

Genetic Analysis of Yield and Yield Attributing Components in Pea

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ISSN : 2158-0006 (Print), 2158-0007 (Online)
http://jag.azjag.org/ 10.21791/jag.v9n1.10865

ABSTRACT

The genetic analysis of pea (*Pisum sativum* L.) was carried out twenty-five germplasm lines under irrigated normal soil condition to determine mode of inheritance of yield and its contributing traits. The experiment was conducted to evaluate in Randomized Block Design (RBD) with three replication at Nidharwa Agriculture Farm S.M.M.Town P.G. College, Ballia, U.P. The data was recorded on twelve characters viz., such as days to 50% germination, days to 50% maturity, plant height, days to maturity, pod length, branches per plant, number of pods per plant, number of seed per plant, biological yield per plant, test weight, harvest index and seed yield per plant. The variation in treatment for all characters was found significant for all the characters. All the 25 genotypes showed vast range of variation for all the 12 characters under investigation. Genotypes such as 725-D, 940-D and ARPANA produced the highest seed yield and several out-yielder genotypes were also observed. The highest amount of the highest seed yield and several out-yielder genotypes were observed for plant height, number of pods per plant and seed yield per plant. The maximum value of heritability (99) was reported for plant height and minimum value of heritability (29) was reported for the pod length while remaining characters expressed the heritability in decreasing order such as pods per plant (97), biological yield per plant (97), seed yield per plant (94), number of branches per plant (85), days to 50% germination (84), harvest index (80), days to 50% flowering (79), test weight (69), days to maturity (64) and number of seed per pod (94). The maximum value of genetic advance in percent of mean was found for the plant height (86.63) and minimum value was found for the days to maturity (5.889). The result revealed that these traits may serve as effective selection attributes for long selection in breeding program for yield improvement.

INTRODUCTION

Pisum sativum L., mean, viability, heritability, genetic advance

INTRODUCTION

Pea (*Pisum sativum* L.) also called "matar" is an important legume vegetable for temperate and sub-tropical regions of the world. Pea is the major pulse crop which contributes the soil improvement either as green manure crop or as cover crop. Botanically pea pods are fruits since they contain seeds and develop from the ovary. Pea (*Pisum sativum* L.) is an annual self-pollinated crop having diploid chromosomes number $2n=2x=14$, cool season or Rabi season crop, belongs to family Leguminosae or fabaceae and sub family is papilionaceae. Pea is a multi-purpose crop consumed in the form of vegetables, salad, soup, chhole, besan, dal etc. It is also being used to make chapatti after mixing with barley or rice. Pea is processed (canned, frozen or dehydrated) for consumption in the off season. In some parts of the world, it is grown for grazing purposes. It has high protein content (20%) and all essential amino acids important for normal activity of living organisms. The seed of the pea may be spherical or round. The germination of the pea is hypogeal fashion and the cotyledon remaining below the soil surface. The pea plant is semi-erect, hollow, slender and succulent stem. Leaves are pinnately compound and each with 1 to 3 pairs of leaflet and terminal branch tendrils. A

pair of leaf-like bracts or stipule is found at the base of petiole of each leaf. The inflorescence is an axillary raceme. The length of pod is 4 to 10 cm, and the shape of pod is inflated to almost cylindrical. Pea has high nutritive value and contains higher protein (20-25%), starch (25-50%), sugar (2-10%), minerals (5%) and water (10-15%) in their seed. Pea is rich in phosphorus and calcium and good source of vitamins like vitamin A and D. Pulse is rich in Lysine but deficient in sulphur containing amino acids like cysteine and methionine. Nutritional value of dry pea grain (%) are higher than the green pea grain. It also plays an important role in nitrogen fixation. Short duration and early varieties of pea have the potential to provide premium returns to the farmers as they can fetch a better price and can be used for multi-cropping. In India, total area under pulses was 146,00 lakh hectares in which area under pea crop occupied 9.45 lakh hectares during 2019. The genetic improvement of crop for quantitative traits requires reliable estimates of genetic variability, heritability and genetic advancement of breeding materials (Dudley and Moll, 1969). In the present study attempt has been made to study the genetics of important quantitative traits including yield.

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**Genetic variability, heritability, genetic advance, correlation
analysis in wheat (*Triticum aestivum* L.)**

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Abstract

The genetic analysis was carried out twenty two germplasm lines under irrigated normal soil condition to determine mode of inheritance of yield and its contributing traits. The experiment was conducted to evaluate in Randomized Block Design (RBD) with three replication at Nidhania Agriculture Farm S.M.M. Town P.G. College, Ballia, U.P. Data were recorded in respect of days to 50% germination, days to 50% flowering, tillers per plant, plant height, flag leaf area, peduncle length, spike length, days to maturity, number of grain per spike, biological yield, 100 seed weight, harvest index and seed yield per plant for their analysis and interpretation to determine the genetic variability, correlation coefficient, heritability and genetic advance analysis. All the 22 genotypes showed vast range of variation for all the 13 characters under consideration. The analysis of variance showed highly significant differences between the treatments for all the characters under study. Genotypes such as New CB, NEW CB- 7, NEW CB- 3 and NEW CB- 45 produce highest seed yield. Thus genotypes can be used as donor parents in breeding programmes and can be beneficial for transferring the desired gene. The highest amount of genotypic and phenotypic coefficients of variation were observed for biological yield per plant, grain yield per plant, followed by harvest index, tillers per plant, peduncle length and number of grain per spike. The heritability in broad sense for thirteen characters studied which ranged from 98% to 52%, maximum for days to 50% germination, followed by days to maturity, biological yield, harvest index, days to 50% flowering, number of grain per spike, peduncle length, grain yield per plant and test weight showed high heritability. Maximum genetic advancement was reported for the trait like harvest index, days to maturity, biological yield, and number of grain per spike. The grain yield per plant exhibited highly significant and positive correlation with tillers per plant, plant height, flag leaf area, and biological yield. The result revealed that these traits may serve as effective selection attributes during selection in breeding program for yield improvement.

Key words: Wheat (*Triticum aestivum* L.), mean, viability, heritability, genetic advance, correlation.

Introduction

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Correlation studies among yield and its components in Indian mustard (*Brassica juncea* L. Czern and Coss)

Nisha Pandey, OP Singh, VN Pathak, Brijesh Singh, DR Singh and Yadavendra Kumar

Abstract

An investigation was undertaken to study correlation and path coefficient analysis for seed yield and its components among 20 genotypes of Indian mustard. The field experiment was conducted under timely sown condition in randomized block design with three replications at Mithauria farm, S.M.M. Town Post Graduate College, Ballia during Rabi season 2017-18. The data were observed on 11 characters viz. days to 50% flowering, number of primary branches, plant height, days to maturity, number of siliques per plant, number of secondary branches, number of seeds per silique, biological yield per plant, test weight, harvest index and seed yield per plant. The seed yield per plant had positive and significant correlation with days to 50% flowering (0.284, 0.256), plant height (0.423, 0.405), test weight (0.590, 0.577) and harvest index (0.749, 0.746) at both genotypic and phenotypic levels. However, it had association with number of seeds per silique (0.278) at genotypic level only. Furthermore, path coefficient analysis of yield contributing characters clearly indicated that harvest index (1.277) showed the highest positive direct effect on seed yield followed by biological yield per plant (0.951), days to maturity (0.1951) and number of secondary branches (0.1430). Observations suggest that these characters served the basis for selection in breeding programme for yield improvement in Indian mustard.

Keywords: *Brassica juncea*, correlation coefficient, path analysis

Introduction

Rapeseed mustard is the third important oilseed crops in the world after soybean (*Glycine max*) and palm oil. Botanically, the genus *Brassica* belongs to *Brassicaceae* family having three elementary species (diploids) with 2n=16, 18 and 20 while other three species are tetraploids including Indian mustard. All rapeseed and mustard crops are grown under wide range of agro-climatic conditions. Indian mustard (*Brassica juncea* L. Czern and Coss) is cultivated throughout the world. It is also cultivated all over India as Major Rabi oilseed crop of northern India. It contains 38 to 42% oil and 24% cake protein.

Indian mustard has some antifungal and antiviral medicinal properties. However, its allyl isothiocyanate is carcinogenic in nature. Mustard oil is used in almost all regions of northern India for cooking and frying due to its pungency liking habits. Industrially, it is used in soap making, grease and scent manufacturing. Oil and meal quality and value added breeding programmes are necessary improvement of rapeseed-mustard. Meal quality is found deteriorated if a high concentration of glucosinolate estimates. *Canola* name is given by Western Canadian Oilseed Association for varieties having less than 2% acid in oil and less than 2 moles of glucosinolate in defatted seed meal. Usually, Indian cultivars have high erucic acid (40-50%) in oil and high glucosinolate (80-120 moles/g) in seed meal which would be needful to minimize it in developing cultivars. Breeding crop varieties tolerant to salt stresses or other stresses are important. Various mechanisms are involved to select suitable most plant types for yield, quality and apply most suitable breeding method to develop modern varieties. It is therefore, essential that germplasm should be chosen on the basis of their phenotypic and genotypic value of quantitative/qualitative traits for suitable breeding strategies in crop improvement. This investigation aimed at knowing the magnitudes of correlation coefficient and path analysis for 11 characters.

Materials and Methods

Twenty strains/varieties were grown in Randomised Block Design (R.B.D.) with 3 replications on dated December 5th 2017. Each treatment was sown in a plot with spacing 3 m V 0.45 m X 0.20 m with recommended packages of practices to raise a good crop.

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Printed on 29.12.2021

S.M.M. Town P.G. College
Ballia (U.P.)



ISSN:0976-4933
Journal of Progressive Science
A Peer-reviewed Research Journal
Vol.12, No.01 & 02, pp 34-38 (2021)

JOURNAL OF PROGRESSIVE SCIENCE, VOL.12, NO.1 & 2, 2021

An assessment of okra (*Abelmoscous esculentus* L.) and Radish (*Raphanus sativus* L.) quality of seed in Ballia district of U.P.

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Abstract

Okra or Bhindi and Radish are important vegetable crops of Ballia district. A number of private and public company sell seeds of these vegetable crops in Ballia market. The different varieties of seeds were collected and tested in the departmental laboratory for knowing about the ratio of healthy and unhealthy categories of seeds. Five varieties of okra and four varieties of radish for zaid cultivation were studied for seed germination, seed viability, disease intensity, period of sprout length and sprout death period on the categories basis and treated and untreated condition. Healthy seeds were superior for all parameters over other categories diseased and treated seed with few reverse observation usually, exhibited poor seed germination, viability etc. A higher disease intensity was observed among diseased seeds. Almost discoloured seeds shown predominance over shrunk one. Seeds were treated by 2 per cent aqueous solution of sodium hypochlorite for five minutes. The conclusion was drawn from the present study that healthy seeds were superior most over discoloured, shrunk and damaged seeds. Usually discoloured exhibited high healthiness over shrunk categories, discoloured and shrunk, if not a genetical attribute, confuse farmers at the time of seed purchase. Seed viability was estimated with one per cent aqueous solution of 2, 3, 5 triphenyl Tetrazolium Chloride.

Key words- Okra, Radish, sodium hypochlorite, seed categories and sprout length.

Introduction

Okra, hindi name Bhindi, a diploid often cross pollinated species (2n=130, chromosome number), an annual important vegetable crop of Kharif and zaid season in India. It is originated in Abyssinia centre; Ethiopia (Vavilove, 1951) and or Hindustan centre; Northern part of India, Pakistan and Myanmar (Zeven and Zhukovasky, 1975). It belongs to family malvaceae. The nutritional value as dietary fibre 12%, vitamin C 38 %, protein 3%, calcium and potassium 8% and magnesium 14% along with sufficient amount of vitamin K on daily basis (USDA report). It has high antioxidant along with lectin protein inhibits cancer cell growth especially breast cancer. India shares approximately 14% of world vegetable production. As per National Horticulture Board 2021-22, Gujarat, West Bengal, Bihar, M.P., Chhattisgarh and U.P. are higher producing states with an average 11.6 Mt. per hectare productivity. India shows 73% of world Okra production followed by Nigeria, Sudan

S.M.M. Town P.G. College
Ballia (U.P.)



ISSN:0976-4933
Journal of Progressive Science
A Peer-reviewed Research Journal
Vol.12, No.01 & 02, pp 24-33 (2021)

Assessment of genetic variability, heritability, genetic advance and relationship of yield and its contributing traits in wheat genotypes (*Triticum aestivum* L.)

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Abstract

Analysis of variance (ANOVA) expresses significance for all characters except spike length and spike weight. The highest mean was observed for days to maturity (107.90) followed by plant height (77.20), days to 50% flowering (73.90) and number of grains per spike (44.70). The estimates of PCV were slightly higher than GCV for all traits. The highest genotypic and phenotypic coefficient of variation was recorded for biological yield per plant, grain yield per plant and number of tillers per plant. High heritability (h^2) coupled with high genetic advance for plant height, biological yield per plant, flag leaf area, grain yield per plant, number of grains per spike, days of 50 % flowering and tillers per plant. The results revealed that these traits may serve as effective selection attributes during selection in the breeding program for yield improvement in wheat. Grain yield per plant was positive and showed a highly significant relation with days to 50 % flowering, tillers per plant, flag leaf area, plant height, days to maturity, biological yield per plant, spike weight and test weight. It revealed that by increasing the value of these traits, grain yield can be drastically increased. Spike length per plant was also significant and can be considered in breeding programs. The highest positive direct effect on grain yield per plant was observed by Biological yield per plant followed by Harvest Index, Days to Maturity and Spike Length, while remaining traits showed negative and direct effect on grain yield per plant. Hence, for the development of high yielding wheat varieties these traits possessing highly significant positive associations should be given more weightage in breeding or selection programme.

Key words: Wheat, (*Triticum aestivum* L), ANOVA, variability, h^2 and genetic advance.

Introduction



Genetic variation, heritability and genetic advance for yield components in Indian mustard [*Brassica juncea* (L) Czern and Coss]

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Abstract

Twenty three variant strains/cultivars of Indian mustard were grown in Ballia (U.P., India) to estimate the presence of genetic variability, GCV and PCV, heritability broad sense and genetic advance. The predominantly often self pollinated Indian mustard gave high significant 'F' test values (ANOVA) for yield and other 11 characters viz. days to 50% flowering, number of primary branches, plant height (cm), days to maturity, number of siliquae per plant, siliqua length (cm), number of secondary branches, seeds per siliqua, biological yield, test weight and harvest index. The highest and lowest mean, range and C.D. were accounted for number of siliquae/plant and test-weight respectively. A slight PCV over GCV was noted for all attributes due to additional values of environmental influence in the expression of corresponding character. Ten characters expressed more than 90 per cent heritability broad sense (h^2_b) which exhibited to assess the extent of the character transmission among coming generations. The magnitude of heritability was influenced by presence of extent of variability between the two generations of population. A high heritability coupling with high genetic advance like siliquae per plant and biological yield would be pertinent attributes to enhance the yield per plant at the time of selection of parents.

Key words: *Brassica juncea* (L.), Genetic variability and Heritability.

Introduction:-

Indian mustard ranks third in production among seven edible oils after soybean and groundnut. It shares about 35% of available vegetable oils followed by groundnut (25%)

Characters Association Studies for Yield Contributing Traits in Indian Mustard (*Brassica juncea*)

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Received 27 August 2019; Accepted 15 October 2019; Published on 15 November 2019

ABSTRACT

Nineteen genotypes of Indian mustard were evaluated during *rabi* 2017-2018 in a Randomized Block Design (RBD) with three replication to study of character association and path analysis. Genotypic correlation coefficient between all characters was higher than phenotypic correlation coefficient indicating strong association among the characters genetically, but phenotypic value is lessened by the significant interaction of environment. Days to 50% flowering, plant height, number of siliqua per plant, biological yield per plant and harvest index had significant and positive association with seed yield per plant at genotypic and phenotypic level respectively. Whereas, number of primary branches was observed significant positive correlation at genotypic level. Path analysis revealed days to 50% flowering, number of primary branches, plant height, number of siliqua per plant, biological yield per plant and harvest index had positive direct effect on seed yield per plant.

Keywords Mustard, *Brassica juncea*, Character association.

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INTRODUCTION

Rapeseed mustard is second most important oil seed crops of our country. Mustard is a member of family *Brassicaceae*, amphidiploid, chromosome number 36. According to ancient scripture and literature, it has been cultivated as early as 5000 BC. The family *Brassicaceae*, contains about 3500 species and 350 genera, is one of the 10 most economically important plant families. Presently rapeseed mustard covers 35.44 million ha with production and productivity of 73.95 metric tones and 2.09 tonnes/ha respectively. In India, the total cultivated area of rapeseed-mustard 6.50 million ha with the production 5.70 metric tons, and productivity 1 tone/ha. The important state of India producing rapeseed and mustard are Rajasthan, Haryana, Madhya Pradesh, Uttar Pradesh and West Bengal. *Brassica* is high in dry matter digestibility in Bengal. *Brassica* which contrasts with good alfalfa, @ 70% 85 to 95% which contrasts with good alfalfa, while the its leaves contain 18 to 25% crude protein, while the root contains about 10% crude protein. Due to their rich nutritional contents, these leaf and root crops have been commonly grown as nutritional fodder for sheep and cattle. The total seed-oil content in Indian mustard varies from 38-46 % and meal or oil cake constitutes nearly 50% of the whole seed. The protein content ranges between 24-30% of the whole seed and 35-40% of the meal (Anand et al. 1976, Singh et al. 2013).

MATERIALS AND METHODS

The experimental consisting 18 genotypes and one check i.e., total 19 treatment were sown in Randomized Block Design with three replications. The

The Pharma Innovation

ISSN: 2582-5033
 P-ISSN: 2582-5033
 E-ISSN: 2582-5033

www.the-pharma-journal.com
 Volume 10, Issue 03, 2021
 Page No. 535-537

Germplasm evaluation, character association and genetic diversity in field pea (*Pisum sativum* L.)

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Abstract

The present investigation was taken to estimate the characters correlation coefficients along with direction and path coefficient analysis with the help of raising 20 variant varieties of field pea at Vidhava farm of S.M.M. Town Post Graduate College, Ballia during *Rabi* season 2017-18. The field experiment was conducted with maintaining principles of experimental designs under timely sown conditions in complete randomized block design with three replications. The data were recorded on eleven characters in complete variation (PCV) values were slightly higher than corresponding genotypic coefficients of variation (GCV) for all attributes revealing small effects of environment in character expression process. Results of correlation coefficients revealed that grain yield had significant and positive associations with pod length (0.580), biological yield per plant (0.700) and test weight (0.484), while, it had a negative but significant association with branches per plant (-0.411). The data for direct and indirect effects were estimated through path coefficient analysis and observed that biological yield per plant (1.301) had highest positive direct effect on seed yield followed by harvest index (0.821), revealing that these characters might be useful during breeding programmes as effective selection attributes for yield improvement in pea.

Keywords: Field pea, *Pisum sativum* (L.), correlation coefficient, path analysis

Introduction

Pea (*Pisum sativum* L.) is a diploid species (2n=14) of family *Fabaceae*. Through in some parts of the world, it is grown for grazing purpose, yet in India it is not only consumed as good source of protein but in a variety of ways. Pea is grown all over the world and is an important pulse crop with varying area and production. In India, area under pea crop was 124.16 lakh hectares with a production of 7.8 lakh tonnes and productivity of 6.28 quintal/ha in 2015-16. Uttar Pradesh is the largest producer in the country followed by Bihar, Haryana, Punjab, etc. It is a high protein (20%) crop with all essential amino acids important for normal activities of living organisms. The fractional composition is also favourable. The most important is it has easily water soluble fibre seed protein (36% to 87%) and green seeds (65% to 82%) along with a series of vitamins, minerals and high fibre content. Immature pods of pea have high level of active lipotropic anti-sclerotic substances like choline and inositol. Being pulse crop it enhances the soil fertility by nitrogen fixation, foliage decomposition, etc.

The major bottlenecks in pulses production in general and pea in particular are negative associations between high production input and sustainable genotypes. Using improved production technology, breeding high yielding disease resistant and suitable plant type which may be highly responsive to inputs and insensitive to light can help to cross the yield barrier. Keeping in view the various shortcomings as well as good attributes in the existing varieties of pea, this investigation was carried out. Eleven characters were taken under the present study for estimates of variability, correlation coefficients and path coefficients analysis. Wright (1921) [17] partitioned the value into cause and effect. It splits the correlation magnitudes into estimates of direct and indirect contribution of each character towards yield along with residual effect as per procedure illustrated by Dewey and Lu (1959) [2].

Materials and Methods

Twenty divergent strains/varieties of pea obtained from different places in the department were grown in *Rabi* 2017-18 using Randomised Block Design (R.B.D.) with 3 replications direct plot December, 2017 at farm of S.M.M. Town P.G. College, Ballia. Each treatment was sown in a plot with distancing of 3 m X 0.30 m X 0.1 m.

Study of path analysis for seed yield and its associated characters in Indian mustard [*Brassica juncea* (L.) Czern and Coss]

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Abstract :- In rabi season 2018-19, 22 strains/cultivars including Varuna of Indian mustard were raised in a randomized block design with three replications for the study of correlation coefficient and path analysis regarding yield and its contributing characters. Analysis of variance (ANOVA) exhibited significant among genotypes for all 12 characters. Number of siliqua per plant, biological yield and harvest-index had a significant positive association with yield. Contrary, days to flower and siliqua-length exhibited negative correlation coefficient at genotypic level with the yield. Path analysis revealed direct, indirect and residual effects as the causation of association among various attributes. The residual effect (R) was estimated -1.086. Biological yield, number of siliqua/plant and harvest index had also positive direct effects for the yield, respectively. Negative correlation coefficients between yield and two characters viz. days to flower and siliqua-length were noted but their direct effects were positive

Key words: Indian mustard, *Brassica juncea*, Correlation coefficient and Path analysis.

Introduction:-

Indian mustard, the most important member of rapeseed mustard group, especially for north Indian population because of liking the oil due to its bitter pungency preferred by them for their kitchen preparations. Indian mustard (*Brassica juncea* L.) which is commonly called *Rai*, *Raya* or *Lahar* is an allopolyploid belongs to family *Brassicaceae* $2n=AB(2n)=36$. Two basic species were involved in natural hybridization and chromosome doubling i.e. *B. campestris* ($2n=AA=20$) X *B. nigra* ($2n=BB=16$) for its evolution. Indian mustard was originated in Middle East due to interspecific hybridization (Prakash, 1980). **Sanjaya** (1976) believed China is secondary centre of origin of Indian mustard from where it reached to India.

Among the rapeseed mustard group, Indian mustard had a lion share (more than 75%) in area and production (Singh, 1993). Due to a high demand of edible oil, India imported 15 million tonnes of edible oil worth approximately 7300 crores INR in 2019 and increased edible oil consumption 19.5 kg/head/year from 15.8 kg to 20.2-21.3 (Jha *et al.*, 2021). The price of 1 litre refined mustard oil varied between 180 - 200 INR in 2021. It is not only today's problem but India has been paying second highest import cost after crude oil and diesel. Yellow revolution was initiated by GOI in 1986-87 to enhance the area, production and

SHORT COMMUNICATIONS

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Breeding and Genetics

Component Analysis of the Factors Determining Grain Yield in Faba Bean (*Vicia faba* L.)

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and Asia were selected. Plots were planted in randomized blocks in triplicate, with four 5m long rows. The rows and plants were spaced 50 and 15 cm apart, respectively. Observations were recorded on 10 randomly selected plants for 10 attributes days to flower, primary branches, plant height, days to maturity, flowers, pods, seeds, and grain yield/plant; 100-seed weight, and seed protein content.

The association between grain yield and its components, and among the components themselves, were computed in terms of genotypic and phenotypic correlation coefficients using genotypic and phenotypic variance and covariance components. These correlations were analyzed by path-coefficient analysis as suggested by Dewey and Lu (1959).

Results and Discussion

Genotypic and phenotypic correlation coefficients between grain yield and the characters contributing to it, and among the characters themselves, are presented in Table 1. Number of primary branches, flowers, seeds, and pods/plant had significantly positive correlations with grain yield. Positive and significant associations were also observed among these attributes. Thus selection for one trait may cause a corresponding increase in other attributes which singly or collectively affect grain yield. Almost similar results were reported by Redondo and Salmeron (1969) and Hebeluck et al. (1982).

Flowers and seeds/plant had direct positive effects on grain yield (Table 2), while primary branches and pods/plant had direct negative effects. Significantly positive correlations of primary branches and pods/plant with grain yield may be due to their indirect effects via seeds/plant and flowers/plant. It is likely that the indirect effects of these two traits nullify the direct positive effect.

The residual value of path ($P_{N1}=0.149$) suggested that some other important agronomic attributes

Abstract
Twenty-four strains of faba bean were grown to determine the extent of the direct and indirect effects of component characters on grain yield. Number of primary branches, flowers, seeds, and pods/plant had significant positive correlations with grain yield. Path analysis showed that flowers and seeds/plant had direct positive effects on yield while primary branches and pods/plant had direct negative effects.

Introduction

Grain yield is a complex character which is determined by a number of component characters. To understand the contribution of each of these characters to the build up of grain yield it is necessary to identify them and study their correlation and causation. Such a study gives information on the importance of each of these attributes which is necessary in deciding upon reliable selection criteria for genetic improvement of yield.

This investigation deals with the extent of the direct and indirect effects of component characters on the expression of grain yield in faba bean.

Materials and Methods

The study was conducted at the University Farm in Kanpur, N. India. Twenty-four strains of faba bean from different geographic regions in Europe, Africa,

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I.G.A.C.
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FABIS Newsletter No. 13, December 1985



Genetic variation, heritability and genetic advance for yield components in Indian mustard [*Brassica juncea* (L) Czern and Coss]

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Abstract

Twenty three variant strains/cultivars of Indian mustard were grown in Ballia (U.P., India) to estimate the presence of genetic variability. GCV and PCV, heritability broad sense and genetic advance. The predominantly often self pollinated Indian mustard gave high significant 'F' test values (ANOVA) for yield and other 11 characters viz. days to 50% flowering, number of primary branches, plant height (cm), days to maturity, number of siliquae per plant, siliqua length (cm), number of secondary branches, seeds per siliqua, biological yield, test weight and harvest index. The highest and lowest mean, range and C.D. were accounted for number of siliquae/plant and test-weight respectively. A slight PCV over GCV was noted for all attributes due to additional values of environmental influence in the expression of corresponding character. Ten characters expressed more than 90 per cent heritability broad sense ($h^2_{b.s.}$) which exhibited to assess the extent of the character transmission among joining generations. The magnitude of heritability was influenced by presence of extent of variability between the two generations of population. A high heritability coupling with high genetic advance like siliquae per plant and biological yield would be prominent attributes to enhance the yield per plant at the time of selection of parents.

Key words: *Brassica juncea* (L.), Genetic variability and Heritability.

Introduction:-

Reprocessed mustard ranks third in production among seven edible oils after soybean and groundnut. It shares about 35% of available vegetable oils followed by groundnut (25%)

NOTE

Listening of Farm Radio Broadcast : Problems and Solutions

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Abstract

Radio is the cheapest communication medium to disseminate the information within a short time with less cost to infinite number of people. Present study was conducted in Kanpur Nagar district of Uttar Pradesh, where 96 wheat growing farmers were selected randomly. This study reveals that highest 85.41% of farmers (respondents/farm radio listeners) did not have time to listen the agricultural or farm radio program regularly; 70.83% of listeners indicated that disturbance created by children was the other problem for not properly listening of farm radio program and they indicated it at second ranking.

Key words : Listening, Farm radio, Respondents, Communication, Time.

Communication plays a vital role in modernization of agriculture. The basic function of mass communication is to transmit information accurately and efficiently with a view to reduce diversities in the action and attitudes of the rural mass. Among the various mass media of communication, radio is one which can be used effectively to reach to the larger number of people with minimum cost amount in a very short time. Krishnamurthy (1) reported that the radio played a major role in the green revolution by giving proper and timely advice to the farmers on improved method of cultivation. The radio has been extremely useful in reaching the people instantly and to post them with up-to-date news and information. Periodical evaluation of farm broadcast is to be taken up for the purpose of knowing the farmers' opinion, knowledge and attitude towards farm broadcast, which helps in improving the content and method of dissemination of modern technologies for rural people (2). In view of the importance of communication through radio, present study was undertaken to identify the problems in listening of farm radio, and their solutions, as perceived by farm radio listeners in respect to wheat cultivation.

The study was conducted in Kanpur Nagar district of Uttar Pradesh during the year 2003. Purposive proportionate stratified random sampling procedure was followed to draw the sample farmers. The

study area comprises 10 CD blocks. Out of these only one block i.e. Bilhaur was selected randomly. This block has 96 villages. For selection of villages, a list of all the villages was prepared and five villages out of this were selected randomly. The sample villages were Kudaure, Kamasan, Baidi Alipur, Gadanpur Chorsia and Anai. Later on respondents were selected on the basis of proportionate sampling procedure. Approximately 2% of respondents were selected from the male population of each selected village (Table 1).

By using the pre-structured interview schedule, the data were collected from selected respondents to assess the problems in listening farm radio programs and to suggest the ways to overcome these problems. Problems chosen were : (1) Lack of time to listen the agricultural programs being broadcasted, (2) radio set's maintenance problem due to costly battery and repairing charge, (3) due to low literacy, most of the scientific agricultural information given on radio are not understandable, (4) disturbances created by children during listening the radio, (5) lack of simple language used in some farm radio programs, (6) the duration of different agricultural programs is not proper, (7) lack of knowledge about proper meter bands and timing of farm radio broadcast and (8) costly package of practices is recommended, which is beyond the reach of the farmers for application.

Table 2 indicates that the maximum number of

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Character's Association Studies for Yield Contributing Traits in Indian Mustard (*Brassica juncea*)

Joohi Ray, O. P. Singh, S. P. Verma*, V. N. Pathak, Brijesh Singh, Chaman Jee

Received 27 August 2019; Accepted 15 November 2019; Published online 15 November 2019

ABSTRACT

Nineteen genotypes of Indian mustard were evaluated during *rabi* 2017-2018 in a Randomized Block Design (RBD) with three replication to study of character association and path analysis. Genotypic correlation coefficient between all characters was higher than phenotypic correlation coefficient indicating strong association among the characters genetically, but phenotypic value is lessened by the significant interaction of environment. Days to 50% flowering, plant height, number of siliqua per plant, biological yield per plant and harvest index had significant and positive association with seed yield per plant at genotypic and phenotypic level respectively. Whereas, number of primary branches was observed significant positive correlation at genotypic level. Path analysis revealed days to 50% flowering, number of primary branches, plant height, number of siliqua per plant, biological yield per plant and harvest index had positive direct effect on seed yield per plant.

Keywords: Mustard, *Brassica juncea*, Character association.

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INTRODUCTION

Rapeseed mustard is second most important oil seed crops of our country. Mustard is a member of family *Brassicaceae*, amphidiploid, chromosome number 2n=36. According to ancient scripture and literature, it has been cultivated as early as 5000 BC. The family *Brassicaceae* contains about 3500 species and 150 genera, 1% of the 10 most economical agricultural plant families. Presently, rapeseed mustard covers 35.44 million ha with production and productivity of 73.95 metric tonnes and 2.09 tonnes/ha respectively in India, the total cultivated area of rapeseed-mustard 6.50 million ha with the production 5.70 metric tons and productivity 1 ton/ha. The important state of India producing rapeseed and mustard are Rajasthan, Haryana, Madhya Pradesh, Uttar Pradesh and West Bengal. *Brassica* is high in dry matter digestibility of 85 to 95% with contrast with good alfalfa. @ 70% its leaves contain 18 to 25% crude protein, while the root contains about 10% crude protein. Due to their rich nutritional contents, these leaf and root crops have been commonly grown as nutritional fodder for sheep and cattle. The total seed-oil content in Indian mustard varies from 38-46% and meal or oil cake contents nearly 50% of the whole seed. The protein content ranges between 24-30% of the whole seed and 35-40% of the meal (Anand et al. 1976, Singh et al. 2013).

MATERIALS AND METHODS

The experiment consisting 18 genotypes and one check in 19 treatment were sown in Randomized Block Design with three replications, etc.

S.M.M. Town P.G. College,
Ballia (U.P.)

Impact of Radio Listening on Knowledge Level of Organised Rural Women

- ◆ Angad Prasad
- ◆ Narahari Singh
- ◆ P.N. Choubey

The existence of a system of mass communication such as radio, television newspaper and similar other media have played a vital role in the daily life of the people. Among the various media of mass communication, radio is one which can be used efficiently to reach large number of people with less cost in a very short time. Taking the importance of radio into consideration for quick delivery of useful information, UNICEF, in collaboration with All India Radio, Department of Social Welfare and Department of Health of State Level made a joint effort and arranged broadcast of radio series on maternal and child health care in different States during 1980s. These programmes are being addressed specially to organized groups of rural women in the area of I.C.D.S. and pregnant lactating mothers in particular. Organised listeners are registered in Anganwadi Centres and directed to listen this programme regularly. The impact of this programme was assessed in the I.C.D.S. area of District Sonbhadra of U.P. to ascertain their listening behaviour and effect on knowledge level during the year 1993 and 1998. The present study was undertaken to assess the impact with the following specific objectives-

1. To assess the change in knowledge of selected aspects of health related to mothers and children.
2. To know the association between level of knowledge of organized listeners in accordance with independent variables--age, education, caste and annual family income.

Methodology:

A well structured and pre-tested schedule was used to collect data in this evaluative study in the year 1993. During the year 1998, with the help of same schedule, data was again collected from the same organized listeners. Purposive.

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Phaubey



Original Research Article

Studies on Genetic Variability, Heritability, Genetic Advance,
Correlation and Path Analysis for Grain Yield and its Contributing Traits
in Indigenous Wheat (*Triticum aestivum* L.)

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ABSTRACT

Keywords
Wheat, <i>Triticum aestivum</i> L., variability, H^2 , correlation and path analysis
Article Info
Accepted: 12 July 2019 Available Online: 11 August 2019

The present investigation was carried out with twenty (with two checks) indigenous genotypes of wheat to study the variability, heritability and genetic advance. The field experiment was conducted under timely sown condition during Khar 2017-18 in randomized block design with three replications at Nidharva Agriculture farm S.M.M. TOWN P.G. College Ballia, U.P. The data were recorded on twelve characters viz. days to 50% flowering, tillers per plant, flag leaf area, plant height, ear length, days to maturity, biological yield, ear weight, number of grains per ear, harvest index, test weight and grain yield per plant. Analysis of variance revealed that the treatments differed significant for all the characters under study except tillers per plant, ear length per plant and ear weight per plant which indicated the material to be of different genetic constitution. The highest values for GCV & PCV were recorded for the character biological yield per plant and grain yield per plant. High heritability along with high genetic advance was obtained for plant height, flag leaf area, biological yield and test weight indicating that traits were under additive gene control and selection for genetic improvement for these traits would be effective. The data showed that the grain yield had significant and positive association with days to 50% flowering (0.423), tillers per plant (0.3039), flag leaf area (0.3252), plant height (0.3459), ear length (0.3891), biological yield per plant (0.6292), ear weight (0.6420), harvest index (0.40040 and test weight (0.5357). Path coefficient analysis revealed that biological yield per plant (0.5356) had the highest positive direct effect on grain yield per plant followed by harvest index (0.3289). The results revealed that these traits may serve as effective selection attribute during selection in breeding program for yield improvement in wheat.

Introduction

Wheat (*Triticum aestivum* L. $2n=42$), a self-pollinated crop of the Gramineae family and genus *Triticum*, is the world's largest famous energy rich cereal crop. Wheat is the second most important cereal staple food crop

consumed nearly 35% of world population and provides 20% food calories. India is the second largest wheat growing country of the world after the China. The world acreage under wheat crop during 2017 - 2018 was 229.67 million hectare with production of 759.75 million tones with an average yield of

ग्रामीण विकास एवं नीतिमयाल उपाययान का दर्शन

बृजेश सिंह

भारत एक विशाल जनसंख्या वाला देश है जिसका एक बहुत बड़ा भाग आज भी गाँवों में निवास करता है। ये लोग आज भी अपनी आजीवनिका के लिए पूर्ण रूप से कृषि पर निर्भर हैं। कृषिगत क्षेत्र में विकास देखें तो भारत की अर्थव्यवस्था का प्रमुख आधार कृषि ही है।

ग्रामीण विकास का अर्थ लोगों का अधिक सुधार और बढ़ती सामाजिक बदलाव देने की है। ग्रामीण विकास कार्यक्रमों में लोगों का बड़ी हुई भागीदारी, योजनाओं को विकेन्द्रीकरण, पूर्ण सुधारों को बेहतर तरीके से लागू करना और ग्राम की आसान उपलब्ध करवाकर लोगों के जीवन को बेहतर बनाने का लक्ष्य होता है। प्रारंभ में, विकास के लिए मुख्य और कृषि, उद्योग, सेवा, शिक्षा, स्वास्थ्य और सामाजिक क्षेत्रों पर दिया गया था। बाद में यह समझने पर कि त्वरित विकास केवल तभी संभव है जब सरकारी प्रयासों के साथ साथ पर्याप्त रूप से जमीनी स्तर पर लोगों की प्रत्यक्ष और अप्रत्यक्ष भागीदारी हो।

वर्तमान में विकास का माहल उच्च विकास के लक्ष्यों को हिसल करने के लिए बनार का पोषण करता है, पर इसमें सरकार अपनी सार्वजनिक/सामाजिक जिम्मेदारियों से बचना कि कोशिश करती है, वर्तमान विकास के माहल में बड़े औद्योगिक घरानों के कर्मों में छूट दे गई, जिसका खासियत कृषि, शिक्षा व स्वास्थ्य जैसे महत्वपूर्ण क्षेत्रों ने भुला। इस क्षेत्र के सरकारी चर्चे में कटौती की गई जिसका असर सबसे अधिक ग्रामीण विकास पर पड़ा। उसके विकास की गति अवरुद्ध हुई है, मानव विकास सूचकांक गिरा है।

हमारे देश की लगभग 70% आबादी गाँव में निवास करती है, सुखी एवं समृद्ध गाँव राष्ट्र के विकास का एक प्रमुख घटक है। उनके आजीवनिका का मुख्य साधन खेती है, कृषि उत्पादन लगातार स्थिर हो गया है तथा कृषकों को अपने कृषि उत्पाद का उचित मूल्य न मिलने एवं उत्पादन लागत बढ़ने के कारण कृषि लाभ का धंधा नहीं रहा। सरकारी आकड़े के अनुसार वर्ष 2016 में 11400 किसानों ने आत्महत्या की है। डॉ. म.एस.स्वामिनारायन कहते हैं यदि कृषकों को विकल्प दिया जाय तो वे तत्काल खेती छोड़ने को तैयार हैं। ग्रामीण जीवनान महज गाँवधुरा, खेता असंशुद्ध ही नहीं बल्कि उनके गाँवों को यदि पढ़ाने की कोशिश करें तो पूरी पीढ़ी में वैकैनी दिखती है। वे बदलाव के पक्षधर हैं, क्योंकि वे बेहतर जीवन चाहते हैं, मगर सवाल यह है कि उन्हें अपनी इच्छाके अनुरूप बेहतर रहन सहन कैसे हासिल होगा? कई लोग इसका वाहक बेहतर शिक्षा को मानते हैं जो न सिर्फ सर्वशुलभ हो गुणवत्ता युक्त हो, इसे सरकार द्वारा मुहैया कराया जाए, शिक्षा निजी हाथों में नहीं होनी चाहिए। युवा सरकारी नौकरी भी चाहते हैं लेकिन वर्तमान में नौकरी के अवसर घटे हैं, जौ.एस.टी. एवं नेटवर्की से पैदा हुई उशल-पुशल ने युवाओं की नौकरी खीन ली है, युवाओं में असंतोष है, अधिक अवसर लगातार घटे हैं।

ग्रामीण भारत के मुख्य आकड़े

- देश में कुल परिवार- 24.47 करोड़
- कुल ग्रामीण परिवार- 17.96 करोड़ (73.41%)
- कुल शहरी परिवार- 6.51 करोड़ (26.59%)
- अभाव ग्रस्त परिवार- 10.71 करोड़
- अभाव की सूचना न देने वाले परिवार- 2.01 करोड़

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$15 + 15 = 30 \times 475 = 1425$. Maria's balance - 1425

Received : 01 November 2014 ; Revised accepted : 16 June 2015

Key words: CMS lines, Cyto-stomix line, GA₃, Hybrid seed production, Manglein, Fico, Yield parameters

10

Find the number of cyto-sterile lines.

Ph.D. Scholar * (ppgphd@gmail.com)

comparative response of four cyto-sterile lines in rice

	Control	T ₂
1	0.00	0.00
2	0.00	0.00
3	0.00	0.00
4	0.00	0.00
5	0.00	0.00
6	0.00	0.00
7	0.00	0.00
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94	0.00	0.00
95	0.00	0.00
96	0.00	0.00
97	0.00	0.00
98	0.00	0.00
99	0.00	0.00
100	0.00	0.00

were prepared as follows:

solution.

prepared.

the out crossing by allowing new

A Study on Out Crossing influencing Mechanisms in Rice

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Abstract—In large scale hybrid rice seed production jobs in china, natural out crossing on male sterile lines has been reported up to 75 per cent with the help of paternal and artificial parameters including growth hormone GA₃. The cultivated rice varieties express limited natural out crossing only up to 1-2 per cent. In the present study an attempt has been made to identify a cheaper alternative of GA₃. Further, the rice germplasm and certain male sterile lines have also been screened for certain suitable floral traits, which may also influence the out crossing. The growth hormones along with suitable floral traits can together enhance out crossing of the cyto-sterile lines significantly. In the present study the effects of 25 treatments were

evaluated on Cyto-Sterile line i.e., IR 58075 A/R. Based on this experiment another experiment was planned to evaluate four selected treatments 60 ppm GA₃, 40 ppm GA₃, 60 ppm Mangiferin and 40 ppm Mangiferin on four cyto-sterile line viz., IR 58075A, PMS 24, PMS 34 and PMS 10A. It was observed that number of treatments scored much higher values than control line the characters like duration of florets opening, angle of opened florets and some other out crossing influencing traits. The study also helped in identification of mangiferin as cheaper alternative of GA₃.

Index terms—Out crossing, Rice, GA₃, Mangiferin, Hybrid seed production.

1. INTRODUCTION

Low out crossing of CMS lines in rice is one of the major problems for low seed set in hybrid seed production plots. A cyto-sterile line with high out crossing potential will economize the cost of hybrid seed including male sterile line (parental line) seed production. Male sterility is most important trait to influence out crossing. Male fertile plant show very little or no out crossing due to self pollinating nature of rice flower. However in male sterile plants, extent of out crossing is further influenced by its floral trait. A wide range (0-44%) of natural out crossing has been observed in male sterile plants/lines (Stansel and Cragmiles, 1966; Ahwal and Virmani, 1972; Czehan *et al.*, 1972; Azzini and Rutger, 1987). Xu and Li (1988) reported out crossing rates ranging

from 14.6 to 53.1% in various experiments conducted at Changshu, Hunan, China. Variability in extent of natural out crossing in male and female lines of rice can be attributed to variations in flowering behavior, floral characteristics of male sterile and pollen parents, and variations in environmental factors. Growth hormones like GA₃ are known to influence floral traits and out crossing. Some recent studies have indicated Mangiferin as cheaper alternative of GA₃ (Singh and Sahoo, 1997 & 1998). The aim of present experiment was to establish the effectiveness of Mangiferin as new growth hormone and cheaper alternative of GA₃ by testing its performance over number of cyto-sterile lines and identifying certain floral traits which can influence out crossing.

II. MATERIALS AND METHOD

Experiments were conducted during 2011-13 to evaluate the treatments and understand the flowering behavior of male sterile lines influencing

out crossing of cyto-sterile lines in rice. This experiment comprised of twenty five treatments (Table 1), which included GA₃, glycine, boric acid,



Genetic architecture of yield and its components in wheat (*Triticum aestivum* L.)

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Abstract

The genetic analysis of wheat (*Triticum aestivum* L.) was carried out twenty three wheat germplasm and two released wheat variety under irrigated normal soil condition to determine mode of inheritance of yield and its contributing traits. The data was recorded on twelve characters viz., such as days to 50% flowering, flag leaf area, plant height, tiller per plant, spike length per plant, number of seed per spike, days to maturity, biological yield per plant, harvest index (%), 1000 grain weight(g.) and grain yield per plant(g.). The variation due to treatments was significant for all the characters. All the 25 genotypes showed vast range of variation for all the 11 characters under consideration. Genotypes such as HRWYT-31 produced highest grain yield per plant followed by STEMRRSN-6108, HD-2967 and PBW-502 these four genotypes significantly out yielded genotypes. The maximum heritability of was recorded for biological yield per plant, grain yield per plant, harvest index, number of seed per spike, flag leaf area, plant height and tiller per plant. Heritability estimates indicating for chance for selection of better genotypes with respect to these characters. Grain yield per plant showed positive and highly significant correlation with tiller per plant and biological yield per plant.

Key words- Wheat, variability, heritability, genetic advance and correlation

Introduction

The many species of wheat together make up the genus *Triticum*; the most widely grown is common wheat (*Triticum aestivum* L.) is the world's leading cereal grain and main food crop for people over the entire world. Wheat occupying commanding position in Indian agriculture which occupies 25 percent of area under cereals and contributing 36 percent of the total food grain production in the country. India is second largest producer of wheat in the word after China. Wheat is the second most important food crop of the country after rice. Global demand for wheat is increasing due to the

Genetic Analysis of Grain Yield and its Components in Pearl Millet

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<http://dx.doi.org/10.22207/JPAAM.11.1.66>
(Received: 13 October 2016; accepted: 19 December 2016)

The genetic analysis was carried out to determine mode of inheritance of yield and its contributing trait under two environments in irrigated and rainfed conditions. The study was undertaken with the help of six generations P_1 , P_2 , F_1 , F_2 , B_1 and B_2 in three environments Varanasi (Irrigated) [E_1] and Mirzapur (Rainfed) [E_2] using six generations. Simple additive-dominance model failed to explain the genetic variation of most of the characters. The estimates for mean and dominance were reduced in Rainfed environment of Mirzapur, though all type of digenic interactions were prevalent in Irrigated environment. Dominance gene effects with duplicate epistasis were pronounced. It is suggested that cyclic breeding particularly reciprocal recurrent selections should be practised to improve yield and its attribute traits in Pearl millet rather than going only for simple selections methods.

Keywords: Pearl millet, Rainfed, Irrigated, Generation Mean Analysis, Genetics.

Pearl millet (*Pennisetum typhoides* (Burm) Stapf and C.E. Hubbard) is one of the important crops of semi-arid tropical regions of Asia, Africa, and America supplying food and fodder under the most trying farming conditions. It is particularly adaptable to nutrient-poor soil and low rainfed conditions, yet it is capable of rapid and vigour growth under favourable conditions (Maiti and Siddiqui, 1981). This is crop is grown primarily for grain production on 26 million ha in the arid tropical region of Asia and Africa (Rai *et al.* 2007) but in USA and Europe, it is mainly grown as fodder crop (Pechman and Borthakur, 1969). In India, it is cultivated in 7.95 million hectare with an annual production of 8.80 million tonnes (Annual Report of Government of India, Ministry of Agriculture, 2013-14). Nevertheless, not only the productivity remained low (1.38 q/ha) but also there are wide

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year to year fluctuations in terms of production and productivity. Therefore, yield improvement of varieties particularly under rainfed situation is of paramount importance. Genetic variability for yield and its component traits is the key component of the breeding programme for broadening gene pool of crops. However, genetic variability for many traits is limited in germplasm (Sahu *et al.* 2009). The overall performance of a genotype may vary due to changes in the environment, and if the heritability for the traits is higher, the selection process will be simpler and response to selection will be greater (Govindaraj *et al.* 2010; Lark *et al.* 1997 & 2000; Singh and Sagar 1989 & 2001; Socorro *et al.* 2008).

The genetic improvement of crops for quantitative traits requires reliable estimates of genetic variability, heritability and genetic advancement of breeding materials (Dudley and Moll, 1969; Iqbal *et al.* 2006; Chand *et al.* 2008; Govindaraj *et al.* 2010). The information on variability and heritability of characters is essential



Status of biotechnological approach to improve faba bean (*Vicia faba* L.) seed yield and quality

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Abstract

Faba bean (*Vicia faba* L.) can be grown in profitable manner under temperate condition (European countries), tropical countries (African Sub-Saharan countries) and hot arid (Middle East countries) than other crops. It is such wonderful legumes which can excel even under adverse soil conditions be it acidic or saline alkaline (pH 4.5 to 8.5-9.0). In India it is still treated as minor legume. Lack of suitable cultivar can be easily overcome by application of modern tools and techniques. Several in-vitro techniques would very useful for faba bean breeding. By means of protoplast fusion and regeneration or by embryo-rescue assisted interspecific crossing, e.g. resistance to black aphid, as occurring in the related species *Vicia johannis*, could probably be introduced to *Vicia faba* L. Still, these techniques are not yet available for faba bean. The same is true for any approach to produce doubled haploid lines. Genetic transformation based on Agrobacteria is possible. Several RAPD markers linked to a gene determining hypersensitive resistance to race 1 of the rust (*Uromyces viciae-fabae*) have been reported. Molecular breeding for resistance to broomrape, ascochyta blight, rust and chocolate spot have been obtained. The use of marker assisted selection (MAS) can complement conventional field breeding by speeding up the selection of desirable traits and increasing selection efficiency. Recently, markers linked to a gene controlling growth habit or to select against traits affecting the nutritional value of seeds (tannins, vicine and convicine content) have also been reported. This review examine the role various technique with reference to faba bean improvement.

Keywords- Faba bean, grain quality, resistance breeding, biotic and abiotic stresses, nitrogen fixation, zero tannin faba

Introduction

Faba bean (*Vicia faba* L.) is among the oldest crops in the world. Globally, it is third most important feed grain legume after soybean (*Glycine max*) and pea (*Pisum sativum* L.). According to FAO, presently it is grown in 58 countries. Probably one of the best performing crops under global warming and climate change scenario because of its unique ability to excel under all most all type of climatic conditions coupled with its wide adaptability to range of soil environment make it strongest contender to be "king of crop". Being so incredible crop, serving human society with potential, unfortunately in

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Review

Improvement of faba bean (*Vicia faba* L.) yield and quality through biotechnological approach: A review

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Accepted 28 August, 2012

Faba bean (*Vicia faba* L.), an old world grain legume, is grown approximately in 3 mha area world-wide from temperate, tropical to hot arid conditions. It is such a wonderful legume that it can excel even under adverse soil conditions; acidic or saline alkaline (pH 4.5 to 9.0). In favourable conditions, it gives very high yields, but low yield may result from biotic and abiotic stress. In India, it is still treated as minor legume. Genetic transformation based on *Agrobacterium* is possible. Several random amplified polymorphic DNA (RAPD) markers linked to a gene determining hypersensitive resistance to race 1 of the rust (*Uromyces viciae-fabae*) have been reported. Molecular breeding for resistance to broomrape, *Ascochyta blight*, rust, and chocolate spot have been obtained. The use of marker assisted selection (MAS) can complement conventional breeding by speeding up the selection of desirable traits and increasing selection efficiency. Recently, markers linked to a gene controlling growth habit or to select against traits affecting the nutritional value of seeds have also been reported. Lack of suitable cultivar can be easily overcome by application of modern tools and techniques. Several *in-vitro* techniques would be very useful for faba bean breeding. New techniques such as protoplast fusion, regeneration, and embryo-rescue, assisted interspecific crossing could probably be introduced to *V. faba* L. to improve yield and quality. This review work examines the role of various techniques with reference to faba bean improvement.

Key words: *Vicia faba*, faba bean, grain quality, resistance breeding, nitrogen fixation, zero tannin.

INTRODUCTION

Faba bean is one of the oldest crops in the world. Globally, it is the third most important feed grain legume after soybean (*Glycine max*) and pea (*Pisum sativum* L.) according to Food and Agriculture Organization (FAO). Presently, it is grown in 58 countries. Despite the

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Abbreviations: RAPD, Random amplified polymorphic DNA, MAS, marker assisted selection, QTLs, quantitative trait loci, ISSR, inter-simple sequence repeat, GUS, β -glucuronidase, GFP, green fluorescent protein, EST, expressed sequence tags, DAP, days after anthesis, CAPS, cleaved amplified polymorphic sites, SCAR, sequence characterized amplified region, the LTR, transposable element, NBS, nucleotide binding site, LTR, transposable element repeat.

incredibility of the crop with its potential of serving the human society in India, it is categorized as minor underutilized, less utilized and not fully exploited (FAOSTAT, 2009). Nitrogen fixed by faba bean results in increased residual soil nitrogen for subsequent crops. It can also be used as green manure which has potential to fix free nitrogen at 150 to 300 kg N ha⁻¹. Faba bean is seen as an agronomically viable alternative to cereal grains. It is a good source of lysine rich protein as well as levodopa (L-3,4-dihydroxyphenylalanine (L-dopa)) used as medicine for the treatment of Parkinson's disease. It is also a naturalistic agent which might help in controlling hypertension. Persons consuming faba bean may suffer from favism (type of anemia) if they lack an enzyme called glucose-6-phosphate dehydrogenase (G6PD). Varieties containing zero tannin are now

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Correlation, Cysto-sterile line, Genetic advance, Heritability, Rice

Introduction

Plant biology of CMS lines is important for out-crossing seed setting in hybrid seed production. Information on the correlation among the floral traits, heritability and genetic distance is essential for effective selection. One of the major problems of low seed set in hybrid seed production plot is "very low out crossing" of CMS lines in a two-parental line with high out crossing potential will greatly economize the cost of hybrid seed production. The important floral traits influencing out crossing is male sterility in rice (Virmann, 1996). Male fertile plant shows sterile, if any out crossing due to self pollinating nature of flower. However in male sterile plants, extent of out crossing is further influenced by its floral traits which are pollen and exertion, duration of floret opening, anther pollen density per unit area, filament length and anthesis of spikelet blooming have been reported by Paul (1994).

Materials and Methods

Cyto-sterile lines and their maintainers, possessing 'Machane' (WA) type of cytoplasm, collected from Directorate of Rice Research, Rajendra Nagar, Hyderabad and NDUAT, Kurnalganj, Faizabad (U.P.), and the materials for the present studies. The cyto-sterile lines and their maintainers were grown in Block Design with three replications during 2009 and 2010 in three meter rows and twenty cent apart. Plant to plant distance within the rows was 25 cm. Cyto-sterile (A) and Maintainers lines were transplanted in 4:2 ratios. Recommended practices were adopted to raise a good crop. The following characters were recorded: number of opening of florets (mm), angle of opened florets (degree), percentage of stigma exsertion, percentage of stigma length (mm), anther length (mm), anther breadth (mm), filament length (mm), filament length (mm), stigma length (mm), stigma surface area (mm²).

and style length were recorded. Heritability estimates were worked out by using the formula suggested by Lush (1949) and Burton and De Vance (1953) and Genetic Advance as suggested by Lush (1949) and Johnson, Robinson and Comstock (1995a). The variability and correlation studies were performed as per by Panse and Subbarne (1954).

3. Results and Discussion

Ten cyto-sterile lines having 'WA' cytoplasm and their respective maintainers for thirteen floral traits viz. duration of blooming, angle of opened florets, percentage of panicle exertion, percentage of stigma exertion, stigma length (mm), stigma breadth (mm), stigma surface (mm²), style length (mm), anther length (mm), anther breadth (mm), anther size (mm³), filament length (mm) and filament length after elongation (mm) were studied for different variability parameters such as mean, range, variance and coefficient of variation. Analysis of variance recorded highly significant treatment difference for all the traits indicating presence of variability for selection. Some of the most important floral traits viz. duration of opening of florets, angle of opened florets, percentage of stigma exertion, percentage of panicle exertion influencing out crossing substantially were predominant in cyto-sterile lines PMS2A/B, PMS6A/B, PMS7A/B, IR58025A/B and IR62829A/B. On the basis of predominance in cyto-sterile lines IR62829A/B expressed variability studies, cyto-sterile line IR62829A/B expressed overall best values for stigma characteristics (stigma exertion percentage, stigma length and stigma surface) followed by PMS3A/B, PMS10A/B and PMS2A/B. The most outstanding line IR58025A showed poor sigma characteristics as compared to other cyto-sterile lines. However, it possessed pronounced anther characteristics. For anther characteristics (anther length and filament length after elongation) cyto-sterile line PMS3A/B, PMS10A/B, PMS2A/B, IR62829A/B and NMS 1A/B were having floral traits contributing substantially to out crossing (Table 1).

Studies of genetic variability, heritability and genetic advance for yield contributing traits in field pea (*Pisum sativum* L.)

VN Pathak, Ravi Kant Pandey, SP Verma, Jeehi Ray, Brijesh Singh and Chaman Jee

Abstract

Twenty-nine diverse genotypes of field pea were evaluated at agricultural research farm, S.M.M. Town Post Graduate College, Ballia during Rabi 2015-2016 in a randomized block design (RBD) with three replication to study of genetic variability, heritability, genetic advance recorded on five randomly selected plants for nine characters. Analysis of variance (ANOVA) revealed significant for all characters. The highest mean value was observed for test weight (149.4g) followed by days to maturity (97.35) and plant height (82.92). The estimates of phenotypic coefficients of variation (PCV) were slightly higher than genotypic coefficients of variation (GCV) for maximum traits. Highest genotypic coefficient of variance (GCV) and phenotypic coefficient of variance (PCV) for maximum traits. Highest advance for pods per plant followed by number of seeds per plant. High heritability coupled with high genetic number of seeds per plant (97.20). The results revealed that these traits may serve as effective selection attribute during selection in breeding program for yield improvement in wheat.

Keywords: Pea (*Pisum sativum* L.), ANOVA, F_1 , genetic advance.

Introduction

Field pea (*Pisum sativum* L., var. *arvense*) is one of the most important pulse crops of India. It grows in winter season and belongs to tribe- Viciae, order-Fabales, family-Leguminosae (Fabaceae), sub-family-Papilionaceae, genus-*Pisum* and species-*sativum* having chromosomes, $2n = 2x = 14$. The origin of field pea was, probably, western Asia. Pea is one of the most important rabi season pulse crops cultivated mainly in U.P., M.P., Bihar, Rajasthan, Odessa, Maharashtra. As per FAO report, India is one of the largest producers of field pea in the world and stands at the fifth place. Yet, it had only seven percent of world production that is 7.8 lakh tonnes. In India, U.P. is the highest producer of the pea accounted 60 per cent of the country production. The area, production and productivity of Ballia district in 2015-16 was 973 ha, 887 metric tonnes and 9.12 q/ha, respectively. (District Agriculture office information).

Field pea is rich in high quality protein and also good source of phosphorus, calcium and vitamins specifically vitamin A and D. Peas are highly nutritive having high percentage of protein (6.2g/100g of fresh weight) and carbohydrates (16.9g/100g of fresh weight) along with essential minerals, vitamins A, B and C (Mukeshya, 1983) ¹ and provide a major portion of the nutritive proteins to the poor masses, majority of which are vegetarian. The development of an intensive breeding and improvement program needs detailed biological information and an understanding of genetic variation for yield and its components. There must be a thorough knowledge of the existence of genetic variability, the mode of inheritance of economic characters, heritability, the kind of gene action and the relative magnitude of additive, dominance and total genotypic and phenotypic variance of the population. Considering the availability of genetic variability, there is scope of yield and quality improvement and there by develop export potential of field peas. Hence the present investigation is carried out for various economic traits and to measure the extent of variability, heritability, genetic advance and their genetic makeup in field peas.

Materials and Methods

The experiment of present investigation was conducted to evaluate the twenty-nine diverse field pea germplasm in Randomized Block Design at Agricultural Research Farm, Subharti, S.M.M. Town Post Graduate College, Ballia (U.P.).

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Chromium effect on oil yield of Palmarosa (*Cymbopogon martinii* Link.) intercropping of vegetable

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(Received on August 15, 2004)

Summary

The field experiment was conducted with six levels of Cr (0, 4, 10, 20, 40 and 80 mg Cr. kg⁻¹ soil) with palmarosa (*Cymbopogon martinii* L.) and intercropping of some vegetables crop in alluvial soils of Varanasi (India). The experiment was applied with FYM as K₂Cr₂O₇ before the transplanting of rooted slips. The plant height and No. of tillers was recorded at 30, 60, 90 and 120 DAT. The yield (transplanting) while herbage and oil yield was recorded at 120 DAT. The herbage yield, oil yield, plant height and No. of tillers including vegetable crops in palmarosa grown field were significantly increased up to 20 mg/kg of Cr among the doses without injury on vegetative parts of plant.

Key words : Chromium; Yield; Palmarosa; Intercropping Vegetable oil.

The discharge of untreated industrial effluent is the most significant aids of pollution for aquatic and non-aquatic land (Baker and Chesnin, 1975) and enriched so many heavy metals in that environment. In such situations cultivation of high value crop like aromatic and medicinally important plant may be a good alternative to farmers and environment Palmarosa (*Cymbopogon martinii* var. Mollia S.) is a multiharvest perennial aromatic grass, which contains geraniol, which find extensive use in flavoring, perfumery.

cosmetics (Singh, 2000) industries pharmaceutical etc. India ranks the countries producing palmarosa (Singh et al., 1993) and it is a supplier to the world market. The community of heavy metals is subjected to change in its valency oxidation as influenced by the matter and soil reaction (Kumar et al., 1998) In view of the above experiment was conducted to study effect of application of Cr in soil herbage and oil yield of palmarosa

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Research Note:

Influence of Neem Products on Urease Activity, Urea Transformation in Soils and Wheat Yield

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Experiment was conducted involving four neem (*Azadirachta indica*) products (Neem oil, Neem cake, Nimco and Nid) as a coating material for prilled urea in three types of soil with wheat as a test crop to study the urea transformation, urease activity and nitrogen use efficiency. Higher concentration of NH_4^+-N was recorded in prilled treatment than other treatments of neem products at tillering stage, however, concentration of NH_4^+-N decreased during and harvesting stage of crop. There was slow transformation of NO_3^--N due to neem (products) coated prills and neem oil proved superior than other products. The urease activity was significantly lower in treatments having neem products as compared to prilled urea. Neem oil coating has shown its superiority in enhancing the N-use efficiency, grain yield, N-concentration in grain of wheat crop in all the soils.

OF NITROGEN AS AMMONIA FROM The neem cake (NC) @ 20 % of urea (cake was treated with acetone 25 ml 100 g cake) and then adding the required amount (20 % by weight of urea) powdered neem cake and mixing the contents of beaker thoroughly (6), neem oil (NO) @ 1% w/w of urea, Nimco® @ 2% and Nimagold® (NG) 1% w/w of urea, neem cake powder had 5.2% N, neem oil (not analysed), Nimagold 6.2% and Nimco 6.1% N. Ten kg of air dried soil (<2mm) was taken in earthen pots. There were 15 treatments under factorial experiment (RBD) with three replications. The required quantity of prilled urea (120 mg kg^{-1} soil) as per treatment were added. Phosphorus and potassium were applied @ 80 mg kg^{-1} soil through single superphosphate and muriate of potash, respectively. Ten seeds of HUW-234, a wheat variety, were sown at 5 hills in each pot and after the germination of seeds, 5 plants were maintained in each pot. Irrigation was done as per need of crop. Soil sample was analysed for NH_4^+-N , NO_3^--N and urease activity at tillering, i.e. 55 DAS (days after sowing), booting (65 DAS) and harvesting (110 DAS) stages of crop. NH_4^+-N was determined by 2M KCl extraction indophenol blue method (7), NO_3^--N by phenol di sulphonic acid method (8) and amide-N by colorimetric method of 2M KCl-PMA extraction (9).

RESULTS AND METHODS

HOUSE EXPERIMENT WAS conducted at Banaras Hindu University, Varanasi. For this study, surface soils (0-15 cm) were collected from a rainfed field (Aflisoil) of a Farm, (Mirzapur), Chakia (Aflisoil), a paddy-wheat crop, and Agricultural Farm of Institute of Soil and Agricultural Sciences (Inceptisol) within campus of the University. The soils were free from undecomposed residues and pebbles, etc.

urease activity by colorimetric method of remaining urea estimation (10). The nitrogen use efficiency of wheat was also calculated. The results were expressed on the basis of oven dry weight of soil. The data was statistically analysed to judge the significance of treatment difference at 5 % level of significance as described (11).

RESULTS AND DISCUSSIONS

NH_4^+-N , NO_3^--N and Remaining Amide-N

The effect of neem products on NH_4^+-N at three growth stages of wheat in S_1 , S_2 and S_3 was statistically significant over control (Table 2). Among the soils, lower NH_4^+-N was observed in S_3 (neem cake and Nimco) and S_2 (neem oil) at tillering stage (35 DAS). It indicates that neem products retarded the hydrolysis of urea (12) because these products create a physical barrier around urea granules. Researchers also claim that neem products contain azadirachtin, an organic compounds which may inhibit the microbial activity. NH_4^+-N concentration was highest at tillering stage and thereafter declined due to nitrification irrespective of soils, however, neem products had higher NH_4^+-N than control (Table 2). The efficiency of neem oil coating was higher followed by Nimco, Nimagold and neem cake in different soils towards regulation

[Signature]

Research Note: Influence of Different Nutrient Sources on Nodulation Growth and Yield of Chickpea

In a pot experiment conducted during November to February, 2006 with chickpea as test crop, application of pressmud @ 10 t ha⁻¹ with DAP @ 100 kg ha⁻¹ significantly increased plant height, nodule and pod numbers/pot, leaf-chlorophyll, grain-protein and grain yield over control and found to be superior than other treatments comprising of pressmud/sawdust/compost/sludge @ 5 or 10 t ha⁻¹ with DAP @ 100 kg ha⁻¹, whereas sawdust treatments decreased pH and bulk density of post-harvest soil. Despite increase in nodule-Fe and Mn by sludge application, it did not reflect on yield parameters of chickpea.

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THE INDISCRIMINATE USE OF COSTLY chemical fertilisers in agriculture has been found to develop nutritional imbalance in soil-plant system (1), environmental hazards viz. water pollution, soil humus reduction, disturbance of atmospheric composition, reduced root nodulation and mycorrhizal association. Chickpea is an important pulse crop and is invariably used for different purposes in different forms, however, its productivity is reported to be declining due to disturbed rhizosphere wherein soil organic carbon (2) and thereby better microbial activity and soil properties (3). But the beneficial effect of organic sources depends on their decomposability, C:N ratio and consequently the nutrient supplying capacity to plants and microbes. Through present investigation, an attempt has been made to quantify the response of two levels (5 and 10 t ha⁻¹) organic sources (pressmud, sawdust, compost and sludge) applied with DAP @ 100 kg ha⁻¹ on nodulation, leaf-chlorophyll, yield and yield attributes of chickpea in Indo-Gangetic soils of Varanasi, Uttar Pradesh.

content were analysed and straw yield was harvested of plants from ground and digested at the determination of N (crude protein = grain/harvest soil) was analysed density and organic content.

RESULTS AND DISCUSSION

Nodulation, Plant height and chlorophyll

Sludge, pressmud, compost and sawdust with DAP @ 100 kg ha⁻¹ significantly increased nodule over control. In pressmud and sawdust DAP produced maximum nodules. However, difference in T₀ treatment less in T₀ treatment response to organic materials. Comparative case in terms of release of nutrients by microbes) responsible for nodulation. Nodule-free materials. Nodule-free maximum with T₀ and respectively (Table 1).

Leaf chlorophyll was estimated with the help of chlorophyll analyzer model Manalita SPAD-502. Plants uprooted from one replication were kept under a gentle stream of water and the adhering soil particles were dislodged and nodules were separated and counted. The dried nodules were acid digested and their Fe and Mn

MATERIALS AND METHODS

A POT EXPERIMENT WAS CARRIED OUT in Rabi (November-February) of 2006 at Institute of Agricultural Sciences, Banaras

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ISSN:0976-4933
Journal of Progressive Science
A Peer-reviewed Research Journal
Vol.12, No.01 & 02, pp 14-18 (2021)

**Correlates of the certain independent variables of
Dairy farmers towards training need assessment in Banda district of
Bundelkhand Region, Uttar Pradesh**

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Abstract

The study was carried out to identify the correlates of certain independent variables of Dairy farmers towards Training Needs of dairy farmers in Banda District. The sample size of 160 dairy farmers was randomly selected for the study and data were collected through personal interview method during 2019-20. Multi stage random sampling technique was adopted for the study with the Ex-Post Facto research design. Banda consists of eight blocks, out of which two blocks were selected randomly viz. Badokhar Khurd and Tindwari. From the selected blocks four villages were selected randomly from each and 20 Dairy farmers selected from each selected village. The study further revealed that among Ten independent variables viz. Age, Education, Caste, Land Holding, Occupation, Annual Income, Social participation, Training Undergone, Mass media Utilization and Total Heard Size where seven variables show the positive significant relationship at 1 per cent level and two variables shows negative significant relationship at 1 per cent level of probability respectively. The results of the study will help the extension agencies & Research Scholars to understand the correlations between the selected variables, which ultimately leads to develop suitable training modules for the dairy farmers for increasing the livestock productivity and improving the living standards of the farmers & better insights & understanding respectively.

Key words: Training Need Assessment, Dairy Farmers, Variables, correlation


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ISSN:0976-4933
Journal of Progressive Science
A Peer-reviewed Research Journal
Vol.12, No.01 & 02, pp 9-13 (2021)

Extent of adoption of tomato cultivation technology among the farmers of Varanasi district (Uttar Pradesh)

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Abstract

Knowledge plays an important role in the field of agricultural development by informing the farmers about new technique in tomato crop. It helps to narrow the gap between research result and their application by the farmers. A stage has come where one can not apply yesterday's methods today and be in business tomorrow. Adoption behaviour of respondents was studied in regard to improved chickpea production technology. It was observed that majority of the tomato growers had 54 per cent respondents belong to low level of adoption group.

Key words- Technique, business, informing

Introduction

Agriculture is the milestone in the history of human civilization. Due to agriculture man settled at a particular place. Agriculture is one of the oldest and prime activities of the human being. It has remained an important source of land. In spite of growing industrialization and urbanization in the world, nearly fifty per cent working population is still engaged in agriculture. In developing countries agriculture sector has been a major source of employment and it has contributed to the national economy. Tomato (*Lycopersicon esculentum* Mill.) belongs to the genus Solanum under Solanaceae family ($2n=2x=24$). Origin: South America, Edible part: Fruit. It is also called "Poor man's Orange" India, "Love of apple" England, self-pollinated (chasmogamy), another dehiscence longitudinally, in florescences: forked racemose cyme, book "tomato" Kallo (1986) father of tomato in India, father of tomato breeding Rick It's Common names are tomato (Spain, France), tomat (Indonesia), faanke'e (chine), litomate (Mexico), Pomodoro (Italy). Tomato is one of the most popular and widely grown vegetable in world. Its many forms are adapted to wide range of soils and climate. Tomato is one of the most important vegetable worldwide. World tomato production in 2018 was about 182.5 million tons of fresh fruit from an estimated 3.9 million ha. It is relatively a short duration crop and gives a high yield it is economically attractive and its area under cultivation is increasing. Vegetables are grown in India since thousands of years but now-a-days, it has become an important enterprise at National and International level. In recent years, the vegetable has become an essential requirement of the daily human diet, because of its nutritional value. Regular use of vegetable provides us most of the essential health building



ISSN:0976-4933

Journal of Progressive Science

A Peer-reviewed Research Journal

Vol.12, No.01 & 02, pp 39-42 (2021)

A study on constraints perceived by Dairy Farmers of Banda district in Bundelkhand Region

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Abstract

The study was carried out to identify the constraints perceived by dairy farmers in Banda District. The sample size of 160 dairy farmers was randomly selected for the study and data were collected through personal interview method during 2019-20. Multi stage random sampling technique was adopted for the study with the Ex-Post Facto research design. Banda consists of eight blocks, out of which two blocks were selected randomly viz. Badokhar Khurd & Tindwari. From the selected blocks, four villages were selected randomly from each and 20 Dairy farmers selected from each selected village. Study reveals that about 90 percent respondents believed, location of veterinary health centers as the major constraints which is followed by lack of knowledge about balanced feeding is another major (81.45%). Other major constraints were high cost disease treatment and lack of knowledge about scientific dairy management in the study area.

Introduction

Milk production in India, is by far the domain of small farmers in a mixed farming system. To maximize the production and thereby profit, the farmer depends on his limited resources available viz., inputs, potential of the animal and feed quality. As per reports of GoUP (2014-15), among the Bundelkhand districts, Banda and Jaluan are leading in milk production. But studies show the possible reason behind this is higher population of buffaloes and cross-bred cattle. Milk Productivity is comparatively low in Banda District. In spite of increase in number of milch animals and total milk production over the years, productivity of milch animals is not very encouraging in the state. To enhance the production potential of milch animals the possible ways are to make availability of developed technologies for mass adoption, to create the required infrastructural facilities vital for adoption and to minimise the constraints. According to Oxford dictionary, Constraint is a thing that limits or restricts something. The constraints perceived by the dairy farmers should be taken into consideration while formulation of strategies for upliftment of dairy farming in the state. Scientific

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ISSN:0976-4933
Journal of Progressive Science
A Peer-reviewed Research Journal
Vol.12, No.01 & 02, pp 19-23 (2021)

Training need assessment of dairy farmers of Banda district in Bundelkhand Region

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Abstract

Information plays an important role in technology adoption and behaviour change. This may be particularly true for practices and decisions in Dairy Farming, which affect farmer's income and animal's health. Proper Training is the key for precise information and skill delivery to Dairy Farmers which ultimately leads to better milk productivity and enhancement in livelihood of specific rural area. This research was an effort to assess the training needs of Dairy Farmers of Banda District in Bundelkhand region. The sample size of 160 dairy farmers was randomly selected for the study and data were collected through personal interview method during 2019-20. Multi stage random sampling technique was adopted for the study with the Ex-Post Facto research design. Banda consists of eight blocks, out of which two blocks were selected randomly viz. Badokhar Khurd and Tindwari. From the selected blocks, four villages were selected randomly from each and 20 Dairy farmers selected from each selected village. Collectively, 160 respondents were selected randomly. It was also observed that majority of the respondents pointed health care as their training preference. The results of the study will help the extension agencies to develop suitable training modules for the dairy farmers for increasing the livestock productivity and improving the living standards of the farmers.

Key words-Training, extension agencies, livestock productivity

Introduction

Information plays an important role in technology adoption and behaviour change. This may be particularly true for practices & decisions in Dairy Farming, which affects farmers' income and animals' health in dairy sector. Proper training is the key for precise information delivery and imparting skill to dairy farmers which ultimately leads to better milk productivity and enhancement in livelihood of specific rural area. Dairy farming is an integral part of the rural ag-

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N-use efficiency in rice is low because substantial amount of applied fertilizer-N is lost through various mechanisms namely, ammonia volatilization, denitrification, leaching



Pot experiments were conducted during the Khari seasons (July - October) 1999 with three soil types (N, N₂ and N₃). The coating of neem cake was treated as a factor (urea cake) provided at 4 to 16 ml 100 g urea and kept in application as outlined in Table 1.

Table 1 - Initial properties of exp

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Nitrate reductase activity of soil influenced by neem (*Azadirachta indica* L. Juss.) products

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AS	After harvesting
5.05	5.00
5.45	5.40
5.30	5.22
2.40	11.38
12.15	11.00
6.52	6.43
6.26	6.05
6.55	6.38
6.22	6.08
0.65	0.83

G manure

Abstract

Culture experiments were studied to evaluate the effect of different neem products and their application on change in nitrate reductase activity (NRA) in different submerged and aerobic soil under condition on change of oxygen unstressed and stressed condition of vertisols, Inceptisols and alfisols. The results showed that the neem-based products viz. neem cake (@20 % w/w of urea, neem oil (@ 1.0 % w/w of urea), Nimco® (@ 2 % w/w of urea) and Neemagold® (@ 1.0 % w/w of urea) respectively to the soil of urea. NRA significantly decreased in inhibitors coated treatment samples than the control, but the activity was high in submerged soil than aerobic and decreased in both conditions from tillering to anthesis stage of crop. Neem oil coating of 1 % applied urea to curtail the loss of N due to limits the N loss in all the soil at every stage among the neem products. NR activity was considerably low in Vertisols than Vertisols and alfisols also.

Key words: Nitrate reductase activity, Types of soil, neem products, paddy and wheat

Introduction

Nitrate reductase catalysed the reduction of NO₃ to NO₂ under oxygen stress condition (Abdelmagid and Ibrahim, 1987). This enzyme is important in the process of denitrification leading to appreciable loss of fertilizer N under waterlogged soil especially in wetland paddy cultivation. The high N fertilization and equally urea is associated with ecological problems such as NO₃ contamination of the ground water and NO₃ emission to the atmosphere (Jarvis, 1996). Use of organic matter to improve the soil properties and a nitrate reductase activity in both flooded and non-flooding soil but the nitrification inhibitors like PMA, HQ and neem cake directly decrease NR activity (Reddy and Chhonkar, 1990) also. There is a need of finding regarding the aerobic condition and neem oil effect. However, the urea coated with neem cake and neem oil based products on nitrate reductase activity in different types of soils in semiarid

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The seed were inoculated with the stickler solution in case of the stickler, were applied as the seed were inoculated with the stickler solution in case of the stickler.

determined at 40 DAS.

discussions

of mungbean with

in general u

reported in post mortem examinations. The significant increase in total bacteria (100) reported that in general the bacteria substrate and declined as it was being the inoculated treatments. The inoculation over the remaining treatment was the nature of the fungi. The decline in fungal population is

4.2) Each of Broadway...

Each of *Bradyrhizobium* strains was grown over remaining treatment

the effect of biofertilizers on the growth of *Bradyrhizobium* + PSN

Treatment combination

17 No inoculation (NI)
18 *Brachyrichtis* (M05)
19 *Brachyrichtis* BML
20 BML M05 + PSM
21 BML + PSM

CDM + CDM

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ISSN:0976-4933
Journal of Progressive Science
Vol.10, No.01 & 02, pp 16-22 (2019)

Knowledge and adoption level of pea growers in Varanasi district (Uttar Pradesh)

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Abstract

The study was conducted purposively in Pindra block of Varanasi district due to maximum area under pea cultivation. A list of the villages of the selected block was prepared and 9 villages were selected with the help of simple random sampling method for the study. After the selection of the villages, a village wise list of the pea growing farmers was prepared and different number of farmers from each village was selected randomly. Thus the total sample was comprises of 120 farmers. The basic objective of the study was to ascertain the knowledge possessed and adoption level of growers as well as the social status of pea growers. The result revealed that 61.66 per cent of the respondents had medium level of knowledge, 81.67 per cent of respondents belonged to medium adoption category.

Keywords- ascertain, adoption, sampling, category

Introduction

Field pea (*Pisum sativum* L.) is one self-pollinated diploid ($2n=14$) annual of the most important annual cool season pulse crop and is valued as high protein food. It is widely grown in the cooler temperate zones and in the highlands of tropical regions of the world. The crop is cultivated in a wide range of soil types from light sandy loams to heavy clays but it does not tolerate to saline and waterlogged soil condition. The soil pH optimum for it is 5.5-6.5. Field pea is one of the most important pulse crops in Ethiopia which is produced for a long time in high- and mid-altitude areas by small farmers. Agriculture has always occupied a prime place in Indian economy. Out of 2.4 per cent of world's land, India is managing 17.5 per cent of world's population. At the time of


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ISSN:0976-4933
Journal of Progressive Science
Vol.10, No.01 and 02, pp 1-7 (2019)

Adoption of improved mustard production technology by farmers in sujananj block of Jaunpur district (Uttar Pradesh)

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Abstract

Five attributes were studied to know the farmer's status on mustard production in the study area. These were participation of respondents in different social, Mass media, extension activities, Level of knowledge about mustard production technology and extent of adoption level of improved production technology of mustard. Majority (43.34 per cent) of respondents had medium adoption, 26.66 per cent had low and only 30 per cent had high adoption of the recommended package of mustard production practices. That might be due to their medium level of knowledge about the recommended package and innovativeness. The respondents were found to be of some traditional in nature to adopt new technology.

Keywords: Adoption, attributes, innovativeness, traditional.

Introduction

Mustard (*Brassica* spp.) is a member of the Cruciferae family. Indian mustard (*Brassica juncea* L.) is predominantly cultivated in Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh, Punjab, Orissa, West Bengal, Assam and Gujarat. It is also grown under some non traditional areas of South India including Karnataka, Tamil Nadu, and Andhra Pradesh. The crop can be raised well under both irrigated and rainfed conditions. India is blessed with varied agro-ecological environments ideally suited for growing a variety of oilseeds which include groundnut, rapeseed and mustard, sunflower, soybean, sesamum, safflower, castor, linseed and Niger seed, two perennial oilseeds (coconut and palm oil). India occupies the place of pride as the world's largest producer of groundnuts, sesamum, linseed and castor seeds (Reddy and Immanuelraj, 2017). In the world, India

Adoption Behavior of Farmer about Potato Production Technology In Varanasi District (U.P)

P.N. Chaube*

Abstract : This study was conducted with that its results may be useful to the extension workers, administrators and communication experts, researchers and planners who are engaged in generating technology and dissemination of improved potato production technology to the farmers. Adoption behaviour of potato growers was studied in regard to adoption of improved potato production technology. It was observed that majority of the potato growers had medium (50 percent) adoption.

Key Words : Adoption, administrators, dissemination etc.

INTRODUCTION : Potato (*Solanum tuberosum* L.) Family (Solanaceae) is one the most important food crop of the world. Potato has been cultivated in India for vegetable purposes. Potatoes are economical food since they provide a source of low cost energy to the human diet.

Potatoes are essential crop and are recommended as a food security crop by the United Nations. They can grow in any climate and conditions. They take less time to grow and need less input than other vegetables and they can be replanted as seed potatoes. Potatoes provide high food energy and complex carbohydrates while taking up a smaller unit of land other alternatives. In 2018, more than 17 million hectares of potatoes were harvested worldwide.

China is the biggest producer of potatoes worldwide, with about one third of the world's potatoes produced in China and India. According to FAO estimates, in 2018, over 368 million metric tons of potatoes were produced worldwide, a substantial increase from 333.6 million metric tons in 2018.

Potatoes are rich source of starch and vitamins especially C & B and minerals. They contain 20.6 % carbohydrates, 2.1 % Protein, 0.3 % Fat, 1.1 % Crude fiber and 0.9 % Ash on fresh weight basis. They contain good amount of essential amino acids like leucine, tryptophan and isoleucine etc.

Agriculture plays a significant role in the process of economic development of any country, particularly in those countries where per capita real income is low. Agriculture has helped countries to a greater extent in the process of their industrialization. Thus agriculture development and industrialization are not alternatives but complementary and are mutually supporting with respect to both inputs and output.

An increase in agricultural output and productivity tend to contribute substantially to an overall economic development of a predominantly agricultural and over populated country like India. Therefore, the level and pace of development in the country have been and still continued to be significantly influenced by the pace of its agricultural development. Vegetables are rich and comparatively cheap sources of vitamins and minerals. Their consumption is palatable, tasty, appetite-promoting, and helps in protection against some degenerative diseases. Besides, vegetables have a key role in neutralizing the acids produced during digestion of proteinous and fatty foods. The presence of large amount of roughages in them promotes digestion and prevents constipation.

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Shodh Sandarsh-IX ♦ Vol.-XXIX ♦ March-June 2021 ♦ 485

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ISSN:0976-4933
Journal of Progressive Science
Vol.11, No.01 & 02, pp 25-28 (2020)

Constraints faced by beneficiaries of Mahatma Gandhi national rural employment guarantee act

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Abstract

The present study was conducted purposively in Bhadohi district of Uttar Pradesh state during the year 2019-2021. From this district Bhadohi block was selected purposively. From Bhadohi block 10 villages were selected purposively for the study. 10 beneficiaries of MGNREGA were selected randomly from each selected village. Thus a total of 100 beneficiaries were selected from Bhadohi block for research study. It was found that, beneficiaries of MGNREGA scheme faced major constraints related to the employment of hundred days (per household per year) is too less in the present situation, low wage rate, Delay in payment of wages and MGNREGA beneficiaries strongly suggested to allot the work in off season time and increase in the wage rate to the beneficiaries.

Keywords: Beneficiaries, randomly, household, wages

Introduction

The Mahatma Gandhi National Rural Employment Guarantee Act to the provides employment to the rural poor by providing 100 days of guaranteed wage employment in a financial year to every household whose adult member volunteer do unskilled manual work. This chapter deals with MGNREG Acts, objectives, goals, features, pattern, transparency and accountability and the performance of MGNREGAs. A majority of people in India live in villages and about 50 per cent of the villages have very poor socio-economic conditions. Since the dawn of independence, concerted efforts have been made to uplift the living standards of rural masses. Rural development as an integrated concept of growth and poverty elimination 'has been of paramount concern in all the consequent five year plans. The Ministry of Rural Development, Government of India, runs a number of schemes and programmes with the principal objective of enabling rural people to improve the quality of their lives. In the process of planned development, it has been realized that a sustainable strategy of poverty alleviation has to be based on 'increasing the productive employment opportunities in the process of growth itself. In the Sixth'



ISSN:0976-4933
Journal of Progressive Science
Vol.09, No.01 & 02, pp 86-94 (2018)

A study about constraints faced by respondents using mass media development in Meerut district of western Uttar Pradesh

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Abstract

Commensurate with the objective of the present study, the multistage and purpose wise random sampling technique has been applied. The present study is confined to C.D block Daurala, district Meerut and the sampling process in this study consists of two stages viz. Selection of villages and selection of respondents. Lack of awareness, lack of good leadership quality and lack of employment were major problem faced by respondents in rural development. High cost of chemical and fertilizers, lack of proper marketing facility and lack of expected awareness were major problem faced by respondent in agricultural development. Maximum number of respondent faced problem by lack of rights for women and child, lack of access to education and school and lack of awareness in women and child development.

Keywords: Rural development, awareness, technique, employment

Introduction

India lives in its "villages" –Mahatma Gandhi. Literally and from the social, economic and political perspective the statement is valid even today. Around 65% of the State's population is living in rural area. People in rural areas should have the same quality of life as is enjoyed by people living in sub urban and urban areas. Further there are cascading effects of poverty, employment, poor and inadequate infrastructure in rural areas on urban centers causing slums and consequential social and economic tensions manifesting in economic deprivation and urban poverty. Hence Rural Development which is concerned with growth and social justice, improvement in the living standard of the rural people by providing adequate and quality social services and minimum basic needs becomes essential. The strategy of rural development mainly focuses on poverty alleviation, better livelihood opportunities, provision of basic amenities and infrastructure

ADOPTION OF RECOMMENDED METHODS OF RECLAMATION OF SODIC LANDS

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ABSTRACT

Farmers were adopted the recommended mechanical, biological, chemical and agronomic methods of sodic land reclamation. Recommendations about drainage practices required for sodic lands were also practiced by farmers, significantly.

During investigation the opinion of respondents were taken regarding the suggestions for improvement in the knowledge & skill of farmers regarding reclamation practices. Respondents suggested that training, method demonstration and result demonstration about the sodic land reclamation practices particularly special counselling for various categories of sodic lands and knowledge about exchangeable sodium percentage and organic carbon in the soil, should be organized regularly.

Key words - Adoption, sodic land, control.

All the soils contain some amount of salts which, though in small quantities (pH below 8.5) are not harmful for the growing plants but their excessive presence (pH above 8.5) may either inhibit or deter growth resulting in conspicuous reduction in crop yield, to extent depending on the kind and amount of salts present, the plants grown and the environmental factors. Soils which contain excess soluble salts that affect plant growth adversely are called "salt affected soils". These problem soils comprise saline soils that contain sufficient soluble salts to interfere with the plant growth, and 'Alkali Soils' that contain excessive exchangeable sodium to adversely affect the crop production. 'Salt affected soils' is a general term which

includes soils having an excess of soluble salts or an excess of exchangeable sodium, or both, to an extent that their presence or action can affect or completely inhibit production of most crops. Salt affected soils are also called 'sodic lands'.

'Sodic lands' are formed when soil and hydrological conditions favour the accumulation of soluble salts in the root zone of crops. Inadequate precipitation and salty irrigation water render the soil salty in the absence of sufficient natural leaching. Sodic lands have high pH (upto 10.8 in 1:2 soil water suspension) and very high exchangeable sodium percentage throughout the profile (as high as 90). Uttar Pradesh has highest area under usar (sodic lands). Considering the potential of sodic lands to produce good quality of crops and need of increasing acreage under cultivation, government of Uttar Pradesh has started U.P. sodic land reclamation programmes in 1989 with the financial assistance of World Bank and European Union. Sodic land reclamation programmes of U.P. are operated by Uttar Pradesh Land Development Corporation (U.P. Bhumi Sudhar Nigam).

MATERIALS AND METHODS

Four villages of block kakwan and four of block maithia were selected from District Kanpur Dehat. Likewise four villages of block Hasinganj and four of block Nawabganj were taken in the study. From the list of beneficiaries having land under sodic land reclamation programmes, 50 respondents were selected from each block through random sampling technique. Thus, a total of 200 respondents were selected from four blocks of two districts for the study.

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ISSN:0976-4933
Journal of Progressive Science
Vol.09, No.01 & 02, pp 75-85 (2018)

Impact of social forestry among the farmers of Jaunpur district (Uttar Pradesh)

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Abstract

The concept of social forestry is so far as it relates to conditions in rural India is not new. Only as far back as 6-7 decades when one reviews the economy of rural India, one comes across the basic fact that a large part of the rural population used to sustain itself on the availability of forest produce in one way or the other. In the past there used to be small village forests attached to practically every village or in some cases for groups of villages. These village forests were not necessarily classified as forest land. In fact they were classified as cultivable wastelands or tree-lands and miscellaneous growth. However, when the population started growing rather at a faster rate due to various health measures adopted by the Government, the forests which used to meet the requirements of the villagers in respect of firewood, small timber, grass, fruits and seeds, etc. were the first to be cleared for food production because food was definitely more important than any other produce. The situation in the thickly populated Indo-Gangetic plain became so worse that in many of the districts now there are hardly any village forest lands. With the basic resource of firewood supply thus gone, the villagers were forced to burn cow dung as fuel. This led to reduction in the quantity of available organic manure in the agriculture fields leading to a gradual reduction in their productivity. Thus a vicious circle has been created in which, in many cases, even the normal food production became lower than before.

Keywords- Distribution of respondents, social forestry, benefit

Introduction

India is one of the important developing countries in the world, which is largely inhabited by rural poor and agriculture as their predominant occupation. Majority of Indian population lives in the villages. India, being a vast fertile country, situated in

Different Approaches and Teaching Aids Being used in Agricultural Higher Education

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ABSTRACT

The term "Agricultural Education" has been referred as a collective term for all education in agriculture, encompassing plant and animal sciences, engineering, economics and others. If, ACT is fully exploited for educational system in our country, it may fulfill all the challenges and demand of educational needs of ever growing population. It is fact that ACT may not be at par with the printed literature, but it may reduce the consumption of paper and pressure on our forest resources at considerable extent and hand in hand, it may give a new dimension in the educational system of India. To know different approaches and teaching methods being used in agricultural higher education in Uttar Pradesh, a study was conducted during the year 2008-10. Altogether, 135 numbers of students studying in randomly selected two agricultural colleges in the state of Uttar Pradesh became the sample size for present study. Percentage, mean, standard deviation were reckoned with the collected data for drawing the results. It was found that lecture method with the use of chalk board and field visit were being used in teaching all the courses of six M.Sc. (Ag.) degree programmes of the two universities. As far as the percentage of course content where the audio cassette could be prepared or not were 73.19 and 26.81, respectively. In case of Agricultural Economics and Agricultural Extension, 89 per cent topics were identified where audio cassettes can be prepared. Similarly, as far as the overall topics of the courses of three degree programme were concerned, the audio cassette preparation was found possible on 210 topics out of 250 which accounts for 84 per cent.

Keywords: Audio cassette, Course content, Education, Topics

INTRODUCTION

The new higher educational system offers an exciting opportunity for innovation and experiment not only in particular discipline, but in multi-disciplines. It will be much comprehensive and in-depth rather an open-ended, experimental, multifaceted and evolutionary. It will attempt to convey an understanding of life and involve balancing and coordination of satisfaction along many dimensions rather than maximizing concerns along with narrowly defined dimension. It will entail an ecological and self realization ethics. It will be both creative and critical and focus attention on and reflect about the values of environmental quality. It may look to be somewhat utopian to the conventional educationalist, but seems to be the only alternative to resolve the various conflicts and fundamental dilemmas of the higher education.

Higher education in India was initiated during British Rule. During 1857, Calcutta University, Bombay University and Madras University were established for undergraduate and post-graduate degree programmes. The Allahabad University was established in 1887. When India became independent there were only 19 universities and 650 colleges. After independence, Government of India laid great emphasis and efforts for higher education programme in the country. Therefore, University Grant Commission was established in 1953 to give systematic and pragmatic approach to the Higher Education in the country. Presently, there are 400 universities and 20,000 colleges for higher studies.

The term "Agricultural Education" has been referred as a collective term for all education in agriculture, encompassing plant and animal sciences, engineering,

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Chaubey

Study on Adoption of Improved Production Technology of Maize Growers In Jaunpur (U.P)

P.N. Chaube*

Abstract : Maize is one of the most important field crops grown by the farmers of our country. In order to harvest better yield of the crop, adoption of recommended cultivation technology by the maize growers is essential even with the advancement of improved technology in maize cultivation. It has been observed that either the same has not reached to the field or the farmers are reluctant to use this technology. The recommended maize production technologies are being communicated to the maize growers through various extension programmes and activities. However, a wide gap still exists between available technologies and their adoption by the maize cultivators. Thus, technological gap seems to be a major problem in the way of increasing maize production in India in general and Jaunpur District of Uttar Pradesh in particular.

Key words : advancement, communicated, gap, reluctant.

Introduction : Maize (*Zea Mays*) is the 3rd most important cereal crop of world. It is a principal food in many countries particularly in the tropics and subtropics. It is widely cultivated throughout the world. Maize is regarded as the "Queen of Cereals". Being a C4 plant, it utilizes solar radiation efficiently even at higher radiation intensity. In general, it has greater worldwide acceptance as human food, animal feed and a source of large number of industrial products. The maize is cultivated throughout the year in all states of the country for various purposes including grain, fodder, green cobs, sweet corn, baby corn, pop corn (9.1%), Bihar (8.9%), Uttar Pradesh (6.1%), Madhya Pradesh (5.7%), Himachal Pradesh (4.4%). Apart from these states maize is also grown in Jammu and Kashmir and North-Eastern states. Hence, the maize has emerged as important crop in the non-traditional regions i.e. peninsular India as the state like Andhra Pradesh which ranks 5th in the country (0.79 m ha) has recorded the highest production (4.14mt) and productivity (5.26t/ha) in the country although the productivity in some of the districts of Andhra Pradesh is more or equal to the rest of the country. (Source- <https://farmer.gov.in>)

Maize can be grown successfully in variety of soils ranging from loamy sand to clay loam. However, soils with good organic matter content having high water holding capacity with neutral pH are considered most suitable for higher productivity. Being a sensitive crop to moisture stress particularly excess soil moisture and salinity stresses; it is desirable to avoid low lying fields having poor drainage and also the fields with higher salinity. Therefore, the fields having provision of proper drainage should be selected for cultivation of maize. Maize is also used in making ethanol and other biofuels. All India Coordinated Maize Breeding Project (AICRP) on maize was launched in 1957 with the objective to develop and disseminate locally superior cultivars and production/protection technologies. AICRP organizes interdisciplinary, institutional, co-operative and systematic testing of newly developed cultivars of both public and private sectors for different agro-climatic zones of the country. The project resulted in refining efforts in the field of Agriculture Extension, M. T. D. College, Ballia, Uttar Pradesh

EXTENT OF ADOPTION OF IMPROVED CULTIVATION PRACTICES OF CAULIFLOWER BY THE FARMERS

P. N. Chaubey

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Abstract- Five attributes were studied to know the farmer's status on cauliflower production in the study area. These were participation of respondents in participation of different social activities, Mass media activities, extension activities, Level of knowledge about cauliflower production technology and extent of adoption level of improved production technology of cauliflower. More than half of cauliflower growers had medium level (45 per cent) of social participation, majority of the respondents belonged to medium (64.16 per cent) mass media participation, More than half of cauliflower growers had medium level (51.67 per cent) of extension participation, majority of the cauliflower growers had medium level (54.17 per cent) of knowledge and majority of the cauliflower growers had medium (53.34 per cent) adoption.

Keywords: Attributes, extension participation, extension activities, level of knowledge etc.

1 INTRODUCTION

Cauliflower (*Brassica oleracea*) is one of the most important vegetable crops of India. The edible part of cauliflower is known as curd, which consists of a shoot system with short internodes, branches apices and bracts. The edible portion of this vegetable is approximately 45 per cent of the vegetable as purchased. Food is broadly classified into cereals, pulses, nuts, oil seeds, fruits, vegetables, milk and milk products, fish, egg and meat. These supply in general proteins, fats, carbohydrates, vitamins, minerals, salt and water. The word 'cole' seems to have been abbreviated from the word 'Caulis' meaning stem. Cauliflower is grown for its white tender head or curd, which is used as a vegetable, soup and for pickle. It is having a good nutritive value. It contains good amount of vitamins like vitamin A, vitamin C and fair amount of proteins and fibers. The cauliflower is also a good source of minerals like Ca, Mg, P, Fe, Na, and S.

Cauliflower is an important vegetables of India. Its cultivation is widely done in the sub-tropical parts of north India. In India, the area under cauliflower was 459 thousand hect. with a production of 8800 thousand tonne and productivity of 19.17 tones/ha. India produces around 32.5 per cent of the world's total production of cauliflower. Individually cauliflower accounts for 5.06 per cent of vegetable production of country. More than 20 million tone of cauliflower is produced annually

worldwide and china and India are among the leading countries. Varying climatic conditions affects production of cauliflower but in the long term a growing demand trend is likely to remain. China produces half of the world's yield which is huge revenue for the country. The cauliflower sector is accounted for over 75 per cent of world production by Chinese and Indian cauliflower.

The awareness of the knowledge gap and adoption gap will enable the researchers, policy makers, planners and extension agencies to fix up the priorities in understanding the activities and steps for research to improve productivity.

2 RESEARCH METHODOLOGY

The study was undertaken in Jaunpur district of Uttar Pradesh during 2020-2021. This district covers an area of 4,038 sq. km. It comprises of 21 blocks. Out of these 1 block i.e. Badalapur block was selected purposively since most of the FLDs are situated in the Badalapur block. The study was conducted purposively in Badalapur block of Jaunpur district due to maximum area under cauliflower cultivation. A list of the villages of the selected block was prepared and 10 villages were selected with the help of simple random sampling method for the study. Village-wise list of rapeseed and cauliflower growers were prepared with the help of agriculture supervisor from each selected 10 Village and total respondents 120 cauliflower growing





CONSTRAINTS PERCEIVED BY THE FARMER IN ADOPTION OF IMPROVED CULTIVATION PRACTICES OF CAULIFLOWER

P. N. Chaubey

Department of Agriculture Extension, S.M. M. T. D. College, Ballia, Uttar Pradesh

Abstract- The requirement of vegetable in the country is rapidly increasing due to increasing population. The cauliflower is widely used as an essential component of food in medicinal forms and also as an immediate source of farmer's income. The present investigation is an effort to know and understand the clear picture of cauliflower cultivation regarding the constraints faced by the farmers, their knowledge and adoption of cauliflower cultivation practices, the constraints faced by them and their sources of information which directly or indirectly affect their knowledge and adoption level about cauliflower cultivation practices.

The awareness of the knowledge gap and adoption gap will enable the researchers, policy makers, planners and extension agencies to fix up the priorities in understanding the activities and steps for research to improve productivity. The identification of the constraints in adoption of recommended cultivation practices of cauliflower will enable the policy makers to prepare plan to rectify these hurdles for mobilizing the quick adoption of cauliflower cultivation which in turn will increase the total agriculture production and improve the socio-economic conditions of farmers which will contribute towards over all national development.

Keywords: Awareness, policy makers, priorities, mobilizing.

1 INTRODUCTION

Cauliflower (*Brassica oleracea* var. *botrytis* L.) is a member of the Cruciferae or Cole crop family. As with other members of the family such as broccoli or cabbage, cauliflower is noted for its adaption to cooler growing conditions.

Cauliflower is an important vegetables of India. Its cultivation is widely done in the sub-tropical parts of north India. In India, the area under cauliflower was 459 thousand hect. with a production of 8800 thousand tonne and productivity of 19.17 tones/ha. India produces around 32.5 per cent of the world's total production of cauliflower. Individually cauliflower accounts for 5.06 per cent of vegetable production of country. More than 20 million tonne of cauliflower is produced annually worldwide and china and India are among the leading countries. Varying climatic conditions affects production of cauliflower but in the long term a growing demand trend is likely to remain. China produces half of the world's yield which is huge revenue for the country. The cauliflower sector is accounted for over 75 per cent of world production by Chinese and Indian cauliflower. The identification of the constraints in adoption of recommended cultivation practices of cauliflower will enable the policy makers to prepare plan to rectify these hurdles for

mobilizing the quick adoption of cauliflower cultivation which in turn will increase the total agriculture production and improve the socio-economic conditions of farmers which will contribute towards over all national development.

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Farmer's Level Constraints in pea cultivation: Constraints faced by pea

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nutrients are essential elements that are used by plants in various ways. Yield and quality of agricultural products and with micronutrients application, therefore human health is protected with feed of enrichment plant etc. Extra essential element only when can perform its function nutrition property that other necessary elements made in balanced ratios for plant. Divalent manganese (Mn^{2+}) is converted to Mn^{3+} or Mn^{4+} easily, therefore in soil manganese plays an important role on oxidation and reduction process, as electron transport in photosynthesis, and quantity decreased due to manganese deficiency, and this is due to low fertility of pollen and low in pollen during grain filling. Zinc uptake of soil solution in calcareous form (Zn^{2+}). In calcareous soils with high pH value may be a valence ion form. Iron in the soil is available for binding element on earth, but its amount was low especially in arid region with alkaline soils (Hassan et al. 2014). Bulk density directly measures soil compaction, and generally does not vary with other soil properties because it is most often expressed on a dry soil

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ADDITIONAL INFO

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Journal of Interpersonal Violence, 10, 1123, 76732-76735.

sulphur in black and alluvial soils.

Collection of fly ash: Dry fly ash was collected from Nannam Thermal Power Corporation plant, Bhipur, Sonbhatra (U.P.). Before application in pots fly ash was sieved, air dried and weighed as per need of treatment combination. Then fly ash was characterized to know their composition of fly ash as

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Dr. Kamur Singh,
Department of Chemical Engineering and Soil Science, S. M. Town PG
College, 57001 U.P., India

बलिया जिले के सुरहा ताल की मृदा उर्वरता का अध्ययन

श्री कृष्ण सिंह, नवीन कुमार शुक्ला, अनिल कुमार सिंह, मणिन्द्र कुमार यादव, आशीष रंजन, प्रभात सिंह एवं मुनिन्द्र पाल
कृषि संस्थान एवं मृदा विज्ञान विभाग, श्री मुलती मनोहर टाउन स्नातकोत्तर महाविद्यालय, बलिया (उ.प्र.) 277001



सारांश

बलिया जिले के सुरहा ताल की मृदा का यह अलग तरह का अध्ययन है, जिससे ताल के मृदा संसाधनों को जाना जा सकता है। सुरहा ताल क्षेत्र जिला मुख्यालय से 8 किलोमीटर उत्तर में स्थित है। ताल की सम्पूर्ण परिधि 19.6 किलोमीटर है। यह गंगा नदी से जुड़ा होने के कारण गंगा नदी के जलस्तर के साथ घटना-वृद्धि रहता है। सुरहा ताल में बारहमासी पानी का फैलाव लगभग 2603.18 है० के आसपास रहता है। पानसून के समय इसमें पानी का क्षेत्रफल बढ़कर 3642.45 है० तक पहुँच जाता है। ताल में बरसात के दिनों में सतत जल वृद्धि से मिट्टी के भौतिक, रासायनिक, जैव रासायनिक और जैविक परिवर्तनों की एक सतत शृंखला चलती रहती है। यह जल के भौतिक गुणों से पर्याय एवं मृदा कणों के साथ मिलकर एक अभस्रदे गार (सिल्ट) का निर्माण करती है। यह गार कार्बनिक पदार्थों के साथ-साथ अन्य पोषक तत्वों की मात्रा से परिपूर्ण होती है। सुरहा ताल के अलग-अलग क्षेत्र की मृदाओं की गहराई के अनुसार मृदा में उपस्थित पोषक तत्वों की मात्रा सहित अन्य गुणधर्मों का अध्ययन किया गया। ताल मृदा के सभी गुणों का अध्ययन 2015-2016 सत्र में कृषि संस्थान एवं मृदा विज्ञान विभाग, श्री मुलती मनोहर टाउन स्नातकोत्तर महाविद्यालय, बलिया की प्रयोगशाला में किया गया। ताल मृदा के अध्ययन के छह स्थानों (साइट) से 0-60 सेंमी गहराई से मृदा का नमूना लिया गया। मृदा नमूनों के विश्लेषणात्मक आंकड़ों से पता चला कि मृदा में बैक्टीरिया कवर्न की मात्रा 0.0375 से 3.826 प्रतिशत तक है, जो सामान्य खेती वाली मृदा से 3 से 4 गुना अधिक है। इसी प्रकार उपलब्ध नट्रोजन (230.43 से 696.19 किग्रा है०), फॉस्फोरस (6.13 से 22.46 किग्रा है०), पोटेशियम (311.6 से 1109.4 किग्रा है०), उपलब्ध गंधक (8.4 से 13 किग्रा है०), मृदा कणकार, धनायन विनिमय क्षमता (सैट्सो) (34.20 से 93.25 सेंटीमोल (P⁺)/किग्रा) तथा उपलब्ध लोहा, कॉपर, जस्ता, मैंगनीज आदि पोषक तत्व की मात्रा साइट-1 में सामान्य मृदा से 10 गुना अधिक मात्रा में पायी गयी। विनिमयशील क्षार (कैल्शियम, मैग्नीशियम, सोडियम, पोटेशियम) सल्टन में पाया गया। ताल भूमि में जल जमाव के कारण गहरे पानी में प्राकृतिक रूप में क्षार की फसल विकसित होती है। उसके साथ अन्य वनस्पतियाँ भी अपना जीवन चक्र पूरा करती हैं। ताल की मृदा 60 सेंमी गहराई तक मृदा के लिए खाद का विकल्प हो सकती है। इसके साथ यह ताल की जलधारा क्षमता को भी बढ़ा सकती है।

ABSTRACT

Balija district is known for so many ancient facts and recreational value but the study of Suraha Tal soil is another matter of versatile and land soil resource inventory. Suraha Tal is located in the 8 km. north of the district headquarter. The entire circumference of the Tal is about 19.6 km. Due to the linking of Tal with great river Ganga, the water level of Tal continue to decrease or increase with level of the water of the river Ganga. Perennial water cover area of this Tal is about 2603.18 ha, which is extending the total flooded area of water about 3642.45 ha during monsoon. Continuous flooding during monsoon causes a series of physical, chemical, biochemical and microbiological changes in Tal land soil, which accelerate the formation of partially decomposed silt (Gard) resulting by interaction among the biological properties of water and soil particles. This Gard is rich in organic matter as well as other nutrients. As per the depth of soils in different areas of Suraha Tal, the amount and properties of the nutrients present in the soil were studied. The study properties of Tal land soils undertaken during 2015-2016 in the laboratory of the Department

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Kumar Singh, Chief Managing Editor,
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Potassium fraction and their availability in potato growing soils of Ballia District, U.P.

Gyanendra Bahadur Singh, Ashok Kumar Singh, Anil Kumar Singh and Naveen Shukla

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Abstract

Potato growing surface soil samples were collected from three village of every three block viz. Bansdih, Reoti and Sohaon for analysis of soil fertility parameters and fraction of potassium. Potato growing surface soil samples of different village resulted soil pH was greater in Bansdih block followed by Sohaon and Reoti block with the range of 6.9-7.4, soil EC ranged from 1.02 – 1.04 had not much more varied in all village. Bulk density of soils of Bansdih block was lower than other block soils, water holding capacity of soil was greater in Reoti block as compared to Bansdih and Sohaon block's soil. The greater (0.34 – 0.86 %) amount organic carbon was observed in Bansdih block's followed by Sohaon and Reoti block. Exchangeable Ca ranged from 7.2-10.0, Mg ranged from 7.5 to 11.0 and CaCO₃ was ranged from 0.29 to 0.49 % in soil of Sohaon block. The available nitrogen value was ranged from 254.3 to 319.0 kg/ha in soils of all three blocks. Similarly available phosphorus (17.2-21.9 kg/ha) and available potassium (268-649.3 kg/ha) in surface soil were shows in considerable range in the different villages of all three blocks. Available sulphur (2.98-6.12 mg/kg soil) was also alarming in the soil of all blocks. Total potassium was ranged from 1784-2728 kg/ha, water soluble potassium was ranged from 151.2 – 362.4 kg/ha, reserve potassium content was ranged from 192.64 - 327.6 kg/ha, NaCl extractable K was 64.8 – 229.6 kg/ha, CaCl₂ extractable K was ranged from 128.8-358.7 kg/ha and ammonium acetate extractable K was ranged from 268-649.3 kg/ha, respectively in different villages of all three blocks.

Keywords- Available nutrients, soil physical properties and fractions of potassium

Introduction

Physico-chemical characterization of soils of Bairia block of district Ballia, Uttar Pradesh

Sandip Kumar Gupta, Ashok Kumar Singh, Anil Kumar Singh, Ashish Ranjan and Naveen Kumar Shukla

Abstract
An investigation was carried out for characterization of soils of Bairia block of Ballia district, (U.P), India. Depth wise soil samples were collected from two pedons selected in two villages. For this purpose, a soil profile was opened in each village. Soil samples were collected from various soil depth viz. 0-15, 15-30, 30-45, 45-60, 60-75, 75-90, 90-105, 105-120, 120-135 and 135-160 cm. Standard analytical methods and procedures were followed for analysis of physico-chemical parameters of soils. Results revealed that pH of soil found to be neutral to slightly alkaline whereas EC was recorded in normal range. Organic carbon content in soil varied from 1.62 to 0.12%. The soil of study area was slightly to moderately calcareous in nature with 1.85 to 3.12% calcium carbonate. Available nitrogen, phosphorus, potash and sulphur content in soil varied from 360.60 to 15.70 kg ha⁻¹, 14.50 to 5.30 kg ha⁻¹, 393.40 to 212.80 kg ha⁻¹ and 12.00 to 5.80 kg ha⁻¹, respectively. The texture of soil was found to be loamy sand to silty loam.

Keywords: Pedon, soil organic carbon, soil depth and NPKS content

Introduction

The soil is the most vital and precious natural resource that sustains all kind of life on the earth. The indigenous ability of soils to supply sufficient amount of essential nutrients has decreased with higher plant productivity levels associated with increased human demand for food. Therefore, one of the greatest challenge today for every stakeholder of agriculture is to develop and implement such soil, crop and nutrients management technologies that could enhance the plant productivity and also improve the quality of soil, water and air. If we do not enhance the plant productivity of our delicate soils, we cannot continue to support the food improve the productive capacity of our delicate soils, we cannot continue to support the food and fiber urging of our ever-growing population (Choudhury, 2017) [1]. Singer and Ewing (2000) [3] stated that "useful evaluation of soil quality is a required agreement about why soil quality is important, how it is defined, how it should be measured, and how to respond to measurements with management, restoration, or conservation practices". Determining soil quality requires one or more value judgments and because there is still much unknown about soil which may have direct bearing on the crop production level. Some of the physical (soil texture, bulk density, particle density, porosity, rooting depth, colour, hydraulic conductivity, infiltration rate, water holding capacity, soil water retention curve and water stable aggregate, etc.), chemical (pH, EC, SOC, CaCO₃, exchangeable cations and anions, CEC, ESP, SAR, macro and micro nutrients) parameters which control the biomass, soil dehydrogenase and phosphatase enzyme activity) parameters which control the soil quality (Jal, 2004) [5]. Soil test-based fertility management is an effective tool for increasing productivity of agricultural soils that have a high degree of spatial variability resulting from the combined effects of physical, chemical or biological processes (Govaris, 1998). However, in India, prevalence of small holding systems of farming as well as the lack of infrastructural facilities are the major constraints for extensive utilization of soil resources, its systematic characterization is prerequisite. Therefore, the present investigation was undertaken for characterization of soil morphological and other related physical, chemical properties of selected pedons and status of soil fertility parameters for soils of district Ballia.

Materials and Methods

Ballia district, the eastern part of the state of Uttar Pradesh is situated in central portion of the Ganges basin. The geographical extent of the district lies between latitude from 25°23' to 26°11' north and at longitudes from 83°38' to 84°39' east with elevation of about 27 to 115 meters above the sea level. The mean annual rainfall ranges from 950 to 1150 mm. The district has an area of 1,981 sq. km and 3,223,642 populations.



Potassium fixation capacity of soil in surface and sub-surface alkaline soils of Ballia district

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*Corresponding author's Email: aksinghdc@rediffmail.com

Abstract

Potassium fixation capacity of soil with their physico-chemical, physical and chemical nature of surface and sub-surface soils of Ballia district was analysed from different village's soil samples. Potassium fixation capacity of surface soil was ranges from 40.4 – 136.3 % and sub-surface soil ranged from 56.2 – 116.2 % of targeted distinguished village soils with their nature as soil pH of surface soil ranged from 7.55 – 8.03 and sub-surface soil 7.21 – 8.35 and where EC was in considerable range in both depth. Organic carbon content varied from 0.37 – 1.20 % in surface soil and 0.18 – 0.60 % in sub-surface soil. Available N, P and K content in surface soil from 221.2 – 347.6 kg ha⁻¹, 9.74 – 14.85 kg ha⁻¹, 201.6 – 436.8 kg ha⁻¹ and sub-surface soil ranged from 158.0 – 293.8 kg ha⁻¹, 8.74 – 12.81 kg ha⁻¹, 246.4 – 414.4 kg ha⁻¹, the textural class of those soils varied from loamy sand to clay loam respectively.

Keywords - Potassium fixation, soil organic carbon, NPK content and soil texture

Introduction

Potassium (K) is known as quality elements and uptake by plants for healthy growth, but Indian agriculture has traditionally relied on the native soil resources of potassium. It's constitutes an average of 1.9% of the earth crust (Tisdale *et al.* 1995). It is an essential macro nutrient element required for growth and development of plants, animals and human beings also. Soil K is known to exist in different forms viz. water soluble, exchangeable, non-exchangeable forms of potassium are prime important as for their availability is concern to plants. There is dynamic equilibrium among different forms of soil potassium and any depletion in a given forms would shift the equilibrium in



Vertical Distribution of Soil Nutrients in Pulse-Growing Black Soil, Sohaon Block in Ballia District, Uttar Pradesh

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In general, the distribution of soil nutrients is governed by soil-forming factors and processes, crops grown and external supply. The continuous mining of the nutrients under intensive cropping system is of serious concern. The large tract of Eastern Uttar Pradesh is witnessing the deficiency of most of the nutrients and Ballia district is not an exception (Singh *et al.* 2017; Gupta *et al.* 2019). Singh *et al.* (2020) have characterised some of the rice-growing soils of Eastern Uttar Pradesh and reported depth-wise distribution of some fertility parameters. Research studies on the horizon-wise distribution of nutrients in the shrink-swell soils of other parts of the country have been reported (Prasad and Gajbhiye 1999; Karthikeyan *et al.* 2014). However, this type of study is lacking for Eastern Uttar Pradesh, particularly for pulse-growing black soils of Ballia district.

Ballia district (25°23' to 26°11' N; 83°38' to 84°39' E) is situated in the central part of the Ganges basin at an elevation 59 m above MSL. The mean annual rainfall ranges from 950 to 1150 mm. Two soil profiles one in Daulatpur village (P₁) and one in Nivrahi village (P₂) of Sohaon block, were studied. Soil samples (19 nos.) were collected from different layers and processed for the analysis. Pigeon pea is dominant *khairif* crop whereas lentil and chickpea are grown in *rabi* on residual moisture or under protective irrigation. If pigeon pea is grown in *khairif*, then farmers opt for a non-pulse crop in *rabi*.

The soil samples were analysed for soil water suspension) using a glass electrode conductivity (EC) was determined in 1:2 extract using Conductivity Bridge (Model Calcium carbonate (CaCO₃) was determined by rapid titration method (Black 1934). The available nitrogen determined by alkaline Perchloric acid method (Subbaih and Asja 1950), available (P) and available potassium (K) were determined (Olseins *et al.* 1954) and available acetate extract method (Mahr *et al.* 1961). Available sulphur (S) was analysed by the outlined by Williams and Shering. Micronutrient cations were determined as proposed by Lindsay and Norrell (1971).

pH, EC, Organic Carbon and CaCO₃

The soils of Daulatpur and Nivrahi irregular distribution of pH with depth. In different cycles of fluvial depositional process of P₁ had an increasing trend of pH with depth. EC of soil samples ranged from 1.007 to 1.221 dSm⁻¹. Gupta *et al.* (2019) also reported a similar trend in some soils of Baria block of Ballia district. EC in some soils of Baria block of Ballia district carbon at different depth of two profiles ranged from 0.52 (Table 1 and 2) and decreased with surface soil of P₁ had higher organic carbon.

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Table 1. pH, EC, O.C., CaCO₃ and available nutrients at different depths of Daulatpur soil profile (P₁)

Depth (cm)	pH (1:2.5)	EC (dSm ⁻¹)	O.C. (%)	CaCO ₃ (%)	N (kg/ha ⁻¹)	P (kg/ha ⁻¹)	K (kg/ha ⁻¹)	S	Fe	Cu (mg/kg ⁻¹)	Zn	Mn
0-15	8.3	1.007	0.52	1.221	205.0	16.72	425	8.75	3.80	2.89	0.9	12.10

STATUS OF SOILS OF BAIRIA SUB-DIVISION OF BALLA, U.P.

AGE INFO

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COLLECTION

ture of the major essential elements required for growth and development of plant animals and microbes. In the case of essential nutrients it is present in largest quantity in most plants, regulate the activity of large number of plant enzymes and thus called as 'master cation'. It affects the quality of fruits, vegetables and flowers and against different biotic and abiotic stresses (Pal, 1992). It is not only from of exchangeable K but also from of non-exchangeable K, which mainly consists of K trapped in clay minerals. Major source of K by crop removal was from of non-exchangeable K. Since K is not dynamic nutrient, its availability in soil and combinations depends upon the chemical reaction between forms of soil K. Soil temperature and the concentrations of K in solution, exchanger phase (Sparks and Blevins, 1992) and the various intrinsic and extrinsic factors viz mineralogy, texture, cation exchange capacity, clay content, organic matter, etc. the various (thermic, hyper thermic, aquatic and udic) soil conditions are not only influence different soil K but also the incorporation of K in soils (Patnam and Venkatar et al., 2001, Singh and Dutta 1986, Singh and Bordoloi, 1992). So that various

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Abstract A soil study was carried out in three villages namely; Trikalpur,

A depth wise soil study was carried out in three villages namely; Trikalpur, Bishunpura and Naina of Reoti Block of Ballia district Uttar Pradesh. Depth wise properties of pedon 1 (Trikalpur), pedon 2 (Bishunpura) and pedon 3(Naina) land was suitable for possible crops cultivation. Soil pH of all pedons as depth wise seen increasing towards alkaline from upper soil (0-15 cm) to the lower depth (120-150 cm) in all pedons its range from 7.3 to 8.2. But their was not substantial difference in EC of soils, density of pedon 1 was lower than other pedon, due to decreasing in organic carbon to increase the mineral contents. The greater amount of organic carbon, available N , P and S was found in at 0-15 cm depth, there after decreasing with increasing depth till pedon. Variation in other soil properties such as soil pH, EC, bulk density, water holding capacity, soil texture, calcium carbonate, exchangeable Ca^{++} and Mg^{++} and DTPA extractable Fe, Cu, Zn and Mn was also observed in scattered pattern in all profile. Thus no horizons development in selected village pedon showed very shallow soil depth. Hence all pedon have observed sand layer at 120-150 cm depth.

Introduction

The capability of land and soil to produce crops is limited and the limits to produce crops are set by soil, climate and landform. However, land capability and their limitation ^{is} depending on agro-ecological set-up which has managed to them (FAO, 1993a). Despite the significant growth in production, the sustainability of some cropping systems ^{is} been showing signs of fatigue. Therefore, comprehensive account of our land resource ^{is} ascertain its potential and problems towards optimizing land use on sustainable basis ^{is} necessary. In the recent past, productivity and fertility of agricultural soils are worldwide

rice productivity, female literacy and development in different agro-climatic zones of Uttar Pradesh

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Uttar Pradesh is a large state with 0.24 million sq km geographical area and 199.5 million human population. It is a large state having 0.24 million sq km geographical area and 199.5 million human population which is 16.49% of the population of India. Agriculture is the main occupation of 66 per cent of the population of the State and the net cultivated area is 164.17 lakh hectares in the state. The state has diverse agro-climatic conditions and the levels of development including agriculture and allied sector contribute just over 22% to UP's GDP. The state is also the biggest contributor to the national agricultural and allied sector with a share of 13%. The state stands second in rice production in India. Rice is the major crop of the state and its production is 11.7 percent in the country in 2014-15. Analysis of the NFSA data revealed that the average production of rice was 2307 kg/ha which ranged from 7928 kg/ha (Aurangabad) to 1466 kg/ha (Banda). The productivity in 13 districts was high (>2500 kg/ha), and 44 districts had productivity less than 1500 kg/ha. The overall male and female literacy for UP were 72.14 and 62.14 percent, respectively whereas the corresponding figures for India were 74.04 and 65.46 percent, respectively. The lowest female literacy was observed in the ACZ2 (Mid Western) and the highest in ACZ1 (Western Plain, 66.4%). Similarly, the gender gap in literacy was 10.6% and the highest in ACZ1 (Western Plain, 17.0) and highest in ACZ5 (Bundelkhand, 22.9). In UP, 33 of 75 districts (43%) of UP were least developed, followed by 22 districts (31%) classified as under developed and 10 districts as developing. Only 5 districts were either developed or most developed. The potential productivity in agriculture in UP, there is needed to focus on empowerment of women in agriculture together with agro-climatic zone based planning.

Keywords: Female literacy, development of districts, rice productivity, agro-climatic zones, Uttar Pradesh.

Introduction
Uttar Pradesh is a large state having 0.24 million sq km geographical area and 199.5 million human population which is 16.49% of the population of India (India 2016). Agriculture is the main occupation of 66 per cent of the population of the State and the net cultivated area is 164.17 lakh

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Review article

Integrated nutrient management in Cashew for Karnataka region

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Abstract

Cashew is a very important plantation /horticultural crop of India. As cashew is a hardy plant, often it has been thought to be highly suitable for afforestation, soil conservation and waste land development. The cashew plantations raised with this objective, did not receive any management nor inputs, thereby resulting in low productivity. However, research results showed that tremendous positive response can be obtained through regular applications of fertilizers and improved management practices which could give two to three fold yield increases. Cashew requires regular fertilizer application to ensure early and high yields in new plantations, and regular high yields from mature trees. It has been reported that legume saved about 50% in fertilizers, while improving the yield and quality as compared with the common methods of fertilizer application. The challenge for cashew crop will be to improve yields in marginal lands and slopy areas where the soil is exposed to degradation strongly limits the growth and production of cashew.

1. Introduction

Cashew (*Anacardium occidentale* L.) occupies an area of 38.17 lakh ha with an annual production of 31.86 lakh tonnes in the world. Cashew production takes place mainly in Central and South American zone, Asia and Oceanic zone and African zone. In the Asiatic zone, Vietnam and India are the major producers. In the African zone, Mozambique, Tanzania and Kenya are the major producers, while the main cashew producing countries are Benin, Guinea Bissau, Ivory Coast, Madagascar, Nigeria, Ghana, Sierra Leone and Togo. In the Latin American zone, the primary producers of cashew comprises of Brazil, Colombia, Costa Rica, Honduras, Salvador, Guatemala, Panama and Venezuela. Cashew was introduced into India by Portuguese travellers in 16th Century for the purpose of afforestation and soil conservation. Cashew is native of Brazil. India was the first country in the world to exploit the international trade of cashew kernels in the early part of 20th Century. India's share of world cashew area is 23.39% and share

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Physical-chemical analysis in DSP command irrigated ecosystem of Ballia district

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Dr. C.L. Sanoria (Reid Professor of Economics) will provide the facility to conduct the experiment.

rite production as an index for the rice

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Accepted on 04.06.2010

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Abstract

A study on canal irrigated soils was carried out in DSP (Doharighun Sahayak Parojana) canal system area of Badliya district which lies between the parallels of $25^{\circ}35'$ and $26^{\circ}12'$ of north and between the meridian of $84^{\circ}12'$ to $84^{\circ}4'$ of the east longitude in the eastern most corner of the state of Uttar Pradesh. The length of the main canal, branches distributaries and minor is about 23 km. along with CCA (Cultural Command Area) of 57918 ha. It exists in middle Gangetic zone with agro climatic region of India. The district is homogeneous for low productivity, a large region of poor, small and fragmented holdings; low literacy of farming community and poor level degree of poverty. The twin menace irrigation induced waterlogging and salinity has been cause of retardance. The rate of loss of biodiversity in rice has been more faster in the present system for better crop production. The rate of loss of biodiversity in rice has been more faster in the present system than in the rainfed system. So with an objective to assess the actual position of agricultural ecosystem under the present investigation was carried out.

... command area hydromorphic and dhankhar soil

Introduction

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of different legumes received 100 kg of soil samples were analysed. E.C., Bd, Organic carbon, available N, P, K, S to assess their content in agriculture farm soil (Asoptolis). The bulk density and pH was found decrease in treatment combination of pea (lentil and pea with their increased amount viz. 30 t/ha & 60 t/ha of soil incorporation. The available N was not effective to decrease by legume residues materials treated under study. Organic carbon was showed not significantly beneficial effect on their enhancement while legume residues materials were indicated greater available N in T_0 at 42 days. The treatment combination of pea (T₁) @ 60 t/ha but the gradual pattern was observed in sequence as legume residues materials showed small variation with gradual increase in available phosphorus in pea (lentil and pea) over the control. So, legume residues as pigeon pea, Lentil and lentil and pea) @ 60 t/ha. The chemical properties of soil due to addition of their chemical as elastic change in the chemical properties of soil.

Production

about 355 million tons (mt) of crop residues are annually produce in India of which can be utilized to supply about 3.54 mt plant nutrients (Chandra, 2011). Crop residues have been found that improving physical, chemical and biological properties of soil, legume crop residues and crops are generally benefit the succeeding cropping system, decomposition than release of different organic acids to decrease soil salinity, improving soil structure and availability of plant nutrients with its become a source, strengthen in soils. The accumulation of organic matter in soil has been found to be one of the causes of soil acidification observe under arhar pasture, lentil and cereal rotations (Yan *et al.* 1996). Soil acidification remains one of the key factors affecting agricultural productivity and sustainability in world crop residues and other systems can a lining effect when add to soil in the absence of plant and leaching (S.M.M. Town *et al.* 2004, Tang *et al.* 1999). However, the chemical mechanism for pH

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ISSN:0976-4933
Journal of Progressive Science
Vol.05, No.02, pp 139-150 (2014)



Influence of fly ash with organic sources on the properties of alluvial soil

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Abstract

The different dose of fly ash as @ 10, 20, 30 and 40 t ha⁻¹ with inorganic fertilizer and organic sources @ 5 tonnes ha⁻¹ as green neem leaf, FYM, panchenium green leaves, flower wastes (marigold and wheat straw), rice straw were treated in sodic alluvial soil for 120 days. Soil samples were analysed for bulk density, p^H, EC, organic carbon, available N, P, K, S, CEC, exchangeable Ca, and Mg. Bulk density was found decrease in all stage, with treatment combination of fly ash and FYM, p^H, bulk density was found increase in treatment with and without fly ash and different organic materials at different sampling date has little variation. Organic matter content was recorded significantly higher in combination with fly ash and organic matter, but did not alone. Fly ash with organic materials at stage III was indicated greater available N value in T₂ then crop residue increases but that increased value. Cation exchange capacity of soil was increased by fly ash with organic materials combination in all stage of experiment but the fly ash with FYM showed maximum increase than green neem leaf. Exchangeable Ca⁺⁺ and Mg⁺⁺ were also found greater in fly ash alone treatment T₂, T₃, T₄ and T₅ where as lower value observed in treatment of T₁, T₂, T₃, T₄, T₅ and T₆ with fly ash alone treatments. Fly ash application @ 10/ha with organic materials viz. FYM green leaf, panchenium, crop residue rice and wheat and flower wastes were found to increase organic carbon, maintained the soil p^H, CEC, available N, P, K in alluvial soil but not alone application

Keywords - fly ash, organic materials, alluvial soil, soil properties

Introduction

Fly ash is well known wastes products of thermal power plants as well as small quantity form steel plant. It is being use for different purposes, viz. brick making, road construction and cement industry in form of its possess as waste disposal problems. The problem of disposal of huge quantities of fly

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12.06.2014

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Release pattern of phosphorus and sulphur in soil influenced by vermicompost and chemical fertilizers

(eds) Mishra, Ashok Kumar Singh, Anil Kumar Singh and Naveen Kumar Shukla
and Ashish Ranjan

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Abstract

phosphorus and sulphur are both play the vital role in the soil environment so on as a laboratory incubation experiment was conducted to their release pattern in the presence of chemical fertilizers and vermicompost. Experiment was layed out in five treatments of chemical fertilizers and vermicompost with three replication and soil samples were analysed for content of sulphate sulphur and available P at 7, 15, 30, 60 and 120 days after treatment incorporation. The treatment combinations of chemical fertilizers were showed small variation in amount of available phosphorus in all incubation stage. A gradual increase was observed from the 7 to 120 days of incubation. The greater amount of available phosphorus was observed from 60-120 DAT but the vermicompost with combination of chemical fertilizers were found to prolonged their available form. The available sulphur content was found gradual increase from 7 days up to 120 days of incubation. Alone application of high dose of vermicompost of incubation, 50% NPK + vermicompost @ 2.5 g kg⁻¹ showed significantly increase greater value of SO₄-S. The application of vermicompost @ 2.5 g kg⁻¹ soil suitable for release of available phosphorus and sulphur in alluvial soil.

Keywords: Available phosphorus, available sulphur, vermicompost, urea, DAP, muric acid test and temperature

Introduction

humic acid is the product of non-thermophilic biodegradation of organic material by the action of earthworms and associated microorganisms. This product is a highly fertile, peat-like material with high porosity, aeration, water-holding capacity and

Effect of organic acid and fly ash on release pattern of phosphorus, potassium and enrichment of Ca and Mg in alluvial and black soils

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Abstract

The different organic acid as malic acid @ 3mg, tartaric acid @ 4 mg, citric acid @ 5mg were mixed in per kg alluvial and black soil with fly ash for the incubation period of 30 to 60 days of both soils in laboratory temperature condition. Soil samples were analysed for available P, K, exchangeable Ca and Mg during incubation period. Fly ash application with organic acid was shows the available phosphorus content was decreases with increasing incubation days and the similar response was appeared for the content of available potassium also. The content of Ca and Mg were appeared to decreasing with increasing incubation days. The combination of organic acid with fly ash were showed greater values in stage III in both alluvial and black soil and fly ash treatments were also lead to enrichment of Ca and Mg.

Keywords: fly ash, organic acids, available P and K, exchangeable Ca and Mg

Introduction

Fly ash is most popular industrial by waste product of thermal power stations in India. It is produced by used of firing of powdered coal for the production of the huge electricity, amounts of fly ash evolved every day by the thermal power plant and is dumped in ash disposal areas which creates the land degradations problems and may cause potential environmental hazards, in spreading diseases and by leaching of unwanted chemicals into ecosystem. Fly ash is chemically a ferroaluminosilicate and a major solid waste of the industrial areas. It is contains many nutrients element essential for plant growth, which can increase crop productivity (Andrino *et al.*, 1980). It contains total major

Evaluation of Integrated Nutrient Management Interventions on a Vertisol in Central India
Cotton (*Gossypium hirsutum*)

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ABSTRACT

Phospho-compost (PC) and poultry manure (PM) were evaluated in field experiments to diversify integrated nutrient management (INM) for rain-fed cotton. Seed cotton yield in the PC (2507–2579 kg ha⁻¹) was similar to the recommended seed cotton yield in the PM (2476–2617 kg ha⁻¹) and farmers practice (FP). INM (2673 kg ha⁻¹) treatment and was significantly better than nitrogen, phosphorus and potassium (100% NPK) (2130 kg ha⁻¹) and farmers practice (FP) (1886 kg ha⁻¹). Yield was lower in the PM (2476–2617 kg ha⁻¹) than in the PC (2507–2579 kg ha⁻¹). Yield was higher in all INM intervention plots due to an improvement in soil nutrient status compared with those receiving 100% NPK. Soilable carbon in soil nutrient status compared with those receiving 100% NPK. Soilable carbon in soil nutrient status compared with those receiving 100% NPK. Soilable carbon in soil nutrient status compared with those receiving 100% NPK.

Introduction

In India, large amounts of phosphorus (P) and entire potassium (K) fertilizer are imported. Fertilizers are costly and farmers apply limited amounts through the soils have low P content. However, reserves of rock phosphate exist (Rao, Srivastava, and Ganeshamurthy 2015), which can be used to prepare enriched phospho-compost (PC) (Manna 2006). Composting of straw-based farm waste with rock phosphate is a strategy to improve the value of the manure (Makimura, Sato, and Imai 1995). By utilizing PC, Singh et al. (2009) reported a significant reduction in the requirement of fertilizer for the rice-wheat cropping system of north India (Singh et al. 2009). In Japan, Hada, Nagaoka, and Zavanelli (2012, 2013) reported enhanced productivity of maize with PC on red soils.

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NOTES

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Niyakatharan 2010). PM is a good s
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are placed on poultry farms (Niyakatwa
received total of cotton (Niyakatwa)
improve 2000), maize and cowpea (AB
there is a likelihood of re
types such as PC and PM. T

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Material and methods

Site

A field study was conducted for Institute of Soil Science, Bhopal (2 with a mean annual rainfall of 1000 mm) with a mean annual rainfall of 1000 mm (pH 8.3). The soil was low in available P (12.8 kg ha⁻¹) and

Treatments

An experiment with 10 treatments. Treatments included control, 5.0 Mg P/M ha⁻¹ + 100% NPK, 5.0 N + 2.5 Mg P/C + 100% N ha⁻¹, 5.0 N ha⁻¹ and 2.5 Mg P/M + practice in the cotton-growing PM are given in Table 1. Fertilizer was given in two equal splits at 15 days before sowing and incoorporated in the soil. Fertilizer was applied in two equal splits at 90–100 days after sowing.

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Evaluation of Integrated Nutrient Management Interventions by Cotton (*Gossypium hirsutum*) on a Vertisol in Central India

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ABSTRACT
Phospho-compost (PC) and poultry manure (PM) were evaluated in field experiments to diversify integrated nutrient management (INM) for rain-fed cotton. Seed cotton yield in the PC (2501–2579 kg ha⁻¹) was similar to the recommended INM (2673 kg ha⁻¹) treatment and was significantly better than nitrogen, phosphorus and potassium (100% NPK) (2130 kg ha⁻¹) and farmers practice (FP) (1886 kg ha⁻¹). Yield was lower in the PM (2476–2617 kg ha⁻¹) than in the PC. Nutrient uptake was higher in all INM intervention plots due to an improvement in soil nutrient status compared with those receiving 100% NPK. Soil labile carbon values were higher in the INM treatments (333–452 mg kg⁻¹), with a greater magnitude in the PC-amended plots (402–452 mg kg⁻¹). Carbon management index (CMI) values were higher for the INM than treatments NPK and FP. Among INM interventions, PC plots had higher values than the PM.

ARTICLE HISTORY
Received 13 May 2012
Accepted 1 June 2012
KEYWORDS
Carbon sequestration
integrated nutrient management
phospho-compost
poultry manure

Introduction

Cotton (*Gossypium hirsutum*) is the major commercial crop grown in central India. Vertisol-type rain-fed cotton are generally low in organic carbon and available nutrient status, consequently with low productivity (Singh et al. 2004). Presently, the resource-poor Indian farmers apply fertilizers at rates below the recommended rates (Blaise, Bonde, and Choudhary 2005). Over the years, with evolution and the replacement of animal power with tractors, the availability of organic manures, especially farm manure (FYM), has declined. Consequently, their application to fields diminished further. It is well established that sustained crop production is possible with management practices that enhance soil organic carbon (SOC) levels (Lal 2001). With regular addition of FYM, cotton production is sustained at a higher level (Blaise, Ravindran, and Singh 2006). However, existing integrated nutrient management (INM) packages (5 Mg FYM ha⁻¹ along with the recommended dose of fertilizers) have not benefited farmers. Firstly, because of the short supply of FYM and, secondly, due to its competing use as a fertilizer source. Thus, the adoption rate of the INM practices is very low. Therefore, there is a need for evolving variable INM interventions, based on farmers' access and availability of other organic sources. In India, large amounts of phosphorus (P) and entire potassium (K) fertilizers are imported. Reserves of rock phosphate exist (Rao, Srivastava, and Ganeshamurthy 2015), which can be used to prepare enriched phospho-compost (PC) (Manna 2006). Compositing of straw-based bio manure with rock phosphate is a strategy to improve the value of the manure (Mishra et al. 1995). By utilizing PC, Singh et al. (2009) reported a significant reduction in the requirement of P for the rice-wheat cropping system of north India (Singh et al. 2009). In Japan, Fujita and Zervany (2012, 2013) reported enhanced productivity of maize with PC on red soils.

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becoming more abundant (Mishra et al. 2010). P2O5 is becoming more abundant in crop lands provides an opportunity to diversify integrated nutrient management (INM) for rain-fed cotton. Seed cotton yield in the PC (2501–2579 kg ha⁻¹) was similar to the recommended INM (2673 kg ha⁻¹) treatment and was significantly better than nitrogen, phosphorus and potassium (100% NPK) (2130 kg ha⁻¹) and farmers practice (FP) (1886 kg ha⁻¹). Yield was lower in the PM (2476–2617 kg ha⁻¹) than in the PC. Nutrient uptake was higher in all INM intervention plots due to an improvement in soil nutrient status compared with those receiving 100% NPK. Soil labile carbon values were higher in the INM treatments (333–452 mg kg⁻¹), with a greater magnitude in the PC-amended plots (402–452 mg kg⁻¹). Carbon management index (CMI) values were higher for the INM than treatments NPK and FP. Among INM interventions, PC plots had higher values than the PM.

Material and methods

Site

A field study was conducted at the Central Institute for Cotton Research, Ballia, Uttar Pradesh, India, with a mean annual rainfall of 1182 mm (pH 8.3). The soil is a Vertisol (ICRISAT 1978) with a total P of 12.8 kg ha⁻¹.

Treatments

Two experiments were conducted. In the first experiment, 10 treatments were included: 1) 100% NPK (2130 kg ha⁻¹); 2) 100% NPK + 2.5 Mg FYM ha⁻¹; 3) 100% NPK + 2.5 Mg PC ha⁻¹; 4) 100% NPK + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹; 5) 100% NPK + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹ + 2.5 Mg FYM ha⁻¹; 6) 100% NPK + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹ + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹; 7) 100% NPK + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹ + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹ + 2.5 Mg FYM ha⁻¹; 8) 100% NPK + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹ + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹ + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹; 9) 100% NPK + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹ + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹ + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹ + 2.5 Mg FYM ha⁻¹; 10) 100% NPK + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹ + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹ + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹ + 2.5 Mg FYM ha⁻¹ + 2.5 Mg PC ha⁻¹.

of fertility
Status of Surha Tal Land Soils of Ballia district, Uttar Pradesh
Ashok K. Singh*, Gyan Prakash Pal and Harishankar Tiwari

Ashok K. Singh, Jayant K. Das and Harishankar Tiwari

Agricultural Chemistry and Soil Science S. M. M. Town PG College, Ballia-277 001, India

the largest floodplains of river

Surtha is one of the main crops of the Pradesb. In general, soils of Surtha

Information is available on the land and in particular Surtha Tal of Ballia study was conducted.

The decrease / increase in organic carbon content seem to be dependent on its accumulation from higher elevation, decomposition of fallen foliages and residues. The available N in soils ranged from 206.6 to 583.3 kg ha⁻¹ through the depth (Table 1) of different sites. The higher availability of N at site 1 is in consonance of organic carbon accumulation in low lying site which usually remains submerged for 4 to 5 months.

The decrease / increase in organic carbon content seem to be dependent on its accumulation from higher elevation, decomposition of fallen foliages and residues. The available N in soils ranged from 206.6 to 583.3 kg ha⁻¹ through the depth (Table 1) of different sites. The higher availability of N at site 1 is in consonance of organic carbon accumulation in low lying site which usually remains submerged for 4 to 5 months.

The site I had relatively higher available P (21.93

kg ha⁻¹) in 0–15 cm layer owing to decomposition and release of P from deposited organic carbon, and it decreased with depth (Table 2). The other sites followed similar trend of P distribution with depth. Tarafdar (2008) reported that microorganisms can lower the pH via release of CO₂ during respiration thereby releasing more P in soil. In general, available K varied from 130.7 to 1049.0 kg ha⁻¹ (1st layer of site 1) and decreased with depth at all the sites.

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bulk density of the soils varied from 1.20 to 1.74 at different sites. The p^H ranged from 6.48 (site 1) and increased with depth at all the sites. The upper layer might be due to higher organic content in the top layer. The range of salts from a surface layer. The p^H ranged from 1.00 to 1.01 with depth at all sites.

Data indicated that surface soil had higher available S than the under lying layers (Table 2). In general, it followed the distribution pattern as of organic carbon. Trivedi *et al.* (1998) also reported that organic carbon regulates the sulphate-S in soils of northern Madhya Pradesh. The site 1 had higher available sulphur than the other sites due to its submergence for 4-5 months. The site 1 had higher exchangeable Ca (10.0 to 12.6 cmol (p+) kg⁻¹) and lowest was associated with site 3 with a tendency to increase with depth. There was little variation in exchangeable Mg at different sites (Table 2). It ranged from 6.5 to 6.6 cmol (p+) kg⁻¹, 5.2 to 5.8 cmol (p+) kg⁻¹, 5.2 to 6.9 cmol (p+) kg⁻¹ and 6.0 to 7.0 cmol (p+) kg⁻¹ at site 1, site 2, site 3 and site 4 respectively. The higher content of exchangeable Mg was found in lower layers than the surface layer.

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Genetic analysis for yield and its components and protein content in table pea
(*Pisum sativum*, L. var. hortense)

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Abstract

Six generation (P_1, P_2, F_1, F_2, BC_1 and BC_2) of fifteen crosses namely *Aiyad P₁ x Aiyad P₂*, *Aiyad P₁ x KS195*, *Aiyad P₁ x KS149*, *Aiyad P₁ x Arkel*, *Aiyad P₂ x KS195*, *Aiyad P₂ x KS-149*, *Aiyad P₂ x KS-136*, *Aiyad P₂ x Arkel*, *KS195 x KS-149*, *KS195 x KS136*, *KS195 x Arkel*, *KS149 x KS-136*, *KS149 x Arkel*, *KS136 x Arkel* were evaluated for days to flower, plant length, number of green pods per plant, number of seeds per pod, green pod yield and protein content in a randomized block design (RBD). The data of six generation were subjected to scaling test to detect epistasis and genetic parameters m , d , h , i , j and l were estimated. Six parameters analysis revealed that in general dominance (h) was more pronounced than additive (d) in most of the crosses for different traits. It was further observed that character plant length were under major control of either additive or additive x additive gene action. The major role of dominance along with additive x dominance and dominance x dominance components of epistasis for days to flower, number of green pods per plant, number of seeds per pod, protein content and green pod yield per plant. Duplicate epistasis is more prevalent than complementary type in the inheritance of the traits in this study.

Key words- Table pea, generation means, gene action, yield components, protein content

Introduction

Table pea (*Pisum sativum* L. var hortense) is the most important vegetable crop of India and world. Among Rabi vegetables, table pea holds an important position of its sources of protein, carbohydrate vitamins A & C, calcium and phosphorus. On dry weight basis, garden pea (wrinkled seeds) contains 10-13 percent total sugar, 33 percent starch and 26.3 percent protein. Sweet test of table pea depends upon the sugar content. Table pea occupies an area of 282.4 thousand hectare with production of 2706.4 thousand tones and average productivity was 96 tonnes per hectare. The table pea shares about 3 percent of total vegetables. Productivity of table pea is considerably low in comparison to other vegetables because of non availability of high pod yielding short duration, stable and disease resistant varieties. Due to lack of a concrete and holistic research programme in this direction, which is major bottleneck in achieving a breakthrough in vegetable production in general and peas in particular. Besides using improved production technology, breeding high yielding disease resistant and suitable plant types which may be highly responsive to inputs and insensitive to light can help to cross the yield barrier is most urgently

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The Pharma Innovation

ISSN 2777-1695
P-ISSN 2777-1695
E-ISSN 2777-1695
Volume 1, Issue 10
October 2022
www.the-pharma-innovation.com

Correlation and Path coefficient analysis for yield and its associated characters of Indian mustard (*Brassica juncea* L. Czern & Coss)

Priya Chaubey, OP Singh, Vishwajet Yadav and Yashwant Nishad

Abstract

In the current study, 25 germplasm of Indian mustard were used during the rabi season of 2020-21 at the Research Farm of Nidharua, S.M.M. Town Post Graduate College, Ballia (U.P.), India. They were assessed for seed yield and yield attribute components for 14 characteristics. The correlation analysis revealed a substantial and positive relationship between biological yield per plant, seeds per siliqua, siliqua per plant, primary branches per plant, length of the main raceme, and 1000 seed weight, leaf area index, harvest index, and biological yield per plant. The results showed a highly substantial positive correlation between seed yield per plant and the number of siliqua per plant and harvest index. At the genotypic level, path coefficient analysis revealed a strong positive and direct effect of harvest index and biological yield per plant towards seed yield in Indian mustard, as well as a high positive and direct influence of 1000 seed weight.

Keywords: Correlation coefficient, path analysis, seed yield, characters, Indian mustard

Introduction

Rapeseed and mustard are the second-largest oilseed crop worldwide and in India after peanuts. After Canada and China, India is the third-largest producer of rapeseed and mustard accounting for 12% of global production. *Brassica juncea*, AA BB, ($n=18$) is an amphidiploid species of the Brassicaceae family that was created by crossing *Brassica nigra* (BB), ($n=8$) *Brassica campestris* (AA), ($n=10$), and is known as Indian mustard. It is an upright plant with fibrous roots that stands between 90 and 200 cm tall. Flowers are actinomorphic, bisexual, and have a full whorl. The blossom is yellow, and the majority of the crop is self-pollinated. However, due to an increase in the population of honey bees, five to thirty percent cross-pollination is seen. The fruit of this plant is called siliqua, and the inflorescence is an extended raceme with immature flowers growing toward the top and the inflorescence's axis having infinite development. The leaves are both glabrous and hairy.

Nearly every state in India grows mustard, but the five most important ones: Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh, and Gujarat contribute more than 80% of the country's land and output. As well as being expanded to these states, this crop is also being grown in other southern states with various agro-climatic conditions, including Andhra Pradesh, Tamil Nadu, and Karnataka.

Brassica has a lot of therapeutic qualities and is a great source of vitamins and minerals. They offer significant amounts of soluble fiber, vitamin C, and other nutrients, typically mustard. In northern India, oil is utilized for frying and cooking. Additionally, it is used to make medications, particularly ayurveda, as well as pickles, Channey, and other foods. Typically, they are produced as alternate feed crops. Brassica crops may be grown for fodder in a variety of climates and soil types. Brassica has a high dry matter digestibility range of 85-95 percent. Because they are so nutrient-dense, leaves and other plant materials provide a superb crop for grazing. It generates a lot of bio-mass, controls weeds, and can increase soil tilth through its root system. It also offers good soil cover in the winter to avoid soil erosion. It is used industrially in the production of soap and in grease and lubricant combinations for various equipment. Young plants' tender leaves are consumed as green vegetables, or sage, and are an excellent source of sulfur and other nutrients for the diet. Even though mustard oil has a low erucic acid content (40-50%), the mustard cake has a high glucosinolate content and a low iodine value, making these factors anti-nutritional. To improve oil quality, high-yielding varieties with beneficial health traits must be developed.

11-12

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Analysis of gene-action in different traits in maize (*Zea mays* L.)

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Abstract

The component analysis of 10x10 diallel set of crosses in maize for fourteen quantitative traits showed highly significant differences for additive components in both the generations for all the characters except number of leaves at 30 DAS, while it was non significant for cob per plant in F₁ generation and seed vigour index in F₂ generation and number of leaves at 60 DAS in both generations. Dominance component showed highly significant values for all the characters under study in both the generations. The estimates for degree of dominance were found to be more than unity in both the generations for all the characters indicated over dominance except only one character number of grain per row which showed partial dominance in both the generations.

Keywords- different traits, gene-action, growth parameters, generation

Introduction

Maize (*Zea mays* L.) is the most important cereal crop in India and world. In India, maize is the third most important cereal after Rice and Wheat than provides food, feed, fodder, and serve as a source of basic material for number of industrial products viz., starch, oil, protein, alcohol, beverages, food sweeteners, cosmetics, bio fuel etc. Currently, it is cultivated over 8.26 million ha with production of 19.51 million tonnes having an average productivity is more than 2.4 tonnes/ha contributing 8.5 percent to the India food basket. The growth rate of area production and productivity has shown a remarkable increase during the past couple of year. Being a C4 plant, maize exhibits a high high yield potential per unit land as compared to other crop. The utilization of heterosis has therefore, assumed a greater significance in developing high yielding hybrids resistant / tolerance to various biotic and abiotic stresses. Information of the gene action and relative amount of additive and non-additive genetic variance present in cross combination will lead to successful heterosis breeding programme.

Materials and method

The experimental consisted of treatment, 10 parent s namely viz. I-65, I-74, TSK-95, I-78, TSK-41-4, TSK-36-1, TSK-64, AU-1 and AU, 45F1s and F2s will be laid out in a Randomized Block Design (RBD) with three replication. The individual Plant data were recorded on five randomly selected plant



ISSN:0976-4933
Journal of Progressive Science
A Peer-reviewed Research Journal
Vol.12, No.01 & 02, pp 24-33 (2021)

Assessment of genetic variability, heritability, genetic advance and relationship of yield and its contributing traits in wheat genotypes (*Triticum aestivum* L.)

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Abstract

Analysis of variance (ANOVA) expresses significance for all characters except spike length and spike weight. The highest mean was observed for days to maturity (107.90) followed by plant height (77.20), days to 50% flowering (73.90) and number of grains per spike (44.70). The estimates of PCV were slightly higher than GCV for all traits. The highest genotypic and phenotypic coefficient of variation was recorded for biological yield per plant, grain yield per plant and number of tillers per plant. High heritability (h^2) coupled with high genetic advance for plant height, biological yield per plant, flag leaf area, grain yield per plant, number of grains per spike, days to 50 % flowering and tillers per plant. The results revealed that these traits may serve as effective selection attributes during selection in the breeding program for yield improvement in wheat. Grain yield per plant was positive and showed a highly significant relation with days to 50 % flowering, tillers per plant, flag leaf area, plant height, days to maturity, biological yield per plant, spike weight and test weight. It revealed that by increasing the value of these traits, grain yield can be drastically increased. Spike length per plant was also significant and can be considered in breeding programs. The highest positive direct effect on grain yield per plant was observed by Biological yield per plant followed by Harvest Index. Days to Maturity and Spike Length, while remaining traits showed negative and direct effect on grain yield per plant. Hence, for the development of high-yielding wheat varieties these traits possessing highly significant positive associations should be given more weightage in breeding or selection programme.

Key words: Wheat, (*Triticum aestivum* L), ANOVA, variability, h^2 and genetic advance.

Introduction

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Abstract

selection in breeding programme for yield improvement in Indian mustard

Keywords: *Brassica juncea*, correlation coefficient, path analysis

Introduction

India. It contains 38 to 42% oil and 24% cake protein.

and path analysis for 11 characters

Materials and Methods

0.20 m with reconnaissance



ISSN:0976-4933
Journal of Progressive Science
A Peer-reviewed Research Journal
Vol.12, No.01 & 02, pp 67-75 (2021)

Genetic variability, heritability, genetic advance, correlation analysis in wheat (*Triticum aestivum* L.)

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Abstract

The genetic analysis was carried out twenty two germplasm lines under irrigated normal soil condition to determine mode of inheritance of yield and its contributing traits. The experiment was conducted to evaluate in Randomized Block Design (RBD) with three replication at Nidhana Agriculture Farm S.M.M. Town P.G. College, Ballia, U.P. Data were recorded in respect of days to 50% germination, days to 50% flowering, tillers per plant, plant height, flag leaf area, peduncle length, spike length, days to maturity, number of grain per spike, biological yield, 100 seed weight, harvest index and seed yield per plant for their analysis and interpretation to determine the genetic variability, correlation coefficient, heritability and genetic advance analysis. All the 22 genotypes showed vast range of variation for all the 13 characters under consideration. The analysis of variance showed highly significant differences between the treatments for all the characters under study. Genotypes such as New CB, NEW CB- 7, NEW CB- 3 and NEW CB- 45 produce highest seed yield. Thus genotypes can be used as donor parents in breeding programmes and can be beneficial for transferring the desired gene. The highest amount of genotypic and phenotypic coefficients of variation were observed for biological yield per plant, grain yield per plant, followed by harvest index, tillers per plant, peduncle length and number of grain per spike. The heritability in broad sense for thirteen characters studied which ranged from 98% to 52%, maximum for days to 50% germination, followed by days to maturity, biological yield, harvest index, days to 50% flowering, number of grain per spike, peduncle length, grain yield per plant and test weight showed high heritability. Maximum genetic advancement was reported for the trait like harvest index, days to maturity, biological yield, and number of grain per spike. The grain yield per plant exhibited highly significant and positive correlation with tillers per plant, plant height, flag leaf area, and biological yield. The result revealed that these traits may serve as effective selection attributes during selection in breeding program for yield improvement.

Key words: Wheat (*Triticum aestivum* L.), mean, viability, heritability, genetic advance, correlation.

Introduction



An assessment of okra (*Abelmoscous esculentus* L.) and Radish (*Raphanus sativus* L.) quality of seed in Ballia district of U.P.

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Abstract

Okra or Bhindi and Radish are important vegetable crops of Ballia district. A number of private and public company sell seeds of these vegetable crops in Ballia market. The different varieties of seeds were collected and tested in the departmental laboratory for knowing about the ratio of healthy and unhealthy categories of seeds. Five varieties of okra and four varieties of radish for zaid cultivation were studied for seed germination, seed viability, disease intensity, period of sprout length and sprout death period on the categories basis and treated and untreated condition. Healthy seeds were superior for all parameters over other categories diseased and treated seed with few reverse observation usually, exhibited poor seed germination, viability etc. A higher disease intensity was observed among damaged seeds. Almost discoloured seeds shown predominance over shrunken one. Seeds were treated by 2 per cent aqueous solution of sodium hypochlorite for five minutes. The conclusion was drawn from the present study that healthy seeds were superior most over discoloured, shrunken and damaged seeds. Usually discoloured exhibited high healthiness over shrunken categories, discoloured and shrunken, if not a genetical attribute, confuse farmers at the time of seed purchase. Seed viability was estimated with one per cent aqueous solution of 2, 3, 5 triphenyl Tetrazolium Chloride.

Key words- Okra, Radish, sodium hypochlorite, seed categories and sprout length.

Introduction

Okra, hindi name Bhindi, a diploid often cross pollinated species ($2n=130$, chromosome number), an annual important vegetable crop of Kharif and zaid season in India. It is originated in Abyssinian centre; Ethiopia (Vavilove, 1951) and or Hindustan centre; Northern part of India, Pakistan and Myanmar (Zeven and Zhukovasky, 1975). It belongs to family malvaceae. The nutritional value as dietary fibre 12%, vitamin C 38 %, protein 3%, calcium and potassium 8% and magnesium 14% along with sufficient amount of vitamin K on daily basis (USDA report). It has high antioxidant along with lecithin protein inhibits cancer cell growth especially breast cancer. India shares approximately 14% of world vegetable production. As per National Horticulture Board 2021-22, Gujarat, West Bengal, Bihar, M.P., Chhattisgarh and U.P. are higher producing states with an average 11.6 Mt per hectare productivity. India shows 73% of world Okra production followed by Nigeria, Sudan



Genetic architecture of yield and its components in wheat (*Triticum aestivum* L.)

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Abstract

The genetic analysis of wheat (*Triticum aestivum* L.) was carried out twenty three wheat germplasm and two released wheat variety under irrigated normal soil condition to determine mode of inheritance of yield and its contributing traits. The data was recorded on twelve characters viz, such as days to 50% flowering, flag leaf area, plant height, tiller per plant, spike length per plant, number of seed per spike, days to maturity, biological yield per plant, harvest index (%), 1000 grain weight(g.) and grain yield per plant(g.). The variation due to treatments was significant for all the characters. All the 25 genotypes showed vast range of variation for all the 11 characters under consideration. Genotypes such as HRWYT-31 produced highest grain yield per plant followed by STEMRRSN-6108, HD-2967 and PBW-502 these four genotypes significantly out yielded genotypes. The maximum heritability of was recorded for biological yield per plant, grain yield per plant, harvest index, number of seed per spike, flag leaf area, plant height and tiller per plant. Heritability estimates indicating for chance for selection of better genotypes with respect to these characters. Grain yield per plant showed positive and highly significant correlation with tiller per plant and biological yield per plant.

Key words- Wheat, variability, heritability, genetic advance and correlation

Introduction

The many species of wheat together make up the genus *Triticum*; the most widely grown is common wheat (*Triticum aestivum* L.) is the world's leading cereal grain and main food crop for people over the entire world. Wheat occupying commanding position in Indian agriculture which occupies 25 percent of area under cereals and contributing 36 percent of the total food grain production in the country. India is second largest producer of wheat in the word after China. Wheat is the second most important food crop of the country after rice. Global demand for wheat is increasing due to the



Cost and benefit analysis of milk production in pertaining to the type of ownership in western part of U.P

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Abstract

A survey study was under taken to asses the relation of the type of ownership with a view to analyzing the cost benefit and output relation in milk production at selected 50 dairy units in western U.P. Which are categorized in to I, II, III, IV, groups having 30 private, 13 Trustee, 03 organizational (Military) and 01 Governmental dairies respectively. It revealed that maintenance cost per animal per head, the average cost was Rs. 20.43 and Rs. 3161. The share of different variable cost ie feeding and labour was 61 and 14 percent and veterinary and miscellaneous value was 0.49 and 1 percent. Organization farms are more scientifically managed followed by private, Govt. and Trustee dairies.

Keywords- Milk production, ownership, herd size, cost benefit, input-output relationship, net income.

Introduction

Man needs food to survive, but it is nutrition that forms the foundation for health, strength and intellectual ability in all human beings. This foundation has yet to be laid in our country. Indian agriculture is an economic symbiosis of crop and milk production. Historically, the role of livestock has been complementary to crop production. Dairying and agriculture are bound together by a set of mutual input-output relationship. Dairying is not an adjunct to the crop mix of Indian farms but is an integral part of the total farming system. Hence, treating dairy cattle as a backbone of the live stock wealth and health of our country would not be an exaggeration. Livestock plays and important role in the economy by generating employment and providing income and health to small farmers and society. At present more than 87 percent of the livestock is owned by farmers having less than 4 ha farm land. The share of agriculture output to GDP was decreased but in same period share of livestock has increased. A growth rate of 4.5 percent has been achieved by dairy sector during past decades as compared to 2 percent growth recorded by agricultural sector as a whole with about 6 percent country's GDP. In term of output, milk is now single largest agriculture commodity in India and its contribution is 26 percent to agriculture GDP. The estimate of milk production in 2011-12 is 127.9 mt and is likely to reach 133.7 mt. in this year. Since 1998 India continue to be the largest producer of milk in the world.

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ISSN:0976-4933
Journal of Progressive Science
Vol.03, No.02, pp 236-243 (2012)

Cost and returns relationship of milk production in pertaining to herd size in western part of U.P.

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Abstract

The study was carried out to assess the relation of herd size with a view to analyzing the cost benefit and out-put relation in milk production at selected 50 dairy units of western U.P., which are categorized into I, II, III, IV, V, VI, VII, VIII, and IX groups having upto 25, 25-50, 50-75, 75-100, 100-200, 200-300, 300-400, 400-500 and over 500 animals respectively. It revealed that maintenance cost per animal head, the average cost was Rs 20.43 and Rs. 31.61 respectively. The share of different variable cost viz. feeding and labour were 61 and 14 percent and for veterinary and miscellaneous the value was 0.49 percent and 1 percent. The dairies having 100 animal heads are more competent than lesser heads or upto 400 animals but against there the large dairies with over 400 heads are also competent and efficient.

Keywords-milk production, herd size, cost benefit, input-output relationship, net income

Introduction

India is the one of the world's largest and rapid growing markets for milk and milk products and getting almost 75 percent growths annually in value terms for milk and milk products. Indian agriculture is an economic symbiosis of crop and milk production. Historically, the role of livestock has been complementary to crop production. Dairying and agriculture are bound together by set of mutual input-output relationship. It once a subsidiary enterprise to agriculture has become a major enterprise and crop production is depending on dairying. Although, dairying is by large in the hand of small and marginal land holders and agricultural labourers. About 80 percent farm family in India possess cows and/or buffaloes as a part of family. Since, 1998 the country ranks first in milk production and it was 53.9 million tonne during 1990-91 while now has become 122.8 million tonnes in 2010-11. The share of agriculture out-put to GDP was decreased but in same period during past decades as compared to 2 percent growth recorded by agriculture sector as a whole. With 6 percent the Indian dairy sector is the largest contributor to country's GDP in terms of output milk is now single largest agriculture commodity in India and its contribution is 26 percent to agriculture GDP. Western part is a most developed region of state. It occupies the western Ganga Plains, Which is well

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The Pharma Innovation



ISSN (E): 2277-7695
ISSN (P): 2319-3243
CODEN: PIJN
SAGE RANKING: 5.23
ISI 2021: 10(8): 535-537
C 2021 TPI
www.thepharmajournal.com
received: 01-06-2021
revised: 09-07-2021
accepted: 09-07-2021

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Germplasm evaluation, character association and Genetic diversity in field pea (*Pisum sativum* L.)

Dr. Singh, Brijesh Singh, OP Singh, VN Pathak, Nisha Pandey, Dr. Vijaya
Nand Pathak and Yadavendra Kumar

Abstract

The present investigation was taken to estimate the characters correlation coefficient along with direction and path coefficient analysis with the help of raising 20 variant varieties of field pea at Nidheria farm of S.M.M. Town Post Graduate College, Ballia during Rabi season 2017-18. The field experiment was conducted with maintaining principles of experimental designs under timely sown conditions in complete randomized block design with three replications. The data were recorded on eleven characters including yield for estimates of phenotypic and genotypic coefficient of variation. Phenotypic coefficient of variation (PCV) values were slightly higher than corresponding genotypic coefficients of variation (GCV) for all attributes revealing small effects of environment in character expression process. Results of correlation coefficients revealed that grain yield had significant and positive associations with pod length (0.580), biological yield per plant (0.700) and test weight (0.484), while, it had a negative but significant association with branches per plant (-0.411). The data for direct and indirect effects were estimated through path coefficient analysis and observed that biological yield per plant (1.303) had highest positive direct effect on seed yield followed by harvest index (0.821), revealing that these characters might be useful during breeding programmes as effective selection attributes for yield improvement in pea.

Keywords: Field pea, *Pisum sativum* (L.), correlation coefficient, path analysis

Introduction

Pea (*Pisum sativum* L.) is a diploid species (2n=14) of family *Fabaceae*. Though in some parts of the world, it is grown for grazing purpose, yet in India it is not only consumed as good source of protein but in a variety of ways. Pea is grown all over the world and is an important pulse crop with varying area and production. In India, area under pea crop was 124.16 lakh hectares with a production of 7.8 lakh tonnes and productivity of 6.28 q/ha in 2015-16. Uttar Pradesh is the largest producer in the country followed by Bihar, Haryana, Punjab, etc. It is a high protein (20%) crop with all essential amino acids important for normal activities of living organisms. The fractional composition is also favourable. The most important is it has easily water soluble fibre seed protein (36% to 87%) and green seeds (65% to 82%) along with a series of vitamins, minerals and high fibre content. Immature pods of pea have high level of active lipotropic anti-sclerotic substances like choline and inositol. Being pulse crop it enhances the soil fertility by nitrogen fixation, foliage decomposition, etc. The major bottlenecks in pulses production in general and pea in particular are negative associations between high production input and sustainable genotypes. Using improved production technology, breeding high yielding disease resistant and suitable plant type which may be highly responsive to inputs and insensitive to light can help to cross the yield barrier. Keeping in view the various shortcomings as well as good attributes in the existing varieties of pea, this investigation was carried out. Eleven characters were taken under the present study for estimates of variability, correlation coefficients and path coefficients analysis. Wright (1921) (7) partitioned the value into cause and effect. It splits the correlation magnitudes into estimates of direct and indirect contribution of each character towards yield along with residual effect as per procedure illustrated by Dewey and Lu (1959) (2).

Materials and Methods

Twenty divergent strains/varieties of pea obtained from different places in the department were grown in Rabi 2017-18 using Randomised Block Design (R.B.D.) with 3 replications dated 7th December, 2017 at farm of S.M.M. Town P.G. College, Ballia. Each treatment was sown in a plot with distancing of 3 m X 0.30 m X 0.1 m.

दुधारु पशुओं के प्रमुख रोग : चिकित्सा एवं रोकथाम

□ डॉ० धर्मनंद सिंह

दुग्ध उत्पादन के क्षेत्र में भारत विश्व में प्रथम स्थान पर है। इसकी उत्पादन दर तेजी से बढ़ रही है। तेजी से बढ़ती जनसंख्या को कारण पूरे विश्व में दुग्ध व दुग्ध पदार्थों की मांग की लगातार बढ़ती जा रही है। डेयरी व्यवसाय आजीविका का प्रमुख साधन रहा है। तथा भारत की कृषि अर्थव्यवस्था में इसका अत्यंत महत्वपूर्ण योगदान है। आज दुग्ध उत्पादन एक सफल डेयरी उद्योग के रूप में स्थापित हो चुका है। डेयरी व्यवसाय में सफलता के लिए उन्नत नस्ल, संतुलित आहार, स्वच्छ एवं आराम देह आवास प्रबंधन का सशुद्ध पशुओं की उचित देखभाल व रोगों से बचाव बहुत आवश्यक है। कमजोर पशुओं में रोगों का प्रभाव अधिक गंभीर है।

इसके लिए पशुओं को नियमित रूप से स्वस्थ संतुलित एवं पोषिक चारा दाना दिया जाना चाहिए। रोकथाम पशुशाला की नियमित साफ-सफाई, जमा-समा पर रोगाणु नाशक दवाइयों का प्रयोग करने से बीमारियों का प्रकाप कम हो जाता है। दुधारु पशुओं में कई प्रकार के रोग फैलते हैं। जो निम्नलिखित हैं-

ज्वर, मा छूट की बीमारियाँ

सन्ध्र बीमारियाँ

जन्तु जन्म बीमारियाँ

मैंगी, वायरस तथा प्रोटोजोआ से उत्पन्न होने वाले रोग एक पशु से दूसरे पशु में फैलते हैं संक्रामक रोग कहलाते हैं जब ऐसे रोग स्वस्थ पशु को रोगी पशु से संपर्क में आने लगते हैं तो उन्हें छूट के रोग कहते हैं। जैसे- ऐन्थ्रैक्स, मलाघोटू, लंगड़ीया

BCV, पशु लंग (RP) तथा TB-

जो कि प्रमुख रोग हैं।

एन्थ्रैक्स इत्यादि प्रमुख रोग हैं।

संक्रामक रोग से बचाव-

1. समय पर संक्रामक रोगों के टीके लगवाना चाहिए।

2. समय पर पशुओं का रामे परीक्षण कराना चाहिए।

3. ऐन्थ्रैक्स जैसे रोग से मरे पशुओं को शव का

मृत पशु को जमीन में गहरे गड्ढे में गाड़ना या जला देना उचित होता है।

4. बीमार पशुओं को एकान्त में बांधना चाहिए।

5. बीमार पशु को स्वस्थ पशु से अलग रखना चाहिए।

6. डेयरी पर रखे गए सांडों का राम मुक्त होना व समय

समय पर परीक्षण कराना

आवश्यक है।

7. खालों व कर्मचारियों का सफा सुथरा व स्वस्थ रहना चाहिए।

8. शुद्ध व साफ पानी का उपयोग होना चाहिए।

9. पशुओं को मक्खियाँ व कीकड़ों से बचाया जाना

चाहिए।

10. पशुशाला की समुचित सफाई व मलमूत्र एवं गोबर

आदि का उचित प्रबंध हो।

पशुओं में फैलने वाले प्रमुख रोग-

1. Anthrax- घुओं में लगने वाला यह एक भयानक रोग है। इसका प्रकोप भेड़-बकरी और घोड़े में भी हो जाता है। इस रोग से पशु की शीघ्र मृत्यु हो जाती है। यह राम गर्मियों में इसका प्रकाप अधिक हाते हैं। यह राम पशुओं से मनुष्यों को भी लग सकता है। बहुत लक्षण प्रकट होने से पूर्व ही रोग से ग्रसित पशु की मृत्यु हो जाती है। और चिकित्सा के लिये समय ही नहीं मिल



आस्था, अर्थव्यवस्था और औषधीय आवश्यकता : देशी गाय और दूध

डॉ० धर्मद सिंह

एएसोशिएट प्रोफेसर- पशु पालन एवं दुग्ध विज्ञान विभाग, श्री मुरली मनोहर राउत स्नातकोत्तर महाविद्यालय,
बलिया, (JODPO) भारत

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सारांश : गाय हमारी घासीय अर्थव्यवस्था की रीढ़ के साथ-साथ अध्यात्म और आस्था की प्रतीक है। हिन्दू धर्म में देशी गाय के महत्व के कारण उसके कुछ आध्यात्मिक, धार्मिक और चिकित्साकीय गुण हैं। प्राचीन काल से ही हमारी भारतीय संस्कृति में गाय का उच्च स्थान है इसे कामधेनु कहा जाता है। नौ विश्वेश्वर भारत: अर्थात् गाय सम्पूर्ण विश्व की माता है विश्व स्तर पर गाय के आध्यात्मिक महत्व को स्वीकार कि या गया है। भारत में प्राचीन काल से ही गोधन मुख्य धन माना जाता था। वैदिक काल में तो गायों की अधिक संख्या व्यक्ति की समृद्धि का मानक हुआ करती थी। हमारे शास्त्रों, वेदों, ग्रंथों में गौ महिमा का वर्णन प्रबलता से देखने को मिलता है। महाभारत व भगवत गीता में भी गाय का उल्लेख है। यज्ञ में दी गयी आहुति भी गाय के घी के बिना पूर्ण नहीं होता।

कुजीभूत शब्द-मनोविज्ञान, शाखा, मनोविरलेपण, अपव्ययन, अध्ययन, संबंधित, चिकित्साकीय, प्रविधिर्वा।

गामि क कार्यों व धार्मिक संस्कारों में दूध, गोबर, घी आदि का प्रयोग उसके आध्यात्मिक क व वैज्ञानिक दृष्टि से देखा जाए तो ऐसी मान्यता है कि उसके गोबर में लक्ष्मी का वास तथा गोमूत्र में गंगा जी का निवास है। गाय के शरीर के अंगों में रोगी देवताओं का वास मन गया है। दूध पिलाती गाय के शरीर को तो बहुत ही शुभ मन जाता है गाय का दूध अकेला एक ऐसा ठोस आहार है। अर्थात् इसको सम्पूर्ण आहार की तलाश दी गयी है। इसमें प्रायः सभी पोषक तत्व प्रचुर मात्रा में उपलब्ध होते हैं। दुग्ध से हमें सम्पूर्ण पोषण प्रदान होता है इसीलिए तो इसे गौ माता कहते हैं।

पंचगव्य- गाय के गोबर से तीपी हुई भस्म, दूध, दही, घी से बना प्रसाद तथा गोमूत्र से सिंचन किया जाता है। गौ माता के पूजन का हमारे जीवन में अत्यधिक महत्व माना गया है। धार्मिक महत्व के अतिरिक्त पंचगव्य कई रोगों में लाभदायक भी होता है। पतूना उद्धार में भगवान् श्री कृष्ण को लम्बायक भी होता है। पतूना उद्धार में भगवान् श्री कृष्ण को नजर लग जाने पर गाय की गोबर की पछू से नजर उतरी गयी थी। वामन के अष्टांग हृदय नामक ग्रन्थ में उल्लेख है कि तब यशुजो के दूध में गाय का दूध अत्यंत बलवर्धक और रसायन है। ऐसी मान्यता है कि गाय कि पीठ पर शीद कि हड्डी में स्थित सूर्यकेतु नाडी विकिरण को रोककर वातावरण को स्वस्थ बनाती है। तथा सूर्यकेतु नाडी सूर्य के संपर्क में आने पर यह स्वर्ण का उत्पादन करती है गाय के शरीर से उत्पन्न स्वर्ण उसके दूध, मूत्र व गोबर में मिलता है जो लाभकारी होता है तथा कई रोगों में स्वर्ण भरम से चिकित्सा होती है। जने आदि तीर्थंकर भगवान् ऋषभदेव का चिन्ह बल था। ऋग्वेद में गायों को अधन्या कहा गया है। यजुर्वेद कहता है

कि गाय अनुपमेय है। अथर्ववेद में गाय को सम्पत्ति यों का घर कहा गया है। भगवान् के पूर्वज महाराज दिलीप नद की गाय की पूजा करते थे। भगवान् मोलनाथ का वाहन नन्दी दक्षिण भारत कि अंगोल तरल का रांड था।

वैज्ञानिक एवं औषधीय महत्व - गाय के दूध में पाए जाने वाले प्रोबायोटिक्स के कारण ये हमारी इम्यून सिस्टम को मजबूती प्रदान करता है जिससे हमारी रोग प्रतिरोधक क्षमता भी मजबूत होती है। गाय का दूध चिकित्सा से भरपूर होता है। इसमें कैल्शियम और प्रोटीन बहुत प्रचुर मात्रा में उपलब्ध होते हैं। मैग्नीशियम विटामिन B12, B2 भी उपलब्ध होते हैं। जो हमारे स्वास्थ्य के लिए बहुत फायदेमंद होते हैं। कैरोटीन ओखों की रोगी यदने में मदद करता है। कैल्शियम से हड्डि या मजबूत होती है गाय का दूध हल्का होने के कारण आसानी से पचता है। नवयुगकाल में अरब के घि कि त्सक ने तथा 1857 में रूस और जर्मनी के अरब के घि कि त्सको ने भी दूध के औषधीय महत्व को समझा है। देशी गाय के दूध में ओमेगा 3 फैटी एसिड मौजूद होता है जिससे दिल स्वस्थ रहता है हार्ड सम्बन्धी समस्याएं भी कम होती हैं।

दुग्ध संगठन -

पानी - 83-87%
कुल ठोस पदार्थ - 12-15%
प्रोटीन - 3-4%
वसा - 3.5-6%
लैक्टोज - 4.7-5%
प्रोटीन - के रीन व के प्रोटीन
अल्फा एस

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कृषि एवं पशुपालन भारत की अर्थव्यवस्था की रीढ़ है। भारत वर्ष में रहने वाले अधिकतर लोग खासकर ग्रामीण क्षेत्रों के लोगों का जीवन कृषि पर निर्भर है। हमारी कृषि भी पशुपालन पर निर्भर है। डेयरी व्यवसाय से आज बहुत से लोग अपना जीवन चलाते हैं तथा अच्छा मुनाफा कमा रहे हैं। डेयरी पशु से प्राप्त आद्य तथा लाल कई अन्य व्यवसायों से बेहतर होता है।

यदि इनके संयुजित रख-रखाव एवं पोषण पर हम वैज्ञानिक तरीके से ध्यान दें तो इससे पूरा-पूरा लाभ उठाया जा सकता है। अन्यथा गुणवत्ता युक्त ज्यादा मात्रा में दुग्ध उत्पादन से ही अधिक लाभ प्राप्त किया जा सकता है। इसके लिए जरूरी है कि दुधारु पशु सही समय पर नियमित गर्भित हो तथा प्रति वर्ष अच्छा प्राप्त होगा। कम लगाना में कम उत्पादित रख कर पशुओं की दुग्ध उत्पादन क्षमता बरामबर बनी रहे। एक डेयरी व्यवसाय में सदैव ज्यादा दुध देने की क्षमता वाले पशु रख जाना चाहिए तथा उनके उचित रख-रखाव व प्रबन्ध संयुजित पोषण तथा उनके रोगों पर प्रभावी नियंत्रण अति आवश्यक है।

1 उच्च उत्पादन क्षमता वाले पशु- कधेरी व्यवसाय सदैव ज्यादा दूध देने वाली गाय या बैसो से ही शुरू करना चाहिए। दुधारु पशुओं का मूल्यांकन उसके दुग्ध उत्पादन क्षमता प्रति वर्ष एक बच्चा देने की क्षमता तथा उसके उत्तम स्वास्थ्य के आधार पर किया जाना चाहिए। इसके लिए उसकी शारीरिक बनावट, अच्छी वंशावली व आयु को ध्यान में रखा जाता है। ताकि भविष्य में किसी प्रकार की समस्या का सामना न करना पड़े। हमेशा श्रेष्ठ पशुओं का ध्यान करना चाहिए। गाय या बैस का तीसरे या चौथे ब्यात तक ही दूध उत्पादन उच्च स्तर पर रहता है। फिर धीरे-धीरे कम होने लगता है। अतः इस व्यवसाय में अच्छी नरसल के कम आयु वाले पशु ही लेने चाहिए। जिससे उनका उत्पादन लम्बे समय तक बना रहे। हमें अधिक दुग्ध उत्पादन वाली नरसल जैसे- जर्सी डिजिटन नरसल की संकर गायें देशी नरसल में साहीवाल, थारपारकर गिर, राठी, सिन्धवी आदि तथा बैसों में मुराँ व उन्नत मुराँ नरसल की शैल पालना चाहिए। जनकी प्रजनन संबंधी समस्याओं का निराकरण एवं उनका प्रबन्धन पर समुचित ध्यान देना चाहिए।

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स्वास्थ्य एवं रोग नियंत्रण— डूबे री का व्यवसाय में पशुओं का स्वास्थ्य प्रबंधन एक महत्वपूर्ण कारक है। जाए कठना चाहिए।

रिंग पशु तरह-तरह भी बीमारियों का शिकार होते रहते हैं। जिससे उनके प्रजनन एवं उत्पादन क्षमता पर विपरीत प्रभाव पड़ता है। सामान्य रखरखाव व खान-पान पर उचित ध्यान न देना एक बड़ा कारण बन सकता है। पशुओं का विभिन्न रोगों से बचाव उपचार से ज्यादा बड़े तर उपाय होता है। इसलिए हमें अपने पशुओं के नियमित टीका लगवाना चाहिए। वैक्सीनें से बचाव उपचार से ज्यादा बड़े तर उपाय होता है। इसलिए हमें अपने पशुओं के नियमित टीका लगवाना चाहिए। यदि पशुशाला, बर्तन, स्थान की समुचित साफ सफाई करके किसी जीवणु रोगों का छिड़काव कर देना चाहिए। यदि किसी पशु को रोग का प्रकोप हो जाता है। तो रोगी पशु शाला में पानी के निकास की उचित व्यवस्था हो तथा पीने के लिए स्वच्छ पानी पशुओं को पर्याप्त मात्रा में देना चाहिए और पर्याप्त साफ-सफाई रखना चाहिए। पशु स्वास्थ्य पशुपालक को शुद्ध पानी पशुओं को पर्याप्त मात्रा में देना चाहिए और पर्याप्त साफ-सफाई रखना चाहिए।

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Dairy Sector: An integral part of nutrition and food security of rural households.

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Abstract

Livestock sector is an important sub-sector of the agriculture of Indian economy. It forms an important livelihood activity for most of the farmers, supporting agriculture in the form of critical inputs, contributing to the health and nutrition of the household, supplementing incomes, offering employment opportunities, and finally being a dependable "mobile bank" in times of need. Besides in income generation and rural development, milk and milk products have a vital role in nutrition and food security in India. Dairying play a critical role in socio - economic growth, empowering rural women and environmental sustainability of rural people.

Key words: dairy, milk, energy, productivity, income, bovine etc.

I. Introduction

Man needs food to survive. But it is nutrition that forms the foundation for health, strength and intellectual vitality in all human beings. All people have physical, social and economical access to sufficient, safe and nutritious food. This foundation has yet to be laid in our country. The disease like small pox and malaria once known for causing great sufferings and miseries have almost been eradicated but malnutrition which is responsible for greater nuisance and sorrows still remains. Our constitution and government proclaim a socialist character based on equality of opportunity. But malnutrition, especially the prevailing insufficiency of protein intake can permanently impair the physical and mental growth in the crucial formative years of life. Thus, it denies both "equality" and "opportunity", saps the energy and breeds inefficiency. Besides, it also decreased the resistance of the body to diseases and infections.

The dietary benefit of milk and milk products will provide a boost for dairy industry. Higher quality of protein and essential nutrients in milk and milk products are of increasing value for food and nutritional security. According to the FAO 2018 report, more than 500 million impoverished people depend mainly upon livestock and many of them are small and marginal farmers.

Present dairy scenario

Dairy production system and agriculture are linked together, each being dependent on the other, and both crucial for overall food security. livestock acts as a supplementary and complementary enterprise. According to NSSO 66th Round Survey (July 2009 – June 2010) on Employment and Unemployment, 15.60 million workers as per usual status (Principal status plus subsidiaries status) were engaged in farming of animals, mixed farming and fishing. Whereas as per estimate of NSS 68th Round (July 2011-June 2012) survey on Employment and Unemployment, 16.44 million workers as per usual status (Principal status plus subsidiaries status) were engaged in the activities of farming of animals, mixed farming and fishing. The value of output from livestock sector was about Rs. 10,43,656 crore at current prices during 2017-18 which is about 33.25% of the value of output from agricultural and allied sector. At constant prices the value of output from livestock was about 31.81% of total agriculture and allied sector. (Source: DAHD, GOI)

Increasing per capita consumption of milk and milk products, changing dietary preferences due to rising urbanisation, and continued government support to the dairy industry will drive demand.

India has been a top ranked producer and consumer of milk and milk products in the world since 1998. Indian agriculture is an economic symbiosis of crop and milk production historically, the role of livestock has been complementary to crop production. Dairying and agriculture are bound together by a set of mutual input-output relationships. Dairying is not an adjunct to the crop-mix of Indian farms but is an integral part of the total farming system. Hence, treating dairy cattle as the backbone of the livestock wealth of our country would not be an exaggeration.

दुधारु पशुओं के लिए हरा चारा एवं उनका संरक्षण

□ डॉ० धर्मेन्द्र सिंह

प्रस्तावना - पशुओं को आहार खिलाने प्राचीन काल से ही एक महत्वपूर्ण कला रही है। दुधारु पशुओं के रख रखाव में उनके उत्तम स्वास्थ्य व अधिक उत्पादन हेतु संतुलित आहार का विशेष महत्व होता है। इस पर होने वाले कुल खर्च का लगभग 60% व्यय सिर्फ आहार पर होता है। इसकी सफलता भी प्रमुख रूप से पशुआहार पर होने वाले व्यय पर निर्भर होता है। पशुओं के शारीरिक विकास, प्रजनन एवं दुग्ध उत्पादन हेतु उसके आहार में सभी पोषक तत्वों को संतुलित मात्रा एवं सही अनुपात में होना आवश्यक होता है। हरा चारा-संतुलित आहार का एक प्रमुख हिस्सा है। ये सस्ते प्रोटीन व ऊर्जा का स्रोत होता है। उच्च कोटि का हरा चारा खिलाकर उत्पादन लागत को कम किया जा सकता है। कम लागत में दुधारु पशुओं को पौष्टिक तत्व प्रदान करने के लिए हरा चारा खिलाना आवश्यक है। शारीरिक आवश्यकताएं पूर्ण हो सकें। पशु आहार ऐसे पौष्टिक तत्वों का बना होना चाहिए जिससे उसकी आवश्यकतानुसार उसे सभी पोषक तत्व मिल सकें। यह सभी तत्व उसे एक ही चारे में नहीं मिल सकते। अतः संतुलित आहार में सूखा हरा चारा एवं पौष्टिक दानों के मिश्रण, मिनरल मिश्रण आदि उचित मात्रा में दिया जाना चाहिए।

दाने की अपेक्षा हरे चारे से पौष्टिक तत्व कम खर्च में मिल जाते हैं। हरे चारे से उनको कैरोटीन के रूप में विटामिन-A मिल जाता है। हरा चारा अच्छे उत्पादन के लिए प्रजनन व साथ ही विभिन्न रोगों से बचाव व अच्छे स्वास्थ्य के लिए आवश्यक होता है। हरा चारा वर्ष भर खिलाना चाहिए। यह तभी तक पशुओं को उपलब्ध हो पाता है। जब तक वह हमारे खेत में मिलता है। हरे चारे की उन्नत किस्मों से वह वर्ष भर हरा चारा प्राप्त कर सकता है। जैसे मक्का, बरसीम लूसर्न, ग्वार, लोबिया, सरसों, आदि साल भर हरा चारा मिलाना, खासकर गर्मी के मौसम में बहुत कठिन होता है। प्रायः वर्षा ऋतु उसके बाद हरा चारा उपलब्ध रहता है तो उसे साइलेज या हरे बनाकर संरक्षित कर सकते हैं। चारे की कमी के समय यह हरे चारे का अच्छा विकल्प हो सकता है। इसमें हरे चारे के सभी गुण व पौष्टिक तत्व भी संरक्षित रहते हैं। पशुओं के लिए हरा चारा बहुत ही आवश्यक होता है।

साइलेज (Silage Making)- इसके द्वारा हरे चारे अपने रसीली अवस्था में गड़ड़े में दबाकर संरक्षित रखे जाते हैं। यह Silage चारा अपार की भौति होता है। जो सुपाच्य होता है तथा पशु इसे बड़े वाद से खाते हैं।

साइलेज बनाने की उपयोगी फसलें- साइलेज बनाने वाले चारे में काफी मात्रा में कार्बोहाइड्रेट तथा नमी होना आवश्यक है। हमारे यहां मक्का एवं ज्वार साइलेज बनाने के लिये सर्वोत्तम चारे हैं। फलीदार फसलों से भी साइलेज बनाई जाती है। परन्तु इनमें कार्बोहाइड्रेट की मात्रा कम होती है। अतः ऊपर से शीरा अथवा खनिज अप्स छिड़कना पड़ता है। कार्बोहाइड्रेट की मात्रा कमी पूरा करने से फलीदार फसलों से अच्छी साइलेज बन जाती है। इसके अतिरिक्त बाजरा, लोबिया, पुश्पाल लूसर्न, बरसीम, जई, घास-पात, अमीले इत्यादि हरे चारे से भी साइलेज बनाई जाती है। साइलेज बनाने वाली फसल को फूलते समय ही काटा जाना चाहिए क्योंकि इस

संरक्षित फसल- पशुपालन एवं दुग्ध विज्ञान विभाग, श्री गुरुजी मनोहर टाउन नगतकोटा महाराष्ट्र राज्य, बीजा (अच्छा) भाग

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Livestock Production and Their Important Constraints in Dairying

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Abstract

The livestock has a unique place in Indian agriculture. It includes cattle, buffalo, sheep, poultry and fish. It contributes to about one fourth of our gross national product. It provides us with milk, draft power, hide, skins, bones, hooves, manures, fuel, meat, egg, wool, honey, wax, fish etc. With one-fourth of world bovine population, India produces only 8 per cent of world milk. Compared to developed countries our per capita consumption of egg and chicken is much less. Our pig population is one of the lowest in the world. Thus, our livestock are poor producers. The reasons are many. About half of the cultivated area is under arid and semi-arid region where agriculture depends mostly on livestock.

Keywords: Milk, protein, livestock, dairy, income, fuel, Agriculture, production etc.

1. Introduction

Livestock is an prominent sector among agriculture and allied activities in India. Lack of scientific management and prejudices of a large section of populace regarding rearing of poultry birds, consumption of egg and its meat are some of the causes of low poultry production. Pigs are still reared by poor section of society under little care to the animals. Apiculture is of recent development in India. Probably because of preference of a vegetarian diet and of regional habit, fish production is still at low ebb.

But with the present scientific knowledge, it is possible to increase the milk production of 50 per cent. India has already shown tremendous growth of poultry industry and with improved methods of feeding, breeding, disease control, is possible to enhance further. Growth of pig population is very rapid one can get 65-85 per cent of live wt. return. It requires small investment on building, etc. So farmer can make profit from it through a proper feeding and disease control measures. Country has got a vast variety of flora sufficient to maintain a large number of bee colonies for producing more honey and wax. We have exploited only a fraction of the 1.62 m ha of fresh water area and 2.02 m ha of brackish-water area suitable for fish farming. So there is a lot of scope to increase our fish production.

Therefore, Livestock sector is a prominent sector among agriculture and allied activities in India. In 1997-98 livestock alone contributed to 25 per cent of total value of agriculture GDP. This has increased gradually from 14 per cent in 1980-81. On the other hand, the contribution of agriculture sector to Gross Domestic product (GDP) decreased from 35 per cent in 1980-81 to 26 per cent in 1997-98. The annual rate of growth in GDP from livestock and agriculture in these years are 7.3 per cent and 3.1 per cent respectively.

Production and population trends

India has witnessed White Revolution attributing manifold increases in milk yield during the post independence era. Milk production in the country has enhanced from 17 million tones during 1951 to 81.5 million tones during 2000-01 and India has become number one in milk production during 1998 after surpassing USA. The target for the 10th Five year Plan though not yet analyzed would be of the order of 100 million tones. The value of milk and its products during 1998-99 was reported to be Rs.8,22,640 million, which accounted for 21 per cent of agricultural output during that year putting milk as the highest contributor to agricultural sector. Milk has become major agriculture produce contributing about 7 per cent to the GDP of India. According to an estimate, the milk production of our country would be 1165 million tones during 2009-10 considering a growth rate of 4 per cent in milk production. Total livestock population is 535.78 million in country showing increase of 4.6 percent over livestock census 2012. (Source : DAHD, Govt, 20th livestock census)

The highest number of our bovine population (209 million cattle and 92 million buffaloes) has placed India at number one position in global scenario of milk production. In India milk production is predominantly the domain of landless labors, small and marginal farmers who generally keep 1-2 milch animals under mixed farming system. The small holders have about 70 per cent of the total milch animals. Most of them are living in rural areas having inadequate facilities/infrastructure at their disposal and access to various services and market. Majority of the animals are reared on crop residues. Further, small and marginal farmers own almost 78 per cent



कुक्कुट पालन : एक लाभकारी व्यवसाय है

□ डॉ० धर्मेन्द्र सिंह

भारत एक कृषि प्रधान देश है जहाँ पर लगभग 79% से अधिक आबादी की जीविकोपार्जन का स्रोत मुख्यतः कृषि एवं पशुपालन है। मनुष्य के आर्थिक सामाजिक, शारीरिक तथा मानसिक विकास हेतु उच्च पोषण युक्त भोजन एवं आमदनी का होना नितान्त आवश्यक है। इसके विकास में कुक्कुट एवं उत्पादन की अहम भूमिका है। कुक्कुट पालन धीरे-धीरे बहुत लोकप्रिय होता जा रहा है। पर्याप्त जानकारी तथा साज्जानी के साथ यदि यह व्यवसाय को प्रारम्भ किया जाए तो इससे अच्छा धन कमाया जा सकता है।

ग्रामीण, शहरी व छोटे तथा बड़े स्तर के कुक्कुट पालक को अल्प समय में स्वरोजगार के अवसर उपलब्ध कराने का एक बेहतर विकल्प है। अल्प समय में उत्पादन क्षमता, अतिशोध शारीरिक बढोत्तरी तथा कम आहार में उत्पादन क्षमता इनकी विशेषता है। कुक्कुट पालन व्यवसाय में कम लागत एवं कम समय में अच्छी आमदनी प्राप्त की जा सकती है।

भारत में ग्रामीण क्षेत्र में कुपोषण एवं गरीबी को दूर करने के लिए पारंपरिक मुर्गी पालन बैकग्राउंड मुर्गी पालन के रूप में प्राचीन काल से ही प्रचलित है। ये ग्रामीण क्षेत्र में लोगों के लिए उच्च गुणवत्ता का प्रोटीन का स्रोत है तथा मांस व अंडा बेच कर परिवार को कुछ आमदनी भी प्राप्त हो जाती है। ये ग्रामीण अर्थव्यवस्था को सुदृढ़ करने का उत्तम साधन बन गया है। आज मुर्गी पालन एक संगठित उद्योग का रूप ले चुका है।

स्थान एवं आवास व्यवस्था— इस व्यवसाय को शुरू करने के लिए मुर्गियों के रहने के लिए समुचित स्थान की व्यवस्था करनी चाहिए। स्थान का चुनाव ऐसी जगह करना चाहिए जहाँ धरातल ऊँचा हो तराई वाले क्षेत्र जहाँ पानी भर जाता हो इस कार्य के लिए अच्छे नहीं माने जाते हैं। यातायात की पूरी व्यवस्था हो तथा वहाँ पर शोरगुल न होता हो। इनके लिए आवास उनके आराम, सुरक्षा, अच्छे उत्पादन एवं सुकृषि के लिए अति आवश्यक है। जो उनके लिए एक अनुकूल वातावरण प्रदान कर सकें तथा उनको परमक्षियों तथा विपरीत मौसम से सुरक्षा भी प्रदान कर सकें।

स्थान की मिट्टी उपजाऊ, दोमट मिट्टी जो पानी को शीघ्र शोष ले जिससे कीचड़ न हो जाए। वातायन विद्युत व जल आपूर्ति की पर्याप्त सुविधा होनी चाहिए। भूमि क्षेत्र की उपलब्धता, उसकी स्थिति, आवास उनकी व्यवस्था तथा उनको रोग से मुक्त रखना इत्यादि बातों को ध्यान में रखते हुए मुख्य तीन विधियों का प्रयोग किया जाता है।

1. Extensive System (विरल विधि)
2. Semi-Extensive System (अर्ध साधन विधि)
3. Intensive System (सघन विधि)

प्रथम विधि में पक्षियों को खुले वातावरण में चरने के लिए छोड़ दिया जाता है। इनको अधिक वर्षा, हवा, सूर्य की गर्मी से बचाने के लिए दीवार चौकियाँ या वृक्षारोपण का होना आवश्यक है। इसमें प्रति मुर्गी 80 वर्ग मी० स्थान की आवश्यकता होती है। रात्रि में विश्राम के लिए दड़वा बनाया जाता है। यह विधि ग्रामीण क्षेत्रों में ज्यादा उपयोगी होता है। दिन में मुर्गियों को बाहर छोड़ देते हैं। जिससे वे गृह बाटिका, आंगन, पशुबाड़ा, सड़क, खेत आदि स्थानों पर विचरण करती रहती हैं। रात्रि विश्राम के लिए स्थाई या अस्थायी (Portable) दोनों प्रकार के दड़वे बनाये जा सकते हैं। दूसरी विधि पहली विधि से अच्छी मानी जाती है। क्योंकि इनमें मुर्गियों को घेरे के अन्दर पालते हैं। इस विधि से पाली गयी मुर्गियाँ अधिक मजबूत, चंचल तथा विभिन्न मौसम को सहन करने वाली होती हैं।

अधिक घास पैदा होने वाले मौसम जैसे वर्षा ऋतु में मांस वाले पक्षियों का उत्पादन निःशुल्क हो

□ एगोसिप्ट प्रोसेसर— पशुपालन एवं दुग्ध विज्ञान विभाग श्री मुरली नन्दोहर राजन स्नातकोत्तर परीक्षालय, बलिया (उ.प्र.), बलिया

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Role of dairy farming in social and economic change of India

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Abstract.

Our country is one of the world's largest and fastest growing markets for milk and its milk products. It is getting almost 75 percent growth annually in value terms for milk and milk products. Indian agriculture is an economic symbiosis of crop and milk production. Historically, the role of livestock has been complementary to crop production. Dairying and agriculture are bound together by set of mutual input output relationship. It once a subsidiary enterprise to agriculture has become a major enterprise and crop production are depend on dairying. Although dairying is by large in the hand of small and marginal land holders and agricultural laborers. About 80 percent farm family in India possess cows and/or buffaloes as a part of family. Animal provide nutrient-rich food products, draught power, dung as organic manure and domestic fuel, hides & skin, and are a regular source of cash income for rural households.

Keywords: Milk, protein, livestock, dairy, income, fuel, production etc.

I. Introduction

Livestock sector is an prominent sector among agriculture and allied activities in India. Dairying plays an important role in socio economic life of India. In India, dairy is recognized as an instrument for social and economic development. Livestock production is backbone of Indian Agriculture and source of employment in rural areas for centuries. This sector has been the primary source of energy for agriculture operation and major source of animal protein for the masses. Therefore India has been house to major draught, milch and dual-purpose breeds of cattle. Our whole system of rural economy has revolved around livestock production. Livestock are natural capital, which can be easily reproduced to act a living bank with offspring as interest, and an insurance against income shocks of crop failure and natural calamities.

Driven by the structural changes in agriculture and food consumption patterns, the utility of livestock has been undergoing a steady transformation, the non-food functions of livestock are becoming weaker. Importance of livestock as source of draught power has declined considerably due to mechanization of agricultural operations and declining farm size. Cereal and legume crop straws have been traditional source of feed for India livestock. These straws have not been valued much in the past but with competitive milk production, its importance as source of feed has gone up tremendously.

Use of dung manure is increasingly being replaced by chemical fertilizers. On the other hand, growth, a fast-growing urban population, burgeoning middle income class, changing lifestyles, increasing proportion of women in workforce, improvements in transportation and storage practices and rise of supermarkets especially in cities and towns are fuelling rapid increases in consumption of animal food products.

Milk production trends in India

In India the average farm size is between 1-3 cows per farm, with 1,000 kg/cow/year on average. Most milk is sold before entering a processing plant and the supply chain is long and complicated. Dairy is sold in small unit rather than in bulk volumes. India's milk production continues to grow, to the point where it now tops the milk output of all the European Union countries.

Several measures were taken to increase the productivity of livestock, milk production has significantly increased by about 25 % from the level of 102.6 million tones at the end of the Tenth plan by the end of 2006-07 to 127.9 million tones at the end of the Eleventh Plan in 2011-12. When the Twelfth Plan began during 2012-13 milk production was 132.43 million tones with an annual growth rate of 3.54%. The per capita availability of milk in India was around 296 Grams per day in 2012-13, 146.3 million tones during 2014-15 as compared to 137.69 million tonnes during 2013-14 recording a growth of 6.26 per cent.

Milk production in India was up by a little more than 4% over the past 12 months, percent annual growth. India has actually been the world's top milk-producing country since 1997, but this is the first time that it has beat out the entire EU. On a country basis, the US produces the second-most milk, and China comes in third and it was 53.9 million tone during 1990-91 while now has become 140 million tonnes in 2013-14 by 6 percent annual growth. The share of agriculture output to GDP was decreased but in same period share of

43.04
30.128

Int. J. Curr. Microbiol. App. Sci. (2020) 9(4): 575-581

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 9 Number 4 (2020)
Journal homepage: <http://www.ijcmas.com>



<https://doi.org/10.20546/ijcmas.2020.904.070>

Research Article

Characterization of Rice Growing Soil of Nagara Block of Ballia District (U.P.), India

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ABSTRACT

An investigation was carried out for characterization of rice growing soil of Nagara block of Ballia district, (U.P.) India. Depth wise soil samples were collected from two selected village and in this respect a soil profile was opened in each village. Soil samples were collected from 0-15, 15-30, 30-45, 45-60, 60-75, 75-90, 90-105 and 105-130 soil depth. Standard method was followed for analysis of physico-chemical parameter of soil. Results revealed that pH of soil found to be slightly alkaline where EC was in normal range. Bulk density of soil found be (1.16 - 1.73 Mg m⁻³) and water holding capacity contained (20.4 - 37.5 %). Organic carbon content varied from (0.07 - 0.59 %). The soil was slightly moderately calcareous (0.39 - 1.37 CaCO₃%). Available N, P, K, and S content in soil varied from (142.2 - 489.8 kg ha⁻¹), (9.76 - 15.28 kg ha⁻¹), (259.6 - 403.2 kg ha⁻¹) and (9.25 - 16.25 kg ha⁻¹). Micronutrients Fe, Cu, Zn and Mn content in soil from (2.37 - 9.02 mg kg⁻¹), (1.31 - 9.07 mg kg⁻¹), (0.12 - 1.22 mg kg⁻¹) and (0.18 - 4.83 mg kg⁻¹) range respectively.

Introduction

Enhanced fertility management is an important tool for increasing productivity of agricultural soils that have a high degree of soil infertility resulting from the combined effects of physical, chemical or biological factors (Govaerts, 1998). However, major constraints to wide scale adoption of soil fertility management in most developing countries. In India, the prevalence of small holding and fragmented land, lack of modern farming facilities for extensive soil fertility management, The importance of

soil fertility and plant nutrition to the health and survival of all life cannot be understated. As human population continue to increase, human disturbance of the earth's ecosystem to produce food and fiber will place greater demand on soils to supply essential nutrients. Therefore, it is critical that we increase our understanding of the chemical, biological and physical properties and relationships in the soil plant atmosphere continuum that control nutrient availability. Soil is the most valuable natural resource. It is at the heart of terrestrial ecology, but is finite and non-renewable. To meet the challenges of this century, new

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NAAS Rating: 3.55, www.jrnl.org.in
 Received: 12.01.2021, Accepted: 20.03.2021
 Publication Date: 30th March 2021

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exudates: Soil carbon is key element which acts as skeleton for all nutrients element in soil plant nutrition as well as soil fertility is. In the mineralization of carbon in soil is to derive the status of different forms of carbon in the budget. The carbon mineralization is the transformation of organic and inorganic materials in to carbon dioxide. The mineralization rate can be used to study the impact of different organic and inorganic materials on soil functions. Chemical, physical and biological alternation and reduction caused mineralization of soil organic carbon (SOC), and increased CO₂ emission [1] is accounted for about 60% of total greenhouse impacts [2]. Trees can sequester atmospheric CO₂ in soils primarily due to higher

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Vertical Distribution of Soils Fertility of Sagarpali and Chitbadagon
Village of Ballia District, Uttar Pradesh

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Received: December 12, 2020
Published: April 23, 2021
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Singh, et al.

Abstract

An investigation was carried out for characterization of soils of Sagarpali and Chitbadagon village of Ballia district. For this purpose, 100 soil samples were collected from two selected village viz. Sagarpali and Chitbadagon. From both Sagarpali and Chitbadagon village, 100 soil samples were collected from 0 - 20, 20 - 40, 40 - 60, 60 - 80, 80 - 100, 100 - 120, 120 - 140 and 140 - 160 cm depths. In this respect a soil profile was opened in each village. Standard method was followed for analysis of physical, chemical and biological properties of soil. Results revealed that pH of soil found to be slightly acid to slightly alkaline where EC was in normal range. Soil found to be 1.40 - 1.54 Mg m⁻³ and water holding capacity 36.89 - 47.79%. Organic carbon content varied from 0.681 - 11.10 mg kg⁻¹, 240.8 - 403.2 kg ha⁻¹ and 4.32 - 8.35 mg kg⁻¹ respectively. The texture of soil was found to be sandy loam to clay loam. Available N, P, K, and S content in soil varied from 10.0 - 150.0 mg kg⁻¹, 1.0 - 10.0 mg kg⁻¹, 10.0 - 100.0 mg kg⁻¹ and 10.0 - 100.0 mg kg⁻¹ respectively. The texture of soil was found to be sandy loam to clay loam.

Keywords: Pedon; Soil Organic Carbon; Available N,P,K,S; Content and Soil Texture

Introduction

Soil is a natural gift for survivable of living organisms and base of nonliving things. Indian soils are generally poor in fertility, as these have consistently been depleted of their finite nutrients resource due to continuous cultivation for many centuries. Out of 20 nutrients, focus have been on nitrogen, followed by phosphorus, secondary and micronutrient have not been given due to attention. As a consequence deficiencies of nitrogen, phosphorus, potassium, sulphur, zinc have been reported to the extent of 89, 80, 50, 41 and 48% respectively (Singh, 2008). The deficiency of sulphur and zinc are becoming more widespread and critical. The use efficiency of applied N, P, K and Zn in Indian soils are 30 - 50, 15 - 20, 70 - 80, 2 - 5% respectively. Thus, problems of nutrient deficiencies are aggravated further because of low use efficiency of applied nutrient, particularly of P and micronutrients. Soil study and their analysis has played historical role in soil fertility maintenance and sus-

tainability in agriculture. Soil profile study helps in precision agriculture in area of all type of soils. In areas, conservation agriculture and in natural areas, remediation. Soil characteristics in natural areas, fertility of area are important aspect in conservation agriculture production. Because of imbalance of nutrients, application coupled with low efficiency of nutrients, deficiency of chemical fertilizers nutrients has become intensive agriculture in day by day since but soil fertility of specific kind of soil to formation with soil ecosystem boundaries to substance plus soil fertility, maintain or enhance water and air quality, human health and habitation (More, 2010). Soil indicator of some other related soil factors such as material homogeneity and heterogeneity, soil texture, material of clay and intensity of weathering of soil

Citation: Ashok Kumar Singh, et al. "Vertical Distribution of Soils Fertility of Sagarpali and Chitbadagon Village of Ballia District of Uttar Pradesh". *ACTA SCIENTIFIC AGRICULTURE* 5.5 (2021): 69-74.

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Study on cost-benefit analysis of milk production in western part of U.P.

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Abstract

The study conducted in western Uttar Pradesh with a view to analyzing the cost benefit and input-output relation in milk production on selected 50 dairy units were categorized into I, II, III and IV on the basis of their ownership groups. It revealed that the average maintenance cost were Rs.31.48, Rs.35.00, Rs.55.60 and Rs.43.03 per animal head per day and the input output ratio to total cost were 1:1.66, 1:1.47, 1:1.64 and 1:0.84 in the groups respectively. The percentage of break-even point have been estimated as 29.06, 98.63, 23.90 and 48.46 accordingly indicating no significant difference between groups. The organizational farm of IIIrd group receiving more net income as Rs. 21388.85 in comparison to other dairies. It was also observed that the dairies having cows only receiving more returns in comparison to buffaloes and dairies having both species. Perhaps, it is due to the inclusion of more number of sahtwal crossbreds. Thus, Crossbreds were found more beneficial than indigenous cows in the study area.

Key Words- Milk production, cost-benefit, input-output relationship, net income, cross breeds and indigenous cow

Introduction

Dairy farming in the country not only plays a vital role in eradicating poverty through generating employment and ameliorating financial stability of farmers but also contributes significantly in obviating protein mull nutrition. It once a subsidiary enterprise to agriculture has now become a measure enterprise and crop productions are being depended on dairying. Although dairying is by large in the hands of small and marginal land holders and agricultural labourers. About 80 per cent of farm family in India possesses cows and/ or buffaloes as a part of family. India one of the largest and fastest growing markets for milk and milk products is getting about 7.5 per cent growth annually in values terms. The country ranks first in milk production and it was 108.4 million tonnes in 2008 while 53.9 million tones during 1990-91 was achieved due to largest bovine population. The share of agriculture out- put to GDP was decreased, but in the same period share of livestock has increased. A growth rate of 4.5 per cent has been achieved by dairy sector during past decades as compared to the 2 per cent growth recorded by agricultural sector as a whole. India has the largest cattle and buffaloes population in the world. According to latest livestock

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भारतीय ग्रामीण अर्थव्यवस्था, कृषि व पशुपालन

डॉ० धर्मेन्द्र सिंह

भारतीय ग्रामीण अर्थव्यवस्था पूर्ण रूप से कृषि पर आधारित है। हमारे देश में कृषि और इससे सम्बन्धित उद्योगों और उत्पादों आपूर्ति अधिक रही है तथा खेती और पशुपालन ग्रामीण जनसंख्या के जीवन यापन का एक मुख्य साधन व स्रोत है। कृषि व ग्रामीण अर्थव्यवस्था की रीढ़ की हड्डी कहा जाता है। क्योंकि यहाँ 70 प्रतिशत से अधिक कृषि पर आधारित है। भारत के समल घरेलू उत्पाद में कृषि का हिस्सा 18.5 प्रतिशत है। इसलिए राष्ट्र को आर्थिक व उत्थान में यहां की ग्रामीण अर्थव्यवस्था का अत्यधिक महत्व है।

पादन
गांवों में रहने वाली 700 मिलियन ग्रामीण जनसंख्या का विकास सीधे तौर पर कृषि और उससे संबंधित क्षेत्रों के विकास से। कृषि का संबंधित क्षेत्रों में वृद्धि एवं उसका समग्र विकास सुदृढ़ ग्रामीण अर्थव्यवस्था का परिचायक है। वर्तमान में कृषि का स्तर घटा है। पिछले दो दशकों से उत्पादन में इतनी वृद्धि नहीं हुई है। जितनी हरित क्रांति की अवधि (1960 से 1970) में हुई थी। परन्तु भारत में कृषि संबंधित क्षेत्रों में हरित क्रांति (फसल उत्पादन), श्वेत क्रांति (दुग्ध उत्पादन), पीली क्रांति (तिलहन तथा मीली क्रांति (मत्स्य पालन) का लाभ उठाया है। हरित क्रांति के दौरान अनाज उत्पादन 1 टन प्रति एकड़ से बढ़कर एकड़ प्रति था। आने वाले दशक में 6 से 8 टन प्रति टन एकड़ उत्पादन की आवश्यकता है। हरित क्रांति तकनीकी के कारण पूरे देश में अनाज उत्पादन लगभग तीन गुना बढ़ा है जो वर्ष 1968-67 में 764 मिलियन टन से 2006-07 में 17.8 मिलियन टन। वर्ष 2007-08 में अनाजों का रिकार्ड उत्पादन 230.61 तथा 2008-09 में 233.8 स्तर तक पहुँच गया है। इस वर्ष खरीफ से अस्थिर मानसून व बाढ़ से प्रभावित होने के बावजूद भी कुल औसत उत्पादन के बढ़ने की सम्भावना है। इसी प्रकार जौ, सब्जी, तिलहन व तथा क्षेत्र की दृष्टि से 32 प्रतिशत। वर्तमान में देश की दलहन उत्पादन क्षमता लगभग 625 प्रति हेक्टेयर

मई 1988 में स्व० प्रधानमंत्री श्री राजीव गाँधी ने देश में तिलहन, तकनीकी मिशन की शुरुआत की थी, जिससे देश खाद्य आत्मनिर्भर बन सके और उसका आयात बंद है। परिणामस्वरूप वर्ष 1989-90 में तिलहन उत्पादन बढ़कर 18 मिलियन टन जितना देश हो गया। अमेरिका, चीन और ब्राजील के बाद तिलहन उत्पादन में भारत का चौथा स्थान है।

सुन एवं डेयरी
ग्रामीण अर्थव्यवस्था को सुदृढ़ करने में पशुपालन और डेयरी उद्योग की प्रमुख भूमिका है। यहाँ पहले पशुपालन, कृषि के साहायक के रूप में था। आज शिक्षित और वैज्ञानिक दृष्टिकोण रखने वाला प्रत्येक किसान दुग्ध उत्पादन को एक मुख्य उद्योग के रूप में मानता चाहता है। उसके लिए नवीन प्रौद्योगिकी, कृषि आधारित ज्ञान एवं सूचना की माँग है। खेती के साथ-साथ पशुपालन की

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भारत जैसे कृषि प्रधान देश की अर्थव्यवस्था को सशक्त बनाए रखने में कृषि एवं पशुपालन की महत्वपूर्ण भूमिका है। देश की आर्थिक और सामाजिक समृद्धि खासकर ग्रामीण अर्थव्यवस्था में पशुपालन व डेयरी का बड़ा योगदान है। विश्व की लगातार बढ़ रही जनसंख्या के परिणाम स्वरूप बढ़ती माँग की पूर्ति के लिए पारंपरिक खेती के साथ-साथ आधुनिक व तकनीकी खेती करना आवश्यक है। प्रोटीन की पूर्ति करने में पशुपालन क्षेत्र का बड़ा योगदान है। हम यूँ कह सकते हैं कि पशुपालन के बगैर खेती और कृषि की कल्पना बेमानी है।

देश की आबादी का लगभग ७० प्रतिशत कृषि एवं पशुपालन पर निर्भर है। अधिकांश दुग्ध उत्पादन छोटे, सीमान्त किसानों और भूमिहीन मजदूरों द्वारा किया जाता है। इसे हम इस रूप में भी कह सकते हैं कि देश का अधिकांश पशुधन, निर्वन वर्ग के हाथों में है। कृषि के साथ-साथ पशुपालन मानव व पर्यावरण दोनों के लिये उपयोगी है, लेकिन आजकल जनसंख्या के दबाव के कारण जोत के आकार छोटे होते जा रहे हैं तथा पशुपालन कम होता जा रहा है। देशी पशुओं के स्थान पर संकर व विदेशी नस्ल के पशुओं का पालन तेज गति से बढ़ रहा है। इससे देशी नस्ल के पशुओं के लिए खतरा उत्पन्न हो रहा है।

किसान अधिक उपज लेने की लालच में विभिन्न प्रकार की रासायनिक खादों और कीटनाशकों का अंधाधुंध प्रयोग कर रहे हैं। परिणाम, जल, वायु, भूमि, तथा वातावरण प्रदूषण के रूप में सामने है। इससे पर्यावरण का संतुलन बिगड़ रहा है। साथ ही मानव जाति के स्वास्थ्य को भी खतरा उत्पन्न हो रहा है। अब चिन्तित सरकारें जैविक खेती पर बल दे रही हैं।

टिकाऊ और देशी नस्ल के पशुओं के पालन पर जोर देने के आवश्यकता है, जो आज हमारे सामने एक चुनौती के रूप में है। इससे रासायनिक उर्वरकों पर निर्भरता कम होगी, लागत में कमी आयेगी, उत्पादन में वृद्धि होगी, जल, भूमि, वायु व वातावरण भी सुरक्षित रहेगा। पर्यावरण संतुलन को बनाए रखने को बल मिलेगा। इसलिए जैविक व टिकाऊ

खेती के लिए स्थाई व पशुपालन पर अधिक बल देना जरूरी है।

कृषि उत्पादन मानसून पर निर्भर है। फिर भी कृषि क्षेत्र में जहाँ पिछले दशक में २ प्रतिशत से भी कम की वृद्धि दर रही है, वहीं पशुपालन क्षेत्र से ४-५ प्रतिशत के आस-पास ग्रामीणों के रोजगार प्राप्त हुए हैं। उनके सामाजिक और आर्थिक स्तर को ऊँचा उठाने में मदद मिली है।

जनसंख्या वृद्धि के कारण प्रति व्यक्ति भूमि की उपलब्धता कम हो रही है। यह उपलब्धता वर्ष १९५१ में ८.८६ हेक्टेयर थी। वर्ष १९६१ तक यह घटकर महज ०.३७ हेक्टेयर ही रह गई। एक अनुमान के अनुसार २०३५ तक इसके ०.२० हेक्टेयर हो जाने की सम्भावना है। यह चिन्ता का विषय है। भारत के कुल भौगोलिक क्षेत्र की १४ करोड़ १० लाख हेक्टेयर कृषि योग्य भूमि का ४० प्रतिशत सिंचित तथा ६० प्रतिशत वर्षा सिंचित है।

वर्षा आधारित खेती में उत्पादकता तथा लागत दोनों कम होती हैं। विश्व के सम्पूर्ण स्थान खण्ड का ३० प्रतिशत भाग कृषि योग्य है। १८ प्रतिशत स्थाई घास क्षेत्र और पशुचरण योग्य भूमि तथा केवल १२ प्रतिशत पर कृषि कार्य सम्पन्न होता है। वर्ष २०१४-१५ में खाद्यान्न उत्पादन २५७.१ मिलियन टन होने का अनुमान था, जो गतवर्ष के औसत उत्पादन से ८५ लाख टन अधिक था। २०१३-१४ में २६५.६ मिलियन टन रहा। कुल जीडीपी में कृषि क्षेत्र की हिस्सेदारी १८ प्रतिशत रही।

खाद्यान्न उत्पादन वर्ष	(मिलियन टन)
२०११-१२	२५६.३
२०१२-१३	२५७.१
२०१३-१४	२६५.६

कृषि सांख्यिकी संगठन (सीएसओ) द्वारा जारी राष्ट्रीय आय की नयी संख्या के अनुसार १२ वीं पंचवर्षीय योजना में कृषि एवं सम्बद्ध क्षेत्रों के लिए ४ प्रतिशत के कृषि लक्ष्य की तुलना में २०१२-१३ में १.२ प्रतिशत से बढ़कर २०१४-१५ के १.१ प्रतिशत की वृद्धि हुई।

Characterization of Soils of Two Village of Maniyar Block, Ballia District, Uttar Pradesh

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Abstract: Two pedons exposed each in Badagon and Rampur villages of Maniyar block, Ballia district to study the layer-wise distribution of some physical and chemical properties. The sand, silt and clay pedon¹ were varied from 25 to 55 %, 30 to 60 %, clay 8 to 16 % while it was 40 to 65 %, 25 to 45 % and clay 10 to 17 % respectively in pedon 2. Bulk density increased with depth upto 90 cm, water holding capacity decreased with increasing depth in both the pedon, and it ranged from 43.35% to 34.02% through depth. The pH ranged from 6.2 to 7.4 in both the pedons but its distribution with depth different in these pedons. The electrical conductivity of soils in both the soils was above to 1ds⁻¹. The organic carbon content was high in upper layer of depth in soils. Calcium carbonate ranged from 2.5 to 0.4% and 3.9 to 0.4 % in pedon 1 and pedon 2. Available N, P and S were higher in surface layer and decreased with depths but their values were in higher side in pedon 2 barring few exceptions with soil depth amount of available P content in surface and sub-surface soil. However, it was slightly medium in soils of pedon 2. The medium available K content was found in surface layer (0-15 cm) and decreased with depth in both the pedons. The S content in surface soil was found to be higher than sub-surface soil. The amount of available S was found in surface horizons (0-15 cm) 13.5 mg kg⁻¹ in pedon 1, and 14.2 mg kg⁻¹ in pedon 2. The surface layer of pedon 1 had 13.4 cmol (p) kg⁻¹ exchangeable Ca while it was 6.4 cmol (p) kg⁻¹ in P2. The exchangeable magnesium in pedon 1 was 8.2 cmol (p) kg⁻¹ at 0-15 cm and 3.2 at 135-150 cm while in pedon 2 had exchangeable magnesium 7.3 cmol (p) kg⁻¹ at 0-15 cm and 3.0 at 135-150 cm soil depth.

Keywords: *Physical properties, chemical properties and available nutrients*

quality of soil, water and air. The understanding of the processes through profile study helps of basis their characterization. The information on characteristics of different layer of soils in block is lacking and hence present study was carried out.

Material and Methods

Maniyar block (25°8'79.96" N, 84°21'60.55" E) of Ballia district occurs at an elevation of 62 meters above the sea level and represents north east alluvial plains. The average maximum (47.5°C) and minimum (25°C)

is well established that soil is the most vital natural resource that nourish all kind of life. The indigenous ability of soils to supply the amount of essential nutrients has decreased due to their productivity levels associated with increasing demand for food. Therefore, one of the challenge today for every stakeholder of agriculture is to develop and implement such soil, crop and management technologies that could improve the productivity and also improve the

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Indian Journal of Agriculture and Allied Sciences

A 0.41

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ISSN: 2591-1109
NAAS Rating: 3.55, www.ijaaas.org.in
No. 1, Year: 2022

Received: 17.01.2022, Accepted: 15.02.2022
Publication Date: 30th March 2022

EFFECT OF ORGANIC AND BIO-AGENTS OF PLANT NUTRITION ON SOIL PROPERTIES, YIELD AND QUALITY OF TOMATO (*Lycopersicon esculentum* M.)

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A pot experiment was carried out in 2018-19 on application of different organic, inorganic and bio-agents for yield and quality of tomato and effect on properties of alluvial soil of Ballia. The effect on growth, yield of fruits, weight of fruit, yield of fruits and average of fruit unit was observed. The higher weight of fruit unit was observed with application of compost @ 10 t/ha¹ + Trichoderma culture. The greater decrease of pH was observed with application of compost 10 t/ha¹ + Trichoderma, whereas lower pH value was observed with application of 50% FYM + 50% Flyash + 50% RDF. The EC of soil was not affected by treatments combination. The maximum organic carbon content (0.75%) was observed by the application of compost @ 10 t/ha¹ + Trichoderma. The higher available nitrogen (340.25 kg/ha¹) was recorded with application of FYM 10 t/ha¹ followed by application of Compost 10 t/ha¹ and FYM 10 t/ha¹ + Trichoderma. The greater soil available phosphorus (12.08 kg/ha¹) content was found with application of FYM 10 t/ha¹ + Trichoderma. The greater soil available K (238.8 kg/ha¹) content was observed with the application of FYM + 50% Flyash + 50% RDF. The maximum sulphur content of 29.09 mg/kg¹ while the lowest content of 20.09 mg/kg¹ with application of 50% RDF + 50% Flyash + 50% FYM and FYM 10 t/ha¹ + Trichoderma. The content of exchangeable Ca⁺⁺ varied from 11.54 to 8.09 and exchangeable Mg⁺⁺ was 1.60 to 1.00 me/100g in compost 10 t/ha¹ + Trichoderma followed by 50% Compost + 50% FYM. The organic manures and bio agent have appeared productive effects on the growth and yield of tomato.

Tomato (*Lycopersicon esculentum* L.) is a major and tremendous popularity gain crop for its low calorific value and is a good source of vitamins A, C and B. It contains higher quantity of total protein, calcium, sodium, magnesium, iron, boron, manganese, zinc, copper, etc. apart from these, it also contains organic acids such as citric, malic and acetic acid. The sole application of organic manure and bio-agents are not able to improve soil fertility and crop productivity. Integrated application has proved superior to other components with respect to yield.

quality and nutrient uptake [2-4]. A bearing tomato plant removes considerable amount of nutrients from the soil; therefore, balanced manuring and fertilization practices in vogue are generally empirical. It is well known that increased dependence on agrochemicals including fertilizers and pesticides has leads to several health hazardous effects on the environment [5]. The continued use of organic fertilizers increases soil organic matter, better water infiltration and aeration, higher soil biological activity as the materials decompose in soil and increases yields after the year of application [6]. The indiscriminate use of chemical fertilizers drastically destroys the physical, chemical and biological properties of soil. Organic manure such as cow dung, *Trichoderma*, compost and C.



an evaluation of vertical distribution of available potassium and sulphur by use of different extractants in soils of Dubahar block of Ballia district U.P., India

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Abstract

An investigation was carried out for depth wise distribution of different forms of available potassium and sulphur in soils of Dubahar block of Ballia district was by collection of depth-wise soil samples from two different village's viz. Nagava and Dubahar by use of standard method. Soil samples from both villages express that soil pH ranges from 6.5-7.7, EC 1.001-1.004 dsm⁻¹, organic carbon 0.03-0.40 % and by use of different extractants for available K and S viz. NH₄OAc extractable - K 169.2 - 347.2 kg ha⁻¹, 0.01 M CaCl₂·2H₂O extractable - K 78.2 - 152.6 kg ha⁻¹, EDTA extractable - K 66.8 - 116.6 kg ha⁻¹, water soluble - K 160.2 - 214.0 kg ha⁻¹, HNO₃ extractable - K extractable - K 66.8 - 116.6 kg ha⁻¹, Mehlich III extractable - K 65.2 - 128.0 kg ha⁻¹, and 1 M NaCl extractable - K 160.2 - 288.0 kg ha⁻¹, and amount of CaCl₂ extractable - S was 5.0 - 6.3 mg kg⁻¹, NaHCO₃ extractable - S 160.0 kg ha⁻¹, and amount of CaCl₂ extractable - S was 5.0 - 5.2 mg kg⁻¹, HCl extractable - S 2.3 - 3.0 mg kg⁻¹, 5.43 - 5.2 mg kg⁻¹, KCl extractable - S was 6.0 - 6.8 mg kg⁻¹ respectively.

Keywords- Extractants, available sulphur, available potassium and soil depth

Introduction

It is well established that potassium is most important major nutrient elements for animal, fish and microbe's growth and development. Soil potassium exists in dynamic equilibrium response for quality development in plants and it is present in important four forms viz. water soluble (SK), exchangeable (Exch-K), non-exchangeable (NEK) and lattice K, of which the first two are important for the growth of higher plants and microbes (Singh *et al.* 2010). A large portion of the total K in soil occurs as structural component of soil minerals and is unavailable to plants. Plants can use only the Exchangeable K present on the surface of soil particles and the K dissolved in soil water phase of Exchangeable-K from, non-exchangeable from. The level of soil solution K depends upon substitution and kinetic reactions that occur between different forms of K, the soil moisture content and the concentration of bivalent cations in solutions and phase (Sparks and Huang 1985). Sulphur

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बलिया (उ०प्र०)

गन्तिक पृष्ठभूमि :-

परिवर्तन प्रकृति का नियम है और इस भूगण्डलीकरण के युग में जब हम वैश्विक परिप्रेक्ष्य में शिक्षा को देखने प्राप्त करते हैं तो यह स्पष्ट रूप से परिलक्षित होता है कि नये समाज के निर्माण हेतु प्रारम्भ से ही शिक्षा का एक योगदान रहा है क्योंकि शिक्षा ही वह अस्त्र है जो व्यक्ति को उनकी आत्मशक्ति से परिचित कराती है।

वर्तमान में शैक्षिक परिवेश तेजी से बदल रहा है। अध्यापक शिक्षा की अवधारणा उसके गतिशील स्वरूप, प्रक्रिया एवं शिक्षक-छात्र भूमिका के बारे में नये ढंग से सोचने का आग्रह कर रहा है। जहाँ एक ओर विज्ञान एवं प्रभावों से सम्पूर्ण विश्व अभिभूत है, वहीं दूसरी तरफ अध्यापक शिक्षा अपनी गुणवत्ता को बनाये रखने में ज महसूस कर रहा है, क्योंकि आज भी देश में अध्यापक शिक्ष की स्थिति में कुछ परिवर्तन को छोड़कर लगभग डूरे पर चली आ रही है। अध्यापक शिक्षा के सैद्धान्तिक विषयों का वर्तमान शिक्षा व्यवस्था से दूर-दूर तक सम्बन्ध है। आज के इस तकनीकी युग में नवपीढ़ी को शिक्षित करने के लिए अध्यापक शिक्षा में उन्हीं पाठ्यक्रमों की माँग

रही है, जिनमें सामाजिक आवश्यकताओं को शीघ्र पूरा करने की क्षमता हो।

केन्द्र एवं राज्य स्तरों पर गठित सभी शिक्षा आयोगों तथा शिक्षा समितियों ने गुणवत्तापूर्ण अध्यापक शिक्षा पर देखा है, जिससे शिक्षा व्यवस्था की आवश्यकताओं की पूर्ति की जा सके। माध्यमिक शिक्षा आयोग (1953) ने भेक स्तर पर शैक्षिक पुनर्रचना हेतु अध्यापकों की व्यवसायिक प्रशिक्षण के महत्वपूर्ण कारक के रूप में बताया है। आयोग (1984-6) ने भी संकेत किया है कि विज्ञान एवं प्रौद्योगिकी पर आधारित विश्व में लोगों की सुरक्षा, उनका ण एवं समृद्धि का निर्धारक शिक्षा होती है तथा शिक्षा में गुणात्मक सुधार सुनिश्चित करने की दृष्टि से अध्यापक का गुणात्मक होना अत्यन्त आवश्यक है। नवीन शिक्षा नीति (1986) एवं संसोधित कार्य प्रस्ताव (1992) ने इस पर जोर दिया है कि अध्यापक शिक्षा एक सतत प्रक्रिया है तथा शिक्षक-प्रशिक्षण के सेवापूर्व एवं सेवाकालिन अंग र परिपूरक है। इसी उद्देश्य हेतु अध्यापक शिक्षा को योजनाबद्ध एवं समन्वित विकास के साथ-साथ गुणवत्ता एवं अध्यापक शिक्षा के मानदण्डों के समुचित अनुरक्षण हेतु राष्ट्रीय अध्यापक शिक्षा परिषद (NCTE) की ना हुई, फिर भी गुणवत्तापूर्ण अध्यापक शिक्षा की व्यवस्था उपलब्ध कराना एक गंभीर चुनौती बना हुआ है।

गन्तिक पृष्ठभूमि :-

अध्यापक शिक्षा के वर्तमान परिदृश्य को लेकर कई बुनियादी प्रश्न उठ रहे हैं। क्या अध्यापक शिक्षा

Sustainable Rural Development : Issues & challenges

-Dr. Omkar Singh*

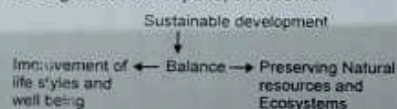
Sustainable Development

Sustainable development is a Process, which aims to meet the needs of the present generation without harming the ability of future generation to develop. It is not only about particular environmental issues such as extinction of species and pollution, but also about economic progress which meets all our needs without leaving future generation with fewer resources that we enjoy.

Subsequently the term was introduced in 1987 by the world commission on environment and development (WCED, 1987) headed by Gro Harlem Brundtand, the then Prime minister of Norway in its report 'Our common future'.

WCED (1987) defined sustainable development (SD) as 'Development that meets the needs of the present without compromising the ability of future generation to meet their own need'. This means that the present resource base is the base for the survival of the future generations too. The Nature has entrusted us with a hard task of preserving the environment while exploiting and passing on to the next generation as we have borrowed from our elders.

According to Douglas Muschett (1997) 'Sustainable development means ecological development and a standard of living which do not impair the future ability of the environment to provide sustenance and life support for the population. Thus sustainable development is maintaining a delicate balance between the human need to improve life styles and feeling of well-being on one hand, and Preserving natural resources and Eco-systems, on which we and future generations depend, on the other.



life styles and well being

Sustainable development requires interrelationships between population, resources and environment and development to be fully recognized and brought into a harmonious, dynamic balance. Besides, for nature, its philosophy is based on balanced consumption aiming at ecological performance. It looks for appropriate technology with welfare of the weakest leading to development for all. What needs to be realized is that sustainable development is both a goal and a process. Attainment requires a fundamental change in attitudes, values and behaviours.

In Practice, therefore, sustainable development is a multifaceted concept involving environmental, economic, socio-cultural and political considerations. The essence is to promote development development, reduce disparities between demand and supply, improve and maintains a healthy environment and contributes towards improving global environment condition. Hence, a very comprehensive concept encompassing three major sets of objectives, integrated together as presented in Fig.



development in rural areas
rural issues such as:
population stabilisation
technologies/technology transfer
efficient use of Natural resources, ie.
water

reduction of pollution
integrated environmental systems
management
education of all
paradigm change in perceptions and
attitude for people

Social and cultural change
Principles of sustainable rural
development are

to integrate development programmes
and conservation strategies through
ecological and economic integration.

to ensure socio-economic security

to respect for carrying capacity

to conserve bio-diversity.

to enable communities to protect local
environment.

to respect cultural and religious
diversity and

to promote tolerance, peace and
democracy.

Rural Development

Rural development is a broad concept and in-
cludes the growth in economic, social and
characteristics in the society, ie. growth
in agriculture, industry, equitable distribution of
education, rational population policy
improving relationships among minority
communities. Hence it implies a
small the areas simultaneously. In this
development is a value loaded term and
should be conceived in comparison
with levels of developed or under develop

In India, agriculture is greatest opportunity

in Rural areas, where 52 percent of cultivable
land compared to 11 percent which is the world
average, we have the largest number of live
stock in the world. India has all the 15 major
climates and 46 out of 60 soil types which exist in
the world with 20 agro climatic regions and 10
Biodiversity Zones. Indian agriculture is geared
for diversity of crops. With a large sunshine hours
and long day length, the conditions are ideally
suited for year round cultivation.

Eight out of every ten impoverished (BPL)
Families of the nation reside in rural areas ie.
villages. Three out of every four rural dweller is
dependent on agriculture for their income. Any
return on investment in agriculture would be at
least four times as effective in solving poverty as
any other sector and transference in agricultural
would directly impact about 500 million Indians.

Therefore we must design eco friendly,
resource efficient and culturally suitable
technology which are more useful cost effective
and sustainable as they use less of resources
and produce minimum waste eg. indigenous
technology

Using scientific method of farming involving
soil characterization matching the right seed to
soil, seeding in time, fertilizer and pesticide
selection water management, pre & post
harvesting methodology, have been adopted for
improving productivity.

For sustainable rural development on a long
term, new Agricultural model has been evolved
careful action plan in how expansion of irrigation
facilities and water management can work
in synchrony. On the demand side, our
sustainability has to be focus on how to reduce
the cultivation of water per unit crop. There is a
need for scientific cultivation with less water and
less land- using methods such as drip irrigation.
Technology can definitely play a major Role in the
water management if it is able to customize itself
according to the needs and constraints, which
are present at the field level.

शिक्षा का अधिकार अधिनियम का समीक्षात्मक अध्ययन

डॉ० ओंकार सिंह

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सार संक्षेप

यह निर्वाह रूप से सत्य है कि मानवीय क्षमता के विकास में शिक्षा का महत्वपूर्ण योगदान है। शिक्षा ही वह सशक्त माध्यम है, जो मानव में अन्तर्निहित शक्तियों का विकास कर समग्र व्यक्तित्व प्रदान करता है। प्राथमिक शिक्षा, औपचारिक शिक्षा का वह प्रथम सोपान है, जिस पर माध्यमिक एवं उच्च शिक्षा का विशाल भवन निर्मित होता है। प्राथमिक शिक्षा का सम्बन्ध किसी वर्ग या व्यक्ति विशेष से न होकर सम्पूर्ण जनसंख्या से है। अतः इसे गुणात्मक रूप में प्रत्येक बच्चे को सर्वसुलभ कराकर राष्ट्र को सशक्त एवं विकसित बनाया जा सकता है। यद्यपि स्वतंत्रता प्राप्ति के पश्चात् राष्ट्र के शिल्पकारों ने भारतीय संविधान में प्राथमिक शिक्षा की सार्वभौमिकता के प्रति प्रतिबद्धता दिखायी, जिसके परिणाम स्वरूप संविधान के अनुच्छेद-45 के अन्तर्गत संविधान लागू होने के 10 वर्षों के भीतर 6.14 वय वर्ग के सभी बच्चों को प्राथमिक शिक्षा निःशुल्क एवं अनिवार्य रूप से प्रदान की जायेगी, परन्तु अब तक राजनैतिक इच्छाशक्ति की कमी एवं प्रतिबद्धता के अभाव में यह उद्देश्य अन्ततः संसद ने 4 अगस्त 2009 को शिक्षा का अधिकार अधिनियम पारित हो गया, जिसके परिणाम स्वरूप देश के सभी बच्चों को शिक्षा का मौलिक अधिकार प्राप्त हो गया।

सैद्धान्तिक पृष्ठभूमि-

भारतीय संविधान में प्राथमिक शिक्षा के सार्वभौमिक प्रतिबद्धता के अनुसार संसद में 4 अगस्त 2009 को 6.14 वयवर्ग के सभी बच्चों को निःशुल्क एवं अनिवार्य शिक्षा पाने का अधिकार अधिनियम पारित हो गया तथा 27 अगस्त 2009 को भारत सरकार के गजट में प्रकाशित हुआ। इसके अन्तर्गत 6.14 वयवर्ग के सभी बच्चों को अपने पड़ोस के विद्यालय में आठवीं कक्षा तक बुनियादी शिक्षा निःशुल्क एवं अनिवार्य रूप से पाने का अधिकार सख्त है। इस अधिनियम के अन्तर्गत यदि 6 वर्ष की आयु तक किन्हीं कारणों से विद्यालय में प्रवेश नहीं ले पाता है तो वह बाद में भी अपनी उम्र के अनुरूप कक्षा में प्रवेश ले सकता है। इस प्रकार उसे अपनी कक्षा के स्तर पर आने के लिए निःशुल्क प्रशिक्षण का अधिकार भी होगा। किसी भी बच्चे के प्रवेश से इन्कार नहीं किया जा सकता। यदि वह 14 वर्ष निम्नलिखित आयु तक बुनियादी शिक्षा पूरी नहीं हो जाती, उसे न तो विद्यालय से निकाला जायेगा। यदि वह 14 वर्ष निम्नलिखित आयु तक बुनियादी शिक्षा पूरी नहीं कर पाता तो भी उसके बाद पढ़ाई पूरी होने तक उसे निःशुल्क शिक्षा दी जाती रहेगी।

जनसंख्या शिक्षा : क्यों एवं कैसे

डॉ० ओंकार सिंह*

सैद्धान्तिक पृष्ठभूमि -

हमारे राष्ट्र के विकास में आज सबसे बड़ी चुनौती है- विशाल जनसंख्या जो भयावह रूप में निरन्तर बढ़ रही है। यह एक सार्वभौमिक समस्या है, जो वास्तव में लगभग सभी समस्याओं की जड़ भी है। जिन समस्याओं का सीधा सम्बन्ध जनसंख्या से नहीं है, उन्हें भी और अधिक जटिल बनाने तथा उनके व्यवहारिक हल को असम्भव बनाने में जनसंख्या की महत्वपूर्ण भूमिका है। हमारे देश में फैले कुपोषण, निरक्षरता, गरीबी, बेरोजगारी, अपराध, बीमारी, प्रदूषण अथवा आम अवनति की समस्यायें अधिकांशतः प्रत्यक्ष तथा कहीं-कहीं अप्रत्यक्ष रूप से विशाल जनसंख्या तथा इसकी तेज वृद्धि दर से ही सम्बन्धित हैं।

निसन्देह जनसंख्या की निरन्तर तीव्र वृद्धि, मानव जाति के लिए अभिशाप है। जनसंख्या के अधिक बोझ से पारिस्थितिकीय सन्तुलन (Ecological Balance) बिगड़ गया है। चूंकि किसी राष्ट्र के विकास का मापक मानवीय संसाधन की गुणवत्ता है। जनसंख्या वृद्धि की दर को नियंत्रित करने और उसकी गुणवत्ता पर ध्यान केन्द्रित कर योग्य नागरिक बनाने की दिशा में जनसंख्या शिक्षा की महत्वपूर्ण भूमिका है। चूंकि आज का बालक कल का एक जिम्मेदार नागरिक बन सके, अतः आवश्यक है कि वह यह जाने कि उसका स्वयं के प्रति, अपने परिवार के प्रति, अपने समाज एवं देश के प्रति क्या कर्तव्य है तथा उसे किस प्रकार निर्वाह करना है।

जनसंख्या शिक्षा हमारे सामाजिक मूल्यों को ध्यान में रखकर इस बात पर बल देती है कि जनसंख्या से सम्बन्धित मूलभूत प्रश्नों पर आज का हर बालक, जो कल माता-पिता बनने वाला हो, तर्कसंगत विचार-विमर्श कर सके और अपने जीवन में यथायोग्य समुचित निर्णय लेने की क्षमता प्राप्त कर सके। जनसंख्या शिक्षा इस सन्दर्भ में परिस्थिति को बदलने की दिशा में एक छोटा सा, किन्तु सुनिश्चित एवं सुनियोजित प्रयास है।

जनसंख्या भयावहता- जनसंख्या वृद्धि किसी राष्ट्र विशेष की समस्या न होकर, सार्वभौमिक समस्या है। यदि भारतीय सन्दर्भ में जनसंख्या की भयावहता को देखें तो स्थिति बेहद गम्भीर है। स्वतंत्रता प्राप्ति के पश्चात् वर्ष 1951 की जनगणनानुसार देश की कुल जनसंख्या 36.11 करोड़ थी, जो वर्ष 2011 के जनगणनानुसार 121.02 करोड़ हो गयी, जो 2001 के जनगणना की तुलना में 18.10 करोड़ अधिक है। हमारी कुल आबादी अमेरिका, इण्डोनेशिया, ब्राजील, जापान, पाकिस्तान एवं बर्मादेश के कुल आबादी के

* वरिष्ठ प्रवक्ता, शिक्षा-शिक्षा विभाग, श्री गुरुजी मनोहर टाउन स्नातकोत्तर महाविद्यालय, बलिया (उ०प्र०)

लगभग बराबर है। भारत में विश्व जनसंख्या का कुल 17.5 प्रतिशत भाग निवास करता है। एक अनुमान के अनुसार संयुक्त राष्ट्र द्वारा प्रकाशित विश्व जनसंख्या परिदृश्य-2004 के अनुसार 2050 तक भारत की जनसंख्या चीन से भी अधिक होगी अर्थात् दुनिया की आधी आबादी केवल भारत एवं चीन में होगी। संयुक्त राष्ट्र के जनसांख्यिकीविद् चेरिल स्वेयर के अनुसार 2050 में भारत की जनसंख्या 159.2 होगी, जबकि चीन का 139.2 करोड़। सन् 2035 तक भारत की जनसंख्या, चीन की जनसंख्या को लौंघ जायेगी।

किसी देश का विकास जनसंख्या के उपयुक्त आकार और श्रेष्ठ गुणात्मक विशेषताओं पर निर्भर करता है। 2005 में जनसंख्या घनत्व 345 प्रति व्यक्ति किमी था जो 2025 में बढ़कर 440 हो जायेगा। बढ़ती जनसंख्या से विकास धीमी हुई है तथा समय के साथ-साथ संसाधनों की प्रति व्यक्ति उपलब्धता घट रही है। अधिक जनसंख्या से भूमि पर लगातार दबाव बढ़ रहा है, वहीं दूसरी ओर दुर्लभ संसाधनों का अधिक दोहन हो रहा है। इतनी बड़ी आबादी का भरण-पोषण कठिन है। प्रति व्यक्ति कृषि जोत दिनों दिन घट रही है। बढ़ती हुई आबादी के भरण-पोषण के खाद्यान्न उत्पादन पर्याप्त न होने के कारण देश में सभी के लिए भोजन जुटाना गम्भीर समस्या होगी। राष्ट्रीय नमूना सर्वेक्षण संगठन के अनुसार देश की दो तिहाई आबादी को 2030 तक शुद्ध पेयजल प्राप्त न हो सकेगा। वर्तमान में पानी की प्रति व्यक्ति उपलब्धता मात्रा 1525 घन मीटर है, वहीं 2030 में यही उपलब्धता 1060 घनमीटर रह जायेगी। आवास एवं शहरी गरीबी निवारण मंत्रालय के आंकड़ों के अनुसार देश में लगभग 2.47 मकानों की कमी पाई गयी है। ऐसे खर्च करने के बावजूद लोगों को बिजली, पानी, ईंधन जैसी सुविधायें नहीं प्राप्त हो रहे हैं। बुनियादी सुविधाओं की कमी के कारण आराम एवं सुख की जगह लोग, परेशानी एवं तनावपूर्ण मलिन बस्तियों में रहने को विवश हैं। बढ़ती जनसंख्या से वन-क्षेत्रों में प्रतिवर्ष कमी के कारण दिनोदिन समस्यायें बढ़ रही हैं। इस प्रकार जनसंख्या का दबाव आर्थिक, सामाजिक एवं भौगोलिक दृष्टि से देश को गहरी क्षति पहुँचा रहा है।

जनसंख्या और विकास आपस में एक दूसरे से जुड़े हुए हैं। उपलब्ध संसाधनों से ही आवश्यकताओं की पूर्ति की जा सके, आम जन को जनसंख्या में चिन्ताजनक वृद्धि के दुष्परिणामों को समझना होगा। संसाधन सीमित हैं, उन्हें एक सीमा तक ही बढ़ाया जा सकता है। माल्थस के अनुसार जनसंख्या गुणोत्तर क्रम में (1, 2, 4, 8, 16,) बढ़ती है, लेकिन व्यक्ति को सन्तुष्ट करने के साधन को समान्तर क्रम में (1, 2, 3, 4, 5,) ही बढ़ पाते हैं। इस स्थिति में जन-जन के लिए आवश्यक है कि हमारे पास जो भी संसाधन उपलब्ध है उनका उचित दोहन हो। जनसंख्या की तीव्र गति को रोकने हेतु जनसांख्यिकी, शैक्षिक पर्यावरण और विकास कार्यक्रमों में तालमेल को बढ़ाया देकर जनसंख्या स्थिरिकरण के लिए प्रयास किया जाय।

किसी भी देश की जनसंख्या वृद्धि उस देश के सामाजिक परिवर्तन को प्रभावित करता है। यदि जनसंख्या वृद्धि आवश्यकता से अधिक हो तो यह स्थिति राष्ट्र की प्रगति में बाधक होती है। जो देशवारिष्ठ्य में जीवन स्तर को निम्न बनाती है, बेरोजगारी में वृद्धि करती है, खाद्य संकट की समस्या उत्पन्न करती है, प्रति व्यक्ति आय में कमी होती है, जिससे पूँजी का निर्माण आवश्यक मात्रा में नहीं हो पाया, जिससे देश की आर्थिक प्रगति बाधित होती है। जैसा कि अशोक मेहता ने कहा है कि "देश की बढ़ती जनसंख्या उस

मूल्य सम्वर्धन में विद्यालयों की भूमिका

डॉ० ओंकार सिंह

सैद्धान्तिक पृष्ठभूमि

वर्तमान समय में वैज्ञानिक आविष्कारों के परिणाम स्वरूप द्रुत गति से होने वाले आधुनिक औद्योगिक विकास, जनसंख्या विस्फोट एवं नगरीकरण के कारण आज मानव निरन्तर विनाश की ओर अग्रसर है। वर्तमान परिवेश में चारों तरफ हिंसा, अराजकता और भ्रष्टाचार आदि की भयावह स्थिति व्याप्त है, जिससे मानवीय जीवन अस्त-व्यस्त होकर किंकर्तव्यविमूढ़ की स्थिति में पहुँच गया है, जिसका मुख्य कारण सही-गलत नैतिकता-अनैतिकता की बीच अन्तर करने की विवेकशक्ति का क्षीण होना है। इस अनिर्णय एवं भौतिकता युक्त परिवेश में मानव जीवन में अशांति, निराशा, भय, लोभ, स्वार्थ, ईर्ष्या, अवसरवादिता, चाटुकारिता आदि ने कर्तव्यपरायणता, ईमानदारी, त्याग, साहिष्णुता आदि का स्थान ले लिया है, जिससे मानवीय मूल्यों में हास हुआ है।

मूल्य सम्वर्धन में शिक्षा की महत्वपूर्ण भूमिका है। शिक्षा ही वह सशक्त माध्यम है, जिसकी सहायता से मानवीय मूल्यों का संरक्षण एवं सम्वर्धन किया जा सकता है। आधुनिक परिवेश में स्वामी विवेकानन्द का कथन— "शिक्षा का लक्ष्य मानव निर्माण हो" यथार्थ प्रतीत होता है। परन्तु वर्तमान समय में शिक्षा का एकांगी रूप दिख रहा है, जिसका केवल एक उद्देश्य छात्रों का मानसिक विकास एवं पुस्तकीय ज्ञान पर बल देना है तथा परीक्षा में अधिक से अधिक अंकों के साथ डिग्री प्राप्त कर नौकरी पाना है। वर्तमान वैश्विक पर्यावरण में छात्रों के समक्ष मानसिक द्वन्द एवं अनिर्णय की स्थिति व्याप्त है, इस मूल्यद्वन्द की कलुषित परिस्थिति

वरिष्ठ प्रवक्ता, श्री० ए०३० विभाग, श्री मुरली मनोहर टाउन महाविद्यालय, बलिया

को हटाना तथा मूल्य शिक्षा के सैद्धान्तिक एवं व्यवहारिक प्रत्यय से विद्यार्थियों को परिचित कराना आज की शिक्षा का प्रमुख लक्ष्य होना चाहिए। मूल्य शिक्षा के माध्यम से विद्यार्थियों में भौतिक समृद्धि एवं अध्यात्मिकता के मध्य सामंजस्य स्थापित कर मानवीय मूल्यों को विकसित किया जा सकता है, जिससे मानव के व्यक्तित्व का सन्तुलित विकास करके सही अर्थों में मानव को 'मानव' बनाया जा सके।

डॉ० रघुकृष्णन का कथन— "आधुनिक मानव ने पक्षी की तरह आकाश में उड़ना सीख लिया, सागर में मछली की तरह तैरना सीख लिया, परन्तु पृथ्वी पर मानव की तरह चलना मूल गया"— यहाँ समीचीन होगा।

मूल्य एवं मूल्य शिक्षा

मूल्य मानव के व्यवहार को नियन्त्रित एवं निर्देशित करते हैं। मूल्य एक ऐसी आचार संहिता या संदर्भों का समूह है, जिसे मानव अपने संस्कारों तथा पर्यावरण के माध्यम से अपनाकर अपने निर्धारित लक्ष्यों की प्राप्ति हेतु जीवन पद्धति का निर्माण कर अपने व्यक्तित्व का विकास करता है। इनमें मनुष्य की धारणार्थ, विचार, विश्वास, मनोवृत्ति, आस्था एवं निष्ठा आदि समाहित होते हैं। ये मूल्य एक ओर व्यक्ति के अन्तःकरण द्वारा नियन्त्रित होते हैं तो दूसरी तरफ संस्कृति एवं परम्परा द्वारा क्रमशः निरस्त एवं परित्यक्त होते हैं। इस मानव जीवन शैली के निर्माण की आधारशिला समाज द्वारा विकसित शिक्षा एवं शैक्षिक प्रक्रिया के द्वारा होती है जो औपचारिक एवं अनौपचारिक परिवेश में मूल्य शिक्षा के माध्यम से समाज में मूल्यों की संस्कृति विकसित करता है, जो मानव का आचार व्यवहार प्रभावित करता है।

मूल्य विमर्श 26

शिक्षक उद्देश्यों के निर्धारण में संज्ञानात्मक एवं
हस्तात्मक गहराई को जो प्रोत्साहित किया जा रहा
है, परन्तु भावात्मक पक्ष की पूर्णतः उपेक्षा की
गयी रही है। अतः भावात्मक पक्ष को शिक्षण
प्रक्रिया में शामिल करने से सम्बद्ध करने हेतु प्रत्युत
पक्ष को शैक्षिक अनुप्रयोग किया जा सकता

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विद्या मेघ

कलाकार एवं समीक्षक : डॉ० गोपाल मधुकर चतुर्वेदी

• डॉ० (श्रीमती) मीना कुमार • एवं • विद्या •

सर्वविदित है कि कलाकार किसी कला-
कृति को रचना के लिए अवसर की अनुभूति को
के आधार पर कल्पना की चरित्तों से वह पद पर
हाथों की धारकन प्रारम्भ कर देता है।

गोपाल चन्द्र मधुकर चतुर्वेदी अलीगढ़ के
एसे ही उत्कृष्ट कलाकारों में से हैं, जिन्होंने
अपने अन्तर्गत पर पढ़ने वाले सामाजिक प्रभावों
को बुझाकर के द्वारा चित्रपट पर अंकित किये हैं।
चतुर्वेदी जी का जन्म 18 दिसम्बर 1932 को
उत्तर-प्रदेश के इटावा में हुआ था। इनके पिताजी
श्री-पंडित राम विहारी नाल चतुर्वेदी हिन्दी
कलेक्टर के पद पर कार्यरत थे, एवं माता जी
श्रीमति सरस्वती देवी बहुत प्रमुखापी एवं कला-
प्रिय गृहणी थी। बाल्यावस्था में भाला-पिता की
कला के प्रति रुचि से प्रेरणा लेकर चतुर्वेदी जी
ने रेखांकन करना आरम्भ कर दिया।

शैटिक की प्रीक्षा के उपरान्त कला की
विधिवत शिक्षा हेतु इन्होंने लखनऊ कला
विद्यालय में प्रवेश लिया। यहाँ पर इन्होंने पाँच
वर्ष फाइन आर्ट में एवं एक वर्ष मूर्तिकला में
गहनता के साथ अध्ययन किया। 1987 में इनको
विश्वविद्यालय से पी० एच० डी० की उपाधि से
सम्मानित किया गया। सन् में डॉ० गोपाल चन्द्र
मधुकर चतुर्वेदी अलीगढ़ के श्री वाणीय
महाविद्यालय के चित्रकला विभाग में कार्यरत हो
गये, और 1992 में ललित कला संकाय के
अध्यक्ष पद से सेवानिवृत्त हुए।

मधुकर जी ने भिन्न-भिन्न विषयों एवं
भिन्न-भिन्न तकनीकों में चित्र रचना की। समाज
में नित नवीन घटनाओं ने इनको प्रभावित कर
चित्रों का सृजन करने की प्रेरणा दी। चतुर्वेदी जी
अध्ययनशील कलाकार के रूप में जाने जाते हैं।
इन्होंने ऐतिहासिक, सामाजिक, धार्मिक एवं कला
विषयक ग्रन्थों का गूढ़ अध्ययन कर अपने कला
के ज्ञान को बढ़ाया और उसको आधार बनाकर
चित्रों का सृजन किया। गोपाल मधुकर चतुर्वेदी का
व्यक्तित्व कला क्षेत्र में चित्रकार व मूर्तिकार के
रूप में उभरा है। इनके चित्रों में जहाँ एक ओर
चित्र-लक्षणों की आभा दिखती है, वहीं आकृतियों
में मूर्ति का टोसपन होता है। संगीत एवं साहित्य में
आभास भी लक्षित होता है। संगीत एवं साहित्य में
रुचि होने के कारण इनकी रेखाओं में स्वरों का
माधुर्य एवं संगीत का लालित्य सन्निहित है। इनकी

मधुकर जी के चित्रों में मानव मात्र के दर्द

का, सधमी का तथा असहाय आकाशों का
इतना सजीव चित्रांकन देखने को मिलता है कि
मन बचस संचने पर आध्य हो जाता है कि
मधुकर स्वयं भी इसी दर्द व घुटन को भोगता
होगा, अन्यथा उनकी ऐतिका में इतना दर्द न
होता। इनका यह दर्द चित्र 'कलाकार का सच'
में भी दिखाई पड़ता है। चित्र में दिखाया गया है
कि आज सच्चे कलाकार के पास रहने को पड़ा
यौन भी नहीं है। टूटा-पूटा घर जिसमें दरवाजा
भी नहीं है, उसको कलाकार ने अपने कुर्से से
ढका हुआ है, समय की मार खाकर उसका कुर्वा
चौर-चौर हो चुका है। यह चित्र कलाकार की
गहनतम संवेदनशीलता को चित्रित कर रहा है।

मधुकर जी समीक्षावादी कला के जगत के
रूप में हमारे सामने आये हैं। समीक्षावादी
आन्दोलन के द्वारा ये भारतीय कला पर
पारवाय प्रभाव को हटाना चाहते हैं और एक
ऐसी नयी कला का निर्माण चाहते हैं, जो जन-
साधारण से जुड़े और भारतीय जन-जीवन के
नजदीक पहुँचे। मधुकर जी के अनुसार हम
कला को व्यंग्य के माध्यम से प्रस्तुत करते हैं।
साधारण जन जैसा सोचता है और जो विन्व
सरलतम होते हैं, उनके द्वारा चित्र रचना करते
हैं। हम ज्यादातर प्रतीक उनके बीच से लेते हैं
और इस प्रकार के चित्रों की पृष्ठभूमि में
ज्यादातर राजनीति है।

'जनतन्त्र' तथा 'अर्थतन्त्र' से जुड़े चित्रों में
मुख्यतः नेताओं की तथाकथित विशालता
(मनता) 'अन्धे सिपाही' द्वारा जग को रास्ता
बताने की आश्वर्यजनक बात कही गयी है। देखा
जाये तो मधुकर व्यक्तिवादी आधुनिक चित्र-
कला से हटकर जनहित में जनता की आशा-
आकांक्षाओं का प्रतिनिधित्व करते हुए भारत-
भूमि की 'गन्ध' के साथ एक सरल तथा स्पष्ट
शैली में 'नई कला' का निर्माण करना चाहते हैं।

विद्वान तथा दार्शनिक इस बात की पुष्टि
करते हैं कि अन्तःप्रेरणा के अभाव में कलाकृति
का निर्माण नहीं हो पाता। मनुष्य स्व-अनुभव से
जितना समझ पाता है उतना पर-अनुभव से

माध्यमिक शिक्षकों के कक्षागत शिक्षण व्यवहार का अध्ययन

★ डॉ० ओंकार सिंह

शोध-सार

[illegible]

सैद्धान्तिक पृष्ठभूमि- शिक्षा एक गतिशील प्रक्रिया है। शिक्षा ही मनुष्य को सृष्टि का अग्रतिम प्राणी बनाये हुए है। शिक्षा द्वारा ही व्यक्ति विभिन्न संस्कारों के माध्यम से अपने शरीर, मन एवं आत्मा के तीनों पक्षों का समन्वित विकास कर समाज एवं राष्ट्र का योग्य नागरिक बनता है। बालक को सर्वोत्तम रूप में विकसित करने का दायित्व निर्वहन किसी न किसी रूप में शिक्षक का होता है। शिक्षक ही वह धुरी है जिस पर शैक्षिक प्रक्रिया के सफल होने का दायित्व अवलम्बित होता है। शिक्षक, शिक्षण प्रक्रिया में पथप्रदर्शक, निर्देशक, सीखने के लिए उपयुक्त नियोजक, सहयोगी एवं व्यवस्थापक के रूप में अद्वितीय स्थान रखता है। शिक्षक को अपने कर्तव्यों, अपेक्षित गुणों, व्यवहारों का समन्वित ज्ञान हो, तभी वह छात्रों के सीखने की प्रक्रिया में उपयुक्त सहायता कर सकता है। अन्यथा

[illegible]

विचारों एवं मान्यताओं का छोड़ देना का अर्थ है। शिक्षण विधियों में आपसूल चूल परिवर्तन अति आवश्यक है। आज आवश्यकता है कि शिक्षकों के कक्षागत शिक्षण व्यवहार में आशोधन एवं परिमार्जन विषयानुरूप करने का प्रयास किया जाय, जिससे कम समय एवं कम संसाधन का उपयोग करके अधिक से अधिक लोगों को बोध गम्य एवं प्रभावी शिक्षण की व्यवस्था की जा सके। इसके लिए आवश्यक है कि कक्षागत परिवेश में शिक्षकों के अन्तर्क्रियात्मक व्यवहार का अध्ययन किया जाय जिससे शिक्षक के शिक्षण-अधिगम की गुणवत्ता का उन्नयन हो सके तथा शिक्षक विषयानुसार नवीन ज्ञान एवं तकनीकी को कक्षागत परिस्थिति में सही ढंग से प्रचारित एवं

समस्या-प्रस्तुत शोध हेतु समस्या का आधारक शोध प्रसारण

माध्यमिक शिक्षकों के कक्षागत शिक्षण व्यवहार का अध्ययन करना मुख्य उद्देश्य है, जिससे पालिका-माध्यमिक शिक्षकों में विषयानुसार शिक्षण में निम्नवत हैं:

परिशीलन-पस्तुत शोध म. मध्यमकालीन
लिए परिस्थिति, क्षेत्र एवं प्रबन्धन की दृष्टि से कुछ महत्वपूर्ण सामग्री है जो निम्नलिखित है

बिहार परिस्थिति, क्षेत्र एवं प्रबन्धन का दृष्टि से उद्देश्य

* गरिष्ठ प्रवक्ता,

माध्यमिक शिक्षकों का शिक्षण व्यवसाय के प्रति अभिवृत्ति एवं

उनके कक्षागत शिक्षण व्यवहार का अध्ययन

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शिक्षा एक गतिशील प्रक्रिया है। शिक्षा ही मनुष्य सृष्टि का अप्रतिम प्राणी बनाये हुए है। शिक्षा द्वारा व्यक्ति विभिन्न संस्कारों के माध्यम से अपने शरीर, एवं आत्मा, तीनों पक्षों का समन्वित विकास कर पाज एवं राष्ट्र का योग्य नागरिक बनता है। बालक सर्वोत्तम रूप में विकसित करने का दायित्व निर्वहन ही न किसी रूप में शिक्षक का होता है। शिक्षक ही धुरी है, जिस पर शैक्षिक प्रक्रिया के सफल होने का धेत्व अवलम्बित होता है। शिक्षक, शिक्षण प्रक्रिया में प्रदर्शक, निर्देशक, सीखने के लिए उपयुक्त गेजक, सहयोगी एवं व्यवस्थापक के रूप में अद्वितीय न रखता है। शिक्षक को अपने कर्तव्यों, अपेक्षित ग, व्यवहारों एवं उद्देश्यों का समुचित ज्ञान हो, तभी छात्रों के सीखने की प्रक्रिया में उपयुक्त सहायता सकता है। अन्यथा वह छात्रों के ज्ञानार्जन में रोधक एवं मिथ्या धारणाओं का निर्माता बन जायेगा। वर्तमान शैक्षिक परिवेश तेजी से बदल रहा है। ग की अवधारणा उसके गतिशील स्वरूप, शिक्षण ग्या एवं शिक्षक-छात्र भूमिका के बारे में नये ढंग से ने का आग्रह कर रहे हैं। जहाँ एक ओर विज्ञान एवं नीकी के प्रभावों से सम्पूर्ण विश्व अभिभूत है, वहीं शी ओर नवीन सामाजिक चेतना के फलस्वरूप ग्यों, दकियानुसी विचारों एवं मान्यताओं को छोड़ की प्रवृत्ति प्रायः हर व्यवस्था की सहज प्रकृति बन है। इस दृष्टि से शिक्षण विधियों में शामिल चूल र्त्तन अति आवश्यक है।

आज आवश्यकता है कि शिक्षकों के व्यवसायिक वृत्ति का अध्ययन कर, उनके कक्षागत शिक्षण हार में आशोधन एवं परिमार्जन विषयानुरूप करने प्रयास किया जाय, जिससे कम समय एवं कम षधन का उपयोग करके अधिक से अधिक लोगों को

बोधगम्य एवं प्रभावी शिक्षण की व्यवस्था की जा सके। इसके लिए आवश्यक है कि कक्षागत परिवेश में शिक्षकों के अन्तर्क्रियात्मक व्यवहार का अध्ययन किया जाय जिससे शिक्षक के शिक्षण-अधिगम की गुणवत्ता का उन्नयन हो सके तथा शिक्षक विषयानुसार नवीन ज्ञान एवं तकनीकी को कक्षागत परिस्थिति में सही ढंग से प्रचारित एवं प्रसारित कर सकें।

समस्या :

प्रस्तुत शोध हेतु समस्या का औपचारिक शीर्षक- "माध्यमिक शिक्षकों का शिक्षण व्यवसाय के प्रति अभिवृत्ति एवं उनके कक्षागत शिक्षण व्यवहार का अध्ययन" है।

उद्देश्य :

प्रस्तुत अध्ययन के निम्नलिखित उद्देश्य हैं-

1. कला वर्ग के माध्यमिक शिक्षकों का शिक्षण व्यवसाय के प्रति अभिवृत्ति एवं उनके कक्षागत शिक्षण व्यवहार में सहसम्बन्ध का अध्ययन करना।
2. विज्ञान वर्ग के माध्यमिक शिक्षकों का शिक्षक व्यवसाय के प्रति अभिवृत्ति एवं उनके कक्षागत शिक्षण व्यवहार में सहसम्बन्ध का अध्ययन करना।

परिकल्पना :

प्रस्तुत शोध की परिकल्पना अधोलिखित है-

1. माध्यमिक शिक्षकों (कलावर्गी) का शिक्षण व्यवसाय के प्रति अभिवृत्ति एवं उनके कक्षागत शिक्षण व्यवहार में सार्थक सम्बन्ध नहीं है।
2. माध्यमिक शिक्षकों (विज्ञान वर्ग) का शिक्षण व्यवसाय के प्रति अभिवृत्ति एवं उनके कक्षागत शिक्षण व्यवहार में सार्थक सम्बन्ध नहीं है।

परिसीमन :

प्रस्तुत शोध में माध्यमिक शिक्षकों के कक्षागत शिक्षण व्यवहार का अध्ययन करना मुख्य उद्देश्य है, जिसके

रिक्त प्रवक्ता, शिक्षक शिक्षा विभाग, श्री मुरली मनोहर टाउन स्नातकोत्तर महाविद्यालय, बलिया (उ०प्र०)

ENVIRONMENTAL EDUCATION FOR SUSTAINABLE DEVELOPMENT

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Dr. Onkar Singh*

Introduction

Education has to play crucial role in society. It is a process which disseminates knowledge, imparts necessary skills and help in forming or changing attitudes. Human beings are an inseparable or an integral part of Environment. Today the conservation of Environment and preservation the human kind are the urgent need. But man's struggle towards a better life and higher standard of living through higher consumption of natural resources i.e. Land, Water, Air, Flora and Fauna etc has resulted in use of technology, in daily life without considering the ill effects on Environment. With Recommendation of Tiwari Committee, our country has accepted an urgent need of imparting environmental education. The E.E aims at developing in the child's awareness and understanding of the physical and social environment in its totality. Environmental studies involve a child's investigation and systematic exploration of him own natural and social environment and prepare him to solve the problems for improving his life.

Definition of Sustainability & Sustainable Development:

"Sustain- to casual to continue (as in existence or a certain state or in force or intensity); to keep up, especially with interruption diminution, flagging etc; to prolong"

(Webster's new International Dictionary)

Sustainability is in the long term cultural, economic and environmental health and vitality with emphases on "the importance of linking our social, financial and environmental well being"

Sustainability encompasses the simple principle of taking from the earth only what it can provide indefinitely, thus leaving further generation no less than we have access to

development in essentially constrained by:-

- (1) What the nature/earth has to offer (Carrying Capacity).
- (2) What we can take from it while not depriving the future generation.
- (3) Improvement of standard of living for present generation within the above constraints.

In ecological terms, the carrying capacity of an eco system is size of the population that can be supported indefinitely upon the available resources and services of that ecosystem. Living within the limits of an ecosystem depends on three factors.

- * The amount of resources available in the eco system.
- * The size of population.
- * The amount of resources each individual is consuming.

On other way sustainable development is the ability to make development choice which respect the relationship between the three "Es"-Economy, Ecology and Equality. For this the three "e" should be viewed from a certain angle for instance-

- * **Economy**- Economic activity should serve common good, is self renewing and should build local assets and self reliance.
- * **Ecology**- It should involve the realization that humans are part of nature, Nature has limits and communities are responsible for protecting and building natural assets.
- * **Equity**- The opportunity for all for full participation in all activities, benefits and decisions making of a society at a given point of time as well as protecting the rightful claims of future generations.

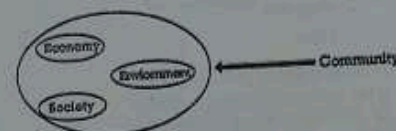
If these ingredients are incorporated in the national goals of all countries then it

ENVIRONMENTAL EDUCATION FOR SUSTAINABLE DEVELOPMENT

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society. Such a society would be characterized by an emphasis on preserving the environment, developing strong peaceful relationships between people and nations and an emphasis on equitable distribution of wealth.

In a conventional approach however these three essential ingredients are treated separately. It is as if the community was made of three separate parts economic environmental and social that do not overlap and are totally disconnected as shown below.



Content:

The content of formal education has four intergrading and interrelated components.

They are:

1. Awareness
2. Real life Situation
3. Conservation
3. Sustainable development

Awareness makes the individuals conscious about the life support system comprising air, land, water, flora, fauna and sunlight. These components have dynamic relationship. Man is The most important organism and has responsibility. Real life situations are that link environment to life. These conditions are location specific and thus problems and priorities of each are different conservation means utilization of natural resources not only by present generation but also by the next generation.

Sustainable development aims at utilization of finite resources in wise manner for development. There is a limit to the growth of living organism and thus the efforts are to be made to utilize the resource wisely and intelligently.

Environmental Education:

Environmental education is an integral

surrounding's including the relation of population growth, pollution resources allocation and depletion, conservation, technology and urban and rural planning to the total human environment. E.E is a study of the factors influencing ecosystems, mental and physical health, living and working condition, decaying cities and population pressures.

E.E is a presses of recognizing values and clarifying concepts related to environment and its problems in order to develop skills and attitudes necessary to understand the environment. It also entails practice in decision making and self formulating a code of behavior about issues concerning environment quality.

Proposed Conceptual model

E.E curriculum is mostly of multidisciplinary or interdisciplinary nature, depending upon organization of concept and the treatment during the study. In interdisciplinary model relevant components of many disciplines are drawn to create a unit of E.E.



Fig 1: Interdisciplinary Model

In multidisciplinary model the concepts of a theme of E.E. are infused into various disciplines.

The interdisciplinary and multidisciplinary models have relative advantages and disadvantages for employment in school curriculum. These may be related to various aspects such as ease of implementation, teacher's skill, curriculum load, modification in existing evaluation system, extent of coverage

पं० दीनदयाल उपाध्याय जी का एकात्म मानववाद एवं शैक्षिक चिन्तन

डॉ० ओंकार सिंह

एसोप्रोफेसर, शिक्षक शिक्षा विभाग

श्री मु०ग०टो०स्ना० महाविद्यालय, बलिया

सारांश

पं० दीनदयाल उपाध्याय जी बालक के अन्दर सामाजिक चेतना का भाव जागृत करने को ही शिक्षा का परमउद्देश्य मानते थे। वे शिक्षा एवं संस्कार के द्वारा ही समाज के जीवन मूल्यों का निर्माण करने के यत्न में थे। समाज में अनुशासन एवं अहंकार साथ-साथ नहीं रह सकते। समाज में संयम बनाये रखने हेतु हम समाज के शाश्वत जीवनमूल्यों को स्थापित करना होगा, जो शिक्षा द्वारा ही सरलता से प्राप्त किया जा सकता है। कक्षा समाज का लघु रूप होता है, अतः आज जो बालक कक्षा में शिक्षा ग्रहण कर रहा है, कल वही समाज में जाकर उसे नयी दिशा प्रदान करेगा। अतः शिक्षा एवं शिक्षक का नायित्व है कि वह आज के युवा को अपनी संस्कृति का रक्षक बनावें, उनमें राष्ट्रभावना का विकास करें, उन्हें स्वतंत्रता का सही अर्थ समझायें तथा स्वामी विवेकानन्द जैसे युवाओं का निर्माण करें, जिससे गडित जी का "भारत पुनर्निर्माण" का स्वप्न साकार हो सके। उपाध्याय जी स्वतंत्रता को और स्पष्ट हुए कहते हैं कि-आजादी सार्थक तभी हो सकती है, जब यह हमारी संस्कृति की अभिव्यक्ति का साधन बन जाये"।

रस्तावना-

पं० दीनदयाल उपाध्याय जी का मानना था कि "कृषवन्तो विश्वमार्यम्" का जयघोष करने वाला भारतवर्ष, विश्व कल्याण के मार्ग को प्रशस्त कर सकता है। हालांकि वे यह भी मानते थे कि देश में भी ऐसी अच्छी विचारधाराएँ हैं जिनसे शिक्षक कल्याण या विश्वशान्ति स्थापित की जा सकती है, परन्तु उनमें परस्पर तालमेल का अभाव है। हमें सब ऐसे आदर्श हैं जो अच्छे हैं। मानव की दैवी

पर्यावरण प्रदूषण : समस्या एवं समाधान

पृथ्वी को तापमान में वृद्धि हो रही है, जलवायु में परिवर्तन हो रहा, जीवन को खतरा है, ओजोन छतरी में छिद्र हो रहा है प्राकृतिक संतुलन बिगड़ रहा है, जल-धन एवं लक्ष दुर्घट हो रहा है अतः यही मानवजातिवासी आदि ऐति पर्वतारोहियों द्वारा सम्पादना पर्याप्त प्रकाशित लेखों में देखने को मिलती हैं।

उत्पन्न तथ्यों से स्पष्ट है कि प्रकृति का प्राणीव्यं के साथ अद्भुत सम्बन्ध है, प्राणी जगत प्रकृति में से पैदा होता है और इसी को सम्बन्ध है, प्राणी जगत प्रकृति में से पैदा होता है और इसी को सम्बन्ध है, प्राणी जगत प्रकृति में से पैदा होता है और इसी को सम्बन्ध है,

साहित्य में चलता-बढ़ता एवं अपनी शैक्षिक सुख-सुविधाओं
आज के विज्ञान युग में धारण अथवा शैक्षिक सुख-सुविधाओं
के बढ़ने के दोहरे में प्रकृति का सगता होना का रहा है, जिसमें
शैक्षिकीय कारकों-वनास्पति तथा जल-जन्तु तथा शैक्षिकीय
कारकों- हवा, ध्वनि, जमीन, आकाश के बीच साधारण
विवर्तित हो रही है, जिसमें प्रणिमात्मकता हनुता पर्याप्त
प्रवृत्ति हो रहा है, जो जल, वायु, ध्वनि एवं ओजोत्पत्ति
वर्षा, धनु-राश्यादि आकाश के अति प्रयोग के कारण मा
जोषक तथा उपन उपन हो गढ़ है। पौर्णमास्यक प्रकृ
प्राप्ति विगढ़ने से पर्याप्तता सम्पत्ति विकास होत है।

[illegible]

परमाणु बमों का परीक्षण, विस्फोट तथा

पूर्वों के अवशिष्ट द्वारा रैडियोधर्मी प्रदूषण फैलता है। कोकाल्ट थोरियम, यूरेनियम प्रमुख रैडियोधर्मी पदार्थ हैं। रैडियोधर्मी प्रदूषण के कारण मनुष्य के अनुवांशिक लक्षणों में परिवर्तन, गर्भशय में शिशुओं की मृत्यु, नवजात शिशुओं के शारीरिक

शहर	उद्योग	घातायत	घरलु
दिल्ली	29.0%	65.0%	6.0%
कलकत्ता	46.0%	35.0%	10.0%
मुम्बई	43.0%	53.0%	4.0%

[illegible]

ऑक्जर सिंह*

होने वाली द्यूतमय वृद्धि से मानव जीवन पर पड़ने वाले दुष्प्रभावों को रोक पाना असम्भव होगा।

सबूतों के साथ ही यह भी स्पष्ट हो जाता है कि यह एक ही व्यक्ति है।

विज्ञान एवं पर्यावरण केंद्र के अनुसार दिल्ली
निलंबित कण (SPM) जिस स्वास्थ्य संगठन द्वारा नि-
र्धारित है, जो सभी प्रदूषकों में सबसे अधिक
हानिकारक है। 10 माइक्रोन व्यास वाले ये धूल कण फेफ-
ड़ों की सीमानियाँ पैदा करते हैं।

प्रकार	प्रति घन सेमी
शहर	1352
कलकत्ता	421
दिल्ली	54
न्यूयार्क	

प्रति-घनसेमी सूचना प्रणाली

शहर	प्रति घन सेमी०
कलकत्ता	1352
दिल्ली	421
मुंबाई	54

स्रोत-पर्यावरण सूचना प्रणाली

देश के महानगरों में वातावरणकृतित एवं आधुनिक
गणपन्थी इमारतों में काम करना भी प्रदूषण स्रोत बनें हैं। इन
इमारतों में इस्तेमाल बिजली की मशीनों से विद्युत चुम्बकीय
तरंगें उत्पन्न होती हैं, जिससे कंप्यूटर वातावरण पर तथा
मशीन को भी मशीन प्रभाव है। ऊष्म कालेज के कारण इन
मशीनों के इ-रेडिएशन के विद्युत चुम्बकीय क्षेत्र उत्पन्न हो जाता
है, जिससे इस क्षेत्र में कार्य करने वाला व्यक्ति अदृश्य प्रदूषण
का शिकार हो जाता है। परिणामस्वरूप रक्त कैंसर एवं
अनाश्रय कैंसर पनप सकता है। विद्युत चुम्बकीय क्षेत्र उत्पन्न
हो जाता है, जिससे इस क्षेत्र में कार्य करने वाला व्यक्ति अदृश्य
प्रदूषण का शिकार हो जाता है। परिणामस्वरूप रक्त कैंसर एवं
अनाश्रय कैंसर पनप सकता है। विद्युत चुम्बकीय क्षेत्र में
नौकर काम करने वालों को सिर दर्द की आम शिकायत रहती
है।

इस प्रकार सूर्य की किरणों को पृथ्वी पर एकत्रिकरण से पृथ्वी परम हो रही है, जिसे ग्रीन हाउस प्रभाव कहते हैं। वायुमण्डल में जब कश्चन डाई ऑक्साइड की मात्रा अधिक हो जाती है तो पृथ्वी को ठण्डा वायुमण्डल में इस प्रकार आच्छादित हो जाती है कि सूर्य से आने वाली किरणों को धरती पर वापस पूर्वक हो आने में होती है परन्तु परावर्तित किरणों को अन्तरीक्ष में लौटते

समय अधिकांश सोझ लेती हैं। जिसके परिणाम स्वरूप चापुंगदल का तापमान बढ़ जाता है। आर्मी, सी.पी. अर्माइ इंटान्जमेंटल पैरल ऑन क्लाइमेट बैंक की रिपोर्ट के अनुसार 1990 की तुलना में समुद्र का जल स्तर 10 से 20 सेंटीमी तक बढ़ा है। पहाड़ों के हिमपात की वजह से पृथ्वी के तापमान 1 वैज्ञानिकों के अनुसार स्थित 50 वर्षों में पृथ्वी के तापमान 1 डिग्री सेल्सियस बढ़ा है। अब यदि 3.6 डिग्री तापक्रम और बढ़ा है तो अंटार्कटिका के विशाल हिमखंड पिघल जायेगे, परिणामतः समुद्र का जल में 1.5 मीटर की बढ़ी हो जायेगी, जिससे 21वीं सदी के मध्य तक समुद्रतटीय शहरों के अधिकांश भागों का अस्तित्व संभाव्य हो जायेगा। सर्वाधिक अर्थव्यय के अनुसार ही एक अस्तित्व संभाव्य हो जायेगा। सर्वाधिक अर्थव्यय पर पड़ेगा, जिसका एक सर्वोच्चिक चरु प्रभाव बंगलादेश पर पड़ेगा, जिसमें पमल क्षेत्र क्षेत्र के 13.47 प्रतिशत एवं वन क्षेत्र 29.9 प्रतिशत क्षेत्र पर पड़ेंगे जायेगा। जलसंश्रय का 9 प्रतिशत जल क्षेत्रों के ध्याननिहित हो जायेगा। श्रीलंका में तापक्रम बढ़ने से वे कृषि पर दुष्प्रभाव पड़ेगा। भारत में तापक्रम बढ़ने से जलवायु फलसों की उत्पादकता घटाना पड़ेगी। औद्योगिक प्रदूषण रूप से आते रहेगा।

चक्रवात अतिरिक्त रूप से आते रहने।

पर्यावरण प्रदूषण के प्रमुख कारक को रूप में बढ़ती जनसंख्या तथा अक्षिा का भी कम योगदान नहीं है। पूरे विश्व को जनसंख्या में अपार वृद्धि हुई है। सन् १९०० में विश्व की अनुमानित जनसंख्या कुल १५७.१ करोड़ थी जो १९७० में बढ़कर ३०२.७ करोड़ तथा सन् २००० में ६१९.९ करोड़ तक पहुँच गई। जनसंख्या की तीव्र वृद्धि से गम्भीर पर्यावरणीय संकट उत्पन्न हो रहा है। विश्व की बढ़ती जनसंख्या के लिए सूख-सुविधाओं को जुड़ने हेतु अत्यल्प मात्र में प्रकृति पर ही दबाव पड़ता है, जिसके परिणामस्वरूप डों जंगलों का एक बड़ा तथा सीमेन्टेड जंगलों का बड़ना रहा है। आबादी का एक बड़ा बढ़ावा गाँवों से नगरों की ओर प्रकृति का शोषण कर रहा है। दूसरा सुविधाओं को बढ़ाने हेतु प्रकृति का शोषण कर रहा है। दूसरा यह शिक्षा का अभाव, जिसके परिणामस्वरूप लोगों में अपने-अपने प्रकृति का अभाव, जिसके परिणामस्वरूप लोगों में अपने-अपने प्रकृति का प्रति जागरूकता का अभाव तथा अपने प्रकृति के प्रति अनभिज्ञता है, जिससे वे निरन्तर प्रकृति से सेहतमंद बनते जा रहे हैं। उन्हें यह पता नहीं है कि प्रकृति दोष के परिणाम स्वरूप मानव जीवन पर क्या दुष्प्रभाव पड़ेगा।

परिणाम पृष्ठ धूमि

एकजीकरण से मुख्य होते हैं। मनुष्यप्रभाल में अधिक हो जाती है जो आच्छादित हो जाती है। ती प्रसुप्त प्राकृतिक को अन्तर्गत में लौटते हैं।

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निद्या मेय

माध्यमिक शिक्षकों का शिक्षण व्यवसाय के प्रति अभिवृत्ति का अध्ययन

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सैद्धान्तिक पृष्ठभूमि—शिक्षण एक गति प्रक्रिया है, यद्यपि सम्पूर्ण शिक्षा का दृष्टिकोण छात्र ही है। परन्तु शैक्षिक अन्विष्ट प्रकृत होने का दायित्व शिक्षक पर ही निहित है। शिक्षा के उद्देश्य, पाठ्यक्रम, प्रविधि एवं शिक्षकों के माध्यम से प्रत्येक पहुँचते हैं। बालक को सर्वोपयुक्त से विकसित करने का दायित्व शिक्षक ही ले करता है। शिक्षक, शिक्षण प्रक्रिया में निर्देशक, निरीक्षक, सौख्य के लिए उपयुक्त ब्रह्म, सहयोगी एवं व्यवस्थापक के रूप में प्रिय स्थान रखता है। यदि शिक्षक को 'कर्तव्य', अपेक्षित गुणों व उद्देश्यों का ज्ञान है तभी वह छात्रों को सीखने की राह-छात्रों के साजगर्ज में अवरोधक व धारणाओं के निर्माता बन जाएगा।

अध्यापकों के कार्य-निष्पादन में जो तीन महत्वपूर्ण हैं, उसमें मानव जीवन के पक्ष—सांस्कृतिक, आर्थिक, वैचारिक, तकनीकी शामिल हैं। आज शिक्षा-प्रणाली अध्यापन-अध्यापन में नयी तकनीकी का प्रयोग करके की आवश्यकता बढ़ रही है। हमारे शिक्षकों को इसका प्रशिक्षण लेना है और व्यापकों को इसकी व्यवस्था करनी है। शिक्षकों में सृजनात्मकता के विकास के नये-आयाम खोल रहे हैं। विद्यार्थियों को इस के लिए प्रोत्साहित किया जाना चाहिए कि वे किसी हित के अपने शिक्षक के साथ हर ऐसे कार्य कर सकें, जिनसे विद्यार्थियों में अधिकतम सर्वांगीण विकास हो सके।

प्रत्येक युग में योग्य नागरिकों के निर्माण के लिए शिक्षा-व्यवस्था को रहा है। शिक्षा-व्यवस्था को केन्द्रिय घुरी शिक्षक है, जो दोषक महत्व को जलाकर दूसरों को प्रकाश देता है। आज के विज्ञान एवं संचार तकनीकों में व्यक्ति, समाज एवं राष्ट्र को प्रकृतियों के अनुरूप शिक्षकों में एक सुधार की आवश्यकता है।

इसके लिए आवश्यक है कि शिक्षकों का व्यवसाय के प्रति क्या रुकाव है, क्या वे व वे भविष्य में योग्य शिक्षक हो सकते हैं,

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जिससे समाज फलीभूत हो सकता है, अध्ययन 2 प्रस्तुत शोध अध्ययन में शिक्षकों का किया जाए। प्रस्तुत शोध अध्ययन इस दिशा में शोधकर्ता का एक प्रयास है।

समस्या—विशिष्ट रूप से प्रस्तुत शोध हेतु समस्या का शोधक है—“माध्यमिक शिक्षकों का शिक्षण व्यवसाय के प्रति अभिवृत्ति का अध्ययन”

उद्देश्य—प्रस्तुत शोध कार्य के अगोलिखित उद्देश्य हैं—

1. अध्यापन विषय के आधार पर, माध्यमिक शिक्षकों का शिक्षण व्यवसाय के प्रति अभिवृत्ति का अध्ययन करना।
2. लिंग के आधार पर, माध्यमिक शिक्षकों का शिक्षण व्यवसाय के प्रति अभिवृत्ति का अध्ययन।
3. शैक्षिक अनुभव के आधार पर माध्यमिक शिक्षकों का शिक्षण व्यवसाय के प्रति अभिवृत्ति का अध्ययन।

परिकल्पना—

1. माध्यमिक शिक्षकों का शिक्षण व्यवसाय के प्रति अभिवृत्ति का अध्यापन विषय के साथ सार्थक सम्बन्ध नहीं है।
2. माध्यमिक शिक्षकों का शिक्षण व्यवसाय के प्रति अभिवृत्ति का लिंग के साथ सार्थक सम्बन्ध नहीं है।
3. माध्यमिक शिक्षकों का शिक्षण व्यवसाय के प्रति अभिवृत्ति का शैक्षिक अनुभव के साथ सार्थक सम्बन्ध नहीं है।

परिस्मरण—प्रस्तुत शोध अध्ययन में शिक्षकों के शिक्षण व्यवसाय के प्रति अभिवृत्ति के प्रति अभिवृत्ति का अध्ययन, शोधकर्ता का मुख्य लक्ष्य है, जिसके अध्ययन हेतु परिस्थिति, क्षेत्र एवं शोध प्रबन्ध को दृष्टि से कुछ महत्वपूर्ण सीमाएँ हैं, जो निम्नवत् हैं—

1. प्रस्तुत शोध अध्ययन में प्रो० एस० पी० अहलवालिया द्वारा निर्मित “अध्यापक अभिवृत्ति सूची” का प्रयोग किया गया है।

प्रस्तुत शोध अध्ययन में मालीपुर जलपद स्थित यू० पी० बोर्ड के स्कूलों के शिक्षकों को समग्र के रूप में लिया गया है।

समग्र एवं जनसंख्या—मालीपुर जलपद के समस्त माध्यमिक विद्यालयों के समस्त अध्यापकों को समग्र के रूप में लिया गया। शोध प्रतिदर्श के रूप में जनपद के प्रत्येक विकास खण्ड से सुविधानुसार दो माध्यमिक विद्यालयों का चयन कर, 285 शिक्षकों का चयन “यादृच्छिक प्रतिदर्श चयन विधि” से किया गया, जिसके अन्तर्गत शोधकर्ता द्वारा प्रतिदर्श के सदस्यों को उनकी विलक्षणता को दृष्टिगत कर विवेकानुसार चयनित किया।

शोध विधि—प्रस्तुत शोध अध्ययन के उद्देश्यों एवं परिकल्पनाओं को ध्यान में रखते हुए “वर्णनात्मक सर्वेक्षण विधि” का प्रयोग किया गया।

प्रयुक्त उपकरण—प्रस्तुत अध्ययन हेतु ए० सी० ई० आर० टी० के सौजन्य से, प्रो० एस० पी० अहलवालिया द्वारा निर्मित “अध्यापक अभिवृत्ति सूची” का प्रयोग किया गया। इस अनुसूची में 15 पद हैं, जो विभिन्न विशिष्ट विधाओं के प्रति अध्यापकों की अभिवृत्ति का बोध कराते हैं।

सांख्यिकी प्रविधि—प्रस्तुत शोध अध्ययन में माध्यमिक शिक्षकों की व्यावसायिक अभिवृत्ति की गणना हेतु अप्रचलित प्रविधि—काई-वर्ग (χ^2) का प्रयोग किया गया है।

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प्राथमिक शिक्षा में ग्राम शिक्षा समिति की भूमिका

- डॉ० ओंकार सिंह *

संक्षेप-सार

प्राथमिक शिक्षा शिक्षा की प्रारम्भिक कड़ी है, अतः इसकी उपदेयता से इनकार नहीं किया जा सकता है। निम्न ही प्रारम्भिक शिक्षा के विकेन्द्रीकरण के परिणाम स्वरूप 'ग्राम शिक्षा समितियों' का ग्राम समाज में बृद्धि एवं रूप-आकार (शेष में विद्यालय छोड़ने की समस्या) में कमी आयी है, परन्तु शैक्षिक गुणवत्ता का काल ह्रास है, जिसका मुख्य कारण शिक्षा व्यवस्था ही नजर आती है। जिससे छात्रों को दूरदूर तक शिक्षा के अभाव का सामना करना पड़ता है, वही सरकारी नीतियाँ एवं उनके क्रियान्वयन में बाधा उत्पन्न कर रही होती है।

अतः आवश्यकता है कि प्राथमिक शिक्षा के गुणवत्ता उन्नयन में 'ग्राम शिक्षा समिति' एवं अन्य आनुषंगिक इकाईयों का समुचित गठन कर, उनकी सामाजिक जवाबदेही सुनिश्चित की जाय तथा इसे राजनीतिक दृष्टिकोण से प्रतिबद्धता, सकारात्मक सोच एवं मिशनरी प्रयास द्वारा ग्राम स्तर पर सार्वभौमिककरण की संकल्पित दिशा में किया जाय, जिससे सही अर्थों में गुणात्मक प्राथमिक शिक्षा जीवन की प्रशंसा बन सके।

सैद्धान्तिक पृष्ठभूमि

यह निर्दिष्ट रूप से सत्य है कि मानवीय क्षमता के विकास में शिक्षा का महत्वपूर्ण योगदान है। शिक्षा ही वह सशक्त माध्यम है, जो मानव में अन्तर्निहित शक्तियों का विकास कर समग्र व्यक्तित्व प्रदान करता है। प्राथमिक शिक्षा, औपचारिक शिक्षा का वह प्रथम सोपान है, जिस पर माध्यमिक एवं उच्च शिक्षा का विस्तार भवन निर्मित होता है। प्राथमिक शिक्षा का सम्बन्ध किसी वर्ग या व्यक्ति विशेष से न होकर सम्पूर्ण जनसंख्या से है। अतः इसे गुणात्मक रूप में प्रत्येक बच्चे को सर्वसुलभ कराकर राष्ट्र को सशक्त एवं विकसित बनाया जा सकता है। यद्यपि स्वतंत्रता प्राप्ति के पश्चात् राष्ट्र के शिल्पकारों ने भारतीय संविधान में प्राथमिक शिक्षा के सार्वभौमिकता के प्रति प्रतिबद्धता दिखायी, जिसके परिणाम स्वरूप संविधान के अनुच्छेद-४५ के अन्तर्गत संविधान लागू होने के ५० वर्षों के भीतर ६-१४ वय वर्ग के सभी बच्चों को प्राथमिक शिक्षा निःशुल्क एवं अनिवार्य रूप से प्रदान की जायेगी, परन्तु आज तक राजनैतिक इच्छाशक्ति की कमी एवं प्रतिबद्धता के अभाव में यह उद्देश्य पूरा नहीं किया जा सका।

वर्तमान में प्राथमिक विद्यालयों का शैक्षिक वातावरण पूर्णतः अशैक्षिक गतिविधियों के लिए निर्धारित हो गया है। गुणवत्ता शब्द का विलोप हो रहा है, प्रतिबद्धता एवं उत्तरदायित्व के बल शब्दकोश की दस्तु बनकर रह गये हैं, जबकि सन् २००२ में ६-१४ वय वर्ग के सभी बच्चों के लिए अनिवार्य शिक्षा व्यवस्था करने हेतु संसद ने ८६वें संविधान संशोधन के तहत इसे मौलिक अधिकार बना दिया है, लेकिन प्राथमिक शिक्षा की स्थिति यह है कि औसत प्रत्येक दिन छात्र उपस्थिति ६०-७० प्रतिशत है, यदि

विद्यालय बन्द होते समय उपस्थिति देखा जाय तो सिर्फ २५ प्रतिशत है। उन्नीसवीं सत्र २५ प्रतिशत शिक्षक अनुपस्थित रहते हैं तथा ४८ प्रतिशत विद्यालयों में कोई शिक्षक गतिविधियाँ संचालन नहीं होती, जहाँ शिक्षक उपस्थित थे। (प्रोब अध्ययन २००४)

इस प्रकार इन परिस्थितियों में सरकार ने प्राथमिक शिक्षा में गुणवत्ता सुनिश्चित करने हेतु ग्राम समा स्तर, स्थानीय समुदाय एवं अभिभावकों की सहभागिता से गठित 'ग्राम शिक्षा समिति' का प्रावधान किया, जिससे राष्ट्रीय योजनाओं (६-१४ वर्ष के सभी बच्चों की शिक्षा प्रदान किये जाने के सम्बन्ध में) के समुचित क्रियान्वयन में ये समितियाँ महत्वपूर्ण भूमिका का निर्वहन कर सकें।

ग्राम शिक्षा समिति का स्वरूप

प्राथमिक शिक्षा में गुणवत्ता उन्नयन हेतु शिक्षा के विकेन्द्रीकरण के अन्तर्गत ग्रामीण स्तर पर स्थानीय समुदाय के सहयोग एवं जनसहभागिता सुनिश्चित करने के उद्देश्य से प्रत्येक ग्राम पंचायत स्तर पर 'ग्राम शिक्षा समिति' का गठन किया गया है, जिसका स्वरूप निम्नवत् है-

१. ग्राम पंचायत का प्रधान
२. ग्राम पंचायत के अन्तर्गत आने वाले बेसिक स्कूलों के छात्रों के तीन अभिभावक (जिसमें एक महिला) जो सहायक बेसिक शिक्षा अधिकारी द्वारा नामित होते हैं।
३. ग्राम पंचायत के अन्तर्गत आने वाले बेसिक स्कूल का ज्येष्ठतम प्रान्तीय अधिकारी।

ग्राम शिक्षा समिति के निम्नांकित कार्य हैं-

- * ग्राम पंचायत क्षेत्र के अन्तर्गत ६-१४ वय वर्ग के बच्चों को प्राथमिक शिक्षा उपलब्ध कराने हेतु बेसिक विद्यालयों की स्थापना एवं देख-रेख करना, नबनों एवं उपकरणों के सुधार हेतु सुझाव देना।
- * ऐसे समस्त आवश्यक कदम उठाना जैसे-संसाधनों की कमी को पूरित करना, शिक्षक-कर्मचारियों की उपस्थिति सुनिश्चित करना, विद्यालय के विकास, प्रचार एवं सुधार के लिये योजना तैयार करना आदि प्रमुख है।
- * ग्राम शिक्षा समिति, ग्राम पंचायत के अन्तर्गत आने वाले सभी ६-१४वय वर्ग के बालकों के नामांकन, तहरीब एवं गुणवत्तापूर्ण शिक्षा की व्यवस्था सुनिश्चित करना मुख्य है।
- * ग्राम शिक्षा समिति के द्वारा केन्द्र एवं राज्य सरकारों द्वारा प्राथमिक शिक्षा के गुणवत्ता उन्नयन हेतु संचालित सभी योजनाओं को सही ढंग से क्रियान्वयन को सुनिश्चित करना।
- * प्राथमिक शिक्षा के प्रति स्थानीय समुदाय में चेतना जागृत करना, जन सहयोग बढ़ाना, जन आन्दोलन का रूप देकर सबकी सहभागिता सुनिश्चित करना आदि है।

इस प्रकार प्राथमिक शिक्षा सार्वभौमिककरण के उद्देश्य से 'ग्राम शिक्षा समितियों' का गठन करके प्राथमिक शिक्षा को विकेन्द्रीकरण के प्रयास किया गया है, जिसके परिणाम स्वरूप छात्र नामांकन में तो आशानुरूप वृद्धि हुई है, परन्तु शैक्षिक गुणवत्ता एवं विद्यालय में छात्रों के तहरीब को सुनिश्चित नहीं किया जा सका है। निरक्षर ही स्थानीय स्तर पर ग्राम शिक्षा समितियाँ अपने उत्तरदायित्वों का सही ढंग से निर्वहन नहीं कर पा रही हैं, जिसके मुख्य कारण निम्नवत् हैं-

- * ग्राम शिक्षा समिति के अध्यक्ष/ग्राम प्रधान का अशिक्षित होना, शिक्षा के प्रति जागरूक न होना।
- * ग्राम शिक्षा समिति के सदस्यों का सही चुनाव न होना। यहाँ तक कि समिति के सदस्यों को अपने

Philosophical Aspect of Universal Religion & Education

Dr. Omkar Singh

Associate Professor, Dept. of Teacher Education, S.M.M. Town PG College, Ballia

Abstract

"There is only one religion, the religion of love."

Further he says: "As all rivers reach the same ocean, all religions are the path to the one and the same God." So various religion are in fact different roads converging at the same destination. Thus the universal religion is unity in diversity. He has confirmed the divine concept by giving to the world a symbol which incorporates the emblems of five major religions of the world; denoting at the same time the five basic human values namely - Satya, Dharma, Shanti, Prema & Ahimsa. On the reference Universal Religion Sri Sai says "Sanatana Dharma is a great Grandfather, Buddhism is the son, Christianity is Grandson, and Islam is the great Grandson. So all the religion form one family." As there is no separable Sun of Hindus, Muslims, Christians, Buddhist, Sikhs ect. There is no separate truth of each religions. Not differences in religions and communities. It's the mind of the man, which is responsible for conflicts and disturbances. It's the grave mistake to a tribute unrest and disturbances in a society to existence of different religion. For thousand of years, people live in India have lived in unity and fraternity in spite of existence of various religion and communities.

Although all religions are supported to promote love, peace, harmony and happy co-existence in the world. There is nothing basically wrong with any religious faith. All religions teach higher values, proper moral code and all sorts of good things to their followers and promise them happiness, self-realisation, salvation and a goal life here and here after. So all religions have come into existence to lead man to Divinity, not to create conflict and disturbances. Education is an important tool bringing behavioural change in men with respect to universal religion, which promote love, peace, harmony, and happy co-existence in all group of religions.

Introduction :

Religion, The word origin from Latin word *religio*-onis, meaning bond/union (with God). We know from scriptures of most religions that God is at everything and everything in God. Every religion has its own Philosophy which is unique to itself and which enables to differentiate it from other religion. Philosophy deals with the whole subject matter of religion, i.e. the basic principles, aim and means to



SYNTHESIS AND STRUCTURAL CHARACTERIZATION OF OXOVANADUM(V), MANGANESE(II), IRON(II), COBALT(II), NICKEL(II) AND BARIUM(II) COMPLEXES WITH N-ETHOXYCARBOXYLPYRROLE-2-THIOCARBOXAMIDE

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Abstracts: The synthesis of some complexes of N-ethoxycarboxypyrrole-2-thiocarboxamide (ETH) with VO(IV), Cr(III), Mn(II), Fe(II), Fe(III), Co(II), Ni(II) and Ba(II) has been reported. These complexes have been characterized by analytical, magnetic moment, thermogravimetric and spectral studies (IR, UV-Vis) and their tentative structures are proposed.

Keywords: Coordination complex, spectroscopic, thermogravimetric, thiocarbonylthio.

1. INTRODUCTION

A large number of biological processes involve metal ions which coordinate with a wide range of ligands having sulphur, nitrogen and oxygen atoms as donor sites. These ligands are generally amino functional in nature capable of enclosing metal ions in an organic sphere. To understand these biological processes, there has been in recent years^{1,2} an increasing interest in the synthesis and design of new model ligands which could lead to metal complexes with properties similar ones found in biological process.

In course of study it is found that ligands containing sulphur or -thiocarboxyl groups not only play a significant role but have very important pharmacological properties³. They have been found to show antiviral and anti-tumor activity which lead to a very great interest in the chemistry of these compounds, particularly in relation to the transition metal ions. A large number of work have been carried out to understand the nature of metal sulphur bond, the donor properties of sulphur in general, the position of ligands containing thiocarbonylsulphur as donor sites in the spectrochemical and nephelauxetic series etc. have not yet been well understood.

2. EXPERIMENTAL

The chemical used in the present study were of ECH or equivalent grade. N-ethoxycarboxypyrrole-2-thiocarboxamide, here referred as ETH, dichlorobis (triphenylphosphine)iron(II), bis(dichlorotriphenylphosphine)nickel(II) and

tris(diphenylphosphine)nickel(0) were prepared according to methods described in the literature^{4,5}.

2.1 Synthesis Of The Complexes

The complexes $M(ETH)_xCl_{3-x}$ ($M = Mn(II)$, $Cr(III)$, $Fe(II)$, $x = 1$ or 2 ; $y = 2$ or 3) and $VO(ETH)_2$ have been prepared by refluxing the ligand (1 mmol) in ethanol (25 ml) for ~ 2 hrs and then adding an ethanol (25 ml) solution of the metal chloride (1 mmol). The mixture was then refluxed on a water bath for 3 hrs, which resulted in the formation of a precipitate. The complex $[Hg(ETH)_2Cl_2]$ was isolated by mixing an ethanolic (20 ml) solution of $HgCl_2$ (1 mmol) and ligand (2 mmol, 20 ml). A light yellow precipitate immediately formed.

All the complexes prepared above were separated by centrifuge repeatedly, washed with ethanol and finally with ether and dried in vacuo over P_2O_5 . The dichloro(ETH)bis(triphenylphosphine)iron(II) complex, $[Fe(ETH)_2Cl_2(PPh_3)_2]$ was isolated when dichlorobis(triphenylphosphine)Fe(II) (1.25 g = 1 mmol) was dissolved in benzene (20 ml) by warming and to this a benzene solution of ETH (0.2 g = 1 mmol in 10 ml) was added.

The reaction mixture was refluxed for ~ 2 hrs and the resulting reddish brown solution concentrated to half of its original volume. On addition of petroleum ether (15 ml, 40-60°C), a green precipitate is formed. To prepare hydride $(ETH)_2$ triphenylphosphine complex, $[Co(ETH)_2(PPh_3)_3]$, to a solution of $[CoH(PPh_3)_4]$ (0.5 g in 20 ml $CHCl_3$), ETH



UNIVERSITY OF BIRMINGHAM

Faculty of Science, School of Chemistry

Department of Chemistry

Chemistry of the Environment

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1999

IMPACT OF HOME ENVIRONMENT ON CHILD DEVELOPMENT

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Abstract

The home environment is a very important influence in the period of child development in order to have a true knowledge of the child and within his world in the community against himself. From imaging research suggests that growing up in a disadvantaged environment causes the brain to develop differently. For example, living in an environment affected by chaos and poverty can lead to changes in the brain's stress system that increase a child's vulnerability to chronic disease later in life. A young child's home environment plays a key role in determining his or her chances for survival and development. Optimal conditions include a safe and well-organized physical environment, opportunities for children to play, explore and discover, and the presence of developmentally appropriate objects, toys and books. Several research studies suggest that children who grow up in households where books are available receive, on average, three more years of schooling than children from homes with no books. This finding holds regardless of a caregiver's level of education, occupation or class and applies to rich and poor countries alike. However, in this key, intensity of a nurturing and supportive home environment, children from the richest world spend less time in home than those from the poorest quartile. Like family income, parental education is a strong influence on children's home environments. In some research on child outcomes, maternal education is a better predictor than family income. In a home imaging study of young children, there were reasonable effects of family income. In a home imaging study of young children, there were reasonable effects of maternal education on brain regions involved in attention skills. In another study, parental educational level was related to children's educational and perceptual scores. Among children of Indian and Indian-Americans, increases in education have been shown to promote improvements in young children's home environments and language development. Parents' education appears to be especially beneficial for children of poor, young or single mothers.

1. The first part of the paper is a review of the literature on the topic. It discusses the various methods used to study the effects of stress on the immune system, and the results of these studies. It also discusses the role of the hypothalamic-pituitary-adrenal axis in the stress response, and the role of the immune system in the development of disease.

2. The second part of the paper is a description of the experimental methods used in the study. It details the subjects, the procedures, and the measurements used to assess the effects of stress on the immune system.

3. The third part of the paper is a discussion of the results of the study. It compares the results of the study to the results of other studies, and discusses the implications of the findings.

4. The fourth part of the paper is a conclusion. It summarizes the findings of the study, and discusses the implications of the findings for future research.



Digitalization And Optical Communication : A Tool For Sustainable Development

*Sugil Kumar Verma

Abstract:-

It is a well known fact that Digital India is the hot centre of many discussions and technological advancements. It is obvious that the countries embracing technology for the benefit of citizens have recorded a radical change in all aspects which triggers GDP growth and leads to high national and per capita income. It is the obligation of the government to improve the living standards of citizens through initiating programmes which accelerates the economic growth. The Digitalization was propelled by the force 'Technology', which was the crucial part in 'Digital India Programme'. India has emerged as one of the country whereby government have initiated this development programme to complete economic development as well as to provide employment to young generation. The main objective was to provide all services to every citizen on the web portal or electronically for making the transactions smooth and transparent. To eliminate black money and corruption from public life, government is investing in new technology. India had started experiencing the digital transformation in many ways from 'feel the full impact' of this change. Through this digitalization will achieve the United Nations

Sustainable Goals Agenda by 2030. This paper helps to understand the impact of Digitalization in economy and to achieve Sustainable Development Goals with the pillars of digital India.

Key words:

Digital India, Optical Communication, Technology, Internet, Sustainable Development

INTRODUCTION:

India went online for the first time in 1990. Back then, the Internet was only meant for the use of educational, research communities and defence purposes. During 1995, the ISDN opened the internet access is public by using modems. Now the game has changed most of the Indians have mobile phones which have internet access. In 2017, India had 331.77 million internet users and the figure is expected to grow 111.38 million internet users by 2022. The internet usage have increased because of fall in the smartphone prices over the past couple of years and the fall in internet data prices. India is the fastest growing economy in the world. Even though India was known as the powerhouse of software, the availability of e-services, government services to citizens has comparatively low. The recent boom in the adoption of digital means for financial

DICKENSIAN JOURNAL

ISSN NO- 0012-2440

**An UGC-CARE Approved
Group – II Journal**

DICKENSIAN JOURNAL,

VOLUME 19, ISSUE 2, December 2019



Synthesis of 1,2,4-Triazoles, 1,3,4-Thiadiazoles and their antimicrobial Activities

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^{1,2}S.M.M.Town P.G. College, Ballia, U.P.

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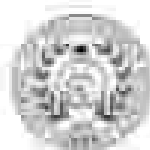
Abstract:

The synthesis of some new 3,5-disubstituted-1,2,4-triazole substituted 1,3,4-thiadiazole and their derivatives through the intramolecular cyclization of 1,4-substituted thiosemicarbazides. Elemental analysis, IR, ¹H-NMR and mass spectral data elucidated the structures of all newly synthesized compounds. Synthesized compounds were studied for their antibacterial and antifungal activities. Some of the tested compounds should exhibit significant pharmacological activities.

Index Terms: Synthesis of 1,2,4-Triazoles, 1,3,4-Thiadiazoles, spectral data and antimicrobial activities of synthesis compounds.

Introduction

The bio-significance, the synthesis and study of biological properties of heterocyclic compounds have gained enough momentum in recent years. Extensive exploratory work has been done on biologically active heterocyclic compounds & compounds of heterocyclic systems and their derivatives incorporating nitrogen, sulphur and oxygen have been synthesized and found to be of commercial importance as biocides. The 1,2,4-triazole and their derivatives constitute an important class of organic compounds with diverse agricultural, industrial and biological activity including anti-microbial^{1,2}, anti-inflammatory³ as well as anti-cancer⁴ activities. Moreover 1,3,4-thiadiazole nucleus constitutes the active part of several biologically active compounds including anti-bacterial^{5,6}, anti-mycotic⁷ and anti-inflammatory⁸ agents. We reported the synthesis of some new 3,5-disubstituted, 1,2,4-triazole, substituted 1,3,4-thiadiazole and their derivatives



ISSN:0976-4933
Journal of Progressive Science
A Peer-reviewed Research Journal
Vol.12, No.01 & 02, pp. 57-66 (2023)

Review research article

Effect of Brassinosteroids on Heavy Metal Toxicity in Plants-A Review

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Introduction

Growth is an organized, well-coordinated complex process where metabolism provides the energy and the building blocks. Plants require light, water, oxygen, minerals and other nutrients for their growth and development. Apart from these external requirements, plants also depend on certain organic compounds to signal, regulate and control the growth of plants. These are collectively called Plant Growth Regulators or Plant Growth Hormones.

However, it is the relative hormone level that regulates the pace of growth of each individual plant part, to produce a form that is recognized as a plant. Earlier, only five groups of hormones (Auxin, Gibberellin, Cytokinin, Abscissic acid and Ethylene) were designated as regulators of plant growth. However, in the recent past, compelling evidences have been put forward to classify an additional group of steroidal substances (brassinosteroids, first isolated from rape (*Brassica napus* L.) pollen), as a new class of phytohormones (phytoestrogens). It was in 1970, when Mitchell and co-workers screened the pollens of nearly sixty species, out of which the extract from about thirty species promoted growth in bean seedlings. This growth promoting substance was called "Brassin".

The search for its active factor(s) was collectively approached in 1974 by the USD, scientists working at Northern Regional Research Center (NRRC), Peoria; Eastern Regional Research Center (ERRC), Philadelphia and Beltsville Agricultural Research Center (BARC), Maryland. Bee-collected pollens (500 lb) were processed through a phytylam-size solvents (2-propanol) extraction procedure at ERRC and succeeded in partial purification at BARC. However, it was crystallized at NRRC and was subjected to x-ray analysis to establish its structure. This biologically active plant growth promoter was found to be steroidal lactone ($C_{27}H_{46}O_6$) and was named as "Brassinolide" which was renamed as "Brassinosteroid". All natural Brassinosteroids have a common S-skeleton and its structural variants come from the type and the orientation of functionalities on the skeleton. Their low level in plants is not uniform throughout its body but young growing tissues have comparatively a larger share than the mature tissues (Yabuta and Takahashi, 1986; Clouse and Sasse, 1998).

BRs are present in the pollen and immature seeds varying its concentration from 1-100 ng g⁻¹ PM, while shoots and leaves typically have lower concentrations ranging from 0.01-0.1 ng g⁻¹

ISSN NO: 1001-1749

WUTAN HUATAN JISUAN JISHU

(WHJJ)

Editor- in chief

Alistair Milne (Loughborough University)

Volume XIV, Issue XI, November/2018

Published By:

WHJJ Journal

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the 1990s, the number of people who have been infected with HIV has increased significantly. In 1990, there were about 1 million people living with HIV in the United States. By 2000, that number had risen to about 4 million. And in 2008, the Centers for Disease Control and Prevention (CDC) reported that there were about 12 million people living with HIV in the United States. This is a dramatic increase, and it is a reflection of the fact that HIV is a highly contagious virus that can be spread through a variety of means, including sexual contact, sharing needles, and mother-to-child transmission. The CDC also reported that in 2008, there were about 17,000 new HIV infections in the United States. This is a significant number, and it is a reflection of the fact that HIV is a highly contagious virus that can be spread through a variety of means, including sexual contact, sharing needles, and mother-to-child transmission. The CDC also reported that in 2008, there were about 17,000 new HIV infections in the United States. This is a significant number, and it is a reflection of the fact that HIV is a highly contagious virus that can be spread through a variety of means, including sexual contact, sharing needles, and mother-to-child transmission.

As a result of the above, the authors have concluded that the use of the proposed model is not only feasible but also effective in predicting the behavior of the system. The model can be used to predict the behavior of the system under various conditions and parameters. The model can be used to predict the behavior of the system under various conditions and parameters. The model can be used to predict the behavior of the system under various conditions and parameters.

the fact that the majority of the population is still in the process of being educated, and that the majority of the population is still in the process of being educated, and that the majority of the population is still in the process of being educated.

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Journal of Management Education 35(1)

IMAGERY IN EZEKIEL'S POETRY

*Dr. Shiv Narayan Yadav**

In the simplest terms, an image means "a picture made out of words." It is usually expressed through a phrase, an epithet, a metaphor, and a simile. C. Day Lewis has observed thus about it : "An epithet, a metaphor, a simile may create an image; or an image may be presented to us in a phrase or a passage in the face of it purely descriptive, but conveying to us something more than the accurate statement of an external reality." Of all these constituents of imagery, Aristotle gives priority to metaphor. Commenting on the significance of the use of metaphor by a poet, Aristotle has observed as follows : "But the greatest thing by far is to be a master of metaphor. It is the one thing that cannot be learnt from others; and it is also a sign of genius, since a good metaphor implies an intuitive perception of the similarity in dissimiles." Broadly speaking, imagery tends to be graphic, visual or expressive in effect, and is used for conveying some similarity, analogy or congruity. It is very useful toward 'concretization of concepts' and 'obliquity of expression'. Vividness, compactness and concentration constitute its hall marks. It is very effective in avoiding direct statements in poetry, as Hugh Kenner has pointed out in most of his essays - "Any image is by its nature more vivid than any statement."¹

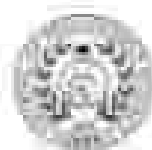
As a matter of fact images constitute the essential elements of art and objectify the poet's emotions with certain vividness, force and intensity. Poetry is an imaginative reconstruction of reality and images are of vital significance in this regard. They unravel the poet's area of associations, demonstrate his ability to conceive fresh and evocative figures and create a varied and rich pattern of meaning in the complex form of poetry. My purpose here is : first, to examine the nature of images in the poetry of Nissim Ezekiel and second, to assess the nascent poetic sensibility operating through them.

The images are beautiful birds
and colourful fish : they fly,
they swim in my Jewish consciousness. (CP, P.261)

Although Ezekiel has persistently insisted on simplicity, as an asset to the poem, he does not ignore the indispensability of the immense potential of poetic language. His interaction and incessant active engagement with the world around him makes heavy demands on his calling. As a result he has, without slipping into obscurity, used images in as much as he is able to achieve precision, economy, subtlety and coherence through the use of images. Seemingly his images can be placed in two categories - the one juxtaposed with the other.

At one extreme, we find the pagan woman and the putrid city standing as the symbols of defilement and, at the other, there is the resplendent nature symbolic of essential vigour, vitality and innocence. Indeed, these are the obsessive images in the poetry of Nissim Ezekiel. These two sets of images, representing two sets of values in contradiction to each other, are the basic constituents of the poet's search for meaning in life and poetry. In fact, they achieve the widest possible connotations and

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ISSN:0976-4933
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The present work has been carried out in the framework of the "Progetto Nazionale di Ricerca in Matematica" (P.N.R.M.) of the Italian Government. The research was carried out in the years 1974-1975, 1976-1977, 1978-1979, 1980-1981, 1982-1983, 1984-1985, 1986-1987, 1988-1989, 1990-1991, 1992-1993, 1994-1995, 1996-1997, 1998-1999, 2000-2001, 2002-2003, 2004-2005, 2006-2007, 2008-2009, 2010-2011, 2012-2013, 2014-2015, 2016-2017, 2018-2019, 2020-2021, 2022-2023, 2024-2025, 2026-2027, 2028-2029, 2030-2031, 2032-2033, 2034-2035, 2036-2037, 2038-2039, 2040-2041, 2042-2043, 2044-2045, 2046-2047, 2048-2049, 2050-2051, 2052-2053, 2054-2055, 2056-2057, 2058-2059, 2060-2061, 2062-2063, 2064-2065, 2066-2067, 2068-2069, 2070-2071, 2072-2073, 2074-2075, 2076-2077, 2078-2079, 2080-2081, 2082-2083, 2084-2085, 2086-2087, 2088-2089, 2090-2091, 2092-2093, 2094-2095, 2096-2097, 2098-2099, 2100-2101, 2102-2103, 2104-2105, 2106-2107, 2108-2109, 2110-2111, 2112-2113, 2114-2115, 2116-2117, 2118-2119, 2120-2121, 2122-2123, 2124-2125, 2126-2127, 2128-2129, 2130-2131, 2132-2133, 2134-2135, 2136-2137, 2138-2139, 2140-2141, 2142-2143, 2144-2145, 2146-2147, 2148-2149, 2150-2151, 2152-2153, 2154-2155, 2156-2157, 2158-2159, 2160-2161, 2162-2163, 2164-2165, 2166-2167, 2168-2169, 2170-2171, 2172-2173, 2174-2175, 2176-2177, 2178-2179, 2180-2181, 2182-2183, 2184-2185, 2186-2187, 2188-2189, 2190-2191, 2192-2193, 2194-2195, 2196-2197, 2198-2199, 2200-2201, 2202-2203, 2204-2205, 2206-2207, 2208-2209, 2210-2211, 2212-2213, 2214-2215, 2216-2217, 2218-2219, 2220-2221, 2222-2223, 2224-2225, 2226-2227, 2228-2229, 2230-2231, 2232-2233, 2234-2235, 2236-2237, 2238-2239, 2240-2241, 2242-2243, 2244-2245, 2246-2247, 2248-2249, 2250-2251, 2252-2253, 2254-2255, 2256-2257, 2258-2259, 2260-2261, 2262-2263, 2264-2265, 2266-2267, 2268-2269, 2270-2271, 2272-2273, 2274-2275, 2276-2277, 2278-2279, 2280-2281, 2282-2283, 2284-2285, 2286-2287, 2288-2289, 2290-2291, 2292-2293, 2294-2295, 2296-2297, 2298-2299, 2300-2301, 2302-2303, 2304-2305, 2306-2307, 2308-2309, 2310-2311, 2312-2313, 2314-2315, 2316-2317, 2318-2319, 2320-2321, 2322-2323, 2324-2325, 2326-2327, 2328-2329, 2330-2331, 2332-2333, 2334-2335, 2336-2337, 2338-2339, 2340-2341, 2342-2343, 2344-2345, 2346-2347, 2348-2349, 2350-2351, 2352-2353, 2354-2355, 2356-2357, 2358-2359, 2360-2361, 2362-2363, 2364-2365, 2366-2367, 2368-2369, 2370-2371, 2372-2373, 2374-2375, 2376-2377, 2378-2379, 2380-2381, 2382-2383, 2384-2385, 2386-2387, 2388-2389, 2390-2391, 2392-2393, 2394-2395, 2396-2397, 2398-2399, 2400-2401, 2402-2403, 2404-2405, 2406-2407, 2408-2409, 2410-2411, 2412-2413, 2414-2415, 2416-2417, 2418-2419, 2420-2421, 2422-2423, 2424-2425, 2426-2427, 2428-2429, 2430-2431, 2432-2433, 2434-2435, 2436-2437, 2438-2439, 2440-2441, 2442-2443, 2444-2445, 2446-2447, 2448-2449, 2450-2451, 2452-2453, 2454-2455, 2456-2457, 2458-2459, 2460-2461, 2462-2463, 2464-2465, 2466-2467, 2468-2469, 2470-2471, 2472-2473, 2474-2475, 2476-2477, 2478-2479, 2480-2481, 2482-2483, 2484-2485, 2486-2487, 2488-2489, 2490-2491, 2492-2493, 2494-2495, 2496-2497, 2498-2499, 2500-2501, 2502-2503, 2504-2505, 2506-2507, 2508-2509, 2510-2511, 2512-2513, 2514-2515, 2516-2517, 2518-2519, 2520-2521, 2522-2523, 2524-2525, 2526-2527, 2528-2529, 2530-2531, 2532-2533, 2534-2535, 2536-2537, 2538-2539, 2540-2541, 2542-2543, 2544-2545, 2546-2547, 2548-2549, 2550-2551, 2552-2553, 2554-2555, 2556-2557, 2558-2559, 2560-2561, 2562-2563, 2564-2565, 2566-2567, 2568-2569, 2570-2571, 2572-2573, 2574-2575, 2576-2577, 2578-2579, 2580-2581, 2582-2583, 2584-2585, 2586-2587, 2588-2589, 2590-2591, 2592-2593, 2594-2595, 2596-2597, 2598-2599, 2600-2601, 2602-2603, 2604-2605, 2606-2607, 2608-2609, 2610-2611, 2612-2613, 2614-2615, 2616-2617, 2618-2619, 2620-2621, 2622-2623, 2624-2625, 2626-2627, 2628-2629, 2630-2631, 2632-2633, 2634-2635, 2636-2637, 2638-2639, 2640-2641, 2642-2643, 2644-2645, 2646-2647, 2648-2649, 2650-2651, 2652-2653, 2654-2655, 2656-2657, 2658-2659, 2660-2661, 2662-2663, 2664-2665, 2666-2667, 2668-2669, 2670-2671, 2672-2673, 2674-2675, 2676-2677, 2678-2679, 2680-2681, 2682-2683, 2684-2685, 2686-2687, 2688-2689, 2690-2691, 2692-2693, 2694-2695, 2696-2697, 2698-2699, 2700-2701, 2702-2703, 2704-2705, 2706-2707, 2708-2709, 2710

WILKINSON=JENNIFER (2002) is an important work of the Graduate Health and Society Division. It is a really beautiful, energy-rich work that is one of the second most important work in the field. It will

continued nearly 55% of total population and provided 70% of all workers. In the second largest urban primary sector of the world after the U.S., the hotel sector was also doing better. In 1997, with 220,000 hotel rooms, Mexico was ranked 13th in the world with 25,000 hotel rooms.

RELEVANCE OF BEHAVIOURAL MODELS IN THE DEVELOPMENT OF ORGANIZATION

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Abstract

Organizational behaviour is the behaviour of human beings in their workplace or only in a corporate setting. It studies the impact that an individual has on behaviour within the organization and how groups work together so that the knowledge can help in explaining and predicting behaviour for the development of any organization. Organizations have a major influence on our daily life. They are created by individuals alone or in groups. On being formed, organizations facilitate division of labor, manage large scale technology, manage the external environment, minimize transaction costs and exert power and control. In simple terms, OB has enriched itself by drawing principles and concepts from psychology, sociology, anthropology & social psychology. OB offers both challenges and opportunities for managers. It offers specific insights to improve a manager's people skills. It recognizes differences and helps managers to see the value of workforce diversity. It can improve quality an employee productivity by showing manager how to empower their people. Finally OB can offer managers guidance in creating an ethically healthy work climate. From the very beginning of the civilized human society, two alternative approaches have been adopted for planning trust on people. One says "Trust everyone unless there is a contrary evidence"; another says "Do not trust anyone unless there is a contrary evidence". Every organization develops a particular model in which behaviour of the people takes place. These models are developed on the basis of management's assumptions about people and the vision of the management. Since these assumptions vary to a great extent, these result into the development of different behavioural models.

पुनर्नवा: लोक एवं शास्त्र का द्वंद
संजीव कुमार मिश्र

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© 2004 Blackwell Publishing Ltd *Journal of Internal Medicine* 255: 103–110

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किन्ति साहित्य में कुछ भारतीय भाषाएँ का प्रयोग हो चुका है और अन्य भाषाएँ साहित्यिक भूमिका की प्राप्ति के लिये अभी संभवतः अत्यन्त आशा की अवधि में हैं। इन्हीं भारतीय भाषाओं में से कुछ प्रमुख, विशेषतः हिन्दी का प्रयोग करने की संभावना है। यह प्रयोग करने की अवधि है। कुछ लोग हैं, जो प्रत्यक्ष विचारों से ही प्रेरणा लेकर इसकी प्रयोगशाला की हैं। यह प्रयोगशाला ही है, जो प्रत्यक्ष विचारों से ही प्रेरणा लेकर इसकी प्रयोगशाला की हैं। यह प्रयोगशाला ही है, जो प्रत्यक्ष विचारों से ही प्रेरणा लेकर इसकी प्रयोगशाला की हैं।

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Source: [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16] [17] [18] [19] [20] [21] [22] [23] [24] [25] [26] [27] [28] [29] [30] [31] [32] [33] [34] [35] [36] [37] [38] [39] [40] [41] [42] [43] [44] [45] [46] [47] [48] [49] [50] [51] [52] [53] [54] [55] [56] [57] [58] [59] [60] [61] [62] [63] [64] [65] [66] [67] [68] [69] [70] [71] [72] [73] [74] [75] [76] [77] [78] [79] [80] [81] [82] [83] [84] [85] [86] [87] [88] [89] [90] [91] [92] [93] [94] [95] [96] [97] [98] [99] [100] [101] [102] [103] [104] [105] [106] [107] [108] [109] [110] [111] [112] [113] [114] [115] [116] [117] [118] [119] [120] [121] [122] [123] [124] [125] [126] [127] [128] [129] [130] [131] [132] [133] [134] [135] [136] [137] [138] [139] [140] [141] [142] [143] [144] [145] [146] [147] [148] [149] [150] [151] [152] [153] [154] [155] [156] [157] [158] [159] [160] [161] [162] [163] [164] [165] [166] [167] [168] [169] [170] [171] [172] [173] [174] [175] [176] [177] [178] [179] [180] [181] [182] [183] [184] [185] [186] [187] [188] [189] [190] [191] [192] [193] [194] [195] [196] [197] [198] [199] [200] [201] [202] [203] [204] [205] [206] [207] [208] [209] [210] [211] [212] [213] [214] [215] [216] [217] [218] [219] [220] [221] [222] [223] [224] [225] [226] [227] [228] [229] [230] [231] [232] [233] [234] [235] [236] [237] [238] [239] [240] [241] [242] [243] [244] [245] [246] [247] [248] [249] [250] [251] [252] [253] [254] [255] [256] [257] [258] [259] [260] [261] [262] [263] [264] [265] [266] [267] [268] [269] [270] [271] [272] [273] [274] [275] [276] [277] [278] [279] [280] [281] [282] [283] [284] [285] [286] [287] [288] [289] [290] [291] [292] [293] [294] [295] [296] [297] [298] [299] [300] [301] [302] [303] [304] [305] [306] [307] [308] [309] [310] [311] [312] [313] [314] [315] [316] [317] [318] [319] [320] [321] [322] [323] [324] [325] [326] [327] [328] [329] [330] [331] [332] [333] [334] [335] [336] [337] [338] [339] [340] [341] [342] [343] [344] [345] [346] [347] [348] [349] [350] [351] [352] [353] [354] [355] [356] [357] [358] [359] [360] [361] [362] [363] [364] [365] [366] [367] [368] [369] [370] [371] [372] [373] [374] [375] [376] [377] [378] [379] [380] [381] [382] [383] [384] [385] [386] [387] [388] [389] [390] [391] [392] [393] [394] [395] [396] [397] [398] [399] [400] [401] [402] [403] [404] [405] [406] [407] [408] [409] [410] [411] [412] [413] [414] [415] [416] [417] [418] [419] [420] [421] [422] [423] [424] [425] [426] [427] [428] [429] [430] [431] [432] [433] [434] [435] [436] [437] [438] [439] [440] [441] [442] [443] [444] [445] [446] [447] [448] [449] [450] [451] [452] [453] [454] [455] [456] [457] [458] [459] [460] [461] [462] [463] [464] [465] [466] [467] [468] [469] [470] [471] [472] [473] [474] [475] [476] [477] [478] [479] [480] [481] [482] [483] [484] [485] [486] [487] [488] [489] [490] [491] [492] [493] [494] [495] [496] [497] [498] [499] [500] [501] [502] [503] [504] [505] [506] [507] [508] [509] [510] [511] [512] [513] [514] [515] [516] [517] [518] [519] [520] [521] [522] [523] [524] [525] [526] [527] [528] [529] [530] [531] [532] [533] [534] [535] [536] [537] [538] [539] [540] [541] [542] [543] [544] [545] [546] [547] [548] [549] [550] [551] [552] [553] [554] [555] [556] [557] [558] [559] [560] [561] [562] [563] [564] [565] [566] [567] [568] [569] [570] [571] [572] [573] [574] [575] [576] [577] [578] [579] [580] [581] [582] [583] [584] [585] [586] [587] [588] [589] [590] [591] [592] [593] [594] [595] [596] [597] [598] [599] [600] [601] [602] [603] [604] [605] [606] [607] [608] [609] [610] [611] [612] [613] [614] [615] [616] [617] [618] [619] [620] [621] [622] [623] [624] [625] [626] [627] [628] [629] [630] [631] [632] [633] [634] [635] [636] [637] [638] [639] [640] [641] [642] [643] [644] [645] [646] [647] [648] [649] [650] [651] [652] [653] [654] [655] [656] [657] [658] [659] [660] [661] [662] [663] [664] [665] [666] [667] [668] [669] [670] [671] [672] [673] [674] [675] [676] [677] [678] [679] [680] [681] [682] [683] [684] [685] [686] [687] [688] [689] [690] [691] [692] [693] [694] [695] [696] [697] [698] [699] [700] [701] [702] [703] [704] [705] [706] [707] [708] [709] [710] [711] [712] [713] [714] [715] [716] [717] [718] [719] [720] [721] [722] [723] [724] [725] [726] [727] [728] [729] [730] [731] [732] [733] [734] [735] [736] [737] [738] [739] [740] [741] [742] [743] [744] [745] [746] [747] [748] [749] [750] [751] [752] [753] [754] [755] [756] [757] [758] [759] [760] [761] [762] [763] [764] [765] [766] [767] [768] [769] [770] [771] [772] [773] [774] [775] [776] [777] [778] [779] [780] [781] [782] [783] [784] [785] [786] [787] [788] [789] [790] [791] [792] [793] [794] [795] [796] [797] [798] [799] [800] [801] [802] [803] [804] [805] [806] [807] [808] [809] [810] [811] [812] [813] [814] [815] [816] [817] [818] [819] [820] [821] [822] [823] [824] [825] [826] [827] [828] [829] [830] [831] [832] [833] [834] [835] [836] [837] [838] [839] [840]

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Silicosis Disease in India with Special Reference to Stone Crushing: An Overview

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(Received on 09/01/2021; Accepted on 15/02/2021)

Abstract

Silicosis is a chronic lung disorder which is a form of occupational pulmonary disease caused by inhalation, retention and pulmonary reaction to crystalline silica, as a result of exposure during mining, stone crushing and quarrying activities, which occurs mostly in developing countries. The inhaled silica particles are removed from the lung at a very slow rate. Thus, even if exposure is stopped the retained particles may continue to exert their effect on lung. This may at last lead to an increased susceptibility to the development of tuberculosis. This review explores the history of silicosis in the India in special reference to stone crushing industry including case studies of occupational disease. In this article authors have been made some of the important available sources for giving a broad idea of the problems and for advancement of research in this field.

Keywords: Silicosis, tuberculosis, pulmonary disease, silica, stone crushing and occupational.

Introduction

Silicosis is a chronic lung disorder which is a form of occupational pulmonary disease caused by inhalation, retention and pulmonary reaction to crystalline silica, as a result of exposure during mining, stone crushing and quarrying activities, which occurs mostly in developing countries. Silicosis is also known as Potter's rot. The inhaled silica particles are removed from the lung at a very slow rate. Thus, even if exposure is stopped the retained particles may continue to exert their effect on lung. The most common form of silica is quartz. Exposure to large amount of free silica can pass through human silica from air (inhalation, ingestion and skin) and does not lead to any immediate visible effect and therefore confused with ordinary dust. Silica is the main component of sand. Cutting, heating, crushing, drilling, grinding or abrasive blasting of these materials may produce free silica dust. Silicosis occurs as the result of deposition of free respirable dust (less than 10 micrometres in diameter) in the lungs.

Historical background

Pulmonary disease associated with occupational exposure to crystalline silica has been described throughout history. The migration of respiratory problems from hotating in dust dates to ancient Greeks and Romans. Hippocrates noted a condition of "breathlessness" in miners, and in the mid-19 century Apschke wrote about lung problems from dust inhalation in miners. In 1690, Liebesius described that when "the dust and coarser fall upon the lungs, the men have lung disease, breathe with difficulty". Ramazzoni et al. in 1713, noted a connection between siliceous symptoms and sand-like substances in the lungs of stone cutters. In the 1840s,

Pravick and Greenhow noted finding silica dust in the lungs of miners and in 1870s, Achille-Vicente (1828-1911) mentioned the term "Silicosis" to describe the disease caused by inhalation exposure to silica (Bhat). As per the U.S. National Institute for Occupational Safety and Health (NIOSH), the most important factor is the development of silicosis is "the product of the concentration of dust containing respirable silica in workplace air and the percentage of respirable silica in the total dust" NIOSH has said, "Silica is not just dust but a dangerous dust". Silicosis increases the risk of contracting pulmonary diseases like Tuberculosis and possibility of developing lung cancer in the future. Production of dust increased significantly due to urbanization and industrialization. The major silicosis prone areas are, sand blasting, quartz mining, foundries, ceramic industry, gun cutting and polishing, stone pencil industries, construction, all stone quarries and crushers, glass manufacture and all mining industries. Stone pencil cutting, stone cutting, and quartz grinding industry carry a high risk of silicosis in India. Exposure to silica dust is also known to predispose to Pulmonary Tuberculosis, Chronic Airflow Limitation, Lung Cancer, Renal Diseases etc.

Silicosis in the Indian Perspective

C. Krishnaswami Rao (1934) first reported about the occurrence of silicosis in India from Kolar Goldfields. The first study on silicosis carried by Anthony Caplan et al. during the period (1940-1946) in India, they surveyed 760 workers of Kolar Gold Fields, detected 342 workers suffering from silicosis.

A RESEARCH OF ATTRACTION-SELECTION-ADDITION ON ORGANIZATION PSYCHOLOGY

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Abstract:

In this research work, we have described about Attraction-Selection-Addition in organization psychology related to our research paper, which is "A Research of Attraction-Selection-Addition on organization psychology". ASA model is a psychology hypothesis that seeks to explain the culture and behaviour of successful businesses. By focusing on the influence of individuals rather than external factors, this approach provides insight into the root causes of organizational success, procedure, and technology. People are explained as the results of three dynamic processes that are **unavoidable** within the model: attraction, selection, and attrition; and the model sheds light on how people enter, exit, and stay in organizations. Members of a group are more likely to join, be chosen for advancement roles, and remain loyal to a company if its members have similar personality traits. Journal articles denoting the Attraction-Selection-Addition hypothesis are the focus of this work.

Keywords: Attraction-Selection-Addition (ASA), Personality characteristics, Emotional Ability, Psychological Attraction, And Public Organization.

Introduction

Psychological Ownership (PO), a good organizational characteristic, will drive 21st-century firm competitiveness (Barnes, 1989). Managers and researchers are paying more attention to employees' PO in the organization (2001; Pierce, 2009).

Personality Traits and Emotional Intelligence

According to the ASA model, organizations that promote a given set of norms and qualities attract individuals who share them (Li et al., 2008). High emotional intelligence and good emotion control are also likely to attract and choose people (Menges & Bruch, 2009). Thus, the ASA model increases personality and emotional intelligence homogeneity throughout a job and company (Menges & Bruch, 2004). Costa & McCrae, (1992) listed that neuroticism is most significantly associated with the experience of negative emotions. High-neurotic individuals, on the other hand, both of which are indicative of a much lower level of emotional intelligence. Finally, neuroticism has been linked adversely to workers' emotional intelligence, a concept that is frequently used interchangeably with the term "negative sentiments and emotions" (Watson & Clark, 1984).

Self-Awareness and Emotional Capability

Emotional intelligence was shown to positively predict performance outcomes (PO) in the workplace by Kaur et al. (2017), found a negative association between structural elements of the work environment and PO for the organization and the job. Ownership of one's work and one's environment and PO for the organization and the job. Ownership of one's work and one's environment and PO for the organization and the job. Ownership of one's work and one's environment and PO for the organization and the job. There will be a shift towards organic and fluid structures within public sector organisations, while adhocratic, centralised, and routine structures within the private sector will become less rigid (Ozer, 2003). (Grylmas, 2010).

Personality Traits and Psychological Ownership

Personality characteristics are widely utilized to study individual behaviour. Based on duties & responsibilities, may psychologically alter. More study is required on how the primary personal difference variables affect PO. Personality traits vary (Dawkins et al., 2015). Previous studies on psychological ownership have neglected personality traits. Menges et al. (2009) imply that a personality trait that has multiple incentives might boost ownership.

प्रोफेसर रामदरश मिश्र

(समस्तों सम्मान से सम्पादित प्रतिभा)

(संस्कृत)

INTERNATIONAL PEER-REVIEWED (REFEREED) JOURNAL

साहित्य मेघ

(साहित्यिक द्वितीय मासिका)

ISSN: 2583 - 5750

RN: (UPHIN/2021/80567)

प्रकाशन का आरम्भिक वर्ष/माह : अगस्त २०२१/ जू २, अंक १२, दिसम्बर २०२२

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Gum ghatti-alginate hybrid bead derived titania spheres for deep removal of toxic dye Remazol Brilliant Violet from aqueous solutions

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ARTICLE INFO

Keywords

Gum ghatti

Alginate gum ghatti composite beads

Remazol Brilliant Violet (RBV)

ABSTRACT

Biopolymer titania spheres were obtained using titanium (Ti) nanoparticles as precursor and alginate gum ghatti composite beads as support. During synthesis, the two independent and gel methods yielded three architectures are well distributed in water. In addition, monodisperse, spherical morphology is adopted for the first time of gel method properties. The novel beads of alginate architectural strength could be obtained by keeping the ratio of the alginate to gum ghatti. The synthesized spheres were extensively characterized using FTIR, ATR, SEM, TEM, and EDS. TEM study revealed that hollow titania spheres (H-TiO₂) are formed through the coprecipitation (CP) mechanism. Adsorption kinetics of model dyes was investigated by employing Freundlich & Langmuir (L-F) dye on the beads. model dye dye adsorption. The dye adsorption mechanism was investigated through using various kinetic models. Adsorption data found to be well represented through pseudo second order kinetic model. Further, dye was also transported through these beads and the obtained diffusion constant value found to be in the order of 10^{-11} m²/s, suggesting pore diffusion mechanism plays significant role in governing overall rate of the reaction process. The adsorption equilibrium data were correlated with the Langmuir isotherm which indicates surface homogeneity of the spheres for dye adsorption. Scanning field provided that the adsorption can be explained reasonably for homogeneous beads without showing any significant loss in adsorption capacity. Overall, the study revealed that the beads spheres can be used as a promising adsorbent specifically for the removal of Remazol Brilliant Violet dye and other reactive dyes in aqueous solution.

1. Introduction

Water quality index have attracted much research attention due to their excellent properties include high crystalline framework, excellent transport behavior, specific surface area, controlled morphology, thermal stability of materials, compressive and tensile pore size [1–4]. Al³⁺ [5–12] for Al³⁺ [13–15]. Titania has proved to be the most appropriate material for various environmental applications due to its biological and chemical inertness, remarkable optical and electrical properties, strong color power, excellent photocatalytic activity, non-toxicity, high chemical stability, non-volatility, non-compatibility with acids, and biocompatibility [16–18]. In [19], the

[20–22] [23–25], recently [26–28] and [29–31] and [32–34] have been successfully fabricated through different methods. However, the processes are more tedious as they require constant control of pH through the column. Moreover, the titania hollow spheres are heavily benefited as they can be very easily separated after the adsorption process. However, this separation is very tedious for water particles. Implying effect of polyacrylamide play a significant role because it changes the characteristics of water adsorbent in terms of porosity, crystallinity, morphology, drying and particle size etc.

Alginate is a natural anionic polysaccharide having blocks of mannuronic and gulonic acid residues. It has the ability to produce thermally irreversible gels by association with one of the divalent

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Article with open access.

https://doi.org/10.1016/j.enmm.2021.100606

Received 13 October 2020; Received in revised form 11 January 2021; Accepted 5 April 2021

Available online 7 April 2021

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Original Article

A study on treatment outcome of tuberculosis cases registered under RNTCP in Sonbhadra District: A Medico-Geographical Perspective

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ABSTRACT

Introduction: Tuberculosis is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*. It mainly affects the lungs (pulmonary TB) and sometimes affects other sites such as pleural (pleural TB). The disease is spread when people who are sick with pulmonary TB expel bacteria into the air by coughing, sneezing, a relatively small proportion (5-15%) of the estimated 1.7 billion people infected with *M. tuberculosis* will develop TB disease during their lifetime. **Objective:** To assess the treatment outcome of tuberculosis patients registered under Revised National Tuberculosis Control Programme (RNTCP) and to find out spatial pattern of tuberculosis patients. **Materials and Methods:** A prospective record based study was conducted based on the secondary data pertaining to the patients registered at six different tuberculosis units (TU) and 24 designated chemotherapy centers (DCC) in Sonbhadra district during the period from 2000 to 2015. **Results:** Overall 85.8% were cure cases and among them 85.3% were as pulmonary cases observed. Success conversion rate of new sputum positive cases at 2 or 3 months after treatment was 85.3%. Cure rate for new sputum positive pulmonary TB cases was 84.3% and out of all success positive cases, 4.1 was 85.4%. Default among new success positive cases was 1.0%. **Conclusion:** The treatment outcome varies case to case of cure and treatment compliance. It is suggested that the DCCs are an effective strategy for tuberculosis treatment may be considered as better alternative for cure the Sonbhadra.

Key Words: Tuberculosis, Extra Pulmonary TB, Mycobacterium tuberculosis, RNTCP and Success Conversion.

Introduction

Tuberculosis (TB) is a major global health problem. It causes 31 health (mortality) among millions of people each year and ranks among fastest communicable disease (M) as a leading cause of death (mortality worldwide. TB is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*. It mainly affects the lungs (pulmonary TB) and can also affect other sites extra pulmonary TB. The disease is spread when people who are sick with pulmonary TB expel bacteria into the air by coughing, sneezing, a relatively small proportion (5-15%) among the estimated 1.7 billion people infected with *M. tuberculosis* will develop TB disease during their lifetime. However, the probability of developing TB disease is much higher among people infected with HIV, and also higher among people affected by risk factors such as under nutrition, diabetes, smoking and alcohol consumption.

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Genetic architecture of yield and its components in wheat (*Triticum aestivum* L.)

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Abstract

The genetic analysis of wheat (*Triticum aestivum* L.) was carried out using three wheat genoplasm and two released wheat variety under irrigated normal soil condition to determine mode of inheritance of yield and its contributing traits. The data was recorded on twelve characters viz, such as days to 50% flowering, flag leaf area, plant height tiller per plant, spike length per plant, number of seed per spike, days to maturity, biological yield per plant, harvest index (%), 1000 grain weight(g) and grain yield per plant(g). The variation due to treatments was significant for all the characters. All the 25 genotypes showed vast range of variation for all the 11 characters under consideration. Genotypes such as HRWYT-31 produced highest grain yield per plant followed by STEMIRSEN-610K, HD-2967 and PDW-502 these four genotypes significantly out yielded genotypes. The maximum heritability of was recorded for biological yield per plant, grain yield per plant, harvest index, number of seed per spike, flag leaf area, plant height and tiller per plant. Heritability estimates indicating for chance for selection of better genotypes with respect to these characters. Grain yield per plant showed positive and highly significant correlation with tiller per plant and biological yield per plant.

Key words: Wheat, variability, heritability, genetic advance and correlation.

Introduction

The many species of wheat together make up the genus *Triticum*. It is most widely grown is common wheat (*Triticum aestivum* L.) is the world's leading cereal grain and main food crop for people over the entire world. Wheat occupying commanding position in Indian agriculture which occupies 25 percent of area under cereals and contributing 36 percent of the total food grain production in the country. India is second largest producer of wheat in the world after China. Wheat is the second most important food crop of the country after rice. Global demand for wheat is increasing due to the

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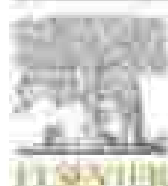
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Abstract

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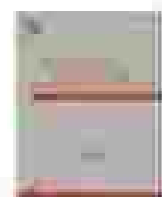
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Contents lists available at ScienceDirect

Inorganic Chemistry Communications

journal homepage: www.elsevier.com/locate/icoor



Short communication

Auto combustion synthesis of ZnO for degradation of organic dye under natural solar light with bactericidal activity



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ARTICLE INFO

Keywords:
ZnO nanoparticles
Photocatalysis
Photodegradation
Microbial
Antibacterial

ABSTRACT

Here we report synthesis of nano sized ZnO using zinc oxide (ZnO) nanoparticles by auto combustion auto combustion method using citric acid as a fuel. Synthesized ZnO nanoparticles were characterized using XRD, FTIR, SEM, TEM, EDS, UV-Vis, and PL. The synthesized ZnO nanoparticles were used for the degradation of organic dye under natural solar light. The synthesized ZnO nanoparticles were used for the degradation of organic dye under natural solar light. The synthesized ZnO nanoparticles were used for the degradation of organic dye under natural solar light. The synthesized ZnO nanoparticles were used for the degradation of organic dye under natural solar light.

1. Introduction

In the textile, food, drug, and plastic industries, a variety of natural and synthetic dyes are utilized. Dye discharge water is also most common industrial effluent. As a result, water pollution is a serious danger to aquatic life and, consequently, nanoparticles [1]. Therefore, before the waste from industries goes into rivers or streams, it is very important to degrade the dye. Methylene blue (MB) dye is commonly used to color cotton, wool, and silk in the textile industry [2,3]. It is often used as the test model dye for photocatalytic studies [4,5]. Due to its wide absorption for broad gap energy (3.2 eV), super semiconductor, fluorescence, it is abundant in nature and is safe for the environment. This is because of which ZnO is used as a potential material for a variety of applications, including the production of solar cells [6], as a photocatalyst [7], in biological applications [8], in agriculture [9] and gas sensors [10]. Under UV or visible light irradiation, ZnO creates electron-hole pairs. The electron and hole can interact with the O₂ absorbed on the photocatalyst's surface, as well as H₂O, to produce H₂O₂ and H₂ respectively, which can further reduce and oxidize the organic pollutants into their respective and products (CO₂ and H₂O, respectively) [11,12]. Other than this analysis, zinc oxide nanoparticles are also used as effective

antibacterial agents in the medical field [13,14]. Nano ZnO has much more antimicrobial activity than other sized ZnO as it possess larger surface to volume ratio [15]. The mechanism for antimicrobial activity of nano ZnO is due to active oxygen species generated by ZnO [16]. Various synthetic processes are used to form ZnO nanoparticles such as hydrothermal synthesis [17], sol gel method [18], microwave assisted synthesis [19], co-precipitation method [20], sonochemical synthesis [21] and etc. Among these various ways, the auto combustion method is particularly appealing because of its low cost, simplicity, and clean processing route. Furthermore, the auto combustion process allows for greater control of morphology, size, shape, chemistry, and weight [22].

In the present study, ZnO nanoparticles were synthesized by using solution auto-combustion method using citric acid as a precursor. The synthesized nanoparticles were characterized using a variety of analysis such as XRD, FTIR, SEM, EDS, TEM and UV-vis analysis. The photocatalytic degradation property of nanoparticles that have been synthesized was evaluated under natural sunlight. The methylene blue dye was used as a representative pollutant. To find optimum conditions required for degradation of dye, effect of catalyst loading, effect of pH was investigated. An antimicrobial property of prepared nano ZnO

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https://doi.org/10.1016/j.icoor.2022.100909

Received 31 March 2022; Received in revised form 6 July 2022; Accepted 31 July 2022

Available online 4 August 2022

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भावानुवाद 'रघुवंश प्रकाश' की संपीक्षा

1998年12月1日

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समुदाय पहली सताब्दी में लिखे संस्कृत के मुनिग्रन्थ भाषाकारि कुलमुक्त भाषाविदास की रचना है। जिसे आज 2-वीं सदी में हिन्दी अनुवाद ही नहीं अपितु हिन्दी के पाठानुवाद की रूप में हम प्राप्त करने को सम्मुख पस्तुत है। विश्व-महा-कुल-ग्रन्थ केन्द्रीय हिन्दी निदेशालय (मानव संसाधन विकास मन्त्रालय) है। वितीय अनुदान से 'संस्कृत परिवर्तनान्तर' नई दिल्ली से जयम संस्कृत के रूप 2014 ई. में प्रकाशित है। तथा है। भारत में सर्वप्रथम अनुसूचितभाषा के अन्तर्गत अनुसूचित लिपि लिपि की प्राप्ति की प्रति अनुसूचित एवं अरोचना की गयी है।

‘‘अपमानादिपातस्य’’ अर्थात्सर्वों की इस परीक्षा से जो अपमान का अपमानित कवि होता विश्वविदिता है। काव्यपात के इस अर्थ में अपमान की जो समझदार भीषण से मानव-जीवन की आन्तरिक यहाँ पर इस की मूर्खों की दिखाने का काम होता है। अतिसर काव्यपात ही अन्तक यहाँ अन्तरीक्षीय है यथा—

पञ्चाङ्ग गिरिनी सुन्दरी वाणेश्वरी ॥

पञ्चाङ्ग गिरिनी सुन्दरी वाणेश्वरी ॥

आपका प्रश्न ने प्रश्न-समूह पर तथा और उसके ऊपर ही निहित है कि लोक जीवन में भात-पिता अर्थात् पौत्र-पौत्रिका के सम्बन्ध का स्थान क्या है। जिस प्रकार पहले पाँचवीं बसके बाद परम्परा उसी प्रकार चलने लगी। उसके बाद तो समाज। इस प्रकार भात-पौत्रों का दूसरे ने अतिशय प्रसन्न से मिले हुए हैं। इन पौत्रों का किसी प्रकार से सम्बन्ध परम्परा सम्भव नहीं है। जिस प्रकार राज्य के राज्य और उन्हें हैं उसी प्रकार लोक जीवन में सक्ति और स्थिति हैं। इससे ही भात है कि सामुदायिक सामन्त ने यदि पाँच-पाँचों का भात-पिता का ऐसा सम्बन्ध ही तो सम्बन्ध का दृष्टि ही कुछ



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Journal of Internal Medicine 247: 111–117

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Journal of Management Education 36(10):1033-1046

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Immunological Control and
Prevention of HIV Infection
Lippincott Williams & Wilkins
© 2002

Journal of Planning Literature
 2000, Vol. 33, No. 1
 1-10

The Journal of the
 American Society of
 Plant Pathologists

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For *Opuntia stricta* (L.) it is a highly productive 100% of family Fabaceae. This is a very poor
of the world. It is grown for grazing (littoral); yet in India it is not only consumed as good
source of protein but in a variety of ways. This is grown all over the world and is an important
paleo crop with varying uses and production. In India, area under pea crop was 224.56 lakh
hectares, with a production of 7.8 lakh tonnes, and productivity of 3.52 quinton in 2015-16.
India produces the largest production of the country followed by China, Myanmar, Turkey, etc.
It is a high protein (27%) crop with all essential amino acids, especially Aspartic acid and
Isoleucine. The nutritional composition is also remarkable. The most important is a low
energy water soluble fibre and protein (16% to 20%) and good acid (60% to 62%) along with
a number of vitamins, minerals and high fibre content. Production yield of pea have high level of
good lysine and aspartic acid contents. The protein and mineral being rich and it
contains the seed fertility by orange, fucose, fucose, fucose, fucose, etc.
The major nutrients in peas (protein, carbohydrate in general and pea in particular are required
macronutrients between high production area and moderate production. Long improved
production technology, breeding high yielding disease resistant and nutrient plant/pea plant
may be highly responsive to region and moisture. It helps us help to avoid the yield barrier.
Keeping in mind the nation's requirements of 111.14 million tonnes in the coming years of
pea, the investigation was carried out. Thirteen characters were taken under the present study
for evaluation of variability, heritability, coefficient of variation and path coefficient analysis.
Wright (1971-72) partitioned the value into direct and indirect to explain the variation
amongst the characters of direct and indirect contribution of each character towards yield
value was residual effect in pea production, discussed by Dey and Das (1981).

Twenty different cross-sections of penicillin from different places at the Department of
Chemistry at Raddi, 2017, 18, using standardised Block Design M.W.D. with 3 replications each.
Experiment: 2017 in form of S₃A₂ T₃ F₃L₃C₃G₃B₃D₃. Each experiment was repeated 3 times
with dimensions of 1 m X 0.30 m X 0.1 m.

ISSN NO-1001-1749

WUTAN HUATAN JISUAN JISHU

An UGC CARE Approved
Group-II JOURNAL

VOLUME-XVI, ISSUE-III, MARCH-2020

The Maladies Afflicting The Higher Education

Dr. Bhattacharya Mridul*

ABSTRACT : Many new laws have been enacted and new policies of education have been framed to improve the existing system of education, yet the standard has been gradually sinking and deteriorating. The problem is rampant everywhere. The modern society has become disoriented of human values. Poverty, illiteracy, discrimination, indiscipline and lawlessness etc. have infected the degree-holder as well as the educated youth. The system adopted by the universities and colleges in the country is neither effective nor genuine. Hence this paper aims at... Pointing out the causes of the maladies in the existing measures, highlighting the special roles university and college have to play in the present condition of the country. The study is based on the various incidents, occurring on the campuses of universities and colleges. The reports and recommendations of the various educational committees and commissions appointed from time to time in the post-independent India have also been taken into consideration. The secondary sources like news papers, research magazines, journals and some reference books on the problems of higher education have also been consulted.

Higher Education, being the third and the topmost rung of the ladder, marks the youth's experiential stages and skills acquired after the 10+2 system in universities and colleges. It aims at making the student citizens and proficient scholars. Higher education in India is undergoing a quantum change. The system is under tremendous pressure in various aspects. These pressures are diversified and multiple. They vary from curriculum development, quality assurance and endorsement to governance issues. The realm of higher education in India has a very rich past. Her ancient universities were the leading centres of learning in the contemporary world. They used to attract students from other countries of the world. Even in the medieval time the famous centres of Islamic learning continued this tradition in India. With the advent of the British rule in the country the entire system of education was transformed leading to the establishment of several modern universities and colleges.

The nearly 69th anniversary of the independent India have so far been mostly enjoyed and over the last twelve five year plan have been launched but the situation in the field of higher education has been worsening day by day. In the post-independent period, access to higher education has risen from 1.4 percent in 1950-51, 1.4 percent in 1960-61 and eight percent in early 2000. India has the largest higher education system in the world in terms of the number of institutions- comprising over 35500 colleges, about 2,180,000 2 million students and over 93400 teachers. It stands second largest in terms of the number of students. The three main types of institutions in India include: universities and university level institutions, colleges, and diploma institutions. There are nearly 10,000 diploma institutions in the country.

Causes of the Maladies : Since the degree-holder youth is afflicted with these maladies, it becomes imperative to study the causes of these maladies.

॥४॥ श्रीगणेशाय नमः ॥ श्रीगणेशाय नमः ॥ श्रीगणेशाय नमः ॥ श्रीगणेशाय नमः ॥ श्रीगणेशाय नमः ॥



Nuclear Reaction As Source Of Energy

* Sapt Kumar Varma

INTRODUCTION:

It is human nature to test, to observe, and to dream. The history of nuclear energy is the story of a centuries-old dream becoming a reality. Ancient Greek philosophers first developed the idea that all matter is composed of indivisible particles called atoms. The word atom comes from the Greek word, *atomos*, meaning indivisible. Scientists in the 18th and 19th centuries revised the concept based on their experiments. By 1906, physicists knew the atom contains large quantities of energy. British physicist Ernest Rutherford was called the father of nuclear science because of his contribution to the theory of atomic structure. Albert Einstein developed his theory of the relationship between mass and energy, one year later. The mathematical formula is $E=mc^2$.

Nuclear Energy:

We need and we use energy in our lives every day. We need and we use energy in our lives every day. We use energy to contract our muscles and move our lips. We use energy to warm our homes and feed our bread. Scientists are busy researching new ways to make energy available for our use.

Nuclear Reactions:

Different atoms make up different

elements; for example, hydrogen, iodine, gold and silver are all elements. Each atom contains a nucleus, and the nucleus contains protons and neutrons. Electrons surround the nucleus of an atom. A nuclear reaction is a reaction that changes the nucleus of an atom. In other words, the number of protons and/or neutrons is changed as a result of a nuclear reaction.

Nuclear Reactions Release with Energy:

Nuclear reactions release energy, and they release a lot of it. There are two types of nuclear reactions. Fission occurs when large nuclei are split into smaller fragments. Fusion occurs when small nuclei are put together to make a bigger one. The heat released in fission can be used to help generate electricity in power plants. Uranium-235 ($U-235$) is one of the isotopes that fissions easily. During fission, $U-235$ atoms absorb loose neutrons. This causes $U-235$ to become unstable and split into two light atoms called fission products. The combined mass of the fission products is less than that of the original $U-235$. The reduction occurs because some of the matter changes into energy. The energy is released as heat. A series of fissions is called a chain reaction. If enough uranium is brought together under the right conditions, a continuous series

USE OF CONTEMPORARY INDIAN ENGLISH IDIOM IN THE POETRY OF NISSIM EZEKIEL

*Dr. Shiv Narayan Yadav**

In the closing decades of our century the emphasis has shifted from English literature to literatures in English. New literatures in English in the Third World countries and Commonwealth countries have gained acceptance among the elite and the academics. So, we find New literatures in English in Africa, Australia, Bangladesh, Canada, Ceylon, India, New Zealand and West Indies. Now the question arises how to distinguish writers of one country from another when both of them write in the same language called English. For instance, how to distinguish Nissim Ezekiel from A.D. Hope, or Derek Walcott. What makes Nissim Ezekiel an Indian, an Australian poet an Australian, and a Caribbean poet a Caribbean, may be evident in the nature of the poet's response to the landscape (topographical as well as metaphysical) of his country as distinct from, or conjoined with or merging into, an intellectual and religious tradition wherever available. The Englishness of Shakespeare, Wordsworth, Keats and Tennyson lies in their intimacy with the English landscape. Judith Wright makes apt comment in this regard :

"Before one's country can become an accepted background against which the poet's and novelist's imagination can move unhindered, it must first be observed, understood, described and, as it were, towards absorbed. The writer must be at peace with his landscape before he can confidently turn to its human figures."¹

The Indian English poet is concerned with the "Indianness" of his experience. Poets like Nissim Ezekiel, A.K. Ramanujan, Jayanta Mahapatra, Kamala Das, R. Parthasarathy, Shiv K. Kumar, Keki N. Datta, O.P. Bhatnagar, A.K. Mehrotra are essentially concerned with the "Indianness" of their experience in order to create a new Indian English Idiom, distinct from the idioms of the writers in the world who write in English.

Indian English poets do express Indian sensibility in their verse. K. Ayyappa Paniker writes:

"Indian Poetry in English" necessarily refers to two parameters; Indian and English. "Indian" may mean, either written by Indian citizens or written about Indian subjects or even expressing Indian sensibility. This implies that there is a sensibility that is identified with the land and the people of India. National sensibilities are ultimately based on racial and cultural factors. Whether they are inherited or acquired is another moot question.² Nissim Ezekiel, Shiv K. Kumar, Jayanta Mahapatra, R. Parthasarathy, Kamala Das and some others underline this typical Indian sensibility in their poetry. Indian English poets are now very conscious of their own identity and sensibilities as pointed out by K. Ayyappa Paniker. John Oliver Perry observes, "the most significant Indian English Poetry since the early 1970's has turned increasingly towards indigenous themes — materials and possibly even forms of poetry."³

Paniker also links it to Indian aesthetic tradition. "The link between Indian poetry in English and the Indian aesthetic tradition may be looked for in two or three areas or aspects; one, the identification

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Abstract: In more than three decades, optical fibre communication has evolved from a remote proposal to commercial reality. This success is based on two major breakthroughs: one related to the efficient generation of light in semiconductor semiconductor devices and the other to the almost uninterrupted transmission of light in long life glass fibres over 100 km of miles. Recently, optical fibre communication technology has made great progress where two been considerably expanding any technology has greatly enhanced communication capabilities in the traditional sense, that makes the optical fibre communication technology as a broad-based tool has been applied. Recent advances in scientific technology have led to the preparation of extremely low loss fibres for the transmission of light. The optical fibre is essentially a dielectric wave guide. Different materials using the materials with high dielectric constant, lower losses and higher refractive coefficient have been studied. Although cylindrical geometries are commonly preferred, the spherical resonators have also been considered. This paper deals with communication using optical fibres. The transmission using high bandwidth can handle vast amounts of information, which can be further improved by reduction in fibre losses, variation in data rates and bandwidth. Development of optical sources and detectors compatible with fibre.

Keywords: Bandwidth, Optical Communication Technology, Data rate, Optical resonator

1 INTRODUCTION

The discovery of laser in 1960 laid the stepping stone for the development of communication system using optical fibre. Optical fibre communication is a technology that is used to transmit signals. The data, video or voice which is modulated with pulse of light that serves as an electromagnetic carrier wave and down a glass tube over a long distance with very little attenuation or loss. The modulated pulse of light propagates through the glass tube using the principle of total internal reflection (TIR). A fibre optic communication link also known as a fiber channel is a system which provides a point-to-point data connection between two points. It comprises of two components consisting of a laser diode or Light Emitting Diode (LED) which convert electric signal to light; a transmission fiber in which the modulated light propagates; and a receiver which convert of a photo detector that converts light to electric signal. The use of fiber optics was gradually not available until 1970 when Corning Glass Works was able to produce a fiber with a loss of 20dB/km. Today's optical fiber attenuation ranges from 0.1dB/km to 1000dB/km depending on the optical fiber used. The applications of optical fiber communications have

increased, at a rapid rate, since the first commercial installation of a fiber-optic system in 1966. Today's telephony companies use optical fibre throughout their system's the backbone architecture and as the long distance connections between city phone systems. In addition to the long distance communication system, optical fibres are also being extensively used for Local Area Network (LAN) network that wire up telephone companies or Robots in offices and cities.

1.1 Importance of Optical Fiber

Optical fibre offers low loss and wide bandwidth capabilities. Some of the potential for being used wherever twisted wire pairs or coaxial cables are used as the transmission medium in communication system. A single conductor that is used to transmit multiple signals. The system can also transmit information similarly to the way a copper wire can transmit electricity. However, copper transmits only a few million electrons per second, compared to an optical fiber that carries up to a 20 billion light pulses per second. The main advantage over large amounts of data transfer is that optical fiber does not

Wordsworth's Tintern Abbey : An Ecocritical Reading

*Dr. Shikha Narayan Yadav**

Ecocriticism is the study of literature in relation to the environment. Scholars seek to analyse text to illustrate the environmental concerns and how the subject of nature has been treated in different ways by the author in it. It first started in USA where it is associated with the Association for the Study of Literature and Environment (ASLE). It is also referred to as "green studies", "ecopoetics" and "environmental literary criticism". Cheryl Glotfelty defines it in *The Ecocriticism Reader* (1996) as "the study of relationship between literature and the physical environment. Just as feminist criticism examines language and literature from a gender-conscious perspective and Marxist criticism brings an awareness of modes of production and economic class to its reading of texts, ecocriticism takes an earth-centred approach to literary studies." (P. XXVIII). His approach was "to restore professional dignity to the undervalued genre of nature writing." (P. XXX).

H. Lawrence Hall defines it as "a study of the relationship between literature and environment in a spirit of commitment to environmental praxis." (P.430.n.20). Simon Estok defined ecocriticism in 2001 as the movement that "has distinguished itself, debates notwithstanding, firstly by the ethical kind it takes, its commitment to the natural world as an important thing rather than simply as an object of thematic study, and secondly, by its commitment to making connections." (P.220).

Camilo Gouveia offers a functional definition that is both broad and discriminating the field of enquiry that analyses and provides works of art which raise moral questions about human interactions with nature, while also motivating audiences to live within a limit that will be binding over generations. Following this definition, Aston Nichols has recently argued that the historical dangers of a romantic version of nature now need to be replaced by "urbanatural rooting", a view that seeks to link urban life and natural world and argues for humans to live more lightly on the planet the way virtually all other species do. Such a view relies on anthropocentrism and the mainstream assumption that the natural world be seen primarily as a resource for human beings. Environmental crisis is caused primarily by a cultural tradition in the West of the separation of culture from nature and the elevation of the former to moral predominance. Arne Naess, a Norwegian philosopher, developed the notion of deep ecology which emphasizes the basic interconnectedness of all life forms and natural features and presents a symbiotic and holistic world view rather than an anthropocentric one.

William Rueckert is said to be the first person to use the term ecocriticism in his essay *Literature and Ecology : An Experiment in Ecocriticism* (1978). Ecocriticism owes much to Rachel Carson's *Silent Spring*. "The intention of Rueckert was to focus on the application of ecology and ecological concepts to the study of literature." (Glotfelty and Harold Fromm, P.107). Ecocriticism emerged in England with the publication of *Romantic Ecology : Wordsworth and the Environmental Tradition*.

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North River, 40 miles from New York City, where the first large-scale, open-pit iron ore mine was developed. The mine was owned and operated by the Federal Iron and Steel Company, which was a subsidiary of the Federal Steel Corporation. The mine was closed in 1962, and the site was abandoned. The mine was one of the largest iron ore mines in the world at the time it was operating.

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अन्तर्गत विदेशी संस्कृति के साथ भारतीय का एक प्रयोग करते हुए अन्तर्गत राजा जलाने होते हैं। वे संस्कृत अन्तर्गत हैं कि क्या भारतीय से अन्तर्गत संस्कृति के समान अन्तर्गत में प्रयोग और अन्तर्गत है अन्तर्गत है। यह का अन्तर्गत है। वे सभी भारतीय संस्कृति जलाने अन्तर्गत पक्षगत नहीं अन्तर्गत वे करते हैं, प्रयोग में जल भारतीय अन्तर्गत जो एक संस्कृति अन्तर्गत का प्रयोग अन्तर्गत है। वे न भारतीय का अधिक और अन्तर्गत अन्तर्गत का वे अन्तर्गत अन्तर्गत है। अन्तर्गत वे भी अन्तर्गत प्रयोग अन्तर्गत है। वे अन्तर्गत अन्तर्गत है। भारतीय संस्कृति का अन्तर्गत अन्तर्गत है। यह प्रयोग विदेशी जो अन्तर्गत की सभी भारतीय संस्कृति की अन्तर्गत में अन्तर्गत अन्तर्गत अन्तर्गत है। एक, का अन्तर्गत

जम्मू-कश्मीर में चीन की नीति और भारतीय सुरक्षा
(पाक अधिकृत कश्मीर के संदर्भ में)

7. निम्नलिखित में से सही विकल्प चुनिए-

[illegible]

1. कवली घाटी
2. खलुवा घाटी
3. लुङ्गला
4. लिङ्गना
5. लुङ्गला

[illegible]

जम्मू-कश्मीर में चीन की सीमा पर चर्चा करने से पूर्व हमें दो बातें जम्मू-कश्मीर से उद्दिष्टातः भौगोलिक परिस्थिती का भी समझना होगा। जब भारत स्वतन्त्र हुआ तो उस समय भारतीय राज्य में शामिल होने वाले राज्यों की संख्या पाँच से सन्ध्या थी। इनमें सबसे ज्यादा विस्तृत जम्मू-कश्मीर की थी जमीनी भी है। इसका क्षेत्रफल 84,471 वर्गमील का है। सन्ध्या के बाद जमीनी राज्य की औसत बहुत घना रहा हुआ है। इन राज्यों की विशेषता यह थी कि यहाँ बहुत ही वास्तुशिल्प निर्माण थी। प्राचीनकाल से कश्मीर पर जमीनी का विशेष प्राधिकार एवं प्रभारितों के व्यवस्थापन का

१. **राष्ट्रीय शासन** का एक राष्ट्रीय अग्रणी विभाग भी मुहूर्त सेवा प्राप्त कि लेने का अधिकार प्राप्त है।

ISSN NO-1001-1749

WUTAN HUATAN JISUAN JISHU

An UGC CARE Approved
Group-II JOURNAL

VOLUME-XVI, ISSUE-XI, NOVEMBER-2020

Business Development of Sustainable Business

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ANALYTICAL STUDY OF ORGANIZATIONAL CONFLICTS IN EDUCATIONAL INSTITUTIONS

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Abstract:

Organizational conflict is a state of discord caused by the actual or perceived opposition of needs, values and interests between people working together. Conflict takes many forms in organizations. There is the inevitable clash between formal authority and power and those individuals and groups affected. There are disputes over how resources should be divided, how the work should be done, and how long and hard people should work. There are jurisdictional disagreements among individuals, educational institutions, and between unions and management. There are subtle forms of conflict involving attitudes, judgments, personality clashes, role differences, and struggles for power and favor. There is also conflict within individuals between competing needs and demands for which individuals engaged in different ways. Conflict affecting organizations can occur in individuals, between individual and between groups. Conflicts within work groups are often caused by struggles over control, status, and scarce resources. Conflicts between groups in organizations have similar origins. The constructive resolution of such conflicts can most often be achieved through a rational process of problem solving, coupled with a willingness to explore issues and alternatives and to listen to each other. All these factors are instructively appealing but are relatively ineffective. Inter-group conflicts could be prevented by establishing clear, operational goals of the organization. These goals will take away group's energy from conflict towards achievement of these goals. In the process they will develop mutual co-operation. They may also be prevented through better communications and interactions between the groups. In this process, there ought to be selection of members in the group so that they could experience the problems themselves and take suitable steps to prevent them. Healthy competition among groups may also prevent conflict in educational institutions.

Key Words: Conflict, Problems, Manager, Educational Institutions, Co-operation.

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON: 1965

Report of the
Commission



REVISION OF THE FEDERAL BUREAU OF INVESTIGATION 1964

WILLIAM J. HARRIS

Special Agent in Charge, Federal Bureau of Investigation, Washington, D.C.

ABSTRACT

The report contains a summary of the work of the Federal Bureau of Investigation during the year 1964. It includes a summary of the work of the Bureau in the areas of law enforcement, intelligence, and administration. It also includes a summary of the work of the Bureau in the areas of research and development, and a summary of the work of the Bureau in the areas of training and education.

1. INTRODUCTION

The Federal Bureau of Investigation (FBI) is the largest law enforcement agency in the United States. It is responsible for the investigation and prosecution of federal crimes, and for the maintenance of law and order. The FBI is also responsible for the collection and dissemination of intelligence information. The FBI is organized into five major divisions: Administration, Criminal Investigation, Identification, Intelligence, and Training. Each division is further divided into several units. The FBI is headed by the Director, who is appointed by the President. The Director is assisted by the Deputy Director. The FBI is also assisted by several advisory committees. The FBI is a part of the U.S. Department of Justice. The FBI is a federal law enforcement agency. It is responsible for the investigation and prosecution of federal crimes, and for the maintenance of law and order. The FBI is also responsible for the collection and dissemination of intelligence information. The FBI is organized into five major divisions: Administration, Criminal Investigation, Identification, Intelligence, and Training. Each division is further divided into several units. The FBI is headed by the Director, who is appointed by the President. The Director is assisted by the Deputy Director. The FBI is also assisted by several advisory committees. The FBI is a part of the U.S. Department of Justice. The FBI is a federal law enforcement agency.

2. THE BUREAU AND ITS WORK

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3. THE BUREAU'S WORK IN 1964

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श्रीमदरुद्रकवि-प्रणीत 'दानियालचरितम्' (मूलपाठ, पातालोचन एवं सम्पादन की सम्भावनाएँ)

विमलेश कुमार शीर्ष *

ग्रन्थपरिचय

संस्कृतसाहित्य के ऐतिहासिक पृष्ठों में चरित प्रमाण काव्यग्रन्थों के नाम तो बहुत मिलते हैं, परन्तु चम्पू की कोटि में गिने जाने वाले ऐतिहासिक काव्य सामान्य मिलते हैं, जिनमें माध्यमालिक भारत के मुस्लिम शासकों पर लिखे गये स्वातंत्र्य काव्य तो अत्यन्त ही दुर्लभ हैं। ऐसा ही अत्यन्त दुर्लभ ऐतिहासिक एवं चरित प्रधान काव्य श्रीमदरुद्रकवि द्वारा विरचित 'दानियालचरितम्' भी है।

'दानियालचरितम्' मुगल सम्राट् अकबर के पाँच पुत्रों में सबसे छोटे, दानियाल की प्रशंसा में लिखा गया है। यह काव्य आन्तरिक रूप में तो किसी ऐतिहासिक तथ्य को प्रस्तुत नहीं करता, अतएव इस रूप में इसे ऐतिहासिक काव्य भी नहीं कहा जा सकता। प्रस्तुत काव्य 1606 से 1609 ई. के बीच बागुलान (मुल्शेर) के शासक नारायण शाह के पुत्र प्रताप शाह के निर्देश पर रुद्रकवि द्वारा लिखा गया है।¹ इस काव्य में कुल पाँच उल्लास हैं और पाँचवें को छोटकर प्रत्येक उल्लास के अन्त में एक पुष्पिका है जिसमें ग्रन्थ, ग्रन्थकार, कवि-संख्याक एवं उल्लास की संख्या को सूचित किया गया है। ग्रन्थ के परिमाण की घर्षा करें तो इसके प्रथम उल्लास में 27 पद्य, द्वितीय में गद्य सहित 14 पद्य, तृतीय में 17 पद्य, चतुर्थ में 11 पद्य और अन्तिम पाँचवें उल्लास में केवल तीन पद्य हैं। पञ्चम उल्लास, जिसे हम इस काव्य का अन्तिम उल्लास भी कह सकते हैं, - के अन्त में ग्रन्थ की अन्तिम पुष्पिका न होने से ऐसा प्रतीत होता है कि यह काव्य अपूर्ण सा है। चम्पूकाव्य के नियमानुसार इसमें गद्य एवं पद्य की व्यवस्थित प्रस्तुति होनी चाहिए, किन्तु इस प्रसंग में यह ब्यातव्य है कि इस काव्य के केवल द्वितीय उल्लास में ही एकमात्र बृहत्काय गद्य उपलब्ध होता है, अन्यत्र कहीं भी नहीं है। इस प्रकार यह चरित-प्रधान चम्पूकाव्य गद्य सहित कुल 62 पद्यों में रचित है।

* सौराष्ट्र, संस्कृत विभाग, कला संकाय, काशी हिन्दू विश्वविद्यालय, वाराणसी।



Genetic variability, heritability, genetic advance, correlation analysis in wheat (*Triticum aestivum* L.)

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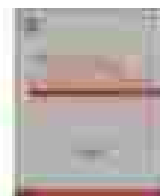
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Abstract

The genetic analysis was carried out twenty-two genotypes from wheat inbred normal and mutation to determine study of inheritance of yield and its contributing traits. The experiment was conducted as replicated Block Design (RBD) with three replications at Nubani Agriculture Farm S.M.M. Town P.G. College, Ballia, U.P. Data were recorded in respect of days to 50% germination, days to 50% flowering, tillers per plant, plant height, flag leaf area, peduncle length, spike length, days to maturity, number of grain per spike, biological yield, 100 seed weight, harvest index, and seed yield per plant for these analysis and comparison is determine the genetic variability, correlation coefficient, heritability and genetic advance analysis. All the 22 genotypes showed existence of variation for all the 13 characters under consideration. The analysis of variance showed highly significant differences between the genotypes for all the characters under study. Genotypes such as New CB, New CB-3, New CB-3 and New CB-45 possess highest seed yield. These genotypes can be used as donor parents in breeding programmes and can be beneficial for transferring the desired gene. The highest amount of genotypes and phenotypic coefficients of variation were observed for biological yield per plant, grain yield per plant, seed yield per plant, tillers per plant, peduncle length and number of grain per spike. The heritability in broad sense for various characters studied which ranged from 19.6 to 72.5, maximum for days to 50% germination, followed by days to maturity, biological yield, harvest index, days to 50% flowering, number of grain per spike, peduncle length, grain yield per plant and seed weight showed high heritability. Maximum genetic advancement was reported for seed and 100 seed weight, days to maturity, biological yield, and number of grain per spike. The grain yield per plant exhibited highly significant and positive correlation with tillers per plant, plant height, flag leaf area, and biological yield. The result revealed that these traits may serve as effective selection attributes during selection in breeding program for yield improvement.

Key words: wheat (*Triticum aestivum* L.), cross, yielding, heritability, genetic advance, correlation.

Introduction



Short communication

Cationic surfactant controlled synthesis of Ag_2ZrO_3 and $\text{Ag}/\text{Ag}_2\text{ZrO}_3$: An efficient visible light active photocatalystsRudra P. Singh^a, Swapnil K. Warkhade^b, Roshita S. Das^c, G.S. Galkwad^d, Subodh Prasad^b, Anil V. Warkhade^{a,*}^a Department of Chemistry, VIT-APAC, National Institute of Technology, Nagpur, India^b Research and Society, Anantpur, 155003 District Institute of Education and Skill Research Center, Samsat, Anantpur, India^c Department of Applied Chemistry, Pimpri Chinchwad Education Trust, College of Engineering, Pimpri, India^d Department of Chemistry, PCCOER, Pimpri Chinchwad Education Trust, Pimpri Chinchwad, India

ARTICLE INFO

Article history:

Received 14 May 2022

Received in revised form

10 June 2022

Accepted 14 July 2022

Available online

15 July 2022

ABSTRACT

Here we report the controlled route for the synthesis of new silver doped metal oxide photocatalyst ($\text{Ag}/\text{Ag}_2\text{ZrO}_3$) nanocomposite via a facile coprecipitation method for enhancing the visible light harvesting ability of silver doped Ag_2ZrO_3 . By employing the surface plasmon resonance (SPR) effect of Ag^+ loaded on Ag_2ZrO_3 and their photocatalytic efficiency has been investigated. The effect of the use of cationic cetyl trimethyl ammonium bromide on the formation of both $\text{Ag}/\text{Ag}_2\text{ZrO}_3$ nanocomposite and pure Ag_2ZrO_3 has been studied. Ag-modified $\text{Ag}/\text{Ag}_2\text{ZrO}_3$ and Ag_2ZrO_3 have been further confirmed by using SEM, EDS, XRD, and XPS analysis. The structural and morphological analysis of the $\text{Ag}/\text{Ag}_2\text{ZrO}_3$ nanocomposite confirmed the existence of the needle. Ag is a metal phase on the surface of the Ag_2ZrO_3 . The $\text{Ag}/\text{Ag}_2\text{ZrO}_3$ nanocomposite exhibits about 100% degradation of a green Methylene Blue dye in just 60 min ($1.9 \times 10^{-2} \text{ mol l}^{-1}$) in comparison to pure Ag_2ZrO_3 (44.68%). TGA is found to be the most suitable spectra responsible for the degradation of MB in case of $\text{Ag}/\text{Ag}_2\text{ZrO}_3$ photocatalyst, while TGA is not a suitable reaction spectra to the case of pure Ag_2ZrO_3 . This analysis just found to be chemically stable with retention of photocatalytic efficiency even up to the 10th photocatalytic cycle.

1. Introduction

Industrial and urban waste water in the form of effluent, especially highly-degradable organic compounds like dyes has always been a challenge in the last few years [1]. Many researchers have been making an effort to extract these organic waste, but conventional chemical methods do not meet the modern environmental norms and the definition of sustainable development [2]. Thus, to enter the sustainable development for human society, there is an urgent need to develop a safer, cleaner, and more efficient technique for remediation the wastewater of the industrial environment [3]. To solve these issues, nanotechnology have been widely used for the removal of these harmful dyes [4] especially semiconductor photocatalysts, which have emerged as a good option to tackle these environmental challenges as photocatalysis is a greener and sustainable approach in which organic compounds such as dyes are easily oxidized by using solar radiation [5–10]. To date, numerous inorganic oxide and various-based visible light and

UV light active photocatalysts have been reported by the reduced photocorrosion of the organic dyes [11–13]. Nevertheless, the utilization of inorganic and semiconductor catalysts has been restricted due to lower catalytic efficiency, poor utilization of visible light, and stability [12]. The literature reveals that there further way to overcome this by doping with noble metals or by the formation of heterojunction with semiconductor semiconductors, as doping helps in stabilization and transportation within the excitation of photo-generated charges [14].

Besides these techniques, designing and engineering of photo catalyst that has metal ions incorporated among metal oxides are particularly worth studying due to having functional potential i.e., sensitization and hindering the photo-generated charges [15]. Many pieces of literature reveal that the practical utilization of solar radiation and photocatalytic efficiency is even improved just by insertion of Ag^+ ions, as silver ions are more active and susceptible to increase owing to use the surface plasmon resonance energy. In practice, this technique is the

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THE ROLE OF OF LEADERSHIP STYLES IN THE DEVELOPMENT OF ORGANIZATIONAL PERFORMANCE

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Abstract:

The various ways of dealing with the subordinates at the workplace is called as leadership style. The art of getting employees together on a common platform and extracting the best out of them refers to effective organizational management. Leadership style plays an important role in strengthening the bond amongst the employees and making them work together as a single unit. It is the management's responsibility to ensure that employees are satisfied with their job responsibilities and eventually deliver their best best. The management must understand its employees well and strive hard to fulfil their expectations for a stress free ambience at the workplace. The supervisor must decide on the future course of action as per the existing culture and conditions in the workplace. The nature of employees and their mindsets also affect the management style of working. An organization and management are a unit. Managers are the leaders of an organization. They motivate and inspire as well as keep team accountable to get work done. Management is tasked with the responsibility of setting regular activities, developing specific action plans and ensuring that a team or department succeeds with their part of the company's success. This could be a production manager making sure the line gets the products out without a high percentage of breakage. It could be a sales manager defining sales goals and the activities that must happen to achieve them. Development addresses issues or works to improve existing things. It is the foundation of innovation at every level of an organization. Innovation goes well beyond some new scientific breakthrough. It includes finding a faster or more efficient way of doing something. If a leadership of a manager is able to develop his team and innovate a process to save time in every order, the manager could improve department efficiency tremendously which ultimately results into the development of organizational performance.

Key Words: Leadership Style, Organization, Performance, Successful Development.



SYNTHESIS OF [4-[4-oxo-2-phenyl-4H-quinazoline-3-yl]-phenoxy]-acetic acid-N-(substituted phenyl)-thiosemicarbazides AND THEIR BIOLOGICAL ACTIVITY

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Abstract: The reaction of [4-[4-oxo-2-phenyl-4H-quinazoline-3-yl]-phenoxy]-acetic acid hydrazide with various phenyl isothiocyanates in isopropyl alcohol gave [4-[4-oxo-2-phenyl-4H-quinazoline-3-yl]-phenoxy]-acetic acid-N-(substituted phenyl)-thiosemicarbazides. The structure of the newly synthesized compounds have confirmed by IR, ¹HNMR and Mass spectra. The compounds have also been screened for their biological activity.

Keywords: Thiosemicarbazide, IR, Spectral studies, Biological activity.

1. INTRODUCTION

The Chemistry of heterocyclic is an interesting branch in organic chemistry. Thiosemicarbazides derivatives are known to possess antibacterial¹⁻³, antifungal⁴⁻⁵ and herbicidal⁶ activities. Quinazoline derivatives are important compounds in chemistry and pharmacology which include anticancer⁷, anti-inflammatory⁸, anticonvulsant⁹ and antidiabetic¹⁰ activities. These biological data prompted us to synthesize some new quinazoline containing thiosemicarbazide derivatives.

2. EXPERIMENTAL

2.1 General Procedure

Melting points were taken in open capillaries and are uncorrected IR spectra (KBr in cm⁻¹) were recorded on Jasco 410 plus FTIR spectrophotometer. ¹HNMR spectra were recorded on a JEOL 300 MHz FT-NMR spectrophotometer using DMSO-d₆ as solvent and TMS as internal standard (chemical shift in ppm).

The mass spectra of compounds were determined with Schimadzu model no. GP 2010. The element analysis was carried out on a Perkin Elmer C,H,N analyser and sulphur analysis was obtained by oxygen flask method. The purity of the compounds was monitored by thin layer chromatography. TLC was carried out on pre-coated 0.2mm silica gel, F₂₅₄ plates.

2.2 General Preparation

1. (4-Acetyl amino-Phenoxy)-acetic acid ethyl ester-(2)

A solution of 4-(hydroxy phenyl)-acetamide (1) 14 gm 0.1 mole) 400 ml N,

N-dimethyl formamide was heated at 70-75°C with ethyl chloroacetate (12.47 ml, 0.10 M) in an oil bath in presence of anhydrous potassium carbonate (12.8 g 0.10 mole).

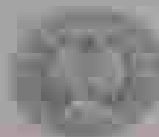
The reaction mixture was cooled and 1500 ml of cold water was added. The white coloured crystalline solid separated was filtered and washed thoroughly with cold water and then with cold ethanol and finally recrystallised from 90% ethanol, yield 72%, m.p. 102°C, IR (KBr)(cm⁻¹) 3345(NH), 1745 (C=O, ester), 1590, 1510, 1510, 1475 (C=C, aromatic).

2. (4-amino-phenoxy)-acetic acid ethyl ester-(3)

Compound-2, (22.7 g, 0.1 mol) was heated with 35 ml concentrated with hydrochloric acid and 100 ml water for about 2 hours. The clear solution obtained was filtered and neutralisation with 35 ml of sodium acetate solution. The compound as white crystalline solid separates on filtration. Yield 73%, m.p. 250°C, IR (KBr)(cm⁻¹) 3466(NH), 1650(C=C), 1550, 1510, 1445(C=C, aromatic).

3. (4-amino-phenoxy)-acetic acid ethyl ester-(4)

Compound-3: (10.58g, 0.05 mol) was suspended in 250 ml ethanol and cooled to 10°C. The reaction mixture was refluxed for about 2 hours and the product was extracted with 3×25ml of dichloromethane. The dichloromethane layer was washed with 3×20ml of water. The compound-4 obtained on distillation



Assessment of genetic variability, heritability, genetic advance and relationship of yield and its contributing traits in wheat genotypes (*Triticum aestivum* L.)

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Abstract

Analysis of variance (ANOVA) expresses significance for all characters except spike length and spike weight. The highest mean was observed for days to maturity (112.90) followed by plant height (72.20), days to 50% flowering (73.90) and number of grains per spike (44.70). The estimate of PCV were slightly higher than GCV for all traits. The highest genotypic and phenotypic coefficient of variation was recorded for biological yield per plant, grain yield per plant and number of tillers per plant. High heritability (h^2) coupled with high genetic advance for plant height, biological yield per plant, flag leaf area, grain yield per plant, number of grains per spike, days to 50% flowering and tillers per plant. The results revealed that these traits may serve as effective selection attributes during selection in the breeding program for yield improvement in wheat. Grain yield per plant was positive and showed a highly significant relation with days to 50% flowering, tillers per plant, flag leaf area, plant height, days to maturity, biological yield per plant, spike weight and test weight. It revealed that by increasing the value of these traits, grain yield can be drastically increased. Spike length per plant was also significant and can be considered in breeding programs. The highest positive direct effect on grain yield per plant was observed by biological yield per plant followed by harvest index, days to maturity and spike length, while remaining traits showed negative and direct effect on grain yield per plant. Hence, for the development of high yielding wheat varieties these traits possessing highly significant positive associations should be given more weightage in breeding or selection programs.

Key words: Wheat (*Triticum aestivum* L.), ANOVA, variability, h^2 and genetic advance.

Introduction



Genetic variability, heritability, genetic advance, correlation analysis in wheat (*Triticum aestivum* L.)

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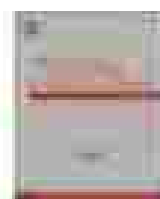
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Abstract

The genetic analysis was carried out twenty-two genotypes from wheat inbred normal and mutation to determine study of inheritance of yield and its contributing traits. The experiment was conducted as replicated Block Design (RBD) with three replications at Nubani Agriculture Farm S.M.M. Town P.G. College, Ballia, U.P. Data were recorded in respect of days to 50% germination, days to 50% flowering, tillers per plant, plant height, flag leaf area, peduncle length, spike length, days to maturity, number of grain per spike, biological yield, 100 seed weight, harvest index, and seed yield per plant for these analysis and comparison to determine the genetic variability, correlation coefficient, heritability and genetic advance analysis. All the 22 genotypes showed existence of variation for all the 13 characters under consideration. The analysis of variance showed highly significant differences between the genotypes for all the characters under study. Genotypes such as New CB, New CB-3, New CB-3 and New CB-45 possess highest seed yield. These genotypes can be used as donor parents in breeding programmes and can be beneficial for transferring the desired gene. The highest amount of genotypes and phenotypic coefficients of variation were observed for biological yield per plant, grain yield per plant, seed yield per plant, tillers per plant, peduncle length and number of grain per spike. The heritability in broad sense for various characters studied which ranged from 19.6 to 72.5, maximum for days to 50% germination, followed by days to maturity, biological yield, harvest index, days to 50% flowering, number of grain per spike, peduncle length, grain yield per plant and seed weight showed high heritability. Maximum genetic advancement was reported for seed and straw yield, days to maturity, biological yield, and number of grain per spike. The grain yield per plant exhibited highly significant and positive correlation with tillers per plant, plant height, flag leaf area, and biological yield. The result revealed that these traits may serve as effective selection attributes during selection in breeding program for yield improvement.

Key words: wheat (*Triticum aestivum* L.), cross, yielding, heritability, genetic advance, correlation.

Introduction



Short communication

Cationic surfactant controlled synthesis of Ag_2ZrO_3 and $\text{Ag}/\text{Ag}_2\text{ZrO}_3$: An efficient visible light active photocatalystsRudra P. Singh^a, Swapnil K. Warkhade^b, Roshita S. Das^c, G.S. Gokhale^d, Subodh Prasad^b, Anil V. Warkhade^{a,*}^a Department of Chemistry, VIT-APAC, National Institute of Technology, Nagpur, India^b Research and Society, Anantpur, 155003, District of Chitradurga and Post Research Center, Kuvempu, Karnataka, India^c Department of Applied Chemistry, Rajawade, L.T. College of Engineering, Nagpur, India^d Department of Chemistry, New India School of Technology, Kuvempu, Karnataka, India, 576 104, India

ARTICLE INFO

Article

June 2022 issue

Short communication

Received 24.4.2022

Revised

Accepted 10.6.2022

ABSTRACT

Here we report the controlled route for the synthesis of new silver doped metal oxide photocatalyst ($\text{Ag}/\text{Ag}_2\text{ZrO}_3$) nanocomposite via a facile coprecipitation method for enhancing the visible light harvesting ability of silver doped Ag_2ZrO_3 . By employing the surface plasmon resonance (SPR) effect of Ag^+ loaded on Ag_2ZrO_3 and their photocatalytic efficiency has been investigated. The effect of the use of cationic cetyl trimethyl ammonium bromide on the formation of both $\text{Ag}/\text{Ag}_2\text{ZrO}_3$ nanocomposite and pure Ag_2ZrO_3 has been studied. Ag-modified $\text{Ag}/\text{Ag}_2\text{ZrO}_3$ and Ag_2ZrO_3 have been further confirmed by using SEM, EDS, XRD, and XPS analysis. The structural and morphological analysis of the $\text{Ag}/\text{Ag}_2\text{ZrO}_3$ nanocomposite confirmed the existence of the needle Ag in a rod-like phase on the surface of the Ag_2ZrO_3 . The $\text{Ag}/\text{Ag}_2\text{ZrO}_3$ nanocomposite exhibits about 100% degradation of a dye Methylene Blue dye in just 60 min ($1.9 \times 10^{-2} \text{ mol l}^{-1}$) in comparison to pure Ag_2ZrO_3 (44.66%). TGA is found to be the most suitable spectra responsible for the degradation of MB in case of $\text{Ag}/\text{Ag}_2\text{ZrO}_3$ photocatalyst, while TGA is not a suitable reaction spectra to the case of pure Ag_2ZrO_3 . This analysis just found to be chemically stable with retention of photocatalytic efficiency even up to the 10th photocatalytic cycle.

1. Introduction

Industrial and urban waste water in the form of effluent, especially highly-degradable organic compounds like dyes has always been a challenge in the last few years [1]. Many researchers have been making an effort to extract these organic waste, but conventional chemical methods do not meet the modern environmental norms and the definition of sustainable development [2]. Thus, to enter the sustainable development for human society, there is an urgent need to develop a safer, cleaner, and more efficient technique for remediation the wastewater of the industrial environment [3]. To solve these issues, nanotechnology have been widely used for the removal of these harmful dyes [4] especially semiconductor photocatalysts, which have always been a good option to tackle these environmental challenges as photocatalysis is a greener and sustainable approach in which organic compounds such as dyes are easily oxidized by using solar radiation [5–10]. To date, numerous inorganic oxide and various-based visible light and

UV light active photocatalysts have been reported by the reduced photocorrosion of the organic dyes [11–13]. Nevertheless, the utilization of inorganic and semiconductor catalyst has been restricted due to lower catalytic efficiency, poor utilization of visible light, and stability [12]. The literature reveals that there further way to overcome this by doping with noble metals or by the formation of heterojunction with semiconductor semiconductors, as doping helps in stabilization and transportation within the excitation of photo-generated charges [14].

Besides these techniques, designing and engineering of photo catalyst that has metal ions incorporated among metal oxides are particularly worth studying due to having functional potential i.e., sensitization and hindering the photo-generated charges [15]. Many pieces of literature reveal that the practical utilization of solar radiation and photocatalytic efficiency is even improved just by insertion of Ag^+ ions, as silver ions are more active and susceptible to increase owing to use the surface plasmon resonance energy. In practice, this technique is the

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Appraisal of Availability of Health Care Facilities (HCFs) in Sambhadra District: A Study in Health Geography

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India is the second largest producer of cement in the world after China. In recent years cement sector has been an important component of population composition, which affects the process of development. The growing concern about human as resource, especially in order to maintain the level of development, human health became an emerging issue for policy makers. Substantial decrease in morbidity and mortality is more likely to be accomplished through an improved system for health including preventive services than merely from further advances in medical sciences. The present paper is an attempt by authors to highlight the availability of health care facilities in the district and block wise disparities in level of healthcare facilities in the study region. A retrospective cross-sectional study was conducted based on the secondary data pertaining to the health care facilities, observed from District Statistical Handbooks (DSH), Sambhadra during the observed period of year 2015-16. The district population ratio for study area ranges between 1.23 (lowest) in Daudh block to 4.00 (highest) in Bahadur block followed by 4.74 (second highest) in Robertsganj Block. Availability of beds as an important indicator of health facilities in the survey population. In the study, there were 171 hospital beds for 1148217 population. The bed population ratio in the terms of per lakh population for Sambhadra district ranges between 5.03 (lowest) in Daudh to 58.04 (highest) in Ayazpur block followed by 45.11 (second highest) in Robertsganj block. In the area under study distributional pattern of doctors and hospital beds are closely related to the levels of urbanization. Robertsganj is the only one Block which shows the sufficiency of both number of doctors and beds under the study. There is urgent need to strongly emphasize the process of strengthening the infrastructural facilities at community health centers and primary health centers level to utilize their full potential.

Keywords: Availability, development, health, observed and preventive.

Introduction

Health is an important component of population composition, which affects the process of development. The growing concern about human as resource, especially in order to maintain the level of development, human health became an emerging issue for policy makers (Singh, Giri & Mishra, 2012). Health problems in a developing country such as India are predominantly reflections of poverty. Substantial decrease in morbidity and mortality is more likely to be accomplished through an improved system for health including preventive services than merely from further advances in medical sciences. R.W. Acemoglu (1972), defines health as a state of adjustment between man and his environment at some point of time in life sequence. Bhore Committee known as the Health Survey and Development Committee appointed by the Government of India under the chairmanship of Sir Joseph Bhore (1943) states: "The term health implies more than an absence of sickness in the individual, indicates the harmonious functions of the body and mind in relation to his physical and social environment, so as to enable him to enjoy life to the

fullest possible extent." The World Health Organization (WHO, 1948) comprehensively defines "health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" and also include the ability to lead a "socially and economically productive life". The role of a good health care system is very much important for preventing disease. In a society where rich and poor people, affluent localities and slums, developed and backward regions with and without resources exist under and governed by a single political authority, inequality in provision of medical care is bound to exist (Akhtar, 1988). Health care is an expression of concern for fellow human beings. It is defined as a "readiness of services rendered to individuals, families or communities by the group of health services or professions, for the purpose of promoting, maintaining, modifying or restoring health". Indeed, such improvements are likely to result from overall social and economic development, from structural change in the society. "Therefore, the necessity of sufficient availability of health services such as hospitals, health centers, etc.



Wheat Supply Chain in Uttar Pradesh: A Case Study of Sultanpur District

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Abstract: The present study is based on data collected from 100 farmers of different operational size across the village of Sultanpur district of Uttar Pradesh in the year 2019-20. The main objectives of the study were to identify the different supply chain for disposal of wheat in market and to examine price spread under these chain. The major supply chain followed were (i) Producer-Village trader-Cummins; (ii) Producer-Village trader-Wholesaler-Retailer-Cummins and (iii) Producer-Wholesaler-Retailer-Cummins. It was observed that price spread was minimum under Chain-1 (Rs.27.72) and maximum the value was maximum under Chain-2 (Rs.29.80). The Chain was found to be the most efficient as the percentage of marketing efficiency was. Sultanpur district was characterized by low productivity of wheat (2.3 tonnes/ha) which was found to be much lower than average productivity of Punjab (4.28 tonnes/ha) and Haryana (3.09 tonnes/ha) (2019-20) season. The respondents mentioned the farmers in production and marketing of wheat faced several technical, marketing, financial and managerial problems in order of their importance, respectively. A concerted effort to address all these issues will be helpful in increasing the production and increasing the role this region in achieving food security for the nation.

Keywords: Marketing cost, Marketing Margin, Marketing Channel, Marketing Cost, Marketing Margin, Price Spread, Marketing Efficiency, Sultanpur District.

1. INTRODUCTION

Wheat is the second most important crop of the country after rice supplying the bulk of calorie requirement of the people. The total consumption of wheat is largely satisfied by changes in its price and the price of its substitutes: kharif grains, oilseeds, pulses, etc. and changing food habits have resulted in increased demand for wheat. Punjab (2019) having followed two changes in the dietary habit of people of India: (i) reduced per capita consumption of rice; (ii) increased consumption per capita of wheat and other food grains; (iii) rise in high protein and energy dense diets; (iv) increased consumption of processed food products and (v) the rising popularity of convenient food and beverages. The diet is increasingly associated with disease without any change, while the lack of low moisture requirement of diet in hot and humid conditions (iii, 2019; iii, 2020).

In spite of the extensive progress in production and productivity, meeting the demand of increasing population is a challenging task. The existing marketing infrastructure created by the country is inadequate for marketing of food grains. Major problems facing the agricultural sector in India include lack of post-harvest infrastructure, low value addition and poor quality of packaging and marketing, lesser institutional system of marketing. Farmers have to pay a high level of marketing cost as account of a large number of intermediaries and a considerable time loss in the supply.

The area of wheat has increased from 27.23 million ha in 2017-18 million ha, production from 77.56 million to 78.98 million tons and production from 40779 million tons to 41241 million tonnes between the period between 2000-2001 and 2020-21 (Table 1). During 2019-20 the wheat production in the country is estimated to achieve a peak level of production i.e. 72 million tonnes. Uttar Pradesh contributes to the maximum area under wheat which is 26.17 million ha. But the state is also a home to several post-harvest problems, low productivity and number of intermediaries. The Sultanpur district of Uttar Pradesh covered an area of wheat 10775 ha in 2019-20 and production 19.98 million ton and wheat production 0.23% of India was (2020, 21).

The present study was conducted to identify the different supply chain for disposal of wheat in market and to examine price spread under these chains. This study also examined the nature of the productivity of wheat.

II. OBJECTIVES

The study was based on data collected from 100 households in different regions of cultivation and marketing of wheat. Multistage stratified sampling procedure was used for selection of respondents of different categories namely, targeted 150, small (25), medium (50), and large (75) of Sultanpur district. There are different channels of disposal, pattern was also identified from the farmers. A total of 70 market intermediaries were also approached to obtain information regarding marketing cost of wheat. The price was taken by working out gross margin and the value received by the farmer in the terminal year 2019-20 was used for computing marketing efficiency, margin and spread (2019).

$$MUE = \frac{MC}{MS - MC}$$

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1000

RESEARCH ARTICLE

MARKETABLE, MARKETING AND MARKETING COST OF RICE AND WHEAT IN BALLIA DISTRICT OF UTTAR PRADESH, INDIA

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ARTICLE INFO

Article History:

Received 08/08/2023

Received in revised form

08/08/2023

Accepted 08/08/2023

Published online 08/08/2023

Key words:

Agriculture marketing, economy, marketing and marketing cost

ABSTRACT

Rice and wheat is the most important food-grain crop in our country and it is the staple food of millions of Indians people particularly in the southern and north-western parts of the country. Present study was aimed to investigate the marketable surplus of rice and wheat in Ballia district of Uttar Pradesh. For this purpose, 120 farmers were selected from six selected villages namely Karam, Bhadwa, Jhama, Barman, Lathwari and Chhabra for the study purpose. An average marketing margin was observed to be 115.54 percent. Total cost of paddy and wheat consumption was observed to be 54.05 and 15.91 quintals respectively.

An overall marketable surplus was 82.34 quintals, marketed surplus was raised with respect to family consumption. The highest marketing cost per quintal was observed in small farms present in paddy crop whereas highest marketing cost per quintal was found in medium farms present in wheat crop respectively.

Keywords: Kaushal Kumar, Ram Tiwari, Hriday Kumar, Jayalaxmi Pawar, Munendra pal and Sandeep Verma, 2023, "Marketing and Marketing Cost of Rice and Wheat in Ballia District of Uttar Pradesh, India", Asian Journal of Science and Technology, 11, 09, 117-120.

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INTRODUCTION

Rice and wheat is the most important food-grain crop in our country and it is the staple food of millions of Indians people particularly in the southern and north-western parts of the country. From Green Revolution period (1965 - 1980) to till now at present year (2020-21) the country is committed to achieve an all-time higher food grains production of 303.34 million tonnes (2020-21) where as the wheat grain production is 109.24 million tonnes and Rice production is 120.32 million tonnes respectively. The fourth consecutive year of record production, buoyed by good grains, (The Ministry of Agriculture and Farmers' welfare) in the food grain production, India is again second rank after China, and about 96 million metric tonnes producing of wheat, wheat is second most important cultivated food crop after rice and feeds hundreds of millions of Indian on a daily basis. It is an especially important staple food in the northern and northern states of the country.

During cropping pattern year 2017-18 total food-grains production of our country was 277.49 million tonnes in India, Uttar Pradesh is the highest total food grain producing state followed by Punjab and Haryana it contributes 42472 thousand tonnes production during 2014-2015. In Uttar Pradesh state, agriculture is the important sector of economy as compared to service as well as industrial sector. This is the main occupation of the peoples and it's about 181.86 million hectares of agriculture land from which 155.22 million hectares area is used for agriculture (2014-15) According to census 2011, Ballia district also keep a better place of food grain production and an important wheat producing district of Uttar Pradesh has produced 64645 million tonnes of food grain; the area under wheat in the district during year 2011-12 was reported as 11,63.90 hectares (19%) with the production of 441134 metric tonnes while (Pratibha Bhatnagar of Ballia District 2017) productivity was 37.50 quintals per hectare. Ballia district is one of the important divisions of marketing system in the development of food grain surplus.

Marketable surplus plays a vital role in contributing capital formation as well as meeting the requirements for even



Biomass Productivity, Crop Yield and Socio-Economic Status of Madhoganj Block Watershed of the District Hardoi as Influenced under Various Soil and Water Conservation Measures

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Abstract

A field study was conducted on biomass productivity and crop yield changes in relation to soil and water conservation practices in selected watershed of district Hardoi (U.P.) India. The results achieved after three years of study shows that soil and water conservation measures have influences crop yield and biomass productivity compared to initial year values in the study area. It is obvious from the data of pre and post-project period of various resource from bench mark survey obtain that the average socio-economic status of rural population has been improved due to soil and water conservation practices adopted in selected area. The stakeholders in the study area are marching towards self-dependence in their needs by the introduction of scientific cropping and timely managing their input resource by creating the awareness among them. It was observed that growing cover crops like cowpea in Kharif followed by gram in Rabi in combination with fodder crops found to be effective for increasing crop yield as well as biomass productivity under scarce moisture condition.

Keywords: Biomass, yield, soil conservation measures, socio-economic status.

Introduction

Conservation agriculture systems require higher levels of biomass production within the rotation to develop and maintain an adequate mulch cover, to increase soil organic matter level, to enhance soil biodiversity and their functions, to raise moisture and nutrient holding capacity, to enhance nutrient supplies, to enrich the soil with nitrogen in the case of legumes and to protect the soil surface. Agricultural practices that enhance soil organic matter are built into conservation agriculture principle and include one or more of the practices, including, minimal or no-till,



Potassium fixation capacity of soil in surface and sub-surface alkaline soils of Ballia district

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Abstract

Potassium fixation capacity of soil with their physico-chemical, physical and chemical nature of surface and sub-surface soils of Ballia district was analysed from different village's soil samples. Potassium fixation capacity of surface soil was ranges from 40.4 – 136.3 % and sub-surface soil ranged from 56.2 – 116.2 % of targeted distinguished village soils with their nature as soil pH of surface soil ranged from 7.55 – 8.03 and sub-surface soil 7.21 – 8.35 and where EC was in considerable range in both depth. Organic carbon content varied from 0.37 – 1.20 % in surface soil and 0.18 – 0.60 % in sub-surface soil. Available N, P and K content in surface soil from 221.2 – 347.6 kg ha⁻¹, 9.74 – 14.85 kg ha⁻¹, 201.6 – 436.8 kg ha⁻¹ and sub-surface soil ranged from 158.0 – 293.6 kg ha⁻¹, 8.74 – 12.81 kg ha⁻¹, 245.4 – 414.4 kg ha⁻¹, the textural class of those soils varied from loamy sand to clay loam respectively.

Keywords - Potassium fixation, soil organic carbon, NPK content and soil texture

Introduction

Potassium (K) is known as quality elements and uptake by plants for healthy growth, but Indian agriculture has traditionally relied on the native soil resources of potassium. It's constitutes an average of 1.9% of the earth crust (Toabite et al. 1995). It is an essential macro nutrient element required for growth and development of plants, animals and human beings also. Soil K is known to exist in different forms viz. water soluble, exchangeable, non-exchangeable forms of potassium are prime important as for their availability is concern to plants. There is dynamic equilibrium among different forms of soil potassium and any depletion in a given forms would shift the equilibrium in



Autoregressive time series modeling for prediction of rainfall, runoff and silt load in Jharkhand state of central India

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Abstract

India is characterized by marked difference in climate and catchment properties across the country. The study was autoregressive time series model, for prediction of annual rainfall, runoff and silt load in karkara nala watershed, Barakar catchment Jharkhand. The area of the watershed is 1751 ha and the data of 9 years from 1993 to 2001 were used to develop the model. The goodness of fit and adequacy of models were tested by Box-Pierce Portmanien test, Akaike Information Criterion and by comparison of measured and predicted data correlogram. The graphical representation between measured and predicted correlogram. Where in the cases of rainfall, runoff and silt load there is a very close agreement between them. The lower values of error indicate the adoptability of the model for forecasting of rainfall, runoff and silt load. The comparison of different developed models, statistical characteristics and graphical representations. Autoregressive model AR (1) is proposed for generation of silt load and AR (2) is proposed for generation of rainfall and runoff in karkara nala watershed Jharkhand. Clearly shows that the developed model can be use efficiently for the prediction of rainfall, runoff and silt load for the Damodar catchment which is benefit for the farmers and research workers for water harvesting, ground water recharge, flood control and development of their water management strategies.

Keywords: Autoregressive, Time series, Barakar Catchment, Rainfall, Runoff, silt load

Introduction

ARTICLES

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शिक्षण संशोधन

Shikshan Sanshodhan

Journal of Arts, Humanities and Social Sciences

ISSN : 2581 - 6241

Bi-Monthly, Peer-Reviewed, Referred, Indexed Research Journal



अंतर्राष्ट्रीय सम्मेलन : साहित्य, समाज और वैश्विक मीडिया

Date : 26 & 27 सितंबर, 2020

संयुक्त तत्वावधान में आयोजित : आगरा कॉलेज, आगरा, उत्तरप्रदेश (भारत)

सबरगामूवा यूनिवर्सिटी ऑफ श्रीलंका (श्रीलंका) एवं 'अंतर्राष्ट्रीय स्तर वैज्ञानिक अनुसंधान संगठन'

IMPACT FACTOR : 3.589

Certificate of Publication

is awarded to

PAPER ID : ICLSGM-H-09

Dr. Ramesh Kumar Rai



For the research paper / article titled

भोजपुरी लोक गीत : समृद्धी से संघर्ष की ओर

Published in 'Shikshan Sanshodhan' : Journal of Arts, Humanities and Social Sciences, Special Issue - 02, Sept - 2020.



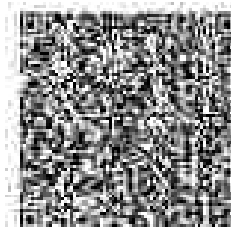
C. Patel

The Managing Editor

Research Culture Society and Publication

<http://shikshansanshodhan.researchculturesociety.org/>

Email: shikshansanshodhan@gmail.com





शिक्षण संशोधन

Shikshan Sanshodhan

Journal of Arts, Humanities and Social Sciences

ISSN : 2581 - 6241

Bi-Monthly, Peer-Reviewed, Referred, Indexed Research Journal



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IMPACT FACTOR : 3.589

Certificate of Publication

is awarded to

PAPER ID : ICLSGM-H-09

Dr. Ramesh Kumar Rai



For the research paper / article titled

भोजपुरी लोक गीत : समृद्धि से संघर्ष की ओर

Published in 'Shikshan Sanshodhan' : Journal of Arts, Humanities and Social Sciences, Special Issue - 02, Sept - 2020.



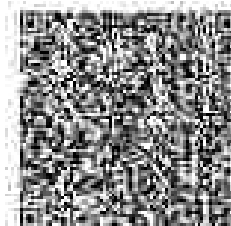
C. Patel

The Managing Editor

Research Culture Society and Publication

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Email: shikshansanshodhan@gmail.com





Synthesis and biological activities of 3,6-disubstituted-1,2,4-triazolo(3,4-b)-1,3,4-thiadiazoles

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Received: 04 July 2021; accepted (revised): 18 November 2022

4-Amino-3-aryl/heteroaryl substituted 5-mercapto-1,2,4-triazoles, have been prepared from the corresponding aromatic carboxylic acid through a multi-step sequence. These triazoles have been made to react with various aromatic acids to yield 3,6-disubstituted-1,2,4-triazolo(3,4-b)-1,3,4-thiadiazoles. Elemental analysis, IR, ¹H NMR and mass spectral data has elucidated the structures of all newly synthesized compounds. These compounds have shown significant pharmacological activities and are found to be highly active against various fungi and bacteria.

Keywords: Triazoles, Triazolo thiadiazoles, Pharmacological activities

Extensive work has been done on 1,2,4-triazoles and 1,3,4-thiadiazoles which represent one of the most biologically active compound possessing a wide spectrum of activities¹⁻⁴ and their pharmacological application as diuretic^{5,6}, hypoglycemic^{7,8}, antiviral⁹, carcinostatic¹⁰, antitubercular¹¹, antibacterial¹², anti-inflammatory¹³ and antifungal¹⁴. A triazole/thiadiazole system may be viewed as a cyclic analog of two very important components thiosemicarbazide¹⁵ and biguanide¹⁶ which often display diverse biological activities. A part of our research work is aimed at developing new biologically active nitrogen and sulphur containing heterocycles. We report the synthesis of some new 3,6-disubstituted-1,2,4-triazolo [3,4-b]-1,3,4-thiadiazole (Scheme-1b) and 4-amino-3-aryl/heteroaryl substituted 5-mercapto-1,2,4-triazole (1a-c) were prepared using method¹⁷ (Scheme-1a). A series of triazolo thiadiazoles (4-8) were obtained by condensation of triazoles with aromatic acid in presence of phosphorus oxychloride. The structure of the compounds were supported by their analytical and other spectral data.

Experimental Details

TLC was used to assess the completion of the reaction and purity of the compounds synthesized. Melting points were taken in open glass capillary tubes using Thiele's tube containing liquid paraffin. IR spectra in KBr were recorded on a Perkin Elmer 337 grating spectrophotometer and ¹H NMR were

recorded by Bruker spectrophotometer (400 MHz) in DMSO-d₆/CDCl₃, using TMS as an internal standard. Mass spectra were recorded in Finnigan Mat 8230 mass spectrophotometers and elemental analysis were recorded on Thermo Aulis Flash A 1112 CHNS analyser. The purity of compounds were checked on silica gel-G coated plates by using ethyl acetate and petroleum ether (1:1) as the eluent and observed in UV light.

Preparation of Arylhydrazide (1)

The methyl/ethyl ester of substituted aromatic acid (0.1 mol) and hydrazine (0.1 mol) were heated and the solution was refluxed for 35 min. 25 mL of ethanol was added to the refluxing mixture as a solvent in order to homogenize the solution. The resulting mixture was further allowed to reflux for 6.5 h. Excess ethanol was distilled out and the contents were allowed to cool. The crystal formed was filtered, washed thoroughly with water and dried.

General procedure for the preparing 2-aryl-substituted-5-mercapto-1,3,4-triazadiazole (2)

To compound 1 (0.1 mol) in 40 mL ethanol, KOH (0.1 mol), absolute ethanol (60 mL) and CS₂ (0.2 mol) were added and refluxed for about 6 h till evolution of hydrogen sulphide was ceased. The reaction mixture was cooled at room temperature and diluted with water. On acidification with dilute hydrochloric acid the required triadiazoles were precipitated. The



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Sybedas Prasad^{a,*}, Avaneesh Kumar Pandey^a, Sitansu Kumar^a, Akhilesh Prasad^a & Chintan Guptha^b

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To link to this article: <https://doi.org/10.1080/17415993.2022.2157680>



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SHG and Economic Development

AJIT SINGH

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The role of women in agriculture production and natural resource management in a developing country is critical to the economies of that country. In the past, the focus has often been on women's reproductive, health care and nurturing roles. These roles are concurrent with their role as agricultural producers in most of the developing countries. These are specific farming responsibilities assigned to female members of the household of society.

In developing countries like India, 81% of the rural women depends upon agriculture either as cultivators, of labourers and participating in several activities, such as sowing, transplanting, weeding, fertiliser application, plant protection, threshing, harvesting, winnowing, processing, storing, selling looking after animals and kitchen gardening etc.

It is acknowledged that the woman is the first agriculturist in the world, when men were basically hunters. It were the women who collected the grains, fruits and cooked food for the men and looked after the domestic animal like cattle, sheep, goats, poultry etc. Throughout the history of mankind till today, women directly or indirectly influenced the issues of agriculture and animal husbandry.

Women and girls are half the world's population, do two third of the world's work hours, secure one tenth of the world's income, and own less than a hundredth of the world's property. Two out of three of the world's illiterates are women, faced with high costs of schooling and linked job opportunity. For the education, many parents tend to invest only on boys. Despite the strong presence of women in all works of life, no program to support their skill, up-gradation in primary, secondary and tertiary sectors of economic activities has been undertaken in a big way exclusively for women except one or two components within a major scheme. The govt. of India launched a central sector scheme of "Women in Agriculture" in 1993-94 to motivate and mobilized women farmers through group approach. These groups would form an effective

Effect of nutrients on seed and oil yield of mustard (*Brassica juncea* L.)

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Introduction

Indian agriculture needs to be more knowledge intensive in order to keep pace with the growing population pressure and diminishing land and energy resources. The oil seed group crops play a significant role in Indian's agrarian economy contributing 22.1 million tonnes reaped from an area of 25.4 million hectares. Oil seeds hold a sizeable share of the country's gross cropped area (13%) and contribute about 5% of its Gross National Productivity (GNP) and 10 % of the value of all agricultural products. The major constraint limiting the productivity of oilseeds is that they are predominantly raised under energy starved conditions. Since the growth and productivity of any crop species are governed to a great extent by its surrounding environments, hence, type and concentration of fertilizers in growth media exert a considerable influence on the growth and mineral composition of the crop plants (Kirkby and Mengel, 1967; Kurvits and Kirkby, 1980; Gashaw and Mugwira, 1981; Ansari, 1990; Jeschke *et al.*, 1992; Parvaiz, 1983; Khan *et al.*, 1990 and Joshi *et al.*, 1991). In recent years, attempts have been made by developing new high yield varieties particularly of mustard, which occupy a prominent position among oilseeds. A preliminary field trial by Lone (2000) with four high yielding varieties of this crop indicated superiority of Pusa Bold under the conditions prevailing at Katihar. The present work deals with the phosphorous and potassium requirements of variety Pusa Bold.

Materials and methods

The experiment was conducted at Farmers field of Katihar district by Krishi Vigyan Kendra, Katihar, (Bihar Agricultural University Sabour, Bhagalpur) during two consecutive years of 2013-14 and 2014-15 to study the effect of nutrients on seed and oil yield of mustard. It lies between Latitude 25°N to 26°N, Longitude 87° to 88°E with an altitude of 20 m above MSL. The climate is sub-tropical and humid having mean maximum and minimum temperature between 44°C and 4°C, respectively and the average annual rainfall of the district is about 1298 mm.

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The experimental soils are non-calcareous light gray flood plain belongs to the Alluvial Tract (Agro ecological zone-II) lies between three major rivers Mahananda, Koai and Ganga. The soil of the experimental plot was sandy loam in texture, having pH around 6.9. The soil samples were collected from different farmer field before start the experiment and after final



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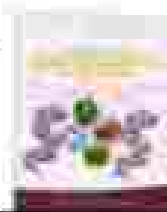
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Original Research Article

<https://doi.org/10.24045/ijcmas.2019.051443>

Effect of Nutrients Application Method on Productivity and Economics of Maize

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²Department of Agriculture Economics, SMSTD College, Ballia

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The concept of balanced fertilization with proper method at proper time gives the way for optimum profitability of farmers. Since most of the soils in Koshi region of Bihar are sandy clay in their textural class with medium to low in N, P, K and Zn. Due to this farmers of Koshi region applying nutrients unscientifically. Therefore, they unable to get best harvest and to augment the profitability from this crop and hence an experiment was conducted in farmer fields of Kanhar district by Krishi Vigyan Kendra, Kanhar, (Bihar Agricultural University Sabour, Bhagalpur) during two consecutive years of 2015-16 and 2016-17 to study the effect of nutrients application method on productivity and economics of maize. The experiment was laid out in alluvial soil with three treatments and ten replications in RBD. The details of treatments was: T₀- Farmer Practices (60:0:0: N:P:K, basal + 50:40:20 N:P:K at 30 DAS+ 30 kg N at 60 DAS), T₁- RDF (60:60:40: N:P:K, basal + 45 kg N at 30 DAS+45 kg N at 60 DAS), T₂- RDF (60:60:40:25: N:P:K, Zn basal + 45 kg N at 30 DAS + 45 kg N at 60 DAS). Healthy and bold seeds of maize var. Pioneer 332 were dibbled into the soil @ 1 seed hill⁻¹ at a spacing of 60 cm X 20 cm. The growth and yield attributes of maize i.e., plant height, plant diameter, leaf length, leaf width, cob length, no. of cob per plant, no. of grains per cob, kernel and stover yield were significantly influenced by different method of nutrient application. There was a progressive increase in the growth and yield attributes with each application methods of nutrients applied from T₀ to T₂ and further increase in growth attributes were noticed when the graded levels fertility were supplemented with Zn as soil application T₂. There was a gradual and progressive increase in growth and yield attributes with basal application of P, K and zinc in comparison to T₀, where P, K applied at 30 days after sowing.

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 Accepted:
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Available Online:
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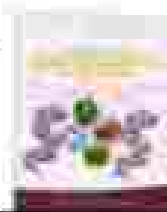
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Climate Change In India (With Special Reference of Green House Effect)

* Dadan Singh

Climate change is one of the main environmental challenges facing the world today. India is facing several problems. Climate change is associated with various adverse impacts on agriculture, water resources, forest and biodiversity, health, coastal management and increase in temperature. Decline in agricultural productivity is the main impact of climate change on India. A majority of population depends on agriculture directly or indirectly. Climate change would represent additional stress on the ecological and socioeconomic systems that are already facing tremendous pressure due to rapid industrialization, urbanization and economic development. This paper analyzes the impact of climate change and its various aspects in the Indian context.

Introduction:

Accumulation of trace gases such as carbon dioxide (CO₂) and methane (CH₄) in the atmosphere, caused mainly due to anthropogenic activities such as burning of fossil fuels, is believed to be altering the earth's climate system. The Intergovernmental Panel on Climate Change (IPCC) in its fourth assessment report observed that "warming of climate system is now

unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global sea level" (Solomon et al., 2007). India has a reason to be concerned about climate change, as a vast population depends on climate-sensitive sectors like agriculture, forestry and fishery for their livelihood.

India is a large developing country with nearly 700 million rural population directly depending on climate-sensitive sectors and natural resources such as water, biodiversity, mangroves, coastal zones, and grasslands for their subsistence and livelihood. Further, the adaptive capacity of dry land farmers, forest-dwellers and nomadic shepherds is very low. Despite being symbolically important, Kyoto Protocol is now widely considered as a "failure" because it neither has initiated emission reduction globally nor it has promised required further cuts in greenhouse gas emissions. Scientists have long warned that even 100% adherence to Kyoto Protocol will do little to limit the change in climate, yet almost 15 long years are spent globally in creating this policy failure. Almost exclusive focus on mitigation in Kyoto

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Climate Change In India (With Special Reference of Green House Effect)

* Dadan Singh

Climate change is one of the main environmental challenges facing the world today. India is facing several problems. Climate change is associated with various adverse impacts on agriculture, water resources, forest and biodiversity, health, coastal management and increase in temperature. Decline in agricultural productivity is the main impact of climate change on India. A majority of population depends on agriculture directly or indirectly. Climate change would represent additional stress on the ecological and socioeconomic systems that are already facing tremendous pressure due to rapid industrialization, urbanization and economic development. This paper analyzes the impact of climate change and its various aspects in the Indian context.

Introduction:

Accumulation of trace gases such as carbon dioxide (CO_2) and methane (CH_4) in the atmosphere, caused mainly due to anthropogenic activities such as burning of fossil fuels, is believed to be altering the earth's climate system. The Intergovernmental Panel on Climate Change (IPCC) in its fourth assessment report observed that "warming of climate system is now

unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global sea level" (Solomon et al., 2007). India has a reason to be concerned about climate change, as a vast population depends on climate-sensitive sectors like agriculture, forestry and fishery for their livelihood.

India is a large developing country with nearly 700 million rural population directly depending on climate-sensitive sectors and natural resources such as water, biodiversity, mangroves, coastal zones, and grasslands for their subsistence and livelihood. Further, the adaptive capacity of dry land farmers, forest-dwellers and nomadic shepherds is very low. Despite being symbolically important, Kyoto Protocol is now widely considered as a "failure" because it neither has initiated emission reduction globally nor it has promised required further cuts in greenhouse gas emissions. Scientists have long warned that even 100% adherence to Kyoto Protocol will do little to limit the change in climate, yet almost 15 long years are spent globally in creating this policy failure. Almost exclusive focus on mitigation in Kyoto

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Essay

Domesticating the Undomesticated for Global Food and Nutritional Security: Four Steps

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Received: 8 July 2019; Accepted: 27 August 2019; Published: 28 August 2019



Abstract: Ensuring the food and nutritional demand of the ever-growing human population is a major sustainability challenge for humanity in this Anthropocene. The cultivation of climate resilient, adaptive and underutilized wild crops along with modern crop varieties is proposed as an innovative strategy for managing future agricultural production under the changing environmental conditions. Such underutilized and neglected wild crops have been recently projected by the Food and Agricultural Organization of the United Nations as ‘future smart crops’ as they are not only hardy and resilient to changing climatic conditions, but also rich in nutrients. They need only minimal care and input, and therefore, they can be easily grown in degraded and nutrient-poor soil areas. Moreover, they can be used for improving the adaptive traits of modern crops. The contribution of such neglected, and underutilized crops and their wild relatives to global food production is estimated to be around 115–120 billion US\$ per annum. Therefore, the exploitation of such lesser utilized and yet to be used wild crops is highly significant for climate resilient agriculture and thereby providing a good quality of life to one and all. Here we provide four steps, namely: (i) exploring the unexplored, (ii) refining the unrefined traits, (iii) cultivating the uncultivated, and (iv) popularizing the unpopular for the sustainable utilization of such wild crops as a resilient strategy for ensuring food and nutritional security and also urge the timely adoption of suitable frameworks for the large-scale exploitation of such wild species for achieving the UN Sustainable Development Goals.

Keywords: anthropocene; climate resilient; food and nutritional security; resource conservation; underutilized crops; Sustainable Development Goals

1. Producing More with Less Resources: The Need of the Hour

The sustainable utilization of our limited natural resources for maximizing the food production [1] within the planetary boundaries [2] is a serious challenge for attaining the United Nations Sustainable Development Goals (UNSDGs), especially the first, second and third goals namely (i) no poverty, (ii) zero hunger and (iii) good health and wellbeing. Since the indiscriminate usage of a critical resource governing agricultural production, i.e., N, has already crossed planetary boundaries [2], there is a growing concern regarding the cultivation of high-input demanding modern crop varieties under resource-poor conditions. Moreover, the quality and availability of two other inputs vital for agricultural production, i.e., water and land, are already in a flinching state [3,4]. The changing climatic condition is another impediment for food production as it negatively affects the quality and availability of the critical resources as well as the quality and quantity of the agricultural production itself [5]. Since we have to enhance the food production by 70% for meeting the demand of the growing population in 2050, the cultivation of resilient, nutritionally rich, and low-resource intensive crops are of paramount importance for human wellbeing and environmental sustainability [6]. In this context, [7,8] the domestication of undomesticated, wild and neglected crops and exploiting their natural traits to

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Book Review

Fostering Nature-based Solutions for Ecosystem Restoration and Attaining United Nations Sustainable Development Goals.

1. Rationale behind nature-based solutions (NbS)

Rampant loss of biodiversity followed by land degradation, un-planned urban expansion and climate change are the mega drivers of loss of ecosystem services in Anthropocene (Lorant *et al.*, 2020). There has been rapid increase in disasters and extreme events globally in the last few decades, that has large impact on the social, ecological and economical aspects (Uthman *et al.*, 2019; Sun *et al.*, 2020). The rapid expansion of urban sprawls, land degradation, depletion of natural resources, encroachment of natural ecosystems by invasive species, enhanced human migrations, unsafe disposal of waste, pollution risks, water availability, energy and food security are other crossing risks of the planet (Uthman *et al.*, 2020). Climate variability and enhancing anthropogenic pressure are having drastic impacts on human livelihood resulting in enhanced social economic vulnerability, degradation of natural ecosystems and resources. The unfavourable future scenario stain 'food wastage' and 'agrobiodiversity losses' as an unaffordable practice that will jeopardise the needed bio resource, energy, fibre, capital, enriched greenhouses gases, and make the living conditions for the forthcoming generations (Huang *et al.*, 2020; Dubey *et al.*, 2020; RACH, 2020). To reduce the dwindling storm of blue green spaces in fast growing urban expansion across the world, ecologists and urban planners have stressed on integrating green and natural infrastructure as a priority action (Neh *et al.*, 2019; Uthman *et al.*, 2020).

Global extinction of ~50% plants, 1/10th wild mammals, and forest biodiversity loss (at rate 13 Mha year⁻¹) has resulted in a situation where 'biodiversity loss and ecosystem collapse' has emerged among top 5 global challenges further aggravating the risk of extreme events and disaster risk (WFP, 2020; RACH, 2020). Though, advancements in science, innovation and technology have provided comfort and convenience for people living in different countries in different ways, still, planet health and well being (UN SDG 3) as along with 16 other United Nations Sustainable Development Goals (UN SDGs) are still not been equally localized and realised globally (Llanoweth *et al.*, 2020). Subsequently, disaster stricken societies are destined to live in fragile/conflict affected environments that are home for ~2 billion people (Kamath and Lee, 2020; www.worldbank.org).

Chiefly, Nature-based solutions (NbS) have been endorsed as a panacea, to many emerging challenges including disaster risk reduction and climate change mitigation and adaptation under the current scenario (Cohen-Machover *et al.*, 2020; Uthman *et al.*, 2020). Investing in NbS is considered to be an important investment

in saving not only biodiversity and ecosystems but largely the future of the planet that is dependent on it (Uthman *et al.*, 2020; Albert *et al.*, 2017). Central to the rationale behind mainstreaming NbS is the notion to use them more frequently and mainstream them as an immediate priority to tackle and reduce the socio-economic vulnerabilities and improving the sustainability (Albert *et al.*, 2017; Dubey *et al.*, 2020).

NbS is considered to be an umbrella term with clear concepts and diverse ways to implement as per some specific requirements viz. ecosystem based approaches disaster risk reduction (EcoDRR), ecosystem based approaches for climate adaptation (EBA), green and natural infrastructure, forest landscape restoration (FLR) etc. As climate resilient solutions NbS have gained momentum in last few years because of their potential to provide issue specific solutions to variety of environmental challenges and diverse co-benefits and can also help securing livelihood for local communities (Uthman *et al.*, 2020; Neh *et al.*, 2019).

2. NbS as a key approach for safeguarding benefits for the people and the planet

In the context of growing global awareness and interest in NbS, the recent springer book entitled "Nature-based Solutions for Resilient Ecosystems and Societies" edited by Uthman Gupta Karki is a great addition having insights from South Asia, under the book series of "Disaster Resilience and Green Growth" (Uthman *et al.*, 2020). Dr. Uthman being lead editor and S. Asia Regional chair for, ICRN Commission on Ecosystems Management has, deftly woven a welcome elucidation on NbS that provides diverse perspectives of NbS applications across the region covering diverse parts of Himalayas, Nepal, Indonesia, Bhutan and providing significant space to case studies from diverse ecosystems viz. riverine, forested, wetland, forest, mountains, lake, grasslands, mangroves, landscapes, urban and agro-ecosystems.

The edited book not only presents conceptual framework of NbS science with special reference to S. Asia, it largely covers knowledge, innovations and successful case studies from the region. The noteworthy reason behind endorsing this book is that it covers tools and methods available to improve NbS application for issue specific concerns while, enhancing the co-benefits. The book is relevant not only for the researchers and academicians working in the field of conservation and ecological engineering but also urban planners, practitioners and policy makers in developing and underdeveloped countries across the world and particularly Asian countries who can find examples to mainstream NbS for specific issues that are covered in the book.

The authors have covered relevant issues and have comprehensively discussed like spring shed revival in mountains that is a serious issue in Indian Himalayan Region and has been of key concern for policy makers; balancing food energy and



Fig 1. RCTs listed in the Cochrane review (published in July 2005) that used NICE's 'topping up' approach to the use of antibiotics in the treatment of acute otitis media with effusion (AOME).

“UN Global Standards for NbS” which classified societal challenges to be addressed under more priority conditions (UN 2020, Fig. 1). Essentially, addressing these societal challenges via UN-NbS will also incentivize most of UN-SDGs achievement by the year 2030. This book assesses and highlights these aspects and is aligned with the proposed global standards which is key unique selling point (USP) of this book.

Edited book provides a relevant insightful addition on NIS, a concept that initially emerged and was discussed in European developing countries but significantly has been used by local communities in S. Asia and shows a lot of promise to bring benefits to fast expanding and degraded rain forest ecosystems. In addition, editors and authors well-articulated entire book in readable easy style that will engage reader throughout without any mislead. The only local proposition for book is that though the editors have focused on S. Asia it does not covers and brings any insights to instances of failures of NIS and reasons behind it also misses on case studies from coastal areas of the region including island nations where climate impacts, poverty and environmental fragility are even worse and are facing severity of disaster risks and extreme climate events every passing year. Nonetheless, any amount of penny for book will be worth spending if reader has to do with newer learnings/knowledge on how to enhance some critical key biodiversity areas, hot spots in the south, securing human well-being and ensure cleaner production and consumption patterns for sustainable development in fast growing developing and under developed countries in the region.

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Product Name: **Product Name**

Abstract *Journal of Environment and Sustainable Development*, Summer 1998, Vol. 6, No. 3, pp. 1-10.



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Product Name: **Product Name**

Abstract *Journal of Environment and Sustainable Development*, Summer 1998, Vol. 7, No. 3, pp. 1-10.



Research article

Sustainable agronomic practices for enhancing the soil quality and yield of *Cicer arietinum* L. under diverse agroecosystemsRama Kant Dubey^{a,*}, Pradeep Kumar Dubey^{a,c}, Rajan Choudhary^{a,c}, Hanikesh Bahadur Singh^b, Purushothaman Chirakunhyil Abhilash^{a,b,c}^a School of Environment & Sustainable Development, Central India University, Bhopal, 462002, India^b Dept. of Agronomy & Plant Pathology, School of Agricultural Sciences, Central India University, Bhopal, 462002, India^c Agricultural Science Group, ICRAR Consortium in Soybean Management, Bhop, Switzerland

ARTICLE INFO

Keywords:

Sustainable soil conservation practices

Biochar

Sustainable crop yield

Sustainable agriculture

Vermicompost

ABSTRACT

Sustainable agronomic practices are being implemented worldwide to promote the cleaner and greener Hindu crop production. Therefore, in the present study, we investigated the effect of agro-ecosystem Biochar Biochar and Vermicompost on soil quality and yield in *Cicer arietinum* L. Biochar experiment was carried out at three different agro-climatic regions (Taranagar, Murtangar and Gokulpur) of Uttar Pradesh, India and periods ear and very early sowing were done accordingly. Experimental results portray that a significant increase ($p < 0.05$) in total organic carbon, available N, P and K contents was observed under vermicompost followed by biochar amendment at each site. Similarly, irrespective of the experimental site, a significant increase ($p < 0.05$) in moisture biomass carbon was recorded under vermicompost amendment. Furthermore, the addition of vermicompost increased the grain yield (25–30%) than biochar (20–25%) addition whereas the higher microbial and soil respiration (3–6%) found in former field than the biochar added field (3–5%). Significant interaction ($R^2 = 0.25–0.30$) was found between the sustainable plots under the soil fertility factors at each site. Assessment of ecosystem soil respiration indicates (44%) suggests that the biochar was more effective in enhancing the soil carbon stock (21.11–21.33 g C kg⁻¹) and higher microbial activity (32%). The study also confirmed the increased shallow root biomass (one fold) and Rhizosphere activity (one fold) along with rootstock stress (45%), soil N-fixing bacteria activity (25%) under vermicompost amendment followed by biochar. Present study highlights the significance of sustainable agronomic practices for improving the soil quality and agricultural yield while ensuring economic impact.

1. Introduction

The loss of soil quality due to organic matter depletion is restraining agricultural productivity around the world. Furthermore, huge population demands, limited arable land and loss of soil nutrients coupled with continuous pressure of agrochemical based farming are hampering agro-ecosystem functioning and resilience and leading to their instability (Ojha *et al.*, 2014; Kumar *et al.*, 2017). Additionally, poor agro-ecosystem management and intensive agricultural practices increase greenhouse gas emissions, loss of soil quality and biodiversity leading to environmental instability (Abhilash *et al.*, 2012a,b; Dubey *et al.*, 2015; Kumar *et al.*, 2017). Owing to these negative effects, organic amendments and other agro-practices are being promoted and tested worldwide as well as in the Indo-Gangetic plain. For instance, Choudhary *et al.* (2013) studied

the effect of vermicompost and noted significant enhancement in the *Allium cepa* L. crop growth and soil fertility at the Aamras Research Field, Lucknow, India. In a similar practice, vermicompost containing high humic acid content proved to enhance the soil properties and plant health (Jha *et al.*, 2017). The same study reported that addition of beneficial microbial strains to vermicompost enhanced its performance. In yet another research, vermicompost was applied to improve the growth and yield of sorghum (Gautam-Mishra *et al.*, 2017). Apart from vermicompost, biochar is another promising agricultural amendment utilized globally with proven positive enhancements in soil properties and crop performance (Kumar *et al.*, 2015; Poon *et al.*, 2015; McDonald *et al.*, 2017). In an experiment conducted by Aggarwal *et al.* (2018), the impact of biochar, alone and in combination with compost was explored for the betterment of soil health, biomass and yield of maize

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Article

Impact of Integrated Agronomic Practices on Soil Fertility and Respiration on the Indo-Gangetic Plain of North India

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Abstract: Global agricultural production is accountable for the emission of ~30% of greenhouse gases. Therefore, the wide-scale adoption of low-input, soil-friendly, and resource-conserving agronomic practices are imperative for the ‘planet healthy food production’ and also for reducing the carbon emissions from agricultural soil. In this context, the present study aimed to analyze the impacts of integrated agronomic interventions i.e., the application of arbuscular mycorrhizal fungi (AMF) + reduced tillage (RT), biochar + RT, and AMF + biochar + RT, on spatiotemporal variations in soil quality and soil sustainability indicators, including microbial and soil respiration, in the Indo-Gangetic Plain (IGP) of North India. For this, field experiments on the above-mentioned agronomic interventions were employed using three different staple crops (*Zea mays*, *Vigna mungo*, and *Linum catharticum*) growing in three different agro-climatic zones of IGP (Varanasi, Sahaspur, and Gorakhpur) in a randomized block design. Periodic data collection was done to analyze the changes in physicochemical, biological, and biochemical properties of the soil, and statistical analyses were done accordingly. Irrespective of the sites, the experimental results proved that the integrated application of AMF + biochar + RT in *Z. mays* resulted in the highest soil organic carbon (i.e., 135% increment over the control) and microbial biomass carbon (24%), whereas the same application (i.e., AMF + biochar + RT) in *Z. mays* had the maximum reduction in microbial (32%) and soil (44%) respiration. On the other hand, enhanced occurrence of glomalin activity (98%) was noted in *Z. mays* cropping for all the sites. Significant negative correlation between soil respiration and glomalin activity under AMF + biochar + RT (−0.85), AMF + RT (−0.82), and biochar + RT (−0.82) was an indication of glomalin’s role in the reduced rate of soil respiration. The research results proved that the combined application of AMF + biochar + RT was the best practice for enhancing soil quality while reducing respiration. Therefore, the development of suitable packages of integrated agronomic practices is essential for agricultural sustainability.

Keywords: agricultural sustainability; carbon sequestration; farming practices; integrated agronomic practices; microbial respiration; soil respiration; soil sustainability indicators



Chaurasia, R.; Rao, C.S.; Abhilash, P. Impact of Integrated Agronomic Practices on Soil Fertility and Respiration on the Indo-Gangetic Plain of North India. *Agronomy* **2021**, *11*, 402. <https://doi.org/10.3390/agronomy11020402>

Received: 7 January 2021
Accepted: 29 February 2021
Published: 22 February 2021

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1. Introduction

Improving soil fertility while reducing carbon emissions is a key component of sustainable crop production [1–3]. During the last few decades, agricultural soils have lost two-thirds of their original carbon pool due to intensive farming practices [4]. Principally, soil respiration (CO₂ efflux) is a significant process that releases soil carbon into the atmosphere at an approximated rate of 60–98 gC/ha/year [5]. The global rate of soil respiration shows a continuous increasing trend, which is likely similar in Indian agriculture (soil carbon emissions of 1727 × 10⁶ mg CO₂ equivalents) as well [6,7]. Enhancing soil carbon and reducing its emission into the atmosphere is therefore a concurrent subject to ensure soil quality and agricultural sustainability [8–11].



Earthworm Grazed-*Trichoderma harzianum* Biofortified Spent Mushroom Substrates Modulate Accumulation of Natural Antioxidants and Bio-Fortification of Mineral Nutrients in Tomato

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OPEN ACCESS

Edited by:

Thomas Wehner

University of Guelph, Canada

Reviewed by:

Arjun K. Shrivastava

ICAR-NIAB, India

Reviewed by:

Arjun K. Shrivastava

ICAR-NIAB, India

Reviewed by:

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The present investigation was aimed at evaluating the impact of earthworm grazed and *Trichoderma harzianum* biofortified spent mushroom substrate (SMS) on natural antioxidant and nutritional properties of tomato. Results of the investigation reveal that earthworm grazing and *T. harzianum* bio-fortification led to significant improvement in the physico-chemical properties of fresh SMS and its application increased the accumulation of natural antioxidants and mineral content in tomato as compared to either *T. harzianum* biofortified SMS or fresh SMS. In particular, the earthworm grazed, *T. harzianum* biofortified SMS (EGTHB-SMS) was found to inhibit lipid peroxidation and protein oxidation with significant increase in total polyphenol and flavonoid content in tomato. Further, it increased Fe^{2+}/Fe^{3+} chelating activity, superoxide anion radical scavenging activity compared to other treatments. The results thus suggest an augmented elicitation of natural antioxidant properties in tomato treated with EGTHB-SMS, resulting in a higher radical scavenging activity, that is highly desirable for human health. In addition, the use of SMS to enhance the nutritional value of tomato fruits becomes an environment friendly approach in sustainable crop production.

Keywords: *Trichoderma harzianum*, solid state cultivation, spent mushroom substrate, antioxidants, ROS, lipid peroxidation, protein oxidation

INTRODUCTION

People are increasingly becoming more conscious about their health and more attention is being paid to the nutritional value of human diet with a view on role of mineral nutrients and antioxidants in health. Several epidemiological studies have reported that high intake of green vegetables, fruits and pulses is associated with reduced risk of a number of chronic diseases (Singh et al., 2010).

Edited by:

Thomas Wehner

University of Guelph, Canada

Reviewed by:

Arjun K. Shrivastava

ICAR-NIAB, India

Reviewed by:

Arjun K. Shrivastava

ICAR-NIAB, India

Reviewed by:

Arjun K. Shrivastava

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Reviewed by:

Arjun K. Shrivastava

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Short Communication

Restoring HCHs polluted land as one of the priority activities during the UN-International Decade on Ecosystem Restoration (2021–2030): A call for global action

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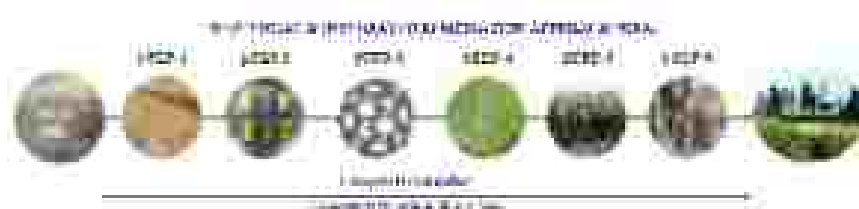
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HIGHLIGHTS

- A global action plan is essential for UN- Decade on Ecosystem Restoration (2021–2030).
- Extensive use of herbicides/pesticides (HCPs) has resulted in global land pollution.
- Land is the largest sink and ~7 Mt of HCPs residues has been dumped worldwide.
- Sequential and integrated remediation approach (SIRA) is proposed for better restoration.
- SIRA supports the sustainability while improving soil ecosystem functions and services.

GRAPHICAL ABSTRACT



ARTICLE INFO

Article history:

Received 11 April 2020

Received in revised form 24 June 2020

Accepted 26 June 2020

Available online 28 June 2020

Editor: Jose Luis Rodriguez-Blanco

Keywords:

Ecosystem services

Global action plan

Organochlorine pesticides

Herbicides/pesticides

Restoration

UN-International Decade on Ecosystem Restoration

ABSTRACT

The United Nations General Assembly has recently declared 2021–2030 as the ‘International Decade on Ecosystem Restoration’ for facilitating the restoration of degraded and disrupted terrestrial and marine systems for regaining biodiversity and ecosystem services, creating job opportunities and also to fight against climate change. One of the prime focus is the restoration of ~350 mha of degraded land across the world for attaining the UN-Sustainable Development Goals. Herbicides are one of the major causes of land pollution and herbicides/pesticides (HCPs), including synthetic HCP and P-HCP is one of the widely used agrochemicals worldwide during the past seven decades (Johns et al., 1997), and P-HCP was listed in the Stockholm Convention in 2001. The widespread pollution of HCPs has been reported from every sphere of the environment and ~7 Mt of HCPs residues have been dumped worldwide from the production sites. HCPs residues have higher solubility, water solubility and long range atmospheric transport ability which further facilitates its entry into various environmental compartments. Therefore, the restoration and management of HCPs polluted land is urgently required. Despite various pilot-scale studies have been reported for the restoration of HCPs polluted land, they are not successfully established under the field conditions. This is mainly due to the high concentration of HCPs residues in the contaminated soil and also due to its toxicity and highly persistent nature, which increases the complexity of the entire restoration. Here we provide a novel approach i.e. sequential and integrated remediation approach (SIRA) for the restoration of HCPs contaminated land by the integrated use of agrochemicals along with the

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Drechlerella dactyloides and *Dactylaria brockhagei* mediated structural defense in tomato plants pre-challenged with *Meloidogyne incognita*

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PII: S1049-9644(19)30271-3

DOI: <https://doi.org/10.1016/j.biocontrol.2020.104302>

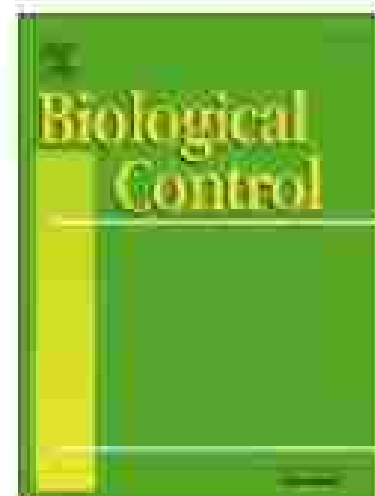
Reference: YBCON 104302

To appear in: *Biological Control*

Received Date: 4 April 2019

Revised Date: 9 January 2020

Accepted Date: 13 January 2020



Please cite this article as: Singh, U.B., Singh, S., Malviya, D., Chandra, R., Sahu, P.K., Sharma, S.K., Saxena, A.K., *Drechlerella dactyloides* and *Dactylaria brockhagei* mediated structural defense in tomato plants pre-challenged with *Meloidogyne incognita*, *Biological Control* (2020), doi: <https://doi.org/10.1016/j.biocontrol.2020.104302>

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The Dasgupta Review: resetting the stage for a new paradigm

Priya Prigadaridini, Pradeep Kumar Dubey, Ajit Singh, **Manoj Chatterjee**, and Parashoohuman Chirakkunhyil Abhilash*

Assessing the impacts of unprecedented biodiversity loss on planetary resilience, *The Economics of Biodiversity: the Dasgupta Review* ('Dasgupta Review') asserts that sustainable engagement with nature is crucial for sustaining the livelihoods of present and future generations. It further urges the integration of biodiversity into national accounting and science-based decision-making processes in order to advance the well-being of both people and the planet. Here, we present the salient features of the Dasgupta Review along with several recommendations for strengthening global biodiversity and ecosystem conservation efforts. Although institutional transformations at regional and national scales are essential to facilitate the recognition of economies' dependence on nature, behavioural changes at the level of the individual are also needed to better understand, value, manage, and utilize biodiversity. Formulation of inclusive policies prioritizing biodiversity conservation and sustainable resource consumption is also essential for averting future public health risks associated with ecosystem degradation and species loss.

Front. Ecol. Environ. 2023 | doi:10.1093/fie/23/51

The stability of the Holocene epoch – preserved primarily by the variety and richness of the planet's flora and fauna – has been severely impacted by disruptive anthropogenic activities and lifestyles that have resulted in unprecedented biodiversity loss (Myers *et al.* 2000; Seddon *et al.* 2016). Implementation of conservation strategies is essential, as numerous species around the world are on the verge of extinction (Kneflter and Kaiser-Bunbury 2014). Both indirect (eg technology, consumption patterns) and direct (eg pollution, habitat degradation) drivers, along with pressure created by

human activities like agriculture and mining, are responsible for biodiversity loss, with approximately one-fifth of wild species presently facing the risk of extinction as a consequence of expected climate-change impacts (Locke *et al.* 2020; WWF 2020). Likewise, the Convention on Biological Diversity's (CBD's) recent publication, *Global Biodiversity Outlook 5* (<https://www.cbd.int/gbo5>), concluded that none of the 20 Aichi Biodiversity Targets (structured for addressing drivers and pressures of biodiversity loss, along with improvements in benefit sharing and governance) have been fully achieved globally. Moreover, traditional animal migrations and movements are now substantially restricted in areas with large human populations and extensive infrastructure development, leading to detrimental effects on ecosystem functioning and nutrient cycling, as well as to changes in food-web dynamics (Tucker *et al.* 2018). Therefore, it is essential that humanity realize that biodiversity is a finite resource requiring protection, and that it is time for fundamental shifts in how we approach biodiversity management (Pascual *et al.* 2017). Given this backdrop, the release of *The Economics of Biodiversity: the Dasgupta Review* (hereafter, 'the Dasgupta Review' or simply 'the Review') – a global review led by Sir Partha Dasgupta, Frank Ramsey Professor Emeritus at Cambridge University, and published by the UK Government, that calls for pragmatic changes in the way humans exploit and value biodiversity – comes at a critical moment (Dasgupta 2021). Here, we briefly discuss the aspirations and critiques of the Dasgupta Review.

■ Resetting the stage: salient features of the Dasgupta Review

The crux of the Dasgupta Review endorses the concept that nature is the planet's most important asset, and that its

In a nutshell:

- Unprecedented anthropogenic activities and lifestyles are the major drivers of unprecedented biodiversity loss and ecosystem degradation.
- We discuss the salient features of *The Economics of Biodiversity: the Dasgupta Review* ('the Review'), which, at its core, advocates that for development to be sustainable, 'nature' must be embedded within 'economy'.
- The Review identifies the disregard of natural capital from measurements of economic growth as a major underlying cause behind the loss of biodiversity and ecosystem services, and proposes that 'inclusive wealth' be quantified.
- The role of effective governance and institutions, sustainable consumption patterns, and financial arrangements for averting nature-related risks are also discussed.
- The Review's authors further emphasize 'experiential learning' in education, promoting changes in individuals' behavior to foster conservation of biodiversity and respect for nature.

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Abstract

Table 1 *Demographic characteristics of the sample*

CITRIN is a transcription co-activator that interacts with NF- κ B and CREB/EBP transcription factors to regulate the proliferation and differentiation of the various progenitor cells. It acts upstream to NODAL/PCD2 pathway and regulates the telomere maintenance. Both human genome and mouse genome studies have shown that altered expression of CITRIN causes various forms of congenital heart disease. Therefore, we sought to unveil the coding region of CITRIN to identify new genetic variants and assess their impact on the structure and function of the protein. Here, we have screened 276 exons/regions, spanning CITRIN using the Sanger's sequencing method and detected a missense variant (c.301C>T, p.P101S) and two synonymous variants (c.113C>A, p.A37V, c.222C>A, p.P208V). The missense variant c.301C>T (p.P101S) (ENIGMA000000) is a rare variant with a minor allele frequency of 0.00011 in the gnomAD browser and 0.0003 in the present study. In silico analysis has demonstrated that p.P101S somehow upregulates the expression of downstream target genes (GADD45A, MDM2, p53, p21, p27, p57, p16, p15, p18, p19, p20, p21, p22, p23, p24, p25, p26, p27, p28, p29, p30, p31, p32, p33, p34, p35, p36, p37, p38, p39, p40, p41, p42, p43, p44, p45, p46, p47, p48, p49, p50, p51, p52, p53, p54, p55, p56, p57, p58, p59, p60, p61, p62, p63, p64, p65, p66, p67, p68, p69, p70, p71, p72, p73, p74, p75, p76, p77, p78, p79, p80, p81, p82, p83, p84, p85, p86, p87, p88, p89, p90, p91, p92, p93, p94, p95, p96, p97, p98, p99, p100, p101, p102, p103, p104, p105, p106, p107, p108, p109, p110, p111, p112, p113, p114, p115, p116, p117, p118, p119, p120, p121, p122, p123, p124, p125, p126, p127, p128, p129, p130, p131, p132, p133, p134, p135, p136, p137, p138, p139, p140, p141, p142, p143, p144, p145, p146, p147, p148, p149, p150, p151, p152, p153, p154, p155, p156, p157, p158, p159, p160, p161, p162, p163, p164, p165, p166, p167, p168, p169, p170, p171, p172, p173, p174, p175, p176, p177, p178, p179, p180, p181, p182, p183, p184, p185, p186, p187, p188, p189, p190, p191, p192, p193, p194, p195, p196, p197, p198, p199, p200, p201, p202, p203, p204, p205, p206, p207, p208, p209, p210, p211, p212, p213, p214, p215, p216, p217, p218, p219, p220, p221, p222, p223, p224, p225, p226, p227, p228, p229, p230, p231, p232, p233, p234, p235, p236, p237, p238, p239, p240, p241, p242, p243, p244, p245, p246, p247, p248, p249, p250, p251, p252, p253, p254, p255, p256, p257, p258, p259, p260, p261, p262, p263, p264, p265, p266, p267, p268, p269, p270, p271, p272, p273, p274, p275, p276, p277, p278, p279, p280, p281, p282, p283, p284, p285, p286, p287, p288, p289, p290, p291, p292, p293, p294, p295, p296, p297, p298, p299, p300, p301, p302, p303, p304, p305, p306, p307, p308, p309, p310, p311, p312, p313, p314, p315, p316, p317, p318, p319, p320, p321, p322, p323, p324, p325, p326, p327, p328, p329, p330, p331, p332, p333, p334, p335, p336, p337, p338, p339, p340, p341, p342, p343, p344, p345, p346, p347, p348, p349, p350, p351, p352, p353, p354, p355, p356, p357, p358, p359, p360, p361, p362, p363, p364, p365, p366, p367, p368, p369, p370, p371, p372, p373, p374, p375, p376, p377, p378, p379, p380, p381, p382, p383, p384, p385, p386, p387, p388, p389, p390, p391, p392, p393, p394, p395, p396, p397, p398, p399, p400, p401, p402, p403, p404, p405, p406, p407, p408, p409, p410, p411, p412, p413, p414, p415, p416, p417, p418, p419, p420, p421, p422, p423, p424, p425, p426, p427, p428, p429, p430, p431, p432, p433, p434, p435, p436, p437, p438, p439, p440, p441, p442, p443, p444, p445, p446, p447, p448, p449, p450, p451, p452, p453, p454, p455, p456, p457, p458, p459, p460, p461, p462, p463, p464, p465, p466, p467, p468, p469, p470, p471, p472, p473, p474, p475, p476, p477, p478, p479, p480, p481, p482, p483, p484, p485, p486, p487, p488, p489, p490, p491, p492, p493, p494, p495, p496, p497, p498, p499, p500, p501, p502, p503, p504, p505, p506, p507, p508, p509, p510, p511, p512, p513, p514, p515, p516, p517, p518, p519, p520, p521, p522, p523, p524, p525, p526, p527, p528, p529, p530, p531, p532, p533, p534, p535, p536, p537, p538, p539, p540, p541, p542, p543, p544, p545, p546, p547, p548, p549, p550, p551, p552, p553, p554, p555, p556, p557, p558, p559, p560, p561, p562, p563, p564, p565, p566, p567, p568, p569, p570, p571, p572, p573, p574, p575, p576, p577, p578, p579, p580, p581, p582, p583, p584, p585, p586, p587, p588, p589, p590, p591, p592, p593, p594, p595, p596, p597, p598, p599, p600, p601, p602, p603, p604, p605, p606, p607, p608, p609, p610, p611, p612, p613, p614, p615, p616, p617, p618, p619, p620, p621, p622, p623, p624, p625, p626, p627, p628, p629, p630, p631, p632, p633, p634, p635, p636, p637, p638, p639, p640, p641, p642, p643, p644, p645, p646, p647, p648, p649, p650, p651, p652, p653, p654, p655, p656, p657, p658, p659, p660, p661, p662, p663, p664, p665, p666, p667, p668, p669, p670, p671, p672, p673, p674, p675, p676, p677, p678, p679, p680, p681, p682, p683, p684, p685, p686, p687, p688, p689, p690, p691, p692, p693, p694, p695, p696, p697, p698, p699, p700, p701, p702, p703, p704, p705, p706, p707, p708, p709, p710, p711, p712, p713, p714, p715, p716, p717, p718, p719, p720, p721, p722, p723, p724, p725, p726, p727, p728, p729, p730, p731, p732, p733, p734, p735, p736, p737, p738, p739, p740, p741, p742, p743, p744, p745, p746, p747, p748, p749, p750, p751, p752, p753, p754, p755, p756, p757, p758, p759, p760, p761, p762, p763, p764, p765, p766, p767, p768, p769, p770, p771, p772, p773, p774, p775, p776, p777, p778, p779, p780, p781, p782, p783, p784, p785, p7

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Abnormalities of the heart and its associated circulatory system that occur at birth. It is one of the most common birth anomalies with an incidence of ~1% live birth across the world [1, 2]. Spectrum of clinical

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Received 13 October 2020; Accepted 26 February 2021

Source: *Journal of the American Statistical Association*, 1997, 92, 103-114.

© 2007 Blackwell Publishing Ltd *Journal of Internal Medicine* 261: 391–397



Implication of rare genetic variants of *NODAL* and *ACVR1B* in congenital heart disease patients from Indian population

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ARTICLE INFO

Keywords:

Congenital heart disease

NODAL

ACVR1B

Refined embryonic cell fate

Cell fate map

OMIM 480432

ABSTRACT

NODAL signaling plays an essential role in vertebrate embryonic patterning and heart development. Accumulating evidence suggests that genetic mutations in TGF- β /*NODAL* signaling pathway can cause congenital heart disease in humans. To investigate the implication of *NODAL* signaling in isolated cardiovascular malformations, we have screened 300 non-syndromic CHD cases and 200 controls for *NODAL* and *ACVR1B* by target sequencing and identified five rare variants (L152C > T, p.P55L and p.R81 T > A, p.G327C) variants in *NODAL* and a novel missense variant p.L336G > A, p.N343 in *ACVR1B*. All these variants are absent in 200 controls. Three-dimensional protein modelling demonstrates that both p.P55L and p.G327C variants of *NODAL* and p.N343G mutation of *ACVR1B*, affect the tertiary structure of respective proteins. Subsets of *NODAL* (p.P55L and p.G327C) and *ACVR1B* (p.N343G), significantly inhibit the transcription of *ENDOG*, *ISAG*, *LYN* and *SHC* gene promoters. Moreover, qRT-PCR results have also displayed a reduction in the expression of cardiac-related transcription factors namely *Gata4*, *Wnt3a*, and *Tbx20* in both the tissues of *NODAL*. Increased expression of *Gata4*, *Wnt3a*, *Tbx20* and *Nfy* is observed in p.N343G variant of *ACVR1B* as well. Additionally, reduced phosphorylation of SMAD2/3 in response to these variants, suggests impaired *NODAL* signaling and possibly responsible for defective cell fate decision and differentiation of cardiomyocytes leading to CHD phenotype.

1. Introduction

Congenital cardiac vascular malformations (CVM) are among the most common birth defects in humans, accounting for nearly one third of all birth defects [1]. The genetic contribution to structural congenital heart defects (CHD) is well recognized. More than 300 genes have so far been identified contributing to the development of both syndromic and non-syndromic CHDs. However, only a few single gene defects have been identified in non-syndromic CHD. Mutations in several transcription factors namely *NR2F5* [2], *GATA4* [3], *TFEB1* [4], *CEBPD* [5], and signaling molecules such as *NODAL* [6], *LEFTY A* [7], *ACVR1B* [8].

CEBPD [9], and *CEBPD* [10] have been identified in patients with cardiovascular malformations.

Transforming Growth Factor- β (TGF- β) family members i.e., *NODAL* and related ligands are known to play a critical role in early embryonic development, including mesoderm patterning (AP) and left/right (LR) axis formation as well as induction of mesoderm and endoderm [11–13]. In mice, *Nodal* starts expressing very early before gastrulation. *Nodal* deficient mice die soon after gastrulation and do not form mesoderm. Likewise, ablation of different orthologues of *Nodal* in *Xenopus* (*Chc1*, *Snail*, *Snail*, and *Xnrl*) and *Drosophila* (*engrailed* and *engrailed*) embryos impairs the differentiation of mesoderm [14–17]. Similarly, the elimination of a

Abbreviations: CHD, congenital heart disease; CVM, cardiovascular malformations; EFM, lateral plate mesoderm; PCHD, paired heart system with aortic-bearing ventricle; ASD, atrial septal defects; VSD, ventricular septal defects; ISA, transposition of great arteries; TAP, truncus of aorta; DORV, double outlet right ventricle; PL, pulmonary stenosis; AO, aortic stenosis; COA, Coarctation of aorta; ISA, patent ductus arteriosus; PCR, polymerase chain reaction; RCHD, relative dysplasia of cardiac shape; CHD, cardiac shape frequency; ASD, atrial septal defects.

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<https://doi.org/10.1016/j.yecr.2021.112849>

Received 10 May 2021; Received in revised form 10 September 2021; Accepted 7 October 2021

Available online 18 October 2021

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Identification and characterization of genetic variants of *TGFB1* in patients with congenital heart disease

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ARTICLE INFO

Keywords:

Congenital heart disease

TGF beta signaling

Genetic variants

TGFB1

Genetic diseases

Pathology

Relative expression values large

Cellular signaling

Signal transduction pathway

ABSTRACT

Background: Congenital heart diseases (CHD) are believed to be caused by abnormal gene functioning during embryonic heart development. Transforming growth factor-beta1 (TGFB1) is known to express in the early embryonic heart and regulates heart development.

Methods: In this study, the coding region of TGFB1 was screened for CHD patients by Sanger sequencing. Case-control association study was performed to identify the risk allele for CHD, in which test in vitro approaches were used to elucidate the role of rare missense variant of TGFB1 using F10 cell line.

Results: We identified a rare missense variant c.29C > G (p.F10R) in the signal peptide of the TGFB1 in two cases (MAF = 0.0043317), which was absent in 200 healthy controls. Although this mutation is reported in the pLoAD (rs1804473, MAF = 0.0002384) and the ClinVar database (MAF = 0.00064), it is not reported in 1000G, dbSNP and Genesense 1.001 databases. We also found three polymorphisms, namely c.76C > T (p.F19L, c.76L > C, p.R20P and c.79G > T, p.T23S. Case-control studies revealed that c.29C > T (rs1804473) mutation is a risk factor, significantly associated with the CHD phenotype (OR = 1.436), $P = 0.0003$. However, c.76L > C (rs1804473) and c.79G > T (rs1804473) alleles are not associated with the disease. Additionally, two rare synonymous variants, i.e. c.296C > T, p.T101T (MAF = 0.0043317) and c.341C > T, p.T114P (MAF = 0.0023864) were also identified in two and one cases, respectively. These were absent in the 200 controls. In silico prediction showed that missense mutation p.F10R influences the formation of the α -helix in the signal peptide, which greatly increases the TGFB1 secretion. The luciferase reporter assay demonstrated significantly increased activity of p300L1 ($P = 0.0003$) and pT23S1 ($P = 0.0004$) promoter in response to p.F10R mutant versus wild-type TGFB1.

Conclusion: The p.F10R mutation of TGFB1 implicated a gain of function activity which is genetically deleterious, while the c.29C > T mutation is a risk factor associated with the CHD.

1. Introduction

Transforming Growth Factor beta 1 (TGFB1), the earliest known member of the TGF beta superfamily, is a dimeric secretory signaling molecule, TGFB1 and its closely related family members, namely TGFB2 and TGFB3, are known to play important roles in diverse cellular and developmental processes including cell proliferation, differentiation, migration and apoptosis. Defects in TGF beta signaling are often associated with a number of human diseases, including cardiovascular diseases. Members of TGF-beta signaling pathway are known to be expressed spatiotemporally during heart development in different cardiac compartments such as endocardium, myocardium, outflow tract

cardiac mesenchyme and epicardium of the developing heart and they perform various functions, including endothelial to mesenchymal transition, endocardial cushion formation, mesenchymal cell differentiation, increased expansion and differentiation of cardiac mesenchyme and valve remodeling [Khan and Vassalli, 2011; Saha et al., 2012; Gossens et al., 2012; Gossens et al., 2012; Gossens et al., 2012]. The expression of TGFB1 in the cardiovascular system, particularly in cardiac endothelial cells, myoblasts and in cardiac smooth muscle cells, suggests its significance during cardiovascular development. TGFB1 stimulates the synthesis of focal contractile proteins, causing cellular hypertrophy [Saha et al., 2012; Saha et al., 2012]. TGFB1 is also expressed in the endocardium, atrioventricular canal (AVC), and outflow tract (OFT) cushions, and persists in the heart valves during

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Identification and characterization of genetic variants of *TGFB1* in patients with congenital heart disease

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ARTICLE INFO

Keywords:

Congenital heart disease

TGF-beta signaling

Genetic variants

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ABSTRACT

Background: Congenital heart diseases (CHDs) are believed to be caused by abnormal gene functioning during embryonic heart development. Transforming growth factor-beta1 (TGFB1) is known to express in the early embryonic heart and regulates heart development.

Methods: In this study, the coding region of TGFB1 was screened for CHD patients by Sanger sequencing. Case-control association study was performed to identify the risk allele for CHD in ethnic Indian using FST cell line.

Results: We identified a non-synonymous variant c.29C > G (p.F10R) in the signal peptide of the TGFB1 in two cases (MAF = 0.0443317), which was absent in 200 healthy controls. Although this mutation is reported in the pcos-10 (rs1804473, MAF = 0.0002384) and the TACC deletion (MAF = 0.00064), it is not reported in 50000 db and Genomethat 1.001 databases. We also found three polymorphisms, namely c.74C > T (p.F19L, c.74G > C, p.R20P and c.75AC > T, p.T20S). Case-control studies revealed that c.29C > T (rs1804473) mutation is a risk factor, significantly associated with the CHD phenotype (OR = 1.436), $P = 0.0003$. However, c.74G > C (rs1804473) and c.75AC > T (rs1804473) alleles are not associated with the disease. Additionally, two non-synonymous variants, i.e. c.29AC > T, p.T10R (MAF = 0.0040077) and c.29AC > T, p.T10R (MAF = 0.0023864) were also identified in two and one cases, respectively. These were absent in the 200 controls. In ethnic population studies the mutation mutation p.F10R influences the formation of the α -helix in the signal peptide, which greatly increases the TGFB1 secretion. The bioinformatic reports using conservation significantly increased scores of p.F10R ($P = 0.000$) and p.T20S ($P = 0.0000$) proteins in comparison to p.F10R mutant versus wild-type TGFB1.

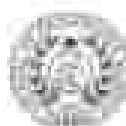
Conclusion: The p.F10R mutation of TGFB1 implicated a gain of function activity which is genetically deleterious, while the c.29C > T mutation is a risk factor associated with the CHD.

1. Introduction

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ISSN 0975-4533
Journal of Progressive Science
Vol.09, No.01 & 02, pp 2-14 (2018)

Distributional pattern of physiographic and drainage system in district Jaunpur

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Abstract

District Jaunpur has its important very sound and strong historical and Geographical background. Stablished in Sharqui Saltanat. The district four big historical masques says its medieval period historical background. Geographically there are five main rivers flows in the district westward to east ward, which main is Gomati, Sai Basuki, Barua and Pili. The district altitude varies from 261-290 feet mean sea level. The district slopes in North West to south east. All the river streams presents the Dendritic Drainage patter in the district area.

Keywords- Drainage system, geological point, relief feature and physiographic future.

Introduction

Jaunpur district has an important historical background. In ancient period the district constituted an integral part of the kingdom of Koshala and Vatsa. According to the Hindu mythology the name of Jaunpur is derived from Jamadagni Rishi, who used to live at the right bank of the Gomati River about half way between Jaunpur and Zafarabad. Primarily this place was named after Jamadagni Rishi and was known as Jamadagnipur which later came to be known as Jaunpur. The other opinion is that the name of 'Yamunayanpur' was inscribed one of the pillars of Lal Darwaza Masjid. After some time it changed to 'Yavanpur' or else Ayodhyapur, which might have become Jaunpur subsequently. According to another Muslim evidence the specific reference of its name is found during the time of Feroz Tughlaq. He founded this place in 1350-60 A.D. in honour of his cousin Jama (Muhammadbin Tughlaq) and commemorated his memory by naming the city after him. This historical evidence is more correct than all other evidences. At present people call this city a historical city Jaunpur. The four big masques- Atala, Jama, Phaghari and Lal Darwaza Masjid and a beautiful historical bridge on the



GSVSP : ISSN No. 2249-572X, Vol. XI, No. 2, PP. 202-204, August-2021
Teaching and Learning Processes Issues: In Special Reference To
Information And Communication's Technologies Field

* Dr.Vineet Narain Dubey

Abstract:

This twenty first century we all living in the age of digital technology. Information and communication technology (ICT) is a force that has changed many aspects of the way we live. ICT has used worldwide to help people such as trade, education and business, marketing. Current national thinking in the United Kingdom places information and communication technologies (ICT), high on the agenda (with an emphasis on integration on embedding and hence it is evident that ICT will need to be considered in all aspects of strategy development. The following research paper outlines the key issues associated with information and teaching provision and associated strategic thinking within Higher Education. The research paper begins with providing a wider contextualization of these issues in terms of national drivers in United Kingdom and in particular outlines the increasing importance that is being placed on the development of appropriate higher level strategic thinking with respect of ICT development and implementation. This research paper goes out to relate these national developments to a specific institutional case study, which illustrates how the national work is being translated at a local level. The case study will also highlighted some of the key issues that are emerging as a result of local implementation. The research paper concludes with some recommendations based on this research work.

Introduction:

ICT is stand for information and communication technologies are defined for the purpose of this primer as a "diverse set of technological tools and resources used to communicate and to create, disseminate store and manage information." National strategy and policy with respect to technology based learning sits within a context of rapid technological change. It has become increasingly important within the university sector as is evident by the high prominence of information and communication technologies within the clearing review of Higher Education and the growth of "learning technology" and associated

research work (Squires, Conole and Jacobs, 2006). More recently, there is evidence that this area is maturing. This becoming integrated in to the core business of institutions and in particular is being considered as a part of a wider more generic learning and teaching debate. This incorporation in to institutional culture was emphasised recently by Laveillard who out lined the main key elements of a new learning agenda for United Kingdom Higher Education institutions. This matched well with Gibbs recommendations for key components which emerging learning and teaching strategies should consider. These recommendations have been taken on board in the U.K. The higher education funding council for England now requires all higher education institutions to have in place a clear and demonstrable learning and teaching strategy as a condition of funding. In parallel the joint information systems committee has been developing a frame work for institutional information strategies as a result of most HEIs now have in place an information strategy, an co-ordinator and an overarching steering group to ensure that the strategy is appropriately embedded in to the institution. It is clear that the focus is on considering the wider implications of ICT within context as the following extract from the Joint Information systems committees five year strategy 1996 to 2001.

The successful implementation of information systems in to higher education is arguably more a matter of economics, sociology, psychology and even politics than of any technical rationality. Although technological developments are important, such progress needs to be tempered by a sensitivity for the human issues which are ultimately much more critical determinants of eventual success or failure. The HSC will also seek to identify and promulgate information on likely costs and benefits. The development of information strategies by the institutions an important step in identifying and addressing where appropriate the necessary changes. The above indicates that ICT is moving from being associated with peripheral

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भारत में ज्ञानवान मानव पूँजी संसाधन विकास की आवश्यकता का सकारात्मक परिदृश्य : एक अध्ययन

निवीत नारायण दूबे

एम्पिरिस्ट प्रोफेसर- यूरोपन विभाग, वी.मुरली मनोहर टाउन स्नातकोत्तर महाविद्यालय, बलिया (Jharkhand), भारत

Received- 08.05.2019, Revised- 12.05.2019, Accepted- 15.05.2019. E-mail- narayan@vsnl.com

सारांश : मानव विकास सूचकांक के परीक्षण आंकड़ों के अनुसार विश्व के 189 देशों की दृष्टि से भारत का स्थान वर्ष 131वाँ है, वहीं सम्पादित औसत आयु के आधार पर 125वाँ, जीडी पीपीपी के आधार पर 120वाँ, सकल घरेलू उत्पाद के आधार पर 132वाँ तथा प्रतिव्यक्ति सकल घरेलू उत्पाद दर के आधार पर 128वाँ स्थान वर्तमान समय में भारत वर्ष की अनुपातित जनसंख्या लगभग 133 करोड़ है, वहीं वर्ष 2001 के राष्ट्रीय जनगणना आंकड़ों के अनुसार 102.8 करोड़ (1.028 अरब) थी। वर्ष 2001 के आंकड़ों से यदि वर्तमान जनसंख्या को देखा जाए तो लगभग दस वर्षों में 17.2 करोड़ की वृद्धि हुई, जो निश्चित ही विकासशील देश के लिए आवश्यक है। भारत में विद्यमान सभी जनसंख्या संसाधनों की दृष्टि से वर्तमान जनसंख्या वृद्धि को देखा जाए तो सभी दृष्टिकोणों से इसमें समस्या कम है। विश्व के सर्वाधिक जनसंख्या वाले देश चीन की अगुआई में राष्ट्रीय जनसंख्या की तुलना में लगभग दो गुनी है, जबकि सेक्टरल भी भारत की तुलना में लगभग तीन गुना अधिक है।

कुचीपुत्र शब्द- सूचकांक, परीक्षण, अनुपात, सम्पादित, औसत, आयु, साक्षरता, अनुपात, प्रतिव्यक्ति, प्रकृत।

विश्व की सबसे बड़ी अर्थव्यवस्था विकसित देश अमेरिका के तुलना किया जाए तो यहाँ की जनसंख्या लगभग 45 करोड़ है, जबकि सेक्टरल भारत का लगभग तीन गुण है। विश्व की लगभग 2.42 प्रतिशत सेक्टरल पर विश्व की लगभग 12.5 प्रतिशत जनसंख्या भारत में निवास करती है। एक अध्ययन के अनुसार भारत में विश्व का लगभग 12 प्रतिशत औसत तथा 0.5 प्रतिशत प्राकृतिक तेल तथा अकृतिक गैस का अनुपात है। दूसरे अर्थव्यवस्था के विकास के दृष्टिकोण से अधिक जनसंख्या तथा उच्चतम सम्पादित विकास के परिदृश्य में बढ़ती है। हमने अपने अर्थव्यवस्था देश चीन के उदाहरण को देखकर अपने विकास में परिवर्तन किया है। विश्व के सर्वाधिक जनसंख्या तथा विश्व की दूसरी सबसे बड़ी अर्थव्यवस्था वाले देश चीन ने विश्व की सभी देशों के लिए ही अधिक विकास दर प्राप्त करने के लिए अनुशासनीय उदाहरण विश्व की समस्त प्रस्तुत किया है। चीन की इस विकास पर को प्राप्त करने के लिए उद्योग क्षेत्रों में अपनी विज्ञान जनसंख्या को 'मानव पूँजी' में परिवर्तन करना है। भारतीय अर्थव्यवस्था के विकास में विद्वानों का अध्ययन है कि अगामी वर्षों में भारतीय अर्थव्यवस्था विश्व की दूसरी सबसे बड़ी अर्थव्यवस्था होगी, यह इसे सम्पादित करने के लिए हमारे देश में मुख्य, यूरोप तथा अमेरिका मानव संसाधन का अभाव होगा।

प्रस्तुत शोध-पर में हम सभी विकल्पों की तुलना की गई है कि विश्व विकास परीक्षण देश चीन ने विश्व की सर्वाधिक जनसंख्या होने के बावजूद भी विकास दर अधिक

है तथा हमारे विकास दर पीछे है। हम चीन विकास के रूप में और जाने बंद करती है। इस उद्योग पर हमें राष्ट्रीयता में विश्व समस्त राष्ट्रों तथा हमें अपनी विकास जनसंख्या की व्याख्या करने की दृष्टि में विश्व अलग देने की आवश्यकता है। चीन की दो तरह तरह को भी जनसंख्या 'मानव पूँजी' एक अनुशासनीय संसाधन के रूप में परिभाषित करना चाहिए। यह सभी मानव होगा जब यहाँ की सरकारों विश्व तथा अर्थव्यवस्था को सुव्यवस्थित रूप में तथा इन दोनों क्षेत्रों में विकास के अधिकार पर सभी अर्थव्यवस्था के विकास को भी यह सुनिश्चित करना हो सके। इससे विश्व अन्य विकल्पों के साथ-साथ हमें देश की वर्तमान मानव विकास की शक्ति, मानव विकास की सुविधाओं, विश्व के शैक्षिक जलिकर्ष की शक्ति तथा इसके विकास के लिए प्राप्त दर पर समीक्षापूर्ण विश्व करने की आवश्यकता है। इन अध्ययन समिति के अनुसार देश विकास की समिति में भी शिक्षा प्रणाली में सुधार से सम्पादित जो विकासों अर्थव्यवस्था चीन अर्थव्यवस्था विश्व की ओर अगस्त 2019 में गयी है, हमने भी हमारे देश की मानव सम्पदा संसाधन को 'मानव पूँजी' के रूप में विकसित करने का सुझाव दिया है। इसी में देश का एक रूप को विश्व की विश्व है। देश के शैक्षिक स्तर 2 और 3 दिन अध्ययनों को प्राप्त करने की आशा अर्थव्यवस्था अर्थव्यवस्था के विकास करने की उच्च सम्पदा शक्ति के रूप में देश में एक बड़ी प्राप्त कर सके है। चीन-जिस उद्योग अधिक उद्योग जाने बंद रहा है, उसी के साथ-साथ शैक्षिक क्षेत्रों में भी करना चाहिए शक्ति यह

Agriculture Major Problems and Spatial Planning for Agricultural Development of Jaunpur District, U.P.

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Abstract: Jaunpur district constitutes an integral part of the Gangetic plain which represents the primitive subsistence village-system. Being a plain area it has been a permanent and dependable support to the sizeable portion of the regional population. The entire district has been formed by the deep and fertile alluvium brought down by the Gomati, Sai, Baruihi, Barma and Pili rivers. This has been a great advantage to this region due to which it is capable of feeding a large peasant population. The pressure of demands and necessities on agriculture is increasing very rapidly, due to growing population of the district. India is a country of villages and villagers who, for obvious reasons depend, mainly on agriculture as their principal occupation. Agriculture by and large, constitutes one of the most important sector of our economy and contributes a sizeable portion (about 50 per cent) of the national income. Agricultural sector is also called 'Primary' sector because it supplies the basic necessities of the human life provides basic input for industries and in addition to this purveys goods of exports. The temporal and spatial analysis of various aspects of agriculture in Jaunpur district reveals that this sector is gradually picking up, but in view of the growing demands of a growing population, the pace of agricultural development is not up to the mark. There are various problems and constraints like soil erosion, soil degradation, salinization, water logging, flood, drought, hail storm, lack of improved (H.Y.V.) seeds, near about 50 per cent unirrigated area, lack of power supply, agricultural credit and finance, problems of godowns, etc. The other problem related to agriculture like growing population, service centres are not effectively serving the rural areas, lack of education, skill and enterprise among the farmers is also a great drawback in the development of agricultural sector in the district Jaunpur.

Introduction: Specially Indian context the pressure of demands and necessities on agriculture is increasing very rapidly, due to growing population. Unless the agricultural sector is properly managed and the effective measures of population control are adopted, particularly in developing countries like India and others, the population-agriculture relationship which is already disbalanced will further deteriorate to an alarming extent. Agriculture is tilling crops and herding animals to produce many of the needs of life, especially foods, drinks and fibers. As the main activity of man throughout much of history, it is of particular interest to the geographer. Over thousand of years, agricultural pursuits became highly diverse regionally and cultivators and herders altered the environment on a massive scale. The cultural landscape over much of the earth's surface became largely agricultural. More than any other economic activity, agriculture is closely related to physical geographic variables viz. weather, climate, terrain and soil texture and qualities. But within roughly comparable physical, geographic circumstances, industrial nations are far more productive per acre than under developed ones. The prominent role of physical geographic factors in agriculture must not be allowed to obscure the importance of cultural variables. The selected methods of dealing with environmental conditions vary according to a number of cultural factors. Farmers in different societies possess different levels of

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पर्यावरण के विशेष संदर्भ में हरित क्रान्ति का समय परिप्रेक्ष्य में बदलता स्वरूप : एक विश्लेषणात्मक अध्ययन

• डॉ० विनीत नारायण दूब

सारांश:

देश की खाद्य, पोषण एवं आजीविका सुरक्षा हेतु कृषि आज के सन्दर्भ में भी सर्वाधिक महत्वपूर्ण है। देश में 1960-70 का दशक खाद्यान्न निर्भरता के मामले में एक घमत्कारी दशक सिद्ध हुआ, जिसमें देश खाद्यान्न के मामले में आत्मनिर्भर हो गया। खाद्यान्न तथा खेती से सम्बन्धित विभिन्न समस्याओं की ओर विश्व का ध्यान आकर्षित करने के लिए वर्ष 2017 को विश्व खाद्य दिवस हेतु चुना गया तथा 'वेन्ज द फ्यूचर ऑफ़ फूड प्रोडक्शन- इवेंट्स इन फूड सिस्टीम रिट्रिब्यूटि एण्ड सस्टेनैबल डेवलपमेण्ट' को इसका विषय माना गया। संयुक्त राष्ट्र संघ द्वारा प्रतिवर्ष 16 अक्टूबर को विश्व खाद्य दिवस के रूप में मनाने का निर्णय लिया गया है। देश को विभिन्न क्षेत्रों में आत्मनिर्भरता प्रदान करने के लिए समय-समय पर अनेक क्रान्तियों में गेहूँ व चावल के क्षेत्र में आत्म-निर्भरता हेतु हरित क्रान्ति के महानायक नारमन ई० बोरलैंग तथा डॉ० एम०एस० स्वामीनाथन के प्रयास से हरित क्रान्ति, खाद्य तेलों की समस्या के समाधान हेतु 'पीली क्रान्ति' मत्स्य के उत्पादन की प्रगति हेतु 'नीली क्रान्ति' डॉ० वर्गीज कुरियन के प्रयास से दुग्ध उत्पादन में आत्मनिर्भरता हेतु 'श्वेत क्रान्ति' चमड़े तथा ककोआ से सम्बन्धित उत्पादन हेतु 'ब्राउन क्रान्ति' तथा देश के कुत्तुकुट पालन एवं अण्डों के क्षेत्र में आत्मनिर्भरता प्रदान करने हेतु 'सिल्वर क्रान्ति' जैसी अनेक क्रान्तियों की शुरुआत हुई तथा उपरोक्त सभी सन्दर्भों में देश को पूर्ण सफलता प्राप्त हुई है। हरित क्रान्ति के विशेष संदर्भ में जहाँ हमें खाद्यान्नों के क्षेत्र में आशातीत

सफलता प्राप्त हुई। वहीं कृषि से सम्बन्धित अनेक समस्याएँ भी बढ़ी हैं। जनसंख्या में हो रही देश की दिन दुगुनी रात घीगुनी अभिवृद्धि हेतु विभिन्न फसलोत्पादन में अनेक आधुनिक प्रविधियों द्वारा पर्यावरण को दृष्टि में रखते हुए भविष्य में और उत्पादन वृद्धि की आवश्यकता है, जिससे देश की खाद्यान्न आत्मनिर्भरता सुरक्षित रहे।

'क्रान्ति' शब्द का सामान्य अर्थ किसी भी क्षेत्र विशेष में 'अभूतपूर्व' अथवा 'तीव्र गति' से होने वाले सकारात्मक परिवर्तनों से समझा जाता है। विश्व संदर्भ पर दृष्टिपात किया जाय तो प्रमुख क्रान्तियों में स्वतंत्रता आन्दोलन से सम्बन्धित क्रान्ति, (उपनिवेशवादियों के विरुद्ध) हरित क्रान्ति (खाद्य समस्या से मुक्ति के लिए उत्पादन से सम्बन्धित), नीली क्रान्ति (मत्स्य उत्पादन), श्वेत क्रान्ति (दुग्ध उत्पादन) तथा पीली क्रान्ति (तीली तथा दलहनी फसलों से सम्बन्धित) प्रमुख रही हैं। इन प्रमुख क्रान्तियों में सर्वाधिक महत्वपूर्ण 'हरित क्रान्ति' प्रमुखतः विश्व की अत्यावश्यक आवश्यकताओं में प्रमुख भूमिका तथा खाने की समस्या के समाधान से सम्बन्धित है। 'हरित क्रान्ति' शब्द में हरित शब्द 'हरा रंग' कृषि फसलों की तरीतिमा से तथा 'क्रान्ति' शब्द इस दिशा में किये गये सकारात्मक परिवर्तनों से सम्बन्धित है। सामान्य अर्थों में इसे अल्प समय में किये जाने वाले कृषिगत उत्पादन में तीव्र गति से होने वाले सकारात्मक परिवर्तनों तथा कृषि उद्योगों से समझा जाता है। पिछली सदी के छठे दशक में एक बड़े कृषि आन्दोलन का शुभारम्भ करने वाले नोबल शांति पुरस्कार से विभूषित

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Global Challenges in Water Sanitation and Health Facilities in Special Reference to Indian Scenario

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Abstract:

Drinking water supply and sanitation in India continue to be inadequate despite long standing efforts by the various levels of government and communications at improving coverage. The level of investment in water and sanitation, albeit low by international standards, has increased in size during the year 2000. Access has also increased significantly. For example in 1980 rural sanitation coverage was estimated at 01 percent and reached 21 percent in the year 2008. Also the share of Indians with access to improved sources of water has increased significantly from 72 percent in 1990 to 88 percent in 2008. At the same time, local government institutions in charge of operating and maintaining the infrastructure are seen as weak and lack the financial resources to carry out their functions. In addition, only some Indian cities have continuous water supply and according to an estimate from 2008 about 69 percent of Indians still lack access to improved sanitation facilities. The lack of adequate sanitation and safe water has significant negative health impacts including diarrhoea, referred to by travelers as the Delhi Bell and experienced by about 10 million visitors annually. While most visitors to India recover quickly and

otherwise receive proper care. A survey of the working conditions of sewage workers in Delhi showed that most of them suffer from chronic diseases, respiratory problems, skin disorders, allergies, headaches and eye infections.

Introduction:

The year 2005 marks the beginning of the "International Decade for action: water for life" and renewed effort to achieve the millennium development goals to reduce by half the proportion of the world's population without sanitation access to safe drinking water and sanitation by 2015. Currently, UNICEF and world health organization estimate that 1.1 billion people lack access to improved water supplies and 2.6 billion people lack adequate sanitation. Providing safe water and basic sanitation to meet the MDGS will require substantial economic resources, suitable technological solutions and courageous political will. We review five major challenges to providing safe water and sanitation on a global basis. Contamination of water in distribution systems, growing water scarcity and the potential for water reuse and conservation, implementing innovative low-cost sanitation systems, providing sustainable water supplies and sanitation for megacities and reducing global

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Land Use and Cropping Pattern of the District Jaunpur U.P.

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Summary: Jaunpur district lies in the eastern part of Uttar Pradesh known as Purvanchal. It constitutes an integral part of the Gangetic plain which represents the intensive subsistence tillage- system. Being a plain area it has been a permanent and dependable support to the sizeable portion of the regional population. The entire district has been formed by the deep and fertile alluvium brought down by the Gomati, Sai, Barahi, Barna and Pili rivers. This has been a great advantage to this region due to which it is capable of feeding a large peasant population. A comparative analysis of the changing pattern of land use over time and space has been attempted highlight the changing nature of agricultural sector. The net sown area average to about 72.8 percent to total reported area, while the double cropped area is 36.44 percent to net sown area. The land holding is very small about small about 87.5 percent holding belong to 0-1 hectare units. The cropping pattern during kharif and rabi seasons shows a typical subsistence agriculture. Kharif crops are grown with least efforts and cost in the study area. Main crops growing in the kharif, rabi and zaid seasons, main crops are wheat, rice, gram, bajara, maize, arhar etc.

The pressure of demands and necessities in agriculture is increasing very rapidly due to growing population. Unless the agricultural sector is properly managed and the effective measures of population control are adopted, particularly in developing countries, the population and agriculture relationship which is already unbalanced, will further deteriorate to an alarming extent. Agriculture is, tillage crops and herding animals to produce many of the needs of life, especially, food drinks and fibres. As the main activity of man through out much of history, it is of particular interest to the geographers. Over thousand of years, agricultural pursuits became highly diverse regionally, and cultivators and herders altered the environment on a massive scale. India is a country of villages and villagers who for obvious reasons depend, mainly on agriculture as their principal occupation. Agriculture, by and large, constitutes one of the most important sectors of our economy and contributes a sizeable portion about 50 percent of the national income. Agriculture sector is also called primary sector because it supplies the basic necessities of human life, provides raw inputs for industries and in addition this, purveys goods of exports.

Objectives: Main objectives of the research paper is that the district Jaunpur agricultural development, why is back ward and which factors are responsible for this situation of the agricultural development of the district. To assess the land use and cropping pattern and variations of the crops in different areas of the district and to assess the changing nature and role of service centre's in the agricultural development of the district.

Methodology: In this research paper all the collection of secondary data from different published source i.e. district gazetteers, agricultural department of the district sources and statistical patrika of many years and other source of the related fields like related magazines, books and districts national information centre's data.

Land use Pattern: A comparative analysis of the changing pattern of land use over time and space has been attempted to highlight the changing nature of agricultural sector. The occupation of agriculture in the district is permanent as it is being carried out here for the last several centuries. Naturally, the long



Educational Facilities, Major Problems and Spatial Plan For District Jaunpur, U.P.

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Received- 18.11.2020.

Revised- 14.11.2020.

Accepted - 17.11.2020

Abstract: The etymology of Jaunpur is uncertain. It may be derived from the word Janadagat a famous Hindu writer (rishi) or it may be derived from the Muslim name Janan. In 1331 AD founded by First Shah Tughlaq. Archaeological evidence of Jaunpur district dates to the late vedic period (1500-100 B.C.). In the 4th Century B.C. Jainism and Buddhism were introduced to the region. In 2011, an official census was made in Jaunpur district. It recorded a population of 46,59,772 of which 22,56,437 were female and 22,74,235 male. Between 2001 and 2011 the population of Jaunpur district grew 14.88 per cent. Literacy increased from 38.84 to 72.68 per cent. In 2011, 84.46 per cent of men were literate and 64.7 per cent of women. This district is exceptional in sex ratio because there were 1018 women for every 1000 men, in comparison to 944 across India.

Key words- uncertain, derived, word, Janan, derived, founded.

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There are six types of education facilities are available in the district like primary to higher and technical education. There are more than 3400 primary schools, 151 middle schools, 443 secondary and senior secondary schools, 133 colleges and one university and one medical college (under construction) in the district Jaunpur. There are many problems in the development of education in the district. There is suggested a spatial plan for educational development in the district. There are 6 taluqa, two tehsils and 10 village committees in the district.

Introduction: well known for its past and the glory of Jamun Jaunpur holds its own important historical, social and political status. The provision of adequate social facilities for the over all development of an organized and disciplined human societies marks the prime concern of a government, planners and politicians. The magnitude and quality of the social facilities is not only indices of the level of social economic development of human society, but it also contributes alot to shaping its human forms and activities. Therefore, the study of the spatial pattern of social facilities in the region comprises a significant part of academic as well as applied research. In India too, the provision

of adequate facilities for the people has been expected as an important goal in the constitution. The minimum needs programme as enunciated in the approach paper to the fifth plan spells out what is meant by adequate social facilities and the norms have to be followed for implementing the programme. In his programme the elementary education is important programme. There are two ways of looking at the educational policies. The guiding principles in the constitution and the MNP of planning commission view them as response to their basic right of the citizens of a free country. Seeing this way, the provision of educational facilities becomes an end itself. It may not necessarily be linked to other productive activities, as it is a basic right of the individual citizen and it has got to be provided, as civilized countries will do other wise although in a developing situation. Where resources are limited, expenditure on education is related to productive activities. As such they may be considered unproductive and will get a low priority. This point of view is understand as social facilities in India have rarely been seen within the framework of a comprehensive plan geared to the other all improvement of the country. Productive use of social facilities which will serve the needs of poorer section as well as of the economy, can be made in two ways. The short term use will be to provide these facilities in decentralized location especially service centre where many new programmes have to be implemented. From a long

METAL COMPLEXES OF 1-BENZOYL-1-CYANOETHYLENE-2, 2-DITHIOLATE LIGAND - SYNTHESIS AND CHARACTERIZATION

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Abstract - Binmetallic complexes $[MM'(bcd)_2]$ ($M = Cu^+$; $M' = Ni^{2+}$; $M = Fe^{2+}$; $M' = Cu^+$; $bcd^{2-} = 1$ -benzoyl-1-cyanoethylene-2,2-dithiolate²⁻ and their I_2 -doped products have been synthesized and characterized using various spectroscopic techniques, magnetic and solid-state electrical conductivity technique. Their I_2 -doped products show behavior of semiconductivity in the 303-523 K temperature range.

1 INTRODUCTION

A binmetallic coordination polymers of the type $[MM'(bcd)_2]$ ($M = Cu^+$; $M' = Ni^{2+}$; $M = Fe^{2+}$; $M' = Cu^+$; 1-benzoyl-1-cyanoethylene-2,2-dithiolate²⁻ (bcd^{2-}) have been synthesized and have been characterized by elemental analyses, magnetic susceptibility, IR and UV-visible spectroscopies and the solid-state electrical conductivity technique. The solid-state electrical conductivities, σ_s , $\sim 10^{-45} \text{ cm}^{-1}$ is measured at room temperature and increase in conductivity with increase in temperature in the 303 - 523 K range with activation energies, $E_a = 0.20 - 0.68 \text{ eV}$ show semiconducting properties of $[FeCu(bcd)_2]$. The conductivity of I_2 -doped products of the complexes are increased in 10^{-10} order of magnitude and show the behavior of semiconductors over the given temperature range.

The coordination polymers involving heterometals with different electronic properties and with N, S based ligands have attracted considerable attention not because of their structural diversities but also for their interesting electrical and magnetic properties.¹ This ligand has a potential as a rubber vulcanization accelerator.² The literature³⁻¹⁰ contains limited examples of the heterobimetallic complexes of the ligand bcd^{2-} , which show diversified coordination patterns with transition metal ions.

Keeping this position mind, the interesting molecular conducting and magnetic¹¹⁻¹⁴ properties of the monometallic and binmetallic complexes of sulfur and nitrogen containing ligands such as thiocyanate (SCN)¹⁵⁻²² and 1,1- as well as 1,2- dithioligands,²³⁻²⁷ herein we report the synthesis, characterization and electrical properties of the heterobimetallic complexes formed with

the ligand 1-benzoyl-1-cyanoethylene-2,2-dithiolate²⁻ and the metal ions Ni^{2+} , Fe^{2+} , and Cu^+ . An important aspect of undertaking the present work is that the ligand bcd^{2-} having an additional sulfur atom in the heterocyclic ring which is normally not associated in bonding with the metal ions may induce substantial S...S/M...S intermolecular stacking, an important prerequisite for the higher conductivities of the complexes.

2 EXPERIMENTAL SECTION

2.1 Materials and General Procedures

All the experiments were carried out in open atmosphere without eliminating moisture and oxygen from the reaction chamber because the ligand and the starting metal salts are stable in aqueous medium. All the reagents used were commercially available and used without further purification. Sodium benzyloacetoneitrile was prepared according to reported literature²⁸ by treating an ethanolic solution of benzyloacetoneitrile with stoichiometric amount of sodium hydroxide in absolute ethanol. The sodium 1-benzoyl-1-cyanoethylene-2,2-dithiolate (Na_2bcd) was prepared in situ by adding CS_2 (1.5 mL, $\sim 2 \text{ mmol}$) to a stirring solution of sodium benzyloacetoneitrile (0.38 g, 2 mmol) in 20 mL DMSO. The colour of the reaction mixture rapidly changed from yellow to red. Red solution of Na_2bcd was obtained was used for the preparation of the complexes. Elemental analysis (C H N) was performed on a Carlo Erba 1108 element analyzer at CDRI, Lucknow. The compounds were decomposed by aqua-regia and the metals, nickel as dimethylglyoximate, copper as cuprous thiocyanate and iron as oxalate were determined gravimetrically following

The Economic Impact of Covid-19 on Agriculture of India

Dr. Sandip Kumar Pandey*

Abstract

Since World War II, the COVID-19 epidemic has posed the world's greatest humanitarian problem. The virus has spread widely, and the number of cases is increasing every day while governments try to contain it. India had acted quickly, enacting a proactive 21-day nationwide shutdown with the intention of flattening the curve and allowing sufficient time to prepare and resource solutions. However, India's efforts to combat the COVID-19 virus have been hindered. The lockdown, on the other hand, came at a financial cost and had a cascade effect across society. In India, the Covid-19 induced lockdown caused a severe economic shock. It brought the economy to a halt by forcing businesses in all sectors to shut down completely. Despite the fact that agricultural activities were exempt, the agriculture value chain was severely disrupted in the early stages of the lockdown. This has a significant negative impact on the rural Indian economy. In several sections of the country, the coronavirus epidemic has sparked a significant reverse migration from urban to rural areas. While other sectors have been reported to be suffering from significant strains, it is crucial to examine the impact on agriculture and related sectors, which employ the vast majority of India's population.

Keywords: Agriculture, Lockdown, Covid-19, Economy

Introduction

The new Coronavirus (COVID-19) epidemic has quickly expanded over the world, inflicting havoc on the lives and livelihoods of millions of people. India, like the United States, has already become a viral hotspot. The first instance of the pandemic in India was discovered in January 2020, causing authorities to swiftly implement a range of measures to slow the virus's spread. Because the disease is highly contagious, a much-needed statewide lockdown was imposed on March 23, 2020, to prevent the COVID-19 pandemic from spreading. During the first few weeks, the restrictions were strict and all non-essential activities and businesses, including retail stores, educational institutions, and sites of religious devotion, were prohibited across the country. As a result, in most parts of the country, these restrictions are gradually being lifted one by one. As the restrictions imposed by the lockdown loosen, it's a good moment to examine COVID-19's influence on various economic sectors. According to several reports, the Indian economy may contract in 2020-2021. This is a worrying sign, because a higher GDP leads to higher living standards, lower poverty, and improvements in other socioeconomic indicators.

A pandemic shock, when compared to a natural shock such as drought or flood, or a trade embargo, may have a greater economic impact due to the loss of human lives. Without a doubt, all of these shocks have an influence on agricultural systems; nevertheless, pandemic shocks affect all sectors of an economy. Droughts are usually localised, affecting only the affected industry or stakeholders, whereas pandemics change food demand and supply across the whole supply chain. Similar to trade embargo shocks, trade embargo

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Climate Change's Impact on Crop Productivity and Indian Agricultural Economy

Dr. Sandip Kumar Pandey*

Abstract

Agriculture is a major source of greenhouse gases, which contribute to climate change and the greenhouse effect. However, climate change is having far reaching effects on agricultural production, which will certainly pose a future threat to food security. Food insecurity is predicted to worsen as a result of climate change, which will raise food prices and reduce food production. As energy prices rise as a result of climate change mitigation measures, food may become more expensive. Due to growing crop water demand and drought, water essential for food production may become scarce. As certain locations become climatically unsuitable for production, competition for land may increase. Furthermore, catastrophic weather events linked to climate change may result in abrupt decreases in agricultural productivity, resulting in quick price hikes.

Climate change has a huge impact on the availability of a variety of resources around the world, especially water, which is necessary for life. Changes in the environment, biodiversity, and natural resources are threatening human health and quality of life. In the twenty-first century, India is anticipated to warm faster than the rest of the world. India will also see increased seasonal temperature differences, with winters warming faster than summers. Due to rising overnight temperatures and hotter days, India's heat waves have persisted longer in recent years, and this trend is expected to continue. The average temperature change is projected to be 2.33°C-4.78°C with a doubling of CO₂ concentrations. These heat waves would result in increased variability in summer monsoon precipitation, wreaking havoc on India's agrarian sector. Climate models predict steady increases in global carbon dioxide (CO₂) concentrations and temperatures. On the other hand, these models aren't very successful at forecasting future changes in local weather. Local meteorological characteristics such as rain, temperature, sunshine, and wind, in combination with locally appropriate plant varieties, cropping patterns, and soil conditions, can boost food production as long as plant diseases are controlled.

Keywords: Climate change; Economy; Agriculture; Rainfall; Crop productivity

Introduction

Weather and climate have a significant impact on agriculture. While farmers are typically adaptable in dealing with weather and year-to-year unpredictability, established infrastructure, local farming practice, and individual experience all contribute to a high degree of adaptability to the local climate. As a result, climate change is likely to have an impact on agriculture, potentially jeopardizing traditional farming systems while also giving opportunity for improvement.

Crop development is expected to be influenced by changes in temperature, precipitation, and CO₂ concentrations. The overall impact of climate change on world food production is projected to be low to moderate with excellent adaptation and enough

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Milk Production and Dairy Development in India

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Manisha Mishra

ABSTRACT

The dairy sector has been a major pillar in sustaining the development of dairy in India. The importance of this sector has been the focus of the Government of India. The National Milk Producers' Union (NMPU) was established in 1948. The Government has developed and managed the Dairy Development Scheme (DDS) in response to the expansion of dairy in dairy farmers. The Government has also been successful in increasing the number of dairy farmers and the number of milk animals. The Government has also been successful in increasing the number of dairy farmers and the number of milk animals. The Government has also been successful in increasing the number of dairy farmers and the number of milk animals.

India having the largest human population in the world ranks first among the world's milk producing Nations since 1996. Milk production in India during the period 1950-51 to 2014-15 has increased from 17 million tonnes to 146.4 million tonnes as compared to 13.77 million tonnes during 2013-14 recording a growth of 2.25% AD. In 2014-15, India recorded 3.1% increase in total milk production from 795 million tonnes in 2013 to 822 million tonnes in 2014. The per capita availability of milk in the country, which was 130 gram per day during 1950-51 has increased to 322 gram per day in 2014-15 against the world average of 294.7 grams per day during 2013.

Thus, it can be safely noted that there is sustained growth in milk production and per capita availability milk production and per capita availability of milk in the country in general and states under reference in the particular during the period of second half of the past century and the two decades of the present.

Suggestions

Since the dairying has become an important secondary source of income for millions of rural families and has assumed the most important role in providing employment and income generating opportunities to the farming population, marginal and small, marginal farmers and landless labourers of the country, the dairy development should be taken on priority basis by the planners and the Government for the purpose of prosperity of rural population of the country.

20. *Chlorophyll a* and *Chlorophyll b*

५५. अर्थात् अर्थ, तब एव सर्वत्र समान है, कि पूर्व सत्य एवं समस्त सत्यम्, अथवा, ५६



SYNTHESIS OF [4-(4-oxo-2-phenyl-4H-quinazoline-3-yl)-phenoxy]-acetic acid-N-(substituted phenyl)-thiosemicarbazides AND THEIR BIOLOGICAL ACTIVITY

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Abstract:- The reaction of [4-(4-oxo-2-phenyl-4H-quinazoline-3-yl)-phenoxy]-acetic acid hydrazide with various phenyl isothiocyanates in isopropyl alcohol gave [4-(4-oxo-2-phenyl-4H-quinazoline-3-yl)-phenoxy]-acetic acid-N-(substituted phenyl)-thiosemicarbazides. The structure of the newly synthesized compounds have confirmed by IR, ¹HNMR and Mass spectra. The compounds have also been screened for their biological activity.

Keywords:- Thiosemicarbazide, IR, Spectral studies, Biological activity.

1. INTRODUCTION

The Chemistry of heterocyclic is an interesting branch in organic chemistry. Thiosemicarbazides derivatives are known to possess antibacterial^{1,2}, antifungal^{3,4} and herbicidal⁵ activities. Quinazoline derivatives are important compounds in chemistry and pharmacology which include anticancer⁶, anti-inflammatory⁶, anticonvulsant⁷ and antidiuretic⁸ activities. These biological data prompted us to synthesise some new quinazoline containing thiosemicarbazide derivatives.

2. EXPERIMENTAL

2.1 General Procedure

Melting points were taken in open capillaries and are uncorrected IR spectra (KBr in cm⁻¹) were recorded on Jasco 410 plus FTIR spectrophotometer. ¹HNMR spectra were recorded on a JEOL 300 MHz FT-NMR spectrophotometer using DMSO-d₆ as solvent and TMS as internal standard (chemical shift in ppm).

The mass spectra of compounds were determined with Shimadzu model no. OF 2010. The element analysis was carried out on a Perkin Elmer C,H,N analyser and sulphur analysis was obtained by oxygen flask method. The purity of the compounds was monitored by thin layer chromatography. TLC was carried out on pre-coated 0.2mm silica gel on F²⁵⁴ plates.

2.2 General Preparation

1. [4-Acetyl amino-Phenoxy]-acetic acid ethyl ester-(2)

A solution of 4-(hydroxy phenyl)-acetamide (1) 14 gm (0.1 mole) 400 ml N,

N-dimethyl formamide was heated at 70^o-75^oC with ethyl chloroacetate (12.47 ml, 0.10 M) in an oil bath in presence of anhydrous potassium carbonate (12.8 g, 0.10 mole).

The reaction mixture was cooled and 1500 ml of cold water was added. The white coloured crystalline solid separated was filtered and washed thoroughly with cold water and then with cold ethanol and finally recrystallised from 99% ethanol, yield 72% m.p. 102^oC, IR (KBr)(cm⁻¹) 3345(NH), 1745 (C=O, ester), 1590, 1510, 1510, 1475 (C=C, aromatic).

2. (4-amino-phenoxy)-acetic acid ethyl ester-(3)

Compound 2, (22.7 g, 0.1 mol) was heated with 35 ml concentrated with hydrochloric acid and 100 ml water for about 2 hours. The clear solution obtained was filtered and neutralisation with 35 ml of sodium acetate solution. The compound as white crystalline solid separates on filtration. Yield 73%, m.p. 250^oC, IR (KBr)(cm⁻¹) 3466(NH), 1650(C=O), 1580, 1510, 1445(C=C, aromatic).

3. (4-amino- phenoxy)-acetic acid ethyl ester-(4)

Compound 3, (10.58g, 0.05 mol) was suspended in 250 ml ethanol and cooled to 10^oC. The reaction mixture was refluxed for about 2 hours and the product was extracted with 3x25ml of dichloromethane. The dichloromethane layer was washed with 3x20ml of water. The compound 4 obtained on distillation



Indian Journal of Agriculture
and Allied Sciences

[illegible]

Received 14.10.2018; Accepted 20.03.2019
Publication Date: 07 March 2019

PRODUCTIVITY DIFFERENCE BETWEEN EXPERIMENTAL PONDS (BHU) AND FISHER'S POND AQUACULTURE PRODUCTION SYSTEMS IN NORTHERN INDIA

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[illegible]

Approximately 10.8 million tonnes (MT) of fish in 2010, the third highest in the world, after China and Indonesia. India's share of global fish production was around 4% according to the FAO. In aquaculture, India followed only by China, with a 7% share in global production. India exported a total of 2.22 million MT. The contribution of MT to the gross domestic product is about 1.25 percent in 2010-11. Further, the share of fisheries in agricultural GDP (Gross Domestic Product) has increased from 2.1 percent in 1990-91 to 3.11 percent in 2010-11. The modified Cyclic Diagram production and decomposition model technology were used to estimate the influence of factors. This study was conducted in Maharashtra, State of western India. Freshwater, total of 10 Prawn fish ponds, 148 common carp fish ponds, 42 tilapia fish ponds and 100 sea bass ponds. Thus, a total of 200 fishers of four species were selected for the study. The decomposition analysis revealed that the year to year contribution of fisher's ponds production systems of aquaculture was less than that an experimental ponds (APHC) production system of aquaculture 22.41 per cent and the combined difference 22.92 per cent difference in the productivity of experimental ponds (APHC) production system and fisher's ponds production system of aquaculture. The contribution of experimental ponds (APHC) systems technology to the productivity difference between the fisher's ponds production system of aquaculture was found 21.25 Percent.

Keywords: *Experimental ponds; Native ponds; Cold-temperature production and decomposition; Sediment*

bioethanol. The country also occupies second position in the world after China. Agricultural systems for about half of the total 56 production and provides food and nutritional security to millions of people at affordable prices as well as sustenance to the livelihood support to a large number of rural populations in the country. The Fisheries sector is an important drive to the coastal socio-economic development of India. Fish production was fully commercial activity in the early 1950s, but the inland and aquaculture have now witnessed one of significant commercial growth. The sector's contribution to national production food and nutritional security and income generation remains to be

well recognized. The number of people employed in direct production in the sugar sector is taken as the only indicator of the magnitude of relative contribution to the national economy. The contribution of people engaged in other auxiliary activities, such as processing, net and gear making, net production and supply, fuel collection and maintenance, packaging, marketing and distribution is also substantial and adds to the overall contribution from the sector. However, those engaged in research, development and administration tend to view the fishing sector as one dominating contributor to the sustainable growth of the nation. Overground the world fisheries sector has been subject to numerous criticisms in recent

SUN TOWN P.G. COLLEGE
(Autonomous)

डॉ. रावेंश कुमार सिंह

संसार, परम ब्रह्म, अमृत विदित जैसे विद्वान् दर्शन प्राप्तकर्ता, जगत् की अनुभूति करते हैं। इन विद्वानों का मानना है कि असीक के सत्यों से बनाकर जगत् रचना के सम्बोधन का तरीका, जगत् पर सही प्रतीकात्मक अनुभूति, जगत्, अमृत, अमृत, पवित्र अमृत ईशान से ही ज्ञान की रूप है। इसका अर्थ है कि, जगत् का जगत् सत्य जगत् जगत् में अनुभूति की रूप। यन्तु यदि मुख्य रूप से देखा जाए तो अपने जगत् में अमृत विद्वान् अमृत हो जाते हैं। अमृत के अमृत जगत् जगत् के अपने अमृत विद्वान् अमृत के अमृत से तथा इस पर परम ब्रह्म है अमृत अमृत के अमृत पर अमृत अमृत। एम के एम के अमृत अमृत के अमृत 600-200 सी.ई. निर्मित है। परम ब्रह्म में अमृत पर पवित्र अमृत के अमृत ईशान से अपने की भारतीयों को अमृत अमृत

Shodh Sandesh VI • Vol. XV III • March 2015 • 29

भारतीय संस्कृति विविधता में एकता की सूत्रधार

राकेश कुमार सिंह

असिस्टेंट प्रोफेसर, प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्व विभाग
श्री मुरली मनोहर टाउन पी०जी० कलेज, बलिया

भारतीय संस्कृति की कुछ ऐसी विशेषतायें हैं जो विश्व के अन्य देशों की संस्कृतियों में दृष्टिगत नहीं होती। अपने विशिष्ट तत्वों के कारण ही भारतीय संस्कृति ने विश्व के देशों में अपनी महत्व को बनाये रखा है। बहुआयामी कृतित्व एवं व्यक्तित्व के धनी पं० दीनदयाल उपाध्याय का भारतीय संस्कृति के प्रति बहुत ही व्यापक दृष्टिकोण था। भारतीय संस्कृति एवं सभ्यता के सम्बन्ध में पं० दीनदयाल ने महात्मा गाँधी की तरह कोई वाद प्रस्तुत नहीं किया। इन्होंने अपने प्राचीन सभ्यता एवं संस्कृति के विशिष्ट तत्वों को ही जीवन में अनुसरण करने पर बल दिया।

पं० दीनदयाल उपाध्याय राजनेता मात्र नहीं थे, वह उच्च कोटि के चिंतक, विचारक और लेखक भी थे। इस रूप में उन्होंने श्रेष्ठ शक्तिशाली और संतुलित रूप में विकसित राष्ट्र की कल्पना की थी। ये विकसित प्राचीन भारतीय संस्कृति की विचारधारा के पोषक थे। इन्होंने पश्चिमी संस्कृति एवं धर्म में तथा भारतीय प्राचीन संस्कृति एवं धर्म में अन्तर स्पष्ट किया। इनके विचार के अनुसार पश्चिमी विज्ञान और पश्चिमी संस्कृति दोनों अलग-अलग चीज़ें हैं, पश्चिमी विज्ञान बहुत सार्वभौमिक है और हमें आगे बढ़ना है तो इसे जरूर अपनाया जाना चाहिए। परन्तु पश्चिमी जगत के अफ़ेला भारतीय संस्कृति अधिक सार्वभौमिक है और यदि हमें आगे बढ़ना है तो हम अपने सभ्यता एवं संस्कृति के नैतिक, धार्मिक, आध्यात्मिक तत्वों से प्रेरणा ग्रहण कर विकास कर सकते हैं। उनके अनुसार— "नैतिकता के सिद्धान्त किसी व्यक्ति द्वारा बनाये नहीं जाते बल्कि खोजे जाते हैं।"

अंग्रेज़ी का शब्द रिलिजन को धर्म के लिए सही शब्द नहीं मानते थे। उनके अनुसार — "धर्म के मूल सिद्धान्त सत्य और सार्वभौमिक हैं।"

पं० दीनदयाल उपाध्याय जी का एकात्म मानववाद एवं तैत्तिक चिन्तन

श्री० ज्योतिषन मिश्र

1. **Identifying the Issue:** The first step is to identify the specific problem or issue that needs to be addressed. This involves understanding the context, the stakeholders involved, and the goals of the project.

की सुश्रुतापेक्षा में प्राथमिकता देना



एक टीचरवाल परभावण जी बलक जी अंदर सामाजिक सेवा का मंत्र बताया करने की ही शिक्षा का परमार्थगत मान्यता है। वे शिक्षा एवं संस्कार के द्वारा ही समाज के जीवन मूल्यों का निर्माण करने की क्षमता है। समाज में अनुशासन एवं जवाबदारी रख-रखाव नहीं रह सकती। समाज में संलग्न बनाने रखने हेतु हम समाज को सामाजिक जीवनमूल्यों को स्थापित करना होगा, जो शिक्षा द्वारा ही संभवता से प्राप्त किया जा सकता है। यहाँ समाज का अर्थ रूप होता है, जो आज की बदलते काल में शिक्षा प्रदान कर रहा है, जो सभी समाज में चलने वाले सभी शिक्षा प्रदान करेगा। आज शिक्षा एवं विज्ञान का दमिय है कि यह आज की दुनिया को अपनी संस्कृति का स्वरूप बनाए, जहाँ राष्ट्रभाषा का विकास करें, उन्हें स्वातंत्र्य का सही अर्थ समझाने तथा स्वामी विवेकानंद जैसे गुरुओं का निर्माण करें, जिससे प्रेरित जी का "भारत मुक्तिर्निर्माण" का स्वप्न साकार हो सके। उपर्युक्त जी स्वातंत्र्य की ओर स्पष्ट हुए कहते हैं कि-आजारी सर्वत्र नहीं हो सकती है, जो यह हमारी संस्कृति की अभिव्यक्ति का स्वरूप बन जाये।

Figure 1

इस दिनदहाले उपलब्धता की इस मांगना का कि "सुखचली विविधतायें" का अवलोकन करने वाला मातापिता, विश्व कल्याण के मार्ग को प्रभावित कर सकता है। हालांकि वे यह भी मानते थे कि विश्व में भी ऐसी अच्छी विचारधाराएँ हैं जिनसे लोक कल्याण या विश्वव्याप्ति स्थापित की जा सकती है, यद्यपि हमने परस्पर आलोचना का अभाव है। "ये सब ऐसी आदर्श हैं जो अच्छे हैं। मानव की ऐसी

Philosophical Aspect of Universal Religion & Education

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Abstract

"There is only one religion, the religion of love."

- Sri Satya Sai Baba

Further he says: "As all rivers reach the same ocean, all religions are the path to the one and the same God." So various religions are in fact different roads converging at the same destination. Thus the universal religion is unity in diversity. He has confirmed the divine concept by giving to the world a symbol which incorporates the emblems of five major religions of the world, denoting at the same time the five basic human values namely – Satya, Dharma, Shanti, Prem & Ahimsa. On the reference Universal Religion Sri Sai says "Sanatan Dharma is a great Grandfather, Buddhism is the son, Christianity is Grandson, and Islam is the great Grandson. So all the religions form one family" As there is no separable Sun of Hindus, Muslims, Christians, Buddhist, Sikhs etc. There is no separate truth of each religion. Not difference in religions and communities. It's the mind of the man, which is responsible for conflict and disturbances. It's the grave mistake to attribute unrest and disturbances in a society to existence of different religions. For thousand of years, people live in India have lived in unity and fraternity in spite of existence of various religions and communities.

Although all religions are supposed to promote love, peace, harmony and happy co-existence in the world. There is nothing basically wrong with any religious faith. All religions teach higher values, proper moral code and all sorts of good things to their followers and promise them happiness, self-realisation, salvation and a good life here and here after. So all religions have come into existence to lead man to Divinity, not to create conflict and disturbances. Education is an important tool bringing behavioural change in man with respect to universal religion, which promotes love, peace, harmony, and happy co-existence in all group of religions.

Introduction :

Religion: The word origin from Latin word religio-ous, meaning bond/unions(with God). We know from scriptures of most religions that God is in everything and everything is God. Every religion has its own Philosophy which is unique to itself and which enables to differentiate it from other religion. Philosophy deals with the whole subject matter of religion, i.e. the basic principles, aims and means to

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- हुनकार जन्म 7 मई 1961 को कोलकाता के जेठानीको हाथकान्हाडी में हुआ, हुनकार पिता रीन्दाकान्हा ठाकुर और माता बाबाय देवी थी।
- हुनकारने अपनी शालात्मिक शिक्षा सीट जेठानी स्कूल में पूरी की थी।
- टीनैज की बेसिस्ट बनने की चाहत में हुनकार पिता की से हुनकार नाम 1978 में हुनकार के मित्रात्मक पब्लिश स्कूल में दाखल कराया, जेठानी बेसिस्टकी में हुनकारकी लक्षि न होने के कारण से 1980 में पिता विद्या रीन्दाकान्हा हिंदू की मांग पर जा गए।
- हुनकार पिता जन्म 1982 में पुनर्जातिनी देवी के साथ हुआ था।
- रीन्दाकान्हा ने अपनी पहली शाला में हाहाहा आज हमें की अपराध में सिद्धी की, हुनकारने अपराध 2000 पीसी की सफाई की थी।

शिक्षा का अधिकार अधिनियम का समीक्षात्मक अध्ययन

डॉ० ओंकार सिंह

एग्रेगेटेड प्रोफेसर

बीएच विभाग, श्री गुरुजी कॉलेज टाउन ब्लाक पाणिपत, हरियाणा (2020)

सार संक्षेप

यह विवेक बल से सत्य है कि भारतीय सभ्यता के विकास में शिक्षा का पहलवानपूर्ण योगदान है। शिक्षा ही वह सशक्त माध्यम है, जो मानव में अन्तर्निहित शक्तियों का विकास कर समग्र व्यक्तित्व प्रदान करता है। प्राथमिक शिक्षा, औपचारिक शिक्षा का वह प्रथम स्तर है, जिस पर माध्यमिक एवं उच्च शिक्षा का विकास भवन निर्मित होता है। प्राथमिक शिक्षा का सम्बन्ध किसी वर्ष का व्यक्ति विशेष से न होकर सम्पूर्ण जनसमुदाय से है। अतः इसे मूलभूत स्वरूप में प्रवेश बच्चे को सर्वशुलभ करके राष्ट्र को सशक्त एवं विकसित बनाए जा सकता है। राष्ट्रीय स्वतंत्रता प्रश्न के पश्चात् राष्ट्र के मिश्रणार्थी ने भारतीय संविधान में प्राथमिक शिक्षा की सार्वभौमिकता को प्रति प्रतिबद्धता दिखायी, जिसके परिणाम स्वरूप संविधान के अनुच्छेद-५१ के अन्तर्गत सर्वोच्च स्तर पर १० वर्षों की सीमा ६-१४ वर्ष की सभी बच्चों को प्राथमिक शिक्षा निःशुल्क एवं अनिवार्य रूप से प्रदान की जायेगी, परन्तु अब तक राजनैतिक दृष्टिकोण से कमी एवं प्रतिबद्धता के अभाव में यह उद्देश्य अगस्त-सत्रह में ४ अगस्त २००९ को शिक्षा का अधिकार अधिनियम पारित हो गया जिसके परिणाम स्वरूप देश के सभी बच्चों को शिक्षा का मौलिक अधिकार प्राप्त हो गया।

वैधानिक पृष्ठभूमि-

भारतीय संविधान में प्राथमिक शिक्षा के सार्वभौमिक प्रतिबद्धता के अनुसार संसद ने ४ अगस्त २००९ को ६-१४ वर्ष की सभी बच्चों को निःशुल्क एवं अनिवार्य शिक्षा देने का अधिकार अधिनियम पारित हो गया तथा २९ अगस्त २००९ को राज्य सरकार की गजट में प्रकाशित हुआ। इससे अन्तर्गत ६-१४ वर्ष की सभी बच्चों को अपने प्रदेश के विद्यालय में आठवीं कक्षा तक बुनियादी शिक्षा निःशुल्क एवं अनिवार्य रूप से देने का अधिकार संभूत है। इस अधिनियम के अन्तर्गत यदि ६ वर्ष की आयु तक किसी बालक को विद्यालय में प्रवेश नहीं हो पाता है तो यह बाद में भी अपनी उम्र के अनुसार उम्र में प्रवेश से सकता है। इस प्रकार उसे अपनी कक्षा के स्तर पर जाने के लिए निःशुल्क प्रशिक्षण का अधिकार भी होगा। किसी भी बच्चे के प्रवेश के इन्कार नहीं किया जा सकता और जब तक उसकी बुनियादी शिक्षा पूरी नहीं हो जाती, उसे न तो विद्यालय से विदाता जायेगा। यदि वह १४ वर्ष निर्धारित आयु तक बुनियादी शिक्षा पूरी नहीं कर पाता तो भी उसके बाद पढ़ाई पूरी होने तक उसे निःशुल्क शिक्षा दी जाती रहेगी।

महामारी में सामाजिक परिवर्तन एवं प्रभाव: स्त्री परिप्रेक्ष्य

❖ निशा कश्यप

कोरोना महामारी वैश्विक स्तर की ऐसी घटना है जो शायद ही भुलाई जा सके। इसने दुनिया को रुकने के लिए विवश कर दिया। साथ ही एक ही समय में विश्व को एक परिस्थिति में बांध दिया।

प्रस्तावना : भारत में कोविड महामारी की असदी का विकराल रूप सामने आया। जब कोविड की विकट परिस्थिति में सरकार को लालाबंदी करनी पड़ी, जिसके परिणाम स्वरूप प्रत्येक व्यक्ति अपनी यथास्थिति में ही रहने के लिए विवश था। इस स्त्री केंद्रित आलेख में हम लालाबंदी से उत्पन्न नई परिस्थितियों में महिलाओं की पारिवारिक, सामाजिक एवं आर्थिक दशाओं को जानने एवं उसकी व्याख्या करने का प्रयास करेंगे। हालांकि लालाबंदी के बाद भी स्थितियाँ पहले जैसी नहीं हो पाईं। बल्कि बदली हुयी परिस्थितियों को सहज स्वीकार करने के लिए नए शब्द "न्यू नॉर्मल" का उपयोग होने लगा। इस नई परिस्थिति में सामाजिक संबंध और अंतःक्रियाएं प्रभावित हुई हैं। समाज में औपचारिक और अनीपचारिक संबंध की स्थिति क्या है?

पारिवारिक स्थिति : सामाजिक व्यवस्था को बनाए रखने में परिवार की महत्वपूर्ण भूमिका होती है, कोरोना काल एवं लॉकडाउन में परिवार की उप-व्यवस्था को बनाए रखने के लिए व्यावहारिक परिवर्तन आया। कोरोना काल में परिवार के संरचनात्मक रूप में कोई बदलाव नहीं आया है, लेकिन परिवार के कार्यवादी एवं अंतःक्रियावादी दृष्टिकोण में बदलाव देखने को मिल रहा है।

लालाबंदी की असामान्य स्थिति ने परिवार की महिलाओं पर प्रतिकूल प्रभाव डाला। क्योंकि पितृसत्तात्मक परिवारों में महिलाएँ दोयम दर्जे की सदस्य हैं, लॉकडाउन के कारण वे दिन-रात के चक्र में परिवार के पुरुष सदस्यों के साथ रहने को विवश रहीं। समाचार पत्रों, सोशल मीडिया एवं इलेक्ट्रॉनिक समाचार स्रोत से स्पष्ट जानकारी मिलती कि महिलाएँ महामारी में सबसे अधिक तनाव झेल रही थीं। तनाव के बहुत सारे कारण सामने आए। जिसमें सबसे महत्वपूर्ण या पर के काम-काज का दबाव। हमारी सामाजिक व्यवस्था के प्रारूप में महिलाओं के

Inorganic Chemistry

Monodentate Coordination of N, N'-Disubstituted Thiocarbamide Ligands: Syntheses, Structural Analyses, In Vitro Cytotoxicity and DNA Damage Studies of Cu(I) Complexes

Sunil K. Pandey,^[a] Durga P. Singh,^[a] Gaetano Marverti,^[b] R. J. Butcher,^[c] and Seema Pratap^{*[a]}

Structural analysis of three novel disubstituted thiocarbamide ligands: N-(naphthyl)-N'-(diisobutyrcarbonyl) thiocarbamide (**H₂L¹**), N-(4-methoxyphenyl)-N'-(diisobutyrcarbonyl) thiocarbamide (**H₂L²**) & N-(2-methoxy-4-nitrophenyl)-N'-(diisobutyrcarbonyl) thiocarbamide (**H₂L³**) and their copper(I) complexes: [CuL¹]/CuCl (1), [CuL²]/CuCl (2) and [CuL³]/CuCl (3) was performed using various spectroscopic techniques (FT-IR, ¹H and ¹³C NMR, HRMS, DSC, DSC analysis and single crystal X-ray studies of **H₂L¹**) and [CuL¹]/CuCl (1). The copper(I) complexes possess trigonal planar geometry coordinating through two thione sulfur atoms from two ligand molecules and one chloride ion. Two intramolecular hydrogen bonding interac-

tions present between C=NH and carbonyl oxygen (C=O) and coordinated chloride stabilize the trigonal planar structure of the complexes. Cyclic voltammogram of complexes 1-3 displayed quasi-reversible redox behaviour corresponding to Cu⁰/Cu⁺ couple. Determination of in vitro cytotoxicity of ligands and their complexes using five human carcinoma cell lines: 2008, C137, A549, A2780 and K562 revealed that copper(I) complexes were more potent inhibitors than the ligands against all the cell lines. The most effective were complexes 2 and 3. The comet assay test of complex 2 and 3 against 2008, C137 and K562 cell lines indicated significant damage to the DNA structure.

Introduction

Cisplatin, a platinum based drug is one of the most used anticancer agents in clinical therapy. However, high general toxicity and development of resistance to some tumors limits its use as anticancer drug.^[1–4] Considerable attempts are being made to replace this drug with suitable alternatives. Therefore, numerous transition metal complexes with a variety of ligands have been synthesized and tested for their cytotoxicity.^[5–12] Amongst these, anticancer properties of transition metal complexes of N, N-disubstituted and N, N'-disubstituted thiocarbamides have attracted considerable interest. The versatile applications of these ligands containing metal atom coordinated with hard N, O and soft S donor atoms are attractive and allow them to show structure-activity relationship.^[13–15] Coordination through only S observed in case of N, N'-disubstituted thiocarbamides is rare and can be explained on the basis of intramolecular hydrogen bond formation

between the carbonyl oxygen atom and thiocarbonyl (NHC) group.^[16–18] Amongst the various transition metal complexes of these ligands, copper complexes have gained more interest since copper is non-toxic and more active in nature.^[19,20] It has also been observed that anticancer properties of complexes are affected considerably by change in the structural motif of the ligands. N,N'-disubstituted thiocarbamides and their complexes have also proven promising antibacterial, antifungal, antithyroid, insecticidal, herbicidal, and plant growth regulatory agents.^[21–23] Additionally a wide array of applications of these compounds in material science includes pre-concentration and separation of platinum group metals,^[24] catalysis in the oxidation of alcohols,^[25] imine and carbon oxides,^[26] and H₂O materials.^[27] Precursors for the synthesis of metal sulfide nanoparticles/nanocrystals.^[28,29] Recently few of the copper(I) complexes of N, N'-disubstituted thiocarbamides synthesized in our laboratory have been used as catalysts for the synthesis of dendrimers.^[30] As part of our continuing investigation on copper complexes as anticancer agents, we report herein the synthetic, structural, in vitro cytotoxicity and DNA damage studies of three Cu⁺ complexes with novel N, N'-disubstituted thiocarbamide ligands.^[31–33]

Results and Discussion

Synthesis and characterization

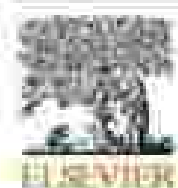
The synthetic pathway is shown in Scheme 1. The one-pot reaction of diisobutyrcarbonyl isothiocyanate and naphthyl amine/p-methoxy aniline/4-nitro-2-methoxy aniline yielded ligands

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Supporting Information for this article is available on the WWW under <https://doi.org/10.1002/slct.201800145>



Contents lists available at ScienceDirect

Polyhedron

journal homepage: www.elsevier.com/locate/poly



Copper(I) complexes of N-(2/4-methoxy/2-chloro-4-nitro)phenyl-N'-(methoxycarbonyl)thiocarbamides as potential anticancer agents: Synthesis, crystal structure, *in vitro* cytotoxicity and DNA damage studies

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ARTICLE INFO

Article history:

Received 10 May 2019

Accepted 4 June 2019

Available online 14 June 2019

Keywords:

Spectroscopic studies

X-ray single crystal

Trigonal planar geometry

Cytotoxicity

DNA damage

ABSTRACT

Synthesis and structural assignment of four trigonal planar copper(I) complexes (1a–4a) having the general formula $[Cu(CH_3COO)_2(SN(R)_2)]$ where R = 2-methoxyphenyl (1), 4-methoxyphenyl (2), 2-chloro-4-nitrophenyl (3) and 2-methoxy-4-nitrophenyl (4) have been described. The characterizations were done by elemental, spectroscopic (FT-IR, ¹H, ¹³C NMR, UV–Vis), TG analysis and single crystal X-ray studies of ligands 1, 3 and complex 2a. In the complex 2a the methoxycarbonyl group adopts its conformation with respect to chlorine atom and are nearly coplanar with the central plane in a trigonal planar geometry. Cyclic voltammogram of complexes 1a–4a displayed quasi-reversible redox behavior corresponding to Cu(I)/Cu(II) couple. *In vitro* cytotoxicity of the ligands and their copper(I)-complexes screened against the human cancer cell lines revealed that complexes were two or three times more potent than the ligands against all the cell lines. DNA damage study of complexes against 2008, C127 (cervical cancer) and KBCH1 (breast cancer) cell lines indicated that cytotoxicity earned by them is directly through perturbation of DNA structure.

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1. Introduction

There has been substantial interest in the design and synthesis of transition metal complexes owing to their relevance in the development of new metal based anticancer drugs. These efforts stem from the discovery of cisplatin and other platinum based anticancer drugs [1–4]. Though severe side effects and restriction to the treatment of a limited number of tumors limit their treatment efficacy. Therefore, scientists have focused upon the discovery of non-platinum metal based anticancer drugs devoid of unpleasant side effects associated with platinum based drugs [5–7]. In this regard, one of the promising classes of compounds displaying potent anticancer properties, though not much explored is N,N'-substituted thiocarbamides and their copper complexes [8,9]. Thorough literature survey revealed that anticancer properties of these compounds are greatly affected by their structural changes [10,11]. The complexes can interact with DNA via covalent and/or non-covalent interactions causing DNA damage and leading to the inhibition of uncontrolled growth of cancerous cells [12–15].

Presence of N, O and S donors present in the structural motif of thiocarbamides provide multitude of bonding possibilities resulting in the complexes of various geometries. The geometry of complexes is also affected by the substituents present on the thiocarbamide moiety [16–20]. The coordination of ligands as bidentate monodentate through thione/sulfur only results in trigonal planar and tetrahedral geometries [16–20] whereas coordination through O and S forms square-planar and octahedral complexes, respectively [21–31]. 1,3-R₂S coordination in square planar copper(I) complexes obtained by solvent induced geometry transformation of copper(I) complexes was reported for the first time by us [12].

Transition metal complexes of substituted thiocarbamides have also received a great deal of attention because of their remarkable applications in material [12,20,22] and biological sciences [15,23–31,33–35]. A wide array of applications in material science includes gas-concentration and separation of platinum group metals [36–39], catalyst in the oxidation of alcohols [18,39], urea and cyano anions [40–42], ion-liquid based (ILO) materials [40,41]. Recently, the complexes of nickel, copper and cadmium have been used as single source precursors for the synthesis of metal sulfide nanoparticles/nanocrystals [34,43–45].

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Characterization of Soils of Two Village of Maniyar Block, Ballia District, Uttar Pradesh

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Abstract: Two pedons exposed each in Budageon and Rampur villages of Maniyar block, Ballia district to study the layer-wise distribution of some physical and chemical properties. The sand, silt and clay pedon¹ were varied from 21 to 33 %, 30 to 60 %, clay 3 to 16 % while it was 40 to 85 %, 15 to 45 % and clay 10 to 17 % respectively in pedon 2. Bulk density increased with depth upto 90 cm, water holding capacity decreased with increasing depth in both the pedon, and it ranged from 43.33 % to 34.02 % through depth. The pH ranged from 6.2 to 7.4 in both the pedons but its distribution with depth different in these pedons. The electrical conductivity of soils in both the soils was above to 1 ds m⁻¹. The organic carbon content was high in upper layer of depth in soils. Calcium carbonate ranged from 2.5 to 0.4 % and 3.9 to 0.4 with depth in soils. Available N, P and S were higher in surface layer and decreased with depths but their values were in higher side in pedon 2 barring few exceptions with soil depth amount of available P content in surface and sub-surface soil. However, it was slightly medium in soils of pedon 2. The medium available K content was found in surface layer (0–15 cm) and decreased with depth in both the pedons. The S content in surface soil was found to be higher than sub-surface soil. The amount of available S was found in surface horizons (0–15 cm) 13.5 mg kg⁻¹ in pedon 1, and 14.2 mg kg⁻¹ in pedon 2. The surface layer of of pedon 1 had 13.4 cmol (p) kg⁻¹ exchangeable Ca while it was 8.4 cmol (p) kg⁻¹ in P2. The exchangeable magnesium in pedon 1 was 6.2 cmol (p) kg⁻¹ at 0–15 cm and 2.2 at 135–150 cm while in pedon 2 had exchangeable magnesium 7.3 cmol (p) kg⁻¹ at 0–15 cm and 3.0 at 155–180 cm soil depth.

Keywords: Physical properties, chemical properties and available nutrients

Introduction

It is well established that soil is the most vital and precious natural resource that nourish all kind of life on the earth. The indigenous ability of soils to supply sufficient amount of essential elements has decreased with higher plant productivity levels associated with increased human demand for food. Therefore, one of the greatest challenge today for every stakeholder of agriculture is to develop and implement such soil, crop and nutrients management technologies that could enhance the plant productivity and also improve the

quality of soil, water and air. The understanding of the processes through profile study helps of basis their characterization. The information on characteristics of different layer of soils in block is lacking and hence present study was carried out.

Material and Methods

Maniyar block (25°8'58.96"N; 84°21'69.55"E) of Ballia district occurs at an elevation of 62 meters above the sea level and represents north east alluvial plains. The average maximum (47.5°C) and minimum (2.5°C)

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Research Article

ASSESSMENT OF VERTICAL DISTRIBUTION OF PHYSICAL AND CHEMICAL PROPERTIES OF SOILS OF CHILKAHAR BLOCK OF BALLIA DISTRICT UTTAR PRADESH

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Received: March 02, 2022; Revised: March 26, 2022; Accepted: March 27, 2022; Published: March 30, 2022

Abstract: The best soil sampling was carried out for physico-chemical and chemical characterization of soils of Chilkahar block of Ballia district. Depth wise soil samples were collected from two villages namely Kurel (K1) and Pate (P2) were collected from different depths. Standard analytical methods and procedures were followed for analysis of physico-chemical and chemical parameters of soils. The results revealed that soil texture was found sandy and heavy, pH of soil was found to moderately acidic to moderate-alkaline where EC is considerable range. Bulk density of soil was found with range of $1.32-1.66 \text{ Mg m}^{-3}$ and water holding capacity contained $27.13-45.33 \%$. Organic carbon content was lower range and Calcium carbonate was moderately calcareous. The Available N , P , K , and S content in soil varied from lower to high and very high range respectively.

Keywords: Soil physical, Physico-chemical, Chemical properties, Soil organic carbon, Available nutrient, Soil texture and depth

Citation: Shivam Singh, et al., (2022) Assessment of Vertical Distribution of Physical and Chemical Properties of Soils of Chilkahar Block of Ballia district Uttar Pradesh.

International Journal of Agriculture Sciences, ISSN: 0975-0713 & E-ISSN: 0975-9107, Volume 14, Issue 1, pp- 11173-11181.

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Academic Editor: Reviewer: S.K. Yadav, Dr Debajyoti Borah, Dr Mahesh Kumar

Introduction

Soils provided food, fodder, fuel and fibre for meeting the basic needs of humans and animals. Day by day increasing population growth of human and animals, demanding foods and related substances. Moreover, the maximum carrying capacity of the soils is finite and limits the production process. It is influenced by intrinsic characteristics of soils, agro-ecological setting, land use and management. This demands systematic appraisal of our soil resources with respect to their extent, distribution, characteristics, behavior and use-potential, which is very crucial for developing an effective land use system for sustaining agricultural production on sustainable basis.

The sustainable development of a region needs not only protection and recovery of natural resources particularly soil and land, but also a scientific basis for the management in harmony with environment [1]. Soil characterization provides the information for understanding of the physical, chemical, mineralogical and microbiological properties of the soils which are highly essential to grow crops, sustain forest and grasslands as well as to support farms and society structures.

The vertical distribution of all soil properties in downwards into the ground with various layers of soil horizons can be reservoir of raw materials for growth and development of organisms on the soil. This cross sectional view is made up of layers, running parallel to the surface and may be slightly or very much different from the other layer existing above or below it. Therefore, the systematic study of morphology and taxonomy of soils provides information of nature and type of soils, their constituents, potentials, capabilities and their suitability for various uses such as land use planning.

There is no information regarding the vertical distribution in Chilkahar block of Ballia district soil for different land use planning under backdrop of Indo-Gangetic plains. Hence, the present experiment was initiated in July, 2019 and the results are presented in this paper in a condensed form.

Materials and methods

Ballia district is situated in central portion of the Ganges and Ghaghara Basin in the eastern part of the state of Uttar Pradesh. Chilkahar block is located 30 km towards west from district head quarter Ballia. The geographical position of Ballia district lies between the latitude of $25^{\circ}23'$ and $25^{\circ}11'$ north latitude and $85^{\circ}38'$ and $84^{\circ}26'$ East longitude and 50 m to 54 m above the sea level. The mean annual rainfall ranges from 380-1080 mm. Study area Chilkahar (Kurel) and Pate villages block lies in $85^{\circ}58'45''$ to $84^{\circ}15'35''$ E longitude and $25^{\circ}51'57''$ to $25^{\circ}48'48''$ N latitude with an altitude of 72 m, above the sea level and Chilkahar Block $85^{\circ}49'35''$ N and $25^{\circ}57'43''$ E with longitude of 83 m above the sea level. For study of vertical distribution of physical and chemical properties of soil, two regions were taken in each village in the wet season of June, 2020 when field was open, no crop and no rain with 48 hours.

Soil samples were collected from selected areas of Chilkahar block soils from the field of soil cultivated area of two villages at Kurel and Pate. Sampling sites were carefully chosen taking in into consideration the ground cover, micro relief, degree of erosion, surface drainage, proximity to roads and all other factors likely to affect the soil in comparison with the natural type. Soil samples were collected from villages namely, Kurel (K1) and Pate (P2). Soil samples were collected on suitable spot (pecon) dug in the two villages - Kurel and Pate to collect the soil samples. Sampling made depth 0-15, 15-30, 30-45, 45-60, 60-75, 75-90, 90-105, 105-120, 120-135 and 135-150 cm depths. About 2 kg of soil from each depth were taken in clean polythene bags separately by khurpi, scale and bucket. After soil processing soil samples were ready to analysis in the laboratory. Soil samples were analysed for pH by use of 1:2.5 soil water suspension by glass electrode. Electrical conductivity (EC) was estimated by 1:2.5 soil-water suspension using conductivity electrode and expressed as dS m^{-1} [2]. Calcium carbonate (CaCO_3) was determined by total fusion method [3]. Bulk density was determined by the method described by Kataria and Choudhary [1998].



Research Article

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Received: March 03, 2022; Revised: March 26, 2022; Accepted: March 27, 2022; Published: March 30, 2022

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International Journal of Agriculture Sciences, ISSN: 0975-0713 & E-ISSN: 0975-9107, Volume 14, Issue 1, pp. -11173-11181.

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Academic Editor: Reviewer: S. K. Yadav, Dr. Debajyoti Borah, Dr. Mahesh Kumar

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Boron in crop production from soil to plant system: A review

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Archives of Agriculture and Environmental Science

An International Journal

ISSN: 2456-6632 (Online)

Volume 5 | Issue 2

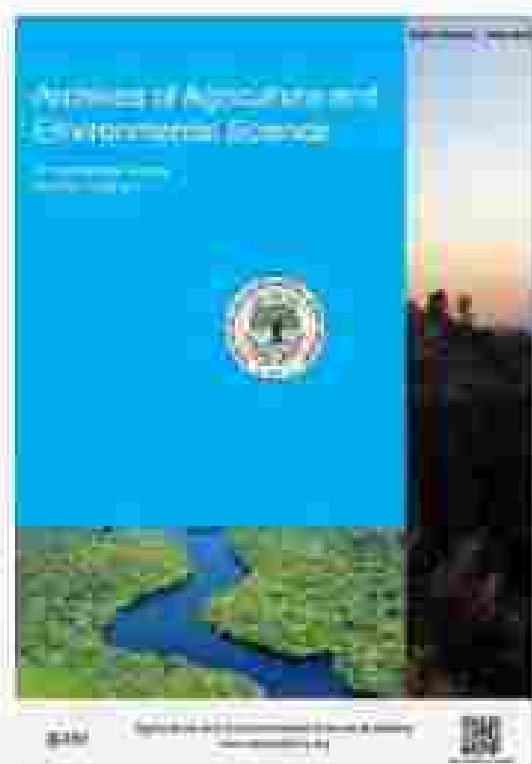
Page No.

218-222

DOI: [10.26632/24566632-2020-0502020](https://doi.org/10.26632/24566632-2020-0502020)

[View CrossMark Data](#)

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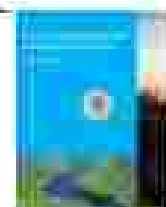


e-ISSN: 2456-6631

This content is available online at AESSA

Archives of Agriculture and Environmental Science

Journal homepage: journals.aessacademy.org/index.php/aess



REVIEW ARTICLE

Boron in crop production from soil to plant system: A review

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ARTICLE HISTORY

Received: 04 November 2019

Revised received: 21 April 2020

Accepted: 20 May 2020

Keywords

Boron

Role of Boron

Soil and foliar application

ABSTRACT

The deficiency of boron is spreading rapidly in Indian soils. Boron deficiency in crops is more widespread than deficiency of any other essential micronutrient. However, imbalanced or excess use of boron fertilizers found to impose negative impact on crops due to very narrow range of boron deficiency and toxicity in soil and plants which increases production cost also. Therefore, optimized boron fertilizer supply in boron deficient soils is important in order to attain normal crop growth, yield and high-quality produce. In this review the role of boron in crop production, its deficiency in crop plants has been discussed.

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Citation of this article: Singh, A.K., Singh, A.K. and Singh, J.P. (2020). Boron in crop production from soil to plant system: A review. Archives of Agriculture and Environmental Science, 5(2): 218-222. <https://doi.org/10.24363/24566631.2020.3802020>

INTRODUCTION

The essentiality of boron (B) for the growth and development of higher plants was demonstrated by Warington in the year (1922) and considered as an essential element for plant growth and development (Pollard et al., 1977; Marschner, 1995). B plays an important role in both structural and functional integrity of plasma membrane (Pollard et al., 1977). B has been reported to affect the plant growth due to its role in cell division, expansion, cell wall formation and stabilization, lignification and xylem differentiation (Marschner, 1995). B has been implicated in counteracting toxic effects of aluminum on root growth of acid-tolerant plants (Dale et al., 1996). It imparts drought tolerance to the plant (Rattan and Goswami, 2002). In muskmelon, application of B improved plant growth and fruit quality, and in addition the incidence of chilling injury decreased in harvested fruit during cold storage at 5°C (Gombirtz et al., 1995). B is continuously required for the normal growth of most plants, otherwise, plants grown in low B containing media exhibit B deficiency symptoms of various forms (Gupta, 1992). The deficiency of B spreading rapidly in Indian soil from 2% in 1960 (Kabral and Vlek, 1983) which reached to 32% soils (Singh, 2012). B deficiency has mostly been reported in the soils of

Assam, Bihar, Meghalaya, West Bengal, Jharkhand and Odisha mainly in acid red and lateritic soils including high pH calcareous soils (Sahera et al., 2009). Now a days to zinc, B has become an important micronutrient in Indian Agrarian (Sathya et al., 2009) required for normal plant growth and obtaining high quality crop yields (Munnu et al., 2014). The important facts pertaining to this important micronutrient is furnished in Table 1.

BORON IN SOIL SYSTEM

Among the essential micronutrients B is the only non-metal and present in non-ionic form. Total B contents in Indian soils ranged between 7 to 520 mg B kg⁻¹ soils (Prasad et al., 2014). Singh et al. (2013) observed that soils were highly deficient in available B with mean contents of 0.35, 0.49, 0.66 and 0.62 mg kg⁻¹ in Chandauli, Mirzapur, Sant Ravidas Nagar and Varanasi district, respectively. Availability of B in soil is influenced by several factors including soil reaction, soil moisture, active calcium and organic matter content (Drege and Power, 1942). Light textured soils (sandy loam and loamy sands) found to be deficient in B content because they were well drained and had good leaching (Ald et al., 2002). Most of the tea soils of Darjeeling Hills are sandy loam and loamy sand soil (light textured) except



Research Article

DELINEATION OF PHYSICO-CHEMICAL STATUS OF KATAHAL NULLAH (BALLIA) WATER AND NEARBY SOIL

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Received: April 02, 2019; Revised: June 26, 2019; Accepted: June 27, 2019; Published: June 30, 2019

Abstract: An investigation was carried out for physico-chemical status of Katahal Nullah water and nearby Nullah bank soil. The soil and water of four villages (Banarshi Manoh, Badua, Khura Nagar-I and Chhotanagar) pH and EC was appeared in saline and normal range. Organic carbon content varied (0.10 to 0.30 %) and CaCO_3 moderately calcareous (1.12 % to 4.00 %). Available N, P, K and S were varied respectively (100.2 to 190.5 kg ha^{-1}), (11.60-14.00 kg ha^{-1}), (212.5-257.2 kg ha^{-1}) and (22.20 to 23.75 kg ha^{-1}) in increasing range. Micronutrients Fe, Cu, Zn and Mn were varied (7.15-8.20 mg kg^{-1}), (0.28 - 21.70 mg kg^{-1}), (0.19-1.34 mg kg^{-1}) and (0.15-10.20 mg kg^{-1}) in considerable range respectively. Similarly in water sample exchangeable Ca^{++} and varied from 0.2 to 162 mg/L pH kg^{-1} and magnesium content of the samples was varied from 2.8 to 6.2 (mg/L pH kg^{-1}). The content of CO_3^{--} and HCO_3^{--} were not detectable in samples except Chhotanagar village (102 mg/L , 5.0 mg/L). Micronutrients Fe, Cu, Zn and Mn in water sample were varied (0.10-0.43 ppm), (0.05-0.14 ppm), (0.05-0.36 ppm) and (0.20-0.22 ppm) respectively.

Keywords: Physical and chemical properties of soil, Micronutrients

Osborn, Dey S., et al. (2019) Delineation of Physico-Chemical Status of Katahal Nullah (Ballia) Water and Nearby Soil. International Journal of Agriculture Sciences, ISSN: 0975-0715 & E-ISSN: 0975-9107, Volume 11, Issue 12, pp- 3550-3572.

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Introduction

Ingestion of vegetable crops by city sewage water or effluents in per urban area is very common. This sewage water or effluents resulted very good and attractive produce due to excess amount of nitrate, phosphate, carbonate and some metallic compounds [1]. After that, they are eaten in human and animal food chain by this path way. Similarly, Katahal Nullah is a perennial watercourse of Ballia city which is connected to River Ganga and Surma Tal with the about 13 km length. It is main outlet of Ballia city water and effluent disposal. Farmers of the Katahal Nullah bank area villages viz. Banarshi Manoh, Badua, Khura Nagar-I, Manohar ghra and Chhotanagar around Ballia city are being using Nullah water for irrigation purpose to produce cereals, fodder and vegetable crops mainly cauliflower, radish, spinach, brinjal etc. The study area is continuously ingested with sewage sludge containing effluent for more than three decades. The present study was undertaken to know the magnitude of contaminants in soil and water which are enter in food chain.

Materials and methods

Study area: The study area in Ballia district lies between the latitude of 25°30' and 26°11' N latitude and 83°36' and 84°15' E longitude and 23 m. of the sea level. The mean annual rainfall ranges from 120-135 mm. The soil of this area are black, alluvial to sandy, open alluvial in nature and it is typically to Indo-Gangetic plain soil. Collection of samples: Soil and water samples were collected from wet land area of Mahanagar, Block (Ballia) soils from the field of wet cultivated area. Sampling sites were carefully chosen taking into consideration the ground cover, flood relief, degree of erosion, surface drainage, growing or stress and all other factors likely to affect the soil in comparison with the normal type. Soil samples were collected from four villages namely, Banarshi Manoh, Badua, Khura Nagar and Chhotanagar are away from Mahanagar) Block (25°15' DE latitude and 84°15' longitude), 1.1 km (25°15'12" latitude and 84°15'17" longitude), 3 km (25°15'17" latitude and 84°15'22" longitude) respectively. Water samples were also collected respectively village including Manohar Ghra (25°15'02" latitude and 84°15'42" longitude) and Chhotanagar (25°15'13" latitude and 84°15'07" longitude).

Soil samples were collected by the help of sharp, spade and polythene bag. Water samples were collected in pre-washed bottle, preserved and analysed according to standard methods. Soil available nitrogen was determined by alkaline potassium permanganate method [2]. Available P was estimated by using Olsen et al. method [1954] [3] and for available K, it was determined by acetate method described by Murr et al. [1962] [4]. Available sulphur content of soil was determined by Williams and Starberg [1910]. The determination of nitrate is easily made by Apico (tration Mart's tration) method. After soil processed soil samples were ready to analysis of targeted possible contaminants in the laboratory of Department of Agriculture Chemistry and Soil Science, B.M.M. Taran P.G. College, Ballia, only Fe, Cu, Zn and Mn analysis were done in Soil Testing Lab, Azamgarh [27]. About 1.5-2.0 kg of fresh soil samples were separately processed and air dried, powdered and sieved through 2 mm brass sieve and stored separately in polythene bag for physico-chemical analysis. The sufficient amount of Zn or collected water samples from all different sites were analysed for pH, EC, exchangeable Ca^{++} and Mg^{++} , CO_3^{--} , HCO_3^{--} , Cl^- , exchangeable Na^+ , SAR, RSC, Fe, Cu, Zn and Mn by standard procedure listed by Patra et al. (2005).

Results and discussions

Physical and chemical properties of soil

Soil density of soil was measured (Table-1) in samples taken from four sites. A was varied between 1.13 to 1.55 Mg m^{-3} among the Banarshi Manoh, Badua, Khura Nagar-I and Khura Nagar-II respectively. The slight variation in increased bulk density of Khura Nagar-I due to cultivation practices might be leads to soil mineral composition but, use of inorganic-fertilizer and very less use organic manure. The water holding capacity (Table 1) varied from 39.30 % to 43.10 %, the sample of Banarshi Manoh was showed 43.30%, Badua village samples were showed 45.50%, 39.30% and 43.10% samples of Khura Nagar-I, Khura Nagar-II respectively. There are small differences of water holding capacity among the all four sites of different Nullah bank sites villages.



Original Research Article

<https://doi.org/10.20546/2020.904.070>

Characterization of Rice Growing Soil of Nagara Block of Ballia District (U.P.), India

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ABSTRACT

Keywords:

Factor, Soil moisture
content, Soil depth,
NPK S content and
Microelements

Article Info

Accepted:
07 March 2020
Available Online:
01 April 2020

An investigation was carried out for Characterization of rice growing soil of Nagara block of Ballia district (U.P.) India. Depth wise soil samples were collected from two selected village and in this respect a soil profile was opened in each village. Soil samples were collected from 0-15, 15-30, 30-45, 45-60, 60-75, 75-90, 90-105 and 105-130 soil depth. Standard method was followed for analysis of physico-chemical parameter of soil. Results revealed that pH of soil found to be slightly alkaline where EC was in normal range. Bulk density of soil found to be $(1.16 - 1.73 \text{ Mg m}^{-3})$ and water holding capacity continued $(20.4 - 37.5 \%)$. Organic carbon content varied from $(0.07 - 0.99 \%)$. The soil was slightly moderately calcareous $(0.99 - 1.37 \text{ CaCO}_3 \%)$. Available N, P, K, and S content in soil varied from $(142.2 - 489.8 \text{ kg ha}^{-1})$, $(9.78 - 15.28 \text{ kg ha}^{-1})$, $(159.4 - 403.18 \text{ kg ha}^{-1})$ and $(9.15 - 16.23 \text{ kg ha}^{-1})$. Micronutrients Fe, Cu, Zn and Mn content in soil from $(1.37 - 9.02 \text{ mg kg}^{-1})$, $(1.31 - 9.07 \text{ mg kg}^{-1})$, $(0.11 - 1.21 \text{ mg kg}^{-1})$ and $(0.18 - 4.83 \text{ mg kg}^{-1})$ rang respectively.

Introduction

Soil test-based fertility management is an effective tool for increasing productivity of agricultural soils that have a high degree of spatial variability resulting from the combined effects of physical, chemical or biological processes (Govaerts, 1996). However, major constraints impede wide scale adoption of soil testing in most developing countries. In India, these include the prevalence of small holding systems of farming as well as the lack of infrastructural facilities for extensive soil testing (Sen et al., 2008). The importance of

soil fertility and plant nutrition to the health and survival of all life cannot be understated. As human population continues to increase, human disturbance of the earth's ecosystem to produce food and fiber will place greater demand on soils to supply essential nutrients. Therefore, it is critical that we increase our understanding of the chemical, biological and physical properties and relationships in the soil plant atmosphere continuum that control nutrient availability. Soil is the most valuable natural resource. It is at the heart of terrestrial ecology, but is finite and non-renewable. To meet the challenges of this century, new



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Original Research Article

<https://doi.org/10.20546/2018.709.393>

Effect of Application Schedule of Microbial and Chemical Insecticides on Insect-Pest Control and Grain Yield of Mungbean (*Vigna radiata* (L.) Wilczek)

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ABSTRACT

Present investigation revealed that three species of insect-pests viz. white fly (*Bemisia tabaci*), jassid (*Delusioa keri*) and thrips (*Callosobruchus indicus*) were found as major insect-pests of mungbean on the basis of their population build up and severity of infestation. White fly, jassid and thrips attacked the mungbean from seedling to maturity stage. Among the microbial and chemical insecticides combination of seed treatment with *Pseudomonas fluorescens* + *Beauveria bassiana* (spraying) gave better response and was found most effective against white fly followed by seed treatment with *Pseudomonas fluorescens*. Similarly in case of jassid, the seed treatment with imidacloprid gave better result followed by combination of seed treatment with *Beauveria bassiana* + *Pseudomonas fluorescens*. In case of thrips, combination of seed treatment with *Beauveria bassiana* gave best performance with lowest thrips infestation and highest reduction over control, followed by the seed treatment with imidacloprid. All the insecticides found to be effective in increasing the yield over control. The highest yield (6.34 q/ha) was recorded in combination of seed treatment with *Beauveria bassiana* and spray with profenophos followed by combination of seed treatment with *Pseudomonas fluorescens* + spray with *B. bassiana* (6.41 q/ha).

Keywords:

Microbial insecticide, Chemical insecticide, White fly, Jassid, Thrips, Mungbean, Yield

Article Info:

Accepted:

27 August 2018

Available Online:

10 September 2018

Introduction

India is the largest producer, importer and consumer of pulses, accounting for 25% of global production from 35% area under pulses

(Ahlawat et al. 2016). In India, the area under pulses are 26.28 million ha (2010-11), and the production is 19.78 million tonnes during 2013-14. The productivity of pulses in the country is 789 kg/ha in the year 2012-13



Review Article

<https://doi.org/10.20546/ijcmass.2018.709.336>

Effect of Drought Stress on Crop Plants with Special Reference to Drought Avoidance and Tolerance Mechanisms: A Review

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ABSTRACT

Keywords:

crop plants, drought stress, yield, drought tolerance, drought avoidance

Article Info

Accepted:

19 August 2018

Available Online:

19 September 2018

The changes in the climate due to global warming and ever dwindling arable land due to the population pressure are increasing strain on available resources for sustainable food production. Therefore, it is an urgent need to have proper idea about the effect of drought stress on crop plants for getting stable production through research intervention. Water deficit due to drought stress influences a wide range of plant processes, from whole plant growth and development to the molecular regulation of essential transcriptional pathways, and this significantly impacts both physiology and metabolism. The studies about the changes in behaviour of crop plants under drought conditions have progressed at a rapid pace and extensive results of such analysis have been made public through various research articles, which can now be easily accessed through the World Wide Web. This review describes some aspects of drought induced effect of drought stress on different important traits of crop plants.

Introduction

The response of plants to drought stress is one of the most complex biological processes, and it involves numerous changes at the physiological, cellular, and molecular levels. Drought is the most frequent yield-reducing factor in arid and semiarid regions, although water deficit may occur even in high rainfall areas. The ultimate detrimental effect of drought stress is reduction in yield, as reported in major crops like rice (Venuprasad *et al.*, 2007), wheat (Kashyap *et al.*, 2013), and maize (Kamara *et al.*, 2004) and some

other important crops such as soybean (Kobres *et al.*, 2011) and chickpea (Khadadadi, 2013). Water stress due to drought can lead to major physiological and biochemical changes such as reduced photosynthesis (Zlatev *et al.*, 2004; Tenare *et al.*, 1999) and reprogramming of gene expression (Neill and Burnett, 1999; Pattanagui and Madore, 1999). Physiological changes under drought stress are often reflected at the transcription level, where the levels of mRNA related to key processes such as photosynthesis are down-regulated (Bartals and Salamani, 2001) and mRNA related to



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EFFECT OF ORGANIC AND BIO-AGENTS OF PLANT NUTRITION ON SOIL PROPERTIES, YIELD AND QUALITY OF TOMATO (*Lycopersicon esculentum* M.)

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Abstract: A pot experiment was carried out in 2020-21 on application of different organic, inorganic and bio-agents for yield and quality of tomato and effect on properties of natural soil of Ballia. The effect on plant height, No. of fruit, weight of fruit, yield of fruits and average of fruit unit was observed. The higher plant height, No. of fruit weight, yield of fruit, average of fruit unit (52.35 cm), 25 cm, 137.48 cm and 84.32 cm, respectively, by the application of compost @10 t/ha² + Trichoderma culture. The greater decrease of soil pH 1.8 was observed with application of Compost 10 t/ha² + Trichoderma, whereas lower pH value (6.8) was observed with application of 50% FYM + 50% Flyash + 50% RDF. The EC of soil was influenced by treated with organic and inorganic materials ranged from 1.001 to 1.005 was indicated no marked difference due to treatment combination. The maximum organic carbon content (8.73%) was resulted by the application of compost @ 10 t/ha² + Trichoderma. The higher available nitrogen (349.35 kg/ha²) was recorded with application of FYM 10 t/ha² followed by application of Compost 10 t/ha² (314.38 kg/ha²). Higher soil available phosphorus (12.68 kg/ha²) content was found with application of 50% Compost + 50% Flyash. The greater soil available K (238.8 kg/ha²) content was observed with the 50% RDF + 50% Flyash + Azospirillum. The maximum sulphur content of 24.89 mg/kg while the lowest was recorded 20.69 mg/kg with application of 50 % RDF + 50 % Flyash + 50 % FYM and FYM 10 t/ha² + Phosphate. The content of exchangeable Ca⁺⁺ varied from 11.54 to 2.89 and exchangeable Mg⁺⁺ was found greater 9.60 me/100g in compost 10 t/ha² + Trichoderma followed by 50% Compost + 50% Flyash. The organic manures and bio agent have appeared productive effects on the growth and yield parameters of tomato.

Keywords: organic sources, bio-agents, inorganic sources, soil fertility and tomato yield

Introduction: Tomato (*Lycopersicon esculentum* M.) is a major and tremendous popularity gain vegetable crop for its low caloric value and considered as an excellent food for human health [1]. It is a good source of vitamins A, C and carotene etc. It contains higher quantity of total sugar (2.5-4.5%), starch (0.6-1.2%) and minerals like potassium, calcium, sodium, magnesium, phosphorus, boron, manganese, zinc, copper, iron, etc. Apart from these, it also contains organic acids such as citric, malic and acetic acids which are known as health acids in fresh tomato fruit. The sole application of organic manures or inorganic fertilizers are not able to sustain the soil fertility and crop productivity. However their integration has proved superior to individual components with respect to yield,

quality and nutrient uptake [2-4]. A bearing tomato plant removes considerable amount of nutrients from the soil; therefore, balanced manuring and fertilization practices in vogue are generally empirical. It is well known that increased dependence on agrochemicals including fertilizers and pesticides has leads to several health hazardous effects on the environment [5]. The continued use of organic fertilizers increases soil organic matter, better water infiltration and aeration, higher soil biological activity as the materials decompose in soil and increases yields after the year of application [6]. The indiscriminate use of chemical fertilizers drastically destroys the physical, chemical and biological properties of soil. Organic manure such as cow dung, Trichoderma compost and



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Potassium in tea (*Camellia sinensis* (L.) O. Kuntze) cultivation from soil to cup quality-A review

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Received: 26-05-2017

Accepted: 12-12-2017

DOI: 10.18805/ag.R-1731

ABSTRACT

Tea (*Camellia sinensis* (L.) O. Kuntze) plants require comparatively higher quantity of potassium for production and quality of produce. After nitrogen, potassium is the second major nutrient for tea plant. Potassium plays vital role in enzyme activation, water relation, photosynthesis protein and starch synthesis. It offers abiotic as well as biotic stress tolerance in tea plants and also improves biochemical parameters and organoleptic quality of tea. However, owing to the climatic conditions and soil mineralogical compositions, tea soils are predominantly poor in their potash content. Thus, the need based adequate supply of potash through inorganic or organic sources as soil application or foliar nutrition in tea growing soils of India is essential to realize the optimum economic yield with desired quality. Furthermore, the possibilities of development of potassium solubilizing biofertilizer with identification of native strains of microbes and development of potassium efficient tea genotype need to be explored. Such attempts minimize the cost of cultivation, sustain soil fertility and prevent environmental pollution.

Key words: Made tea quality, Potassium management, Stress resistance, Tea, Tea soil

INTRODUCTION

Potassium (K) third important plant nutrient (Meena *et al.*, 2014) is also the second most important nutrient after nitrogen for tea (Ranganathan and Nagesan, 1985). Tea plant is considered as a calcifuge, and does not grow well in soils of high base saturation (Eden, 1976). Tea rather requires comparatively higher quantity of K for better production and quality of the produce (Subba Rao and Brar, 2002). K plays vital role in enzyme activation, water relation, translocation, energy relations, translocation of assimilates, photosynthesis and protein and starch synthesis (Majumdar and Karikye, 1967).

Without adequate supply of K, the plants will have inadequately developed roots, hence will grow slowly with lesser yields (White and Karley, 2010) and increased susceptibility to diseases and pest (Troufflard *et al.*, 2010). Application of K improves drought tolerance of plants and improves quality of the produce (Jeyar, 2010). The response of the yield of tea to added potassic fertilizer differs in relation to the sufficiency of K available in soil. The availability of K in most tea soils is not adequate due to the acidity and will reduce further as the soils become more acidic. Thus, the possibilities of responses to the applied K fertilizer will, therefore, increase as soil pH reduces (Wilson, 1975 b). K deficiency emerges after a certain interval on soils where there was originally no response to applied K fertilizer (Ali *et al.*, 1977; Godriashvili and Peterburgsky,

1986). K deficiency has an apparent consequence on the recovery of pruned tea and on the bush frame health (Wilson, 1975a). Continuous cropping without K fertilization reduces economic yields and sometimes causes death of the plants. K fertilization therefore becomes imperative and with the future passage of time application levels need to be extended (Ranganathan *et al.*, 1988 and Mahanta, 1986b). In addition to above, recent climate models predict that incidences and duration of drought and heat stress periods are increasing in many regions, negatively affecting our major crops, - and thus our food security. Therefore, major challenges for agriculture are to improve crop yields in more resource effective systems and to sustain plant development, yield formation under biotic and abiotic stress conditions (Reynolds *et al.*, 2011). The salient achievement of studies made so far on importance and role of K in tea culture is furnished in Table I.

K in tea soils: The major portion of K in tea soil is present in inorganic form bound to soil colloid (Anonymous, 2011). The threshold value of available K in soil could be between 150-200 ppm and even at that levels, 48-54 % could get depleted at the end of cropping season (Anonymous, 1983-84). In general, available K was higher in top soil than sub soil (Singh *et al.*, 2011). A large number of agricultural soils including tea plantations are commonly low in plant available K (Bagrinalilahi *et al.*, 2013). Tea naturally grows in tropical to temperate conditions, where the annual rainfall is more

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Plant Archives

Journal homepage: <http://www.plantarchives.org>
DOI:10.17692/plantarchives.2023.v23i01.043

SHEER DISTRIBUTION OF PHYSICO-CHEMICAL CHARACTERISTICS OF DUBAHAR BLOCK SOILS OF DISTRICT BALLIA, UTTAR PRADESH, INDIA

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(Date of Receiving: 20-12-2022; Date of Acceptance: 01-03-2023)

ABSTRACT

The present study was undertaken to find out the sheer distribution of physico-chemical characteristics of Dubahar block soils of district Ballia, Uttar Pradesh. To do so depth wise soil samples from two profiles were collected from village Nagwa and Dubahar. To view profile from each village, bonded analysis methods were followed for the analysis of the physico-chemical characteristics of the soils. Results revealed that the pH of the soils was found to be moderately acidic to slightly alkaline (6.3 to 7.7) in reactive horizon and 6.5 was found to be in normal range (5.5 to 7.5). Soil organic carbon content varied from 0.5 to 1.5% in high range (0.25 to 2.0%) whereas cation exchange capacity was recorded (0.27 to 2.02%). The available N, P, K, and S content in soil varied from (100 to 425) kg ha⁻¹, (2.2 to 15.28 kg ha⁻¹), (124.5 to 249.6 kg ha⁻¹) and (0.1 to 21.2 mg kg⁻¹) respectively. The bulk density of soil ranged between (1.44 to 1.28 Mg m⁻³) and water holding capacity (10.0 to 22.0%). The natural clay of the soil was found to be clayey to clay loam.

Keywords: Available primary nutrients, distribution, secondary nutrients, cations, soil texture and soil organic carbon.

Introduction

Soil profile study is considered to be one of the most important aspects for information on soil formation and its characteristics. In general, the horizon property of a soil profile follows the topography of a landscape. Designation of horizon boundaries comes from soil colour, texture, structure, consistence, root distribution, effervescence, rock fragments, and reactivity measurements. A profile characteristic of soil provides the basic information required in planning an efficient system of soil and water management in general, and for dry-land conditions in particular. The amount of water stored in a profile depends on soil physical properties like depth, texture, bulk density, aggregation etc. (Prigat et al., 1993). Soil study and their analysis have played a historical role in soil fertility maintenance and sustainability in agriculture, whereas imbalance and inadequate fertilizer use causes low efficiency of other agro inputs. The efficiency of chemical fertilizer nutrients declining tremendously in intensive agriculture day by day over the last decades. Sustainability of the soil is the need of today's agriculture (Gargh et al., 2014). Soil test-based fertility management has been effective tool for increasing the productivity of cultivated soils that have a high degree of spatial variability resulting from the combined effects of physical, chemical and biological processes (Goyerni, 1961). In India, these

include the prevalence of small holding systems of farming as well as the lack of infrastructural facilities for extensive soil testing (Sain et al., 2008). Moreover, the changes in the climate due to global warming and ever-dwindling arable land due to population pressure are increasing the strain on available resources for sustainable food production (Debn et al., 2018). Therefore, the present investigation was undertaken to study the physico-chemical characteristics of the soils of Dubahar block of district Ballia, Uttar Pradesh for optimum utility and management of soil.

Materials and Methods

Study area

District Ballia is the easternmost part of the state of Uttar Pradesh, India, which lies between the parallel of 25°23' and 26°11' North latitude and 83° 38' and 84°39' East longitude and 39.19 m to 64.92 meters above the sea level. The mean annual rainfall ranges from 930-1150 mm.

Soil sampling and physico-chemical analysis

Soil samples were collected from two village of Dubahar block viz. Nagwa and Dubahar of the area from the well-cultivated field on 26 July, 2019. The sites were chosen carefully taking into consideration the ground cover, micro relief degree of erosion, surface drainage proximity to train



ISSN: 0976-3376

Available Online at <http://www.portageet.com>

ASIAN JOURNAL OF
SCIENCE AND TECHNOLOGY

Asian Journal of Science and Technology
Vol. 11, Issue, 04, pp.3334-3336, April, 2018

RESEARCH ARTICLE

STUDY OF AVAILABLE POTASSIUM BY DIFFERENT EXTRACTING REAGENTS AND FERTILITY STATUS OF SOILS OF BAIRIA SUB-DIVISION OF BALLIA, U.P.

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ARTICLE INFO

Article History:

Received 10th January, 2018

Received in revised form

14th February, 2018

Accepted 24th March, 2018

Published online: 30th April, 2018

Key words:

Soil depth, Extracting reagents,
Fertility status and location

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ABSTRACT

The extracting reagent variability is most important factor for the availability of potassium in soil and related soil fertility also. For that a depth wise soil sample was analyses by different available K extracting reagents as well as soil fertility status. The soil pH, EC, organic carbon, available N, P, K and S were found in considerable quantity in surface (0-15 cm) and sub-surface (15-30 cm) horizon soil. The Biocharline study of different extractants for available K was 0.01M CaCl₂ extractable K, H₂SO₄ extractable K, EDTA extractable K, water soluble extractable K, 1 M NaCl extractable K, Mehlich-III extractable K and total K, in the soil determine the availability of the soil potassium. Under this study, several and several ammonium acetate extractant was found to appear for considerable amount of available K among the extractants for soils of Bairia sub-division and as per two village viz. Bripapur and Tivari Ka Mandi based pedon samples.

Citation: Anurag Kumar Singh, Ashok K. Singh and Anil Kumar Singh, 2018, "Study of available potassium by different extracting reagents and fertility status of soils of Bairia sub-division of Ballia, U.P.", Asian Journal of Science and Technology, 11, (04) 3334-3336.

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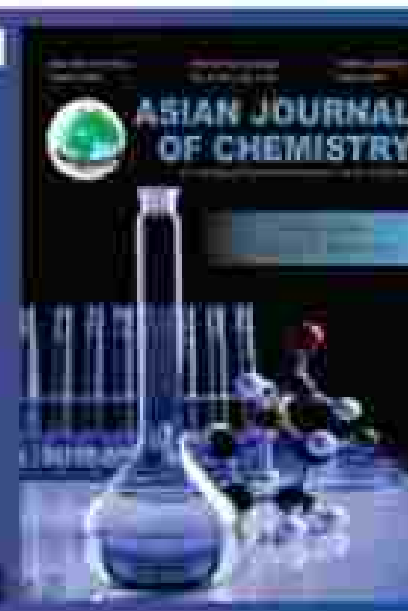
INTRODUCTION

Potassium is one of the major essential elements required for growth and development of plant animals and microbes. Among the essential nutrients it is present in largest quantity (1 to 4 percent) in most plant, regulate the activity of large number of plant enzymes and thus called as 'master cation'. It is also enhances the quality of fruits, vegetables and flowers and resistance against different biotic and abiotic stresses (Pal, 1992). Plant feed not only from of exchangeable K but also from non-exchangeable K, which mainly consists of K trapped in the interstices of non-expanding clay minerals. Major contribution of non-exchangeable K by crop removal was reported particularly in soils under continuous cropping without K application (Srinivas Rao et al., 2007). Since potassium is the most dynamic nutrient, its availability in different forms and combinations depends upon the equilibrium and kinetics reaction between forms of soil K, soil moisture content, temperature and the concentrations of bivalent cations in solution, exchange phase (Sparks and Huang 1985) and the various intrinsic and extrinsic components of soils viz. mineralogy, texture, cation exchange capacity (CEC), clay content, organic matter, etc. the hydrothermal regimes (thermal, hyper thermal, aquatic and ultr) along with soil parameters are not only influence different soil attributes but also the incorporation of K in soils (Peterson and Frost 1934, Bhaskar et al. 2001, Singh and Datta 1984, Singh et al. 1999, Ravumartary and Boriool 1992). So that various

attempts are made to assess the status of potassium draw the suitability in the recent aluminum.

MATERIALS AND METHODS

The depth wise soil samples were collected in April 2017 from two village of Ballia District in Bairia Block of Ballia District U.P. Before the collection of samples two suitable spot (site) were dug soil profile in the two village (Bripapur near Khepadi Bate Ashram and Tivari Ka Mandi near Kati Mandi Mandir). The geographical extent of the district is from 25°23' to 26°11' North latitude and from 83°28' to 84°59' East longitudes and 213.2 feet above the sea level. About 500 g fresh soil sample per soil profile and each depth were collected and processed by air dried, powdered and sieved through 2 mm brass sieve and stored separately in polythene bags for physico-chemical, and chemical analysis. The collected soil samples from both soil profile were analyses for soil pH, EC, Organic carbon, available N, P, S, and fractions of K by using standard method described by different authors. The pH and EC were determined in 1:2.5 ratio of soil water suspension method described by Kanwar and Chopra (1993). Organic carbon content of soil was determined by Walkley and Black's (1934) rapid titration method as described by Kanwar and Chopra (1993). Available N was determined by alkaline potassium permanganate method (Sabbath and Anja 1938). Available P was estimated by using Olsen's et al. (1954).



Synthesis and Characterization of Some New [RR'SeL] Complexes (L = Macrocyclic Ligand): A Photoelectron Spectroscopic Study (Part-II)

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Received: 24 May 2019;

Accepted: 29 June 2019;

Published online: 16 November 2019;

AJC-19615

Forty eight complexes of type [RR'SeL] (where R = R' = CH₃; R = R' = *n*-C₄H₉; R = R' = *n*-C₈H₁₇; R = R' = *i*-C₃H₇; R = R' = C₆H₅; R = C₆H₅, R' = C₂H₅; R = C₆H₅, R' = CH₃ and R = C₆H₅, R' = CH₂Cl; L = newly prepared macrocyclic ligands) have been synthesized and characterized by elemental analysis, molar conductivity, IR and XPS data. An octahedral geometry was established for all these prepared complexes.

Keywords: Selenium, Macrocyclic ligand, X-ray photoelectron spectroscopy.

INTRODUCTION

The chalcogenolates have attracted enormous attention owing to their importance in biological systems and their ability to form metal complexes and clusters of various bonding modes and structural motifs [1-7]. The recent interest in the study of metal chalcogenolate complexes stems from the potential use of these complexes in preparation of semiconducting metal selenides and tellurides [8] and nanoparticles [9]. Important application of alkali and alkaline earth metal chalcogenolates in synthetic and technical chemistry resulted in reports of the number of targeted molecules [10-12]. Metal chalcogenides (M_xE_y; M = Pd or Pt, E = S, Se or Te) find several applications in catalysis and the electronic industry. Metal chalcogenolates have an attractive potential to serve as precursors for the synthesis of such chalcogenides. These metal complexes are isolated as polymeric, non-volatile, insoluble or sparingly soluble. To suppress polymerization, sterically demanding chalcogenolate ligands have been employed. Organoselenolato metal complexes can be synthesized *via* selenium insertion into alkali metal-transition metal bonds of carbonylates and subsequent reactions with organohalides [13]. Corrigan and coworkers [14] have synthesized Zn(II) selenolate complexes and used it as capping agent in the synthesis of nanoclusters. Puddephat *et al.* [15] have

reported the first cationic Pt(VI) selenolate complexes by reacting adamantanoid compound [Hg₄(SePh)₆(L)₄][ClO₄]₂ with [PtMe₂(bu₂bpy)]. Laitine *et al.* [16] have prepared a series of metal selenolate complexes [Pt(SeR)₂(PPh₃)₂] which are significant as synthons for more complicated species. Many transition metal chalcogenolates *e.g.* Ni(II) [17], Pd(II), Pt(II) [18] and Zn(II) [19,20] selenolate complexes have been prepared with bulky ligands. Recently, Yam *et al.* have prepared a series of dinuclear copper(I) [21,22] and Ag(I)-chalcogenolate complexes [23] and studied their photophysics. The structure and bonding studies of transition-metal chalcogenolates are well documented, analogous studies with the more electropositive elements (*i.e.* alkali, alkaline earths and *f*-block elements) are less well defined. Structural studies of ionic chalcogenolates are generally hampered by thermal sensitivity and dissociation tendency in neutral donor solvents. The unstable lithium selenolate undergoes self-addition, which eventually yields uniformly a complex macrocyclic ring [24]. Magnesium selenolate showed selective Michael/aldol induction for preparation of anti-aldols from β -substituted α,β -unsaturated esters [25,26]. Much of the recent interest in lanthanide chalcogenolates results from their possible use as precursors to lanthanide chalcogenolates. These materials are of wide interest due to their unusual magnetic, electronic and optical properties [27]. A wide variety



Synthesis and Spectral Studies of Ru(II) complexes with Macrocyclic Ligands

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(Received: June 26, 2021; Accepted: July 27, 2021)

ABSTRACT

Fifteen Ru(II) complexes of the type $[RuCl_2(L)]$ (where $L=N_4$ donor macrocyclic ligands) have been synthesised by reaction of $[(RuCl_2(DMSO))_2]$ with fifteen macrocyclic Schiff base ligands containing N_4 donors groups. The prepared fifteen $[RuCl_2(L)]$ complexes were characterised by elemental analyses, molar conductivity, UV-Visible, IR, X-ray photoelectron spectra (XPS) and magnetic susceptibility measurements and an octahedral geometry was proposed for all these complexes.

Keywords: N_4 macrocyclic Schiff base complexes, Ru(II) complexes, elemental analysis, UV-Visible, Magnetic susceptibility measurement, X-ray photoelectron spectra (XPS).

INTRODUCTION

During past few decades the chemistry of macrocyclic of metal have been developed very extensively due to its applications in coordination chemistry^{1,2}; bioinorganic chemistry³ catalysis⁴⁻⁶; organometallic chemistry⁷ and biocoordination chemistry⁸. Many macrocyclic ligands e-g. Robson type tetraaminodiphenol macrocyclic ligands^{9,10}; N_4S_2 donor macrocyclic ligands¹¹; crown ethers; porphyrins; saturated and unsaturated polyamine⁶⁻¹²; polyazamacrocycles¹⁸; have been synthesised.

A number of Schiff base macrocyclic ligands have been reported¹⁴. In which many macrocyclic ligands have been synthesised by the template condensation reaction¹⁵. Several transition metal ion complexes in living organisms work as enzymes or carriers in macrocyclic ligand environment¹⁶ and used as modelling on the active sites of metalloenzymes¹⁷.

Various macrocyclic metal complexes have been used as detecting tumor lesions¹⁸ as in labeling monoclonal antibodies with radioactive models¹⁹ as in



Techno-Economic Analysis of Second-Generation Biofuel Technologies

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Frontiers in Bioengineering and Biotechnology, [www.frontiersin.org](#)

Abstract

The ever-increasing environmental pressure and fuel demands along with attention for non-petroleum fuel sources are driving technology for fossil alternatives. The second-generation biofuel technologies seek to make the agricultural waste or residue of agricultural processes relevant to use fuel. The problem is with the efficiency with which they are produced. The techno-economic assessment gives a useful perspective about the production efficiency of the technologies. In this paper, the techno-economic analysis of the residue of different second-generation biofuel systems using the pre-fermentation, fermentation, and fermentation steps are compared. The fermentation and conversion of the biomass has been discussed in more detail with its techno-economic assessment available in the literature and conversion. Technological change is studied by means of divided into two stages when it is provided by other parties' technologies such as fuel conversion and advanced fuel conversion reactions. In the pre-fermentation of biomass technologies, the ethanol and pre-fermentation is the most favored step of the process because for the conversion of biomass. The other technologies such as the pre-fermentation technologies often only cost a higher price of the product as the change for storage and consumption of gas for engine fuels. In the hydrogen step, the fermentation and fermentation technologies have the advantage for being more efficient. However, it is not as for ethanol use the separate hydrogen and fermentation fuels the other hand. The major concern along with the ferment is the period of pre-fermentation with hydrolysis requiring high temperatures, more to fermentation. The high energy and cost. The study compares of different fuels related to biomass related to pre-fermentation of second-generation biofuel technologies through this of review. Although the present is literature of the techno-economic analysis performed, only results with techno-economic analysis are provided.



Nanoencapsulation strategies for improving nutritional functionality, safety and delivery of plant-based foods: Recent updates and future opportunities



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ARTICLE INFO

Keywords:
Plant-based foods
Nanotechnology
Microencapsulation
Food safety
Sustainability

ABSTRACT

Currently, food industries largely based on animal products including egg, meat, and fish are facing a burning challenge to meet the continuously increasing consumer demand. The greater sustainability of plant-based foods has raised the transition from animal foods to plant foods due to its ecological, economic, and alternative sources. Different plant-derived ingredients like gum arabic, alginate-chitosan, dairy films, starch, soy-lecithin, shell and long chain monounsaturated fatty acids are used to develop plant-based foods. However, selection of most important ones being critical for creating a successful real product. Most actually, when the use of bioactive ingredients is required, some challenges like instability and reaction with other food matrices posed in development of plant-based foods. In this context, nanoencapsulation of food ingredients is an emerging and innovative field for consistent and targeted delivery with various prophylactic activities. The technology via, complexing nanoencapsulation facilitates the release of food ingredients, improvement in bioavailability, and digestion in the human body. Moreover, the plant-based foods are getting considerable attention in the scientific community due to development of various analogues of meat, egg, and milk. This review describes the recent updates in scientific substantiating of plant-based foods highlighting their prophylactic measures, market on meat, and plant-based ingredients with physical, functional, and molecular properties, and encapsulation strategies for estimation of various factors, maintenance of food quality, and assurance of safety as well as bioavailability or beneficial outcomes.

1. Introduction

The word “plant-based” food or diet refers to foods produced mostly from plant sources, such as vegetables, nuts, grains, pulses, seeds, fruits, and other foods obtained from plants that do not contain any animal-derived ingredients (Fardet, 2017). A plant-based diet mainly focuses on healthy whole foods or minimally processed plant-derived foods, since processing of food removes substantial amount of nutrients, greatly compromising its nutritive value. For example, eating a whole apple has distinct effect on satiety and insulinemic response than an apple puree or refined apple juice (Yadav et al., 2017). The plant-based foods avoid all types of animal products such as, meat, fish, chicken, egg, and dairy products (Ornish, 2017).

In most of the cases, people confuse the terms “plant-based diet” with “vegan diet” (which only includes food obtained from plant sources, free from animal sources) while others synonym it with vegetarian diet (that might include dairy products and eggs but does not contain meat) or semi-vegetarian diet and Mediterranean diets, that

involves a limited amount of animal-based food (Dubey et al., 2020). Vegetarian diet is preferred by a large population, since it has many health benefits, including reduced risk of coronary heart diseases, diabetes, high blood pressure, and longer life (Hargreaves et al., 2021; Yu, 2022; McManus and Webb, 2017). The Mediterranean diet is also based on plant foods with occasional addition of fish, chicken, eggs, cheese, and yogurt, as well as nuts and desserts (Smith et al., 2011). It has been observed in both large population studies as well as randomized clinical trials that the Mediterranean diet reduces the risk of heart diseases, metabolic syndrome, diabetes, cancers (including prostate, breast and colon cancer), depression, and frailty in older people, along with better mental and physical function (Sutton et al., 2020; O’Keefe et al., 2017). More importantly, adaptation of plant-based food for diet has numerous advantages in the busy lifestyle of the modern generation. For instance, carotenoids obtained from tomatoes, various vitamins of fruits and omega-3 fatty acids isolated from walnuts, chia seeds and flax seeds possess antimicrobial, antioxidant and anticarcinogenic properties (Rao and Padilla, 2014). After consumption of food, these bioactive

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Role of Potassium (K) Solubilising Microbes (KSM) in Growth and Induction of Resistance against Biotic and Abiotic Stress in Plant: A Book Review

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Received: 20 June 2019; Revised: 25 August 2018; Accepted: 20 October 2019

Abstract During green revolution, the basic target was to food people without caring for the environment and soil health, so the random use of chemicals destroyed the natural texture of soil, reduced the soil fertility. A lot of scientists around the world reported that deprivation of available nutrients in soil affect the plant health and yield that directly lead to increase the chances of perception of disease in human by reducing the immunity power. Now a days, soil fertility and health are going to decrease so the major needed for sustainable agriculture. In this review, our focus on potassium (K) nutrient which is very important for providing strength and immunity to plant under stress conditions. This element is naturally present in soil but in

The book entitled *Potassium Solubilizing Microorganisms for Sustainable Agriculture* was edited by Vijay Singh Meena, Bihan Ram Maurya, Jay Prakash Verma, Ram Swaroop



Meena and published by Springer India in 2016, 338 pp., price 142.79 • Online ISBN 978-81-322-2776-2
In animal and plant systems in life both animal and plant as a macronutrient. In plant system, potassium (K) is required system, potassium (K) plays a very important role as it serves



Chapter 3.2.22 - *Alpinia officinarum*

Agnes Müller-Schäfer,¹ Ganesha Prasad Kumar Choudhary,² Sumitkumar Singh,³ Anurag Chatterjee,⁴ **Chaitanya Kumar,**⁵ Anand Kumar Saini,⁶ Ganesh Kumar Jaiswal,⁷ Jay Chandra Verma⁸

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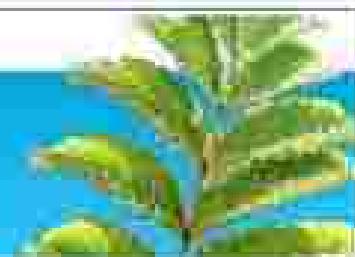
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Abstract

Alpinia officinarum Hance (ginger) is a perennial ginger family plant. Ginger has been traditionally used for many years to treat several different diseases including cold, pain, inflammation, stomach ache, and microbial infections, and it also works as an antioxidant and anticancer agent. Different parts of *A. officinarum* have been used either directly or by processing through different methods for treatment. Plant parts like rhizomes, leaves, aerial parts, and roots of ginger were extracted both in polar and nonpolar solvents to enhance the disease control property. Ethanol extract of this plant is more effective in all kinds of disease. This chapter summarizes the application of *A. officinarum* in curing different diseases from microbial infection to mental disease. Our main focus in this chapter is on the mechanism of ginger in curing Alzheimer disease.



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Correlation studies among yield and its components in Indian mustard (*Brassica juncea* L. Czern and Coss)

Nisha Pandey, OP Singh, VN Pathak, Brijesh Singh, DR Singh and
Yadavendra Kumar

Abstract—An experiment was undertaken to study correlation and path coefficient analysis for seed yield and its components among 20 genotypes of *Malva* muscata. The field experiment was conducted under timely sown condition in randomized block design with three replications at Fafanah farm, K.M.M., Jember Padjadjaran College, India during 2017-18. The data were observed on 11 attributes viz: days to 50% flowering, number of primary branches, plant height, days to maturity, number of siliques per plant, number of secondary branches, number of seeds per silique, biological yield per plant, seed weight, harvest index and seed yield per plant. The seed yield per plant had positive and significant correlation with days to 50% flowering (0.284, 0.251%), plant height (0.423, 0.402%), seed weight (0.290, 0.277%) and harvest index (0.349, 0.336%) at both genotypic and phenotypic levels. However, it had non-significance with number of seeds per silique (0.27%) at genotypic level only. Furthermore, path coefficient analysis of yield contributing characters clearly indicated that harvest index (0.277) showed the highest positive direct effect on seed yield followed by biological yield per plant (0.091%), days to maturity (0.091%) and number of secondary branches (0.143%). Observations suggest that these characters served the basis for selection in breeding programme for yield improvement in *Malva* muscata.

Keywords: Business ethics; organizational commitment; employee engagement

Repeseed-mustard is the third important oilseed crops in the world after soybean (*Glycine max*) and palm oil. Botanically, the genus *Brassica* belongs to *Brassicaceae* family having three elementary species (triploids) with $2n=16$, 18 and 20 while other three species are tetraploids including Indian mustard. All repeseed and mustard crops are grown under wide range of agro-climatic conditions. Indian mustard (*Brassica juncea* L. Czern and Coss) is cultivated throughout the world. It is also cultivated all over India as Major Rabi oilseed crop of northern India. It contains 53 to 47% oil and 14% cake content.

Indian mustard has some antifungal and antiviral medicinal properties. However, its allyl isothiocyanate is carcinogenic in nature. Mustard oil is used in almost all regions of northern India for cooking and frying due to its pungency liking habits. Industrially, it is used in soap making, greases and scent manufacturing. Oil and meal quality and value added breeding programmes are necessary improvement of rapeseed-mustard. Meal quality is found deteriorated if a high concentration of glucosinolates estimates. Current score is given by Western Canadian Oilseed Association for varieties having less than 2% acid in oil and less than 2 moles of glucosinolates in defatted seed meal. Usually, Indian cultivars have high erucic acid (40-50%) in oil and high glucosinolates (80-120 moles/g) in seed meal which would be harmful to minimize it in developing cultivars. Breeding crop varieties tolerant to salt stresses at other stresses are important. Various mechanisms are involved to select suitable most plant types for yield, quality and apply most suitable breeding method to develop modern varieties. It is therefore, essential that germplasm should be chosen on the basis of their phenotypic and genotypic value of quantitative-qualitative trait for suitable breeding strategies in crop improvement. This investigation aimed at knowing the magnitudes of correlation coefficient and path analysis for 11 characters.

Twenty strains varieties were grown in Randomised Block Design (R.B.D.) with 3 replications on dated December 1st 2017. Each treatment was sown in a plot with spacing 3 m X 0.45 m X 0.20 m with recommended packages of practices to raise a good crop.

As per requisite periods, five randomly selected plants/plot, data were recorded for days to 50% flowering, number of primary branches, plant height, days to maturity, number of siliques per plant, number of secondary branches, number of seeds per silique, biological yield per plant, test weight, harvest index and seed yield per plant for their analysis and interpretation.

Results and Discussion

By analysis of variance (ANOVA) estimates, genotypes were found highly significant for all characters. Correlation coefficient analysis helps to determine the nature and degree of relationship between any two of measured characters. This correlation does not consider dependence of one variable (character) over the other.

Direct contribution of each component to the yield and indirect effects of other traits were estimated by path analysis. Path coefficient analysis fulfils the lacuna of correlation coefficients. Wright (1921) [1] gave the idea for partitioning of associationship of any component with yield as direct and indirect effects and analysed as per procedure given by Dewey and Lu, 1959 [2].

The correlation coefficient analysis (Table 1) revealed that, in general, the values of genotypic correlations were slightly higher than their corresponding phenotypic correlations indicating the preponderance of inherent associations among the traits. It revealed that seed yield had significant and positive associationship with days to 50% flowering and number of seeds per silique. Similarly, harvest index, test weight and plant height shown highly significant values of correlation coefficient with yield. Some other characters were also correlated with each other and they were indirectly responsible for increasing seed yield. A markedly high positive correlation coefficients were observed between days to flowering with plant height and days to maturity; number of primary branches with plant height and test weight, plant height with test weight; days to maturity with harvest index; number of siliques per plant with biological yield; number of seeds per silique with test weight and harvest index and test weight with harvest index. But, a negative correlation was measured between days to flowering with number of seeds per silique; number of primary branches with days to maturity and secondary branches; plant height with test weight; days to maturity with biological yield; number of siliques per plant with number of seeds per silique, test weight and harvest index; secondary branches with test weight and biological yield with harvest index. These correlation coefficients indicate that a breeder can improve the seed yield per plant

not only by selecting the seed yield per se but along with plant height, seeds per silique, test weight and harvest index. But, a taller plant would have more test weight due to later flowering and more number of primary branches. A higher significance of test weight with the harvest index as well as the seed yield are important attributes for yield enhancement.

The genotypic correlation coefficient values are usually interaction of linkage and pleiotropic genes. The pleiotropic effect is more illustrative explanation over linkages. A correlation coefficient magnitude and direction may be changed in coming generations by using biparental mating if it was governed by linkage but it cannot change in case of pleiotropic effect. Similar results have been reported by Sirohi et al. (2004) [3] and Gangapur et al. (2009) [4].

The results of path coefficient analysis carried out using simple correlation coefficients among the characters with yield given in table 2. Days to flowering had a direct negative effect (-0.333) over significantly positive correlation with seed yield along with some positive and negative indirect effects of other characters. Similarly, positive but highly significant correlation coefficient between plant height and seed yield had partitioned (0.079) direct effect along with other character indirect effects. The number of seeds per silique though had negative (-0.243) direct effect on positive significant seed yield, yet the positive correlation was measured due to positive indirect effect of days to flowering, plant height, siliques per plant, biological yield and residual effect (0.1923) with some negative indirect effects for other characters. Though, correlation coefficient was observed highly positive between test weight and seed yield yet the direct effect was negative (-0.054) usually because residual effect and some positive indirect effect and trace magnitude of negative indirect effects in case of few attributes. Likewise, the highest correlation coefficient between harvest index and seed yield (0.749) was due to high residual effect and high positive direct effect (0.177) along with some positive indirect effects of days to flowering, plant height, days to maturity, etc. with some negative indirect effects.

With insight view on the correlation and path analysis give the inference of importance of studied attributes to the seed yield. The harvest index and test weight which are valuable attributes of total biological yield along with taller plant with late flowering and maturity and primary branches which are indirectly linked with the plant height and therefore should be considered as selection criteria during time of selection. Similar results have been reported by Shikari and Sakhumakpetra (2004) [5], Sirohi et al. (2004) [3] and Gangapur et al. (2009) [4].

Table 1: Genotypic and Phenotypic correlation among 11 characters in Mustard (*Brassica juncea* L.)

ENo	Character	Days to 50% Flowering	No. of primary branches	Plant height (cm)	Days to maturity	No. of siliques per plant	No. of secondary branches	No. of seeds per silique	Biological yield per plant(g)	Test weight	Harvest index (%)	Seed yield per plant (g)
1	Days to 50% Flowering	1	0.177	0.375**	0.031**	0.062	0.064	-0.303**	0.005	0.029	0.212	0.244*
		0	0.130	0.071**	0.294*	0.061	0.063	-0.423**	0.061	0.007	0.156	0.280*
2	No. of primary branches	1	0.352**	-0.149**	0.071	-0.207**	-0.011	0.212	0.438**	-0.031	0.178	
		0	0.257**	-0.117*	0.022	-0.477**	0.018	0.211	0.438**	-0.036	0.123	
3	Plant height (cm)	1	0	-0.426	-0.097	0.231	-0.183	0.107	0.338**	0.243	0.421**	
		0	0	-0.433	-0.196	0.232	-0.123	0.109	0.331**	0.239	0.406	
4	Days to maturity	1	0	0	1	-0.236	0.018	0.114	-0.179**	-0.052	0.294*	0.014
		0	0	0	-0.239	0.020	0.092	0.092	-0.303**	-0.049	0.266*	0.006
5	No. of siliques per plant	1	0	0	0	1	-0.012	-0.401**	-0.429**	-0.267*	-0.019*	0.017
		0	0	0	0	-0.013	-0.252*	-0.619**	-0.267*	-0.306*	-0.055	
6	No. of secondary branches	1	0	0	0	0	1	-0.014	-0.154	-0.385**	-0.017	-0.079
		0	0	0	0	0	-0.023	-0.106	-0.362**	-0.106	-0.110	

S	No of seeds per siliqua						%	GCV (%)	PCC	GCV (%)	PCC	GCV (%)	PCC
6	Biological yield per plant(g)							0.136	0.447**	0.281**	0.281**	0.136	0.447**
7	Test weight							0.136	0.447**	0.281**	0.281**	0.136	0.447**
10	Harvest index (%)							0.136	0.447**	0.281**	0.281**	0.136	0.447**

GCV = Genotypic Coefficient of Variation

* Significant at 5% level

PCC = Phenotypic Correlation Coefficient

** Significant at 1% level

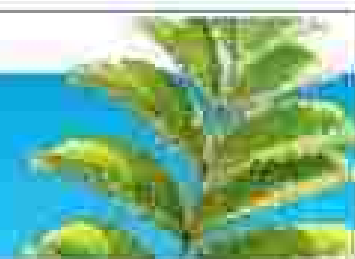
Table 2: Direct and indirect effects of genotype level of different quantitative characters on yield in Mustard (*Brassica juncea* L.)

SN	Character	Direct effect	No. of primary branches	Plant height (cm)	Days to maturity	No. of siliques per plant	No. of secondary branches	No. of seeds per siliqua	Biological yield per plant(g)	Test weight	Harvest index (%)	Seed yield per plant (g)
1	Days to 50% flowering	-0.249	-0.098	-0.270	-0.114	-0.071	-0.010	0.171	-0.323	-0.018	-0.272	-1.262
2	No. of primary branches	0.025	0.142	0.052	-0.049	0.003	-0.005	0.002	0.003	0.004	-0.003	-0.029
3	Plant height (cm)	0.003	0.029	0.078	-0.002	-0.009	0.007	-0.004	0.012	-0.026	0.009	-0.023
4	Days to maturity	0.046	-0.004	-0.002	0.194	-0.000	0.003	0.022	-0.006	-0.003	0.004	-0.012
5	No. of siliques per plant	-0.004	-0.003	0.025	0.004	-0.234	-0.003	1.702	-0.109	0.000	0.000	-0.057
6	secondary branches	0.000	-0.005	0.000	0.005	0.002	0.143	-0.004	-0.022	-0.006	-0.004	-0.079
7	No. of seeds per siliqua	0.023	-0.001	0.044	-0.028	0.098	0.003	-0.243	0.003	-0.146	-0.001	-0.279
8	Biological yield per plant(g)	0.003	0.005	0.146	-0.019	0.598	-0.007	-0.000	0.001	0.130	-0.007	-0.000
9	Test weight	-0.002	-0.024	-0.010	0.003	0.011	0.003	-0.003	-0.007	-0.004	-0.029	-0.000
10	Harvest index (%)	0.071	-0.042	0.103	0.178	-0.012	-0.014	0.000	-0.025	0.000	0.271	0.749

Residual effect = 0.182

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ISSN (E): 2277-1982
ISSN (P): 2582-8242
NAAS Rating: 5.25
DOI: 10.26907/2582-8242
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www.thepharmajournal.com
Bommalu, 02-06-2021
Accepted: 08-07-2021

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Germplasm evaluation, character association and genetic diversity in field pea (*Pisum sativum* L.)

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Abstract

The present investigation was taken to estimate the characters correlation coefficients along with dispersion and path coefficient analysis with the help of raising 20 distinct varieties of field pea at 10th district farm of S.M.M. Town P.G. College, Ballia during Kharif season 2017-18. The field experiment was conducted with maintaining principles of experimental design under study under conditions in complete randomized block design with three replications. The data were recorded on various characters including yield for estimates of phenotypic and genotypic coefficient of variation. Phenotypic coefficient of variation (PCV) values were slightly higher than corresponding genotypic coefficients of variation (GCV) for all attributes revealing small effects of environment on character expression pattern. Results of association coefficient showed that grain yield had significant and positive association with pod length (0.780), biological yield per plant (0.705) and test weight (0.694), while it had a negative but significant association with branches per plant (-0.431). The data for direct and indirect effects were estimated through path coefficient analysis and observed that biological yield per plant (0.304) had highest positive direct effect on seed yield followed by test weight (0.527), revealing that these characters might be useful during breeding programme as effective selection criterion for yield improvement in pea.

Keywords: Field pea, *Pisum sativum* L., association coefficient, path analysis

Introduction

Pea (*Pisum sativum* L.) is a diploid species ($2n=14$) of family *Fabaceae*. Though in some parts of the world, it is grown for grazing purpose, yet in India it is not only consumed as good source of protein but in a variety of ways. Pea is grown all over the world and is an important pulse crop with varying area and production. In India, area under pea crop was 124.16 lakh hectares with a production of ~ 3 lakh tonnes and productivity of 6.28 q/hectare in 2015-16. Uttar Pradesh is the largest producer in the country followed by Bihar, Haryana, Punjab, etc.

It is a high protein (20%) crop with all essential amino acids important for normal activities of living organisms. The fractional composition is also favourable. The most important is it has easily water soluble fibre seed protein (38% to 47%) and green seeds (65% to 82%) along with a series of vitamins, minerals and high fibre content. Immature pods of pea have high level of active lipotropic anti-sclerotic substances like choline and inositol. Being pulse crop it enhances the soil fertility by nitrogen fixation, foliage decomposition, etc.

The major bottlenecks in pulses production in general and pea in particular are negative associations between high production input and sustainable genotypes. Using improved production technology, breeding high yielding disease resistant and suitable plant type which may be highly responsive to inputs and insensitive to light can help to cross the yield barrier. Keeping in view the various shortcomings as well as good attributes in the existing varieties of pea, this investigation was carried out. Eleven characters were taken under the present study for estimates of variability, correlation coefficients and path coefficients analysis.

Wright (1931) partitioned the total into cause and effect. It splits the correlation magnitudes into estimates of direct and indirect contribution of each character towards yield along with residual effect as per procedure illustrated by Dewey and Lin (1959).^[1]

Materials and Methods

Twenty divergent strains/varieties of pea obtained from different places in the department were grown in Feb. 2017-18 using Randomised Block Design (R.B.D.) with 3 replications dated 7th December, 2017 at farm of S.M.M. Town P.G. College, Ballia. Each treatment was sown in a plot with distancing of 3 m X 0.30 m X 0.1 m.

The data on five randomly selected plants were taken for plant height, days to maturity, branches per plant, pod length, number of pods per plant, biological yield per plant, 100 seed weight, harvest index and seed yield per plant while, days to 50% germination and days to 50% flowering were observed on plant 5 only. The data were analysed by standard statistical method.

Results and Discussion

The observed variability among genotypes was estimated by analysis of variance (ANOVA). All characters exhibited significant variance except number of seeds/pod. The seed yield per plant was a most important character which was a result of the multiplicative interactions of several genes in different directions. Such genes which are responsible for characters are termed as yield components. The genetic architecture of seed yield is based on the effects produced by various yield components directly with one another. Therefore, identification of important yield components and information about associations of them with yield and also among each others are useful for developing efficient breeding strategy to evolve high yielding varieties. In this respect, the correlation coefficients between two variables or characters help us in understanding the nature and magnitude of association among yield and yield components. The phenotypic correlation coefficient is the cumulative effect of genetic and environmental interaction, while genotypic correlation coefficient provides a real association value between two characters and they are highly useful in selection of parents.

The table 1 clearly depicts that for almost all the characters phenotypic correlation coefficients were slightly less than their corresponding genotypic one. The seed yield per plant was more positively significant for biological yield, pod length and test weight, while a significant but negative high magnitude of association was noted between seed yield and branches per plant. The important positive associations were also observed between days to germination with branches per plant and days to maturity, days to flowering with plant height, days to maturity and biological yield, plant height with maturity, branches per plant, number of pods per plant and biological yield, days to maturity with branches per plant, number of pod per plant and biological yield, branches per plant with number of pods per plant, pod length with test weight and harvest index, number of pods per plant with biological yield and test weight with harvest index. On the other hand contrary to these associations negative and significant correlation coefficient were observed between days to germination and days to flowering as well as plant height. Days to flowering had negative and significant association with harvest index while plant height with pod

length, test weight and harvest index also had similar result. Another similar direction was noted between days to maturity and pod length, test weight and harvest index. Branches per plant with pod length, test weight and harvest index, pod length with number of pods per plant, number of pods per plant with harvest index resulted in negative and significant association. And at last negative and significant association was reported between biological yield and harvest index. The correlation coefficient values if significant are a result of pleiotropic and linkage effects due to presence of pleiotropic and interlinked genes on same chromosome. Positive association is the result of coupling and negative association is due to repulsion. Any association may be broken down in next generation as segregating or generation mean due to breakage of earlier established correlation coefficients through crossing over or biparental matings. So the observation of a particular correlation in a direction may get an alternate way in next generation. Similar results have been reported by Shinde *et al.* (1993), Singh *et al.* (2002), and Tyagi *et al.* (2002).^{1-3,4,5,6}

As written earlier, three characters viz. biological yield per plant and test weight had positive association with seed yield per plant while branches per plant had negative association. The biological yield had greatest direct effect on seed yield (1.303), (table 2) with other indirect positive effects of days to flowering, plant height, days to maturity, branches per plant, etc. while three attributes i.e. days to germination, pod length, test weight and harvest index showed negative indirect effects. The test weight had negative direct effect (-0.195) but positive correlation coefficient was observed due to indirect effects of plant height, days to maturity, branches per plant, pods per plant, biological yield and days to germination along with negative indirect value for harvest index. The negative association between branches per plant with seed yield was partitioned into direct effect (-0.433) with another indirect negative values for biological yield, pods per plant, days to flowering and days to germination. While on the other hand, plant height, days to maturity, pod length, test weight and harvest index had shown indirect positive effects. A high magnitude of residual effect (1.634) was estimated in path analysis.

The insight view of the correlation and path analysis reveals that breeder should consider biological yield, test weight, branches per plant, days to maturity with reference to days to germination with dwarf plant size and more number of pods per plant would be beneficial for yield improvement. This is supported by the findings of Katoch (2016)⁷ and Devi *et al.* (2017).⁸

Table 1: Genotypic and Phenotypic Correlation Coefficient for eleven characters in pea (Pisum sativum L.)

Characters	Days to 50% germination	Days to 50% flowering	Plant height (cm)	Days to maturity	Branches per plant	Pod length(cm)	No of pod per plant	Biological yield per plant(g)	Test weight	Harvest index(%)	Seed yield per plant (g)
Days to 50% germination	r_{22} r_{22}	0.662** 0.216**	0.416** 0.425**	0.264* 0.264*	0.401** 0.376**	-0.110 0.386	0.212 0.229	-0.176 -0.168	-0.134 -0.118	0.134* 0.116	-0.020 -0.010
Days to 50% flowering		r_{33} r_{33}	0.589** 0.387**	0.395** 0.321*	0.426 -0.007	-0.228 -0.192	0.144 0.124	0.236** 0.277*	-0.264 -0.265	-0.317** -0.301**	-0.080 -0.079
Plant height			r_{44} r_{44}	0.563** 0.477**	0.431** 0.429**	-0.703** -0.660**	0.686** 0.850**	0.505** 0.476**	-0.583** -0.488**	-0.016** -0.645**	-0.175 -0.157
Days to maturity				r_{55} r_{55}	0.686** 0.629**	-0.004** -0.021**	0.723** 0.642**	0.300* 0.272*	-0.401** -0.401**	-0.625** -0.413**	-0.133 -0.101
Branches per plant					r_{66} r_{66}	-0.886** -0.746**	0.794** 0.700**	0.108 0.118	0.902** -0.821**	-0.386** -0.495**	-0.411** -0.286*

Pod Length						r_{E} r_D	0.000** 0.011**	-0.000 0.005	0.002** 0.003**	0.173** 0.328**	0.230** 0.321**
Number of pods per plant						r_{E} r_D	0.000** 0.001**	-0.000** -0.007**	0.002** -0.000**	0.172 0.181	0.172 0.181
Biological yield per plant						r_{E} r_D		-0.014 0.005	-0.043** -0.049**	0.300** 0.291**	0.300** 0.291**
Test weight						r_{E} r_D			0.002** 0.003**	0.002** 0.003**	0.002** 0.003**
Harvest Index						r_{E} r_D				0.170 0.200**	0.170 0.200**

r_{E} = Phenotypic Correlation Coefficient

** Significant at 1% level

r_D = Genotypic Correlation Coefficient

* Significant at 5% level

Table 2: Direct and Indirect effect of genotype level of different quantitative characters on yield in pea (*Pisum sativum* L.)

Character	Days to 50% germination	Days to 50% flowering	Plant height (cm)	Days to maturity	Branches per plant	Pod length (cm)	No. of pods per plant	Biological yield per plant (g)	Test weight	Harvest Index (%)	Seed yield per plant (g)
Days to 50% germination	-0.488	0.294	-0.134	-0.199	-0.196	0.005	-0.223	0.003	0.000	-0.078	-0.050
Days to 50% flowering	0.001	-0.002	-0.001	-0.028	-0.002	0.018	-0.010	-0.024	0.013	0.021	-0.002
Plant height (cm)	0.379	0.400	-0.004	-0.215	-0.390	0.001	-0.093	-0.200	0.019	0.011	-0.175
Days to maturity	0.021	0.022	0.001	0.000	0.000	-0.006	0.009	0.004	-0.000	-0.001	-0.155
Branches per plant	-0.371	-0.020	-0.022	0.044	-0.919	0.210	-0.110	-0.000	0.043	0.132	-0.015*
Pod length (cm)	0.100	0.123	0.005	0.000	0.797	-0.000	0.023	0.010	-0.007	-0.004	0.000*
No. of pods per plant	0.000	0.003	0.000	0.238	0.390	0.252	0.302	0.251	0.200	-0.117	0.172
Biological yield per plant (g)	-0.277	0.439	0.001	0.390	0.137	0.013	0.005	1.003	0.004	-0.140	0.700*
Test weight	-0.001	-0.121	0.200	0.292	-0.337	-0.014	0.375	0.020	-0.002	-0.001	0.000*
Harvest Index (%)	0.120	-0.021	-0.171	-0.122	-0.629	0.010	-0.001	-0.000	0.010	0.021	0.170

Residual Effect = 0.024

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Responses Of Soil Parameters In The Terrestrial Ecosystem Due To Nitrogen (N) Enrichment: A Mini Review

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Abstract

In the existing age, Human-induced reactive Nitrogen (Nr) deposition is the major source of N in the terrestrial ecosystem. Reactive N plays an important role in global climate change through altered ecosystem processes, including acidification, mineralization, leaching of base cations, metal toxicity, microbial properties, altered species composition and diversity. These modifications impose a great threat to plants, microbes, human health and other living organisms. Current understanding on Nr deposition and its impact on natural ecosystem processes and properties basically depends on the simulated and observational N deposition studies. However, our understanding of the mechanisms, which regulate the response of soil parameters under N enrichment are still limited. Interaction among various parameters could play significant role in regulation of ecosystem properties and processes under N deposition. However, most of the studies have focused on the separate responses of soil pH, mineral-N availability and base cations under N-enrichment, which do not provide mechanistic understanding regarding change in soil parameters. Till date very few studies have been performed the simultaneous responses of soil pH, mineral-N availability and base cations under N-enrichment. In this review we have summarized the effect of N-input on soil pH, mineral-N and base cations, with other interactive parameters. The study also emphasizes on interactive study of soil parameters under N-input for better apprehension of mechanism responsible for the change in soil properties and processes.

Keywords: Nitrogen deposition; soil acidification; base cation; mineralization; terrestrial ecosystem

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Introduction

Nitrogen (N) significantly participate in the growth, metabolism and reproduction of organisms. It exist in different forms in the cell such as nucleic acids, proteins, chlorophyll, amino sugars, vitamins, which are undoubtedly important for life (Coleman et al., 2004). It constitutes approximately 78% of gases present in the atmosphere, but it is also a limiting nutrient in the terrestrial ecosystem (Ehler et al., 2007; Lebaner & Treseder, 2008). As it could not be taken directly in N_2 (inert) form, so it has to be fixed first in reactive form. Only a few microbes can break high energy triple bond of N_2 and fix atmospheric nitrogen into the available forms. Share of microorganism in nitrogen fixation is 100-300 Tg of per annum (Galloway et al., 2005), share of lightning is 3-10Tg of nitrogen fixation per annum (Prather et al., 2001), and anthropogenic activity (food demand and energy consumption) contributes 156Tg yr⁻¹ in 1995 to 187tg yr⁻¹ in 2005 (Galloway et al., 2005) of nitrogen fixation per annum.

In preindustrial time, biological nitrogen fixation was predicted up to (90-130) $\times 10^9$ metric tonnes yearly (Galloway, 1995). N deposition was reported more than 50 kg ha during 2000-2010 worldwide (Penuelas et al., 2013), relatively high N deposition was recorded in many tropical regions in comparison to Europe and North America since the 1980s (Galloway et al., 2004; Dumet et al., 2016) (Lamarque et al. 2005) speculated that N deposition by 21st century is projected to lie between 60 and 100Tg-N-yr⁻¹ over global landmass on the basis of A2 scenario N deposition has profound impacts on the soil and vegetation via altering soil pH (Carey et al., 2015; Ye et al., 2015), mineral N availability (Ye et al., 2018) base cation leaching (Lucas et al., 2011; Cai et al., 2017), microbial diversity, enzyme activity (Song et al., 2017; Peng et al. 2017), plant diversity, community structure and productivity (Tang et al., 2017).

Effect of N treatment may vary according to the background N deposition level, N treatment level, time of N treatment, the form

of N treatment, environmental factors, soil properties, etc (Liu et al., 2015). Besides these, a wide range of climatic factors such as moisture and temperature, along with N fertilization also regulate the soil acidification, availability of mineral-N and buffering capacity of the soil (Xu et al., 2016; Cai et al., 2017). Temporal variation is also important in the regulation of soil processes i.e. acidification, N-transformations and buffering capacity. Temporal variations comprise the change in precipitation and temperature, which are generally associated with seasonal patterns (Zhang et al., 2008).

Mineral N is the chief nutrient that govern the quality and fertility of the soil. Continuous excess increase of N deposition may lead to N saturation where availability of inorganic N exceed the biological demand (Lohse et al., 2005) via altered mineralization, even reduce plant productivity and diversity (Wat mough & Dillon, 2003; Magill et al., 2004; Han et al., 2013). Variation in soil mineralization due to N enrichment responsible for altered environmental pH (Niu et al., 2017; Ma et al., 2016; Tian & Niu, 2015). Alteration in Soil pH is responsible for the change in the structure and composition of the soil bacterial assemblage (Fierer & Jackson, 2006; Rouak et al., 2010) as well as cation exchange capacity of the soil (Messiga et al., 2013; Cai et al., 2017; Mao et al., 2017). Long-term N-enrichment mediated reduction in pH leads to reduced nitrification (Bobbink et al., 2010). Soil acidification cause leaching of base cation (Bowman et al., 2008; Tian & Niu, 2015; Lucas et al., 2011) which affects the nutrient quality of soil and change the SOC content (Chapin et al., 2011).

As per our observation, there is diverse results have been found regarding responses of soil parameters due to N enrichment, which causes are still not clearly understood. Simultaneous studies of these soil parameters are still very limited. There is a lack of interactive study on the interdependency of soil N-mineralization, acidification and base cations in the terrestrial ecosystem. Therefore, this review is focused on how and to what extent N deposition influences the soil acidification, N-

mineralization and buffering capacity of the soil.

Consequences of N-input on Soil pH

The N-induced soil acidification has been identified as a significant threat to the terrestrial ecosystem functioning, mostly grasslands, as grasslands are more prone to acidification due to N-enrichment. Various Studies on N stimulating effect on soil properties have shown more or less similar outcomes, which advocate the decrease in pH due to the addition of N. However, some studies have shown that the N addition rate increased, the soil pH decreased continuously (Zhang et al., 2012; Ma et al., 2016; Raza et al., 2020) while Chen et al. (2015) reported decrease in soil pH in a 2 year of N-treatment in comparison to control, pH increased in each treatment level in the next year in comparison to the previous year. Significant reduction in the pH of topsoil was reported at high level of N-input (Widdig et al., 2020). It might be possible due to seasonal fluctuations, inter-annual variability in precipitation and temperature or by alteration in the uptake of inorganic nitrogen forms by the plants. A study conducted in tropical broadleaf forest showed no significant change in pH after 7 years of simulated N input (Huang et al., 2021). Tian and Niu (2015) in a meta-analysis found that the fertilization of urea and NH_4NO_3 added more to soil acidification than NH_4^+ -form fertilizer, due to the volatilization of NH_3 . After 20 years of N-enrichment, effect on soil pH declined (Tian & Niu, 2015). Vulnerability for acidification under N enrichment was found higher in grasslands than forests and among forests acidification was found least in boreal forest. Tian and Niu (2015) also reported that soil pH did not alter significantly in the boreal forest because the boreal forest is dominated by conifer species which prefer NH_4^+ as N source rather than

NO_3^- (Hange et al., 2005). Preference of NH_4^+ over NO_3^- decreases the substrate for nitrification (which cause release of H^+), so they are less susceptible to acidification due to N-deposition, whereas pH in the tropical and temperate forest were found to be significantly declined.

Different ecosystems respond differently as they differ in their edaphic properties and background environment (Table 1). Like the pH values were found to increase along with increasing rates of N addition (Luo et al., 2017) in coastal mangrove sediments, which is contrasting to most of the studies that found a decrease in soil pH due to N addition.

NaNO_3 was used as a source of N by Luo et al. (2017) and they urged that due to an increase in phenolics as a result of N treatment, pH increased. Moisture content along with N addition has potential effects on soil pH via affecting the leaching process (Lucas et al., 2011) as well as the rate of mineralization. (Cai et al., 2017) conducted a study in a semi-dry grassland and reported that the soil pH declined due to N-input under both ambient and supplementary water treatments, but the effect was significant when N was applied without water, whereas with water the effect was not significant. They advised that N stimulated decrease in soil buffering capacity was prevented due to water addition and decreased soil available N via leaching of NO_3^- , resulting in improved pH status (Cai et al., 2017). However, Lieb et al. (2011) reported that increased NO_3^- leaching under water treatment caused increased leaching of base cation too and thus resulted in enhanced soil acidity. This contradiction might be possible due to the discrepancy in the various properties of the soil (Li et al., 2020).

Table 1. Impact of various form and doses of N-input on soil pH, base cations and available-N in various studies. (NA= Not Available)

Location (Latitude and Longitude)	Form of N	Dose of N ($\text{kg N ha}^{-1}\text{year}^{-1}$)	Duration of N treatment	pH	Base cations	Available-N	Reference
41°49' 42" N 117°36' 11" E	Urea	0, 20, 40, 60 and 80	2009-2019	Significantly reduced at 60 N treatment	NA	Increased significantly, higher at 10 N treatment	Chen et al., 2017

47°N-56°N, 104°E	N ₂ O ₅ (N)	0, 17.5, 32.5, 100, 175 and 200	1996-2011	Significantly reduced in both year treatment, while, however, post-tillage pH increased	Ca ²⁺ , Mg ²⁺ , K ⁺ concentrations decreased with N ₂ input, while mostly Ca ²⁺ and Mg ²⁺ decreased and K ⁺ increased	Increased with increase in N ₂ treatment, while post-tillage decreased	Chen et al., 2011
47°N-48°N, 132°-137°E	None	0, 15 and 30	2005-2012	High input of water supply, pH decreased in N-treated plots, while with increased water supply, pH increased in both control and N-treated plots	N/A	N/A	Shi et al., 2014
42°N-44°N, 116°E-118°E	None	0, 30, 60, 120 g N ₂ O ₅	N/A performed	pH reduced significantly in both paddies and orchards under treatment, while N ₂ deposition	Ca ²⁺ , K ⁺ significantly reduced in both water treatment under N ₂ input, while Mg ²⁺ decreased in orchard with increased water N ₂ input	Increased in both orchard and paddies under N ₂ addition, but no more produced in orchard paddies	Fan et al., 2017
47°N-48°N, 136°54'-137°03'E	N ₂ O ₅ (N)	0, 17.5, 32.5, 100, 175 and 200	2000-2006	Increased with increasing N ₂ deposition	N/A	Increased with increasing N ₂ input	Cheng and Xiao 2012
40°38'N, 118°42'N and 118°56'N	N ₂ O ₅ (N)	0, 17.5, 32.5, 100, 175 and 200	1996-2014	Reduced significantly	Na ⁺ , K ⁺ , Mg ²⁺ , Ca ²⁺ and Mn ²⁺ decreased significantly and increased Al ³⁺ and Fe significantly	Increased	Yan et al., 2018
	N ₂ O ₅ (N)	0, 10, 20, 30, 60, 100, 150, 200, and 300 with two different depths (2 and 12 cm) per year	2000-2014	Reduced significantly	Mostly differently after the application of N input, while Mg ²⁺ , Ca ²⁺ decreased in very high-N doses. But so, few elements increased. Fe and Mn decreased in both 1 cm and 12 cm layer and with increasing input N ₂ input	N/A	Wang et al., 2018
	N ₂ O ₅ (N)	0 and 40	1996-2010	N/A	N/A	Increased significantly	Muller et al., 2011
10°23'45"-22°N, 112°45'38"-117°E	N ₂ O ₅ (N)	0 and 45	2000-2011	Slightly reduced	N/A	NH ₄ ⁺ decreased and NH ₄ ⁺ increased	Carey et al., 2011

	NO ₃ ⁻ Ca ²⁺ Na ⁺ H ⁺	4 and 76	2007-2009	In: Decline in Ca ²⁺ in Largest slightly increased, In: Decrease significantly decreased	N/A	In: Tiller and Largest no effect was found, while in Largest NAD treatment significantly	Troffelt et al., 2011
46-47%, 70-87% N	11Ca ²⁺ Mg ²⁺ Na ⁺ Cl ⁻ H ₂ O ⁺	6, 96 (28 and 146)	1996-2006	Declined significantly	Ca ²⁺ reduced significantly Al increased, while Ca ²⁺ Mg ²⁺ and Na ⁺ remain unaffected	N/A	Morrissey et al., 2011

Responses of base cation due to N enrichment

Base cations play important role in soil buffering capacity, which in-turn regulates soil pH. Base cations also play significant role in vital activity and helps in the maintenance of ecosystem structure and function. As different concentration and the ratio of base cations require by different plant species, variation in concentration and ratio of these cation cause change in species composition and diversity. Different studies on responses of base cation under N-enrichment have shown in Table 1. In a study, decrease in Ca²⁺, Mg²⁺ and Na⁺ and increase in Al³⁺ was reported in response to increasing concentration of N, while year-wise concentration of these base cations increased (Chen et al., 2015), however, no significant change in the concentration of base cations and acids cations were observed under 7 years of simulated N-input (Huang et al., 2021). (Cai et al., 2017) demonstrated that total exchangeable cations of the soil significantly decreased with rising N level under ambient and supplementary water treatments. Concentrations of soil exchangeable Ca²⁺ and Na⁺ significantly reduced due to N treatment under both ambient and additional water conditions. Concentration of exchangeable Mg²⁺ increased under N treatment with ambient water condition. Concentration of the soil Ca²⁺ and Mg²⁺ significantly enhanced under water addition in the control (N₀) treatment (Cai et al., 2017). A meta-analysis performed by Lucas et al. (2011), it was reported that exchangeable Ca²⁺, Mg²⁺ and K⁺ reduced by 26%, 25% and 22% in temperate forest, grasslands and boreal forest, while Ca²⁺ concentration enhanced significantly in tropical forest due to N enrichment. Response

of soil base cations also vary according to the fertilizer type. A substantial reduction of exchangeable Ca²⁺, Mg²⁺, and K⁺ from the soils under ammonium nitrate (NH₄NO₃) fertilizer application was found, whereas under ammonium sulfate ((NH₄)₂SO₄) application only Ca²⁺ showed a significant reduction (Lucas et al., 2011). Tian and Niu (2015) reported a significant decline in concentration of Ca²⁺, Mg²⁺ and K⁺ in both grasslands and forests in response to increased N-input. However, they found that the concentration of Na⁺ was significantly declined and Mn²⁺ was increased in grassland but not in the forest. So according to Tian and Niu (2015) grasslands are proceeding towards Mn²⁺ buffering phase.

A decline in base cations might be possible due to coupled leaching of base cation along with NO₃⁻ (Lieb et al., 2011). Vulnerability of grassland towards other stresses enhanced due to the reduction in base cations concentration (Bowman & Cleveland 2008). In an experimental study, reduction in soil-exchangeable base cations by 46%, 37% and 53% for Ca²⁺, Mg²⁺ and K⁺ respectively under the uppermost level of N treatment was reported (Bowman & Cleveland 2008). Base cations concentration is also influenced by a change in soil organic carbon (SOC) content in response to accelerated N-input (Chapin et al., 2011; Fang et al., 2017). SOC concentration in response to N-input either increased (Zhang & Han 2012), decrease (Liu & Greaver, 2010) or remain unchanged (Han et al., 2013) depending on the ecosystem type, fertilizer type and dose of fertilizer used as well as duration of N-deposition. Altered SOC concentration caused change in anion concentration of humus and thus affected the

binding of base cations with humus, which results in the altered availability of soil base cations (Fang et al., 2017). So, ecosystem in which SOC declined as a result of N deposition will face extreme acidification due to promoted base cation leaching (due to reduced amon in humus because of reduced SOC) and increased H^+ concentration (Fang et al., 2017).

Effect of N-input on Soil mineral-N

Nutrient quality of soil is mainly governed by the decomposition and mineralization potential of soil, as plants nutrients uptake occurs mainly in the form of minerals. However, in recent studies, it has been revealed that a few plants can directly take up organic N compounds (Raab et al., 1996). Inorganic N largely derived from atmospheric deposition, fertilization, mineralization and biological N fixation. It affects the soil properties through altered litter quality, rate of mineralization, C:N ratio, microbial communities etc. Hypothetically, the total organic pool present in the soil is mineralizable, but the dynamic fraction of organic-N which mineralized each year is only 1-3% (Bremner, 1965). N enrichment causes the change in mineral-N concentration (Table 1) on account of alteration in the rate of mineralization and other soil processes (Han et al., 2013). Tropical studies have shown that in the high level of N-input significantly increase the concentration of soil NO_3^- and NH_4^+ (Chen et al., 2015; Han et al., 2013), however concentration in each level of N-input was lower in the next year than previous year (Chen et al., 2015), which might be due to altered annual precipitation pattern, temperature (Schaeffer et al., 2013) or shift in preference of inorganic N uptake (Ashton et al., 2010; Zhou et al., 2019). N enrichment studies have found a significant increase in mineral-N (NH_4^+ and NO_3^-) concentration in response to increased N treatment with a decreased rate of mineralization in high N treated plot (Han et al., 2013). Zhang et al., 2012 reported that rate of mineralization and mineral-N concentration increased simultaneously. An increase in mineral-N may be significant (Jing et al., 2016) or non-significant (Knoblauch et al.,

2017). Response of different form of mineral-N vary under N-input, i.e. a study conducted in the temperate steppe showed that the concentration of ammonia significantly decreased and nitrate concentration increased under N (urea) addition (Zhang et al., 2013).

Availability of water also impact the responses of mineral-N under N-input. Cai et al., 2017 reported that N treatment significantly increased the concentration of soil mineral-N under ambient and simulated water addition. A significant reduction in the concentration of soil NO_3^- at high N dose with water treatment was reported, which may be possible due to leaching losses. Moreover, interaction between water and N showed significant effect on the concentrations of soil NO_3^- and NH_4^+ (Cai et al., 2017).

A study conducted in semi-arid grassland of inner magnolia (Lin et al., 2015) showed that in the 1st year of experiment soil ammonium concentration enhanced but not significantly under the high level of N treatments ($(NH_4)_2SO_4$, NH_4Cl and KNO_3), however nitrate concentration was not affected significantly. In the second year, soil NO_3^- concentrations increased under high level of $(NH_4)_2SO_4$ treatment, however decreased under high level of NH_4Cl and KNO_3 treatments. NH_4^+ concentrations declined under all three high level of N treatments in the second year of experiment. Depth of soil also influences the consequence of N-input on mineral-N, as reported in some studies that N input potentially affected the surface zone of soil, but sub-surface strata was not much affected. (Zeng et al., 2015) demonstrated that the concentration of soil mineral-N increased significantly with increasing the N level. While, inorganic N in sub-surface zone showed small increase with a minor change in soil pH.

Conclusion

From above study it can be inferred that N-Enrichment results in the diverse effect on the soil parameters under different conditions. Soil pH showed generalized response under N- treatment in different condition, but the spatial and temporal response of the mineral-

N was not consistent under different N treatment. Responses of base cations were also inconsistent under different form of N-input in space and time. Our knowledge about interactive response of soil acidity, N availability and base cation due to N-input is still limited; only a few studies have introduced the simultaneous role played by soil pH, base cations and inorganic-N in the ecosystem. Since soil pH, available-N, and base cations play important role in biochemical processes of the soil, therefore the mechanism which is responsible for these changes under N-enrichment needs to be investigated in order to mitigate the negative effect of N-enrichment on ecosystem structure and function.

Acknowledgement

Authors are grateful to the Council of Scientific and Industrial Research (CSIR), New Delhi, India for financial support.

Conflicts of interest Authors declares that they have no known conflicts of interest associated with this study.

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5th National Conference and Workshop on Doubling Farmers Income
for Sustainable & Harmonious Agriculture 'DISHA-2022'

11th & 12th, September 2022

KEYNOTE/LEAD PROCEEDINGS BOOK

(Volume-5)

Organized by



KNIPSS, Sultanpur, UP

Chief Editor

Dr. Alok Kumar Singh

in association
with



Keynote/Lead/Research Paper Proceedings Book

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Edition—June, 2022

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Not for Sale

ISBN: 978-81-928932-5-6



978-81-928932-5-6

Published by:

Mr. Gajendra Parmar, Proprietor, Parmar Publication
854, KG Ashram, Bhuinphod, Govindpur Road,
Dhanbad-828109, Jharkhand
Email id: gajendraparmar2562@gmail.com
Web Site: www.parmarpublisher.com

Cover Page Photo Credits: Mr. Anupam Bharti, Deputy Director,
(Agriculture/Horticulture) MGNREGA, Rural Development Department

Cover Page Design, Page Setting, Layout and Limited Copies Printing at Hyderabad by Shri N Suresh Babu

13

STUDIES ON CORRELATION AND PATH ANALYSIS FOR YIELD
CONTRIBUTING TRAITS IN FIELD PEA [*PISUM SATIVUM* L.]

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ABSTRACT

Twenty-nine diverse genotypes of field pea were evaluated for genetic variability, correlation coefficient and path analysis during *Rabi* 2015-2016 with three replications in a randomized block design (RBD). The data were recorded on five randomly selected plants for nine characters. The highest mean value was observed for test weight (149.46) followed by days to maturity (97.35) and plant height (82.92). The grain yield per plant showed positively significant association with number of seeds per plant (0.792), number of pods per plant (0.767), plant height (0.333), days to maturity (0.303) and number of branches per plant (0.265) but, it showed highly significant and negative correlation coefficient with test weight (-0.206). Path coefficient analyses marked maximum positive direct effect for number of pods/plant (0.679) followed by number of seeds/plant (0.433) and days to maturity (0.222). The results provide information that yield attributing abovementioned traits would be exploited during selection of parents.

Key Words: Field pea, *Pisum sativum*, correlation coefficient, path analysis.

Introduction

Field pea (*Pisum sativum* L. var. *arvense*), $2n = 2x = 14$, being an important pulse crop of winter season in India belongs to tribe *viciaeae*, family *Fabaceae*, sub-family-*Papilionaceae*, genus- *Pisum* and species-*sativum*. Probably, western Asia is origin of it. Pea as *rabi* season pulse crop is cultivated mainly in U.P., M.P., Bihar, Rajasthan, Odisha, Maharashtra, etc. India is one of the largest producers of field pea in the world and stands at the fifth place. Yet, it had only seven per cent of world production that is

7.8 Lakh tonnes. In India, U.P. is the highest producer of the pea accounted 60 per cent of the country's production. The area, production and productivity of Ballia district in 2015-16 was 973 ha, 8.87 metric tonnes and 9.12 q/ha respectively. (DAO, Ballia). Field pea is rich in high quality protein followed by phosphorus, calcium and vitamins, especially vitamin A and D. Peas are highly nutritive having high percentage of protein (6.2g/100g of fresh weight) and carbohydrates (16.9g/100g of fresh weight) along with essential minerals, vitamins A, B and C. Majority of population of the country are vegetarian and as a pulse crop, it provides a high digestible protein percentage, vitamins and minerals (Makasheva, 1983). It is used by Indian population in a variety of ways viz. green grain, conserved grain, *besan*, *dal*, pickles, animal fodder, etc.

Materials and Methods

As written earlier, twenty nine diverse field pea lines were grown in Randomized Block Design (RBD) at Agricultural Research Farm, *Nidharia* of S.M.M. Town Post Graduate College, Ballia (U.P.). These genotypes exhibited wide spectrum of variation for various morphological characters. Each germplasm in each replication was grown at 2m x 0.3m x 0.15m spacing with recommended cultural practices. The observations were recorded on five randomly selected plants per replication and averaged for analysis of variance. A few characters were observed at plot level visually viz. days to flowering, maturity and test weight (electronic weighing machine). The data were recorded for days to 50% flowering, days to maturity, plant height (cm), number of branches per plant, number of seeds per plant, number of pods per plant, number of seeds per pod, test weight (1000-seed weight) (g) and seed yield per plant (g). Statistical analysis was carried out according to standard statistical procedure.

Correlation coefficient (r) was used to measure the mutual association of any two independent characters at genotypic and phenotypic levels. Path co-efficient analysis was calculated as per formula suggested by Dewey and Lu (1959).

Results and Discussion

The correlation coefficient for seed yield and other characters is presented in **Table 1**. The genotypic correlation coefficients were higher over phenotypic one for all. A very strong positive association of seed yield per plant was observed at both genotypic and phenotypic levels with number of seeds/plant, number of pods/plant, plant height, days to maturity and number of branches/plant but, a negative value was also found between test weight and yield. The correlation coefficient between number of pods and seeds/plant; days to flowering and maturity; plant height with pods and seeds per plant and seeds per pod had positive, but negative between pods per plant and seeds per pod and test-weight. It exhibited that if partitioning of photosynthates towards more pod number would, probably, cause of less seed number per pod. A strong positive

associationship was noted between flowering period and maturity period. The results revealed that a taller plant, late maturing coupled with more pods and seed per plant with higher branching and test weight would be good criteria for selection of parents, although test weight and yield had shown a negative associationship. The above results revealed that correlation coefficients, observed among the almost all important yield components were highly positive with seed yield. Thus, selection if it is practiced, for improving the traits basis individually or simultaneously, would likely to bring improvement in yield due to correlated response. Similar findings were also reported by various breeders (Sirohi *et al.*, 2006; Lavanaya *et al.*, 2010; Dhama *et al.*, 2010 and Sharma and Sharma, 2012.) For the estimation of a negative correlation coefficient value between yield and 1000 seed weight, a contrary finding was found by Kumar *et al.*, 2010 and Muhammad *et al.* 2013.

Path analysis provides elucidation of correlation coefficient estimated between two attributes. It partitions the total correlation coefficient into direct, indirect and residual effects. Since yield is the most important attribute to a breeder, therefore, the evaluated relationship in magnitudes and direction of yield *per se* with different contributing attributes had preponderance over other correlation values among different traits. The findings of the path analysis for various agronomic traits were depicted in **Table-2**. The residual value was estimated 0.450. The residual estimation provides the joint effect of such attributes which did not take in study. Fortunately, days to maturity, plant height, number of branches per plant, number of pods per plant and number of seeds per plant had shown positive associationship with seed yield. While, on the other hand, the yield had negatively significant with test weight. The highest and positive direct effect was computed (0.619) for number of pods per plant followed by number of seeds per plant (0.433), number of seeds per pod (0.246) and days to maturity (0.222). Contrary to it, direct but negative effect was noted highest for plant height (-0.179) followed by number of branches per plant (-0.58). Though yield had negative association with test weight, yet, a positive but very slight magnitude of (0.020) direct effect was recorded. The more magnitudes of associationship for pods and seeds per plant were due to higher corresponding direct effects along with some indirect effects. Similar findings were also reported by different scientists. (Kumar and Sharma 2006, Kaur *et al.* 2007 and Chetram *et al.* 2010.

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A Review: Effect of Physicochemical and Hydro geochemical Factors on Arsenic Sedimentation and Mobilization

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(Received: 01 January 2023; Revised: 15 February 2023; Accepted: 17 February 2023; Published: 23 February 2023)

(Published by: Richa Trivedi)

ABSTRACT: The adsorption behavior of arsenic was studied experimentally for a wide pH range from 2 to 11. It was found that adsorption of As^{3+} occurs at pH 8, while adsorption of As^{5+} occurs at pH 4. At low pH like 2, the adsorption of As^{3+} and As^{5+} is very low, while at high pH like 11.5 the adsorption rate increases. The order of adsorption of different constituents of As and aqueous media is $AsO_4^{3-} > AsO_3^{3-} > H_2AsO_4^- > H_2O > H_2AsO_3^-$ for $As(III)$ and $AsO_4^{3-} > H_2AsO_4^- > H_2AsO_3^- > H_2AsO_2^- > H_2O$ for $As(V)$. Arsenic acid ($H_2AsO_4^-$) adsorbed at pH 8, while arsenic acid ($H_2AsO_3^-$) adsorbed at pH 4. Arsenic forms in $H_2AsO_4^-$ and $H_2AsO_3^-$ are As^{3+} and As^{5+} , respectively. Conjugate bases of $H_2AsO_4^-$ and $H_2AsO_3^-$ are AsO_4^{3-} and AsO_3^{3-} , respectively, which show increasing rates of adsorption at high pH like 11.5. Arsenic adsorption in aqueous media is aided by ions such as Cl^- , HCO_3^- , $H_2PO_4^-$, SiO_4^{2-} , and PO_4^{3-} . Cations such as Na^+ , Mg^{2+} and Ca^{2+} increase the rate of adsorption of As^{3+} and As^{5+} contents in groundwater, and this rate would be further increased with an increase in the concentration of these ions. The reason for the great adsorption of As contents is due to the electrostatic forces created on adsorbents by the union of charges on the adsorbent surface after the adsorption of cations.

Keywords: Arsenic adsorption, Arsenate (As^{5+}) and Arsenite (As^{3+}), Co-existences, Electro positivity, Electrostatic force.

INTRODUCTION

At present, arsenic toxin and its widespread distribution are a major concern throughout the world, including in India. The present study reveals a high concentration of As (range 50–986 g/l) in ground water affected by vast areas of the north-eastern states of India. This high concentration of As in ground water becomes a significant topic when compared to the admissible limits quoted by the WHO (World Health Organization) and BIS (Bureau of Indian Norms) (10 g/l and 50 g/l, respectively). In this paper, we are going to explain the effects of physicochemical and hydrogeochemical factors on arsenic sedimentation and mobilization in the Ganga-Meghna-Brahmaputra Basin. Arsenate (As^{5+})

and Arsenite (As^{3+}) are two types of oxidation states of arsenic in the groundwater of affected areas. These two oxidation reactions are interconverted by the oxidation of As^{3+} into As^{5+} and the reduction of As^{5+} into As^{3+} .

Arsenic also exists in another form, i.e., organic form, and it's formed by the biomethylation of arsenite.

Groundwater Arsenic contamination in Eastern Gangetic River Basin reported worldwide in recent studies which causes many adverse effects not only for drinking but also for irrigation purpose (Azam, 2013). During monsoon time arsenic goes into groundwater by disintegration of Fe(III)-oxy hydroxides and in pre monsoon time arsenic reversibly adsorb on Fe(III)-oxyhydroxides (Azam, 2020). A definite relationship

exists between the behavior of arsenic and rainfall intensity (Arzan, 2010). Arsenic mostly exists in two types of oxidation states which are arsenate (As^5) and Arsenite (As^3) (Azam and Emayur 2015). Many factors control arsenic concentration and transport in groundwater, which include: Redox potential (Eh), adsorption/desorption, precipitation/dissolution, Arsenic speciation, pH, presence and concentration of

competing ions, biological transformation, etc (Arzu and Karver 2013).

Studies on As contamination in groundwater in different states of India, such as West Bengal, Madhya Pradesh, Bihar, and Uttar Pradesh, show the flood tide plain of the Ganga River, while Assam and Manipur show the flood tide plains of the Brahmaputra and Imphal gutters.



Fig. 1. Brahmaputra-Ganga-Meghna Basin showing Arsenic affected groundwater areas

Arsenic enters the food chain through plants and animals and harms the environment and humans (Giller and Fanner 1989). There are two types of arsenic contamination:

i. Spontaneous releases of arsenic from arsenic-rich groundwater (Smedley *et al.*, 2003) and ii. Human emissions (Zheng *et al.*, 2014) include mining and mine concentration (Wei and Zhou 1992), irrigation (Narita *et al.*, 2003), and pesticide use (Alami *et al.*, 2015), etc.

Local arsenic contamination is due to, as environmental conditions change, released as from mines and desorbed from minerals. Severe arsenic contamination occurs due to the discharge of arsenic-containing wastewater into underground rivers through pipes, fissures, gullies, and sinkholes (Zheng *et al.*, 2014). With the increase in population and industrial development, the seriousness of the drinking water problem becomes very important. It has been reported that a large number of water bodies in various parts of the world have AS concentrations above 50 g/L and have been identified as problematic (Smedley and Kinniburgh 2002). It has also been observed that the groundwater and rivers that spread across the Gangaic Plain in India are highly contaminated by arsenic. This condition of high AS causes a serious problem for the safety of aquatic ecosystems and the health of local populations (Ma *et al.*, 2013). Sprinkler irrigation has demonstrated to be a useful tool in minimizing the bioaccumulation of As and

Cd in rice grain of Carnise genotype cultivated in a soil heavily polluted by both elements (elemental concentration of 50 mg kg⁻¹ each) (Spatu *et al.*, 2021). A significant release of As and NO₃⁻ from sediments at shear stress levels typically measured in estuaries. Substantial release of these constituents due to sediment resuspension does not hence require large storm events but occurs at shear stresses with magnitudes that occur regularly (Taditane *et al.*, 2022).

Mobilization Mechanism of As. It has been found that arsenic-contaminated groundwater was not mainly associated with arsenic-rich areas in source rocks in most of the regions studied. Two important factors were identified.

First, mobilizing arsenic from the solid or adsorbed phase to the groundwater occurs due to highly specific biogeochemical processes, and second, arsenic contents are retained in aquifers because mobilized arsenic accumulates and is not washed away (Smedley and Kinniburgh 2002). In other words, it can be said that the rate of arsenic released from the source must be rapid compared to the groundwater flushing rate. Arsenic can be transported in groundwater in a variety of ways:

1. Alkaline and oxidizing conditions carrying out desorption of arsenic and reducing conditions results in the dissolution of arsenic.
2. Reduction of the bond strength between arsenic and mineral surfaces (Smedley and Kinniburgh 2002).

dissolution, resulting in the release of As^{3+} , As^{5+} , and Fe^{2+} present on such coatings. The chemical reaction is: $2\text{FeOOH}\cdot\text{As(s)} + 3\text{H}_2\text{COOH} + 14\text{H}^+\text{CO}_3 \rightarrow 2\text{Fe}^{2+} + \text{As(s)} + 16\text{HCO}_3^- + 11\text{H}_2\text{O}$

where As(s) is sorbed As and As(d) is dissolved As.

The application of fertilizers to subsurface soil causes the release of As sorbed to aquifer minerals by competitive exchange with phosphate (H_2PO_4^-) ions that migrate into aquifers.

Excessive accumulation of in groundwater is the second mechanism involving the dissolution of FeOOH under reducing conditions and is considered to be the most probable reason for.

Adsorption-desorption process of arsenic in sediment-water interface. For water contamination, sediment is considered a buffer zone. Many different types of complex biological, chemical, and physical processes, such as adsorption, desorption, and/or aggregation or precipitation, occur at water interfaces in sediments (Zou, 2004). Under certain conditions, sediments thus accumulate pollutants and become sources of pollutants (Jin et al., 2003). Arsenic aggregates with positive colloids in water, as it generally occurs as negative colloids (SiO_2 , H_2SiO_3 , etc.). Due to the adsorption process, arsenic deposits as sediments in water beds due to the rapid transformation from the aqueous to the solid phase (Anwar et al., 2004; Patena et al., 2005). Therefore, the sediment-water interface has a significant impact on arsenic migration through the adsorption-desorption process within. Through laboratory experiments and field observations, Chen and Li (1993), Gong et al. (2006) studied how, under hydraulic disturbance, the adsorption-desorption of arsenic at the sediment-water interface occurs. Research has explained that sediment and water are closely considered.

The potential for arsenic contamination in surface waters is due to the increased release of arsenic into water from sediments. During the dry season, arsenic in sediments has a poor ability to resuspension. Therefore, little arsenic is transported downstream. During the wet season, flooding upsets the sediment and water balance, allowing arsenic to resuspension and downstream transport of pollution.

Artenic adsorption affected by hydrogeochemical characteristics and physicochemical properties of sediment. Previous studies have found that adsorption capacity is affected by variations in pH and the charge of colloids. Existence of arsenic in sediments as suspended colloids and light behavior because the colloidal charge changes with changes in pH (Gadiq, 1997), it is extracted by aqueous alkaline solutions (Smedley et al., 2002). According to Manning and Goldberg (1997), the adsorption capacity of arsenic in kaolinite reaches a maximum at pH 5.0 but decreases sharply above pH 6.5.

Anwar et al. (2004) tested the release rate of As from sediment pore water and found that arsenic begins to desorb when pH reaches 9. Release capacity peaks when pH reaches 12. Johnson and Sarker (2007) rely on a double-diffusion (mode) to calculate the pH dependence of the adsorption of arsenic acid (As^{3+}) and arsenic acid (As^{5+}) by hydrated iron oxide (FePO_4) and the Dammak and Morel (1996). It is known that when the pH exceeds 8.5, the amount of arsenic adsorption drops sharply.

Because the distributions of As(III) and As(V) in water solution depend on the pH of the medium, the adsorption mechanism of Arsenic is more complex, as shown by Eqs. (1)-(3) and (4)-(6) at 25°C.



Therefore, different ways of arsenic species distribution on the surface due to different pH ranges.

A study of the effect of pH change on the rate of adsorption shows that large amounts of As(V) are adsorbed on iron hydride when the pH is between 4 and 10, and more As(V) is released into the water as the pH increases. In addition, it was observed by Gupta and Chen (1972) that As(V) is readily adsorbed to aluminum hydride at pH 4–7, with strong adsorption occurring above pH 7.0. Between pH 4 and 9, adsorption kinetic behavior does not show any relevant change. The displayed result shows that acidic conditions promote the adsorption of As(V) , while alkaline conditions promote the adsorption of As(III) .

Coexisting ions. The presence of coexisting ions in water either suppresses or promotes the adsorption behavior of arsenic. Arsenic content in groundwater (Smith et al., 2003; Smedley et al., 2005). As a result, As(III) adsorption is inhibited by competitive effects between anions in water such as SO_4^{2-} , SiO_4^{4-} , PO_4^{3-} , HCO_3^- , Cl^- , F^- , and HPO_4^{2-} , and they could increase the adsorption of As(III) anions to varying degrees. With increased concentration of anions in water, the inhibitory effect becomes stronger, and it was observed that anions such as Cl^- , HPO_4^{2-} , and SO_4^{2-} have particularly strong inhibitory effects in for adsorption behavior, the adsorption of As(III) (Livesey and Huang 1981). Adsorption of As(V) (Goh and Lim 2007). However, for As(V) , new adsorption sites are formed when ions such as SO_4^{2-} , Cl^- , F^- , and HCO_3^- combine with the sediment. Adsorption of As(III) and As(V) is related to the presence of cations such as Ca^{2+} , Mg^{2+} , and Na^+ in water, and they increase adsorption rate with increasing cation concentration. This is due to the accumulation of cations on the surface of the adsorbent.

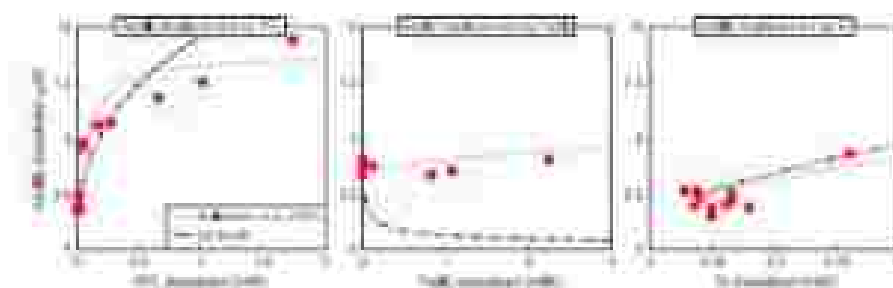


Fig. 4. Arsenic adsorption affected by the presence of Coexisting ions in water

The presence of arsenic enhances the electropositivity behavior of an adsorbent surface and directly enhances the electrostatic force of a cation. This enhancement of electrostatic force has the effect of attracting and binding more arsenic anions on the surface of the adsorbent; therefore (Smith *et al.*, 2002), binding more arsenic anions on the surface of the adsorbent increases with increasing cation concentration. Schmedley *et al.* (2003) As a result, high As concentrations in groundwater are due to high concentrations of NH_4^+ , HCO_3^- , Fe, Mn, and P. The fact that the highest As concentrations are likely to be found in groundwater indicates that SO_4^{2-} reduction occurs under strongly reducing conditions and As mobilization occurs with low SO_4^{2-} concentrations. In addition, Sedláček *et al.* (2008) examined major organic species with high arsenic. Groundwater is Ca-Mg-HCO_3^- chemical Characteristics and hydrological conditions of arsenic-rich groundwater in Sonargaon (Bangladesh, Middle East).

Physico-chemical properties of sediments. The adsorption of As(III) and As(V) by sediments indicates the presence of oxides (iron, aluminum, manganese, etc.) and organics in water bodies. As(III) and As(V) in the particles form insoluble arsenic compounds, which enhance the ability of sediments to adsorb arsenic. Which are influenced by complex surface reactions that can adsorb oxides of iron, aluminum, and manganese, and 80% of the arsenic in water precipitates in sediments containing high arsenic ferrate, as observed by Moenke (1956). At pH = 5.1, Ocarino *et al.* (1983); Wang *et al.* (2010) observed strong adsorption to As(V) and As(III) with interaction of iron manganese compounds.

In addition, the distribution of medium and medium-high arsenic levels outside the estuary was studied by Li *et al.* (2011). Adsorption amounts of As(III) and As(V) in euna-estuary sediments occur due to high levels of organic matter and metals such as iron, manganese, and aluminum in estuary sediments. In the meantime, and also observed that the adsorption amount of As(III) to the sediments is larger than that of As(V). Aside from that, Uddin and Lundberg (1995) performed the correlation analysis. There is a positive correlation with both Al and Fe and the content of the main chemical elements and arsenic in the sediment.

Functional groups include carbonyl, phenolic hydroxyls,

alcohol extract hydroxyls, ethers, amides, and organic particles that cooperate with arsenic, giving the sediment a greater adsorption capacity so it can adsorb large amounts of arsenic (Wang and Mulligan 2006). In addition (Ding *et al.*, 2007), arsenic migration and accumulation on colloidal iron oxide occur because the organic acid colloid has a large specific surface area, adsorption capacity, and a protective colloidal effect against colloidal iron oxide (Wang and Mulligan 2006). Most studies have found that the amount of arsenic adsorbed in sediment is directly proportional to the organic matter content of the sediment, and some studies suggest that the release of arsenic is carried out by the presence of organic matter on the sediment surface Yang *et al.* (2008). In the groundwater of the Hetuo Plain migration, concentration and transformation of arsenic are facilitated by the presence of a reducing environment rich in high pH and organic matter. Because microorganisms produce a reducing environment by decomposing a substance that consumes oxygen organically, As a result, groundwater's high arsenic content is increased by the release of As from the sediments. Through geochemical studies of the arsenic environment in Hetuo Plains of Inner Mongolia, organic matter is an important contributor to arsenic-rich groundwater and showed rich sedimentary environments. Tang *et al.* (1996).

CONCLUSIONS

We have obtained many results for understanding the effects of physicochemical and hydrogeochemical factors on arsenic sedimentation and mobilization properties, and researchers have conducted numerous studies related to morphology, adsorption laws of arsenic in water. Promising conclusions:

1. The morphology and adsorption of arsenic are affected by the pH of aqueous media, and with increasing pH, arsenic adsorption decreases, but the optimum pH for arsenic adsorption gives conflicting results regarding it. Under optimal environmental conditions, the adsorption of As(III) and As(V) as a function of pH gives even more different and conflicting conclusions regarding it.
2. It was observed that cations facilitate the process while anions coexisting in water interfere with the arsenic adsorption process. The presence of coexisting ions in

water either suppresses or promotes the adsorption behavior of arsenic. Arsenic content in groundwater. As a result, As(III) adsorption is inhibited by competitive effects between anions in water such as SO_4^{2-} , SiO_4^{2-} , PO_4^{3-} , HCO_3^- , Cl^- , F^- , and HPO_4^{2-} , and they could increase the adsorption of As(III) anions to varying degrees.

3. Minerals are positively correlated with arsenic content, and the Mn, Fe, and Al contents of the sediments facilitate the adsorption of arsenic. However, the adsorption of arsenic by organic matter remains a controversial issue.

4. Functional groups include carboxyl, phenolic hydroxyl, alcohol ester hydroxyls, ethers, and amides. Organic particles cooperate with arsenic, giving the sediment a greater adsorption capacity so it can adsorb large amounts of arsenic.

5. Presence of Arsenic enhances the electropositivity behavior of an adsorbent surface and directly enhances the electrostatic force of a cation. This enhancement of electrostatic force has the effect of attracting and binding more arsenic anions on the surface of the adsorbent.

6. Another potentially important process to increase As in water is the dissolution of iron oxide itself under reducing conditions. Research also reveals that excessive water use for irrigation and fertilizer use caused the mobilization of phosphate from fertilizers below shallow aquifers and the desorption of As through anion exchange at reactive mineral surfaces.

FUTURE SCOPE

1. The presence of arsenic enhances the electropositivity behavior of an adsorbent surface and directly enhances the electrostatic force of a cation. This increase in electrostatic force has the effect of attracting and binding more arsenic anions on the adsorbent's surface.

2. Minerals are positively correlated with arsenic content, and the Mn, Fe, and Al contents of the sediments facilitate the adsorption of arsenic. However, the adsorption of arsenic by organic matter remains a controversial issue for further research.

Acknowledgement: The authors are thankful to WPH (World Health Organization) and HSE (Ministry of Indian Standards) for arsenic data in contaminated groundwater at different places.

Conflict of Interest: None

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How to cite this article: Ahmed, Ayesha, Shihab-Kamal Nabil, Elmaghrabi, Ibrahim, Prasad Kishor, Soudik-Kumar Prasad, Gupta A. K., Kumar Karan, Arunachal Kumar Singh, Upa Kumar and, Richa Bhatia. (2023). A Review / Effect of Physicochemical and Microbial geochemical factors on arsenic mobilization and distribution. *Ecological Forum* - 64. *Ecological Forum*, 22(2), 1046-1059.



Health Care Facilities Availability Major Problems and Spatial Plan for District Jaunpur : An Analysis

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Received: 22.05.2021, Revised: 28.05.2021, Accepted: 29.05.2021

Abstract: Health is wealth, healthy life is important for human being, health and human development form integral components of the socio-economic development of a nation or region. In the constitution the public health and sanitation are incorporated in the state list. In India planned economic development since independence has been associated with an appreciable achievement in the field of health care facilities. As result, the expectation of life at birth has improved significantly, the death rate has shown a remarkable decline as a consequence of control and eradication of communicable diseases such cholera, small pox and plague combined with reduction in the incidence of malaria and accompanied by the provision of safe drinking water and sanitation facilities. The work of providing health care facilities was greatly accelerated after independence under the democratic set up when the need of maintaining public health for productive purpose was realised. In the Jaunpur district too, rapid strides have been made in the expansion of medical and health facilities services over the five year plans. A number of government and private hospitals, clinics and dispensaries have been established in various parts of the district.

Key words: wealth, healthy life, human being, development, integral.

Introduction- The India and U.P. state government have provided the free facility of '102/108 state and central ambulance free services' very appreciable in the district serious patients and serious accidents. In the district Jaunpur owing to the poor unbalanced diet and low level of caloric intake, the general health in the area doesn't match the recommended standard for poverty of the people. Most of the diseases to which the people fall prey every year are in fact deficiency diseases. The major diseases in the district are, malaria, typhus, influenza, cold and flu, cholera, measles, diarrhea, scarlat, anemias, epidemic goitre, beri-beri and stomach diseases etc. However the government agencies and departments are making all out efforts, particularly after independence to control these diseases and to improve the general health by expanding the network of health care facilities in the district area. The number of health and medical facilities have increased over the year. The various kinds of

dispensaries and the number of doctors and beds in the district (1985 to 2021). The temporal growth is greater in case of allopathic dispensaries, doctors and beds as compared to Ayurvedic and Homeopathic ones. There are about five types of health and medical facilities available in the district Jaunpur. They are sub-health centres or midwife centres, maternity and child welfare centres, additional primary sub-centre, primary health centres and community health Centres. In the facilities in districts Sadar Jaunpur, Marhau, Kerkani, Machhaliyahar & Badiapur tehsil in good condition but other 21 development blocks are poor conditions, but at present to the U.P. State and India government efforts are improving in medical facilities. All the medical facilities are available in the district headquarters but other necessary and important facilities are available at the community and block level health care hospital centres.

In India, the provision of adequate facilities for the people has been expected as an important goal in the constitution. The minimum needs programme as enunciated in the approach paper to the fifth plan spells out what is meant by adequate social facilities and the norms which have to be followed for implementing the programme. The provision of adequate social facilities for the over all development of an organized and disciplined human societies marks the prime concern of a government, planners and politicians. Therefore, the study of the spatial pattern of social facilities in a region constitutes a significant part of academic as well as applied research. The research paper study of the spatial pattern of health facilities in 'Jaunpur' district acquires an added importance and is likely to significant facts for planning and development purposes.

Science of human nutrition deals with relation of food to health and diseases. It aims at provision of optimum amounts of various nutrients required to attain or maintain a positive state of health of all groups of

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Industrial Development, Distribution Problems Policy suggestions and spatial plan for location of Industries in Jaunpur District

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Received- 15.04.2020, Revised- 18.04.2020, Accepted- 15.04.2020, Email- vna00001@yahoo.co.in

Abstract: Industries are the backbone of any developing country economy and in a west country like India its importance is all the more pronounced. The tradition of industry in India is very old as the known history at back to the Indus valley civilization. The district Jaunpur is not better condition in industrial development except some small and medium scale industrial units. This districts condition is poorer in the other neighbouring district like Sant Ravidas Nagar (Bhadohi), Sultanpur, Allahabad (Nanhi) and Varanasi. There should be a great need of promotion of industries in this district. According to the vast size, shape and location of the district there are a lot of opportunities in this district industries promotion and development. If there is large number of registered industrial units near about 10422 turnover of small scale industries in 14145 lac, estimated average member of daily worker employed in S.S.I. Units, 2053, number of large scale industrial estates, 02 and other industrial areas in the district. There should be a great need, support and policy decisions of state and central governments. The current decision of U.P. government to close the large scale industrial units of district 'U.P. State Spinning mill, Siddikpur, Jaunpur and U.P. Sugar Corporation limited, Shahganj, Jaunpur has negative effect in the industrial development of the district. The other effective problems like conventional out look, scarcity of raw materials scarcity of capital, lack of infrastructure, technological gap and high cost of production and scarcity of skillful labour are barriers of the district industrial development. For the district industrial development solve the above problems and barriers by the responsible government of the U.P. State and Centre.

Key Words: Industries, Distribution, Promotion, Conventional Policy decisions, Corporation

Introduction: Jaunpur district located in the Varanasi division of Uttar Pradesh. Jaunpur district town serves as the district headquarters. The district has been divided in to six tehsils and 21 development blocks in order to speedily implementation of development schemes. Total population of the district is 4494204 with population density of 1113/Sq kilometer and literacy rate is 72.66 percent of the census 2011. Jaunpur district has an important historical background. In ancient period the district constitute an integral part of the Kingdom of Kushala and Varta. According to the Hindu mythology the name of Jaunpur is derived from Jundagil Kishi, who used to live of right bank of the Gomati river about half way between Jaunpur and Zafarahad. The specific reference of its name is found during the time of Feroz Tughlaq. He founded this place in 1395-60AD in honour of his

cousin Juna (Muhammad bin Tughlaq) and commemorated his memory by naming the city after him. The four big mosques, Atala, Jama, Banghira and Lal Darwaza masjid and a beautiful Shahi bridge on the Gomati river middle portion of the city who connects in to two parts, North and South of the city reminds us of the art and architecture of the Bahari kings. These medieval period monuments have important place in district style of architecture (Location Map Fig. No.01). Jaunpur district lies in the eastern part of Uttar Pradesh known as 'Purvanchal' it forms the north-western portion of the Varanasi division and south west portion of Azamgarh division. The district is situated between the parallels of 2502' North to 2601' North latitudes and between meridians of 82007' East to 83005' East longitudes. It covers a geographical area about 4038 Sq.Km. out of which

Spatial Distribution of Population and Density Pattern of Jaunpur District, U.P.

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Abstract:

Man is predominantly powerful element in the evolution of the cultural landscape, because the significance of natural resources in an area can be assessed only in the context of the people who are utilizing them. It is not the number of people but also the knowledge, his efficiency and his living standard which for that matter, the settlement system which he attempts to build, which count much in the formation and stabilisation of a particular cultural pattern. The population and settlement constitute the pith and core of human habitat, hence their spatial analysis is likely to bring to light certain relationship between man and his habitat that are particularly important in the understanding of development problem is a density populated area with a predominantly rural economy. In, 2011 year latest population of district Jaunpur recorded of 4494204 of which 2220465 were female and 2273739 male. The population density is 1113 people per square kilometers between 2001 and 2011. The population of district grew average 14.89 per cent of the district Jaunpur.

Introduction :

Jaunpur district historically is known as Sheeraz-e-Hind. It was founded by the Feroz-Shah Tughlaq in memory of Muhammad bin Tughlaq in, 1359 A.D. (Jauna Khan). The etymology of district Jaunpur. The district has an important historical background. In ancient period the district constituted and integral part of the kingdom of Koshala and Vatsa. According to the Hindu mythology the name of Jaunpur is derived from Jamudagni Rishi, Who used to live at the right bank of the Gomati river about half way between Jaunpur and Zafarabad. The specific reference of its name is found during the time of Feroz Tughlaq. He founded this place in 1359 A.D. in honour of his cousin Jauna (Muhammad Bin Tughlaq) and commemorated his by naming the city after him. This historical evidence is more correct than all other evidences. At present people this historical city known as Jaunpur city.

Objectives:

The present research paper main objective is that the district Jaunpur population is increasing very rapidly and the district has facing problems to related the population

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Distributional Pattern of the Soils and Natural Vegetation of the District Jaunpur

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Abstract:

District Jaunpur is a part of middle Ganga plain which signifies a vast alluvial stretch between the foot hills of Siwaliks in the northern and southern hills and plateaus in the south. This vast alluvial plain was originally an elongated depression between the Gondwana land and the Himalayas. In the Pleistocene and sub recent periods, it was filled up with a huge quantity of alluvial sediments brought down by the numerous rivers from the Himalayas resulting into a level plain with very gentle seaward slope. But the recent aeromagnetic survey of the Ganga valley throws new light which does not support the possibilities of the frontal plains forming either a fore deep or deep. Rift valley as postulated by Oldham, Suess, Berrard and others. The district area slightly slope from north-west to south-east. Some undulations have been caused by rivers and their tributaries. The average height of the area above mean sea level is 85 meters to 92 meters in the west to 77 meters in the east. The soils are mainly sandy, loamy and clayey and vegetations are mainly Dry mixed Deciduous and Bamboo Trees.

Introduction:

District Jaunpur presents a level plain and constitutes an integral part of the Ganga. Rivers of the district flow roughly from north-west to south-east. The rivers of the district constitute the determining features in the physical aspect of the district. The main drainage channels, The Gomati, the Sai and the Basahi divide the district area in the four drainage channels. The Gomati, the Sai and the Basahi divide the district area in the four almost parallel strips, each with fairly distinct physical characteristics. The first and the largest north-eastern tract lies to the north of the Gomati river extending from Sultanpur on the north and Ghazipur to the south-east. The second tract which is the most fertile and populous part of the district, lies between the Gomati and the Sai. The third tract lies between the Sai and the Basahi rivers and is composed of thick clay. The south western portion of the district constitutes the fourth tract, it is a long and narrow strip between the Basahi and the Barna river with considerable portion of high level barren land to the south of Machhalishahar Tehsil of the District.

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Distributional Pattern of Climate, Seasons and Rainfall of the District Jaunpur

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Abstract:

The District Jaunpur has a monsoon climate like eastern Uttar Pradesh Climate. It consistent with that of the Northern plain and central highlands including the Aravalli range, hot semi-arid eco region 4.3°C and hot dry eco-region 9.2°C . The temperature varies between about 4.3°C (39°F) and 44°C (111°F) The annual normal rainfall is near about 1098 millimeters (43.2 inch) The monsoon season occurs from the third week of June to first week of October every year. Normally there are 45 rainy days per year of which 31 occur in the monsoon season. The district regularly three or four years gap suffers drought, floods and pestilence.

Introduction :

The climate of the district Jaunpur is fairly similar to other district of eastern Uttar Pradesh. According to the climatic classification, it lies in the northern sub-continental interior of the sub-tropical climatic belt. As a result, it is moist and relaxing except in the summers and cold seasons. According to the Indian climate the district Jaunpur climate is 'Monsoon Climate' The district enjoys the typical monsoon climate, which is, by and large, directed and controlled by the pressure conditions prevailing in the control and south-east Asia. Accordingly the district has enjoys many other seasons.

Major Objectives and Methodology:

The main objectives of the district Jaunpur climatic conditions is that to assess the real climatic conditions, its distribution, types of seasons and distributional pattern of Annual rainfalls. All the data are collected by primary and secondary data sources like, district statistical bulletins, weather reporting stations like, Babatpur Aerodrome weather observatory Record office and other district centers. Some primary data are collected by self observations and other available sources.

The climatic conditions of the district Jaunpur follows the Indian monsoon climate except some characteristics. The district Jaunpur has many seasons in the year.

The cold winter season:

The district enjoys the cold winter season from midNovember to February. After Post monsoon or transitional season, the temperature decrease gradually. The shorter days and decreasing of temperature betokens the advent of winter season. After some

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Essential Oils and Their Application in Food Safety

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Food industries are facing a great challenge due to contamination of food products with different microbes such as bacteria, fungi, viruses, parasites, etc. These microbes deteriorate food items by producing different toxins during pre- and postharvest processing. Mycotoxins are one of the most potent and well-studied toxic food contaminants of fungal origin, causing a severe health hazard to humans. The application of synthetic chemicals as food preservatives poses a real scourge in the present scenario due to their bio-incompatibility, non-biodegradability, and environmental non-sustainability. Therefore, plant-based antimicrobials, including essential oils, have developed cumulative interest as a potential alternative to synthetic preservatives because of their ecofriendly nature and generally recognized as safe status. However, the practical utilization of essential oils as an efficient antimicrobial in the food industry is challenging due to their volatile nature, less solubility, and high instability. The recent application of different delivery strategies *etc.* nanoencapsulation, active packaging, and polymer-based coating effectively addressed these challenges and improved the bioefficacy and controlled release of essential oils. This article provides an overview of essential oils for the preservation of stored foods against bacteria, fungi, and mycotoxins, along with the speculated mechanism of action and technological advancement by using different delivery systems for their effective application in food and agricultural industries as natural green preservatives.

Keywords: essential oils, antimicrobial, mycotoxins, nanoencapsulation, food safety

INTRODUCTION

Currently, the achievement of food security is based on food access, food stability, food utilization, and, most importantly, its preservation to avoid further contamination. These four food pillars constitute the socioeconomic background and influence the affordable food requirements. With regards to food insecurity, the microbes and their associated toxins are prime driving factors for major food spoilage and biodegradation due to their long-term impact along the food chain and food web. In several developing countries, 25–30% loss of foods has been reported due to microbial contamination (Rishi *et al.*, 2017). Microbial contamination of foods in different stages of production and processing causes different foodborne diseases. In addition to microbial contamination, some bacteria and fungi are reported to produce toxins. Many of these microbial toxins are thermostable in nature and are not destroyed by high temperatures during cooking or food processing (Kafarouti, 2014). Bacteria produce two different types of toxins, *etc.* endotoxins and exotoxins. Exotoxins are proteinaceous substances secreted by *Clostridium botulinum*, *Bacillus cereus*, *Staphylococcus aureus*, *Escherichia coli*, and *Campylobacter*

OPEN ACCESS

Edited by:

Peter Møller, Aarhus
University, Denmark

Reviewed by:

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Technology, India
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Specialty section:

This article was submitted to
Food Safety,
a specialty of the journal
Frontiers in Sustainable Food Systems

Received: 14 January 2021

Accepted: 04 April 2021

Published: 20 May 2021

Citation:

Maurya A, Prasad J, Das S and
Doley AK (2021) Essential Oils and
Their Application in Food Safety.
Front. Sustain. Food Syst. 5:654428.
doi: 10.3389/fsys.2021.654428

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Abstract

rice (*Oryza sativa* L.) growth and productivity has been negatively affected due to high soil salinity. However, some salt-tolerant plant growth-promoting bacteria (SP-GPBs) enhance crop growth and reduce the negative impact of salt stress through regulation of stress biochemical, physiological, and molecular features. Until today, only SP-GPBs were isolated from saline soil of eastern Uttar Pradesh, India, and screened for salt tolerance in *Sorghum* salt (NaCl) concentrations up to 3000 mMol/L (30M) that of dryland, thinned strains (indirect) better growth and plant growth properties (PGPs) in NaCl saturated medium. Among them, one most effective *Bacillus pumilus* strain (JPV51) was molecularly characterized, which showed potential PGPs, such as indole-3-acetic acid (IAA), antimicrobial protein-1, catalase, and (ACC) deaminase activity. Furthermore, protein accumulation and phytoalexin (PAP) production at different concentrations of NaCl (0–300 mM). For experiment was conducted on rice (Variety CSR42) in different NaCl concentrations (0, 50, 100, 200, and 300 mM) with and without inoculation of *Bacillus pumilus* strain JPV51. At elevated concentrations of NaCl, the stress effect on chlorophyll content, carotenoids, antioxidant activity was recorded in non-inoculated (only NaCl) plants. However, inoculation of *Bacillus pumilus* strain JPV51 showed positive nitrogen and improve growth parameters of rice as compared to non-inoculated in similar condition. A significant ($P < 0.05$) improvement plant height (11.90–26.48%), root length (9.55–33.04%), chlorophyll content (18.13–37.34%), carotenoids (8.38–23.44%), plant fresh weight (13.33–33.55%), and dry weight (8.88–30.88%) were recorded from 50 to 300 mM NaCl concentration in inoculated plants as compared to non-inoculated. Moreover, the plants inoculated with *Bacillus pumilus* strain JPV51 showed improvement in antioxidant enzyme activities of catalase (13.14–35.91%) and superoxide dismutase (16.88–46.01%). Besides, the significant improvement in root exudate activities, such as alkaline phosphatase (11.37–33.51%), acid phosphatase (38.49–45.94%), urease (14.77–47.84%), and α -glucosidase (25.71–86.12%) were recorded in inoculated pots as compared to non-inoculated. These results suggest that *Bacillus pumilus* strain JPV51 is a potential SP-GPB for promoting plant growth activities, soil enzyme activities, microbial flora, and mitigating the deleterious effect of salinity in rice.

minerals, rice plants are classified as glycophytes which have very poor physiological and molecular traits (Wang et al., 2018; Islam et al., 2020). Further, rice is a model crop plant to study physiological, biochemical and molecular functions under salinity stress (Khan and Humaira, 2016). Salt stress is one of the major limiting factors of abiotic stress and reduced rice productivity. In many regions of the world, crop productivity is limited due to increasing rates of soil salinization. In

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Essential Oil Nanoemulsion as Eco-Friendly and Safe Preservative: Bioefficacy Against Microbial Food Deterioration and Toxin Secretion, Mode of Action, and Future Opportunities

OPEN ACCESS

Edited by:

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Reviewed by:

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Sudhakar Kumar Singh,
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SPECIALTY SECTION:

This article was submitted to
Food Microbiology,
a section of the journal
Frontiers in Microbiology

RECEIVED: 11 July 2021

ACCEPTED: 11 October 2021

PUBLISHED: 25 November 2021

CITATION:

Sharma A, Singh PK, Das S,
Prasad J, Rishi A, Upadhyay N,
Kumar AK and Sarma AK (2021)
Essential Oil Nanoemulsion as
Eco-Friendly and Safe Preservative:
Bioefficacy Against Microbial Food
Deterioration and Toxin Secretion,
Mode of Action, and Future
Opportunities.
Front. Microbiol. 12:751982.
doi: 10.3389/fmicb.2021.751982

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Microbes are the biggest shareholder for the quantitative and qualitative deterioration of food commodities at different stages of production, transportation, and storage, along with the secretion of toxic secondary metabolites. Indiscriminate application of synthetic preservatives may develop resistance in microbial strains and associated complications in human health with broad-spectrum environmental non-sustainability. The application of essential oils (EOs) as a natural antimicrobial and their efficacy for the preservation of foods has been of present interest and growing consumer demand in the current generation. However, the loss in bioactivity of EOs from fluctuating environmental conditions is a major limitation during their practical application, which could be overcome by encapsulating them in a suitable biodegradable and biocompatible polymer matrix with enhancement to their efficacy and stability. Among different nanoencapsulated systems, nanoemulsions effectively contribute to the practical applications of EOs by expanding their dispersibility and faster their controlled delivery in food systems. In line with the above background, this review aims to present the practical application of nanoemulsions (a) by addressing their direct and indirect (EO nanoemulsion coating leading to active packaging) consistent support in a real food system; (b) biochemical actions related to antimicrobial mechanisms; (c) effectiveness of nanoemulsion as bio-nanopreservative with large scale practical applicability; (d) critical evaluation of toxicity, safety, and regulatory issues; and (e) market demand of nanoemulsion in pharmaceuticals and nutraceuticals along with the current challenges and future opportunities.

Keywords: essential oil, biochemotherapy, biodegradable, nanoemulsion, food preservative, eco-friendly



Plant Growth-Promoting Bacteria: Biological Tools for the Mitigation of Salinity Stress in Plants

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OPEN ACCESS

Edited by:

Wenbin Zhang, Chinese Academy of Agricultural Sciences, China

Reviewed by:

Amel Hachimi, University of Tunis, Tunisia
Mahmoud Elmaghrabi, University of Agriculture, Egypt

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Specialty section:

This article was submitted to Microbiology, a section of the journal Frontiers in Microbiology

Received: 29 November 2020

Accepted: 12 May 2021

Published: 07 July 2021

Citation:

Kumar A, Singh S, Gaurav AK, Srivastava S and Verma JP (2021)

Salinity stress is one of the major abiotic stresses threatening sustainable crop production worldwide. The extent of salinity affected area is expected to cover about 50% of total agricultural land by 2050. Salinity stress produces various detrimental effects on plants' physiological, biochemical, and molecular features and reduces productivity. The poor plant growth under salinity stress is due to reduced nutrient mobilization, hormonal imbalance, and formation of reactive oxygen species (ROS), lipid toxicity, and osmotic stress. Additionally, salinity also modulates physicochemical properties and reduces the microbial diversity of soil and thus decreases soil health. On the other hand, the demand for crop production is expected to increase in coming decades owing to the increasing global population. Conventional agricultural practices and improved salt tolerant crop varieties will not be sufficient to achieve the yields desired in the near future. Plants harbor diverse microbes in their rhizosphere, and these have the potential to cope with the salinity stress. These salinity-tolerant plant growth-promoting bacteria (PGPB) assist the plants in withstanding saline conditions. These plant-associated microbes produce different compounds such as 1-aminocyclopropane-1-carboxylate (ACC) deaminase, indole-3-acetic acid (IAA), antioxidants, extracellular polymeric substance (EPS), and volatile organic compounds (VOC). Additionally, the naturally associated microbiome of plants has the potential to protect the host through stress avoidance, tolerance, and resistance strategies. Recent developments in microbiome research have shown ways in which novel microbe-assisted technologies can enhance plant salt tolerance and enable higher crop production under saline conditions. This focused review article presents the global scenario of salinity stress and discusses research highlights regarding PGPB and the microbiome as a biological tool for mitigation of salinity stress in plants.

Keywords: microbiome, plant growth-promoting bacteria, salinity stress, salt stress amelioration, sustainable agriculture

INTRODUCTION

SHORT COMMUNICATION



Mechanistic investigations on antifungal and anti-aflatoxigenic activities of chemically characterised *Cerum corvi* L. essential oil against fungal infestation and aflatoxin contamination of herbal raw materials

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ABSTRACT

This study aimed to investigate the efficiency of chemically characterised *Cerum corvi* essential oil (C*c*EO) against aflatoxin B₁ (AFB₁) producing strain of *Aspergillus flavus* (AF-LTP-W5-4) causing deterioration of herbal raw materials (HRM). GC-MS analysis of the EO revealed the presence of carvone (55.82%) as a dominant component. C*c*EO caused complete suppression of *A. flavus* growth and AFB₁ secretion at 0.7 and 0.5 µl/ml, respectively. The investigation on antifungal mode of action showed that C*c*EO inhibited fungal growth via disrupting ergosterol biosynthesis and triggered efflux of vital cellular ions. The inhibition of AFB₁ biosynthesis was attributed to the inhibition of cellular methyl glyoxal (MG) biosynthesis. In addition, C*c*EO showed remarkable antioxidant activity (IC₅₀ = 10.564 µl/ml) against DPPH (2,2-diphenyl 1-picrylhydrazyl) radicals. Based on overall results, it can be concluded that the C*c*EO may be recommended as potential antifungal agent for protection of HRM from fungal infestation and AFB₁ contamination.

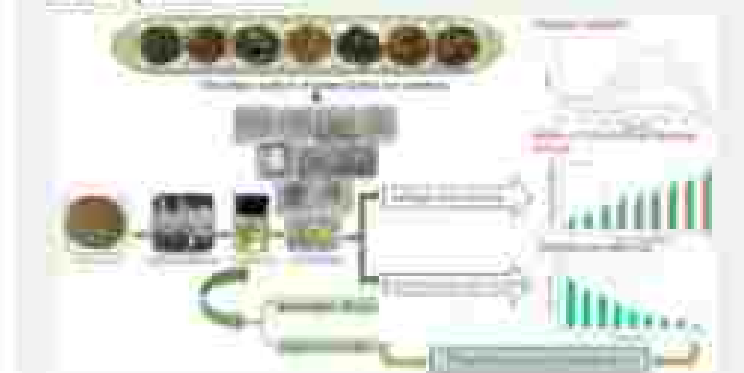
ARTICLE HISTORY

Received 23 July 2021

Accepted 7 October 2021

KEYWORDS

Cerum corvi essential oil; aflatoxin B₁; methylglyoxal; herbal raw materials; safety profile



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 Supplemental data for this article can be accessed online at <https://doi.org/10.1080/13652013.2021.1999999>.

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Review

Does plant—Microbe interaction confer stress tolerance in plants: A review?

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ARTICLE INFO

Keywords:

Stress

PGPR

Plant-microbe interaction

Plant growth

Mycorrhizae

Food security

ABSTRACT

The biotic and abiotic stresses are major constraints for crop yield, food quality and global food security. A number of parameters such as physiological, biochemical, molecular of plants are affected under stress condition. Since the use of inorganic fertilizers and pesticides in agriculture practices cause degradation of soil fertility and environmental pollution. Hence it is necessary to develop safer and sustainable means for agriculture production. The application of plant growth promoting microbes (PGPR) and mycorrhizal fungi enhance plant growth under such conditions. It offers an economically favoring and ecologically sound ways for improving plants against stress conditions. PGPR may promote plant growth by regulating plant immunity, improve nutrient acquisition, nitrogen fixation and enhance the antioxidant system. While arbuscular mycorrhizae (AM) enhance the supply of nutrients and water during stress condition and increase tolerance to stress. This plant-microbe interaction is vital for sustainable agriculture and industrial purpose, because it depends on biological processes and replaces conventional agriculture practices. Therefore, microbes may play a key role as an ecological engineer to solve environmental stress problems. So, it is a feasible and powerful technology in future to feed global population at available resources with reduced impact on environmental quality. In this review, we have attempted to explain about abiotic and biotic stress tolerant beneficial microorganisms and their modes of action to enhance the sustainable agricultural production.

1. Introduction

The 21st century has been marked by global climate change. Many research studies have reported that environmental stresses are a major global threat to future of food security (Nelson and Hayes, 2000), while the world population is projected to reach from a current estimated 7 billion approximately to 8.4 billion by 2050 (Singh et al., 2011). Due to increasing climate variation, population and reduction in soil health for crop cultivation are threats for agricultural sustainability. It can become more prevalent in coming future due to these climate change and extensive agricultural practices (Vashistha et al., 2009). Since our traditional agriculture system which is unsustainable while population is increasing (Jaiswal et al., 2014), it is becoming very difficult for farmers and policy makers to produce such large amounts of food to fulfil the needs of growing population. On another hand, the indiscriminate use of chemical fertilizers, pesticides, weedicides etc. in agriculture causes extreme loss of beneficial microbial diversity from the soil.

Our agro-ecosystem is continuously affected by abiotic and biotic stress which directly change the crop productivity and soil health and fertility. Various stress factors separately affect the growth and

productivity of crop plants. The stresses are simply classified as abiotic and biotic stress. Abiotic and biotic stress constitutes 50% and 30% respectively in losses in agricultural productivity worldwide. The abiotic and biotic stress can either be natural or human induced. The major abiotic stresses are temperature, drought, salinity, and heavy metal stress. Stress condition has a wide range of effects on the plant morphology, physiology, biochemistry and even on gene regulation. Temperature, water deficiency, salinity and heavy metal pollutant are major stress factors in relation to climate change. The abiotic stress factors also influence the biotic stress and reduce crop productivity. The major effect of these stresses result loss of soil microbial diversity, soil fertility and competition for nutrient resources (Chahal et al., 2015).

Only the possible alternatives is plant associated microbial community, such as mycorrhizal fungi and plant growth promoting bacteria (PGPR), which helps the plants growth and development under different types of abiotic and biotic stresses. The application of efficient microorganisms like plant growth promoting rhizobacteria (PGPR) and mycorrhizal fungi are helpful in enhancing and improving sustainable agriculture and environmental stability. Microbes associated with plants, on the basis their effects on plants are classified into three groups: beneficial, deleterious and neutral. Various genera of

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Fungal and mycotoxin contamination of herbal raw materials and their protection by nanoencapsulated essential oils: An overview

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ARTICLE INFO

Keywords:
Herbal raw materials
Mycotoxins
Essential oils
Nanotechnology
Nanocapsules
Nanoencapsulation

ABSTRACT

Recently, consumption of herbal raw materials (HRMs) has been an emerging concern owing to its multiple potential against broad range of human diseases. However, there are various risks involved regarding the fungal and mycotoxin contamination. These HRMs often constitute a large surface area of deterioration, leading to degradation of their active principles. Different chemical preservatives have been frequently used to protect HRMs from fungal and mycotoxin contamination, however, their indiscriminate use could lead to adverse effects on human health and environment due to chemical toxicity. The use of essential oils (EOs) based formulations has been recommended as a green alternative of synthetic preservatives having greater safety profile and biodegradable nature. Nanoencapsulation maintains the stability of EOs and facilitates the controlled delivery with improvement in maintenance of biological principles of HRMs against fungal and mycotoxin mediated biodegradation in home pharmaceutical stores. This review summarizes the pharmacological properties of some HRMs, the extent of degradation by fungal and mycotoxin contamination, preservation through nanoencapsulated EOs, mode of action, packaging of EOs as preservatives and finally future opportunities to mitigate the associated problems.

1. Introduction

Although we cannot neglect the role of allopathic medicines in combating health disorders, however, their side effects, microbial resistance, and lack of specific treatment against some newly emerged chronic diseases are some major limitations associated with their sustainable personal applicability. The HRMs considerably used in traditional medicinal system since long duration is now receiving attention of health practitioners. However, despite having significant role in global healthcare system as complementary medicines to improve human health, quality of HRMs, is one of the burning challenges in formulation of standardized herbal formulations (Sapichum and Kumbha, 2016). Warm and humid environmental conditions of tropical and subtropical regions, the major suppliers of HRMs, induce fungal and mycotoxin contamination. Among different contaminants, mycotoxins, a toxic secondary metabolite produced by *Fusarium* fungi, is of great concern due to their adverse health impacts on humans as well as alteration in inherent therapeutic potential of drug caused by qualitative as well as quantitative deterioration of important active principles (Dubey et al., 2020; Vaidya and Sanyal, 2017). Some of the mycotoxins resist the pasteurization procedures due to their heat stable nature and bioaccumulate in humans via formulated drugs (Abdelhadi et al., 2020). Mycotoxin contamination also reduces the

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The Role of Microbes to Improve Crop Productivity and Soil Health



Akhilesh Kumar and Jay Prakash Verma

Abstract Soil microbes are the most important candidature for enhancing soil fertility and health. The plant growth promoting microbes and arbuscular mycorrhizae (AM) are used for enhancing plant growth and yields of agricultural crops under normal and stress conditions. It improves plant growth on various physiological parameters of plant in response to external stimuli by a number of different mechanisms. The mechanisms involved in growth promotion include plant growth regulators, production of different metabolites, and conversion of atmospheric nitrogen into ammonia, etc., by direct and indirect ways. In addition, it also provides resistance against biotic components (pathogens) through induced systemic resistance (ISR) and systemic acquired resistance (SAR). Plant microbe's interaction contributing in plant growth promotion and disease control under changing environment and enabling more sustainable agriculture without compromising ecosystem functioning. Plant growth regulators maintain beneficial plant-microbe interactions such as interaction between plant growth promoting rhizobacteria (PGPR) and arbuscular fungi. The microbial diversity in rhizospheric soil maintains soil health and productivity. Thus, the inclusive use of plant growth promoting rhizobacteria helps to get sustainable agriculture production under normal as well stress condition. This review highlights an overview of the beneficial effect of microbes for enhancing sustainable agricultural production.

Keywords Soil microbes · Rhizobacteria · Sustainability · Soil health · Mycorrhizae

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© Springer Nature Singapore Pte Ltd. 2019
V. Achai and A. Mukherjee (eds.), *Ecological Wisdom Inspired Restoration Engineering*, EcoWISE, https://doi.org/10.1007/978-981-13-0149-0_14



OPEN ACCESS

EDITED BY

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RECEIVED

This article was submitted to
Food Microbiology,
a section of the journal
Frontiers in Microbiology

RECEIVED 16 June 2021

ACCEPTED 18 July 2021

PUBLISHED 06 August 2021

CITATION

Singh BK, Chaudhary AK, Das S, Tiwari S,
Mazra A, Singh VK and Dubey NK (2021)
Chitosan-encompassed Aniba rosaeodora
essential oil as antifungal preservative
for antioxidant and anti-aflatoxin activity
in millet with emphasis on cellular and in
vivo efficacy

Front. Microbiol. 12:676678

doi: 10.3389/fmicb.2021.676678

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Chitosan encompassed *Aniba rosaeodora* essential oil as innovative green candidate for antifungal and antiaflatoxigenic activity in millets with emphasis on cellular and its mode of action

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The present study demonstrates first time investigation on encapsulation of *Aniba rosaeodora* essential oil into chitosan nanoemulsion (AREO-CNE) with the aim of improvement of its antifungal and aflatoxin B₁ (AFB₁) inhibitory performance in real food system. The GC-MS analysis of AREO revealed the presence of linalool (31.66%) as a major component. The successful encapsulation of EO into CNE was confirmed through TEM, FTIR, and XRD analysis. The *in-vitro* release study showed the controlled release of AREO. AREO-CNE caused complete inhibition of *Aspergillus flavus* ATLHPS-11 growth and AFB₁ production at 0.8 and 0.7 μl/ml respectively, which was far better than AREO 0.4 and 1.2 μl/ml, respectively. Impairment of ergosterol biosynthesis coupled with enhancement of cellular membrane leakage confirmed plasma membrane as the possible antifungal target of both AREO and AREO-CNE. Significant inhibition of methylglutaryl (MG) synthesis in ATLHPS-1 cells by AREO and AREO-CNE confirmed their novel antifungal mode of action. *In-silico* molecular docking studies revealed effective interaction of linalool with Ver-1 and Gm-A protein, leading to inhibition of AFB₁ biosynthesis. Further, AREO-CNE showed enhanced antioxidant activity with IC₅₀ values 1.790 and 1.706 μl/ml against DPPH and ABTS^{•+} radicals, respectively. In addition, AREO-CNE caused 100% protection of tested millet (*Setaria italica* seeds) from AFB₁ contamination and lipid peroxidation over a period of 1 year without compromising its sensory properties and exhibited high safety profile with LD₅₀ value 95.58/400 g body weight. Based on enhanced performance of AREO-CNE over AREO, it can be recommended as a novel substitute of synthetic preservative for preservation of stored millets.



RESEARCH

Chitosan-Based Nanoencapsulation of *Ocimum americanum* Essential Oil as Safe Green Preservative Against Fungi Infesting Stored Millets, Aflatoxin B₁ Contamination, and Lipid Peroxidation

Bijendra Kumar Singh^{1,2} · Shikha Tiwari¹ · Akash Maurya¹ · Somnath Das² · Vipin Kumar Singh⁴ · Nawal Kishore Dubey¹

Received: 1 April 2022 / Accepted: 19 January 2023 / Published online: 26 February 2023
© The Author(s), under exclusive license to Springer Science+Business Media, LLC, part of Springer Nature 2023

Abstract

Present study deals with the first-time report on encapsulation of *Ocimum americanum* essential oil (OAEO) into chitosan matrix with enhanced antifungal, aflatoxin B₁ (AFB₁) inhibition, antioxidant activity, and in situ efficacy in the millet food system. GC-MS analysis suggested citral (66.72%) as the major component of OAEO. Physicochemical characterizations through SEM, FTIR, and XRD analysis confirmed the successful loading of OAEO into chitosan nanocapsules (OAEO-CsNc). In vitro release profile of nanoencapsulated OAEO exhibited biphasic burst and controlled volatilization, a prerequisite for long-term antifungal effect in the stored food systems. OAEO-CsNc completely inhibited the growth and AFB₁ production of *Aspergillus flavus* at 0.2 and 0.175 µL/mL, respectively. Inhibition of ergosterol biosynthesis followed by the release of vital cellular ions, and 260, 280 nm absorbing materials from AFLIPS1-1 cells suggested plasma membrane as a potential site of antifungal action of OAEO-CsNc. Significant reduction of cellular methylglyoxal (an AFB₁ inducer) level in AFLIPS1-1 cells after fumigation with OAEO-CsNc confirmed the novel biochemical mechanism of anti-aflatoxigenic activity. Additionally, in silico modelling of citral (major component of OAEO) with Vpr-1 and Oms-A protein suggested the hydrogen bond-dependent molecular interaction for inhibition of AFB₁ biosynthesis. OAEO-CsNc showed significant in situ antifungal, anti-aflatoxigenic, and lipid peroxidation-suppressing potentialities without altering the organoleptic and germination properties of *Setaria italica* seeds. Moreover, the appreciative safety profile (LD₅₀ = 11,162.06 µL/kg) of OAEO-CsNc in a mammalian model system (*Mus musculus*) strengthens its recommendation as an effective green preservative against fungal infestation, AFB₁ contamination, and reactive oxygen species-mediated lipid peroxidation in stored food commodities.

Keywords *Ocimum americanum* essential oil · *Setaria italica* · Aflatoxin B₁ · Nanoencapsulation · In situ efficacy · In silico modelling

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Introduction

Despite of substantial advancements in contemporary food processing technology, moulds and mycotoxins contamination in different agricultural commodities during storage periods is an unavoidable challenge across the world even in the twenty-first century. Mycotoxins, which are toxic secondary metabolites of fungal species generally belonging to the genera *Aspergillus*, *Penicillium*, and *Fusarium*, commonly contaminate the cereals and food grain products (Abdunnasir & Ye, 2017; Jafarzadeh et al., 2022; Naidu et al., 2022). Fungal infestation and mycotoxin contamination in stored food commodities obstruct the normal synthesis of different biomacromolecules such as nucleic acids and proteins, resulting in the emergence of various health problems (Kos et al.,



Deconstruction of lignocellulosic biomass for bioethanol production: Recent advances and future prospects

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ARTICLE INFO

Keywords:
Bioethanol
Lignocellulosic biomass
Agro residues
Cobactin
Deconstruction strategy

ABSTRACT

The rapid annual emission due to fossil fuel and agro waste residue burning is 36.73 megatons CO₂ equivalent. Many international organizations focus on alternative energy sources such as biofuel production. In this regard, biofuel production has gathered pace and increased dramatically, with the US and Brazil leading the list for bioethanol production. Recent advancement in pre-treatment technologies include the use of toxic liquids and deep eutectic solvents. In this review, many recent advancements on pre-treatment technology of biomass have been discussed. This review also emphasizes on the recent advancements made in the field of saccharification technology. Bioethanol production from cellulosic biomass is facilitated by a complex set of enzymes including endoglucanase, exoglucanase and β-glucosidase apart from other auxiliary enzymes and accessory proteins. In this review, multiple approaches have been explored which enhance biofuel production such as developing cellulose degrading microbial consortia and genetically modified microbes. This study also highlights the importance of bioethanol production with reference to climate change concern, advances in technologies and future perspectives.

1. Introduction

Population growth, food security, energy security and climate change concerns are the interconnected challenges faced by mankind today. With increasing population, the food demands of the people are increasing which consequently results in increased agro waste production. Further, with improving lifestyles energy demands of the people are increasing and thus energy security concerns of the countries come into the picture. To satisfy the energy demands, dependency on fossil fuels has increased which has led to increased emissions into the atmosphere. The increased emissions into the atmosphere have led to climate change concerns and global warming issues due to the rise in CO₂ concentration that may be correlated to the overuse of oil products. The solution to this lies in the problem itself. The agro residues that are produced as a result of food production can be utilized for bioenergy production. Agro residues or agro waste present a major source of raw material for renewable energy production. Bioenergy makes a substantial contribution to global energy demand with nearly 14% of the current total energy share [1]. Bioethanol one of many bioenergy types, with lesser greenhouse gas emission property is the main renewable fuel today. Earlier it used to be commercially produced by the fermentation of

sugar-based raw materials such as cornstarch and cane sugar [2,3]. The production of fuel from sugar-based raw materials poses a threat to food supplies owing to its competition with food crops. This led to a transition from first-generation to second-generation bioethanol [4]. Waste lignocellulosic biomass from food crops can be utilized as a potential resource for bioethanol production [5]. Lignocellulosic biomass such as wheat straw, rice straw, sugarcane bagasse, corn cob and cotton ginseed are few of the many agro residues that can be used for bioethanol production as they are abundant and renewable. According to the current estimate of FAO for 2022, there is an annual waste production of 3.71×10^{10} kg of nutrients for all crops combined [6]. More than 50% increase in agro waste production is expected by 2050 [6]. The stubble burning of the biomass leads to the production of almost 36.73 Teragrams of CO₂ equivalent emissions [7]. Alternatively, this can produce almost 24.6 GL of bioethanol per year according to the calculations by Kim and Dale [8].

Further, estimates suggest that the market for bioethanol production is expected to reach 140 billion litres by 2022 [9]. Therefore, economically, technologically feasible and sustainable technology is required to satisfy the market demands. Bioethanol production includes pre-treatment, enzymatic hydrolysis and fermentation [10]. This can be achieved by the development of suitable technology for the pre-

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<https://doi.org/10.1016/j.fuel.2022.128179>

Received 17 July 2021; Received in revised form 23 June 2022; Accepted 24 June 2022

Available online 12 July 2022

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Article

Encapsulation of *Cymbopogon khasiana* × *Cymbopogon pendulus* Essential Oil (CKP-25) in Chitosan Nanoemulsion as a Green and Novel Strategy for Mitigation of Fungal Association and Aflatoxin B₁ Contamination in Food System

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Abstract: The present study deals with the encapsulation of *Cymbopogon khasiana* × *Cymbopogon pendulus* essential oil (CKP-25 EO) into a chitosan nanoemulsion and efficacy assessment for inhibition of fungal infestation and aflatoxin B₁ (AFB₁) contamination in *Sesquium cumini* seeds with emphasis on cellular and molecular mechanism of action. GC-MS, ATR-FTIR, and XRD analysis revealed the encapsulation of CKP-25 EO in chitosan with controlled delivery. The CKP-25-Ne displayed enhanced antifungal (0.09 µL/mL), anti-aflatoxigenic (0.07 µL/mL), and antitumour activities (IC₅₀ AFB₁ = 6.94 µL/mL; IC₅₀ AFB₂ = 5.40 µL/mL) in comparison to the free EO. Impairment in cellular organelles, methylglucol biosynthesis, and in silico molecular docking of CKP-25-Ne validated the cellular and molecular mechanism of antifungal and anti-aflatoxigenic activity. The CKP-25-Ne showed in vitro efficacy for inhibition of lipid peroxidation and AFB₁ secretion in stored *S. cumini* seeds without altering the sensory profile. Moreover, the higher mammalian safety profile strengthens the application of CKP-25-Ne as a safe green nano-preservative against fungal association and hazardous AFB₁ contamination in food, agriculture, and pharmaceutical industries.

Keywords: CKP-25-essential oil; aflatoxin B₁; mitigation; preservative; methylglucol; molecular docking



Citation: Prasad, J.; Das, S.; Maurya, A.; Soni, M.; Yadav, A.; Singh, B.; Dwivedy, A.K. Encapsulation of *Cymbopogon khasiana* × *Cymbopogon pendulus* Essential Oil (CKP-25) in Chitosan Nanoemulsion as a Green and Novel Strategy for Mitigation of Fungal Association and Aflatoxin B₁ Contamination in Food System. *Foods* **2023**, *12*, 722. <https://doi.org/10.3390/foods12060722>

Academic Editors: Juan Miguel Lopez Roldán, Tago Roldán and Rapsana Gökdemir

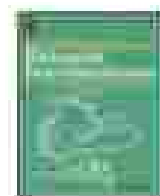
Received: 11 December 2022
Revised: 10 January 2023
Accepted: 22 January 2023
Published: 7 February 2023



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1. Introduction

Sesquium cumini L. (also known as Jamun), belonging to the family Myrtaceae, is a commonly cultivated medicinal plant in tropical and subtropical regions throughout the world [1]. The seeds are beneficial for the treatment of diabetes and inflammatory disorders due to presence of phenolic and bioactive components like carotenoids, ellagic acid, tannic acid, caffeic acid, quercetin, and polyphenols [1,2]. During the storage conditions, *S. cumini* seeds are infested by a variety of fungi such as *Aspergillus*, *Penicillium*, and *Fusarium*, resulting in excessive loss of medicinal properties and nutrient components due to the production of hazardous mycotoxins, and thus significantly reducing their market value [3]. Among different reported mycotoxins, aflatoxin B₁ (AFB₁) produced by *Aspergillus flavus* has been paid serious attention due to their hazardous impact on human health and animals [4]. Most importantly, AFB₁ is considered as a carcinogenic, teratogenic, mutagenic, and immunosuppressive agent, hence, classified as Class I human carcinogen by International Agency for Research in Cancer [5]. In addition, oxidative stress-mediated lipid peroxidation has a negative impact on stored food commodities after AFB₁ contamination, causing off-flavor, off-odor, and deterioration of nutrient components [6]. Moreover,



Synthesis, characterization and *in situ* bioefficacy evaluation of *Cymbopogon nardus* essential oil impregnated chitosan nanoemulsion against fungal infestation and aflatoxin B₁ contamination in food system

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ARTICLE INFO

Keywords

Cymbopogon nardus essential oil

nanotechnology

Aspergillus fumigatus

ABSTRACT

The present investigation aimed to synthesize *Cymbopogon nardus* essential oil impregnated chitosan nano-emulsion (No-CHNC) and its practical efficacy as novel green delivery system for prevention of *Aspergillus fumigatus* against food storage storage fungi, Aflatoxin B₁ (AFB₁) synthesis and lipid peroxidation. Chemical characterization of CHNC revealed about 80.74% as major components. Successful impregnation of CHNC into chitosan nanoemulsion was confirmed through DLS, AFM and TEM analysis. *In vitro* release study shows biphasic release profile with initial burst followed by sustained release of CHNC from chitosan nanoemulsion. No-CHNC exhibited enhancement in *in vitro* antifungal, antifungal activity (3.12 µL, 6%) and antioxidant activity over CHNC. The antifungal and antifungal mechanism of action of No-CHNC was associated with inhibition of ergosterol biosynthesis, membrane leakage of cellular contents, and impairment in cellular morphological characteristics. *In vivo* antifungal inhibition of *Aspergillus fumigatus* of stored wheat (10%) and 20% protein, confirming the molecular action the inhibition of AFB₁ production. *In vivo* investigation suggested remarkable prevention of *E. coli* count against fungal infestation, AFB₁ production and lipid peroxidation without affecting organoleptic attributes. Furthermore, higher molecular nanotechnology strengthens the application of No-CHNC in safe nano-particle and smart preservative in place of chemical affecting synthetic preservatives in emerging food, agriculture and pharmaceutical industries.

1. Introduction

Cymbopogon nardus (L.) Stapf (also known as *Lemon grass*) is one of the frequently used traditional medicinal plants belonging to the family Poaceae and the seeds are used as nutritive food sources due to the presence of bioactive compounds like flavonoids, terpenoids, saponins, polyphenols and glycosides, actively participated as a prophylactic measure of various diseases, particularly for diabetes [1]. Moreover, fruits are rich source of sugar, phenolic components (tannins, gallic acid, anthocyanins, and flavonoids), vitamin C, secondary metabolites and different antioxidant compounds with hepatoprotective, neuroprotective, and anticancerous activities [2]. However, during storage, seeds are infested by a number of storage fungi, most commonly belonging to the genera *Aspergillus*, *Penicillium*, and *Fusarium*, resulting in depletion of

medicinal and nutritional ingredients and subsequent reduction in market value. Among different storage fungi, *Aspergillus fumigatus* has gained outstanding interest due to the production of aflatoxin, a secondary metabolite, especially called as aflatoxin, with a number of health ailments. Among different reported aflatoxins, aflatoxin B₁ (AFB₁) has been classified as class 1 human carcinogen due to mutagenic, teratogenic, immunosuppressive activities and more importantly, the potentiality to develop hepatocellular carcinoma and liver metastasis along with acute toxicity in human and animals [3]. According to the estimated FAO/WHO expert committee, consumption of stored food commodities contaminated by aflatoxin has also chronic effects at the dietary level [4]. During storage, AFB₁ synthesis led to production of massive free radicals resulting in lipid peroxidation and ultimate decomposition of nutritive components of *E. coli* seeds.

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<https://doi.org/10.1016/j.ijbiomac.2022.123346>

Received 20 September 2021; Received in revised form 4 February 2022; Accepted 11 February 2022

Available online 18 February 2022

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