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REVIEW

Molecular Breeding Strategy and Challenges Towards Improvement of Blast Disease Resistance in Rice Crop

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Rice is a staple and most important security food crop consumed by almost half of the world's population. More rice production is needed due to the rapid population growth in the world. Rice blast caused by the fungus, *Magnaporthe oryzae* is one of the most destructive diseases of this crop in different part of the world. Breakdown of blast resistance is the major cause of yield instability in several rice growing areas. There is a need to develop strategies providing long-lasting disease resistance against a broad spectrum of pathogens, giving protection for a long time over a broad geographic area, promising for sustainable rice production in the future. So far, molecular breeding approaches involving DNA markers, such as QTL mapping, marker-aided selection, gene pyramiding, allele mining and genetic transformation have been used to develop new resistant rice cultivars. Such techniques now are used as a low-cost, high-throughput alternative to conventional methods allowing rapid introgression of disease resistance genes into susceptible varieties as well as the incorporation of multiple genes into individual lines for more durable blast resistance. The paper briefly reviewed the progress of studies on this aspect to provide the interest information for rice disease resistance breeding. This review includes examples of how advanced molecular method have been used in breeding programs for improving blast resistance. New information and knowledge gained from previous research on the recent strategy and challenges towards improvement of blast disease such as pyramiding disease resistance gene for creating new rice varieties with high resistance against multiple diseases will undoubtedly provide new insights into the rice disease control.

Keywords: rice blast disease, molecular breeding, DNA markers, QTL mapping, marker-aided selection, gene pyramiding

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Multiplex SSR–PCR approaches for semi-automated genotyping and characterization of loci linked to blast disease resistance genes in rice

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ABSTRACT

In the present study, 63 polymorphic microsatellite markers related to rice blast resistance genes were fluorescently labelled at the 5′-end with either 6-FAM or HEX using the GS dye set and incorporated into a multiplex SSR–PCR for the detection of fragments using an automated system. For rice F_2 families obtained from crosses between Pongsu Seribu 2 (Malaysian blast resistant cultivar) and Mahsuri (a susceptible rice cultivar) the genotypes for 13 designated multiplex SSR panels were determined. The genotyping assays were performed using a capillary-based ABI PRISM 3100 genetic analyser. The sizes of the SSRs alleles observed in the range from 79 to 324 bp. The observed marker segregation data were analysed using the Chi^2 test. A genetic linkage map covering ten chromosomes and comprising 63 polymorphic SSR markers was constructed, and the distorted loci were localised to linkage groups. The results indicated that distorted loci are presented on eight chromosomes.

1. Introduction

Microsatellites are a ubiquitous class of simple, repetitive DNA sequences present in both eukaryotic and prokaryotic organisms [1]. The abundance, distribution throughout the genome, multiallelic nature, high reproducibility and the inherent prospect of variation and ease of assay using PCR SSRs has made these microsatellites an important source of genetic markers [2–4]. Over 2500 microsatellite markers have been genetically mapped in rice, and each of about 157 kb [5–11]. These SSR markers belong to Class I (di-, tri-, tetra-repeats), which were released after the completion of the Nipponbare genome sequence in 2005 [12]. The hypervariability of SSRs among related organisms and simple, reproducible assay makes them worthy for a wide range of applications, such as genotype identification, mapping of genes and quantitative trait loci, genetic diversity analysis and marker-assisted selection (MAS) [13,14]. SSRs have been widely used in cereal research, and the use of these sequences in MAS has

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Article

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Biosynthesis and Characterization of Silver Nanoparticles from Methanol Leaf Extract of *Cassia didymobotyra* and Assessment of Their Antioxidant and Antibacterial Activities

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The biosynthesis of silver nanoparticles (AgNPs) was achieved for the first time using methanol leaf extract of *C. didymobotyra* and their in vitro antioxidant and antibacterial activities were also evaluated. Methanol leaf extracts of *C. didymobotyra* after mixing with $AgNO_3$ solution showed the change in color from light brown to dark yellowish brown within 1 hour. UV-visible spectroscopy study showed the surface plasmon resonance at around 420 nm clearly indicating the biosynthesis of AgNPs. Transmission Electron Microscopy (TEM) analysis proved the presence of biosynthesized AgNPs in spherical shape with huge disparity in sizes. The average size of biosynthesized nanoparticle was about 18 nm. The occurrence of face centered cubic shapes of nanoparticles was established by X-ray diffraction (XRD) patterns. Further, Fourier transform infrared spectroscopy (FTIR) study showed the possible capping of AgNPs because of the active biomolecules present in the methanol leaf extract of *C. didymobotyra*. The antioxidant activities of biosynthesized AgNPs were evaluated by 1,1-diphenyl-2-picryl hydrazyl (DPPH) radical scavenging assay and found that AgNPs demonstrated a strong antioxidant properties compared to methanol leaf extract. Nevertheless, the biosynthesized AgNPs exhibited a strong antibacterial activity against all the tested human pathogenic bacterial strains compared to crude methanol leaf extract of *C. didymobotyra*. Thus, it is concluded that these biosynthesized AgNPs are cost effective, eco-friendly in nature and could be applied for developing new antibacterial drugs and other biomedical applications in near future.

Keywords: Antioxidant Activity, Biosynthesis, FTIR, Nanoparticles, TEM, XRD.

1. INTRODUCTION

Nanobiotechnology is an emerging field of science which has been applied for various applications such as catalysis, photonics, electronics, antimicrobials, therapeutics, molecular diagnostics, drug delivery and environmental science.[1–2] Modern research is exploring the potential uses of nanoparticles and their new applications are rising quickly. The nanoparticles prepared by noble metals like gold, silver and platinum display enhanced characteristics on the basis of their size, distribution and morphological features.[3] Therefore, researchers are trying to find new methods of nanoparticles synthesis by adopting different materials. The physical and chemical synthesis methods of nanoparticles are very expensive and their application is restricted due to use of toxic chemicals.[4] Thus, the researchers are currently adopted a rapid, cost effective and environmentally friendly biological approach for the synthesis of nanoparticles using bacteria, fungi, and plant extracts.[5] Amongst the various biological approaches, the synthesis of nanoparticles using plants as whole or

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Detection and identification of phytoplasma associated with witches' broom and little leaf disease in *Arundo donax*: first report from India

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During the survey of two successive years 2012–2013, in nearby places of Gorakhpur districts, Uttar Pradesh, India, *Arundo donax* plants were found to be exhibiting witches' broom, excessive branching accompanied with little leaf symptoms with considerable disease incidence. Nested PCR carried out with universal primers pair R16F2n/R16R2 employing the PCR (P1/P7) product as a template DNA (1:20) resulted in expected size positive amplification ~1.2 kb in all symptom-bearing plants, suggested the association of phytoplasma with witches' broom disease of Narkat plants. BLASTn analysis of the 16S rRNA gene sequence showed the highest (99%) sequence identity with *Candidatus* phytoplasma asteris (16SrI group). In phylogenetic analysis, the sequence data showed close relationships with the members of 16SrI phytoplasma and clustered within a single clade of 16SrI group and closed to B subgroup representatives. This is a first report of 16Sr I-B group phytoplasma associated with witches' broom accompanied with little leaf disease of Narkat in India.

Keywords: *A. donax*; phytoplasma; witches' broom; 16S rRNA gene; nested PCR; BLAST analysis; phylogenetic analysis

Introduction

Arundo donax is a perennial herbaceous plant (Poaceae) found in grasslands and wetlands throughout a wide range of climatic zones. It reproduces by rhizomes and can essentially remain alive throughout the year. The adult plant resembles bamboo or corn and the young plant stems resemble large grasses such as ryegrass and common reed. It's native to Mediterranean region and cultivated throughout the world. It has long been associated with humans and has been also cultivated in Asia, southern Europe, North Africa and the Middle East for thousands of years (Mirza et al. 2011). However, *A. donax* has been commercially cultivated for the production of reeds for musical instruments. These days great interest is being given to *A. donax* for renewable energy source due to its rapid growth rates in different soil, climatic condition, biotic and abiotic stresses (Kausar et al. 2012) and high biomass production. Energy crops are cultivated with the purpose of utilising their biomass to produce energy and at the same time reduce carbon dioxide emission (Kausar et al. 2012).

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RESEARCH PAPER

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Effect of Different Concentrations of Pyridoxine Aqueous Sprays Solutions on Leaf Biochemical Components, Herb Yield and Essential Oil of Peppermint (*Mentha piperita L.*)

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ABSTRACT

A eld experiment was conducted during late Rabi season (Jan-May 2012) on Peppermint (Mentha piperita L.) to study the e ect of di erent concentra ons of pyridoxine aqueous sprays solu ons (0.01, 0.02, 0.03, 0.04 and 0.05%) applied 40 days a er sowing on leaf biochemical components (total free amino acids, leaf chlorophyll and caretenoid content), herb yield (t/ha) and essen al oil (%) of Peppermint. It was observed that 0.03% pyridoxine aqueous sprays solu on was best for total free amino acids, leaf chlorophyll and caretenoid of peppermint (Mentha piperita L.). Moreover, the herb yield and essen al oil (%) was also noted that maximum with the same 0.03% pyridoxine aqueous sprays solu on.
Keywords: Pyridoxine, Leaf Biochemical Components, Herbs Yield and Essen al Oil Content.

INTRODUCTION

Peppermint (*Mentha piperita L.*) is a higly hardly aroma c herbs. This species has strong odour and a more aroma c taste. It is rich in essen al oil. It is administered in serous nervous disorders in headaches, collies nervous vomi ng and tympani s hiccups atulence and periodine discharges with nervous symptoms. As a flavoring agent peppermint is used in wide range of pharmaceu cals, confec onary, alcoholic drinks, dental creams and mouth washes

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Foliar Biochemical Approaches in Ten Sugarcane (*Saccharum officinarum L.*) Cultivars

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Sugarcane, rice-bran, pyridoxine, starch, amylase activity

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ABSTRACT

A field experiment was conducted during 2007-08 (spring planting) at Agricultural farm of G.F. College, Shahjahanpur U.P. to study the effect of soil applied (0, 10, 20, 40 and 60 kg/ha) rice bran alongwith pre-sowing soaking of setts in 0.03% pyridoxine solution in ten sugarcane (*Saccharum officinarum* L.) (CoS 8436, CoS 93255, CoS 96268, CoSe 98231, CoSe 01235, CoS 01424, CoSe 95422, UP 097, CoSe 92423 and CoS 96275) cultivars in 4 x 2.5m plots each treatment replicated thrice in a factorial randomised block design. The soil was sandy loam, pH 7.10, E.C. 0.30 dS/m, Organic carbon 0.25%, available N 150 kg/ha, available P 10.20 kg/ha and available K 120kg/ha. A uniform basal dose of 150 kg N, 60kg P and 80 kg K/ha was applied to each bed before sowing. Nitrogen was given in (1/3 + 1/3 + 1/3) split doses as top dressing. Urea, monocalcium single super phosphate and muriate of potash were used as perspective sources of NPK. Third leaf was selected for the biochemical assays for fresh tissue material at pre-monsoon (120 DAP), post-monsoon (210 DAP), early ripenning (270 DAP), late ripenning (330 DAP) and at maturity (360 DAP) of the crop. The seed rate was (90 x 45cm) row to plant spacing. Weeding was done when required during the course of growth of plants. Standard agronomical practices were followed of the crop. The crop was sown on 24 Feb 2007 and harvested for early varieties on 20 January 2008 and 1 March 2008 for late varieties (DAP = Days after planting). Authentic seeds of sugarcane (*Saccharum officinarum* L.) varieties were obtained from Division of Sugarcane Breeding, U.P. Council of Sugarcane Research, Shahjahanpur, U.P. A significant increase in leaf starch content was noted as a result of soil applied rice bran as well as 0.03% pyridoxine soaking upto post monsoon (210 days) stage. The later two final stages showed a reverse trend as compared to control. CoSe 92423 showing mostly highest values for leaf starch content at all growth stages as compared to other cultivars showing a high source potential. As far as the interaction effect was concerned 0.03% pyridoxine soaking x CoSe 92423 gave significantly highest value upto post monsoon (210 days) stage and lowest value in the later final stages followed by the interaction 40 kg/ha soil-applied rice bran x CoSe 92423. The lower values in the last two stages shows conversion of carbohydrates into sugars for the storage. There was an increase in the level of amylase content significantly upto maturity stage. The impact of 0.03% pyridoxine sett soaking was maximum for this trait followed by 60kg/ha soil applied rice bran foliar biochemical analysis. CoSe 92423 responded best and gave maximum amylase activity at all stages of growth compared to other cultivars seems to be linked directly with sucrose accumulation in the cane.

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ECO FRIENDLY EFFECT OF PYRIDOXINE AQUEOUS SPRAYS ON GROWTH, LEAF NPK CONTENTS AND HERB YIELD OF PEPPERMINT (MENTHA PIPERITA L.)

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ABSTRACT

A field experiment was conducted during late Rabi season (Jan-May 2014) on Peppermint (Mentha piperita L.) to study the effect of different concentrations of pyridoxine aqueous sprays solutions (0.01, 0.02, 0.03, 0.04 and 0.05%) applied 40 days after sowing on growth (Leaf no., fresh and dry weight per plant), leaf NPK (at 50, 70, and 90 days) content and herb yield (t/ha) at harvest. It was observed that 0.04% pyridoxine aqueous sprays solution was best for the most of growth characteristics. Moreover, the herb yield was also noted that maximum with the same 0.03% pyridoxine aqueous sprays solution. The leaf NPK content showed a gradual decrease at all selected growth periods.

Keywords: Pyridoxine, Growth Parameters, Leaf NPK Content and Herb Yield.

I. INTRODUCTION

Productivity of a plant could be thought of initially as a combination of its capacity for growth, favorable biochemical reactions leading to fungal yield potential. It seems probable that many more widely useful commercial properties of plants could be improved by selection of the appropriate cultural practice to affect the physiology of the plat in the required way. Profitable investigations, as in might be conducted in such qualities as growth, herb yield and essential oils used for flavoring. Economies of production would ultimately decide the profitability of peppermint oil production and optimization of inputs would be necessary prerequisite if peppermint production has to be adopted with economic viability in the country. Mentha piperita L. (Peppermint) comes in the second largest group of essential oils. Treatment of seeds with very dilute solutions of B-Vitamins that stimulated the growth of roots in the seedlings so that they could explore efficiently. The soil around them (Ahmad, 1975, Afish et al., 1979). There effects would be ultimately manifested in better growth and higher productivity coupled with considerable fertigue economy (Samiullah et al., 1985, Ansari 1986). The present author decided, therefore to study the effect of different concentrations of aqueous pyridoxine solutions application on growth leaf nutrient (NPK) content at various stages as well as on herb yield at harvest in peppermint Mentha piperita L.

II. MATERIALS AND METHODS

This field experiment was performed during late "Rabi" season of 2014 in a sandy loam soil at experimental field of G.F. College, Shahjahanpur. The experiment was designed to study the effect of different concentration (0, 0.01, 0.02, 0.03, 0.04 and 0.05 % aqueous solutions of pyridoxine applied at 40 days to sowing on foliage on growth (leaf no. fresh and dry weight / plant), leaf nutrient (NPK) content at 50, 70 and 90 days to sowing and herb yield (t/ha) at harvest in 2 x 2 sq.m bed. The sowing was done on 5 January 2014 a uniform dose of 50 kg N, 60 Kg each of P and K was given uniformly to each bed. FYM @ 20 q/ha was uniformly used during field preparation. The crop was irrigated fortnightly. The harvesting was done on 10 May 2014. The weeding was done when required. 1 % aqueous Bavistin treatments to seeds before sowing uniformly for 2 hours.

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EFFECT OF INTEGRATED NUTRIENT MANAGEMENT ON HERB YIELD AND ESSENTIAL OIL CONTENT OF PEPPERMINT (*Mentha piperita L.*)

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ABSTRACT

A field experiment was conducted during crop growth period of 2015 (January 2015 to May 2015) on 'Kosi' variety of Peppermint (*Mentha piperita L.*) to study the effect of Integrated Nutrient Management on herb yield essential oil content. Herb and essential oil yield at harvest only in this field experiment under 5 sq m bed size, each treatment replicated thrice.

T_1, Control; T_2, FYM @ 20 tonnes/ha, T_3, *Azotobacter spp. +Pseudomonas striata;* T_4, 50% N of RDF+ *Pseudomonas striata;* T_5, 50% P_2O_5 of RDF +*Azotobacter spp.*; T_6, 50% RDF; T_7, 100% RDF; T_8, T_3 + T_6, T_9, T_6 + 10 tonnes FYM/ha; T_{10}, T_3 + T_9, T_{11}, T_3 + T_7, T_{12}, T_2 + T_3 + T_7, T_{13}, T_2 + T_3 + T_6

It was observed that total herb yield and essential oil content increased significantly by all Integrated Nutrient Management treatments. Treatment T_{11} containing FYM @ 20 tonnes/ha + Azotobacter + Pseudomonas striata+50% RDF was found best for herb yield 56.25% more than control (No treatment).

Key words: *Herb yield, essential oil content, fertilizer (NPK), FYM, Azotobacte and Pseudomonas striata.*

I. INTRODUCTION

Peppermint (*Mentha piperita* L.) is a hardy aromatic herb. This species is a cross between *M. spicata* and *M. aquatica.* This plant has strong odour and a [illegible] taste. It is rich in essential oil (0.5-1.5% approx.). This species originated in Europe. It is commercially cultivated in America, France, South Africa, Yugoslavia, Hungary, England, Thailand, Vietnam and Bulgaria. In India it is commercially cultivated annually in tarai regions (Kaze et al. 1999 and Bhattacharya 2000) with Uttar Pradesh and Punjab as leading states. [illegible] 3%, containing 50% [illegible] and 4% esters (Bhatia 1983, Breslow 1965, Chop[illegible]

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Comparative performance of micropropagated and conventional plants of sugarcane

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Abstract

An experiment was performed to study the comparative performance of micropropagated and conventional plants. A total of 200 micropropagated plantlets of each variety, hardened for one month, were transplanted in the field. Simultaneously, the donor varieties were also planted using 1 bud-setts in three rows for comparison of various qualitative traits like Brix %, Sucrose % and Purity %. A comparative perusal of data showed that the sugarcane variety CoSe 01235 had higher Brix % as well as Sucrose % than the variety CoS 99259 in their respective counterparts, in a particular month. The Brix % and Sucrose % were marginally higher in tissue cultured plants than their donors in all the three months. However, the purity % was recorded to be marginally higher in CoS 99259 in both micropropagated and donor plants as compared to the respective plants of variety CoSe 01235.

Keywords: Brix, Micropropagation, Sugarcane, Quality traits.

Introduction

Plant tissue culture offers the best methodology through micropropagation of sugarcane for quality and phytosanitary planting material at a faster rate in a shorter period of time. The main advantage of micropropagation is the rapid multiplication of new varieties, improved plant health and its usefulness in germplasm storage. It is the best method for propagation as it produces plants phenotypically similar to the mother plant and gives much more rapid multiplication rate. Shaw (1990) reported that micropropagation is being used in several sugar industries, for the development of disease free clones, mostly to facilitate their safe and speedy movement through quarantine. It has now become a valuable alternative to the conventional clonal propagation methods for seed production. Tissue culture can increase the propagation potential by 20-35 times (Geijskes et al., 2003, Snyman et al., 2006). In addition, plants can be disease-indexed (Snyman et al., 2007) and healthy material multiplied in much less time compared to the conventional vegetative route. Establishment of *in vitro* culture is the first stage in any micropropagation system. Its success depends on choice of explants, varied compositions of nutrients and hormones in culture media, methods of subculturing and also on aseptic environmental conditions. Newly released varieties due to different genetic and physiological nature show different requirements of nutrient media, plant growth regulators and environment for proper development under *in vitro* condition. The present experiment was carried out to study comparative performance of micropropagated and conventional (donor) plants for their quality traits using CoSe 01235, an early

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Antibacterial Activity of Different Extracts of Black Pepper

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Abstract— It has been well known since ancient times that medicinal plants have antimicrobial activity due to the presence of bioactive constituents, therefore they become important sources of drugs formulation. The antibacterial activity of seed extracts of Black pepper was evaluated by well diffusion method. Acetone, methanol and benzene solvents were used for the extraction. During the analysis Pseudomonas aeruginosa and Staphylococcus aureus both were found most sensitive to the benzene extract and inhibition zone measured as 16mm for both bacteria at 100µg/ml. Minimum activity was shown by both acetone and methanol extracts. The study concluded that antimicrobial activity of extracts increases as the concentration increases.

Keywords— *Antimicrobial activity, black pepper, minimum inhibitory concentration, zone of inhibition.*

I. Introduction

Plant-derived medicines have been part of traditional healthcare in most parts of the world since ancient times and there is increasing interest in plants as sources of anti-microbial agents [1]. Given the alarming incidence of antibiotic resistance in bacteria of medical importance, there is a constant need for new and effective therapeutic agents [2, 3]. However, there has also been a rising interest for natural products from plants for the discovery of new antimicrobial and antioxidant agents in the last three decades and in recent times. More so, many of these plants have been known to synthesize active secondary metabolites such as phenolic compound found in essential oils with established potent insecticidal and antimicrobial activities, which indeed has formed the basis for their applications in some pharmaceuticals, alternative medicines and natural therapies [4]. Natural plant products, including medicinal plant extracts, are increasingly being used as agrochemicals for controlling diseases due to their non-phytotoxicity and easy bio-degradation [5]. Black pepper (*Piper nigrum* L.) is well-known cooking herb and the extracts have been reported in various natural medicines. Black pepper is produced from the still-green, unripe drupes of the pepper plant which have a bitter, hot, sharp taste, tonic to the liver, stomachic, abortifacient, aphrodisiac and digestive. Black pepper is known to inhibit the growth of various microbes such as *Staphylococcus aureus, Bacillus subtilis, Pseudomonas aeruginosa, Escherichia coli, Alternaria alternata, Aspergillus niger, Aspergillus flavus* and *Fusarium oxysporum*. Black pepper (*Piper Nigrum* L.) is an important healthy food owing to its antioxidant, antimicrobial potential and gastro-protective role. The present investigation was undertaken to test the antimicrobial activity of seed extract of black pepper against selected [illegible]

II. Materials and Methods

Plant Material

The seeds of spice black pepper used for the present study were collected from the local market of Shahjahanpur, Uttar Pradesh (India).

Bacterial Cultures

Staphylococcus aureus (NCIM-2079), *Bacillus subtilis* (NCIM-2123), *Escherichia coli* (NCIM-2064) and *Pseudomonas aeruginosa* (NCIM-5210).

Solvents and Media

Methanol, Benzene and Acetone solvents for extraction, Nutrient Agar.

Preparation of extract

1. 10 gms of Black pepper was ground finely and used for solvent extraction via Soxhlet apparatus following standard protocol [6]. After the complete process, the collected extracts were subjected for evaporation at room temperature. The dried extracts were stored at 4°C for future analysis.

Minimum inhibitory concentration (MIC) Well diffusion method

Extracts were tested for the anti-bacterial potential by Agar well diffusion method [7]. Initially, autoclaved nutrient media were poured in the Petri plates under laminar air flow and after solidification of media the bacterial suspension (24 hrs old) swab over the media. The wells were prepared using cork borer. Test sample was dissolved in DMSO in different concentrations such as 25, 50, 100 µg/ml and 40 µl dissolved test sample from each concentration was loaded to the wells and incubated for 24 hrs at 37°C. DMSO (Di Methyl Sulfoxide) used as a negative control whereas antibiotic amoxicillin disc having amoxicillin 10µg concentration used as positive control.

III. Results and Discussion

In present study antimicrobial activity of Black pepper was carried out. Table I shown the antimicrobial activity of spice extracted in acetone, methanol and benzene solvents against *Staphylococcus aureus, Bacillus subtilis, Escherechia coli* and *Pseudomonas aeruginosa*. The maximum zone of inhibition was observed against *Pseudomonas aeruginosa* (16mm) and *Staphylococcus aureus* (16mm) at 100 µg/ml of benzene extract followed by 50 µg/ml benzene extract (15mm) against both the bacteria. 100µg/ml acetone extract showed 15mm

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RESEARCH ARTICLE

Synthesis and Characterization of Styrenated Poly(ester-amide) Resin from *Melia Azedarach* Seed Oil -An Eco-friendly Resource

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Abstract: Due to fast depletion of petrochemical stock and environmental concern both, utilization of vegetable oils as a renewable resource in the synthesis of polymeric materials are in the spotlight of the chemical industries. Keeping these facts in mind we have attempted to utilize *Melia azedarach* seed oil (MASO), a renewable and eco-friendly resource presently rot away at the various plantations in each season in the synthesis of styrenated poly(ester-amide) resin (SMAPEA). The poly (ester-amide) (MAPEA) was prepared by the aminolysis of triglyceride oil with diethanol amine followed by the poly (condensation) with phthalic acid. The MAPEA then treated with styrene in different per hundred of resin (phr) to obtain a series of SMAPEA resins. The synthesized intermediates and final resins have been characterized by the measuring the physico-chemical properties as per standard laboratory methods and spectral analyses. The coatings of SMAPEA were also tested for physico-mechanical performances.

Keywords: Vegetable oil, Styrene, Poly(ester-amide), Renewable resource, *Melia azedarach*

Introduction

Vegetable oil based poly(ester-amide) are amide modified alkyds that have improved film properties over normal alkyds in terms of drying time, hardness, water vapor resistance, chemical and thermal resistance[1-3]. In addition to these poly(ester-amide) resins are also known for high durability in many service environment[4,5]. However, their use as a versatile coating material is restricted due to their high baking temperature for curing[5,6]. Incorporation of metals, metalloids and organic moieties like styrene, vinyl acetate, acrylates reduce the curing temperature of the resin appreciably[1,7]. Modification of the oil based polymeric resins with the styrene monomer or its copolymer with other acrylic monomers not only reduces the baking temperature but also enhances the scratch hardness, protective efficiency and thermal stability[7,8].

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Synthesis and Characterization of methyl Methacrylate Modified Poly (Ester-Amide) Resins from *Melia Azedarach* Seed Oil as Coating Material

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ABSTRACT

Synthesis of polymeric materials from natural renewable resources has attracted a lot of attention of researcher throughout the world as they not only reduce the dependency on petrochemicals but also friendly to the environment. Utilization of non-traditional and non-edible vegetable oils in the synthesis of valuable polymeric materials solves the problem of waste disposal as well as bringing down the cost of end products. *Melia azedrach* seed oil (MASO), a non-traditional and non-edible seed oil is utilized for the synthesis of poly (ester-amide) (MAPEA) by the aminolysis with diethanolamine followed by step-growth polymerization with phthalic acid. To improve the performances and utility of the MAPEA, methyl methacrylate (MMA) classified as hard monomer in the literature of acrylate embedded to it in different phr to obtained methyl methacrylate modified poly (ester-amide) (MMMAPEA) resins. The MMMAPEA resins were characterized by physic-chemical analysis as per standard reported methods. The structural elucidation of the resin was carried out by spectral analyses. Physico-mechanical and chemical/corrosion resistance performances of the MMMAPEA resins were investigated for the optimization of MMA content.

Keywords: *Melia azedarach*, methylmethacrylate, Poly (ester-amide), vegetable oil, coatings.

INTRODUCTION

Polymeric materials are playing very important role in the modern society and are replacing metals in diverse field of life[1-3]. However, the major drawbacks of polymeric materials are their non-biodegradability especially those derived from petrochemicals[4,5]. Furthermore use of petrochemicals largely affected the environment with the increase in emission of green house gases and accumulation of non-biodegradable waste on earth[6]. Worldwide potential demands for replacing petroleum derived raw materials with renewable ones are quite significant due to both realizations that our petroleum resources are finite and not suitable for environment[6,7]. Recent investigations are therefore focused on producing polymeric materials from natural renewable resources which have ability to grow again and again and also posse's inbuilt biodegradability[8].

Among different renewable resources vegetable oils obtained from the different seeds play vital role in the synthesis of polymers[9]. Seed oils are cost effective, eco-friendly, eco-toxic towards humans and are also biodegradable in nature[9-11]. Common seed oils such as linseed[12], castor[9], soybean[4] and sunflower[13] have been largely used in the synthesis of low molecular weight polymers like alkyds, epoxies, poly(urethane)s, interpenetrating polymer networks (IPNs) poly(ester-amide)s and many others[14]. Those polymers are extensively used in the coatings, paints, and adhesives and bioengineering industries. Among aforesaid traditional oils some of them posses the medicinal values and edible too[15]. Therefore it is desirable to explore the spectrum of

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Historical perspective

Recent trends in electrospinning of polymer nanofibers and their applications in ultra thin layer chromatography

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ABSTRACT

Fabrication of polymer derived electrospun nanofibers by electrospinning as chromatographic sorbent bed for ultra thin layer chromatography (UTLC) is a very demanding topic in analytical chemistry. This review presents an overview of recent developments in the fabrication of polymer derived electrospun nanofibers and their applications to design UTLC plates as stationary phases for on-plate identification and separation of analytes from their mixture solution. It has been reported that electrospun fiber based stationary phases in UTLC have enhanced separation efficiency to provide separation of analyte mixture in a shorter development time than those of traditional particle based TLC stationary phases. In addition, electrospun UTLC is cost effective and can be modified for obtaining different surface selectivities by changing the polymer materials in electrospun devices. Electrospun UTLC plates are not available commercially till date and efforts are being rendered for their commercialization. The morphology and diameter of electrospun nanofibers are highly dependent on several parameters such as type of polymer, polymer molecular weight, solvent, viscosity, conductivity, surface tension, applied voltage, collector distance and flow rate of the polymer solution during electrospinning process. Among the aforementioned parameters, solution viscosity is an important parameter which is mainly influenced by polymer concentration. This review provides evidence for the fabrication of UTLC plates containing electrospun polymer nanofibers. Furthermore, the future prospects related to electrospinning and its application in fabricating of different types of electrospun nanofibers are discussed. The present communication is aimed to review the work which is appeared during 2009–2014 on the application of polymer derived electrospun nanofibers in ultra thin layer chromatography.

Contents

Abbreviations: AE-UTLC, aligned electrospun ultra thin layer chromatography; AFM, atomic force microscopy; AP MALDI MS, atmospheric pressure matrix assisted laser desorption/ionization mass spectrometry; ATR FTIR, attenuated total reflection Fourier transform infrared spectroscopy; BSA, bovine serum albumin; CA, cellulose acetate; CNTs, carbon nanotubes; [illegible]; DCM, dichloromethane; DMAc, N,N-dimethylacetamide; DMF, N,N-dimethylformamide; DMSO, dimethyl sulfoxide; [illegible]; ESCA, electron spectroscopy for chemical analysis; ESEM, environmental scanning electron microscopy; ESI-MS, electrospray ionization mass spectrometry; [illegible]; FESEM, field emission scanning electron microscopy; [illegible]; FTIR, Fourier transform infrared spectroscopy; [illegible]; HPTLC, high performance thin layer chromatography; [illegible]; MS, mass spectrometry; MWNTs, multi walled carbon nanotubes; [illegible]; PAN, polyacrylonitrile; [illegible]; PBS, phosphate buffered saline; PC, polycarbonate; PCL, poly(ε-caprolactone); [illegible]; PVA, polyvinyl alcohol; [illegible]; TLC, thin layer chromatography; [illegible]; UTLC, ultra thin layer chromatography; [illegible]; XRD, X-ray diffraction.

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कालीन–उद्योग और शाहजहाँपुर

डॉ. मोहम्मद तारिक

जनपद शाहजहाँपुर उत्तर प्रदेश के बरेली मण्डल के दक्षिण पूर्व कोण पर गर्रा एवं खन्नौत नदियों के मध्य, स्थित है तथा पूर्व में लखीमपुर खीरी, दक्षिण में हरदोई एवं फर्रुखाबाद, पश्चिम में बरेली व बदायूँ और उत्तर में पीलीभीत जनपदों से घिरा है।

शाहजहाँपुर औद्योगिक दृष्टि से पिछड़ा जनपद है। जनपद के अधिकाँश उद्योग कृषि पर आधारित हैं तथा यहाँ का मुख्य हस्तकला उद्योग कालीन उत्पादन है।

कालीन की उत्पत्ति के विषय में अनेक किंवदंतियाँ हैं. ऐसा माना जाता है कि मध्य एशिया के बंजारों ने अपनी भेड़ों आदि के ऊन को विभिन्न प्रकार की जड़ी–बूंटियों से रंगकर कालीन उत्पादन का शुभारम्भ किया।1 संसार का सबसे पुराना कालीन जायरेक (PASYRYKC-CARPET) है जो अनुमानतः ईसा से 500 वर्ष पूर्व बनाया गया था तथा जो अल्टाई की पहाड़ियों में प्राप्त हुआ था, इसकी खोज 1949 ई0 में सोवियत पुरातत्ववेत्ता रूडेन्को ने की। समय के साथ कालीन निर्माण की कला ईरान पहुँची। ईरान पहुँचकर इस कला ने इतनी उन्नति की कि ईरान को आधुनिक कालीन की जन्म भूमि कहा जाने लगा।

भारत में यह कला कब और कैसे आयी इस सम्बन्ध में प्रायः माना जाता है कि मुगल शासकों द्वारा 16वीं शताब्दी में ईरान से कुछ कालीन बुनकरों को यहाँ लाकर इस कला का श्री गणेश सन् 1580 ई0 में महल में शाही कारखाना खोलकर कराया गया। तदुपरान्त 17वीं शताब्दी में कालीन बनाने के कारखाने दिल्ली, आगरा और लाहौर में खोले गये। मुगल सम्राट अकबर, जहाँगीर और शाहजहाँ के समय में इस कला का काफी विस्तार हुआ।5 धीरे–धीरे यह कला भारत के कुछ और स्थानों में भी फैली जिनमें श्रीनगर, अमृतसर, भदोही, बनारस, शाहजहाँपुर और आगरा मुख्य हैं। मुगलकाल की समाप्ति पर भारत में कालीन उद्योग को बड़ा झटका लगा। इसका अस्तित्व बना तो रहा लेकिन बहुत कम इकाईयाँ कार्यरत रहीं। अतः 19वीं शताब्दी तक कालीन के बुनने का काम बहुत कम था। कुछ विदेशी व्यापारियों ने भारत में इसे जीवित किया। कालान्तर में अमेरिका और यूरोप को भारत से कालीन निर्यात ने इसके उत्पादन को और बढ़ाया। धीरे–धीरे इस भारतीय उद्योग ने अंतर्राष्ट्रीय कालीन उद्योग की प्रतिस्पर्धा में अपना स्थान बनाना आरंभ कर दिया।

वर्तमान कालीन उद्योग की उत्पादन तकनीक द्वितीय विश्व युद्धकाल से भिन्न है। कालीन के डिजाइन तथा पैटर्न बदल गये हैं। भारत में अमृतसर, मिर्जापुर, भदोही, आगरा, जयपुर, जोधपुर, क श्मीर, हैदराबाद, बनारस, शाहजहाँपुर इत्यादि, जगहों के कालीन की सुन्दरता, कला तथा दस्तकारी में विशिष्टता है। कालीन यहाँ का विशेष उद्योग है। यहाँ के कालीन का डिजाइन ईरानी तथा मध्य एशिया जैसे बुखारा, समरकन्द तथा बुर्किस्तान जैसा है। यहाँ बहुत मुलायम तथा लम्बे रेशे के ऊन का प्रयोग होता है। दूसरी विशेषता यहाँ के कालीनों में सन्तुलित रंग तथा नये–नये काल्पनिक डिज़ाइन हैं।

कालीन के बुनकरों की पूरे देश में संख्या दो लाख से ऊपर है तथा लगभग 65000 करघे हैं। उत्तर प्रदेश के मिर्जापुर–भदोही में अकेले 35000 बुनकर हैं। यहाँ पर कालीन उद्योग लगभग 400 साल पुराना कहा जाता है। एक रोमांचक कहानी इस सन्दर्भ में कही जाती है कि कालीन बुनाई की कला यहाँ कैसे आयी ? एक काफिला जी.टी. रोड से गुज़र रहा था जो लुट गया। इसमें एक ईरानी बुनकर था जिसको गाँव वालों ने बचा लिया। उसने गाँव वालों को बदले में कालीन बुनने की कला सिखाई। कश्मीर में लगभग 500 वर्ष पहले कालीन बुनने की कला आयी थी। यहाँ अधिकतर मुसलमान थे इसलिए इस कला पर शुरू से मुस्लिम आबादी का एकाधिकार हो गया लेकिन बाद में इस कार्य में हिन्दू आ गये। कच्चे माल की उपलब्धि, जलवायु, अनुकूल दातायरण और कालीन की खपत को दृष्टि में रखते हुये कालीन बुनकरों ने समय–समय पर स्थान परिवर्तन करके इस कला का भारत में विस्तार किया। 18वीं शताब्दी के अन्त में लगभग

ज़रूरत व्यावहारिक बाल साहित्य की

...का समाज बदला है तो बाल-साहित्य भी बदला है। आज बदले हुए साहित्य की चमक दिख भी रही है पर पूरी तरह नहीं! अब पुरानी धारा को छोड़कर समाज-सापेक्ष लीक पर चलने की ज़रूरत है, चर्चा कर रहे हैं **मोहम्मद साजिद खान**

...सवीं सदी ने देश-दुनिया और समाज को तेज़ी से बदला है। ...हन, खान-पान यहां तक कि संपूर्ण जीवन-शैली ही बदल गई है। ...का बच्चा वह नहीं रहा, जो हम समझ रहे हैं। ऐसे बदलते समय-... में बाल-साहित्यकारों की ज़िम्मेदारी, सतर्कता और भी बढ़ जाती है। वस्तुतः समाज हमेशा बदलता रहा है और बदलना भी चाहिए, किंतु ...छले दो दशकों में समय का बदलाव कुछ इतना तेज़ी से हुआ है कि ...त सी चीजें हमारी नज़रों में आए बिना, अनचीन्हे ही हमारी ज़िंदगी ...का एक हिस्सा बन गई हैं और जब तक हम सतर्क हो पाते, उन्होंने ...जीवन की बहुत सारी चीजें निगल लीं। समय का बदलना बुरा नहीं है, उसका 'विघटन' घातक है।

आज के आविष्कारों और नव-तकनीकी-युग ने सुख-सुविधाओं के ...आयाम स्थापित किए हैं। इसे आप जीवन के हर क्षेत्र में देख सकते हैं। कदाचित् इसने अनजाने में बहुत से जीवन-मूल्यों से हमें दूर कर दिया है। संस्कार, मेल-मुलाकात, रहन-सहन, खान-पान, जीवनादर्श ही नहीं ...क संपूर्ण संस्कृति ही बदल दी है। आज अन्योन्याश्रितता का दौर ...खत्म हो चला है। यह कम से कम हमें एक-दूसरे से बांधता तो ...। इकोनॉमिक्स का 'बार्टर सिस्टम' टकसाली मुद्रा के चलन के कारण ...से ही हाशिए पर चला गया हो पर यह था एकदम पुख्ता! भला इस ...से हम एक-दूसरे से जुड़े तो थे, वक्त पड़ने पर एक-दूसरे के लिए ...ड़े तो थे! आज हम हर चीज़ को मुद्रा में आंकते हैं रिश्तों को भी! ...पहले गांव में किसी के घर छप्पर चढ़ाया जाता था तो नौजवान ही क्या, ...बूढ़े भी आ जुटते थे उसे चढ़ाने। इसका एक स्पष्ट आंतरिक-अंतर्कथ्य ...यह भी था कि अगर आज कोई एक किसी के लिए खड़ा होता था ...दूसरा भी बदले में उसकी ज़रूरतों के लिए हमेशा खड़ा रहता था। ...पहले एक घर में आग जलती थी पर उस आग से चूल्हे कई घरों के ...जलते थे। तब घर की अम्मा पड़ोस की ताई, चाची आदि से दो क्षण बात ...करती थीं। ...आज सबके घर गैस-चूल्हे ...। यह आत्मीयता का दौर था। ... न आग मांगने का दौर रहा, न ही रिश्तों में गर्माहट रह गई। मैं ...फिर दोहराना चाहूंगा कि परिवर्तन बुरा नहीं होता, उसका गलत इस्तेमाल बुराई की ओर ले जाता है। यह बात आधुनिकता-विरोधी और पुरातनता का ...-पक्षी लग सकती है, लेकिन यहां उन ...की ही ... है जो हमारे जीवन-मूल्य थे, क्या कारण है कि वे ...हमसे दूर हो गए?

पहले पीढ़ियों का बदलाव चालीस-पचास साल में दिखता था ...बाद में वह दौर भी आया जब यह बदलाव पंद्रह से बीस वर्षों तक सिमट ...गया। आज तो आधुनिक आविष्कारों और तकनीक ने संपूर्ण जन-मानस ...को ही बदल दिया है। आज पीढ़ियों का बदलाव दो पीढ़ियों में नहीं, एक ...घर के ...सदस्यों के बीच देखा जा सकता है। मानसिक ...

और सोचने के बदलावों ने सोच को बदल दिया है। अपने ही इर्द-गिर्द देखें तो बहुत से ऐसे परिवार मिलेंगे जिनमें पिता अपने सबसे बड़े पुत्र के लिए 'आउटडेटेड' है और छोटे भाई के लिए बड़ा भाई! आज सूचना-क्रांति ने बच्चों को समय से पहले ही 'मैच्योर' कर दिया है। शिशु अब शिशु जैसी हरकत नहीं करता। करे भी तो कैसे? गर्भ में पल रहे शिशु के समय से ही माता-पिता सतर्क होकर उसके जीवन का गणित हल करने लगते हैं (जिसे उसे जीना है)। इतनी सतर्कता कि उनका बच्चा दुनिया में आने के बाद 'सुपर माइंड' या 'सुपर हीरो' हो। ऐसे में 'डीएनए' की अतिरिक्त खुराक उसके 'डीएनए' और मस्तिष्क की कोशिकाओं—'न्यूरॉन-एक्सॉन' में बदलाव लाए तो क्या बुरा? पैदा होने के बाद ही उसकी समझ को आधुनिकता की गलत खुराक देकर लक्ष्य की ओर केंद्रित किया जाने लगता है। एक ही दिन में 'करोड़पति' बनाने की तैयारी कराई जाती

हर कोई आग से शीतलता की ओर भागता है। पतझड़ की जगह हरियाली पसंद करता है। आज का समाज बच्चों के लिए दहकती हुई संघर्षों की आग जैसा है। फिर उसे ऐसा बाल-साहित्य क्यों न दिया जाए जो उसे शीतलता भरा आनंद दे? बाल-साहित्य के द्वारा उसे उपदेश मत दीजिए, आज के संघर्ष मत समझाइए, ज़िंदगी की नाप-जोख मत सिखाइए, सब पता है। वह हर रोज़ जूझ रहा है तमाम समस्याओं से। घर, परिवार, समाज उसे बहुत कुछ स्वतः सिखा रहा है। बच्चों को ऐसा बाल-साहित्य देना चाहिए जो शीतल बयार की तरह 'सिम्पैथी' दे सके, उसका हमसफ़र बन सके, कुछ क्षण का विश्राम, प्रेरणा और मनोरंजन दे सके।

है। पहले बच्चों को रापने ..., हकीकत ज्यादा दिखाई जाती थी। पैदा ... सिखाया जाता था। आज का बच्चा पिता को मात्र संरक्षक और अध्यापक को शिक्षा से जोड़ने वाली कड़ी के रूप में देखता है। यही कारण है कि वह पिता और अध्यापक को भी अपशब्द कह दे तो 'चलता' है। कल्पना और हवाई दौड़ आखिर कब तक साथ दे सकती है? जो शिशु 'मैया मैं तो चंद्र खिलौना लैहों' से ही मान जाता था, क्या आज वह मात्र इसी ... रह गया है? गौर कीजिएगा, शिशु भी अब एक ... पसंद नहीं करता। उसे चाहिए नित नए-नए खिलौने। मिट्टी के खिलौने और लकड़ी के ... से उसे भला ... जिसे आप ... वह किशोर ... गया है ... मत कहिए ... कुछ वर्षों बाद सीखेगा ... वह चंद रोज़ में ही सीख लेता है। उसे

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'सोज़-ए-वतन' और 'कथा सम्राट' प्रेमचंद

डा० मो० अरशद खान*

'सोज़-ए-वतन' का प्रकाशन 1909 में हुआ। यह प्रेमचंद का पहला कहानी संग्रह है। इसकी कहानियाँ मूल रूप से उर्दू में लिखी गई थीं। और चूँकि यह प्रेमचंद की आरंभिक कहानियाँ हैं इसलिए इनमें उर्दू की क़िस्सागोई और दास्तानों की प्रवाहमयी काव्यात्मक शैली तथा द्विवेदी युगीन उपन्यासों की घटना प्रधानता और भाषा की रवानी के दर्शन सहज ही होते हैं। हंसराज रहबर लिखते हैं, "उनकी भाषा अपने से पहले के उर्दू लेखकों की भाषा की तरह कठिन और कृत्रिम थी। उस पर 'क़िस्सा-ए-चहार दरवेश' और रतननाथ सरशार के 'फ़िसानए आज़ाद' का रंग चढ़ा हुआ था।"[1] उनकी आरंभिक कहानियों में कहीं तो सरशार का रंग निखरकर आता है, कहीं विशन नारायण दर का और कहीं टैगोर का। कोई व्यवस्थित और स्थिर शैली नहीं मिलती। इन कहानियों में प्रेमचंद न तो चरित्र-चित्रण पर ध्यान दे पाए हैं और न ही घटनाओं को यथार्थता का संस्पर्श दे पाये हैं। कला के दृष्टिकोण से देखा जाय तो इन्हें श्रेष्ठ कहानियाँ भी नहीं कहा जा सकता और प्रेमचंद की रचनात्मकता की लंबी यात्रा के आरंभिक चिह्न के अलावा इनका ज्यादा महत्त्व भी नहीं है। किंतु जब-जब प्रेमचंद की कहानियों की चर्चा होगी इन्हें अवश्य याद किया जाएगा। इन कहानियों के द्वारा प्रेमचंद ने पहली बार हिंदी कहानी को राष्ट्रीय सवालों से जोड़ने की शुरूआत की थी और इस बहाने पराधीन भारत के साहित्यकारों के रचनात्मक सरोकारों का संकेत दे दिया था। इस संबंध में राम विलास शर्मा बिल्कुल सटीक बात कहते हैं, "पहले महायुद्ध में कांग्रेस के नेताओं ने अंग्रेजों का साथ दिया। महात्मा गाँधी ने रंगरूट भर्ती करने के लिए दिन को दिन और रात को रात नहीं गिना। लेकिन प्रेमचंद ने अपनी कहानियों से पहले ही असहयोग आंदोलन छेड़ दिया था।"[2]

'सोज़-ए-वतन' की कहानियाँ, जिनसे एक समय अंग्रेज़ सरकार को विद्रोह पैदा होने का डर पैदा हो गया था, आज पढ़ने पर उतना अपील नहीं करतीं। इन कहानियों में वतन के दर्द (सोज़) की अभिव्यक्ति तो है पर उस दर्द के प्रतिकार की नहीं; और न ही ऐसा ठोस कारण जिसकी वजह से उन पर सिडीशन का आरोप लग जाता। साथ ही 'दुनिया का

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'पत्नी' और जैनेंद्र का नारी–चिंतन

सारांश

हिंदी कथाकारों में जैनेंद्र का नाम विशेष महत्वपूर्ण है। जैनेंद्र ने हिंदी कथा साहित्य को नवीन जीवन–दर्शन,रचना–शिल्प और भाव–बोध प्रदान किया। जैनेंद्र ने प्रेमचंद के सामाजिक यथार्थ से अलग मनोजगत की दुनिया और दार्शनिक चिंतन को अपनी रचनाओं का आधार बनाया, जो उनके स्वतंत्र चिंतन का परिचायक है। जैनेंद्र की अधिकतर रचनाएँ नारी चरित्र प्रधान हैं। जैनेंद्र ने नारी चरित्रों के अंकन में जिस सूक्ष्म मनोवैज्ञानिक दृष्टि का परिचय दिया है वह महत्वपूर्ण है। स्त्री–जीवन के विविध पक्षों और उसकी मनोदशाओं का जैसा विश्वसनीय अंकन जैनेंद्र ने किया है, वह उस दौर में अन्यत्र दुर्लभ दिखाई देता है। जैनेंद्र की एक महत्वपूर्ण कहानी है–'पत्नी'। प्रस्तुत शोध पत्र में इस कहानी के माध्यम से जैनेंद्र के नारी विमर्श की मूल भावभूमि का विश्लेषण करते हुए, उनमें प्रगतिशील चेतना की झलक और आधुनिक नारी विमर्श के बिंदुओं को तलाशने का प्रयास किया गया है।

मुख्य शब्द: हिंदी कहानी, नारी–विमर्श, दार्शनिक–चिंतन,विवाह–संस्था, प्रेमचंद–काल, मनोविश्लेषण, क्रांतिकारी–चेतना, स्वाधीनता–आंदोलन,व्यक्ति–चरित्र, वर्ग–चरित्र

प्रस्तावना

जैनेंद्र हिंदी कहानी का ऐसा चेहरा हैं, जिन्हें छोड़कर हिंदी कहानी के एक विशेष समय को उसकी समग्रता में नहीं समझा जा सकता। हिंदी साहित्य में जैनेंद्र का आगमन 1929 में हुआ। यह दौर कथा जगत में प्रेमचंद के चक्रवर्तित्व का था। ऐसे में जैनेंद्र ने प्रेमचंद के युग से चमकते हिंदी साहित्य के फलक पर अपना एक अलग स्थान निर्मित किया, जैनेंद्र का यही वास्तविक महत्व है। उन्हें एक ओर शरत और रवींद्र से जोड़कर देखा गया तो दूसरी ओर दस्तोयेवस्की से। कहीं उनके साहित्य को 'रोमानी कल्पना का प्रयोगमात्र', कहा गया तो कहीं नपुंसकता का सार्थक प्रवक्ता[1]। किंतु "जैनेंद्र का सर्वाधिक महत्व इस बात में स्वीकारा जाना चाहिए कि उन्होंने कथा साहित्य को नई दिशा दी।"[2] "हिंदी में दर्शन, मनोविज्ञान, आध्यात्म और भाव–निष्ठा को कला चेतना के साथ संपृक्त करने का श्रेय जैनेंद्र को ही प्राप्त है।"[3] जैनेन्द्र लीक छोड़कर चलने वाले कहानीकार थे। प्रेमचंद के नितांत अभिन्न होने के बावजूद उन्होंने प्रेमचन्द के आभामंडल से बाहर निकलकर सामाजिक यथार्थ के मार्ग से परे नया पथ चुना। पर उन्हें प्रेमचन्द का विपरीत ध्रुव नहीं समझा जाना चाहिए। सच तो यह है कि प्रेमचन्द और जैनेन्द्र को साथ–साथ रखकर ही तत्कालीन जीवन और इतिहास को उसकी समग्रता के साथ समझा जा सकता है। इस संबंध में विजयेंद्र स्नातक का यह कथन महत्वपूर्ण है कि –"जो जैनेंद्र कुमार को नहीं समझते, उनसे कुछ कहना व्यर्थ है, किंतु जो जैनेंद्र के कथा साहित्य की शक्ति से पूरी तरह परिचित हैं उनसे मेरा निवेदन है कि वे जैनेंद्र के प्रदेय को उसी रूप में स्वीकार करें जिस रूप में प्रेमचंद ने स्वीकार किया था।"[4]

किंतु इससे भी इनकार नहीं किया जाना चाहिए; और न ही बचाव करने का प्रयास, कि जैनेंद्र की रचनाओं में– विशेषकर उपन्यासों में– दार्शनिक और आध्यात्मिक तत्वों के विश्लेषण से दुरूहता पैदा हुई है। परंतु ये सारे तत्व जहाँ–जहाँ भी आए हैं, वहीं वे पात्रों के अंतर्जगत की दुनिया सृजित करते–से लगते हैं। यही कारण है कि पाठक को जैनेंद्र के पात्र बाहरी दुनिया और घटनाओं से अछूते और अपनी अंतर्मुखी गतियों से संचालित लगते हैं।

जैनेंद्र की रचनाओं में प्रायः नारी पात्र प्रधानता लिए हुए होते हैं। जैनेंद्र ने नारी पात्रों के चित्रण में सूक्ष्म मनोवैज्ञानिक दृष्टि का परिचय दिया है। स्त्री के विविध रूपों और उसकी मनोभावनाओं का जैसा विश्वसनीय अंकन जैनेंद्र ने किया है, वैसा और कहीं मुश्किल से दिखाई पड़ता है। यद्यपि अधुनिक नारी–विमर्श को जैनेंद्र की रचनाओं से जोड़कर नहीं देखा जा सकता, पर उनके [illegible] यदि सहानुभूति पूर्वक विचार किया जाए तो– अंकुरित होते लक्षित किए जा सकते हैं।

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बाल साहित्य की चुनौतियाँ

डॉ० मोहम्मद अरशद खान

इक्कीसवीं सदी में बाजारवाद, भूमण्डलीकरण, बढ़ती हुई भौतिकता और पाश्चात्य जीवन मूल्यों के आत्मसातीकरण ने साहित्य और संवेदना के सम्मुख अभूतपूर्व संकट खड़ा कर दिया है। जीवन मूल्यों में परिवर्तन के कारण भौतिक लाभ ही किसी वस्तु की महत्ता का मानक हो गया है। साहित्य और कला स्वयं को बौद्धिक कहलाने और भीड़ से अलग दिखने–दिखाने का साधन मात्र बनकर रह गए हैं। जीवन में आ रहे यंत्रीकरण ने संवेदनाओं का ह्रास किया है। इसका सीधा असर साहित्य पर पड़ा है। बाल साहित्य भी इन चुनौतियों के दायरे से बाहर नहीं है।

आज बाल साहित्य की चुनौतियाँ द्वि–स्तरीय है। समय–समाज के दबावों और बदलती परिस्थितियों का संकट तो यह सह ही रहा है, अपने महत्व, अपनी स्वीकार्यता और आंतरिक परिस्थितियों की मुश्किलें भी उसे झेलनी पड़ रही हैं।

बाल साहित्य के सम्मुख आज सबसे बड़ी चुनौती संचार क्रांति है। यद्यपि संचार क्रांति से पुस्तकों का अस्तित्व खत्म नहीं होने वाला, तो भी अपना महत्व बचाए रखने के लिये उन्हें अपना रूप–परिवर्तन अवश्य करना पड़ेगा। "टेलीविजन एक अर्थ में निरादेश बाल साहित्य के लिए चुनौती बनता जा रहा है। यह चुनौती है बाल साहित्य के लेखकों और प्रकाशकों के लिए। टेलीविजन के कार्यक्रम जितने रोचक, जानकारीपूर्ण और मनोरंजक होते हैं, बच्चों की पुस्तकों का भी उसी प्रकार सुंदर, आकर्षक और रोचक होना अनिवार्य हो गया है। टेलीविजन के सूचना–प्रधान कार्यक्रम विभिन्न विषयों की जैसी रोचक जानकारी देते हैं, उसी प्रकार अधिक विस्तार के साथ रोचक शैली में पुस्तकों में जानकारी देनी होगी। वास्तव में टेलीविजन ने जहाँ लेखकों के सामने शैली, भाषा और सशक्त कथा–तत्व की चुनौतियाँ खड़ी कर दी है, वहीं प्रकाशकों के सामने पुस्तकों की साज–सज्जा, छपाई आदि के लिए प्रश्न उत्पन्न कर दिए हैं।"[1]

नंदन, बालहंस, बच्चों का देश, देवपुत्र, नन्हे सम्राट आदि का वर्तमान आकर्षक साज–सज्जा युक्त प्रस्तुतीकरण संभवतः इसी चुनौती का परिणाम है।

बाल साहित्य के समक्ष एक और महत्वपूर्ण चुनौती प्रतिस्पर्द्धात्मक समाज में बच्चे के कैरियर और भविष्य से आशंकित उनके अभिभावक–गण हैं। इसके परिणामस्वरूप बच्चे के बस्ते का बोझ बढ़ता जा रहा है। होमवर्क के बढ़ते दायरे से खेल और मस्ती के पल इतने घटते जा रहे हैं कि बच्चे को बाल साहित्य तक पहुँच पाना असंभव–सा लग रहा है। "माता–पिता बच्चों को आगाह करते हैं कि अगर परीक्षाओं में नंबर कम आए तो कुछ भी नहीं होगा। सारा कैरियर चौपट हो जाएगा। महँगी पढ़ाई भी बच्चों में विविध किस्म की दुश्चिंताएँ जगाती रहती हैं।"[2] आज बहुत से बच्चे ऐसे भी हैं, जिन तक बालसाहित्य मात्र नर्सरी राइम्स और हिंदी की पाठ्य पुस्तकों के रूप में पहुंच रहा है।

बाल साहित्य के अपने कुछ आंतरिक संकट भी हैं, जो शायद ज्यादा गंभीर हैं। इसमें कोई राय नहीं कि सौ वर्षों के इतिहास में बाल साहित्य ने आज अपना एक मुकाम बना लिया है। वह कम से ही सही लोग उसका महत्व स्वीकारने लगे हैं। ऐसे में आज हर कोई बाल साहित्यकार बन बैठना चाहता है। और आज इस तरह के साहित्यकारों और उनके रचे साहित्य की मात्रा इतनी ज्यादा है कि आम आदमी उन्हीं के बाल साहित्यानुभव के आधार पर बाल साहित्य के बारे में अपनी राय कायम कर लेता है। बाल साहित्य के प्रति लोगों का अगंभीर दृष्टिकोण और उसे बचकाना मानने की मानसिकता के निर्माता यही बाल साहित्यकार हैं। इस तरह के रचनाकारों के लिए "बाल साहित्य लेखन महज एक शौक, मशहूर होने का साधन या खाली समय व्यतीत करने का माध्यम भर है। ऐसे लोगों ने येन–केन–प्रकारेण पत्र पत्रिकाओं के संपादक मंडल में अपनी जान–पहचान बना ली है, परिणामस्वरूप इल्ला–पुल्ला जो कुछ भी लिख देते हैं, वह छप भी जाता है।"[3]

दूसरी ओर जो समर्थ रचनाकार हैं उनकी खेमेबाजी और गुटबाजी एक तो करेला–दूजा नीम चढ़ा जहावत को सार्थक करती है। "बाल साहित्य खानखा के झगड़ों और गुटबाजियों का अड्डा बनता जा रहा है। बाल साहित्य को जो सिर्फ अपनी गद्दी और महंती का बिछौना मानते हैं, उन्होंने बाल साहित्य की पूरी की पूरी जमीन घृणा और वैमनस्य से पाट दी है।"[4]

अगंभीर संपादक भी आज बाल साहित्य के लिये बड़ा संकट है। आज के दौर में पत्रिका–प्रकाशन निश्चित रूप से कठिन कार्य है। बिना किसी स्थायी आर्थिक संबल के, जिसका आधार विज्ञापन, सरकारी अनुदान या पूंजीपति हो सकते हैं, नियमित और आकर्षक रूप में पत्रिका प्रकाशन असंभव प्राय लगता है। जाहिर है बाल साहित्य की सामग्री में कुछ ऐसी सामग्री प्रकाशित करना भी संपादक की मजबूरी होती है जो बाल साहित्य बिल्कुल नहीं होती। पर इन दबावों में ज्यादातर संपादक अपनी पत्रिका की स्तरीयता नहीं बरकरार रख पाते और इन दबावों और सुविधाजीविता के चलते अपना आदर्श भुला बैठते हैं।

उन स्थानों की स्थिति तो और बुरी है, जहाँ बाल साहित्य आनुषंगिक रूप में प्रकाशित होता है। खासतौर से समाचार पत्रों के बाल साहित्य के पृष्ठों में बाल साहित्य की छीछालेदर सोचने को विवश करती है। "यहाँ तक कि सबसे कनिष्ठ उपसंपादकों को बाल पृष्ठों के संपादन का कार्य सौंप दिया जाता है, जैसे यह काम सबसे सरल और साधारण हो।"[5] वर्तमान की पारस्परिक, पीठ–ठोंक प्रशंसा के दौर में सम्पादकों के दायित्व–निर्वाहन पर भी प्रश्न उठे हैं। प्रकाश मनु लिखते हैं–"सबसे बड़ी दिक्कत तो यह है कि आज के बाल साहित्य के संपादक का बच्चों से कोई संवाद नहीं रह गया है वह सुंदर शब्दों का मुखौटा ओढ़े एक तानाशाह है जो पुराने राजाओं की तरह शुद्ध अंडे के घेरे से निकल ही नहीं पाता। और उसके फैसले बड़े अजीब ढंग से होते हैं। आपने राह चलते उससे नमस्ते नहीं की, तो आप लेखक नहीं है, आपको नहीं छापा जाएगा। आपने कहीं अगर ऐसा कह दिया, वैसा लिख दिया तो आप 'काली सूची' में आ गए।"[6]

बाल साहित्य के विकास में यह प्रवृत्ति एक प्रश्न चिन्ह जैसी है पुरस्कार और सम्मान, जो प्रोत्साहन और प्रेरणा के स्रोत होते हैं, के संदर्भ में भी विचित्र विसंगतियाँ हैं। पहली बात तो यह कि हकदार

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डॉ. दरख़्शा गनी

...संसार का यह देश है जहाँ विभिन्न जाति और धर्म के ...विवाह करते हैं यहाँ विभिन्न संस्कृतियों एवं भाषाओं में ...होने के बावजूद भी अनुपमता इसकी शान रही है। ...कवियों तथा लेखकों ने अपनी अपनी रचनाओं में ...का बखूबी चित्रण किया है। इसे विभिन्न-मुखी सांस्कृतिक ...कहा जाये तब सामासिक संस्कृति के रूप में जानते हैं।

भारतीय संस्कृति को सामासिक संस्कृति का रूप देने हिन्दू धर्म-भिन्नता संस्कृति की महत्त्वपूर्ण भूमिका रही है। ...र अकबराबादी के जमाने में हिन्दू धर्म और धर्म-प्रधान नीति ...मुस्लिम धर्म अकबराबादी धर्मनिरपेक्षतावादी नीति ने भारतीय ...सांस्कृतिक संस्कृति के निर्माण में महत्त्वपूर्ण भूमिका निभाई। ...समय हिन्दू धर्म की विकृत धर्म व्यवस्था ने पीड़ित हिन्दू ...मात्र के लिये धर्म के भौतिक धर्म से प्रभावित होकर अपने ...रिवाजों और संस्कारों के साथ मुस्लिम धर्म की अपना ...था। इसी कारण में विभिन्न बोली और भाषा वाले के भारतीय ...सांस्कृतिक संस्कृति के विकास में विशेष योगदान दिया। इस ...समय का प्रभाव जनता तुलसी से हुआ। इसके भारतीय ...सांस्कृतिक संस्कृति का यह स्वरूप एक ओर सूफियों ने ...इसका शादर, भजन, कीर्तन, जागरण, उत्सवों तथा मुसलि ...ोहर्रम में मर्सिया, जलसे, ऐसाल तथा रमजान आदि के द्वारा ...परम्परा विकास पाती रही।

इसी सामासिक संस्कृति के विकास की कड़ी में एक ...नज़ीर अकबराबादी रह गये है। नज़ीर के काव्य 'आदमनामा' ...इसे उनके विकास स्तर के आधार पर उन्हें विशिष्टता प्रदान ...करता है। आदमनामा, आगरा का प्राचीन नाम है जिस प्रकार ...शाय अकबर की उदार और समन्वयवादी नीति का प्रतीक ...बनकर सभी सामने आया है, उसी प्रकार उसी उदार और ...समन्वयवादी नीति का प्रतीक नज़ीर का काव्य और स्वयं कवि ...नज़ीर है। नज़ीर अपने काव्य आगरा पर गर्व करते हुए उसकी ...ऐतिहासिक कहते, जामीर कहते आगरे का है। कुतब कहो, ...दहीर कहो आगरे का है। पुरातिन कहो, फकीर कहो आगरे ...का है। अकबर कहो, अकीर कहो आगरे का है।"

यह देश बसुधा और कुटुम्बकम के भाव का था, जहाँ धर्मों और साधा और कृष्ण के प्रेम के अफसाने, सूफियों के कृष्ण भक्ति गीत और बोलचाई से भजन सर्वत्र की जबान पर रहते थे। इसी माहौल में कवि नज़ीर ने कविताएँ लिखना प्रारम्भ किया।

नज़ीर अकबराबादी के काव्य में हिन्दी एवं उर्दू साहित्य में तत्कालीन भारत के सांस्कृतिक रंगों में रंगी हुई एक विशेष परम्परा का सूत्रपात हुआ। उन्होंने अपने काव्य में जिस भारतीय संस्कृति को चित्रित किया, वह न केवल हिन्दू संस्कृति थी और न केवल मुस्लिम संस्कृति बल्कि वह हिन्दू-मुस्लिम सामासिक संस्कृति का रूप था। इस सामासिक संस्कृति को चित्रित करने में उनका सामासिक व्यक्तित्व उभरकर सामने आया। नज़ीर के काव्य के इसी सांस्कृतिक स्वरूप के संबंध में 'साहित्य अदब उर्दू' में प्रोफेसर मुख्तारुल हसन के संबंध में लिखते हैं-"नज़ीर के अज्ञान दी तो शंख की फूंक, सावन सुहाई तो जनेऊ की पहना, मुहर्रम में सिर तो होली में बीच की चले, रमजान में रोजे रखे तो शबबंदन में राखी भी बाँधी, शबेबारात में मशालजुलूस छोड़ी तो दीवाली पर दीप भी जिलाए जिले, बकरे, पीर-पैगम्बर की शान में कविताएँ लिखीं तो बंजारानामा, मदारिस, गेंदे और तरबूज पर भी अद्भुतकवी चमत्कृत, ईद, बकरीद के साथ-साथ राखी, होली, दीवाली, दशहरे और जन्माष्टमी पर उनके अपने अंदाज हैं।"

नज़ीर अकबराबादी ने भारतीय तीज-त्यौहारों, रीति-रिवाजों तथा धार्मिक सन्दर्भों का चित्रण अपने काल में अपने-अपने किया है। 'मदारी' कविता में साम्प्रदायिक जैसे पवित्र त्यौहार का चित्र इस प्रकार खींचा है-"सबके है हर तरफ़ बयां-बयां शानों की धूम बड़ी बजार अब तो है हर इक मुकाम जिले है सारी बीवे शाद में धूम से रमजान जो दिन में गुजरे है कहूँ बयां आज तो खाने में मैं अपने /यही आता है जी में बनके बावन आज तो खाने में मैं अपने हाथ से प्याले के बीच प्यार की सानी।"

नज़ीर ने दीवाली पर्व का बखूबी और मनोरम चित्र इस प्रकार खींचा है-"हर इक मकां में जला फिर दीया दीवाली का/ घरों के जी को सभी का भला दीवाली का/अजब बहार का है दिन बना दीवाली का।"

भारतीय संस्कृति में दीवाली त्यौहार खुशी, आशा, आशा और विश्वास का प्रतीक माना जाता है। उसी प्रकार होली का त्यौहार प्रेम, भाईचारे तथा प्रसन्नता के रूप में देखा जाता है। नज़ीर ने उसका चित्रण इस प्रकार किया है-"पियो तू हल्के न रख कुछ मुजा होली में/बजे ढके पिचकों से आवाज में बाद होली में/ गली है रंग की कैसी बनाए होली में। हुआ है खेले मदन आजकार होली में/अजब यह हिन्द की देखी बहार होली में।" होली के रंग प्रेम और सौहार्द के प्रतीक है।

नज़ीर यहाँ होली त्यौहार को विशिष्टता की दृष्टि से देखते हैं। इस त्यौहार में सभी लोग अपने दिलों का मैल साफ करके एक दूसरे के साथ प्रेम से गले मिलते हैं। इसके अतिरिक्त ब्रज की होली का चित्रण करते हुए नज़ीर लिखते हैं-"जो कुछ कहती है जबरा बहुत दिखा प्यारी/ नहीं है अपने लिए पास ले के पिचकारी/ मुसाहब देख के फिर छाती से लगाती है वह यार की यारी।"

यहाँ नज़ीर ने राधा और कृष्ण के होली खेलते समय का चित्रण किया है। इसको पढ़कर ऐसा लगता है जैसे नज़ीर ने अपनी आँखों से राधा और कृष्ण को होली खेलते हुए देखा हो। राधा और कृष्ण के होली खेलने का एक चित्र नज़ीर ने इस प्रकार भी खींचा है-"छलकाम उधर से जब आए वहीं होली का तैयारी/ और आई उधर से ले रंग लिए सुख होली की राधा प्यारी/ तब कृष्ण ने राधा गोरी के एक भरकर मारी पिचकारी/ सब तुख पर सेंदि आन पड़ी और भीग गई तन की सारी।"

होली के साथ-साथ नज़ीर ने ईद के त्यौहार और अवेक्षता पर भी कविताएँ लिखी हैं। ईद का अर्थ है-खुशी और इसके आने की खुशी और तैयारियों का चित्रण नज़ीर इस प्रकार करते हैं-"चाँद की खुशदिली से जो है उदय-उदय नूर। सूरत हो ए! वह देखते ही ईद का सिकार/चोजाके तन में जर्द, सुनहरी, कर्फ़ेद, लाल/दिल क्या के हैं सब ही पड़ा इन की बात-चाव।"

ईद के त्यौहार पर सिवईयाँ बनाने और इंसाफ जाने का एक रिवाज है और इसका एक विशेष महत्व भी, जिसका चित्रण नज़ीर इस प्रकार करते हैं-"पीकाने पकर से उठते महाने की धूम है/ शीरी शकर, सिवय्यों पकाने की धूम है/ पीरी जवाँ को मेवों खाने की धूम है। लड़कों को ईदगाह जाने की धूम है/ ऐसी न अजमत न कयामत की सुहाती जैसी हर एक दिल में है इस ईद की खुशी।" अभ्यंजना का वर्णन करते हुए नज़ीर लिखते हैं-"पयोंकर कहें न अपनी मजबूती शब्दशः/ पायकर, मदारी, हलवे से है भारी शब्दशः/ पिंडियों की है ठुमरी की मजेदारी अलंकार/ सुरों की रक्स की है मदमाती शब्दशः। सच्ची है सच्चे दिल से मगर प्यारी अभ्यंजना।"

भारतीय संस्कृति में जितना महत्व तीज-त्यौहार, रीति-रिवाजों और परम्पराओं का है, उतना ही महत्व संस्कारों का भी है जैसे नामकरण, विवाह और अंतेष्टि संस्कार आदि। बच्चे के जन्म के बाद उसका नामकरण हिन्दू-मुस्लिम दोनों धर्मों के होता है। नज़ीर ने कृष्ण के नामकरण संस्कार का चित्रण इस प्रकार किया है-"मुहूर्त्त जूती, चल हुआ और नौबत का गुलगीर मचा/ फिर चित्रत गर्ग ने नाम रखा, सब कुनबे के मित्र बैठे आ।""

नज़ीर के समय में नामकरण के अवसर पर लोक में विभिन्न रस्में प्रचलित थीं, उनका चित्रण नज़ीर इस प्रकार करते हैं-"नन्द और जशोदा और बजाने करने की देता बोर लगे/ पकवान, मिठाई मेवे से भर थाली आगे देर लगे/ गाव गाती आई बंजारन बी, और नाच पहोंचित आ कैसी/ कुछ ढोल बजाते आई थे, कुछ पीत उड़ा के गाती थी/ कुछ हर दम पुकार इस बालक का बधैया होगा यहीं/ कुछ साल पैगंबी के रहती, कुछ लोरे सुनाया करती थी/ कुछ बातों की हम कैसे है नेग जच्चा के दिन बन लेने को/ कुछ कहती हम तो आए है आनन्द बधाव देने को/ कोई पूरी पैदी गाए करे, कोई बाते सन्द और भूली/ कोई लाई हैसली और खड़वे, कोई जुगों टोपी पेरा थी।""

नज़ीर ने विवाह संस्कार को 'शादी-शादी, ब्याह कन्हैया' में इस प्रकार चित्रित किया है। जैसे कृष्ण के गाता पिता को एक विवाह की चिन्ता रहती है/ वैसे ही चित्र इनका चित्रण भी की अपनी सुत-बुत्तियों [illegible] सीख और हुए सियाने, वह बालकपन की [illegible] देखा नन्द और जसोदा ने यह कि प्रधान अब हुए सयाने/ अब उनकी शादी की सोचें अपने दिल में आकर, करें अब उनकी कहीं सगाई।""

भारतीय संस्कृति में विवाह में घुड़ चढ़ी/घोड़ी चढ़ने की प्रथा है। नज़ीर की कविता 'महादेव जी के विवाह' में इस सांस्कृतिक परम्परा का चित्रण इस रूप में किया है, जहाँ महादेव जी के शरीर पर लगी राख को नज़ीर ने उबटन के रूप में वर्णित किया है-"घुल राख भभूत और लाल जीते कस्तूरे कर में एक सुहाग/ इस जोगीपन के बिच थी का था दूल्हन का यही जोर बाना/ वह छाप भांग की मुख तन पर वह हाल न दी का था उबटन।""

विवाह के समय वर सज्जा का चित्रण 'महादेव का ब्याह' में इस प्रकार करते हैं-"उस यक्त खुशी से शादन पर बिच बैठे बनकर दूल्हा/ मुख पान की लाली कर बैठी और आँखों बीच लगा काजल/ कर हार पहनना थी का और तन हुकती का बाना/ इस हार पुरी के बीच हुआ दूल्हन पनकला दुकुर था।""

इस प्रकार नज़ीर ने संस्कार से [illegible] छोटे-बड़े सभी रीति-रिवाजों तथा खुशी और गम [illegible] अपनी लेखनी चलाई। उन्होंने देवी पूजा, घर बास, [illegible] एवं विवाह आदि [illegible] सभी त्यौहार, व्यौहार तथा विभिन्न आदि [illegible] परम्पराओं और रीति-रिवाजों का अपने काव्य में [illegible] चित्रण।

اہانت رسول کے واقعات اوران کا سدِ باب

(قرآن پاک اور سیرتِ رسول اکرم ﷺ کی روشنی میں)

درخشاں غنی

شعبۂ ہندی۔ جی الف کالج ،شاہ جہاں پور Mobile: 07417246118

دشمنان اسلام نے ہمیشہ ہی رسول خدا حضرت محمد مصطفی ﷺ کے پاک صاف کردار پر انگلی اٹھانے اور گستاخی کرنے کی کوششیں کی ہیں۔ پچھلے کچھ عرصے سے حضور ﷺ کی شان میں گستاخی اور نازیبا کلمات کا سلسلہ جاری ہے۔ ۲۰۱۵ء کی ابتدا میں فرانس میں توہین رسالت اور اہانت آمیز کارٹون کے ذریعے وہی غلطی دہرائی گئی پھر اتر پردیش کے شہر دیوبند میں سوشل میڈیا پر اہانت رسول ﷺ کے واقعات اور اب ہندو مہاسبھا کے زہریلی ذہنیت رکھنے والے ایک شاتم رسول ﷺ کے ذریعے پیغمبر اسلام حضرت محمد ﷺ کی شان میں گستاخی کے معاملے نے ایک بار پھر مسلمانوں کے مذہبی جذبات کو ٹھیس پہنچائی اور تکلیف دی۔ ہے

کسی خاص تنظیم کے ذریعے مسلمانوں کے مذہبی جذبات مجروح کرنے کے لیے مختلف قسم کی ناپاک کوششیں لگاتار کی جاتی رہی ہیں۔ سستی شہرت کے متلاشی لیڈران کی طرف سے حضور اکرم ﷺ کی شان میں گستاخی سے بھی اندازہ ہوتا ہے کہ ایسے لوگوں کو صرف اپنی وقتی خوشی سے مطلب ہے۔ حضور اکرم ﷺ کی شخصیت پر بے بنیاد الزامات عائد کرنے والے عناصر کا مقصد معاشرہ میں انتشار و خلفشار پیدا کر کے نفرت پھیلانا اور اپنے سیاسی مفاد حاصل کرنا ہے۔

آج ایسا محسوس ہوتا ہے کہ پوری دنیا محمد مصطفی ﷺ کے حقیقی تعارف سے بہت حد تک محروم ہو گئی ہے۔ آج اس کی ضرورت ہے کہ ہم اسلام مخالف طاقتوں کی حرکتوں اور رسول اکرم ﷺ کی شان میں گستاخی کرنے والوں کے ناپاک ارادوں کے جواب نبی کریم ﷺ کے حقیقی تعارف میں کوشش کریں اور یہ دور حاضر کا تقاضا بھی ہے کہ دنیا کے سامنے پیارے نبی ﷺ کی حیات طیبہ [illegible] اختیار کریں جس سے یہ گستاخی کا سلسلہ ختم ہو جائے۔

اسلام ایک ایسا دین ہے جو ایک ایسے نبی پر مکمل ہوا جن کی ذات پاک کو آج چودہ سو سال گزر جانے کے باوجود بھی ہم پوری دنیا کے سامنے ایک مثال اور مکمل ACCURACY کے ساتھ دکھا سکتے ہیں۔ کہ وہ کون ہیں اور کیا ہیں، کیسے ہیں؟ سوچنے کی بات یہ ہے کہ پھر ایسا کیوں کہ آپ کی ذات پاک اس باخبر اور روشن خیال دنیا سے چھپی رہ گئی۔ اس کا ذمہ دار کس کو ٹھہرایا جائے کہ ٹھیک طرح سے حضرت محمد ﷺ کا تعارف پوری دنیا کے سامنے پیش نہیں ہو سکا۔ جس کا نتیجہ اس شکل میں دیکھنے کو مل رہا ہے کہ کوئی بھی آپ کے بارے میں کچھ بھی کہتا پھر رہا ہے وہ کیسے تھے اور کیا تھے؟ اس طرح ان کی پیروی کرنے والی امت کو بھی ذلیل و رسوا کیا جاتا ہے۔ آج ہماری اس تحریر کا مقصد آپ ﷺ کی سیرت مبارکہ کے کچھ خاص پہلوؤں کو قرآن کریم کی روشنی میں سب کے سامنے اجاگر کرنا ہے تا کہ پھر کوئی آپ ﷺ پر انگلی اٹھانے سے پہلے ہزار بار سوچے کہ وہ کیسے ہیں اور کیا ہیں؟

اللہ تعالی نے حضور اکرم ﷺ کو ساری انسانیت کے لیے اسوہ بنا کر بھیجا ہے جس کا قرآن کریم میں ارشاد اس طرح ہوا ہے۔

"حقیقت یہ ہے کہ تمہارے لیے رسول کی ذات میں ایک بہترین نمونہ ہے۔" (الاحزاب:۲۱)

اللہ تعالی نے قرآن کریم میں حضور ﷺ کی بعثت کو ساری انسانیت کے لیے رحمت قرار دیتے ہوئے فرمایا ہے:

"ہم نے تمہیں سارے جہانوں کے لیے رحمت ہی رحمت بنا کر بھیجا ہے۔" (الانبیاء:۱۰۷)

حضور [illegible]

कितने पाकिस्तान : एक राजनीतिक अध्ययन

दरखशाँ सुनी असिस्टेंट प्रोफेसर, हिन्दी विभाग, जी. एफ कालेज, शाहजहाँपुर

अगर हम इतिहास देखें तो पाएंगे कि साहित्य और राजनीति का संबंध बहुत पुराना है। संस्कृत साहित्य से परिचित लोग जानते हैं कि बाणभट्ट की कादंबरी में 'शुकनासोपदेश' राजनीति के बारे में एक गंभीर उपदेश है। प्रसिद्ध ग्रंथ 'पंचतन्त्र' की रचना ही राजकुमारों को राजनीति की शिक्षा देने के लिए हुई थी। कालिदास ने भी अपनी रचनाओं में राजनीति पर टिप्पणी की है। विशाख का 'मुद्राराक्षस' तो विशुद्ध रूप से राजनीतिक नाटक है। यहीं यह प्रश्न उठना स्वाभाविक है कि आखिर क्यों साहित्य को राजनीति के जुड़ाव की एक परम्परा रही है। इसके उत्तर में यह कहा जा सकता है कि साहित्य समूचे समाज से जुड़ा होता है जिसका एक रूप राजनीति है। अतः साहित्य और राजनीति का संबंध भी अत्यंत स्वाभाविक है।

अगर कलाकार अथवा साहित्यकार में बुनियादी ईमानदारी है तो वह किसी भी कीमत पर जनता का पक्ष नहीं छोड़ेगा, लेकिन जनता के सर्वोत्तम हितों की रक्षा में उसका योगदान भाग गात्र का ही रहेगा। जब तक कि वह विद्यमान राजनीतिक जटिलताओं की तह में पहुँचकर उनकी ओर सारे संघर्षरत लोगों का ध्यान आकर्षित नहीं करता। राजनीति की जमीन पर होने वाली हार जीत संपूर्ण जीवन को प्रभावित करती है। कलाकार सुंदर जीवन का सपना देखता हुआ उसे साकार करने में तब तक असमर्थ रहेगा जब तक कि समकालीन राजनीतिक परिस्थितियाँ अनुकूल नहीं होंगी।

किसी भी युग की राजनीतिक स्थितियों को उस काल की सामाजिक एवं सांस्कृतिक परिस्थितियों से अलग नहीं कर सकते। इस दृष्टि से कमलेश्वर के उपन्यास 'कितने पाकिस्तान' में हम उन बिन्दुओं एवं स्थितियों का अध्ययन करेंगे जो राजनीति से संबंधित है।

कितने पाकिस्तान' में कमलेश्वर ने विभिन्न राजनीतिक बिन्दुओं को उठाया है। देश के नेता, राजनेता अपने स्वार्थ के लिए राजनीति का दुरुपयोग करते हैं और देश की स्थिति से बेखबर रहते हैं। चुनाव के समय और सरकार बनाने-गिराने के समय तो जनता से संवाद के लिए व्याकुल रहते हैं परन्तु देश की सुरक्षा के लिए प्राण न्योछावर कर देने वाले सैनिकों के प्रति कोई दायित्व बोध नहीं होता। उपन्यास में 'अदीब' देश के प्रधानमंत्री और रक्षामंत्री के नाम शिकायती पत्र में उनकी इसी संवेदनहीनता तथा लापरवाही की ओर संकेत करता है-"प्रिय प्रधानमंत्री और रक्षामंत्री जी। यह तो आपके नैतिक पतन की पराकाष्ठा है कि जब आपकी सरकार गिराई गई थी, तो दूसरे ही दिन आप देश की जनता को सन्देश देने के लिए दूरदर्शन पर मौजूद थे, लेकिन जब उत्तरी सीमान्त पर रुथाडुन सेक्टर अजय कुमार आहुजा मारा गया, लाइट लेफ्टिनेंट नचिकेता अपनी जान को खतरे में डालकर क्षतिग्रस्त जहाज से कूदा, जब कारगिल क्षेत्र में ही वायुसेना का हेलिकाप्टर क्षतिग्रस्त हुआ और चालक दल के चार सदस्य मारे गए, साथ ही सरकारी आँकड़ों की विश्वसनीयता संदिग्ध होने के बावजूद यह बताया गया कि हमारी सेना के 29 जवान मारे गए हैं, 128 घायल हैं तथा 12 लापता हैं, तब इस देश को विश्वास में लेने के लिए, उसके संकट और दुख में शामिल होने के लिए आपको दूरदर्शन पर आने की जरूरत महसूस नहीं हुई! यह संवेदन हीनता की इन्तिहा है।"[9]

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Influence of Incomplete Fusion Reaction on Complete Fusion Below 10 Mev/ Nucleon Energies

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Abstract: An attempt has been made in the present work to provide an ample opportunity to explore the information about the influence of incomplete fusion (ICF) reaction dynamics on complete fusion in heavy ion induced nuclear reactions. Excitation functions for several evaporation residues produced in the interaction of projectile ^{16}O with target ^{nat}Lu have been measured over the wide projectile energy range ≈ 70-100 MeV. The recoil-catcher activation technique followed by the offline γ-ray spectroscopy has been used for the present measurements. In case of precursor decay, we have made use of Cavinato *et al.* formulation to calculate the independent cross-section of the identified residues. The measured EFs are compared with theoretical predictions of statistical model code PACE-2 and any enhancement in the measured cross-section from theoretical prediction may be due to ICF reaction process. An attempt has been made to estimate the ICF contribution of the cross-section from the measured excitation function data and the dependence of ICF cross-section on projectile energy.

Keywords: Heavy Ion Nuclear Reaction, Fusion, Excitation Function, Activation Technique, Break-up Probability

1. INTRODUCTION

In recent years, the study of heavy-ion (HI) induced nuclear reactions with heavier target nuclei has been the subject of renewed interest for the better understanding of reaction dynamics. It is now well established from the earlier

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Effect of the Critical Angular Momentum on Incomplete Fusion Dynamics

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Abstract: An attempt has been made to calculate the critical angular momentum (ℓ_{cm}) from the experimentally measured total ER cross-sections and are compared with Bass model predictions (using PACE-2). A comparison between experimentally measured and theoretically calculated critical angular momentum for the systems $^{16}O + {}^{45}Sc$ and $^{16}O + {}^{74}Ge$ has been done. In case of $^{16}O + {}^{45}Sc$ system, it is found that the experimentally measured ℓ_{cm} values are slightly lower than the theoretically calculated values at projectile energies from 66 to 114 MeV. The low values of ℓ_{cm} associated with ICF-channels for this system suggests that at these projectile energies, ICF may not be strictly associated with peripheral collision. Instead there appears to be deeper penetration of the projectile with the target at these beam energies. But for the system $^{16}O + {}^{74}Ge$ at projectile energies from 65 to 112 MeV, the experimentally measured ℓ_{cm}-values are consistent with theoretically calculated values. This shows that ℓ_{cm}-values associated with ICF channels for this system suggests that at these projectile energies, ICF may be associated with peripheral collision.

1. INTRODUCTION

The study of incomplete fusion (ICF) of heavy ions with different targets has been a growing interest at energies above the Coulomb barrier [9,14]. Observations of heavy ion induced reactions show that at projectile energies above the Coulomb barrier, the dominant nuclear reaction mechanisms are

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Effect of the Target Deformation on Incomplete Fusion Dynamics

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Abstract. To investigate the role of target deformation on incomplete fusion dynamics, a particle-gamma coincidence experiment has been performed at Inter University Accelerator Centre, New Delhi. Spin distributions for various evaporation residues populated via complete and incomplete fusion of ^{16}O with ^{154}Sm at 6.3MeV/nucleon have been measured. Experimentally measured spin distributions of the residues produced as incomplete fusion products associated with fast α and 2α-emission channels observed in forward cone are found to be distinctly different from those of the residues produced as complete fusion products. The mean value of input angular momentum J_0 for evaporation residues produced through xn channels (complete fusion products) is found to be $J_0 \sim 7\hbar$, while the mean value of input angular momentum J_0 for the residues produced through direct αxn and 2αxn channels (incomplete fusion products) in forward cone, are found to be $J_0 \sim 9\hbar$ and ~ 12ħ respectively for $^{16}O + ^{124}Sn$ (spherical) system [7]. The mean value of input angular momentum J_0 for the system $^{16}O + ^{169}Tm$ (deformed) reported in ref. [8], are found to be ~10ħ for xn-channels (complete fusion products) and for direct αxn and 2αxn channels (incomplete fusion products) the value of J_0 approaches to ~ 13ħ and ~16ħ, respectively. The mean values of the input angular momentum observed for xn (complete fusion products), αxn and 2αxn (incomplete fusion products) in $^{16}O + ^{154}Sm$ (spherical) system are smaller than that of the mean values of the input angular momentum observed for xn (complete fusion products), αxn and 2αxn (incomplete fusion products) in $^{16}O + ^{169}Tm$ (deformed) system. The comparison of data inferred that the mean values of the input angular momentum are smaller in case of spherical target than that of deformed target at same projectile energy of ^{16}O-ion beam. It means that the target deformation affect the incomplete fusion dynamics.

1 Introduction

The study of incomplete fusion (ICF) dynamics induced by heavy ions has been a growing interest at energies above Coulomb barrier. The first experimental evidence of ICF reactions was given by Britt and Quinton [1], who observed the break-up of the incident projectiles like ^{12}C, ^{14}N and ^{16}O into alpha clusters in an interaction with the surface of the target nucleus at bombarding energies ≈10.5 MeV/nucleon. Subsequently, Galin et al. [2] also observed the break-up of projectile and called such reactions, leading to the emission of "fast" alpha particles, as 'ICF reaction' or 'break-up fusion reaction'. The major advances in the understanding of ICF dynamics were made after the charged particle-γ coincidence measurements by Inamura et al. [3]. Some recent observations [4-6] show that at projectile energies above the Coulomb barrier, both the processes complete fusion (CF) and incomplete fusion (ICF) may be considered as dominant reaction mechanisms. Semi-classical theory of heavy ion interaction says that the CF and ICF processes may be categorized on the basis of input angular momentum imparted in the system. In CF, the attractive nuclear potential overcomes the repulsive Coulomb and centrifugal potentials in central and near central collisions. Consequently, CF takes place at a small value of impact parameter, where as the formation of fully equilibrated compound nucleus takes place. However, at relatively higher values of impact parameter, the repulsive centrifugal potential increases and hence the dominance of attractive nuclear potential ceases to retain entire projectile. Therefore, an incompletely fused composite system comprising of a part of projectile plus the target appears in the exit channel that leads to ICF process wherein the involvement of input angular momentum is relatively larger than that of needed for CF process to take place. At this stage if the input angular momentum exceeds the critical limit for CF, no fusion

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Research Article

MEASUREMENTS OF ANNUAL EXPOSURE AND INHALATION DOSE DUE TO RADON AND ITS PROGENY IN THE DWELLINGS OF HARDOI DISTRICT (U.P.) BY USING SOLID STATE NUCLEAR TRACK DETECTOR (SSNTD)

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ABSTRACT
In the present study annual exposure and inhalation dose due to radon and its progeny were measured in some selected dwellings of Hardoi District (U.P.) by using solid state nuclear track detector (LR 115 Type-II Plastic track detector). The measurement was repeated on a time integrated four quarterly cycles to cover all the four seasons (summer, rainy, autumn & winter) of the calendar year. The value of annual exposure from radon progeny in the dwellings was found to vary from 0.046 WLM to 0.0.148 WLM with an average value of 0.097 WLM in summer season, 0.054 WLM to 0.130 WLM with an average value of 0.092 WLM in rainy season, 0.018 WLM to 0.156 WLM with an average value of 0.087 WLM in autumn season and 0.113 WLM to 0.292 WLM with an average value of 0.203 WLM in winter season where as the inhalation dose due to radon progeny was found to vary from 0.178 mSv/y to 0.57 mSv/y with an average value of 0.376 mSv/y in summer season, 0.209 mSv/y to 0.504 mSv/y with an average value of 0.356 mSv/y in rainy season, 0.069 mSv/y to 0.605 mSv/y with an average value of 0.337 mSv/y in autumn season and 0.438 mSv/y to 1.132 mSv/y with an average value of 0.787 mSv/y in winter season. The results shows higher value of annual exposure and inhalation dose in winter season as compared to the other season. At all the places the annual exposure and inhalation dose was found below to the action level 3-10 mSv/y as recommended by the International Commission on Radiation Protection (ICRP). Therefore, it is concluded that the study area is quite safe from radiation protection point of view.

Keywords: Annual Exposure, Inhalation Dose, Radon, SSNTD, Progeny

INTRODUCTION
Radon and its short-lived decay products in the environment play the most important role to human exposure from natural sources of radiation. Radon is a naturally available radioactive gas, which is the decay product of radium. Various researchers have reported that exposure to high levels of environmental smoke at the workplace and in other public sector indoor settings are important risk factors for lung cancer risk in workers (Kreuzer *et al*., 2000). The possibility of cancer induction due to indoor radon has been attracting attention in the scientific community during the past decades. It is now wieldy recognized that indoor radon is a largest single source of exposure to ionizing radiation in the environment. Radon is well established human carcinogen for which extensive data are available extending into the range of general population exposure. For the population as a whole, the average effective radiation dose from radon is estimated to the greater than the dose from all other natural sources of radiation combined, greater than the dose from industrial activities including nuclear power and the dose from medical treatments including x-ray. It is well known that inhalation of the short-lived decay products of radon and their subsequent deposition along the walls of various airways of the bronchial tree, provides the main pathway for radiation exposure to the lungs. Indoor radon and its decay products are assumed to be health hazardous for human. About 90% of average radiation dose received by human from natural sources and about 50% is due to inhalation of radon and its progeny present in the dwellings. Studies from different parts of the world show that the well-planned and systematic measurements of indoor radon concentrations for all seasons during a calendar year are necessary to calculate the actual dose due to exposure to indoor radon. The activity concentrations of indoor radon and their progeny are largely

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Radon Exhalation Rates and Radium Estimation Studies in Soil Samples Collected from Various Locations in the Environment of Shahjahanpur District of Uttar Pradesh, India

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Abstract: *The measurements of radium content and radon exhalation rates in terms of mass and area in soil samples collected from various locations in the shahjahanpur District were carried by using cylindrical can technique(CCT) based on LR-115 type II plastic track detector. From the result it was found that the effective radium content in the study area varies from 0.485Bq/kg to 2.503Bq/kg with an average value of 1.362Bq/kg. The radon exhalation rate in terms of mass varies from 0.389 $x10^{-1}$ $BqKg^{-1}d^{-1}$ to 2.009 $x10^{-1}$ $BqKg^{-1}d^{-1}$ with an average of 1.093 $BqKg^{-1}d^{-1}$ where as radon exhalation rate in terms of area varies from 1.314 $x10^{-4}$ $Bqm^{-2}d^{-1}$ to 6.791 $x10^{-4}$ $Bqm^{-2}d^{-1}$ with an average value of 3.696 $x10^{-4}$ $Bqm^{-2}d^{-1}$.Measured values of radium content in soil samples collected from different locations in the study area were found to be less than the permissible value of 370 $Bqkg^{-1}$ and also lower than the average global value of 35 $Bqkg^{-1}$ as recommended by Organization for Economic Cooperation and Development (OECD).Thus the result shows that the study area is safe from health hazard effects point of view.*

Keywords: Radon, cylindrical can technique, soil sample, radium content, LR-115type II plastic detector

1. Introduction

Radium is a naturally occurring radioactive element and presents in soil, sand, rock, water, plants in parts per million (ppm) [1]. Some types of rocks have higher than average uranium contents. These include light-colored volcanic rocks, granites, dark shales, sedimentary rocks that contain phosphate, and metamorphic rocks derived from these rocks. Radium is a member of uranium radioactive series. The decay of ^{238}U through ^{226}Ra gives Radon. Radon is constantly being generated by the radium in rock, soil, water and materials derived from rocks. The radon generated in rocks usually stays trapped in that material unless the rocks are fractured. ^{222}Rn and its parent ^{226}Ra are part of the long decay chain for ^{238}U. ^{238}U decays to form ^{226}Ra which has a half-life of 1600 years.^{226}Ra then decays to form ^{222}Rn gas which has a half-life of 3.8 days [2]. Since uranium is essentially everywhere in the earth crust, ^{226}Ra and ^{222}Rn are present in almost all rock and all soil type. Radium is found in soil, water, plants and food at low concentration. Radium mainly enters the body through the food chain. Higher levels of exposure generally occur through food consumption with average levels of 0.6 pCi/d to1.0 pCi/d or through the drinking water with an average level of 0.6 pCi/d to1.0 pCi/d [3]. The higher the uranium level is in an area, the greater the chances are that houses in the area have high levels of indoor radon. Radium, being chemically similar to calcium, tends to follow it in metabolic processes and becomes concentrated in bones. The alpha particles given off by radium and radon bombard the bone marrow and destroy tissues that produce red blood cells. It may cause bone cancer. Also the chronic (long-term) exposure to radium in humans, by inhalation has resulted in acute leucopenia while oral exposure has resulted in anemia, necrosis of the jaw, abscess of the brain and terminal bronchopneumonia [3].

Thus the chronic (long-term) exposure to radium in humans is injurious to health. The radium content of a sample also contributes to the level of environmental radon. A higher amount of radium results in a higher concentration of radon, and also a higher level of gamma radiation in the building [4]. Higher values of ^{226}Ra in soil contribute significantly to the enhancement of indoor radon [5].

The major source of radon in the atmosphere at least 80% is from emanations from soil that derived from rocks. Radon gas can enter a house from the soil under the house by process of diffusion through concrete floors and walls, and through cracks in the concrete slab, floors, or walls and through floor drains, sump pumps, construction joints and cracks or pores in hollow-block walls [4]. Normal pressure differences between the house and the soil can create a slight vacuum in the basement, which can draw radon from the soil into the building. Inhalation is the main route of entry, into human body, for radon and its progeny [6]. Most of the radon gas inhaled is also exhaled. However, some of radon"s decay products attach to dusts and aerosols in the air and are then readily deposited in the lungs. Some of these are cleared by the lung"s natural defense system swallowed or coughed out [6].The life time of ^{222}Rn is long relative to breathing times. Most of it that is inhaled is exhaled again rather than decaying or becoming lodged in the lungs and later decaying. In contrast, the immediate, promptly decaying daughters of ^{222}Rn (^{218}Po, ^{214}Pb, ^{214}Bi, and ^{214}Po) attach to a surface, typically of aerosols, which can be inhaled. They then deposit on epithelial surfaces within the lung, and shortly decay. The result is that the sensitive surfaces of the bronchi are irradiated by these decays, the most energetic and destructive of which are the heavily ionizing, short range particles from the polonium isotopes ^{214}Po and ^{218}Po [7]. As the chronic (long-term) exposure to radium and indoor radon concentration in humans being is

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MEASUREMENTS AND SEASONAL ANALYSIS OF RADIOACTIVE GASES IN THE ENVIRONMENT OF RAMPUR AND NEARBY TOWN (U.P.) BY USING *SOLID STATE* NUCLEAR TRACK DETECTOR (SSNTD) TECHNIQUE

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Abstract

Measurements of radioactive gases i.e. radon and thoron & their progeny concentration were carried out in some selected dwellings in Rampur and nearby towns of Uttar Pradesh by using Solid State Nuclear Track Detector (SSNTD).The radon-thoron twin dosimetry cups were used for the measurements. The measurement was repeated on a time integrated four quarterly cycles to cover all the four seasons (summer, rainy, autumn &winter) of the calendar year. During summer, rainy, autumn and winter seasons the radon concentration was found to vary from 9 Bq/m3 to 55 Bq/m3 with an average of 18.72 Bq/m3, 11Bq/m3 to 40 Bq/m3 with an average of 24.41 Bq/m3, 15 Bq/m3 to 46 Bq/m3 with an average of 29.93 Bq/m3and 25 Bq/m3 to 85 Bq/m3 with an average of 44.92 Bq/m3 respectively where as its progeny concentration varied from 0.32mWL to 5.94mwL with an average value of 2.02mWL, 1.18mWL to 4.32mWL with an average value of 2.63mWL, 1.62mWL to 4.97mWL with an average value of 3.23mWL and 2.70mWL to 9.18mWL with an average value of 4.85mWL respectively. The thoron concentration was found to vary from 7.33 Bq/m3 to 22.5Bq/m3 with an average value of 11.66Bq/m3, 10.50 Bq/m3 to 23Bq/m3 with an average value of 16.05 Bq/m3, 11.66 Bq/m3 to 24.5 Bq/m3 with an average value of 17.44 Bq/m3, and 17.66 Bq/m3 to 30 Bq/m3 with an average value of 21.35 Bq/m3 respectively where as its progeny concentration varied from 0.19mWL to 0.60mWL with an average value of 0.32mWL, 0.28mWL to 0.62mWL with an average value of 0.43mWL, 0.31mWl to 0.66mWL with an average value of 0.47mWL and 0.47mWL to 0.81mWL with an average value of 0.57mWl respectively in different seasons. All values were observed below the recommended action level (200Bq/m3) set by the various organizations (ICRP, 1993)

Keywords: Radioactive gases, solid state nuclear track detector, dwelling, environment, nuclear tracks

INTRODUCTION

The earth's crust contains small amount of the primordial radionuclides ^{238}U and ^{232}Th. These decay through a chain of radioactive nuclides to stable isotopes of lead. Most of the decay products are isotopes of solid elements but two are gasses.^{222}Rn from the decay of uranium and ^{220}Rn from thorium. The name "radon" sometimes used generally for all isotopes of the gas but sometimes reserved for ^{222}Rn. ^{222}Rn being called thoron. In the nature three isotopes of radon are present and all these isotopes alpha emitters,^{219}Rn ($T_{1/2}$ =3.9d), ^{220}Rn ($T_{1/2}$ =55s), ^{222}Rn ($T_{1/2}$=3.62s).They are a members respectively, of uranium, thorium, and actinium chains. Only ^{222}Rn (known as radon), and ^{220}Rn (known as thoron) are present in the environment in the considerable amounts. The half-lives of ^{222}Rn progeny are shorter than 30 minutes. Due to this fact, product decay inside the respiratory tract when inhaled, is very high. Similar situation is observed of thorium^{232}Th chains. As a result of decay of ^{220}Rn short lives progeny produced and the most important among them is ^{212}Pb with half-life10Gh. Some of the radon daughter products are alpha emitter and this type of radiation can cause high doses in the tissues in the respiratory tracks. Therefore radon progeny plays so important role for the radiation hazard for the humans, more important as the role of the parent isotope radon. Radon is the main source of radiation for any human being. Human beings have been exposed to them since inception. Exposure of ionizing radiation, which can not be detected by any sense of our body, is injurious to our health. ^{222}Rn and ^{220}Rn and its short lived daughters are the most important source of ionizing radiations prevalent in our environment, which are probably responsible for causing adverse effects on human lungs. In India out of 98% exposure dose from natural radioactive sources, about 75% is due to radon and its progeny. The contribution of indoor thoron concentration is generally considered negligible because of its short half-life about 55.6sec (Ramola et. al., 2005). Also thoron being short lived and due to its movement up to1 1.5 fit from ground level, it is considered to have negligible effect on the nuclear track detectors (Toussaint et. al., 1995).As the detectors were placed at a height of 1.75 meters from the ground level; thoron and its progeny have no impact on the detectors film. Therefore special attention has been drawn to the indoor radon concentration, since Radon (^{222}Rn) and Radon progeny indoors contribute the largest dose of exposure to the population at large among natural radiation sources (Tracy et. al, 2006; UNSCEAR, 1993; Obayashi et. al 1990 and UNSCEAR 2000). Indoor thoron (^{220}Rn) and its progeny however have not been taken seriously in the national survey in many countries. Since it is assumed for some reason or other that indoor thoron and its progeny have not been regarded to contribute to the effective dose of the general public significantly in comparison with the indoor Radon and its progeny. A UK survey (Cliff et al 1992) of exposures to ^{220}Rn suggested that doses from this nuclide would exceed those from radon in only about 2% of cases and that the mean dose from ^{220}Rn is about an order of magnitude smaller than that from ^{222}Rn. It has been estimated (Meiters, 1992) that domestic radon exposures are responsible for about 2,000 of the 34,000 lung cancer deaths in Britain each year. Smoking is, of course, by far the dominant cause of lung cancer, but estimates suggest that radon is more important than passive smoking, thought to be responsible for a few hundred deaths each year (Darby et. al., 1995). It has been established that prolonged

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Estimation of Equilibrium Factor, Equilibrium Equivalent Concentration and its Seasonal Variation in Indoor Atmosphere by Using Solid State Nuclear Track Detector (SSNTD) Technique

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Abstract: Estimation of equilibrium factor (F), equilibrium equivalent concentration (EEC), inhalation dose and its seasonal variation in indoor atmosphere of Hardoi District were carried out in sixty dwellings of 10 different villages. In the present study the average values of radon and thoron equilibrium factor was found to 0.26 and 0.06 respectively in summer season, 0.31 and 0.05 respectively in rainy season, 0.32 and 0.15 respectively in autumn season, 0.37and 0.17 respectively in winter season. The average values radon and thoron equilibrium equivalent concentration (EEC) was found to 4.88 $Bqm^{-3}$and 0.96 Bqm^{-3} in summer season, 7.56 Bqm^{-3} and 0.96 Bqm^{-3} in rainy season, 9.66 $Bqm^{-3}$and 3.22 Bqm^{-3} in autumn season , 14.80 Bqm^{-3} and 4.25 Bqm^{-3} respectively in winter season. The total inhalation dose was found to vary from 0.2 $mSvy^{-1}$ to 0.69 $mSvy^{-1}$ with an average value of 0.61 $mSvy^{-1}$ in summer season, 0.33 $mSvy^{-1}$ to 1.93 $mSvy^{-1}$ with an average value of 0.60 $mSvy^{-1}$ in rainy season, 0.16 $mSvy^{-1}$ to 3.16 $mSvy^{-1}$ with an average value of 1.57 $mSvy^{-1}$ in autumn season, and 1.0 $mSvy^{-1}$ to 4.38 $mSvy^{-1}$ with an average value of 2.19 $mSvy^{-1}$ in winter season. The equilibrium factor was found close to the worldwide value (0.4) for indoor condition. At all the places, the average inhalation dose was found below to the action level 3-10 $mSvy^{-1}$ as recommended by the International Commission on Radiation Protection (ICRP).

Keywords: DRPS/DTPS, Equilibrium Factor, SSNTD, EEC, Radon, Thoron, Inhalation Dose.

I. Introduction

Radon is a naturally occurring radioactive gas generated by the decay of uranium-bearing minerals in rocks and soil. It is the most important contributor to human exposure from natural radioactive sources. As it decays, radon gas produces radioactive decay products generally known as radon progeny (short lived decay products) that form solids which can be inhaled and lodge in lung tissue. These solids pose a potentially greater health risk than gas when they are airborne. Exposure to radon and its progeny in indoor atmosphere can result into significant inhalation risk to population particularly to those living in homes with much higher levels of radon. It is now well established fact that radon when inhaled in large quantity causes lung disorders and is the second major cause of lung cancer after smoking. The exposure of population to high concentrations of radon and its daughters for a long period leads to pathological effects like the respiratory functional changes and the occurrence of lung cancer [1]. During recent years, radon monitoring has become a global phenomenon due to its health hazard effects on population (Radiation workers and general public). It has been estimated that out of 2.2mSv of dose, which an individual receives annually from low- level exposure, 1.27 mSv is due to radon isotopes and their short lived progeny ([2], [3], [4]). As the radon in the environment (indoor and outdoor), soil, ground water , oil and gas deposits contributes the largest fraction of the natural radiation dose to population, tracking its contraction is thus of fundamental interest from radiation protection, health and hygiene point of view (whether in mining developments, coal fields, thermal power plants, housing, building construction material etc.) It is well established that the absorbed radon dose in the lungs is mainly due to radon progeny especially polonium-214 (half life=.000164 second) and polonium-218(half life=3.05minute) but not the radon gas. These short lived decay products are also radioactive and attached themselves to natural aerosol particles in the atmosphere. Both unattached decay products and decay products attached to the particles may be inhaled and may deposit on the walls of the lungs and other parts of the respiratory system. As these radon decay products undergo further decay, they emit alpha particles which irradiate the cells lining the walls of the respiratory system. Equilibrium factor between radon, thoron and its short lived progenies is very important for dose assessment from inhalation of radon and thoron. It must be determined in each radon monitoring. In reality, the concentrations of radon, thoron and its progeny vary significantly with time, place, mode of ventilation, humidity etc. Therefore, an assumed equilibrium

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Mathematical Model on Noise Pollution

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ABSTRACT
For many of us, the concept of pollution is limited to nature and resources. Howeve noise that tends to disturb the natural sythms of life makes for one solid pollutant noi takes place when there is either exercise amount of noise or an unpleasant sound th causes temporary disruption in the natural balance. Large number of vehicle on ro produce heavy noise and people get it difficult to get accustomed to that the high noi leads to different health problems like hearing problems, health issues sleeping disord etc. the present work discusses the fundamentals of acoustics and analysis of vehicul traffic noise. A large number of sets of data were recorded at different dates in a rando manner in order to account forstatistical temporal variations in traffic flow conditions.

troduction

Noise can be defined as the level of sound which exceeds e acceptable level and creates annoyance. Frequent exposure high level of noise causes severe stress on the auditory and rvous system. Extended exposure to excessive sound has en proved physical and psychological damage. Because of s annoyance and disturbance implications, noise adds to ental stress and hence affects the general well being of those xposed to it. The source that affects the most is traffic noise. traffic noise, almost 70% of noise is contributing by vehicle oise. Vehicle noise is created by engine and exhaust system of vehicles, aerodynamic friction, interaction between the vehicle and road system, and by the interaction among vehicles Noise measuring devices typically use a sensor to receive the noise signals emanating from a source. The sensor, owever, not only detects the noise from the source, but also ny ambient background noise. Thus, measuring the value of the detected noise is inaccurate, as it includes the ambient background noise. Many different type of instruments are available to measure sound levels and the most widely used are sound level meters.

Introduction to Vehicular Traffic Noise

Traffic noise will continue to increase in magnitude and severity because of population growth, urbanization, and the associated growth in the use of automobiles. It will also continue to grow because of sustained growth in of vehicles.

Vehicle Noise Sources

It is well established fact that vehicular traffic noise is a major source of community annoyance especially near highway carrying fast traffic. Many people consider the truck noise to be the principal offender.

Rapidly changing population patterns on the national scene, and developed public expectancy in terms of environmental effects have generated the requirement to [illegible] environmental impact statement is the noise that my result from the traffic noise as more complicated due to the terrain variation.

A number of factors can influence the traffic noise, wh major sources are noise emission from vehicle, interaction tyres with road surface, traffic flow conditions and drivi habits.

Noise Prediction Models

Traffic noise prediction models are required as aids in design of highways and other roads and sometimes in assessment of existing or envisaged changes in traffic nc conditions. They are commonly needed to predict so pressure levels, specified in terms of (Leq) L10, etc., set government authorities.

Traffic noise prediction models are required as aids in design of roads and sometimes in the assessment of existin envisaged changes in traffic noise conditions.

They are commonly needed to predict sound pres levels, specified in terms of Leq, L10 etc. Several models h been developed by regression analysis of experimental from fundamental variables such as traffic flow, vehicle sp etc.

The noise nuisance was aggravated by the indiscrimi horn blowing, rapid accelerations and overtaking.

Results and discussions

Modeling of traffic noise

Modeling of traffic noise has several uses, inclu estimating current noise exposure along roadways, asse the effect of roadway changes, and predicting the perform of noise abatement options. The basic elements of traffic modeling are the traffic source levels and the propagati attenuation of sound between traffic and receiver. Ty source related inputs to traffic noise models are the spee volume of vehicle types, operating mode of the vehicle the length of roadway with line of sight to the rec location. Propagation related inputs include the ac characteristics of the ground, the number of lanes of r site geometry and topography and the type of geometry c

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ORIGINAL ARTICLE

Age specific survival, death and life expectancy of *Menochilus sexmaculatus* Fabr (Coleoptera: Coccinellidae) on different aphid species under nature and environment

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ABSTRACT

The observations with respect to age specific survival, death and life expectancy of Menochilus sexmaculatus on different aphid species revealed that it took maximum period of 56 days to complete generation on Aphis craccivora and shortest of 50 days on Lipaphis erysimi, respectively. The survivorship and the mortality exhibited an irregular pattern with high and low peaks. The peaks reflecting maximum mortality and low peaks denote the negligible mortality on respective days. As far as the life expectancy was concerned, it declined gradually till the culmination of generation on all aphid species. In nature, the pupae of M. sexmaculatus were also found parasitized by Oomyzus scaposus, and Dinocampus coccinellae. Abiotic factors viz., temperature, relative humidity, rainfall, wind velocity and evaporation also play an additional role in the mortality of M. sexmaculatus in natural environment. Moreover, variation in the rate of mortality of M. sexmaculatus could also be influenced by the quality of foods or variation in aphid species.

Key words: *A. craccivora, cocccinellid, H. coriandri, life table, L. erysimi, M. rosae, R. nymphae*

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INTRODUCTION

Age specific survival provides simple and more informative statistics for comprehensive description of survival of an organism. In nature, this table helps to record a series of sequential size that reveal population changes throughout the life of an organism. The survival of organism may, however, depend on numerous environmental factors such as, temperature, relative humidity, wind velocity, sunshine, evaporation and rainfall, which affect the natural population density of an organism (1 and 2). The collection of data for survival of natural enemies is an important factor for pest management strategies in biological control system (3 and 4). Obviously, predators reduce the survival and fecundity of their specific prey, but at a higher level of organization, the populations of both predator and prey species interact with each other. The predators depend on prey for its survival and consequently affect their population (4 and 5).

Aphids attack many economically important crops and propel their proboscis in the phloem system of plants for sucking the cell sap (6 and 7). Many aphids have a narrow host range, for example, mustard aphid, *Lipaphis erysimi*, feeds only on cruciferous plants; *Hyadaphis coriandri* on coriander plants; *Macrosiphum rosae* only on rose plants and *Rhopalosiphum nymphae* on duck-salad and some ornamental plants (8). However, some aphid species have broader host range and have been classified as polyphagous. For example, the host range of cowpea aphid, *Aphis craccivora* feed on more than 100 plant

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ORIGINAL ARTICLE

Alteration in Testicular acid phosphatase on administration of γ-radiation Swiss albino mice

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ABSTRACT

Activity of acid phosphatase in the present study was observed to change after exposure to various doses of γ- radiation. The value in control and radiated mice were after 0.05Gy, 0.10Gy, 0.15Gy, 0.20 Gy and 0.25Gy were 6.10 KA/unit, 8.55 KA/unit, 4.73 KA/unit, 10.83 KA/unit, 6.09 KA/unit and 4.67 KA/unite, respectively. Statistically, the significant value was 10.83 KA/unit. Increment in AcPase concentration may be suggestive of increased lysosomal activity, leaching of enzymes from lysed cells or necrotic changes due to phagocytic action of lysosomal enzymes. On the other hand, increased utilization of AcPase in cell organelles/tissues degradation of damage may account for attenuated AcPase functions may severely impair spermatogenesis.

Key words: *ionized radiation, lysosomal enzyme, testes*

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INTRODUCTION

Ionized radiation was the first to be recognized as environmental teratogen to effect the humans. Gamma radiations are one of the most penetrable emanations for biological tissues. Mammalian testes are an ideal organ to study a variety of cellular processes example cell division, growth, differentiation and maturation. Radiation induced damage to testes have been subject of absorbing interest in addition of emanation of natural radiations from earth crust, the increased use of radionucleotides in medicine, veterinary research, and therapies has increased the vulnerability and sensitivity of human, animals and plant population to radiation hazards [1]. This threat is real, since all cell and organisms have the inherent ability to bioamplification example mutation, cancer, tereta formation and cytogenetic aberrations [2 and 3]. They are known to cause a variety of oscillations in the cytoarchitecture, permeability, irritability, conductivity and metabolic status of cells. The extent of such perturbation in many cases appears to be dependent on dose related relationship. However, this is not always true due to heterogenicity of tissues and their physiological and biochemical status. Several physical, chemical and biological factors plays deterministic role in the radio sensitivity response. Several cytopathologies and aberrations in the enzyme-isoenzyme, and enzyme-substrate profile have been described in different somatic tissue type. The information on these aspects in gonodal tissues (exocrine and endocrine) is somewhat fractured, debatable and, therefore, needs further study in a variety of mammalian and other forms to arrive at some common and meaningful conclusion.

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Effect of gamma radiation on alkaline phosphatase enzyme in Swiss albino mice

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ABSTRACT

Alkaline phosphatase (Alkpase) is an androgen-dependent enzyme. Experimental groups its value was observed to be variable consequent to γ-radiation. In control mice and ones radiated by 0.05 Gy, 0.10 Gy, 0.15 Gy, 0.20 Gy and 0.25 Gy the values were computed to be 22.83 KA/unit, 28.34 KA/unit, 27.81 KA/unit, 12.88 KA/unit, 17.34 KA/unit, 16.28 KA/unit respectively. Statically the significant change was induced by 0.25 Gy and it was 16.28 KA/unit. At other dose level there were oscillations in Alkpase values. This may possibly be due to differential sensitivity of cell and tissue type of testes. However, increase of Alkpase at some doses indicates increased phosphorylation, membrane permeability and transfer of metabolites in the testicular cells. These may alter androgenic functions of the leydig cells. However at higher dose significant decrease in Alkpase amounts may mean attenuated 'turnover' of androgen. This would have serious effects on libido and sexual behavior.

Key words: Ionized radiation, lysosomal enzyme, testes

INTRODUCTION

Ionized radiation was the first to be recognized as environmental pollutant to effect the living organisms. Gamma radiations are one of the most penetrable ionized radiations for biological tissues. The consequential effect of this is characterized by mutation and cell cycle delay. Loss of reproductive abilities and even survival are the long term effects of these cellular and molecular pathologies (Hittleman *et al.* 1980, Fowler 1989 and El-Benhawy *et al.* 2015). In addition of emanation of natural radiations from earth crust, the increased use of radionucleotides in medicine, veterinary research, and therapies has increased the vulnerability and sensitivity of human, animals, and plant population to radiation hazards (Wilmink and Grundt 2011). This threat is real, since all cell and organisms have the inherent ability to bioamplification e.g mutation, cancer, tereta formation and cytogenetic aberrations (Eberhard et al. 2013 and Comish et al. 2014). Several cytopathologies and aberrations in the enzyme-isoenzyme; and enzyme-substrate profile have been described in different somatic tissue type. The information on these aspects in gonodal tissues (exocrine and endocrine) is somewhat fractured, debatable and, therefore, needs further study in a variety of mammalian and other forms to arrive at some common and meaningful conclusion.

MATERIALS AND METHODS

Procedure of Radiation: The animals were restrained in position by tying rubber bands around the fore, and hind limbs. They were exposed to single pulse of various doses of γ-radiation for different times by Cobalt-60 camera. Radiations were applied to the abdominal region at a point where the paired abdominal testes were located. Control groups were sham irradiated and maintained for comparison with γ-irradiated males under similar conditions.

Surgical Processes and Preparation of Testicular Homogenates: Mice of control and experimental groups were weighed before and after radiation. They were sacrificed by cervical dislocation after 24 h of radiation. Testes were surgically excised under aseptic conditions. They were freed off of excess fascia and blood clots; rinsed several times

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Research Article

Response of Vitamin B_1 (Thiamine Hydrochloride) in Improving Growth and Yield of Mustard (*Brassica juncea* L.)

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ABSTRACT

A field experiment according to simple randomized block design was conducted with the aim to find out the effects of foliar spray of thiamine hydrochloride (vitamin B_1) on growth, nutrient uptake and yield characteristics of mustard (*Brassica juncea* L.) variety (Var.) Varuna. The plants were sprayed with 0.01, 0.02 and 0.03 wt% thiamine hydrochloride solution and a spray of distilled water was also maintained as a control. Spraying was done in a single spray after 40 days of sowing (DAS) i.e., at flower initiation stage (Ansari, 1988). The growth parameters studied include plant fresh weight, plant dry weight, leaf area (LA), leaf area index (LAI), crop growth rate (CGR), relative growth rate (RGR), net assimilation rate (NAR) and uptake of N and P at different growth stages. Yield as well as its components such as number of pods per plant, 1000 seed weight, yield, biological yield, harvest index, oil content and oil yield were measured at harvest. In general spray of 0.03 wt% of thiamine hydrochloride solution was found to be the best in comparison to any other concentration of the treatment for most of the parameters studied. Growth parameters like plant fresh weight, plant dry weight, CGR, RGR and NAR showed significant results at the early stages of sampling (that is, 60-80 DAS). In case of LA and LAI, there was no significant difference between thiamine hydrochloride spray treatments. Thiamine hydrochloride solution at 0.03 wt% was found significantly best in case of nitrogen uptake at 60 and 80 DAS while in case of phosphorous uptake, 0.02% was statistically the best, however, it was at par with 0.03 wt% thiamine hydrochloride solution at 60 DAS. Different yield parameters like the pod number per plant, biological yield and seed yield as well as oil yield registered significant results. The results suggest that the performance of *B. juncea* L. var. Varuna can be improved by spraying the plants with aqueous thiamine hydrochloride solution. Thus, it was concluded that the spray of thiamine hydrochloride solution ensured better growth and yield.

Keywords: Mustard, Vitamin B_1, Foliar spray, Growth, Nutrient uptake, Yield

INTRODUCTION

The oilseeds are playing very important role in the Indian economy. Demand of such oil seeds is increases day by day. Therefore, it is required to raise the production to maintain the equilibrium between demand and production. Rapeseed-mustard shares about 28% of the total oil ... production in India with area of 6.32 m ha. and production of 6.12 mt. The average productivity is low ... (Kumar and R...

... responsible for low yield of mustard in India, poor soil fertility status and sub-optimal use of fertiliser nutrients appear to be most important (Prem and Kumar, 2004; Kumar, 1998). Application of optimum cultural practices and use of high yielding varieties can be beneficial to enhance the improved productivity of such crops. A positive role of micronutrients and different techniques of application of fertilisers in crop growth and development has been established (Mohammad *et al.*, 1987; Samiullah *et al.*, 1990; Chauhan *et al.*, 1994). However, unchecked

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Impact of metal nanoparticles on the morphological and physiological changes in plants: A review

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Abstract

Nanotechnology has been broadly used in the agricultural system since last few decades throughout the world, but still facing some challenge to be used as nano-fertilizers, because of its toxicity and hazardous effects on the environment as well as on the human health. Nevertheless, the nanomaterials could serve as a potential tool for the agriculturally important crops. They have shown varied effects on the morphological and physiological changes, uptake and translocation in different parts of plants. Application of various nanoparticles showed dose dependent responses of the different agriculturally cultivated crops and it may vary from plant to plant and species to species. The aim of this review article is to focus effect of nanoparticles on the morphological and physiological changes in plants, their uptake and accumulation in the various biological systems and their consequences on the cellular and genetic toxicity in plants.

Introduction

Plants are the key components of the biological system and the main source of metabolic pathways and channels occur into the food chain [1]. The nanoparticles synthesized by biological means are advantageous compared to chemical or microbial synthesis because of their economic, rapid and cost-effective method [2]. The nanoparticles synthesized from the plant materials are referred as biogenic or phytosynthesized nanoparticles. The phytosynthesized nanoparticles have distinct assets viz., greater surface area and stability, uniform shape and size compared to physically or chemically synthesized methods (Figure 1). The phytosynthesized nanomaterials are the major concern for the researchers, whose are still trying to optimize the nanomaterials to be used as nano fertilizers for agriculturally important crop plants in respect to the guarantee of their safe use [3]. Various nanomaterials used in modern agricultural practices have both positive and negative impacts on the cultivated crop plants. Yang and Watts [4] observed the effect of very low concentration of alumina nanoparticles on the carrot, cabbage, corn, cucumber and soybean. They concluded that alumina nanoparticles have shown phytotoxic effect on all the tested plants. Similarly, Lin and Xing [5] also found that the exposure to higher concentrations of aluminium, alumina, multi-walled carbon nanotube, zinc and zinc oxide nanoparticles on root development and seed germination has a phytotoxic effect on the tested plant species. However, the effect of the phytotoxicity of functionalized and non-functionalized single-walled carbon nanotubes on the root growth and development of cabbage, carrot, cucumber, lettuce, onion, and tomato has been investigated by Canas et al. [6]. They concluded that amongst all the various tested crop plants the phytotoxicity vary greatly in between the functionalized and non-functionalized single-walled carbon nanotubes, which may also lead into an adverse effect of the root growth and development.

Apart from this dark shadow, some researchers also highlighted the positive impacts of the nanoparticles on the growth, development and physiological parameters of the plants [7-11] investigated that the foliar or seed treatments of TiO_2 NPs could enhance the growth of spinach. Similarly, Racuciu and Creanga [12] found that application of TMA-OH coated Fe_3O_4 NPs increase the growth of popcorn at lower concentrations. However, Panwar et al. [10] observed the effect of foliar treatments of ZnO NPs in the range of 10-100 mM on the seedling germination, growth and biomass production of tomato and stated that the application of 20 mg/l of ZnO NPs showed comparatively better seed germination, growth and biomass production of tomato than other tested treatments. There are some reports of previous researchers, which may enrich our knowledge about the interactions of nanoparticles with plants, but still few reports or no comprehensive report is available, which may directly focus on the effect of nanoparticles on the morphological and physiological changes induced by the nanoparticles on the plants. Thus, the aim of this review article is to focus on the morphological and physiological changes, uptake and translocation in different parts of plants and their consequences on the cellular and genetic toxicity in plants.

Effect of nanoparticles on the morphological and physiological changes in plants

The interaction of nanoparticles with plants had varying effects on the morphological and physiological parameters, but it may be contingent upon the plant species, types and concentrations of

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Key words: *metal oxide nanoparticles, plant growth, seed germination, uptake, translocation*

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Nitrate and Nitrogen Oxides: Sources, Health Effects and Their Remediation

Khalid Rehman Hakeem, Muhammad Sabir, Munir Ozturk, Mohd. Sayeed Akhtar, Faridah Hanum Ibrahim, Muhammad Ashraf, and Muhammad Sajid Aqeel Ahmad

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Review Article

Antimicrobial Properties of Plant Essential Oils against Human Pathogens and Their Mode of Action: An Updated Review

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A wide range of medicinal and aromatic plants (MAPs) have been explored for their essential oils in the past few decades. Essential oils are complex volatile compounds, synthesized naturally in different plant parts during the process of secondary metabolism. Essential oils have great potential in the field of biomedicine as they effectively destroy several bacterial, fungal, and viral pathogens. The presence of different types of aldehydes, phenolics, terpenes, and other antimicrobial compounds means that the essential oils are effective against a diverse range of pathogens. The reactivity of essential oil depends upon the nature, composition, and orientation of its functional groups. The aim of this article is to review the antimicrobial potential of essential oils derived from MAPs and their possible mechanisms of action against human pathogens. This comprehensive review will benefit researchers who wish to explore the potential of essential oils in the development of novel broad-spectrum key molecules against a broad range of drug-resistant pathogenic microbes.

1. Introduction

Medicinal and aromatic plants (MAPs) constitute a large part of natural flora and are considered an important resource in various fields such as the pharmaceutical, flavor and fragrance, perfumery, and cosmetic industries [1]. At present, more than 80% of the global population depends on traditional plant-based medications for treating various human health problems [2–4]. According to an estimate, the worth of herbal products on the global market is approximately 62 billion USD, and it is predicted to grow up to 5 trillion USD by the year 2050 [5]. More than 9000 native plants have been identified and recorded for their curative properties, and about 1500 species are known for their aroma and flavor. Essential-oil-based products or natural aroma chemicals are in higher demand in the cosmetic, food, perfume, and pharmaceutical industries, and more than 250 types of essential oils, at a value of 1.2 billion USD, are traded annually on the international market [3, 6].

Essential oils obtained from MAPs are aromatic in nature because of a mixture of multifarious chemical substances that belong to different chemical families, including terpenes, aldehydes, alcohols, esters, phenolic, ethers, and ketones [3, 7]. Essential oils have tremendous business potential on the global market owing to their unique flavor and fragrance properties and also biological activities [6, 8]. Essential oils are employed in aromatherapy and for the treatment of several diseases including cardiovascular disease, diabetes, Alzheimer's, cancer [9]. The antimicrobial impacts of essential oils and their chemical components have been recognized by several researchers in the past [3, 10–13]. Furthermore, studies have shown the synergistic effect of any two or more ingredients of essential oils against various human pathogens [5]. More recently, the prevalence of antimicrobial drug resistance has prompted researchers to discover novel antimicrobial molecules to treat various human pathogens [16]. Some of the presently available synthetic drugs fail to inhibit

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Control of Basal Stem Rot Disease in Oil Palm by Supplementation of Calcium, Copper, and Salicylic Acid

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Continuous supplementation of mineral nutrients and salicylic acid (SA) as foliar application could improve efficacy in controlling basal stem rot (BSR) disease in oil palm seedling. It is revealed from the results that the highest disease severity index (58.3%) was recorded in T8 treatments at 9 months after inoculation. The best disease control was achieved by T7 treatments (calcium/copper/SA [Ca/Cu/SA]) (5.0%) followed by T1 (5.5%), T5 (5.8%), T3 (8.3%), T6 (8.3%), T4 (13.3%), and T2 (15.8%) treatments. Continuous supplementation of Ca/Cu/SA was found to be the most effective in controlling the disease and the high performance liquid chromatography results showed the detection of ergosterol at very low concentration in the treated samples. Moreover, the transmission electron microscopy analysis results clearly indicated that T7 treatment was also enhancing lignification, which was responsible for the thickness of the secondary cell walls and middle lamella compared to untreated samples. It was therefore, concluded that continuous supplementation of minerals nutrients and SA could effectively suppress disease severity by reducing ergosterol activity and also improve the process of lignification in the treated plants. Furthermore, this treatment also managed to delay the onset of BSR symptoms and promote the growth of the seedlings and eventually suppress the BSR disease.

Keywords : basal stem rot, copper, *Ganoderma boninense*, induced resistance, salicylic acid

World demand for oil and fat is on yearly increase and as a consequence, the area planted with oil palm in Malaysia tremendously increased from 0.3 million hectares (ha) to 4.49 million ha in 1970 and 2008, respectively (Mohd Basri, 2009). In Southeast Asia, basal stem rot (BSR) disease has remained one of the major obstacles in oil palm cultivation. It is caused by the white-rot fungus, *Ganoderma boninense* which cuts down the oil palm yield in most production areas in Malaysia as well as Indonesia. To date, BSR is controlled by using cultural practices, biological control agents such as *Trichoderma* spp. and selected systemic chemical fungicides. However, till now, no single control proven to effectively control BSR in the field was reported (Susanto et al., 2005). The difficulty managing this disease is due to not exhibiting any external symptoms on mature palms until advanced stage. When it comes to this stage, the infected trees may not be able to respond to any treatment given. Therefore, enhanced nutritional programmes (ENPs) by using mineral nutrients and plant hormone, appropriate dosage application at seedling stage should be done, in order to make them resistant towards BSR disease when they are transplanted in the field.

Nutritional status of a plant has a major impact on dis-

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Morphological and Molecular Characterization of *Pratylenchus coffeae* Isolates from Banana Rhizosphere in Peninsular Malaysia

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Abstract
Pratylenchus coffeae, a root-lesion nematode from *Musa* rhizospheres in Peninsular Malaysia, is described and illustrated. Nematodes were recovered from root and soil using the modified Baermann's method and morphological features were measured with the aid of Dino capture camera with graticle. Extraction of Genomic DNA was conducted using Worm lysis buffer and Polymerase chain reaction with specific primers. The species is characterized by a body length range of 423 - 659 µm (mean: 541µm), body width of 19 - 35 µm. Percentage of shaft in relation to stylet ranged between 6 - 12µm and stylet length from 14 - 25 µm. Lip heights and widths of the population examined ranged from 1 - 3 µm and 6 - 7 µm respectively. Similarly, observations on median bulb heights and widths gave ranges of 1 - 2 µm and 6 - 8 µm respectively. Tail of the Malaysia populations examined ranged from 33 - 51 µm length and 14 - 25 µm width respectively while body diameter at vulva ranged from 19 - 50 µm. The sequence comparison of the ITS rDNA expansion region was in the same clades with the *P. coffeae* isolate from Japan (KR102619).

Keywords: Molecular, Morphological, *Musa*, ITS, rDNA, *Pratylenchus*

INTRODUCTION

Root lesion nematode, *Pratylenchus* spp., causes considerable damage to banana plant (*Musa* spp.) wherever they occur. They are among the most economically damaging plant-parasitic nematodes found on a wide range of crops. *Pratylenchus coffeae* (Zimmermann, 1898; Filipjev and Stekhoven, 1941) and *P. goodeyi* (Sher and Allen, 1953) are both major pests of Musa. They also inflict considerable damage on other economic crops. Plant-parasitic nematodes display slight morphological diversity, which are important characters for species differentiation, but similarity in species morphology interpretations, as well as numerous other factors, which made accurate and reliable nematode species identification tasking, even for most-qualified nematode taxonomists (Coomans, 2002). Nematode management strategy is species-specific and thus, the identification of nematode species existing in any particular area is imperative. Accomplishment of any successful nematode management approaches and the prevention of the spread of parasitic nematodes locally and internationally, depend on accurate identification to the species level.

The genus *Pratylenchus* is recognizable

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Research Article

Influence of Different Nitrogen Treatments on the Growth and Yield of *Ocimum*

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ABSTRACT

A factorial randomised block designed experiment was conducted to evaluate the effect of different levels of nitrogen on growth, herb and seed yield of three species of *Ocimum*, namely *O. sanctum* (Holy Basil), *O. basilicum* (Sweet Basil) and *O. americanum* (Wild Basil or Black Tulsi) with the objective to select the better species under local conditions which ultimately improve the production of the crop. The treatments consisted of four levels of nitrogen, namely 0 (control), 50, 100 and 150 kg N/ha. A uniform basal dose of phosphorous and potassium fertilisers was given to the soil before transplanting at the rate of 20 kg P/ha and 30 kg K/ha, respectively. The sampling was done at 50, 70 and 90 days after transplanting (DAT). The different parameters such as plant height, number of branches per plant, fresh and dry herb yield per plant were investigated at different sampling stages, whereas the yield parameters like oil content in herb, seed and oil yield were measured at harvest (90 DAT). It is revealed from our results that N_3 and S_3 were found the best among all the tested treatments. However, the interaction ($S_3 \times N_3$) excelled among all the interactions studied. Thus, the application of nitrogen at the rate of 150 kg N/ha could be recommended for maximising herb and oil yields of *Ocimum* plants under local agro-climatic condition.

Keywords: Basil, Growth parameters, Nitrogen fertiliser, *Ocimum* species, Oil content, Seed and oil yield

INTRODUCTION

The importance of medicinal and aromatic plants and their traditional knowledge is being realised throughout the world since time immemorial. More than 250,000 plant species are known on the earth, among them about 15,000–20,000 plant species have been reported for good medicinal values. However, only 7,000–7,500 species are used by traditional communities for their medicinal values (Thomas, 1997). Recently, due to increasing incidence of side effects of other medicinal systems, about 80 per cent of world population spotted the plant-derived medicines for the first line of primary health [World Health Organization (WHO), 2008]. In the United States, about 25 per cent of pharmaceutical prescription contains at least one plant-derived ingredient (Samy and Gopalakrishnak one, 2007).

The family Lamiaceae (Mint family) embedded with numerous aromatic species has been used as herbal treatments for a variety of ailments. *Ocimum* (commonly known Basil) is one of the important genera of this family. All the species of *Ocimum* are medicinally important and used to control many chronic diseases. Its leaves contain 0.5–2 per cent essential oil and methyl chavicol (estragol), eugenol, linalool, methyl cinnamate and camphor (Yaldiz *et al.*, 2015). Basil is used as a medicinal herb in treatments of headaches, coughs, diarrhoea, worms and kidney malfunctions. Basil essential oil has been utilised extensively in food industry, perfumery and

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UTILIZATION OF *PONGAMIA GLABRA* SEED OIL IN THE DEVELOPMENT OF ECO-FRIENDLY PRODUCTS : AN OVERVIEW

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Efforts have been made to search eco-friendly specially chemicals from spectrum of natural renewable resources. Among different renewable resources vegetable oils obtained from various seeds spotted largely due to their unique properties and eco-friendly characteristics. *Pongamia glabra* seed oil categorized as non-edible and abundantly available in the spectrum of nature. In present article effort has been made to overview the use of *Pongamia glabra* seed oil as an alternative fuel and feedstock for many polymeric recipes of viable applications. The uses of *Pongamia glabra* seed oil not only increase the feed stocks of eco-friendly renewable resources but also minimize the demand of petrochemicals going to deplete day by day.

KEYWORDS : Biodiesel, Biopolymer, Pongamia glabra, Renewable resource, Seed oil.

INTRODUCTION

The interest in the industrial use of oils from animal and plants stock is increasing significantly due to threat of global environment crises and the reduction in reserve and oil production volume (Samarth and Mahanwar, 2015; Alam and Alandis, 2011; Bisht *et al.*, 1989). Development of eco-friendly products using materials obtained from renewable natural resources have gain considerable attention now-a-days throughout the world. Such developments not only reduce the emission of green house gasses but also provide an infinite alternative to the chemical industries as they have ability to grow again and again (Lebarbe *et al.*, 2012; Saxena *et al.*, 2012). Renewable resources obtained from the mother nature's are successfully used for the development of useful materials as well as alternative fuels (Sharma *et al.*, 2015; Kumar *et al.*, 2003). Numerous renewable resources such as starch, lignin, protein, alginate, wool fiber and vegetable oil has been utilized in the formulation of various valuable materials of enormous utility in daily life (Lochab *et al.*, 2012; Meier *et al.*, 2007; Jiménez *et al.*, 2015). Among different renewable resources vegetable oils, a triglyceride embedded with different unsaturated and saturated fatty acids play vital role in the synthesis of specialty materials of practical utility in addition their application as biodiesel directly or with certain modifications (Gruter *et al.*, 2006; Johari *et al.*, 2015). Seed oils are eco-friendly, biodegradable and abundantly available throughout the world at cheaper cost. Furthermore, use of non-edible vegetable oils in the different industrial applications provides a more fruitful

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Studies on Iron Embedded Polyesteramide Resin Derived from *Melia-azedarach* Seed Oil-A Renewable Resource

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ABSTRACT

Due to the depletion of petroleum oil reserves and the environmental issues both, efforts have made to utilize the renewable resources in the polymer synthesis now-a-days. Among the different renewable resources seed oils of different plants pay considerable attraction due to its unique properties. *Melia azedarach* is a medium sized tree largely cultivated throughout the country as a shadow tree. The seeds of the plant have approximately 40-wt% non edible oil with sufficiently high unsaturation. In the present work, oil of the *Melia azedarach* seeds utilized in making iron embedded polyesteramide with the objective to provide satisfactory utilization of abundantly available raw material significantly going waste in every season. The physico-chemical characterization of the polymeric material and intermediates were carried out as per standard laboratory methods. The structural elucidation of the polymeric resin was carried out by spectral analyses. The film properties of the iron embedded polyesteramide were also investigated in different environments. The results show that the iron embedded polyesteramide derived from *Melia azedrach* show good physic-mechanical and corrosion resistance performances in different service conditions.

Keywords: *Melia .azedarach* seed oil, Iron-filled polyesteramide, coating material.

INTRODUCTION

Polyesteramide resins are amide modified alkyds contain both amide and ester linkages in the polymeric chain[1-3]. They have reported for improved characteristics over normal alkyds in terms of hardness, ease of drying and better resistance ability towards water vapor[4-6]. Therefore, these resins are largely used as a coating materials or binder for paints to protect the metals from environmental corrosion and wood from biological organisms[7-8]. Furthermore, incorporation of metals, metalloids and organic moieties like styrene, acrylates, methacrylates in the polymeric materials improve the performances

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ORIGINAL ARTICLE

Studies on poly (ester-amide) derived from succinic acid and fatty amide diol of *Melia azedarach* seed oil- An Eco-friendly development

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ABSTRACT

Over the past few years efforts have been made to develop eco-friendly biopolymers from the natural renewable resources throughout the world with the objective to arrest the dependency on petrochemicals and also reduce risk of environmental pollutions. Synthesis of polymers of practicable utilities from the non-edible and non-conventional vegetable oils a precursor of natural renewable resource solves the problems of waste disposal as well as bringing down the cost of end products remarkably. In present work, Melia azedrach seed oil (MASO) is utilized for the preparation of poly (ester-amide) (MAPEAS) through the amidation with diethanolamine followed by poly (condensation) polymerization with succinic acid. The MAPEAS resin was characterized by physic-chemical analysis as per standard laboratories methods. The formations of ester as repeating linkage was also confirm by FT-IR spectroscopy. Physic-mechanical and chemical/corrosion resistance performances of the MAPEAS polymeric films were investigated.

Key words: *Renewable resource, Melia azedarach seed oil, Poly (ester-amide), coatings*

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INTRODUCTION

The consumers and industries interest in the development of environment friendly materials have catapulted agricultural resources as feed stocks for the chemical industries [1]. Now-a-days due to interdisciplinary approaches through research and development in biosciences, synthetic chemistry, biotechnology, it is possible to architect the eco-friendly materials from natural resources. Numerous renewable resources like starch, lactic acid, proteins, lignin, chitosen, vegetable oils and many others have used in development of polymeric materials of practical utility [2-6]. Among different renewable resources vegetable oils especially those obtained from the seeds of different plants spotted by the researchers largely due to their unique properties, functionalities, eco-toxicity towards human beings and worldwide abundant availability [7].

Seed oils such as linseed, sunflower, castor, soybean, coconut, and many others have already been utilized in making useful polymers [7-9]. Among these oils some of them have medicinal values and edible too. Therefore, it is desired to explore the spectrum of nature's blessings and utilized the non-edible, nontraditional vegetable oils in the syntheses of usable polymers. This will ultimately helpful in the establishment of equilibrium of demand and availability of feed-stock as well as provides useful application to the waste materials rotting away in every plantation seasons.

Studies on Alumina incorporated Polyesteramide Derived from Melia azedarach Seed Oil

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ABSTRACT

Polyesteramide resin (MAPEAM) was prepared from N,N-bis(2-hydroxy ethyl) Melia azedarach oil fatty amide (HEMAFA) a precursor of natural renewable resource using polycondensation reaction with maleic acid. With the view to improve the physico-mechenical properties aluminium was incorporated in backbone of the polymer to obtain the alumina incorporated polyesteramide resin of Melia azedarach seed oil (Al-MAPEAM). The physico-chemical analyses and spectroscopic techniques were used for the characterization of Al-MAPEAM polymeric resin. The film properties of the Al-MAPEAM were also investigated in different corrosive environments as per standard reported methods. Studies shows that syntheses of aluminium incorporated polyesteramide using Melia azedarach seed oil as a starting material provides a more practicable utilization to it.

Keywords: Melia azedarach seed oil, Alumina-filled polyesteramides, coating materials, vegetable oil.

INTRODUCTION

Polyesteramide resins are amide modified alkyds embedded with both amide and ester groups, reported for improved performances in terms of hardness, ease of drying, water vapour resistance over normal alkyds which contain only ester linkages[1-3]. These resins are largely used as a coating materials or binder for paints used to protect the metals from environmental corrosion and wood from biological organism[4,5]. Furthermore, incorporation of metal in the polymers appreciably enhances the physico-mechanical properties in terms of hardness, resistance to scratch, flexibility and bending[6] as well as also reduces the curing temperature[7].

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SYNTHESIS AND CHARACTERIZATION OF ANTIMONY INCORPORATED POLYESTERAMIDE DERIVED FROM *MELIA AZEDARACH* SEED OIL A SUSTAINABLE RESOURCE

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ABSTRACT

The renewable resources are the remarkable alternative of petrochemicals for the syntheses of polymeric materials. Among different renewable resources, vegetable oils especially those are non-edible play vital role in polymer synthesis. Melia azedarach seed oil are non-edible and abundantly available in the country is utilized in the making antimony containing polyesteramide with view to provide more fruitful utilization of significantly going to waste in every season. Coating properties of the developed resin were also investigated as per standard laboratory methods. The physic-mechanical and chemical resistance performances proved that the antimony incorporated Polyesteramide derived from Melia azedarach seed oil can be used as corrosion protective coating materials.

Key Words: Melia Azedarach Seed Oil, Antimony Containing Polyesteramide, Renewable Resources, Coating Materials

I. INTRODUCTION

Utilization of renewable resource especially obtained from plant origin like cellulose, lignin, cashew nut cell liquids, and vegetable oil in the development of useful materials have got the prominent position in the field of Chemistry and Technology now-a-days[1-3]. This is due to fast depletion of petrochemical reserves and fluctuation in prices both[4]. Among the different renewable resources, vegetable oil obtained from different seeds play vital role in the synthesis of polymeric resins like alkyds[5], epoxies[6], polyurethanes[7], polyamides[7], poly(ester-amide)s[2,8] and many others. These polymeric resins are extensively used in coatings, adhesives and paints industries. The traditional vegetable oils, like castor, soybean, coconut, sunflower, linseed and others are successfully utilized in the synthesis of theses polymeric resins[7,8]. However, among these oils some are edible and other possess the medicinal values. Therefore, it is desire to utilized non-edible and non-traditional seed oils in the development of polymeric materials of more practicable utility and explores the natures blessing for mankind.

Melia azedarach is a oil seed bearing plant largely cultivated in the many part of the country especially in the rural areas due to its valuable timber as well as ornamental look[9]. *Melia azedarach* seed oil (MASO) o

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Fabrication of nanofiber stationary phases from chopped polyacrylonitrile co-polymer microfibers for use in ultrathin layer chromatography of amino acids†

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Electrospun polyacrylonitrile (PAN) copolymer nanofiber based ultrathin layer chromatography (UTLC) plates fabricated by a facile electrospinning method have been used as the stationary phase [illegible] identification and monitoring of the migration behavior of twenty amino acids [illegible] like n-butanol, ethylene glycol, ethyl acetate and their mixtures as the mobile phase. The PAN copolymer spun nanofibers exhibited physical and chemical robustness in the mobile phases used during the present study. Nanofiber sheets were produced using three different concentrations i.e. 8, 10 and [illegible] wt% of PAN at variable flow rates i.e. 0.2, 0.5 and 1.0 mL h^{-1} for each solution of PAN. The surface morphology and diameter of the electrospun PAN nanofibers were examined using scanning [illegible] microscopy techniques. The effect of layer thickness on chromatographic performance of [illegible] plates in the separation of amino acids was also investigated. The electrospun PAN UTLC plates prepared from electrospinning 10% (w/v) PAN solution in dimethylformamide using a 0.2 mL h^{-1} flow rate [illegible] were found to be most efficient for imparting differential migration among the amino acids [illegible] of a mixture of n-butanol–ethylene glycol–ethyl acetate [illegible] 1 : 2 by volume as the mobile phase. The chromatographic performances of PAN derived UTLC plates and commercially available [illegible] HPTLC plates were compared in respect of their use in the analysis of amino acids. In addition, PAN derived UTLC plates were also compared with silica gel TLC plates and Dowex [illegible] resin (Na^+-form) for amino acid sensitivity. The PAN derived UTLC plates were found [illegible] providing better sensitivity, rapidity and lower solvent requirement for development. The [illegible] method was successfully applied for the identification of the lysine and methionine [illegible] in commercial drug samples.

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Introduction

Thin layer chromatography (TLC) experienced a dramatic surge in the 1970s and 2001s with the introduction of high performance TLC (HPTLC) and ultra TLC (UTLC) plates for selective separation and purification.[1-4] UTLC exploits a monolithic layer of silica gel bound to the solid supports without the use of binding material. UTLC can be distinguished from conventional TLC and HPTLC on the basis of the layer thickness and the development distance of the analyte. The layer thickness in UTLC (10 μm) is much less than the usual layer thickness (100–200 μm) of TLC/HPTLC.[5] The separation of analytes on the UTLC plates requires short development distances [illegible], very low amounts of sample (i.e., analyte) and [illegible] volume (i.e., mobile phase). The parallel analysis of samples and several off-line post chromatographic detection modes are [illegible] of UTLC. Moreover, UTLC provides [illegible] shorter development times and [illegible] efficiency [illegible] sensitivity than that of TLC/HPTLC. [illegible] samples can be separated simultaneously [illegible] single UTLC plate using a low amount of [illegible]. However, the [illegible] with [illegible] has been [illegible] the adsorption surface [illegible] with [illegible] structures have been developed to enhance the separation performance of UTLC [illegible] years.

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ORIGINAL ARTICLE

Synthesis and characterization of heterobimetallic complexes of the type $[\underline{Cu}(pn)_2][MCl_4]$ where M = Co(II), Ni(II), Cu(II), Zn(II), Cd(II), and Hg(II)

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KEYWORDS
Bimetallic;
1,3-Propanediamine;
Cationic anionic moiety;
Stabilization;
Chloride transfer;
Equilibrium

Abstract A series of new bimetallic transition metal complexes of the type $[Cu(pn)_2][MCl_4]$ have been synthesized (where M = Co(II), Ni(II), Cu(II), Zn(II), Cd(II) and Hg(II); pn = 1,3-diaminopropane) and characterized by elemental analysis, molar conductance, TGA, IR and electronic spectra. All the compounds are 1:1 electrolyte in DMF. The Cu(II) ion is square planar while metal ions in the anionic moiety acquire their usual tetrahedral arrangement. On the basis of these studies it is concluded that anionic moiety is electrically stabilized by its cationic counterpart.
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1. Introduction

Although diamines are well known chelating agents, they also behave as bridging ligand either with cis or trans conformation. The 1,3-diaminopropane is known to form six membered chelate ring with the metal ions (Miyoshi et al., 1972; Allmann et al., 1990). $[Cu(pn)_2]Cl_2$ is known to have a tetragonally distorted pseudooctahedral unit with C_{2h} symmetry where chloride ions are weakly bonded and remain uncoordinated (Davey and Stephens, 1971). Chemistry of tetrahalogeno complexes is well established. Such complexes are strictly termed as halide complexes (Hald and Rasmussen, 1978a,b; Okba and Rasmussen, 1994). After a closer examination of $M(en)Cl_2$ X-ray powder photographs and vibrational data it has been pointed out that $Zn(en)Cl_2$ and $Cd(en)Cl_2$ should not be formulated as $[Zn(en)_2][ZnCl_4]$ or $[Cd(en)_2][CdCl_4]$; nevertheless, this type of formulations are reported in the older literature (Sukarova et al., 1993; Fatmi et al., 2007).

Gerken and coworkers have reported the synthesis and stabilization of tetrachloroarsonium and tetrabromoarsonium cations using weakly coordinating bulky anions as counter anions. It has been reported that $[AsCl_4][As(OTeF_5)_6]$ is stable while $[AsBr_4][As(OTeF_5)_6]$ undergoes slow decomposition at room temperature but kinetically more stable than AsF_6 and $[AsF_2(OTeF_5)_6]$ salt, which rapidly decomposes upon warming at room temperature. The synthesis and stabilization of such complexes are recent matter of concern (Pastorek et al.,

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Synthesis and Characterization of Poly (ester-amide) of Adipic Acid and Fatty Amide of *Melia Azedarach* Seed Oil – An Eco-friendly Resource

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Abstract: Synthesis of polymeric materials from renewable resources has attracted the attention of researcher worldwide as they are not only reducing the dependency on petrochemicals, a finite resource but also friendly to the environment. Synthesis of valuable polymers from non-conventional and inedible vegetable oils solves the problem of waste disposal as well as bringing down the cost of end products. *Melia azedarach* seed oil (MASO), a non-traditional, non-edible and abundantly available resource is utilized for the synthesis of poly (ester-amide) (MAPEAA) by the aminolysis with diethanolamine followed by step-growth polymerization with adipic acid. The MAPEAA polymeric resin was characterized by physico-chemical analyses as per standard reported laboratory methods. The structural elucidation of the resin was carried out by spectral analyses. Physico-mechanical and chemical/corrosion resistance performances of the resin were also investigated.

Keywords: *Melia azedarach* seed oil, renewable resource, vegetable oil, Poly (ester-amide)

1 Introduction

There have been potential demands worldwide for replacing petroleum based raw materials with the renewable ones [1-3]. This is quite significant from the societal and environmental points of view. Among different renewable resources vegetable oils obtained from seeds of various plants are in the spotlight of the chemical industries as they are abundantly available in nature and also show low eco-toxicity as well as low-toxicity towards humans [4-7]. Common traditional seed oils such as linseed, sunflower, castor, soybean, coconut are being largely used in the synthesis of polymers like alkyds, epoxies, polyurethanes, interpenetrating polymer networks (IPN)s, poly (ester- amide)s and many others [4,6-10]. These polymers are extensively used as coatings, adhesives, insulators and biomedical structures. However, among afore mentioned traditional oils some of them possess medicinal values and are edible too [11,12]. Therefore, it is important to explore the gift of the nature and utilize the non-edible and non-conventional seed oils as starting raw materials for the development polymers, which ultimately reduce the demands of conventional vegetable oils.

Melia azedarach belongs to the family meliaceae largely cultivated in rural areas due to its valuable wood [13,14]. The seeds of plants contain about 40-45 % triglyceride oil with sufficiently high iodine value, which provide the film formation ability to the synthesized polymers [15,14]. Meagre utilization of *Melia azedarach* seed oil, especially in the polymer syntheses encourages us to utilize this triglyceride oil in the synthesis of poly(ester-amide) using adipic acid as a dibasic acid [14-16].

Poly (ester-amide)s of vegetable oil origin are amide modified alkyds and have hybrid properties of both functionalities pendent amide and repeating ester, consequently show better performances than normal alkyds in terms of hardness, water vapor resistance and corrosion resistance [9,12]. In present work efforts have been made to synthesize the poly (ester-amide) resin through poly (condensation) reaction between adipic acid and fatty amide diol of *Melia azedarach* seed oil obtained by amidation of triglyceride oil with diethanol amine. The synthesized polymeric resin has been characterized by measuring the physico-chemical properties as per standard laboratory methods and spectral analyses.

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Modified Alkyd Resins as the Versatile Coating Materials derived from Vegetable Oils

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ABSTRACT

Over the years efforts have been made to design eco-friendly specialty chemicals from natural renewable resources. Among different renewable resources vegetable oils obtained from various seeds spotted largely due to their unique properties, functionalities and worldwide abundant availability. In the present review article efforts have been made to highlight the inside of the alkyd resins; oldest polymeric resin derived from vegetable oils, with respect to time to time technological modifications to improve the practical utilities. In view to reduce the use of organic solvents, synthesis and application of different types of water-born alkyds were enlightened in detailed. Furthermore, utilization of nontraditional and nonconventional seed oils in the development of versatile resin also accounted which ultimately provides profitable utilization to them as well as reduces the cost of final products.

Keywords: Vegetable oil, Renewable resource, Alkyd resin, Coating materials

INTRODUCTION

The consumer and industrial both interests in the progress of eco-friendly materials have catapulted the environmentally benign agricultural resources as feedstock for the production of valuable polymers. Over the years efforts have been made to design eco-friendly specialty chemicals from the spectrum of natural renewable resources [1-3]. Nature is blessed with numerous herbs and plants, abundantly yielding variety of bio-based feed stocks that can be tailor-made to various valuable materials [4,5].

Numerous polymeric materials have been synthesized using renewable resources such as starch, lignin, protein, wool fiber, vegetable oils and many others [6,7]. They find innumerable useful applications such as plasticizer, adhesive, biodegradable packaging materials, biological appliances, biomedical engineering, coatings and binder for paints [6,8,9]. Among different renewable resources vegetable oils obtained from the different seeds may prove to be ideal alternative for chemical industries [1, 2, 10]. Seed oils are cost effective, eco-friendly, les toxic towards human beings and moreover biodegradable in nature. Chemically vegetable oils are triglyceride of unsaturated and saturated fatty acids [2,6]. Numerous polymeric materials have been developed from the vegetable oils of enormous potential of utility [11,12].

One of the oldest polymers prepared from triglyceride oils is polyester resin and traditionally known as alkyd resin. Alkyd resins have acquired a prominent position in paints and coating industries because of their economy, ease of applications and good protection of materials from environmental attacks [4,8,10]. Moreover, they are known for biologically degradable polymers as they have repeating ester moieties [10]. The compositions and functionalities of fatty acids play the pivotal role in the properties of alkyd resins, whereas natures of dibasic acids, polyols also significantly affect the properties of the resins [8,13].

Drying and semi-drying oils, such as sunflower, coconut, castor, soybean and linseed oils are traditionally used in the preparation of oil-modified polyesters [4,8,10,13]. In addition to these numerous non-traditional vegetable oils such as rubber seed, orange seed, *Jatropha curcas*, Albiziabenth and tomato seed oils were also reported for the syntheses of polyester resins to provide a profitable utilization to these cheaply available raw materials [4,10,13-16]. In present communication efforts have been made to provide the insight of alkyd resin with respect to the modifications to inculcate viable applications as well as utilization of nonconventional and nontraditional vegetable oils in the development of versatile resin to maintain the equilibrium between demand and feed stocks.

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Victorian age and use of the Greek Mythology in Poetry

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Abstract

Queen Vicoloria's reign in Great Britain from 20 June 1837 her death in 1901 is an era of political reform, economic growth industrialization, scientific discoveries, religious activities and rise middle class etc. General society was progressing. But the other side this 'progressive society' shows a clash between science and relig crisis of faith (This crisis was reflected in Matthew Arnold's poem D Beach) Child labour like children working in coal mines (best represe by contemporaray novelst Charles Dickenes). Representative poet Victorian age like Lord Alfred Tennyson, Matthew Arnold wants to giv reading public something fresh and beautiful apart from the conte themes of their time. So these poets looked towards the great Gre mythical world which was in their eyes harmonious, fresh, spiritually and beautiful in contrast to the Victorian World. These poets treated Greek myths of Ulysses,Tiresias, Demeter and Persephone, Empedo to name only a few in their poems with full enthusiasm.

Keywords: Contemporary Victorian Society, Political Democracy, Refo Bill, Indsutrialization,UglyWorld, Greek Myths: Ulys Tiresas, Demeter and Persephone, Religious Doubt, Victo Worrior, Scientific Discoveries Etc.

Introduction

The period of Queen Victoria in England from 1837 to 1901 is period of flourishing of art and literature in its all forms. Apparently looki is a period of peace, economic development emergence of the mid class, absence of any major war. General public seems to look satisf with her queen and her reign. But a deep look in the contemporary soc shows that all was not well.

Aim of the Study

The aim and purpose of this study is to show to the readers picture of contemporary Victorian Society, and to justify that so someVictorian poets like Tennyson and Matthew Arnold looked towards Greek mythical world for the theme of their poems.

The age was alive with new activities in every field and sphere life. It was a period of political democracy with the passing of the first reform bell in 1832, and the second reform act of 1846 and the repeal Corn laws in 1846. England was fast turning from an agricultural into industrial country. The basic inventions of power loom, the steam engi and the process of making iron with coal gave rise to industrialization. result of this industrialization was that the machines which were invented serve man, made men their slave, rather they were neglecting reflecting the Victorian society G.M. Yong says, "Machine had so redu the value of labour that, at any moment, the workman might find h working like a slave in the midst of plenty which his own hand accepted to create"

There was a revolution in commercial enterprise, due to the g increase of available markets, and as a result of this, an immense advan in the use of mechanical devices. The new commercial energy reflected in the great exhibition of 1851, which was hailed as inauguration of a new era of prosperity. On the other side of this picture commercial expansion we see the appalling social conditions of the industrial cities, the squalid slums, and the exploitation of cheap labour. evils of industrial revolution were vividly painted by such writer as Cha Dickens through his novels. Another aspect of this material progress that it led to the rise of the middle class which had a worldly rationalistic outlook torwards life.This bourgeois which was mos merchants class had changed the society and intellectual milieu of the The people of this class believed in hard work and worshipped both G and wealth. The average merchant class was God fearing but, at the time, it practises comfort loving and for their comfort they could

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RESEARCH ARTICLE

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ROBERT BRIDGES : VICTORIAN SINGER OF LOVE AND JOY

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ABSTRACT
The period in great Britain from 1837 to 1901 is ruled by Queen Victoria (1819-1901).Generally this period is associated with economic growth and prosperity, industrialization, rise of middle class and with no major war in Britain . In the contemporary literary world, Tennyson, Browning, Arnold, Swinburne, Hopkins were great poet. Though Robert Bridges (1844-1930) was a Poet laureate of Britain from 1913 to 1930 but he was labeled only as an experimenter and master of prosody, had he not published his masterpiece 'Testament of Beauty' and his Shorter lyrics, which established him as a poet. Shorter poems got popularity because here the Victorian reader find some fresh themes, which otherwise he was missing in the poetry of great Victorian poets. Shorter poems was Bridges Successful attempt to give his readers a chance to look again towards nature, joy and love with a fresh vision.

Keywords: Victorian period, Hopkins and Bridges, Shorter poems Testament of beauty, love and joy.

Robert Seymour Bridges (1844-1930) was a Victorian Poet, critic a trained physician. He was a also a poet laureate of Britain from 1913 to 1930. It is Bridges who introduced Gerard Manly Hopkins in the literary world, who is now considered a superior poet. His literary friendship with Hopkins is well known in literature. Bridges is more remembered as an experimenter in verse and his technical mastership over prosody. Bridges as a poet came in limelight with the publication of his long poem, The Testament of Beauty and Shorter Poems in two volumes in 1890. He also wrote verse plays including Prometheus the forgiver (1883) Demeter: A Mask, Eros and Psyche (1885), Achilles in Scyros (1890), The Return of Ulysses (1890) etc. with a limit success.

It this paper an attempt has been made to show Bridges position as poet of love and joy, to prove it, example has been taken from his Shorter Poems.

There are, several lyrics in the shorter poem in which Bridges has dealt with love. Bridges' love lyrics present his difference moods of love. Bridges has covered almost all the aspects of love, i.e. Platonic love, spiritual love, weeded love, parting in love etc. These poems bring about a fusion between the pleasant and the unpleasant experiences of life. But the dominant mood in Bridges' love poetry is that of joy and happiness. Brett Young a critic of Robert Bridges, however, remarked. 'It is almost as though the poet's haughty disdain of emotion made him

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Remarking An Analisation

The Debate on Grammar: A Historical Overview

Abstract

This paper commences with the evolution of grammar and its expansion through the different ages. The different opinions and views formulated by numerous grammarians, academicians and linguists resulted in the establishment of formal rules about language usage. Moreover, with the advent of written representations, formal rules about grammar rules were reinforced. Thus, the main focus of the paper is the debate that arises out of the establishment and development of grammar.

The emergence of English as a universal link language and the power of the language to broaden an individual's job opportunities have resulted in the mushrooming of a large number of establishments that promise to teach fluent English. A lot of people ultimately end up getting admitted in such establishments and institutes. At the same time the situation in the education system in India is in need of an overhaul, because even today majority of learners, despite years of learning English, are still not capable of forming grammatically correct sentences. Grammar has always been a matter of debate at the level of pedagogy and philosophy. This paper is an attempt to highlight this debate.

Keywords: ELT - English Language Teaching
ESL - English as a Second Language
EFL - English as a Foreign Language
LSRW - Listening Speaking Reading Writing
CLT - Communicative Language Teaching
GTM - Grammar Translation Method
TG - Transformational Grammar
GTM - Grammar Translation Met

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Introduction

The term "grammar" is derived from the Greek root, 'Grammatike techne' which may be translated as the "Art of writing".

The meaning and the scope of grammar was later developed by the detailed studies, through centuries, by such grammarians as Plato, (5th Century BC), Panini (5th Century BC), Aristotle (3rd Century BC), Dionysus Thrax (1st Century BC), Alexandarians (1st Century BC), Varro (1st Century BC), work of Cicero and Virgil in Latin, Donatus (4th Century AD, Latin), Priscian (6th Century AD, Latin), Aelfric (11th Century AD, Latin) and many others. These grammarians established grammar as a disciplinarian area of studies for further investigations and research. In fact as a result of their work the teaching of grammar largely became a substitute for the teaching of a language.

However, it was the emergence of linguistics in the 20th century, which questioned the very scope and function of grammar and gave birth to what we call today modern grammar as opposed to the traditional grammar. Linguistics questioned not only the definition, description and function of the traditional grammar, but also its role in the overall language teaching programme. In a nut-shell, the emergence of linguistics created a debate regarding the very use of grammar traditional or modern. For instance, while Frank Cawley (1957) went to the extent of arguing that the teaching of grammar is a waste of time", Michael West (1962) argued that "grammar is a preventive and corrective medicine". The contribution of linguistics, notwithstanding, in the Indian context, grammar still dominates the language learning and teaching programmes. It is only in over the last three to four decades (mostly in the Central Universities and Boards) that gradually it is either replaced by actual language exercises or is being taught inductively. This change is an output of the realization of the fact

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Ayesha

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Psychoanalytical Study of Othello's Character

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Abstract:

The Purpose of the study is to analyze and apply the psychoanalytical approach, to the character of Othello the protagonist who is the victim of Iago's evil designs. Othello finds a good position for himself both in Venation society and in the state by killing the Turks for the welfare of the Venation State. The conflict is that he serves a state in which he himself is an alien. His own origin is not lost but buried in order to adapt him to the values of Venation society and culture.

Keywords: Psychoanalysis, the moor, venation culture, cynicism, infidelity, credulity.

Othello by William Shakespeare is an amazing and well read drama. Iago in this play is a villain and a soldier under Othello's command. Othello is a noble Moor fighting against the Turks who are a threat for Christianity. The main thrust of the play is not the velour of Othello, the protagonist but the personal life and the passions of the characters. Othello's downfall as a jealous husband and Iago's villainous designs result in tragedy. Iago by skillfully rousing each victim to passion deceives Othello and induces him to fall.

Othello is described as romantic naïve, heroic and a mere servant of the state. He has a trusting nature in which he gives it all.Iago out of evil nature and perverted designs, schemes to bring Othello's happiness to an end. The drama presents before the reader two remarkable characters; Iago as a dominant force and the honest Moor his victim, Othello. He arouses Othello's feelings and emotions against Desdemona and Cassius. Othello is

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RESEARCH ARTICLE

Comparative Study on Electrical and Dielectric Properties of Sintered Nano and Micro Silicon Nitride Ceramics

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ABSTRACT

In the present work we have studied the electrical conductivity, dielectric constant and dielectric loss of Sintered Silicon Nitride ceramics. In this study it was found that the grain size has great impact on electrical conductivity and dielectric properties of Sintered Silicon Nitride Ceramics. The result shows more efficiency of electrical and dielectric properties with nano sized grain. The sintering was performed in a programmable furnace at 950 K. The dc conductivity increased in the temperature range 300 K to 950 K. At higher temperature T > 500 K, the dc conductivity increases exponentially with temperature for both of the investigated samples. Dielectric constant and loss are measured in the temperature range 300 K to 950 K with frequency range 1 KHz to 1 MHz. To confirm the grain size, the samples are characterized by the Scanning Electron Microscope (SEM). These types of samples can be used as a high temperature resistant conducting material.

Keywords: Nano ceramic, Silicon Nitride, Electrical, Dielectric and Structural Properties.

1. Introduction

Silicon nitride has attracted considerable interest due to its excellent high-temperature mechanical properties, such as strength, hardness, wear resistance, thermal shock resistance and chemical inertness. This material is utilized for structural applications at high temperatures and its domains of application extend from vessels for chemical reactions to heat-exchanger bearings, engines and gas turbine components [1-3]. Si_3N_4 is also a wide-band-gap semiconductor used in the optical and electrical device industries [4]. In the 20th century, new ceramic materials were developed to use in advanced ceramic engineering, for example, in semiconductors. However, [illegible] nanotubes and nanowires have recently [illegible] because of their [illegible] associated with their [illegible] properties [illegible] mechanical and chemical [illegible] have been proposed and developed for the synthesis of Si_3N_4 nanowires. Most popular methods for the synthesis of nanowires are chemical vapor deposition [5-7], carbo-thermal reduction of silica and carbon in nitrogen-containing ambient [8-11], nitration of silicon powder [12-13] and the nitration of a Fe–Si catalyst [14]. Silicon nitride ceramics have been frequently used as structural materials for high-temperature applications. They exhibit unique properties because of their high fracture toughness due to a composite microstructure and a high creep resistance controlled by grain boundary. The high-strain-rate plasticity of a silicon nitride ceramic, known as superplasticity, was first reported in 1990 [15]. The report [illegible] indicated that silicon nitride with a small grain [illegible] exhibit plastic behaviour even if it is [illegible] tough and tracing. Since 1990, many [illegible] silicon nitride ceramics have been developed

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STUDY OF RADON EXHALATION RATES IN COAL FLY ASH SAMPLES COLLECTED FROM ROSA THERMAL POWER PLANT (RTPP) SHAJAHANPUR BY USING SSNTD TECHNIQUE

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RECEIVED : 20 May, 2017

In the present study radon exhalation rates in terms of mass and area have been measured in coal fly ash samples collected from Rosa Thermal Power Plant, Shahjahanpur (U.P.) by using cylindrical Sealed Can Technique (SCT) based on LR-115, type II nuclear plastic track detector. In the present work radon activity concentration was found to vary from 145.35Bqm^{-3} to 290.70Bqm^{-3} with an average and average value of 191.15Bqm^{-3}. Radon exhalation rate in terms of mass was found to vary from 8.70 mBqKg^{-1}h^{-1} to 17.41mBqKg^{-1}h^{-1} with an average value of 11.44 mBqKg^{-1}h^{-1} where as radon exhalation rate in terms of area was found to vary from 280.35 mBqm^{-2}h^{-1} to 544.19 mBqm^{-2}h^{-1} with an average of 272.09 mBqm^{-2}h^{-1}. The observed values of radon exhalation rates in coal fly ash samples in the present study were found below the average value of 57.6Bqm^{-2}h^{-1} as recommended by International Commission on Radiation Protection (IRCP). Thus the result shows that the study area is safe as far the health hazard effects of radon activity concentration and radon exhalation rate are concerned.

INTRODUCTION

Coal is the main energy source for electricity generation in the world. In India, a large amount of energy generation comes from coal combustion in thermal power plant (TPP). This combustion process generates large amounts of fly ashes. In recent years due to the use of fly ash in building materials, it has become a subject of worldwide interest. Radon exhalation rate is most important for the measurement of radiation risk in coal and fly ash. The radon exhaling properties of porous materials, both naturally occurring like soil, coal and rocks and man-made like mining wastes, fly ash and many building materials etc. have been the object of several investigations. Coal is important material for power generation. Coal contains trace quantities of naturally occurring primordial radionuclides which acts as a source of radon isotopes Rn-222 and its daughter products are considered to be the main sources of inhaled alpha-activity resulting from coal burning in industrial cities. Considerable work has been undertaken to investigate radon exhalation as well as well as other hazards from coal combustion by-products (Ingersoll, 1981; Stranden, 1983; Nakaoka *et. al*, 1984, 1985 and Karamdoost *et al*, 1988). The measurements carried out by Tufail *et al*., (1988) show that the radon concentration inside the coal mines is about 5-10 times greater than that of radon levels outside the mines. Coal combustion results in the emission of its particulate byproduct-flyash

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Measurements of Radon Exhalation Rates from Some Building Materials by Using Solid State Nuclear Track Detector (SSNTD)

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Abstract: Radon exhalation rates in terms of mass and area and radon concentration from the sample of some building materials in shajahanpur district of U.P. (India) were carried out by using cylindrical can technique (CCT) based on LR-115 type II plastic track detector. From the result it was found that the radon concentration, radon exhalation rates (in terms of mass and area) and annual effective dose in the sample of different building material varies from 145Bq/m³ to 180Bq/m³ with an average values of 158.25Bq/m³, 23.04×10^{-3} Bqm^{-2}d^{-1} to 28.06×10^{-3} Bqm^{-2}d^{-1} with an average of 25.02×10^{-3} Bqm^{-2}d^{-1}, 0.69×10^{-3} BqKg^{-1}d^{-1} to 0.86×10^{-3} BqKg^{-1}d^{-1} with an average value of 0.76×10^{-3} BqKg^{-1}d^{-1} and 4.57 mSv/y to 5.67 mSv/y with a an average value of 4.98 mSv/y respectively. Measured values of radon concentration, radon exhalation rate in terms of mass and area and annual effective dose in the sample of different building materials in the study area were found to be less than the permissible value of 200 Bqm^{-3}, 0.016 Bqm^{-2}s^{-1} (57.6 Bqm^{-2}h^{-1}) and 10.00 mSv/y respectively as recommended by ICRP (ICRP, 1993). The present result shows that the building materials do not pose a significant radiation hazards.Thus the use these materials for the construction of building in the study area is considered to be safe from radiation protection point of view.

Keywords: Radon, cylindrical can technique, building material, LR-115 type II plastic detector

I. Introduction

Radon is a naturally occurring radioactive gas that is part of the uranium decay series. Its presence in the environment is associated mainly with trace amounts of uranium and its immediate parent, radium-226, in rocks and soil. Materials obtained from the earth crust's such as building materials bricks, white cement, black cement, gypsum, sand, marble, ceramic, different types of stones, etc. may contain traces of U-238 and Th-232.These radionuclides decay to radon (Rn-222) which is a radioactive gas with half life 3.82 days. Prolong exposure to radon may increase the risk of lung cancer ([1], [2]) because it delivers55% of the total dose to the cells of the respiratory system [3].Due to long half- life of radon gas it can reach from the earth's crust or from the walls and floors of the buildings into both outdoor and indoor air. In case of indoor air, the risk of exposure to radon is higher, especially for building with poor ventilation systems which may lead to a higher indoor radon concentration. The radon exhalation is also important factor, since it gives the exhalation rate of the radon from the study material. Building materials are the main source of radon inside houses. The most popular building materials are bricks, white cement, black cement, gypsum, sand, marble, ceramic, different types of stones, etc.These building materials contains some amount of radon. Radon is released into ambient air from soil and stones due to ubiquitous uranium and radium in them, thus increasing the airborne radon concentration. The radioactivity in soils is related to radioactivity in the rocks from which the soil is formed. Soil gas measurements have shown radon concentrations ranging from a few hundred to several thousand pCi/l[4].The United States Environmental Protection Agency has estimated that the average soil in the country contains about one part per million of uranium, phosphate rock contains 50 to 125 ppm and granite contains about 10 to 50 ppm.In the high east but as much as 500 ppm in the west [5]. When a radon atom is produced inside a grain of a mineral, it can escape from that grain by at least two mechanisms. (1) Due to recoil the radon atom receives momentum which enables it to travel a certain distance trough a material. This recoil range is about 65 nm in air, 0.1 μm in water and 35 nm in clay [6]. (2) Radon atoms not escaping the grain by recoil may still be able to leave the mineral by diffusion. This involves diffusion through a solid structure diffusion coefficients will be small and only atoms close to the surface will stand a chance to escape. The radon released from the grain by recoil may be imbedded in adjacent grains and may no longer be available for transport. The fraction of radon atoms, generated in the soil grains and reaching the pore volume of the soil, is known as the emanation coefficient. This coefficient depends basically n the soil grain size-distribution, on the porosity and on the water content. The [illegible] soil grains and the pores determine [illegible]

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Estimation of Activity Concentration of Uranium, Thorium and Potassium, by Using HPGe Detector

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ABSTRACT

The measurements of activity concentration of uranium, thorim and potassium were carried out in radiation shielding bricks, granites, soil, hematite, bricks, and sand by using a high resolution high purity Germanium (HPGe) gamma-ray spectrometer system. The activity concentrations of uranium, thorium and potassium contents are 80 ± 5 Bq/kg, 103±10 Bq/kg and 1014±15 Bq/kg, respectively in radiation shielding bricks, 61 ±2.0 Bq kg, 23.27±1.8 Bq/kg and 270±14 Bq/kg, respectively in hematite aggregate, 50±4.0 Bq/kg, 41±3.7 Bq/kg and 370±5 Bq/kg, respectively in cement, 57±3.5 Bq/kg, 64.56±2.0 Bq/kg and 990±7.3 Bq/kg, respectively in ordinary aggregate, 35±2.0 Bq/kg, 50±2.8 Bq/kg and 490±11 Bq/kg, respectively in sand, 31±1.75 Bq/kg, 42±2.5 Bq/kg and 280±10 Bq/kg, respectively in bricks and 27±2.0 Bq/kg, 18±2 Bq/kg, 190±7 Bq/kg, respectively in soil. The result shows that the measured activity concentrations in all samples are less than the average international recommended value. The calculated indoor and outdoor effective dose due to natural radioactivity of radiation shielding bricks, hematite aggregate, ordinary aggregate, cement, bricks, sand, and soil samples are also lower than the average national and international recommended value of 1.0 mSv.Y-1.

Keywords: Natural radioactivity, HPGe detector, Gamma radiation, Elemental concentration.

INTRODUCTION

The natural radioactivity present in the environment is the main source of radiation exposure for humans and constitutes the background radiation level. The main natural contributors to external exposure from gamma rays are ^{226}Ra, ^{232}Th, and ^{40}K. Since these radionuclides are not uniformly distributed, the knowledge of their distribution in soil and rocks play an important role in radiation protection and measurement. It is important to determine the radiation dose for typical environment, respective contribution for radiation exposure is about 13.8% for ^{40}K, 55.5% for ^{226}Ra, and 14% for ^{232}Th. Naturally occurring isotopes of uranium and thorium are unstable elements and go through several steps of radioactive decay, before ultimately becoming the stable element. They eject alpha and beta particles. Gamma radiation usually accompanies each of these particles ejecton. Uranium occurs in minerals such as pitchblende, uraninite, etc. It is also found in phosphate rock, lignite and monazite sands. Radon is formed from the decay of radium, which in turn is formed from uranium. Uranium is present to some extent in all rocks but is most common in those of granitic composition and its concentration varies with specific sites and geological materials. There are two principal radiological effects derived from radioactivity in soils, Rocks, granites etc., that justifies the interest of their measurement. First is the internal irradiation of lung by alpha emitting short-lived decay products of Rn-222 and Rn-220. Second is the external irradiation of the body given by gamma rays emitted from in-situ radionuclides. The soil concentration of radionuclides with respect to the natural background levels and regulatory control actions, estimating the potential environmental transport to man, and studying the magnitude and extent of deposition, specially for

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Radiation dose in the indoor atmosphere due to radon and thoron

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Keywords: Radon, Thoron, annual effective dose, annual equivalent dose and SSNTD

Abstract
Radio nuclides ^{222}Rn and ^{220}Rn, from the uranium and thorium decay chains are noble gases produc the decay of their immediate respective nuclides ^{226}Ra and ^{224}Ra present in the rocks, uranium ore soils. These gases can leave the earth's crust by processes such as diffusion, advection, and enter i atmosphere. ^{222}Rn and ^{220}Rn decay products are the radioactive isotopes of polonium, bismuth, lea thallium. These daughter products, being the isotopes of heavy metals, get attached to the existing ae particles in the atmosphere. Radiation dose in the indoor atmosphere due to radon and thoron has carried out in the dwelling of Rampur District (U.P.).The significant contribution to the total dose rece by the population is subjected to the natural radiation due to the inhalation of ^{222}Rn, ^{220}Rn and their d products. LR-115 Type II Solid State Nuclear Track Detector (SSNTD) technique was used for measurements of the ^{222}Rn concentrations, annual effective dose rate and annual equivalent dose rate to lung in the studied area. The mean annual effective dose rate and the mean annual equivalent dose rat the lung in the studied area were found to be 1.36 mSv/y and 0.435v/y, respectively. The ra concentration was found varied from 20Bq/m³ to 80 Bq/m³ with an average value of 54.13 Bq/m³ whic less than recommended ICRP value (148 Bq/m³) and therefore does not pose any serious threat to occupants. The indoor radon concentration has been found to vary considerably with the ventilat condition, construction of building materials, and volume of the room.

1. Introduction

Radon is a naturally occurring odorless, colorless, tasteless inert gas which is imperceptible to our senses. It is produced continuously from the decay of naturally occurring radionuclide such as U-238, U-235 and Th-323.The radioisotope Rn-222, produced from the decay of U-238, is the main source (approximately 55%) of internal radiation exposure to human life (ICRP, 1993).Worldwide average annual effective dose from ionizing radiation from natural sources is estimated to be 2.4mSv of which about 1.0 mSv is due to radon exposure (UNSCEAR, 2000). The measurement of radon in man's environment is of interest because of its alpha emitting nature. A certain fraction of the radon escapes into the air where, in the outdoors, it is quickly diluted and is of no further concern. However, in confined spaces such as homes and office buildings, radon can accumulate to harmful levels. Many environmental pollutants are classified as cancer-causing solely on the basis of laboratory studies using either animals or cell cultures. In the case of radon, there is direct evidence from human studies of a link between exposure to radon and lung cancer. For this reason radon has been classified by the International Agency for Research on Cancer, a branch of the World Health Organization, as a Group I carcinogen. This places radon in the same group of carcinogens as asbestos and tobacco smoke. Most of our time is spent indoors; therefore, the measurement and evaluation of radon concentrations in buildings are important (Ristic, 1998; Hamori et al., 2004). Worldwide measurements of radon activities in the indoor air of dwellings are continuously presented all over the world (Singh et al., 2002; Iyogi et al., 2003).The numerous measurements of the activity concentration of radon in different countries along with epidemiological studies regarding the indoor radon and risk of lung cancer have been published in recent years (Field et al., 2000).The main sources of indoor radon are soil, building materials (sand, rocks, cement, etc.), tap water, natural energy sources used for cooking like (gas, coal, etc.,) which contain traces of U-238, the topography of the area, house construction type, soil characteristics, ventilation rate, wind direction, atmospheric pressure and even the life style of people. The main objective of this work was to assess the indoor radon concentration, the annu effective dose rate, the annual dose equivalent rate to the lung a the associated level of risk to the populace.

2. Experimental Techniques

The Solid State Nuclear Track Detectors (SSNTDs) is a important tool in investigations concerning the presence of radio gas. Solid State Nuclear Track Detectors (SSNTDs) (Fleischer e al., 1975) are insulating solids both naturally occurring and man made. In this present work, the technique of using the Solid State Nuclear Track Detectors (SSNTDs) has been utilized for the study of indoor radon and thoron level in dwellings of the study area. The radon (^{222}Rn) and thoron (^{220}Rn) concentration is calculated from the track density. The annual equivalent dose rate to the lung received by the population is calculated based on guidelines given by the International Commission on Radiological Protection (ICRP) and United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR).The main objective of this work was to assess the indoor radon concentration, the annual effective dose rate, the annual dose equivalent rate to the lung and the associated level of risk to the populace.

LR-115 type II detectors were cut into rectangles and placed in specially made envelopes (Fig. 1) from cardboards. The detectors were hanged in the various dwellings of the study area at a height of 2m from the ground level. The sensitive lower surface of the detector was freely exposed to the emergent radon/thoron so that it was capable of recording the alpha-particles resulting from the decay of radon/thoron in the room. After the 3 months exposure, the detectors were subjected to chemical etching in a 2.5N sodium hydroxide solution at 60°C, for 90 m in a constant temperature water bath to enlarge the latent tracks produced by alpha particles from the decay of radon. After the etching the detectors were washed with running cold water, then dried in air. After a few minutes of drying in air, the detectors were ready for track counting. The tracks were counted (alpha particles) were then converted into radon and thoron concentration by applying the calibration factor for LR-115 type II bare detector. The track density was calculated using the equation:

Track density (D) = Average number of sparks/Area of electrode

Concentration of indoor radon gas in Bq/m³ was calculated using the formula:

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An Efficient Identity based Multi-Proxy Multi-Signcryption Scheme from Bilinear Pairings

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ABSTRACT

[illegible]

Keywords

[illegible]

1. INTRODUCTION

[illegible]

[illegible]

[illegible]

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[illegible]

2. PRELIMINARY WORKS

[illegible]

[illegible]

- Bilinearity: [illegible]
- Non-degeneracy: [illegible]
- Computability: [illegible]

[illegible]

Definition 1: [illegible]

Definition 2: [illegible]

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Effect of Gamma Radiation on Total Testicular Protein of Swiss Albino Mice

Abstract

The amount of total protein in the testes of irradiated mice displayed decremental trend vis –a- vis control. T.P of control was 162.33 mg/dl. While in case of irradiated groups the corresponding values for 0.1Gy it was 150.93 mg/ml, and for 0.2 Gy and 0.30 Gy the corresponding values were 149.933 mg/ml and 149.23 mg/ml respectively. Which shows 6.63%, 7.45% and 7.88% lower than the control (which was considered as 100%).

Decremental trend were observed in the total testicular protein. This may be due to random collision of gamma radiation on polypeptide chain of protein molecule causing fragmentation of definitive point i.e "Fragile sites". This process of collision and fragmentation is based on the theory of probability. The fragments thus produced may be small or large and consequently may escape detection by standard biochemical techniques as used in the present studies. The study of gamma radiation thus absorbed may also causes denaturation or coagulation of protein (J Infrared Milli Terahz Waves 2011)

Keywords: Ionized Radiation, Total Protein, Fertility, Mammalian Testes

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Introduction

Mammalian testes represent a intricate association of heterogenous cell population whose primary exocrine function is to produce spermatozoa; and endocrine function is to synthesize and release a variety of androgens. These functions are distinctly compartmentalized i.e., spermatogenesis in the seminiferous tubules and androgenesis in the leydig cells. A sustained generations of precursors via enzymatic intervention occurs in both processes. However in the former this entails the formation of stage specific protein during spermatogenesis. The metabolic status of germ cells, endocrine cells (Leydig) and somatic cells (Sertoli) of the testes is known to undergo cyclic changes that coincides with the cycles of the seminiferous epithelium and hormone production. The testis is considered as one of the most radiosensitive organ of the mammals (Ellis, 1970, Grahn and Carnes, 1988, Liu et al. 2006 Khan et al.,2015. Considerable information is available on the gamma radiation induced histo- and cyto-pathologies of mammalian testes. It has the ability to cause ionization and formation of free radicals which is suggested to cause cellular injury and genetic lesion (Hawas, 2013, Eberhard et al.,2013. However, studies on alteration in the biochemical milieu have received relatively less attention. The literature on dose and duration related changes in the testicular protein (T.P) is relatively scant and fragmented.

The present investigations were therefore, carried out to monitor the biochemical changes in the testes of Swiss albino mice challenged by single pulse of gamma radiation.

Aims of the Study

Mammalian testes is an ideal organ to study a variety of cellular processes i.e. cell division, growth, differentiation and maturation. Radiation induced damage to testis have been subject of absorbing interest in addition of [illegible] natural radiations from earth crust, the increased use of [illegible] in medicine, veterinary research, and therapies has [illegible] the [illegible] and sensitivity of human, animals, and [illegible] radiation hazards (Wimirk & Grundi 2011). This [illegible] and organ [illegible] the inherent ability to bioamplification [illegible] cancer [illegible] and [illegible] 2013, Comisre et al., 2014). The cytogenetic aberrations [illegible]

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ORIGINAL ARTICLE

Age specific survival, death and life expectancy of *Chilocorus circumdatus* Fabr (Coleoptera: Coccinellidae) on mustard aphid *Lipaphis erysimi* Kalt at varying temperature

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ABSTRACT

Age specific survival, death and life expectancy of Chilocorus circumdatus at varying temperature showed that it took a maximum of 38 days to complete generation at 16±1°C and minimum of 31 days at 28±1°C on Lipaphis erysimi, respectively. The survivorship and mortality showed an irregular pattern with high and low peaks. The high peaks reflecting maximum mortality and low peaks showed negligible mortality. As far as life expectancy was concerned, it declined gradually till completion of generation at all the temperature regimes. Although, the minimum peaks of high mortality was observed at 24±1°C as compared to other temperatures. C. circumdatus developed faster at 28±1°C, but number of high peaks of mortality increased accordingly at this temperature. Therefore, 24±1°C considered as most suitable temperature for development of C. circumdatus under laboratory conditions.

Key Words: Aphids, development, feeding, ladybird beetle, temperature

INTRODUCTION

Ladybirds are most familiar group of brightly colored beetles, which are symbols of Good in many myths. Some authors believe that the term "lady" in ladybird refers to the Virgin Mary. They believe that during the middle age, in Europe, the agricultural crops were plagued by pests, and then farmers began praying to Lady Mary. Thereafter, when they returned to their field, ladybeetles appeared in the fields and miraculously saving their crops by eating the pests, therefore farmers to call them beetles of our lady. Among different ladybird beetle species *Chilocorus circumdatus* is a small sized beetle with orange elytra and black margin. *C. circumdatus* is considered as insectivorous by feeding on variety of insect like aphid, thrips, scale insect, whiteflies and other soft bodied insects. *C. circumdatus* was introduced from China to India, Sri Lanka, Indonesia (Miyatake, 1970), Hawaii (Leeper ,1976) and other countries including California, Australia and South Africa (Rao et al. 1971, Rosen and De Bach 1978, Houston 1991 and Seago et al. 2011).

The study of life tables can provide accurate data of mortality, survival and expectancy of life. The collection of life-table data is an important factor for pest management strategies through the release of natural enemies (Devi et al., 1997) and play important role in biological control system (Chi and Yang 2003 and Ali and Rizvi 2010). Therefore, to identify the numerical changes in age distribution, age specific life table of *Chilocorus circumdatus* was constructed in the present study.

MATERIAL AND METHOD

To accomplish present objective, Indian mustard, *Brassica juncea* were grown in a plot sized 10 x 10 meter and each replicated thrice. There is no pest management practices flowed to grow the Indian mustard, so the fauna and crop were exposed to aphid infection. The aphids collected during the course of study were identified as *Lipaphis erysimi* Kaltenbach from the Laboratory of Aphidology, Department of Zoology, University of Kalyani, West Bengal, India. Among the complex of different ladybird beetle *Chilocorus circumdatus* were also found to feed on mustard aphid.

Adult females of *C. circumdatus* were collected and brought to the laboratory for rearing them singly in Petri dishes (90 x 10 mm). A blotting paper was spread over inner surface of Petri dishes for egg laying. Fresh infested cut twigs of mustard plant along with aphids were provided as food to beetles daily. The eggs laid by females were counted and transferred in other Petri dishes, with the help of soft camel hair brush. Further, counted number 100 zero day old eggs obtained from *C.*

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REVIEW ARTICLE OPEN ACCESS

Taxonomy in Biological Science and Its Basic Role in Species Conservation

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ABSTRACT

Taxonomy and species conservation are often assumed to be completely interdependent activities. However, a shortage of taxonomic information and skills, and confusion over where the limits to 'species' should be set, both cause problems for conservationists. There is no simple solution because species lists used for conservation planning (e.g. threatened species, species richness estimates, species covered by legislation) are often also used to determine which units should be the focus of conservation actions: this despite the fact that the two processes have such different goals and information needs. Species conservation needs two kinds of taxonomic solution: (i) a set of practical rules to standardize the species units included on lists; and (ii) an approach to the units chosen for conservation recovery planning which recognizes the dynamic nature of natural systems and the differences from the units in listing processes that result. These solutions are well within our grasp but require a new kind of collaboration among conservation biologists, taxonomists and legislators, as well as an increased resource of taxonomists with relevant and high-quality skills.

Keywords: species; taxonomy; phylogeny; conservation planning

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INTRODUCTION

Taxonomy is the science of classifying organisms. At no time there has been a greater need for taxonomists than now when the crisis facing biodiversity is escalating. Decision 11/8 of the second meeting of the Conference of Parties to the Convention on Biological Diversity (CBD) identified the lack of sufficient taxonomists as a significant impediment for implementing the decisions of the convention at national as well as international levels. Over the past half a billion years the world lost perhaps one species per million species each year including everything from mammals to plants and today the annual rate of extinction is estimated to be 1000 to 10000 times faster [1]. This is really a matter of grave concern for all those who think that our biodiversity is precious and should be protected. It is also known now that centimelan extinctions take place on many
regions of the world today and not merely a thing of the past which happened in that cloud forest of the Western Ecuador in 1978-1980. Besides we are quite ignorant of the real magnitude of the world's biodiversity. The audit of biodiversity today is far short of a reality. Though opinions on the biodiversity of the world differ from 5-100 million [1] species, a 'best guess' or mid way on the road, places it at 14 million living species today [2].

One basic information about animals and plants is organized and stored is by taxonomic categories (typically species) [another way is by subject, such as vision or food and feeding]. It is important to emphasize why good taxonomic databases are essential for studying biodiversity, (2) why taxonomy entails, (3) why a hierarchical classification is useful, and (4) why classifications and names change, thereby making it more difficult to accumulate and keep track of information for many purposes from conservation management to inventories, to species entering commerce, etc.

Taxonomists have two important tasks: to name organisms and to classify them. The system of hierarchical classification and a two-word system for naming species began with Linnaeus in 1758. The system was codified in 1842 [3], and it became the system used by all zoologists worldwide from 1843 to the present, with changes and improvements along the way. (The present Code which all zoologists follow is discussed in Appendix A of the Catalog). The two-word name for species consists of a generic name and a specific name. A genus may contain more than one species, and species are placed together in a genus

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Gamma radiations induced aberrations in bone marrow chromosomes of Swiss albino mice

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ABSTRACT

Bone marrow chromosomes are known to be highly radiosensitive. The current study seeks to examine the changes in chromosomal morphology post exposure to gamma radiation in Swiss albino mice. Observation of slides of control mice show no significant damage in chromosomes number (40) and morphology. However, after administration of 0.20 Gy, 0.40 Gy, 0.60 Gy, 0.80 Gy of 60 CO-gamma rays a number of abnormalities were observed. Chromosome fragments, breaks, appearance of rings, dicentric chromosomes were found in all cases. The only difference was in their frequency. When the doses were higher the variations were observed more frequently. However, at a dose of 0.60Gy and 0.80 Gy in addition to the aforesaid abnormalities, aneuploidy was also observed. Bone marrow cells showing such defective morphology possibly may also suffer from attenuation of their genetic, physiological and biochemical mechanism(s). These observations indicate the sensitivity of the genomic apparatus of mice subjected to low doses of gamma radiations. The biomedical importance of this study can be easily visualized in the possible cytogenetic effects that would influence the generations to come. The rampant use of this radiation therefore warrants further, indepth investigation in view of the long term genetic hazards and impairment of fertility of an individual due to gamma rays.

Key words: Aneuploidy -chromosome morphology -ionized radiation - mitotic index

INTRODUCTION

Natural background radiation of various forms exists in the biosphere and comes from three well known and studied sources *i.e.*, cosmic rays, living cells and earth crust. Living cells, which have the inherent capability to bio-accumulate and bio-amplify radioactive isotopes from the environment. A variety of radioactive elements such as radium, thorium and uranium are present in the earth's crust and emit α, β, γ-rays. Such radioactive elements are extracted and put to use in various industries, nuclear weapons test explosions, medicine, power generation, agriculture and radio sterilization (Singh, 2011; Waghmaree et al. 2013; Zalewska et al. 2014). In addition to the aforesaid effects, certain radiations are also the principle causative factors for somatic lesion, necrosis; carcinogenesis, mutagenesis and teratogenesis (Breitner 1988;Upton et al.1992; Nikula et al.1995, IARC 2002; Eberhard et al. 2013; Comishet al.2014).

Radiation damages occur through collision of photon particles with atoms and molecules in cells which ionize to give rise to ions and free reactive radicals. Free radicals are believed to play a major role in more than sixty different health conditions including the ageing process, cancer and arthrosclerosis (Sanaa et al.2015). Gamma radiation

ORIGINAL RESEARCH PAPER

Zoology

AMPHISTOMATOUS PARASITES OF BUFFALO: A CASE STUDY ON THEIR LYMPHATIC SYSTEM

KEY WORDS: Lymphatic system, Buffalo, Amphistomatous parasite

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ABSTRACT

The system represents a primitive circulatory system of simple flattened mesenchyma cells and contains a fluid resembling the primitive invertebrate blood. ***Fischoederius cobboldi***, The lymphatic system consists of two main longitudinal lymphatic ducts ducts run parallel and internal to the intestinal caeca, as in the other species, and the distance between the two ducts is proportional to the distance between the caeca ***Ceylonocotyle etahensis n.sp.*** The lymphatic system in this new species consists of a pair of longitudinal lymphatic ducts, running dorsally to the intestinal caeca from the anterior to the posterior end of the body. The lymphatic system in *Olveria bosi* consists of two longitudinal vessels one on either side, running internal to the intestinal caeca. As in *G. indica* they give out branches in all directions.

INTRODUCTION

The systematic importance of the lymphatic system cannot be much stressed in trematodes, in general, as it probably does not exist in all of them, but in the limited few where it has been reported it does point to a definite phylogenetic and family relationship. Looss (1902) recognised these ducts as a definite entity and in 1912 he even expressed that the worms can be classified on the basis of this system. Mac Callum (1905) described some channels in the amphistomes of fish, but with a wrong observation. Stafford (1905) had clear understanding of the entity and distinction of the lymphatic vessels. Stiles and Goldberger (1910), who did a lot of work on amphistomes, did not mention anything about the system. Stunkard (1917, 25, & 28) described it in several genera and attached sufficient importance. Maplestone (1923) discarded it for being of no practical importance. Willey (1929 & 30) studied it in details in a number of genera.

MATERIALS AND METHODS

The live worms of amphistomes, though present in smaller number, in the ruminants slaughtered in the local slaughter house could be obtained during the different parts of the year. Gravid as well as very small immature worms can be obtained during the different months of the year. The worms are flattened under pressure of the two slides tied together with a thread and fixed in a concentrated solution of acidic Corrosive sublimate from 18 — 24 hours. After fixation these are washed first in distilled water, then in tap water from an hour to several hours depending upon the size of the worm, as very thin and small worms require a shorter washing period. It is always better to change the water two or three times and to examine the individual worms under the binocular for proper washing. After washing the worms are treated with 0.5% solution of Sodium-thio-sulphate and washed again. In glycerin mounts the lymphatic ducts appear to be yellow. The permanent preparations are not possible as the precipitate formed in the ducts is washed off during dehydration.

The other method for the fixation of the system has also been quite satisfactory. The live worms are pressed between the two Odes and kept either in a large petri-dish or a specimen tube and boiling 90% alcohol is poured over them. The lymphatic ducts become very prominent due to the coagulation of the lymphatic fluid within and are fixed with the worm. The worms are cleared in glycerin and studied as such. The ducts so fixed take Borax carmine and Carmine alum stains and their permanent preparations can be made, but as all other parts of the body also take the stain the prominence of the ducts is lost. The smaller worms are directly studied in the living condition for the excretory and lymphatic systems.

OBSERVATIONS

***Fischoederius cobboldi* (Poirier, 1883)**
(Stiles & Goldberger, 1910) (Plate 1)

The lymphatic sytem consists of two main longitudinal lymphatic ducts ducts run parallel and internal to the intestinal caeca, as in the other species, and the distance between the two ducts is proportional to the distance between the caeca. This distance is increased near the acetabulum where the ducts begin to run on the two sides of the testes. They also give many branches to the acetabulum over which they ramify. At its anterior end each longitudinal duct, as in the other species, becomes divided into four thin, long branches, which form inverted U-shaped plexus over the oral sucker and are also continued for a short length of the oesophagus. During their course the longitudinal ducts give out a large number of branches to the various organs of the body. The oesophagus, the testis, and the excretory bladder are supplied by branches from both the longitudinal ducts. The intestinal caeca get their supply from the longitudinal ducts of their respective sides. Of all these branches, the genital branches are quite prominent. The ovary is supplied by the branch supplying the testis of its side. The branches in this species are comparatively thinner, and longer than in the other species, and each primary lateral branch may give off eight to ten secondary branches forming a net work in the body. The lateral branches of one side may not only meet the branches of the other side in the median line, but may even be continued upto the longitudinal duct of the other side. The branching in the species resembles the one found in *Carmyerius spatiosus*.

***Ceylonocotyle etahensis* n.sp. (Plate2)**

The lymphatic system in this new species consists of a pair of longitudinal lymphatic ducts, running dorsally to the intestinal caeca from the anterior to the posterior end of the body. At the posterior end, each longitudinal duct divides into two branches, a little anterior to the acetabulum, and also the excretory bladder, while the other longer branch continues laterally and supplies the lateral, dorsal, and ventral part of the acetabulum and also the body in this region. At the anterior end, the longitudinal duct divides into two, which send four recurved branches on the dorsal and the ventral sides of the oral sucker. During their course the two longitudinal ducts supply branches to the various organs of the body forming plexuses round them. The intestinal caeca are richly supplied with branches from the longitudinal ducts of their sides. The branches are simple and small and never more than two branches are given off from a single original branch except in the posterior region of the body. The terminal knobs of the branches are of moderate size.

***Olveria bosi* Tendon, 1951**
(Plate 3)

The lymphatic system in *Olveria bosi* consists of two longitudinal vessels one on either side, running internal to the intestinal caeca. As in *G. indica* they give out branches in all directions. Anteriorly the longitudinal vessels give out 4 or 5 branches forming plexuses near the oral sucker while the main ducts turn posteriorly forming inverted-U at their ends. Posteriorly the main ducts cross the intestinal caeca and run on the sides to reach the acetabulum. The

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Original Research Paper

Zoology

SEASONAL VARIATIONS IN THE INCIDENCE OF INFECTIONN IN AQUATIC SNAILS

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Mohd.Shoeb — Department of Zoology, G.F.College, Shahjahanpur, U.P

ABSTRACT It is seen that the percentage of infection in a particular species of snail is not constant either in different months of a season or during the same seasons and different years. It is also seen that the occurrence of amphistome infections is seasonal; the incidence of infection being high both in the South-west monsoon and Post-monsoon seasons. Trematode infections have been found to be high both in Post-monsoon and winter seasons.

KEYWORDS : Seasonal incidence, Amphistomes, Trematodes, Snails

INTRODUCTION

Sewell (1922) and Porter (1938) have rightly pointed out that to estimate the degree of seasonal incidence of infection in snails it is absolutely necessary that one should confine his attention to a definite locality all the year round. Sewell is of the opinion that to arrive at definite conclusion one should examine a large number of snails individually from a definite locality to estimate the intensity of infection and to study them for several years by tubing and dissecting them.

GEOGRAPHICAL LOCATION AND CLIMATE OF ETAH DISTRICT

The district of Etah lies in the U.P. State, in northern India. Geographically it is located between the parallels of 28° 1' and 28° 54' north latitude and those of 78° 56' and 79° 47' east longitude. In its general appearance the district is an open plain, sloping gradually from north of south. During the winter, the coldest months are January and February. After February, the temperature rises gradually in March and April, reaching its maximum in May and June. It then falls gradually due to rain in July, August and September. The end of the October marks the commencement of winter. The average rain fall for the whole district is near about 44 - 45 inches, but the total varies considerably in the different sub-divisions, being much greater in the north than in the South and specially the south - west. The maximum and minimum temperature usually found in the district in different months of the year.

MATERIAL AND METHODS

For the present study, the year was divided into four seasons according to the Metrological Department, Poona (India): (1) Winter season comprising December, January and February, (2) Hot weather season consisting of March, April and Maya, (3) South-West Monsoon Season comprising June, July, August and September, and (4) Post-monsoon season in October and November. Snails were collected mainly in the morning hours from various sources. They were sorted out, counted and examined for amphistome cercariae and other trematode infection on the same day, using Leiper's (1915) Test-tube technique.

RESULTS AND DISCUSSION

During the present survey the nature and extent of variations in the incidence of Amphistome and other trematode infection in aquatic snails in the above four seasons were studied.

AMPHISTOME INFECTION

On a perusal of Table 1, it is seen that the occurrence of amphistomes infections is seasonal; the incidence of infection being high both in the South-west monsoon and Post-monsoon seasons. As for the individual species, *L. exustus* was found to be heavily infected (12.43%) in the South-west monsoon season, *B. pulchellus* was observed to harbor maximum amphistome infection (5.52%) in the Post- monsoon, with no infection in other seasons. *G. convolusculus* carried only light infection, the maximum (3.46%) in Post-monsoon and minimum (0.49%) in winter, while no amphistome infection was found in Hot weather.

Table1 - Seasonal variations in the % incidence of amphistome infection in Snail

Snails Species	Seasons in different years											
	Post -monsoon (Oct-Nov)			Winter (Dec-Feb)			Hot Weather (Mar-May)			South-West monsoon(June-Sept)		
	2000	2001	2002	2000-2001	2001-2002	2002-2003	2001	2002	2003	2001	2002	2003
B.pulchellus	1.81	2.63	16.9+	-	-	-	-	-	-	-	-	-
G.convexiusculus	2.76	2.60	4.58	0.51	0.55	0.39	-	-	-	-	0.98	2.02
L.exustus	5.63	7.26	4.71	5.73	4.87	1.69	-	-	-	5.55	5.08	17.2
L.luteola	13.33	15.38	4.91	-	4.7	-	-	-	-	-	-	-
L.auricularia	-	-	-	-	-	-	-	-	-	-	-	-
M.lineatus	-	-	-	-	-	-	-	-	-	-	-	-
M.tuberculata	-	-	-	-	-	-	-	-	-	-	-	-

TREMATODE INFECTIONS OTHER THAN OF AMPHISTOMES

Trematode infections have been found to be high both in Post-monsoon and winter seasons. Only one species, i.e. *L. exustus* showed the maximum infection (25.12%) in the South-west monsoon, and minimum (3.57%) in the Hot weather. In *L. exustus* second rise in infection was observed in Winter (16.52%) and Post-monsoon(16.52%). *L. luteola* was found heavily (16.87%) infected only in the Post-monsoon and lightly (10.52%) in Winter, with no infection in Hot-Weather and South-west monsoon seasons. *L. auricularia* was found infected in all the seasons, the maximum (14.83%) infection being in the Post-monsoon and minimum (4.42%) in Hot weather. *B. pulchellus* was found infected throughout the year, the maximum (29.62%) infection being in the Winter and minimum (2.19%) in Hot weather. In the Post-monsoon period, *B. pulchellus* carried 8.15% infection and in South-west monsoon

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Original Research Paper

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STUDIES ON THE INCIDENCE AND NATURE OF AMPHISTOME INFECTION IN SNAILS

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ABSTRACT In all 17,074 specimens of snails belonging to the following seven species, *Melania (T.) lineatus* (Muller), *M. (T.) tuberculatus* (Muller), *Lymnaea luteola* Lamarck, *L. auricularia* (Draparnaud), *Indoplanorbis exustus* (Deshayes), *Gyraulus convexiusculus* (Hutton), *Bulimus pulchellus* (Benson) were collected and examined. During the present survey, out of 17,074 snails examined only 190 snails, i.e. 1.11% were found to be positive for amphistome infection and 862 snails, i.e. 5.04% were found positive for cercariae of other trematodes.

KEYWORDS : [illegible]

INTRODUCTION

Domestic animals are most important to the economy of a country in form of milk industry, food industry, leather industry and their byproducts. The amphistomatous parasites of these animals play a vital role in form of heavy economic loss to the country due to poor health heavy mortality of such animals caused by the heavy infection of these amphistomes in adult as well as immature forms. Large numbers of trematodes have been reported from Indian cattle, buffaloes, sheep, goats and other domestic animals. The amphistomes are the most common trematodes which cause heavy mortality among the livestock. Therefore the present study was undertaken on the occurrence of adults and larval amphistomes in aquatic snails.

MATERIAL AND METHODS

Snails were collected mainly in the morning hours from various sources. They were sorted out, counted and examined for amphistome cercariae and other trematode infection on the same day, using Leiper's (1915) Test-tube technique. A Survey of the incidence and nature of amphistome infection in aquatic snails in Etah District (U.P.) was carried out for a period of 36 months, i.e. from October, 2000 to September, 2003.

RESULTS AND DISCUSSION

In all 17,074 specimens of snails belonging to the following seven species were collected and examined *Melania (T.) lineatus* (Muller), *M. (T.) tuberculatus* (Muller), *Lymnaea luteola* Lamarck, *L. auricularia* (Draparnaud), *Indoplanorbis exustus* (Deshayes), *Gyraulus convexiusculus* (Hutton), *Bulimus pulchellus* (Benson). Small number of the following species of snails were also examined but they were found to be negative for amphistome infection except to snail marked (*) which was found infected only once for *Cercaria bansipurensis* n.sp *Cyclophorus* (*Litostylus*) *involvulus* (Muller), *Vivipara bengalensis* (Lamarck), *V. dissimilis* (Muller), *Pila globosa* (Swainson), *Pila sp.*, **Helicorbis coenosus* (Benson), *Lamellidens marginalis* (Lamarck).

INCIDENCE OF AMPHISTOME INFECTION IN AQUATIC SNAILS

During the present survey, out of 17,074 snails examined only 190 snails, i.e. 1.11% were found to be positive for amphistome infection; and 862 snails i.e. 5.04% were found positive for cercariae of other trematodes (Table I).

Out of 2, 910 specimens of *B. pulchellus*, only 12 (i.e. 0.41%) were found positive for amphistome infection, while 103 (i.e. 3.53%) were found to be infected with other trematodes. Jain (1976) reported 0.45% amphistome infection in *B. pulchellus* in Bareilly district (U.P.).

Out of 6,942 specimens of *G. convexiusculus*, [illegible]

from Kumaon hill. Jain (1976) reported only 0.58% snails of *G. convexiusculus* species harbouring amphistome infection and 2.8% snails were found infected with the infection of other trematodes in Bareilly district (U.P.)

Out of 1,739 *I. exustus* examined, 121 (i.e. 6.95%) were found to harbor amphistome infection and 288 (i.e. 16.56%) were infected with other trematodes. Sewell (1922) recorded that in the Calcutta area trematode infection in *I. exustus* varied from 0.5-44.2% while in the Wynaad area it ranged from 0.0-50%. Varma (1954) recorded much lower trematode infection in *I. exustus* in Bihar.

Out of 333 *L. luteola*, only 18 specimens (i.e. 5.4%) were found infected with amphistome cercariae, and 33 (i.e. 9.9%) were positive for other trematode infections. Malaki (1960) reported 32.4% infection of distome cercariae in *L. luteola* of Kumaon hills. Sahai (1967) found 5.80% of *L. luteola* positive for larval trematodes. Jain (1976) recorded 5.9% snails infected for amphistomes and 10.7% for other trematodes.

Out of 3,440 specimens of *L. auricularia* examined during the present survey. None was found positive for amphistome infection, but 258 (i.e. 7.5%) were found to harbor infections of other trematodes. Sewell (1922) recorded 33.3% and 16.6% infections in *L. acuminata* from Manipur and Assam, respectively. Bhalerao (1933) found that 40-60% *L. acuminata* (=*L. auricularia*) were infected with *Fasciola gigantic* in Almora (Uttar Pradesh). Sahai (1967) reported that 9.13% *L. auricularia* were infected with larval trematodes. Jain (1976) found no amphistome infection but reported that 8.8% snails were harbor in infection of other trematodes in Bareilly district.

Table-1 Incidence of amphistome and other trematode in snails

Snails species	No. of Snails examined	Total no. of infected snails	Percentage of total infection	Positive for amphistome infection		Positive for other trematode infection	
				No. of snails	Percentage	No. of snails	Percentage
B. pulchellus	1910	115	3.94	12	0.41	103	3.53
G. convexiusculus	6942	192	2.76	39	0.56	153	2.20
I. exustus	1739	409	23.5	121	6.95	288	16.56
L. luteola	333	51	15.31	18	5.4	33	9.9
L. auricularia	3440	258	7.5	-	-	258	7.5
M. lineatus	787	20	2.54	-	-	20	2.5
M. tuberculatus	933	7	0.75	-	-	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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Research Article

Description of Digestive Tract of *Notonecta glauca* Linn, the Indian Backswimmer

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Abstract: The backswimmer, *Notonecta glauca* Linnaeus for the morphological and bioecological investigations were collected during, the months of July to November from various ponds, ditches, and canals of Mathura and its nearby areas. These bugs were easily recognised due to their oblong, convex body; large eye; short four jointed antennae; four jointed rostrum; large triangular scutellum; anterior legs inserted at the posterior margin of the prosternum; moderate long pronotum; last joint of antennae being must shorter than the penultimate one and posterior tarsi being without unguiculi. These insects are commonly known as water boatman and backswimmer as they swim on their backs with the help of their long oar like hind legs. They are extremely predaceous and are very common around the edges of freshwater reservoirs such as ponds, lakes and streams throughout India and the way be easily taken with a net. In the present study, a detailed description of the digestive tract of the aforesaid insect has been noted.

1. Introduction

Notonecta glauca Linnaeus is the most commonly distributed insects of family Notonectidae Leach (1815) in India. These are most interesting and fascinating of all aquatic Hemiptera of the tropics and subtropics and are commonly known as backswimmer as they swim on their backs with a long oar like hind legs. These are medium sized, about 14 to 17mm long aquatic insects and are [illegible] from the all other water bugs [illegible] in the water, because they swim "Upside down" i.e. on their backs. The body is linear, developed wide posteriorly; wings well developed. Hemelytra with corium and clavus well defined membrane short without anal vein. The forelegs are relatively short and raptorial. Middle legs are somewhat shorter and used for killing the prey. Hind legs are very long, oar like with swimming hair, extended towards the head when at rest, without claws. First tarsal segment on the forelegs are so small that it is often overlooked. Scutellum well developed. Abdomen with medium keel, and carry air for respiration under the [illegible]. *Notonecta glauca* Linnaeus is very common around the edges of fresh water ponds, lakes and streams and may be easily taken with a net. They are predator hunters and feed upon many kinds of small animals including tadpoles, crustaceans, insects and their larvae etc. They sometimes even trouble bathers by infinite painful bite, when handled. They fly freely at night, leaping out of the water to take wings. Very little is known about the bionomics of these insects. The eggs are glued or inserted into the tissues of aquatic plants.

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2. Materials and Methods

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These bugs were killed by chloroform vapours, and fixed in different fixatives. Small punctures were made by microneedles to the abdominal before putting them into fixative in order to ensure proper fixation. The fixatives use were;

(1) Bouin's fluid,
(2) Alcoholic Bouin's and
(3) Zenker's fluid

Ecotoxicology
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Does seed size and surface anatomy play role in combating phytotoxicity of nanoparticles?

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Accepted: 1 January 2017

Abstract Rapid utilization of nano-based products will inevitably release nanoparticles into the environment with unidentified consequences. Plants, being an integral part of ecosystem play a vital role in the incorporation of nanoparticles in food chain and thus, need to be critically assessed. The present study assesses the comparative phytotoxicity of nanoparticle, bulk and ionic forms of zinc at different concentrations on selected plant species with varying seed size and surface anatomy. ZnO nanoparticles were chosen in view of their wide spread use in cosmetics and health care products, which allow their direct release in the environment. The impact on germination rate, shoot & root length and vigour index were evaluated. A concentration dependent inhibition of seed germination as well as seedling length was observed in all the tested plants. Due to the presence of thick cuticle on testa and root, pearl mil (xerophytic plant) was found to be relatively less sensit to ZnO nanoparticles as compared to wheat and mun (mesophytic plants) with normal cuticle layer. No corre tion was observed between nanoparticles toxicity and s size. The results indicated that variations in surface anato of seeds play a crucial role in determining the phytotoxic of nanoparticles. The present findings significantly c tribute to assess potential consequences of nanoparti release in environment particularly with major emphasis plant systems. It is the first report which suggests t variations observed in phytotoxicity of nanoparticles mainly due to the predominant differences in size and s face anatomy of tested plant seeds and root architecture

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ORIGINAL ARTICLE

Growth and Yield of *Ocimum* as a Function of Nitrogen Fertilization

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ABSTRACT

A field trial according to factorial randomize block design was conducted to evaluate the effect of nitrogen on growth, herb and seed yield of three species of Ocimum *namely* O. sanctum, O. basilicum *and* O. americanum. *The objective of the experiment was to select the better species under local conditions which ultimately improve the production of the crop. The treatments consisted of three levels of nitrogen viz. 50, 100 and 150 kg N/ha. A control without nitrogen was also maintained for reference. A uniform basal dose of phosphorous and potassium fertilizers were given to the soil before transplanting at the rate of 20 kg P/ha and 30 kg K/ha respectively. The different parameters such as plant height, number of branches per plant, fresh and dry herb yield per plant were investigated at 50, 70 and 90 DAP; whereas the yield parameters like oil content in herb, seed and oil yield were measured at harvest (90 DAP). It is revealed from our results that 90 N kg/ha, O. americanum as well as its interaction were found best among all the tested treatments at all the sampling stages except for the oil content which gave the best result at 100 kg N/ha. Thus, the application of nitrogen at the rate of 150 kg N/ha under the local climatic condition could be recommended for maximising herb and oil yield.*

Key words: Ocimum, *Nitrogen fertilizer, Oil Content, Seed and Oil Yield*

INTRODUCTION

Most of the crude drugs which are used in medicinal preparations come from the state of their wild growth. Natural resources are going to deplete day by day due to excessive exploitation. Therefore, it becomes necessary to bring these plants under domestication to combat the required demand of resultant product. Since long time, there has been increasing demand for traditional drugs in the world market (Kumar *et al.* 2011). According to a report of WHO (2008), about 65-80% population of developing countries diverted towards traditional system of medication for their primary health care because of some ill effects produced by other system of medicine (Akhtar *et al.* 2014a; Swami et al. 2016). *Ocimum* (commonly known as Basil) belongs to the family Lamiaceae (Mint family) and is grown for herbs which are rich with numerous aromatic plant species used traditionally as a medicinal plant in the treatment of various ailment as well as in pharmaceuticals, perfumery and cosmetic industries (Simon *et al.* 1999, Javanmardi *et al.* 2002). Moreover, it also possesses various beneficial effects, e.g., antiseptic, carminative, antimicrobial and anti-oxidative as well as insect-repelling properties and toxic activities (Baranauskiene *et al.* 2003, Telci *et al.* 2006, Akhtar *et al.* 2014b).

Nutrition plays very crucial roles in overall growth and development of various crop plants under diverse agro-climatic conditions. Among different nutrients, nitrogen (N), phosphorus (P) and potassium (K) are required in somewhat larger quantities and, therefore, deserve a special attention (Noggle and Fritz, 1986, Salisbury and Ross, 1992). In the case of medicinal plants that synthesize essential oils, use of proper nutrients can increase oil yield and quality by enhancing the amount of biomass per unit land area, leaf area development and photosynthetic rate (Daneshian et al. 2009; Singh *et al.* 2016). Moreover, the essential oil content and its composition are also affected by plants genotypes, agro-climatic conditions and agricultural practices (Ram *et al.* 2003, Swamy *et al.* 2016). Nitrogen is one of the important essential nutrients and is used by plants to build many organic compounds: amino acids, proteins, enzymes and nucleic acids. Accordingly, N plays an important role in synthesis of the plant constituents through the action of different enzymes (Salisbury and Ross, 1992). As nitrogen is an integral part of chlorophyll molecule, it

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ORIGINAL ARTICLE

The Role of *Jatropha curcas* Seed Oil in the Sustainable Development: An Overview

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ABSTRACT

Utilization of natural renewable resources has been gaining lot of attention of researchers now-a-days for the development of specialty chemicals and other useful materials. Renewable resources have ability to grow again and again, ultimately reduce the dependency on non-renewable resource petrochemicals, which is going to deplete day by day. Among numerous renewable resources vegetable oils especially those obtained from variety of seeds have received lot of attention of researchers, due to their distinctive properties and eco-friendly characteristics. Jatropha curcas seed oil (JCSO) classified as a non-edible, abundantly available in the spectrum of nature due to easy cultivation and low maintenance. In present communication effort has been made to overview the utilization of JCSO in different areas of practical utility.

Key words: *Biodiesel, Biopolymer, Jatropha curcas seed oil, sustainable development*

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INTRODUCTION

Development of eco-friendly products and energy generating sources using materials obtained from renewable natural resources have gain considerable attention now-a-days throughout the world [1-3]. Such developments not only reduce the emission of green house gasses but also provide a sustainable platform to the chemical industries as they have ability to grow again and again [4-6]. Furthermore, their productivity can be increased on demand by more cropping and plantations. Numerous agricultural wastes have been utilized to architect the numerous bio-based materials and documented in literature. Furthermore, vigorous efforts continue to utilize these raw materials in more useful way to overarching the goal of sustainability [7-8]. Among different renewable resources vegetable oils (VO) especially those obtained from seeds of different plants have largely spotted by the researchers due to their unique properties, such as ease of availabilities, functionalities for derivatizations and non-toxicity during processing [9-11]. Utilization of vegetable oils of non-edible categories in the development of useful materials is additionally significant as they are also not affecting the stock of edible materials.

Jatropha curcas is belonging to Euphoriaceae family, a shrub or small tree found in tropical and subtropical parts chiefly in America and Africa [12-15]. It can be propagated easily by seeds or cuttings. It grows wild in tropical and subtropical regions, hardy to dry weather conditions. It found to show the drought resistance properties too. It grows upto

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(3)

Effects of Thiamine Hydrochloride on plant growth and nutrient uptake of mustard

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Abstract

A factorial randomized field experiment was conducted to study the seed soaking effect of different concentrations of thiamine hydrochloride solution on two mustard cultivars. The seeds of mustard (*Brassica juncea* L. Czern & Coss.) cultivars 'Rohini' and 'Varuna' were soaked in 0.01, 0.02, 0 % aqueous solutions of thiamine hydrochloride along with water soaked control. A uniform basal dose of 90kg N, 30kg P and 30kg K/ha were given to soil at the time of sowing in the form of urea, mono calcium super phosphate and muriate of potash respectively. The effect of these treatments was observed on shoot length, dry weight/ plant, leaf area, leaf area index and nitrogen content and its uptake at 40, 60, 80, 100 and 120 L after sowing (DAS), crop growth rate, relative growth rate and net assimilation rate at 0-40, 40-60, 60-80, 80-100 and 100-120 days. In general plants rose from 0.03% soaking treatment enhanced values for various parameters studied, whereas in between two tested varieties, 'Varuna' performed better. Interaction effect of soaking × variety was found to be non-significant for the most of the characters studied except for the dry weight, CGR and RGR. For dry weight it was significant at 100 and 120 DAS whereas for CGR the interaction effect was significant only between 40-60 DAS period. It was found that values for variety Rohini at water soaked control and 0.03% treatments were significantly different and were at par with 0.01 and 0.02% treatments. Interaction effect of RGR was found to be only significant at final stage, where it was found that variety Varuna at 0.02% treatment gave significantly inferior value to 0.01 and 0.03% treatments, whereas variety Rohini at 0.02% treatment was significantly superior to these two other treatments. In case of nitrogen uptake at all sampling stages, 0.03% thiamine hydrochloride again proved to be the best and gave significantly higher values than water soaked control which were 75.14, 35.5, 41.49, 19.41 and 20.13 percent more at 40, 60, 80, 100 and 120 DAS respectively. Though the interaction effect was found to be non-

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Allelopathic effect of aqueous extract and hot water extract of different parts of *Eclipta alba* (L.) Hassk. on *Malva sylvestris* L. germination and growth

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Abstract

The allelopathic potential of *Eclipta alba* using *Malva sylvestris* L. as model plant. The different concentrations (0.5%, 1%, 2%, 4%) of cold and hot aqueous extract of different parts of *Eclipta alba* were applied to determine their effect on emergence percentage, radicle and plumule length of test plant. The seeds of test plant were soaked on filter paper of Petri dishes (4" diameter) moistened with respective extracts. The treatments were arranged in completely randomized design with three replicates of each concentration. A control was set up having the filter paper saturated with water only. Both the cold and hot water extract have no effect on emergence percentage. Aqueous extracts from all parts (root, stem, leaf) reduced plumule and radicle length of the test plant. It was observed that hot water extract of leaves, stem and root shown more inhibitory effect than cold water extract. The reduction in both cases were in this order; leaves>root>stem.

Allelopathy refers to the production and exudation of chemical compounds, including secondary metabolites, harmful to other species or their functions and influencing the growth and development of agricultural and biological systems[5,23]. These chemicals are largely classified as secondary metabolites (such as alkaloids, isoprenoids, phenolics, flavonoids, terpenoids and gluconolates etc.[16]. These chemicals with allelopathic potential exist in almost in all plants and most of the tissues. These chemicals are released directly from living plants into the environment through root exudation, leaching, volatilization and passively liberated through the decomposition of plant residues[23]. Allelopathic substances released by the plants accumulate in soil to physiologically active leve[12,24]. These allelochemicals are found to accumulate and persist for considerable time, thus, significantly interfering with the growth of neighbouring plants and weeds[17,18]. Integrated weed management is one of such approaches where allelopathy can play its eco-friendly role in weed management[9]. The allelopathic properties of plants can be exploited successfully as tool

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Allelopathic potential of *Eclipta alba* (L.) Hassk. against crops (*Phaseolus aureus* Roxb. and *Oryza sativa* L.) and weeds (*Cassia tora* L. and *Cassia sophera* L.) plants

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Abstract

A petridish assay was carried out to study the allelopathic effect of aqueous extract of different parts of *E. alba* on seedling growth and dry biomass of crop (*Phaseolus aureus* and *Oryza sativa*) and weed (*Cassia tora* and *Cassia sophera*) plants. Aqueous extract of leaf, root and stem were prepared by soaking dried plant parts of *E. alba* in water (1:2 w/v) for a period of 24h. The aqueous extract from root, stem and leaf had no effect on seed germination of test plants. When compared to control, aqueous extract from leaf, stem and root significantly reduced growth and dry biomass of test plants. Weeds were more sensitive to extracts than crops. The negative effect of leaf extract on seedling growth and dry biomass were more pronounced followed by root and stem extract and overall effects of extracts were positively correlated with extract concentration (0.5%,1%,2% and 4%). The study therefore indicated the release of growth inhibitors (allelochemicals) which exhibited the allelopathic stress against seedling growth and dry biomass of test species.

Allelopathy refers to the production and exudation of compounds, including secondary metabolites, harmful to other species or their functions and influencing the growth and development of Agricultural and Biological systems[1,22]. These allelo-pathic effects are due to inhibitory substances (allelochem-icals) that are released directly from living plants into the environment through root exudation, leaching, volatilization, and passively liberated through the decomposition of plant residues[22]. Allelochemicals released and leached from the aerial and decomposed parts of donor plants finally enter into the soil. In many situations, the chemicals may reach other plants (receivers) through transport from the donor plants in the soil and may induce the inhibitory or stimulatory activity on the receiver plants. All plant parts including leaves, stems, pollen, flowers, roots, buds, rhizomes, seeds and fruits have been shown to contain allelochemicals, but leaves and roots are the most important source[2,23].

Eclipta alba (L.) Hassk. Is a small branched annual herbaceous plant belonging

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RESEARCH PAPER

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Post–harvest Changes in Acid Invertase activity as a result of some Chemicals Sprays in Sugarcane Cultivars

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ABSTRACT

E ect of some chemicals (water spray, Sodium metasilicate (1%) , Sodium azide (1%), Lime (1%), Trash covered, Ammonium bi oride(1%), Benzoice acid(100ppm), Ampicillin compound(500ppm), Zinc sulphate(1%), Salicyclic acid (1%) sprays applied on harvested cane to assess the magnitude of post-harvest acid invertase enzyme ac vity at an interval of 24 hrs upto 240 hours taking harvested cane separately as Control for comparisons. There was a marked decrease in acid invertase ac vity with the passage of me appreciably due to chemicals spray treatments including trash covered in all the four Sugarcane cul vars (CoS 8272, Co0238,CoS8279 and CoS011) as compared to untreated control harvested cane at all stages up to 240 hrs indico ng possibly to minimize post-harvest sugar losses. Best treatments were signi cant par cularly by applica on of Sodium Metasilicate, Ampicillin Compound and Trash Covered in minimizing sugar losses as compared to control. Variety Co5011 responded most to these treatments in sugar losses throughout the study.

Keywords: Post-Harvest, Acid Invertase Ac vity, Sugarcane and Chemical Sprays.

INTRODUCTION

Invertase is a hydrolase and cleaves sucrose into two monosaccharides during post harvest deteriora on of Sugarcane stalks degrading most essen al part sucrose of commercial cane suger (CCS).It becomes important for farmers and Sugar mills (the top priourity) to check losses during cut to crush period par cularly when me lag which some mes exceeds more then 3 days or more entailing excessive losses in recoverable Sugar due to deteriora on of harvested cane (Solomon et al. 2001), especially during late crushing season (temp. 38-42° C). Some me due to surplus cane produc on or due to late func oning of Sugarmills, extension of milling season is a very common phenomenon leading to tremendous loss in sugar recovery. In the past many authors have discussed and tried various physico chemical methods in minimising the sucrose losses in Sugarcane (Chanda et al. 2012,Kumar and Devdas 2012,Mahadeviah and Ansari 2013,Misra et al 2017) .The present study was aimed to study the e ect of some chemicals spray solu ons applied on harvested cane to curtail acid invertase ac vity to cut down the post-harvest sucrose losses in Sugarcane from harvested cane upto 240hrs lag period.

MATERIALS AND METHODS

The experiment was conducted at the experimental eld of G.F. College, Shahjahanpur U.P located at la tude 27°53 N, longitude 79°54'E, and at 154.53 meter. It has a semi-arid and sub-tropical climate of tarai region with hot dry summers and cold winters. Four Sugarcane varie es, (COS 8272 and Co0238)two early maturing

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ANTIBACTERIAL ACTIVITY OF AEGLE MARMELOS LEAF EXTRACRACTS

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Abstract- Since ancient times, medicinal plants are well known for antimicrobial activity due to the presence of various bioactive constituents; therefore they become important sources of antimicrobial drugs. The antibacterial activity of acetone, chloroform and benzene leaf extracts of *Aegle marmelos* was evaluated by well diffusion method. During the analysis *Pseudomonas aeruginosa* and *Staphylococcus aureus* both showed significant sensitivity for all the extracts and inhibition was measured as 18mm zone of inhibition for both bacteria at the concentration of 100µg/ml test sample. The minimum activity was reported against *Escherichia coli*. The overall study concluded that plant *Aegle marmelos* have potential antimicrobial activities which help in the development of new antimicrobial drugs against resistant micro-organisms.

Keywords-*Aegle marmelos*, Antimicrobial activity, Minimum inhibitory concentration, *Pseudomonas aeruginosa*

I. Introduction

During last two decades, it has made massive investments on pharmacological, clinical and chemical researches all over the world in an effort to discover still more potent plant drugs. About 250,000 living plant species contain a much greater diversity of bioactive compounds than any chemical library made by humans but only few plant species have been systematically investigated for the presence of bioactive compounds (Wakdikar, 2004). So, a large number of medicinal plants still remain to be investigated for their possible pharmacological values. But systematic efforts were not made to test the efficacy and toxicity of folklore herbs on scientific basis or to standardize their evaluation procedure. *Aegle marmelos*, commonly known as bael also called Bengal quince, golden apple, Japanese bitter orange, stone apple, or wood apple, is a species of tree native to India and Bangladesh. It is present throughout Southeast Asia as a naturalized species. It is sacred tree and used to worship Lord Shiva. The bael leave considered as the three eyes or trident weapon of Lord Shiva. The bael fruit sometimes referred as Shreephal and worshiped in many hindu houses. The leaves are used for a diabetic. The infusion of leaves can be used against peptic ulcer. Leaves are also useful for the treatment of Jaundice, leucorrhea, wounds, deafness, conjunctivitis. Raw leaves can be used to cure gastric problems and irritation in the bowel. Oil prepared from leaves is proved to stop insect infestation. The leaves are also used in pediatric disorder. Extract from leaves is used in the anti-fungal activity. Aqueous extract of *Aegle marmelos* leaves, was evaluated for hypoglycemic and antioxidant effect by Upadhya et al., (2004). Maheshwari et al., (2009) studied on ethanolic extract of dried fruit pulp of *Aegle marmelos* against various intestinal pathogens i.e. *Shigella boydii, S. sonnei* and *S. flexneri* and proposed that certain phytochemicals including phenols, tannins and flavonoids were effective against all. It was also confirmed by Kaur et al., (2009) by getting treat *E. coli* with *Aegle marmelos* fruit extract. Citarasu et al, (2003) also experimented *Aegle marmelos* on certain pathogenic bacteria like *Salmonella typhi, Pseudomonas aeruginosa, Aeromonas hydrophyla* and *Vibrio sp.*, and concluded its positive bactericidal effects. The present investigation was undertaken to test the antimicrobial activity of leaf extract of bael plant against selected pathogens.

II. Materials and Methods

Plant Material

The leaves of *Aegle marmelos* were collected from local area of Shahjahanpur district of Uttar Pradesh (India) and were authenticated by Dr. Zafar Abbas, Head of Botany Department, Gandhi Faiz-e-Aam College, Shahjahanpur and a voucher specimen BT/18 has been submitted to the herbarium of department for reference sample.

Bacterial Cultures

Staphylococcus aureus (NCIM-2079), *Pseudomonas aeruginosa* (NCIM-2036) and *Escherichia coli* (NCIM-2064).

Solvents and Media

Chloroform, Benzene and Acetone were used as solvents for extraction. Nutrient Agar

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Synthesis, Characterization and Biological Activities of Some 5-benzophenonyl-3-mercapto-4-substituted-1,2,4-triazoles

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ABSTRACT

The novel compounds 5-benzophenonyl-4-amino (benzylidene)-3-mercapto-1,2,4-triazole, 5-benzophenonyl-3-mercapto-4-pyrrolidine-1,2,4-triazole and 5-benzophenonyl-4-amino-[illegible]-3-mercapto-1,2,4-triazole were synthesized from the starting compound [illegible]. These synthesized compounds were screened for their antibacterial activities on *Escherichia coli*, *Streptococcus pyogenes* and *Pseudomonas aeruginosa* and antifungal activities on *Candida albicans*, *Aspergillus niger* and *Aspergillus clavatus*. The compound-7 was found to be more active against *C. [illegible]* while compound-8 exhibited greater activity against *A. niger*.

Keywords: 5-benzophenonyl-3-mercapto-4-substituted-1,2,4-triazole, Antimicrobial activity.

INTRODUCTION

Heterocyclic chemistry is one of the most important branches of organic chemistry, which constitute the largest and varied family of organic compounds. These are the widely found in nature particularly in nucleic acid, protein, alkaloids, haem, chlorophyll, vitamins and hormones. 1,2,4-triazoles and its derivatives are an important class of compounds which show a wide range of pharmacological properties such as antifungal[1,2], antibacterial[3,4], antimalarial[5] and antiviral[6]. Benzfused azoles are the example of such important chemicals in a variety of naturally produced compounds and they are also important target in drug discovery[7]. The derivatives of 5-benzophenonyl-3-mercapto-4-substituted-1,2,4-triazoles are prepared through mannich reaction. They also exhibit analgesic[8], antidiabetic[9] and antitumor[10] activities.

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ORIGINAL ARTICLE

Conformational isomers of dichloro *bis* (1,3-diaminopropane) copper(II): Synthesis, characterization and DFT modeling

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Conformations;
Propanediamine;
Octahedral

Abstract Three isomers of [Cu(pn)$_2$Cl$_2$] in solid state have been synthesized, isolated and characterized by elemental analysis, molar conductance, FTIR, TGA, EPR, electronic spectra and DFT calculation. The molar conductance of 1 mM solution of the complexes measured in DMSO falls in 30–34 Scm^2 mol^{-1}. All the isomers in aqueous medium show similar absorption pattern in the UV–visible region of the spectra. They are nearly identical in solution although in the solid state they exist in three distinct colors. The change in the color of complexes is due to change in conformations of the propanediamine molecule. Cu(II) in [Cu(pn)$_2$Cl$_2$] lies on an inversion center. It is octahedrally coordinated to four nitrogen of 1,3-diaminopropane (pn) and two chloride ions displaying three different spatial conformations namely chair–chair, chair–boat and boat–boat. The TGA of the complexes suggests that Cu is left as final residue at 600 °C. The entire data have been supported by DFT calculation.

1. Introduction

Metal ions and organic ligands are two potent and necessary components for designing discrete molecules, however, covalent and hydrogen bonding interactions are important factors which have the ability to control the molecular topology of varying conformations (Ribas et al., 1999; [illegible] et al., [illegible]). Hydrogen bonds play a major role in the widening of [illegible] angle [illegible] the ideal 90° value (Allen, 2002). Since the energy of hydrogen bond is much lower than a covalent bond, it does not predominantly affect the electrical and magnetic properties of the [illegible].

1,3-Diaminopropane may coordinate with Cu(II) [illegible] in [illegible] of planar conformation (Sundberg et al., [illegible]; [illegible] et al., 2005; Ribas et al., 1991; Hay et al., 1997). The reluctance

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Antimicrobial Activity of Some Indian Medicinal Plants

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Abstract

Ethnopharmacology has contributed to the discovery of many important plant-derived drugs. Four different plant extracts were tested for antimicrobial activity in vitro, using well diffusion method. Benzene extract of *S. aromaticum* (100µl) showed highest antimicrobial activity (19mm) against *P. aeruginosa*. All extracts of all four plants showed moderate activity against *E. coli* and *E. aerogenes*. *C. sativum* and *C. longa* were not effective against any pathogen. In future, these plants can be further subjected to isolation of the therapeutic antimicrobials for health purposes as medicine.

Keywords: Agar Well Diffusion, Medicinal Plants, *P. Aeruginosa*, *S. Aromaticum*

Introduction

Ethnopharmacology has contributed to the discovery of many important plant-derived drugs (Singh et al., 2011, Soejarto, 1996). Since prehistoric times man has used plants for various purposes and he will continue to do so as long as life continues on this planet. Even in an age of substitute man-made materials, plants and plant products are still in great demand. Plants purify the air we breathe and serve as food for both man and beast; they are a source of fuel for cooking, lighting, heating and provide materials for building and construction (Martino et al., 2002). In the present work, 4 different medicinal plants belonging to different families were evaluated for their antibacterial properties.

Review of Literature

In recent years usage of commercial anti-microbial drugs against human pathogenic microorganisms increased extensively. Numerous studies have been carried out on various natural products screening their antimicrobial activity. Effective antimicrobials have been developed over the past years, several reports development of antibiotic resistance of human pathogens to available antibiotics (Martino et al., 2002).Due to the cost effectiveness, safety, increasing failure of chemotherapy and antibiotic resistance, search for plant resources has been increased for their potential antimicrobial activity (Hammer et al., 1999). Kaur et al., 2017, Yadav et al., 2018 and Yadav., 2018 tested the antimicrobial activity of plants and showed that plants are a potential source of innovative antibiotic prototype.

Objective of the study

The present investigation was performed to study the antimicrobial [illegible] Indian medicinal plants against four pathogens.

Methodology

Materials and Methods

Plant Material

S.No.	Plant	Material
1	[illegible]	Fruit
2	[illegible]	Buds
3	*Coriandrum sativum*	Fruit
4	*Curcuma longa*	Rhizome

Bacterial Cultures

The microorganisms used were *Staphylococcus aureus* (NCIM-2079), *Enterobacter aerogenes* (NCIM-2695), *Escherichia coli* (NCIM-2064), and *Pseudomonas aeruginosa* (NCIM-5210).

Solvents and Media

Acetone, Benzene and Methanol solvents for extraction, Nutrient Agar.

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Phytochemical Screening of Five Medicinal Plants

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Abstract

For drug discovery and development detection of the bioactive principles present in medicinal plants is a valuable step. The present study deals with phytochemical screening of five medicinal plants for alkaloids, carbohydrates, flavonoids, glycosides, proteins, phenols, saponin, steroid, tannin and terpenoids. All the five plants were found to contain glycosides and terpenoids. Alkaloids were present only in black pepper and garlic. Phenols were present in all except black pepper and garlic. Proteins were present only in garlic. Tannins were present in all except cinnamon and clove. Highest number of bioactive compounds were present in garlic followed by guava and lowest in clove.

Keywords: Alkaloids, Glycosides, Medicinal Plants, Terpenoids.

Introduction

In developing countries major part of the total population uses traditional folk medicine obtained from plants. Plants are valuable source of natural products for maintaining human health, as studies on natural therapies have intensified. More than 150 000 plant species have been studied and several of them contain therapeutic substances and the use of plant compounds for medicine has gradually increased.

Review of Literature

World Health Organization says that medicinal plants are probably the best source of a variety of drugs. About 80 % of population in developed countries use traditional medicine containing compounds derived from medicinal plants (Castello et al., 2002). India is rich in biodiversity and it offers a unique opportunity for drug discovery research. A number of traditional natural products have been increased and much work has been done on selected ethno medicinal plants for antibacterial activity against pathogenic strains of both Gram negative and Gram positive bacteria (Jachak, 2007, Singh, 2002). The bioactive constituents from plant origin show antimicrobial activity against some microorganisms like bacteria, fungi and protozoa. Antimicrobial drugs either microbicidal (kill microbes) or microbistatic (prevent the growth of microbes). Thus, the drugs derived from plants have shown great promise in the treatment of various diseases including viral infections caused by microorganisms due to their antimicrobial activity (Kaur et al., 2017, Yadav et al., 2018 and Yadav, 2018). The present study deals with phytochemical screening of five medicinal plants for alkaloids, carbohydrates, flavonoids, glycosides, proteins, phenols, saponin, steroid, tannin and terpenoids.

Objective of The Study

The present investigation was performed for phytochemical analysis of five medicinal plants.

Methodology

Collection of Plant Material

Plant materials were collected from local market of Shahjahanpur and identified by Department of Botany, Gandhi Faiz-e-Aam College, Shahjahanpur. [illegible] stored in laboratory for future use.

Preparation of Extract

[illegible] powdered material was used for solvent extraction via Soxhlet [illegible] following standard protocol (Nag et al., 2012). After the complet[illegible] collected extracts were subjected for evaporation at room temperature. The dried extracts were stored at 4°C for future analysis.

Phytochemical Screening

Phytochemical screening was carried out to determine the presence of [illegible] tannins, flavonoids, glycosides, terpenoids, phytosterols and cardiac glycosides, proteins, carbohydrates and phenols.

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E: ISSN NO.: 2455-0817 *Remarking An Analisation*

Antibacterial activity of Indian spice Black pepper (Piper nigrum L.)

Abstract

Many spices—such as clove, oregano, thyme, cinnamon, and cumin—possessed significant antibacterial and antifungal activities against food spoilage bacteria and even antibiotic resistant microorganisms. Piper species have been used in traditional medicine for intermittent fevers and to promote the secretion of bile. The antibacterial activity of seed extracts of Black pepper was evaluated in vitro, using well diffusion method. Three different extracts of pepper were used which included acetone, methanol and benzene. The maximum zone of inhibition was against *Pseudomonas aeruginosa* (18mm) and *Staphylococcus aureus* (18mm) at 100 µl/ml of benzene extract. Minimum activity was shown in both acetone and methanol extract. Antimicrobial activity of extracts increases as the concentration increases against all the bacteria.

Keywords: Black Pepper, Minimum Inhibitory Concentration, Pseudomonas aeruginosa and Zone of Inhibition.

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Introduction

The systematic investigation of drugs of plant origin used in indigenous medicine on modern scientific lines was started more than thirty years ago and much has been accomplished during this short time. A number of important medicinal plants prescribed by the Vaids and Hakims have been carefully investigated from every point of view. Their chemical composition has been determined, the pharmacological action of the active principles worked out by animal experimentation and it is only be such a thorough enquiry that the real merits of these drugs have been proved (Zafar, 1994). Due to alarming incidence of antibiotic resistance in bacteria of medical importance, there is a constant need for new and effective therapeutic agents (Ahmad et al., 1998, Bhawani and Ballow, 2000). However, there has also been a rising interest for natural products from plants for the discovery of new antimicrobial and antioxidant agents in the last three decades and in recent times. More so, many of these plants have been known to synthesize active secondary metabolites such as phenolic compound found in essential oils with established potent insecticidal and antimicrobial activities, which indeed has formed the basis for their applications in some pharmaceuticals, alternative medicines and natural therapies (Meghwal and Goswami,2012). Black pepper (*Piper nigrum*) is well-known cooking herbs and the extracts are used as medicinal products. Black pepper is produced from the still-green, unripe drupes of the pepper plant which has a bitter, hot, sharp taste, tonic to the liver, stomachic, emmenagogue, abortifacient, aphrodisiac and digestive. Black pepper alone accounts for about 35% of the world's total spice trade. The Materia Medica of Ayurveda, which dates back to 6,000 B.C., has many references advocating the use of pepper in a variety of ailments, particularly those pertaining to the gastro-intestinal tract (Akamasu,1970, Charaka,1941,Chatlandy et al., 1999, Chopra and Chopra,1959, Kaviraj,1993, Perry,1980,Ray and Nagarsheth,1976). Piperine is the active principle alkaloid of black pepper (*Piper nigrum* L.). The piperine content is 3-9% (on dry weight basis) in P. Black pepper is known to inhibit the growth of various microbes such as *Staphylococcus aureus, Bacillus subtilis, Pseudomonas aeruginosa, Escherichia coli, Alternaria alternata, Aspergillus Niger, Aspergillus flavus and Fusarium oxysporum* (Kaur et al., 2017)

Aim of the Study

The present investigations were undertaken to find the antimicrobial activity of seed extract of black pepper against selected pathogens.

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Phytochemical Screening and Antibacterial Activity of Aegle Marmelos Leaf Extracts

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Abstract

Phytochemical investigation was carried out on the chloroform extracts of the leaves of *Aegle marmelos*. Preliminary phytochemical studies revealed the presence of flavonoids, alkaloids, glycosides, steroids, phenols, saponins, terpenoid, cardiac glycosides and tannins as the chemical class present in the extracts. During antimicrobial analysis *Pseudomonas aeruginosa* and *Enterobacter aerogens* both showed significant sensitivity for all the extracts. The minimum activity was reported against *Escherichia coli*. This outcome indicates that the leaves can be useful for treating different diseases because the therapeutic activity of a plant is due to the presence of particular class of compounds and thus can serve as potential sources of useful drugs in future.

Keywords: *Aegle marmelos* Leaves Extracts, Phytochemical Screening, Antibacterial Activity.

Introduction

During last two decades, it has made massive investments on pharmacological, clinical and chemical researches all over the world in an effort to discover still more potent plant drugs. About 250,000 living plant species contain a much greater diversity of bioactive compounds than any chemical library made by humans but only few plant species have been systematically investigated for the presence of bioactive compounds (Wakdikar, 2004). Plant's secondary metabolites have been of interest to man for a long time due to their pharmacological relevance (Arora et al., 2003). The use of drugs derived from plants has been utilized as a source of many potent and powerful drugs for thousands of years all over the world (Lewis and Elvin-Lewis, 1977). Even in modern times, plant-based systems continue to play an essential role in health care and in the recent past increasing research evidence is getting accumulated, which clearly indicate the positive role of plant extracts for health care (Shabnam Javed et al., 2012). The bael fruit sometimes referred as Shreephal and worshiped in many hindu houses. The leaves are used for a diabetic. The infusion of leaves can be used against peptic ulcer. Leaves are also useful for the treatment of jaundice, leucorrhea, wounds, deafness, conjunctivitis. Raw leaves can be used to cure gastric problems and irritation in the bowel. Oil prepared from leaves is proved to stop insect infestation. The leaves are also used in pediatric disorder. Extract from leaves is used in the anti fungal activity. Aqueous extract of *Aegle marmelos* leaves, was evaluated for hypoglycemic and antioxidant effect by Upadhya et al., (2004). Maheshwari et al., (2009) studied on ethnolic extract of dried fruit pulp of *Aegle marmelos* against various intestinal pathogens i.e. *Shigella boydii*, *S. sonnei* and *S. flexneri* and proposed that certain phytochemicals including phenols, tannins and flavonoids were effective against all. It was also confirmed by Kaur et al., (2009) by getting treat *E. coli* with *Aegle marmelos* fruit extract. Citarasu et al, (2003) also experimented *Aegle marmelos* on certain pathogenic bacteria like *Salmonella typhi*, *Pseudomonas aeruginosa*, *Aeromonas hydrophyla* and *Vibrio sp.*, and concluded its positive bactericidal effects. Yadav et al., (2018) studied leaf extracts of *Aegle marmelos* against many bacterial strains and found that *Pseudomonas aeuginosa* and *Staphylococcus aureus* were most sensitive against acetone and chloroform extract.

Aim of The Study

The present investigation was performed for phytochemical analysis and to test the antimicrobial activity of leaf extract of bael plant against selected pathogens.

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क्षेत्रीय ग्रामीण बैंकों का ग्रामीण विकास में योगदान का मूल्यांकने

डॉ0 पुनीत कुमार श्रीवास्तव*

लेखक का घोषणा-पत्र

अन्तर्राष्ट्रीय शोध पत्रिका मार्क में प्रकाशनार्थ प्रेषित क्षेत्रीय ग्रामीण बैंकों का ग्रामीण विकास में योगदान का मूल्यांकन शीर्षक लेख/ शोध प्रपत्र का लेखक मैं पुनीत कुमार श्रीवास्तव घोषणा करता हूँ कि लेखक के रूप में इस लेख की सभी सामग्रियों की जिम्मेदारी लेता हूँ, क्योंकि मैंने स्वयं इसे लिखा है और अच्छी तरह से पढ़ा है और साथ ही अपने लेख/ शोध प्रपत्र को शोध पत्रिका मार्क में प्रकाशित होने की स्वीकृति देता हूँ। यह लेख/ शोध प्रपत्र मूल रूप में या इसका कोई अंश कहीं और नहीं छपा है और न ही कहीं मैंने इसे छपने के लिये भेजा है। यह मेरी मौलिक कृति है। मैं शोध पत्रिका मार्क के सम्पादक मण्डल को अपने लेख के संशोधन एवं सम्पादन की पूर्ण अनुमति देता हूँ। मार्क में लेख प्रकाशित होने पर इसके कॉपीराइट का अधिकार सम्पादक को देता हूँ।

इतिहास इस बात का साक्षी है कि भारत में सदियों से ऐसी अर्थ-व्यवस्था रही है जिसे अपनाकर प्रत्येक गाँव अपनी आधारभूत जरूरत के लिए आत्मनिर्भर रहते थे। विकेन्द्रित, अहिंसात्मक संरचना वाले गांवों की यह प्रमुख विशेषताएँ रही है कि उनके संचालन शाश्वत स्वाभाविक प्रक्रिया पर आधारित रहे है। सभी को पर्याप्त जमीन, मकान, अनाज, कपड़ा आदि प्राप्त होता रहा है। कहा जाता है कि भारत में घी, दूध की नदियां बहा करती थी। भारत को सोने की चिड़िया कहा जाता रहा है। गांवों का प्रशासन, गांवों की न्यायपालिका, सामाजिक और धार्मिक रीति-रिवाज का पालन अपने निर्धारित सिद्धान्तों पर आधारित रहा है।

गांवों के संबन्ध में कहा गया है कि ''ग्राम तो एक विशाल भूमि वाला भौगोलिक क्षेत्र होता है जहाँ लोग अपना घर बनाकर परिवार सहित निवास करते है, गाँव की विशेषता यह है कि उसका क्षेत्रफल बड़ा होता है। बनिस्पत शहरों के, जहाँ रहने के घरों की तुलना में उपलब्ध जमीन की मात्रा सीमित होती है। शहर तो सभ्य क्षेत्र है जहाँ रहने हेतु जमीन सीमित होती है, परन्तु रहने के घरों की संख्या अधिक है, परन्तु परिणामस्वरूप शहर में भीड़-भाड़ तथा सीमितता पाई जाती है। प्रो0 संतोष कुमार दास के अनुसार ''धरती के चार भाग होते है- 1. वास्तु, 2. कृषि योग्य भूमि, 3. गोचर भूमि, 4. जंगल। प्राचीन समय में वास्तु भूमि का मालिक किसान होता था। जितने युद्ध करते थे भी या, खेतों के हरण के लिए हुआ करते थे। गोचर भूमि और जंगल पर सबका अधिकार होता था।''

प्रत्येक ग्रामीण के जीवन में कृषि का स्थान सर्वोपरि रहता है। प्राचीन काल में भारत के निवासी अपने स्वयं की भूमि पर कृषि कार्य करते थे। गांव का स्वावलम्बी जीवन, भले ही उसे प्राप्त होने वाली आय नगण्य हो, शहर के ऐशो-आराम की जिंदगी की अपेक्षा जहाँ वे आत्म-सम्मान से जी न सके, कहीं अधिक श्रेष्ठ रही है। गाँव का समग्र विकास तभी संभव है। जबकि सम्पूर्ण गाँव की रचना तथा कृषि की संपूर्ण प्रक्रिया अर्थात् सभी कुछ ऐसी हो कि प्रत्येक ग्रामीण को मूलभूत व ऐशो आराम की सभी वस्तुएँ गाँव के अपने विभिन्न साधनों द्वारा ही उपलब्ध हो। यह ध्यान रहे कि ''कृषि प्रबंधन संबन्धी सारे नीति नियम पूर्व निर्धारित किये गये है।

प्राचीनकाल में किसान धनवान होता था। उसकी आमदनी खेती से, पशुओं से, बागों से और जंगल की उपज से होती थी।

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देश के विकास में क्षेत्रीय ग्रामीण बैंक की भूमिका

पुनीत कुमार श्रीवास्तव
विभागाध्यक्ष,
वाणिज्य विभाग,
गाँधी फैज-ए-आम कॉलेज,
शाहजहांपुर

सारांश

क्षेत्रीय ग्रामीण बैंक की स्थापना का मूल उद्देश्य सुदूर ग्रामीण क्षेत्रों में वैत्तिक सुविधाएं उपलब्ध कराकर ग्रामीणों का आर्थिक विकास करना है। यह विकास छोटे व सीमान्त कृषक, भूमिहीन मजदूर, ग्रामीण दस्तकार, लघु उद्योग व व्यवसाय में लगे लोगों व समाज की विभिन्न आर्थिक रीढ़ाओं से जुड़े पिछड़े वर्ग को पर्याप्त मात्रा में ऋण-सुविधा उपलब्ध कराने से हो सकता है। इस प्रकार वाणिज्यिक बैंकों की भांति क्षेत्रीय ग्रामीण बैंक भी रिजर्व बैंक द्वारा दिये गये निर्देशों का पालन करते हुये उपयोग अधिकांशतः प्राथमिकता प्राप्त क्षेत्रों का ऋण प्रदान करते हैं। वित्तीय संरचना के विस्तार के लिए सार्वजनिक क्षेत्र के बैंकों द्वारा प्रायोजित क्षेत्रीय ग्रामीण बैंकों की स्थापना भी की गयी थी।

मुख्य शब्द : ग्रामीण बैंक, उत्पादक ऋण, भारतीय रिजर्व बैंक।

प्रस्तावना

क्षेत्रीय ग्रामीण बैंकों की स्थापना का मूल उद्देश्य भारत का ग्रामीण विकास एवं कृषि विकास करना है। ग्रामीण विकास एवं कृषि विकास दोनों एक दूसरे के पूरक हैं।

क्षेत्र के विकास में बैंकों की एक विशिष्ट भूमिका होने के अनुरूप क्षेत्रीय ग्रामीण बैंकों ने अपने स्थापना काल से वर्तमान काल तक प्रगति के नये आयाम स्थापित किये हैं। अपनी स्थापना से अब तक की अल्प अवधि में क्षेत्रीय ग्रामीण बैंक ने देश के अर्द्धनगरीय एवं ग्रामीण क्षेत्रों में वित्तीय सुविधाओं को अधिक से अधिक उपलब्ध कराये जाने के दृष्टिकोण से अपनी शाखाओं को तीव्रता से विस्तार किया है। वर्तमान में सम्पूर्ण देश में 196 ग्रामीण बैंकों की स्थापना हो चुकी है। लगभग 14313 शाखाओं से देश के 500 जनपद आवृत है।

भारतीय वैत्तिक जगत में व्यापक आर्थिक सुधारों का क्रम 1991 में प्रारम्भ किया गया। इस परिप्रेक्ष्य में वित्तीय सुधार समिति का अभिगत था कि इन सुधारों के कार्यान्वयन से बैंकों की वित्तीय स्थिति में पारदर्शिता आएगी। इस क्रम में आय निर्धारण, आस्ति वर्गीकरण, पूंजी-पर्याप्तता के मापदण्डों को लागू किया गया। अब भारतीय रिजर्व बैंक ने बैंकों द्वारा प्रदत्त ऋणों पर ब्याज दरों की अविनियमन की धारणा को पूर्ण रूप प्रदान किया। इससे भारतीय वैत्तिक जगत में स्वस्थ प्रतिस्पर्धा का वातावरण एवं बैंकिंग के नये युग का सूत्रपात हुआ (एवं वैश्वीकरण की प्रक्रिया भी प्रारम्भ हुई) जिससे ग्रामीण वित्त के नये अवसर एवं चुनौतियाँ भी उभरी है।

वित्तीय एवं विकासात्मक गतिविधि एवं गतिशील प्रक्रिया है जिसका कार्य किसी युग में समाप्त नहीं होता है। बदलता हुआ सामाजिक-आर्थिक पर्यावरण, नव विकास एवं नवीन स्वरूप आवश्यकताओं के बीच अंकुरित करके संवर्द्धन के नये आयाम सृजित करता रहता है। बदलती हुई परिस्थितियों के अनुकूल ग्रामीण आवश्यकताओं में भी परिवर्तन आता रहता है। इन परिवर्तन जन्य आवश्यकताओं की पूर्ति हेतु वित्तीय एवं विकासात्मक गतिविधि का उभरे क्षेत्र और अधिक व्यापक एवं विस्तृत हो जाता है। इस महत्वपूर्ण दायित्व का निर्वहन करने हेतु आर्थिक भारतीय नव बैंकिंग के क्षेत्र में क्षेत्रीय ग्रामीण बैंक का ग्रामीण विकास हेतु वित्त पोषण गतिविधियों का मूल्यांकन महत्वपूर्ण प्रतीत होता है।

क्षेत्रीय ग्रामीण बैंकों ने गठन वर्तमान प्रतिस्पर्धा के कारण अपने लक्ष्यों के प्राप्त करने में कहाँ तक सफलता प्राप्त की है ? इसका मूल्यांकन समीचीन हो जाता है क्षेत्रीय ग्रामीण बैंकों ने ग्रामीण आर्थिक विकास में अपनी भूमिका का निर्वाहन किस प्रकार किया है ? क्या क्षेत्रीय ग्रामीण बैंक द्वारा प्रदत्त वित्त पोषण से ग्रामीण क्षेत्रों को वित्तीय एवं विकासात्मक सहयोग प्राप्त हुआ है? ग्रामीण क्षेत्र के निवासियों ने बैंकिंग आदत की जागरूकता के विकास में क्षेत्रीय ग्रामीण बैंकों की क्या भूमिका रही है ? उक्त का निष्पक्ष मूल्यांकन ही प्रस्तुत अध्ययन के प्रमुख उद्देश्य है।

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Debate on the Relevance of Grammar Teaching in ELT

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Abstract

This Paper highlights the debate on the relevance of grammar teaching in ELT-English Language Teaching. Many learners of the English language may be victims of grammar with the difficult task of learning grammar. This fear experienced by them is not unwanted. The learner's experience of being taught grammar involves memorization, drills and so on. At times methods do very little to help the learner understand the language and its structure. This has led to the questioning of the pedagogic benefits of grammar study.

The role of grammar in the language curriculum has been a topic of immense debate among the teachers and academicians. This debate is something that is not a recent development, but it has been going on for decades.

The emergence of English as a universal link language and the power of the language to broaden an individual's job opportunities have resulted in the mushrooming of a large number of establishments that promise to teach fluent English. A lot of people ultimately end up getting admitted in such establishments and institutes. At the same time the situation in the education system in India is in need of an overhaul, because even today majority of learners, despite years of learning English, are still not capable of forming grammatically correct sentences.

As a consequence, through the study of the debate about the use of grammar in teaching English or for that matter any second language, an attempt will be made to understand the arguments generated by the two warring groups and suggestions will be made at the end of the study. These suggestions are in no circumstances solutions to the debate, but will serve as an investigation into the problem.

Keywords: ELT-English Language Teaching, Grammar, Pedagogy, Pedagogic Grammar, G1- Grammar 1,G2- Grammar 2, and G3- Grammar 3, Greek, Latin, Greeco-Roman, Debate, CIEFL-Central Institute of English and Foreign Language.

Introduction

The teaching of grammar has been perceived differently by its consumers. While some learners and teachers liked it, the others at to lump it as a part of language courses. Michael West (1952, cited in W.R. Lee 1967: 29, ELT Selections 1) perceives grammar as "a preventive and corrective medicine safeguarding or rectifying those points of word-use which are (perhaps owing to the analogy of the mother tongue specially liable to error."

Aim of the Study

The main aim of this paper is to compile the debatable issues that came especially after the emergence of Modern Linguistics with regard to pedagogic grammar. It was found that grammar has always been a part and parcel of a language teaching programme, be it the phase of structuralism or that of communicative approach. The recent trends have certainly changed the extent of grammar items in the language course and even the teaching and learning methodology. The last couple of decades have especially stressed on the innovative role of the teachers and the importance of functional grammar.

Review of Literature

Hannan (1988), (cited in Nachiengmai Yawalak's article, The Teaching of Grammar in Thai TESOL Bulletin, Vol. 10, No. 2, Aug. 1997) considers "grammar is highly valuable as an important part of the study of language, of ideas, and of writing".

Carner (cited in TESOL Bulletin, Vol. 10, No. 2, August 1997) in Nachiengmai Yawalak's The Teaching Grammar believes that

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Debates in Pedagogic Grammar

Abstract

This Paper highlights the grammar debate at the pedagogic level. The terms 'grammar' and 'pedagogic grammar' have been defined afresh, keeping in mind the recent dichotomies in grammar teaching. An attempt has been made to discuss aspects pertaining to grammar such as 'Traditional vs Modern', 'prescriptive vs descriptive', 'correctibility vs acceptability'.

In the academic world, grammar has always been hotly debated due to dissensions among groups with regard to its purpose, extent, scope or the contents of its teaching. Despite the best efforts of grammarians and linguists to minimize the debate, it proved to be ineffective in the real teaching and learning situations.

Keywords: ELT - English Language Teaching ESL - English as a Second Language EFL - English as a Foreign Language LSRW - Listening Speaking Reading Writing CLT - Communicative Language Teaching GTM -Grammar Translation Method TG - Transformational Grammar GTM - Grammar Translation Met

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Introduction

Teaching grammar is as old as its origin. With the Greeks there happened to be two sets of grammarians. One who were intellectually curious to understand their language better, and the other who wanted to make their living by teaching.1

This tradition of two sets of grammarians continued till date with the only change that over a period of time even the teachers/ grammarians contributed enthusiastically on such issues as the scope, purpose, types, materials and methodology of grammar teaching.

When the Latin adopted Greek as a model and started to teach Latin grammar, the Romans had to identify the aspects of grammar that needed to be taught as a part of curriculum. This issue kept expending with the consideration of Latin grammar as the model for teaching of the vernacular languages in the whole of Europe including English.

The first problem that came before the pedagogic grammarians was the difference between the languages. For instance, English is non-inflected language, while the Greeco-Roman, models are inflected languages and hence did not fitted. A simple example of the word, 'Like' can be taken from 2 (ibid).

The word 'like' in English can be used as an Adjective, Conjunction, Noun or even Verb depending on the context of use in a sentence. In inflected languages, like Greek and Latin a single word such as 'like' can not normally have such a wide variety of functions suffixes would differentiate the noun, verb, adjective, and preposition.

In addition to such an inappropriateness of the model, the second problem that arose when the first English grammarians adopted Ancient models were the respect for Latin that led to prescriptivism. A sense of respect and holiness was attached to the grammar rules that were inherited from Latin – a dominant language of the Church for centuries.

Besides these English was a young language, emerging out of various transitions and confusions of the earlier stage. To overcome such a situation languages started to be compared and contrasted for the purpose of teaching. Such concepts as comparative and historical linguistics, contrastive analysis at the psychological theory of behaviourism came to the rescue until the time when pure linguistics is to be differentiated from applied linguistics that included English Language Teaching (E.L.T.) besides other related interdisciplinary areas of the studies. Until the 18th century grammar of a language was taught on the basis of traditional assumptions regarding language with Latin grammar as a model.

The convergence of linguistics and the research advancements in sociology, psychology introduced a remarkable change in the Pedagogic Grammar. The significance of 'what' and 'how' of grammar were questioned.

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PLACE OF GRAMMAR IN ELT METHODS AND APPROACHES

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ABSTRACT
The place of grammar in the English Language Teaching courses have often kept switching over the centuries depending on the prevalent convention / practice or the dominant theories of language analysis and language learning premised on which several ELT methods were prepounded one after the other. Some of the ELT Methods are being discussed below in order to identify the place and role of grammar in the English Language Teaching programmes.

Keywords: ELT-English Language Teaching, EFL-English as a Foreign Language, L1-First Language, GT-Grammar Translation Method, TL-Target Language, LSRW-Listening, Speaking, Reading and Writing and CLT-Communicative Language Teaching.

Grammar – Translation Method

This method ruled the world for more than a century. The main concentration of this method was to help learners to acquire the knowledge of the target language. This method did not focus on spoken form of language.

O'Grady et al. (1993) suggest

This method emphasizes reading, writing, translation, and the conscious learning of grammatical rules. Its primary goal is to develop literary mastery of the second language. Memorization is the main learning strategy and students spend their class time talking about the language instead of talking in the language. The curriculum requires the memorization of paradigms, patterns and vocabulary, with translation being used to test the acquired knowledge. Consequently, the role of L1 is quite prominent.

(O'Grady et al., 1993)

The G.T. Method dominated in Europe for foreign language teaching/learning for almost a century ranging from 1840 to 1940. But the earliest course for language learning teaching based on G.T. method was published by J.C. Fick in South Germany in 1779.

The German Scholars like John Seidenstucker, Karl Plotz, H.S. Offendorf, and John Meidinger were the main force behind the exploration and implementation of the G.T. Method moreover, an American teacher B.Sears too used this method as Prussian Method from 1845 onwards.

Grammar learning/teaching was totally based on the goal of helping students to read and appreciate foreign language and literature. Interacting grammar learning/teaching second language was used as it was believed, to translate in and out of the target language. The grammar learning/teaching was consisted of the memorization of the rules of the various sentence patterns, various grammar was taught prescriptively guided by the rules of the target language as well as greater emphasis was paid on accuracy.

Mostly the experts of EFL believe that G.T. Method is the invention of eighteenth century and in 19th century. They adopted the strategy of liking grammatical rules with translation. G.T. Method has

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STUDY OF RADON GAS DIFFUSION AND ITS PERMEABILITY THROUGH SOME BUILDING CONSTRUCTION MATERIALS BY USING SSNTD TECHNIQUE

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Study of radon diffusion and radon permeability through some building construction materials has been carried out by using solid state nuclear track detectors (LR-115, type II plastic track detectors). Uranium ore has been used as a radon source. In the present work radon diffusion coefficient and corresponding diffusion length through some building materials like sand stone, gypsum, fly ash, soil, cement, granite, sand and lime stone have been calculated. The comparative radon permeability through these materials has also been studied. The average radon diffusion coefficient and corresponding diffusion length was found maximum (4.23×10^{-8} m^2/s and 1.42 m) for sand and minimum (0.05 m^2/s and 0.14 m) for granite. The building construction materials like soil, fly ash and cement are found to be least permeable to radon flow. Similarly the building materials sand stone, gypsum and sand are found to be permeable to radon flow while the building materials lime stone and granite are found to be radon-tight.

KEYWORDS : Radon, Diffusion coefficient, Diffusion length, Building materials, Radon Permeability.

INTRODUCTION

Radon is a radioactive gas that is produced by the decay of uranium. As radon is a radioactive gas, therefore it can diffuse through porous building materials used in the construction work. It has been well established that many building materials used in construction work contains radioactive elements and their decay products. Thus building materials contribute significantly in increasing the natural radiation in the ambient air and poses a health hazard. Radon is also known carcinogen and is estimated to cause up to 10% of all lung cancers in European countries (Darby *et. al.*, 2005). Radon is naturally occurring and emanates from soil and rock. It percolates up through the through soil and buildings and if it is not evacuated there can be much higher exposure levels indoors than outdoors (Nazaroff, 1992). As radon is a gas, it is able to diffuse through the soil and other materials around the foundation of a home. Homes tend to operate under a negative pressure, meaning that the air pressure inside the home is lower than the air pressure outside (Gadgil, 1992). This negative pressure comes about from: (a) the stack effect by which the upward flow of warm air inside the home creates a positive pressure area at the top of the home and a negative pressure area at the bottom. (b) Vacuum effect caused by air vented to the outside by exhaust fans, clothes

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ORIGINAL ARTICLE

Microanalysis of Uranium by Using Solid Sate Nuclear Track Detector: Techniques, Problems, Prospects

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ABSTRACT

Uranium is the heaviest and radioactive trace element found in geological materials at ppm level. It is distributed non-uniformly and mainly occurs in a dispersed state. Uranium present in the earth is transferred to water, plants, food supplements and then to human beings. Intake of uranium and its decay series elements can be harmful to human health. When absorbed in the body it can constitute a far greater radiation health risk as the internal tissues are irradiated continuously with radiation till the isotopes are eliminated in faces or urine or else lose radioactivity by natural decay. Due to irradiation somatic mutation may occur which can alter control mechanism of cell division leading to cancer. Evaluation of the occurrence and distribution of this environmentally important trace element-can be important in assessing its mobilization to ecosystem. Although the permissible intake limit is 40 mg/d, low dose rates for a long time can be malignant as the uranium miners exposure data show the linear relationship between the incidences of lung cancer and accumulated exposure. Besides the radiological importance, uranium plays significant role in various cosmo-chronological and nucleo synthesis events. Evaluation of the occurrence and distribution of this environmentally important trace element-can be important in assessing its mobilization to ecosystem. In this paper microanalysis of uranium has been carried out by using solid state nuclear track detector. Techniques, problems and its prospects have also been discussed.

Key words: *SSNTD, Uranium, Radioactive Decay, Environment*

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INTRODUCTION

Uranium is the heaviest and radioactive trace element found in geological materials at ppm level. Although it is considered a rare element, it has higher abundance in earth's crust than other toxic elements such as K, Sb, Cd, Bi, and Hg etc. It is distributed non-uniformly and mainly occurs in a dispersed state. The heterogeneity is due to the geochemical processes which have recycled slowly the crustal material to and from the mantle. Ingenuous and metamorphic rocks have higher uranium concentration than sedimentary rocks. The earth's crust has 95 % ingenuous and 5 % sedimentary rocks. The amount of uranium in the outer 10 Km of the earth's crust is estimated to be about 1.3 X 10^{14} tons corresponding to the radioactivity of 1.7 X 10^{24} Bq. Uranium present in the earth is transferred to water, plants, food supplements and then to human beings. Intake of uranium and its decay series elements can be harmful to human health. When absorbed in the body it can constitute a far greater radiation health risk as the internal tissues are irradiated continuously with radiation till the isotopes are eliminated in faces or urine or else lose radioactivity by natural decay. Due to irradiation somatic mutation may occur which can alter control mechanism of cell division leading to cancer [22]. Although the

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Spin distribution of evaporation residues formed in complete and incomplete fusion in $^{16}O+^{154}Sm$ system

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ABSTRACT

Spin distributions for several evaporation residues populated in the $^{16}O+^{154}Sm$ system have been measured at projectile energy ≈ 6.2 MeV/A by using the charged particle-γ-coincidence technique. The measured spin distributions of the evaporation residues populated through incomplete fusion associated with 'fast' α and 2α-emission channels are found to be entirely different from fusion-evaporation channels. It is observed that the mean input angular momentum for the evaporation residues formed in incomplete fusion channel is relatively higher than that observed for evaporation residues in complete fusion channels. The feeding intensity profile of evaporation residues populated through complete fusion and incomplete fusion have also been studied. The incomplete fusion channels are found to have narrow range feeding only for high spin states, while complete fusion channels are strongly fed over a broad spin range and widely populated. Comparison of present results with earlier data suggests that the mean input angular momentum values are relatively smaller for spherical target than that of deformed target using the same projectile and incident energy highlighting the role of target deformation in incomplete fusion dynamics.

1. Introduction

The investigation of heavy ions (HI) induced reactions has been a topic of special interest, particularly the complete fusion (CF) and incomplete fusion (ICF) at energies near and above the Coulomb barrier [1–9]. Several reaction channels may open in the interaction of two heavy ions and a transfer of cluster of nucleons may take place. First experimental evidence of ICF dynamics was reported by Britt and Quinton [10] in break-up of the incident projectiles like ^{12}C, ^{14}N and ^{16}O into alpha clusters. Later on, similar features were also observed by Galin et al. [11]. However, major advances in the study of ICF dynamics took place after the exclusive measurement of charged particle-γ-coincidence by Inamura et al. [12], Geoffroy Young et al. [13], Gavron et al. [14] and, Westerberg et al. [15] reported the light ions based studies in coincidence with prompt γ-rays of evaporation residues. Siwek-Wilczynska et al. [16] provided a classical picture to understand the ICF dynamics. Zolnowski et al. [17] and Yamada et al. [18] pointed out that the projectile like fragments (PLFs) are emitted during the interaction of projectile with target based on charged particle ($Z = 1, 2$) coincidence with prompt γ-rays. Semi-classical theory of HI interaction categorizes the CF and ICF processes on the basis of driving input angular momentum ℓ imparted in the system. According to the sharp cut-off approximation [19–21] the CF process lies in the driving input angular momentum range $0 \le \ell \le \ell_{crit}$, while the ICF process lies in the range $\ell_{crit} \le \ell \le \ell_{max}$. It may be understood in the following way: for CF, the attractive nuclear potential overcomes the repulsive Coulomb and centrifugal potentials in central and near central collisions. Consequently, at

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NUCLEAR PHYSICS A

Observed side feeding in incomplete fusion dynamics in $^{16}O + ^{160}Gd$ reaction at energy ~5.6 MeV/A: Spin distribution measurements

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Abstract

Spin distributions of various residues populated via complete fusion (CF) and incomplete fusion (ICF) reactions in the interaction of ^{16}O with ^{160}Gd at the projectile energy $E_{proj} \sim 5.6$ MeV/A have been studied. The experimentally measured spin distributions of the residues associated with the ICF reactions are found to be distinctly different from those populated via the CF reactions. An attempt has been made to extract the side-feeding pattern from the spin distributions of CF and ICF reaction products. It has been observed that the CF products are strongly fed over a broad spin range. But, no side-feeding takes place in the low observed spins as low partial waves are strongly hindered in the fast α-emission channels associated with ICF in the forward direction. It has also been observed that the mean input angular momentum for direct α-emitting (ICF) channels is relatively higher than compound α-emitting (CF) channels, and it increases with direct α-multiplicity in forward direction.

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NUCLEAR PHYSICS A

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Investigation of incomplete fusion dynamics at energy 4–8 MeV/nucleon

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Abstract

The recoil-catcher activation technique followed by the offline γ-ray spectroscopy has been adopted for the excitation function measurement of residues populated in $^{12,13}C$ induced reactions with ^{175}Lu target at lower projectile energies ≈ 4–8 MeV/nucleon. The independent cross-sections for some of the populated residues have been estimated by subtracting the contributions of higher charge precursor isobars from the measured cumulative cross-sections. The measured excitation functions are compared with theoretical predictions based on statistical model code PACE-4. This comparison reveals that complete fusion process solely contributes in the formation of xn-pxn channels and an enhancement in the measured cross-sections of α-emitting channels from the theoretical predictions may be attributed to the incomplete fusion process. The incomplete fusion probability is found to be higher in case of ^{12}C than for a one neutron rich projectile ^{13}C throughout the incident energy region. Present findings obtained for $^{12,13}C$ + ^{175}Lu systems have been compared with informations extracted from previously studied systems and projectile structure is found to strongly affect the incomplete fusion dynamics in terms of projectile α–Q-value along with projectile–target mass-asymmetry. Moreover, it may be pointed out that Morgenstern's mass-asymmetry systematic is predic-

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Research Article

Beta type integral operator involving generalized Bessel-Maitland Function

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Abstract: The main object of the present paper is to establish integral involving generalized Bessel-Maitland functions $J^{\mu,\beta,\gamma,\delta}_{\alpha,\beta,\nu,\delta,\rho}(z)$ defined by Khan et al. [6], which are expressed in the terms of generalized (Wright) hypergeometric functions. Some interesting special cases involving generalized Mittag-Leffler functions are deduced.

Keywords: Generalized Bessel-Maitland function, Generalized (Wright) hypergeometric function and integrals, Mittag-Leffler function.
2010 Mathematics Subject Classification. 26A33, 33C45, 33E12.

1. Introduction

The special function of the form defined by the series representation

$$J^{\mu}_{\nu}(z)=\sum_{n=0}^{\infty}\frac{(-z)^n}{n!\,\Gamma(\mu n+\nu+1)}=\phi(\mu,\nu+1;-z), \tag{1.1}$$

is known as Bessel-Maitland function, or theWright generalized function (see [10;Eq.(8.3)]).It has a wide application in the problem of physics, chemistry, biology, engineering and applied sciences. The theory of Bessel functions is intimately connected with thetheory of certain types of differential equations. A detailed account of applications of Bessel functions are given in the book of Watson [17].

The generalized hypergeometric function represented as follows (see [20]):

$${}_pF_q\left[\begin{matrix}(\alpha_p);\\(\beta_q);\end{matrix}z\right]=\sum_{n=0}^{\infty}\frac{\prod_{j=1}^{p}(\alpha_j)_n z^n}{\prod_{j=1}^{q}(\beta_j)_n n!}, \tag{1.2}$$

provided $p\le q$; $p=q+1$ and $|z|<1$ and $(\alpha)_n$ is well known Pochhammer symbol.

The Fox-Wright generalization ${}_p\Psi_q(z)$ of hypergeometric ${}_pF_q$ function is given by (cf [13, 19, 20]):

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ORIGINAL ARTICLE

Isolation and characterization of fungal pathogens of mulberry leaves

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ABSTRACT

Mulberry leaf spot disease is common in the tropical region. It reduces the quality of leaf, which directly affects the suitability for silkworm rearing. The study was conducted to isolate and characterize the fungal pathogens of mulberry plants. There were two isolates of pathogenic fungi causing leaf spot, isolated from the diseased leaves of mulberry collected from different mulberry gardens of Uttar Pradesh. The findings revealed that two pathogens i.e. Pseudocercospora mori and Cercospora moricola were found to be associated with the concentric leaf spot of the mulberry plants. The infections in the mulberry plants began early to the rainy and winter seasons in the form of patches and later caused severe defoliation at every experimental site.

Key words: *Fungal infection, Leaf spot, Mulberry, Silkworm*

INTRODUCTION

Sericulture is known as an agro based cottage industry. It plays an important role in improving the rural economy because it possesses high employment and income generation capability with minimum investment (Hiwara, 2001). Mulberry leaves are the source of nutrition (Proteins, carbohydrates, vitamins, and minerals). It is reported that about 70% of the silk protein produced by silkworm are directly derived from the protein of mulberry leaves (Narayan *et al.* 1967 and Krishnaswami *et al.* 1970). A mulberry plant belongs to genus *Morus* and family Moraceae. It is widely distributed in Asia, Europe, and Africa on a wide range of climatic conditions that vary from temperate to tropical areas (Yoshida *et al.*, 2002 and Tang *et al.*, 2005). Four species of mulberry plants namely, *Morus alba, M. indica, M. serreta* and *M. laevigata* are raised as main food plant of silkworm in India. Mulberry is affected by a number of diseases (Reddy *et al.*, 2009). Among the various diseases, leaf spot is the most devastating for mulberry cultivation. The leaf spot caused by *Cercospora moricola* Cook decreases the leaf production. It is a major disease of mulberry (*Morus spp.*) occurring both in temperate and tropical regions. Both diseases damage the quality and quantity of mulberry leaf and cause annual leaf loss of about 20-25 % due to defoliation and destruction of leaf area (Sukumar and Ramalingam, 1989), and make the leaves less nutritive (Siddaramaiah and Hegde, 1990).

The nutrients of mulberry leaves such as chlorophyll and carbohydrates were decreased due to fungal infection (Ghose *et al.*, 2003 and Tang *et al.*, 2005). Many fungicides are reported to be effecting in combating both the diseases (Munshi *et al.*, 1987; Munshi *et al.*, 1994; Philip *et al.*, 1994 and Tanki *et al.*, 2005). The affected leaves of *Cercospora moricola* become yellowish and wither as the diseases become severe (Rajewu, *et al.*, 2005). The foliar disease leaf spot (*Cercospora moricola*) deteriorates the nutritional value of the leaves reduces the leaf yield and make the leave unsuitable for silkworm larvae (Jayarajan, 1986 and Sharma *et al.*, 1993). Sengupta *et al.*, (1991) reported that the *Cercospora moricola* and *Cercosporaella mori* cause major epidemic disease of mulberry plants and reduced leaf yield between 10-20% during rainy and winter seasons. During the growth period of the mulberry plants in rainy season, fungal pathogen, *Cercospora moricola* comes in contact with mulberry leaves under existing environmental conditions and causes disease with interfering the normal physiological function of the mulberry leaf. The net result is the degradation of quality leaves. This paper describes the symptoms of the disease, and identification of the pathogen.

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Gamma radiations induced aberrations in bone marrow chromosomes of Swiss albino mice

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ABSTRACT

Bone marrow chromosomes are known to be highly radiosensitive. The current study seeks to examine the changes in chromosomal morphology post exposure to gamma radiation in Swiss albino mice. Observation of slides of control mice show no significant damage in chromosomes number (40) and morphology. However, after administration 0.20 Gy, 0.40 Gy, 0.60 Gy, 0.80 Gy of 60 CO-gamma rays a number of abnormalities were observed. Chromosome fragments, breaks, appearance of rings, dicentric chromosomes were found in all cases. The only difference was in their frequency. When the doses were higher the variations were observed more frequently. However, at a dose of 0.60Gy and 0.80 Gy in addition to the aforesaid abnormalities, aneuploidy was also observed. Bone marrow cells showing such defective morphology possibly may also suffer from attenuation of their genetic, physiological and biochemical mechanism(s). These observations indicate the sensitivity of the genomic apparatus of mice subjected to low doses of gamma radiations. The biomedical importance of this study can be easily visualized in the possible cytogenetic effects that would influence the generations to come. The rampant use of this radiation therefore warrants further, indepth investigation in view of the long term genetic hazards and impairment of fertility of an individual due to gamma rays.

Key words: Aneuploidy · chromosome morphology · ionized radiation · mitotic index

INTRODUCTION

Natural background radiation of various forms exists in the biosphere and comes from three well known and studied sources *i.e.*, cosmic rays, living cells and earth crust. Living cells, which have the inherent capability to bio-accumulate and bio-amplify radioactive isotopes from the environment. A variety of radioactive elements such as radium, thorium and uranium are present in the earth's crust and emit α, β, γ-rays. Such radioactive elements are extracted and put to use in various industries, nuclear weapons test explosions, medicine, power generation, agriculture and radio-sterilization (Singh, 2011; Waghmarot al. 2013; Zalewska et al. 2014). In addition to the aforesaid useful effects certain radiations are also the principle causative factors for somatic lesion, necrosis, carcinogenesis, mutagenesis and teratogenesis (Bircimer 1988;Upton et al.1992; Nikula et al. 1995, IARC 2002; Eberhard et al. 2013; Comishet al.2014).

Radiation damages occur through collision of photon particles with atoms and molecules in cells which ionize, give rise to ions and free reactive radicals. Free radicals are believed to play a major role in more than sixty different health conditions including aging process, cancer and arthrosclerosis (Sanas et al.2015). Gamma radiation

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ORIGINAL ARTICLE

Fecundity Preference of *Pieris brassicae* L. (Lepidoptera: Pieridae) on Different Cole Crops

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ABSTRACT

In an experiment, Pieris brassicae showed significant variations in fecundity and pivotal age of butterfly with respect to different cole crops. The higher fecundity was recorded as 160 eggs in 5 days pivotal age of butterfly on cabbage. The percent reduction in fecundity with respect to cabbage was recorded as 11.86% on cauliflower, 28.13% on gobhi sarson, 33.13% on yellow sarson and 38.13% on Indian mustard. The life table parameters i.e., superior net reproductive rate and inferior length of generation was recorded as 42.13 females/female/generation and 29.85 days on cabbage. As far as rate of development was concerned, the higher intrinsic rate and lower finite rate was observed as 0.1681 and 1.3282 females/female/day on cabbage. The shortest doubling time and highest annual rate of increase of butterfly recorded as 6.41 days and 1.42E+17/annum, when it reared on cabbage. The fecundity of cabbage butterfly showed preference in an order of cabbage (Brassica oleracea var.capitata) > cauliflower (Brassica oleracea var. botrytis) > gobhi sarson (Brassica napus var.neelam) > yellow sarson (Brassica rapa var. jhumka) > Indian mustard (Brassica juncea var. varuna).

Key words: Annual rate of increase, Doubling time, Net reproductive rate, Potential fecundity

INTRODUCTION

The crops grown in winter season are known as cole crops. It consist several vegetables of family Brassicae, including broccoli, cabbage, cauliflower, collards, rapeseed etc. The nutrient content in cole crops varies considerably. It contains vitamins like vitamin A, vitamin B, vitamin C and vitamin D, and also contains carbohydrates and minerals like Calcium, Phosphorus etc. Cabbage is a major cole crop of India, cultivated in both hills and plain regions (Khalid, 2006). It is annual or biennial polymorphous, glabrous and dicotyledon flowering plant and derived from leafy wild mustard found in mediterranean region around 100 AD. Cabbage is a hardy vegetable, grows in fertile soil and can be harvested any time after formation of head (Ali *et al.*, 2017). Cauliflower is also closely related to cabbage and has a compact head. It is less hardy than cabbage, requires cold and moist climate for satisfactory growth. It is rich in minerals, namely, iron, magnesium, phosphorous etc (Ali and Rizvi, 2007, Iqbal *et al.*, 2014). Besides cabbage, cauliflower, rapeseed-mustard also has commercial importance under oilseeds belonging to cruciferae grown in India. It is most important oilseed crop next to groundnut in the country. These crops are grown both in sub-tropical and tropical part of the country (Rizvi *et al.*, 2009).

The most important factor limiting crop production is the presence of pests especially insects, mites, nematodes and pathogens, cause regular qualitative as well as quantitative losses in diverse ecological conditions. It has been estimated that insect pest alone in different vegetable crops causes more than 40 % of yield loss annually. There are about 38 insect pests, which are known to attack different crops (Pajmon, 1999, Bhati *et al.*, 2015). Among them, *Pieris brassicae* is one of the most destructive pests causing damage at all growing stages such as vegetative, flowering and seedling stage of cabbage, cauliflower and mustard (Sachan and Gangwar, 1980; Lal and Ram, 2004, Khan and Kumar, 2017).

The strategy for insect control in vegetables is necessarily different from other crops because of their nature of utilization. Hence, emphasis must be given to minimize pesticidal load by adopting eco-friendly approaches for insect pest management. Such management initially requires the detailed study on the habits, habitat, life cycle and occurrence of target pests. Therefore, present

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ORIGINAL RESEARCH PAPER

Zoology

KEY WORDS: Lymphatic system, Buffalo,Amphistomatous parasite.

STUDIES ON THE LYMPHATIC SYSTEM OF SOME AMPHISTOMATOUS PARASITES OF BUFFALO

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ABSTRACT

The lymphatic system in few amphistomes and discussed the relationship between it and the excretory system. He is of view that practically it is not possible to consider it for classification purpose. The lymphatic system has been known to exist in only a few families of trematodes, specially in the families Paramphistomatidae, Microscaphidiidae; Cyclocoelidae, Heronimidae, and S.pratchidae. It has also been reported from a monogenetic genus. The system represents a primitive circulatory system of simple flattened mesenchyma cells and contains a fluid resembling the primitive invertebrate blood.

INTRODUCTION

The lymphatic system has been known to exist in only a few families of trematodes, specially in the families Paramphistomatidae, Microscaphidiidae, Cyclocoelidae, Heronimidae, and S.pratchidae. It has also been reported from a monogenetic genus. The system represents a primitive circulatory system of simple flattened mesenchyma cells and contains a fluid resembling the primitive invertebrate blood. Van Beneden as early as 1893, showed the lymphatic ducts in a monostome without giving any explanation. Wallin (1893) interpreted these ducts as excretory ducts. Looss (1896) identified the lymphatic ducts as a part of the excretory system, with a change of function.

Alvey & Martin (1934) studied it in genus of monogenea also. Willey (1935 & 54) showed a relationship between the excretory and lymphatic systems and even expressed the two systems to be identical in the early stages of the life, an observation which needs further verification and study. Tandon (1951 & 55) described it in a few amphistomes. Morishi (1924) described it as a monostome. Fukui (1929) described it in a number of amphistomes. Jain (2001) also described the lymphatic system in few amphistomes and discussed the relationship between it and the excretory system. He is of view that practically it is not possible to consider it for classification purpose.

MATERIALS AND METHODS

The live worms of amphistomes, though present in smaller number, in the ruminants slaughtered in the local slaughter house could be obtained during the different parts of the year. Gravid as well as very small immature worm can be obtained during the different months of the year. The worms are flattened under pressure of the two slides tied together with a thread and fixed in a concentrated solution of acidic Corrosive sublimate from 10 — 24 hours. After fixation these are washed first in distilled water, then in tap water from an hour to several hours depending upon the size of the worm, as very thin and small worms require a shorter washing period. It is always better to change the water two or three times and to examine the individual worms under the binocular for proper washing.

After washing the worms are treated with 0.5% solution of Sodium thiosulphate and washed again. In glycerin mounts the lymphatic ducts appear to be yellow. The permanent preparations are not possible as the precipitate formed in the ducts is washed off during dehydration.

The other method for the study of the system has also been quite satisfactory. The live worms are pressed between the two slides and kept either in a large petri-dish or a specimen tube and boiling 90% alcohol is poured over them. The lymphatic ducts become very prominent due to the coagulation of the lymphatic fluid within and are filled with the worm. The worms are cleared in glycerin and studied as such. The ducts so fixed take Borax carmine and Carmine alum stains and their permanent preparations can be made, but as all other parts of the body also take the stain the prominence of the ducts is lost. The smaller worms are directly studied in the live condition, and both the excretory and lymphatic system can be seen simultaneously.

OBSERVATIONS

Carmyerius spatiosus (Stiles & Goldberger, 1910)Nasmark, 1937 (Plate 1)

The lymphatic system consists of two main long sudtrial lymphatic ducts which run along the entire length of the worm, on its dorsal side, internal to the intestinal caeca, except for a short distance in the anterior region where they run external to the caeca. Each longitudinal duct divides into two branches, near the middle of the acetabulum, one branch supplies the dorsal side, while the other runs postero-laterally giving a large number of branches to the postero-ventral part of the acetabulum, forming a net work around it.

At the anterior end also the main longitudinal duct divides into two branches at the level of the oral sucker. One of the branches runs singly in a zigzag course from the anterior end of the oral sucker to the level of the intestinal bifurcation, while the other divides into two and follow the same course as the first supplying the oral sucker and the oesophagus near the oesophagus and the intestinal bifurcation the longitudinal duct gives three or four branches, each of which divides into two and all these supply the oesophagus, the intestinal caeca and the reproductive ducts in this region. The intestinal caeca are surrounded by a large number of branches from the longitudinal ducts of the respective sides. The lymphatic plexuses around the testes are formed by the transverse branches from the main ducts of the respective sides, while the ovary gets its supply from both the sides and the branches to it come also from those supplying the two testes. The excretory bladder, which is profusely surrounded by the lymph ducts, gets its branches from both the sides.

Besides these the longitudinal ducts give off a large number of branches in transverse direction to the general body both laterodorsally and lateroventrally as well as towards the median line. The branches are thin, slender, and wavy. These give off secondary, tertiary and quarternary branches, which extend to a great length in the transverse direction, resulting in the union of the branches of the two sides in the median line. The branches finally terminate in knobed ends.

Gastrothylax crumenifer (Creplin, 1847)Stiles & Goldberger, 1910(Plate 2)

The lymphatic system consists of the two main longitudinal lymphatic ducts, which run more or less parallel and internal to the intestinal caeca, during their course, except for some distance in the region of pharynx where they run external to the caeca. Each longitudinal duct divides into two anterolaterally to the acetabulum, one of the branches supplies to the anterior dorsal part, while the other runs laterally and its branches supply the ventral and posterior parts to the acetabulum. At the anterior end the longitudinal duct divides into two, each again

ORIGINAL RESEARCH PAPER

Zoology

THE ENCYSTMENT AND AN EARLY DEVELOPMENT OF CERCARIA OF FISCHOEDERIUS ELONGATUS IN EXPERIMENTAL ANIMALS

KEY WORDS: cercaria, F. elongates, encystment, development.

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ABSTRACT

The collection from the lamb, consisting of specimens from the rumen, was clearly referable to *F. elongatus*. The flattened and elongated specimens in the regions of the ventral pouch were typically pinkish and exhibited excretory system conforming to that of the cercaria . In permanent stained mounts of the dorsoventrally and laterally pressed specimens, the digestive and reproductive systems tallied fully with descriptions available for this species in the extent and character of the intestinal caeca; one testis was placed dorsal to the other; vesicula seminalis with associated structures and developing uterus were mainly situated.

INTRODUCTION

Numerous specimens of *L. luteola f. australis* were collected, on many occasions, from several ponds at Bhaisa (13 Km. away from Etah) and around the Gopalganj area, Etah. They were individually kept under diffuse sunlight, between 9 A.M. and 12 noon, in beakers half-filled with tap-water for observing the emergence of the cercariae developing in them. The emerging amphistome cercariae were studied in slide preparations of the live specimens. The two types available represented the Pigmentata group. A form enjoying a comparatively greater incidence in *L. luteola f. australis* was, after tentative identification, allowed to encyst on clean leaves of *Ficus religiosa* (peepal) placed in the beakers. The extensive metacercarial material was subsequently fed to 5 laboratory - reared guinea-pigs, 1 rabbit, 3 albino rats, 1 kitten, 2 kids and 1 lamb to determine its specific identity and to evaluate the course of development, whether successful or refractory, in these experimental animals.

MATERIAL AND METHODS

CERCARIA

Cercariae collected from *L. luteola* were identified as Carcariae indicae Sewell, 1922. These cercariae were studied alive and after encystment. These encysted cercariae were fed to a lamb, a guinea pig, a kid and other animals. Apart from the lamb which, autopsied 126 days after infection, had alone yielded a number of developing juveniles referable to *F. elongatus*, the 2 developing flukes available from the other experimental animals included 1 specimen each from a guinea-pig and a kid. These specimens were studied alive for details of the excretory system and, after fixation in 10 per cent formalin, the immature fluke from the guinea-pig was stained in borax carmine for permanent mount.

Brief accounts of the cercaria, metacercaria and the recovered juveniles and flukes attaining maturity have been attempted. Observations made during this study have further enriched our knowledge about the development and morphology of the species.

OBSERVATION

Cercaria and its encystment

The cercariae lacked pigmentation. The body was of 0.412-0.912 mm X 0.294-0.627 mm. size and had 0.529-0.999 mm. long tail carrying a median excretory duct. It had typical eye spots lying just behind the brain area. The oral sucker was small, had minute papillae on its anterior margin and was of 0.044-0.118 mm. size. The oesophagus was 0.059 — 0.190 mm. long. There was no revealing prominent brain mass near its middle. It locked the sphincter. Caecum was 0.118 — 0.323 mm. long and terminated near the middle of the body. Oesophagus and intestinal caeca had granular contents. Acetabulum was well-developed and measured 0.073 — 0.206 mm. in size, the ratio between suckers was Excretory bladder was prominent and had an anteriorly directed excretory pore. Main excretory trunk had a transverse commissure and carried a median diverticulum lying near the level of the caecal ends and passing backward towards the acetabular level near the level of the brain. Large excretory granules filled the main longitudinal trunks and transverse commissure including its diverticulum (Fig. 1). Rudiments of symmetrically placed testes and medianly situated ovary connected with the ducts were visible in front of the excretory bladder in stained preparations (Figs. 2, 3).

The cercaria started to encyst on the sides of the beaker and on the leaves introduced. The process was initiated by the detachment of the tail about 15 minutes after emergence (Fig. 4). The cyst wall was 0.015 — 0.022 mm. thick, yellowish-brown and was in two layers. The structures visible in metacercaria of 0.294 — 0.353 mm X 0.350 — 0.382 mm. size were : oral sucker, 2 eye-spots, typical excretory system and an acetabulum (Fig. 5).

JUVENILES

The youngest of the juveniles, a 5-day-old specimen, recovered from guinea-pig, reveals 4 distinctive features of the digestive and excretory systems in the living state (Fig. 6, 7). The measurements recorded from the permanent preparation were : length, 333.9 1..t ; width, 111-3 p. ; oral sucker, 31.8 p. X 47.7 1.1 , and acetabulum, 63.6p. X 63.6p.

The collection from the lamb, consisting of 21 specimens from the rumen, was clearly referable to *F elongatus*. The flattened and elongated specimens in the regions of the ventral pouch were typically pinkish and exhibited excretory system conforming to that of the cercaria (Fig. 8). In permanent stained mounts of the dorsoventrally (Fig. 9) and laterally pressed (Fig. 10) specimens, the digestive and reproductive systems tallied fully with descriptions available for this species in the extent and character of the intestinal caeca; one testis was placed dorsal to the other; vesicula seminalis with associated structures and developing uterus were mainly situated.

F elongatus, recorded in bovine and bubaline hosts (Yamaguti, 1958), occurs in Indian cattle, buffalo, sheep and goats (Thapar, 1956). The infection developing successfully in an experimental lamb adds to the cases so far recorded in 2 calves and 1 cow from Madras and Bareilly respectively. The present experimental work on partial life-cycle in an ovine host is evidently a first report.

The collection from the experimental animals included 8 specimens found to represent the type (*F. E.*) *explanatum* developing from the encysted cercariae obtained mostly from *L. (Lymnaea) luteola australis* (Singh, 1970). The recovery figures relating to this type from *L. luteola australis* are given. These specimens were easily distinguishable on account of the excretory system, extent and character of intestinal caeca and the topography of the developing gonads (Fig. 11, 12).

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ORIGINAL ARTICLE

Effect of feed additives on economic parameters of eri silkworm, *Philosamia ricini* Donovan (Lepidoptera: Saturnlidae)

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ABSTRACT

The observations on different parameters of eri silkworm with respect to feed additives revealed that the larval duration of eri silkworm was recorded significantly ($F_{4,12}$ = 0.11, p < 0.01) minimum on black gram additive (19.50±0.289 days) followed by mung bean additive (21.00±0.289 days), pigeon pea additive (22.00±0.289 days) and castor alone used as control (22.00±0.577 days). The larval and cocoon weight of eri silkworm was recorded significantly ($F_{3,11}$ = 0.94 & 0.95, p < 0.01) maximum (7.25±0.046 and 3.35±0.012 gram) on black gram additive. The highest cocoon shell weight and shell ratio was recorded (0.49±0.023 gram and 14.63±0.688 %) further on black gram additive. The pupal period of eri silkworm remarkably showed ($F_{3,11}$ = 5.72, p < 0.01) shortest duration (9.75±0.144 days) on black gram additive and longest (12.17±0.220 days) on pigeon pea additive. In addition, pupation rate and leaf silk conversion rate (LSCR) of Philosamia ricini showed significant ($F_{3,11}$ = 0.65 & 1.74, p < 0.01) and highest rate (85.00±1.732 and 3.05±0.035 %) on black gram additive and lowest rate (81.33±0.882 and 2.78±0.040 %) on control. Therefore, eri silkworm, Philosamia ricini showed highest preference on Vigna mungo additives followed by Cajanus cajan, Vigna radiate and Ricinus communis.

Key words: *Cajanus cajan, eri silkworm, Ricinus communis, Vigna mungo, Vigna radiate*

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INTRODUCTION

Eri silkworm is only non-mulberry silkworm, which is domesticated completely. The 'Eri' is derived from the Sanskrit term 'Erranda', which refers to castor plant, although it is primary food source of eri silkworm. However, Arora and Gupta (1979) listed about 30 host plant species on which eri silkworm is known to feed and Manjunatha (2008) reported it as polyphagous. Due to availability of castor plants throughout India and Eri silk can easily cultivate on it in both natural as well as domestic conditions. Eri silk is as soft as other kinds of silk and can be blended with other fibres like wool and polyester for durability and decoration (Siddiqui, *et al*, 1993 & Manjunatha, 2008).

India ranks second in silk production after china, and account about 23060 mt of mulberry and non-mulberry silk. Among them mulberry contributes about 80.73%, eri 13.14%, tasar 5.55% and muga negligible 0.5% of the total raw silk production in the country (Tripathi and Ahmad, 2013). However, the contribution of eri silk from different part of India is about 740 mt from Assam, 374 mt from Manipur, 202 mt from Meghalaya, 115 mt from Nagaland, 5 mt from Arunachal Pradesh, 4.2 mt from Mizoram, 14 mt from Andhra Pradesh, 8 mt from West Bengal, 130 mt from Bihar, 3.10 mt from Chattisgarh, 0.20 mt from Jharkhand, 10 mt from Kerala, 4.10 mt from Orissa, 0.10 mt from Sikkim and 4.0 mt from Uttar Pradesh (Giridhar, *et al*, 2002 & Manjunatha, 2008).

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Calibration of Cellulose Nitrate ($C_6H_8O_8N_2$) Solid State Nuclear Track Detector CN-85 (LR-115, Type II) for the Measurements of Radon concentration

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Abstract: *A solid state nuclear track detector or SSNTD (also known as an etched track detector or a dielectric track detector, DTD) is a sample of a solid material (Photographic emulsion, crystal glass or plastic) exposed to nuclear radiation (Neutrons or charged particles, occasionally also gamma rays) Solid state nuclear track detectors (SSNTD) are widely used for radon measurements and CN-85 (LR-115, type II) is one of the most popular solid state nuclear track detector (SSNTD). Calibration is imported because it's the only way of evaluating the precession and accuracy of an instrument and making adjustments such that no errors occur in the readings. The main objective of this work is to calibrate the detector and also determine the calibration factor for the measurements of radon concentration through the passive method with CN-85 (LR-115) detectors.*

Keywords: *SSNTD, Calibration Factor, Environmental Radon, Alpha Tracks*

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I. Introduction

Radiations have always been a part of our natural environment. Human beings are always exposed to natural radioactive radiation present in the environment. The natural radioactivity is the main component to human exposure. Radon (^{222}Rn) and their short lived decay products are recognized as the most important contributors to committed effective dose received by population due to natural sources[1]. Radon and its short-lived decay products in the environment play the most important role to human exposure from natural sources of radiation. Radon is a naturally available radioactive gas, which is the decay product of radium. The possibility of cancer induction due to indoor radon has been attracting attention in the scientific community during the past decades. It is now widely recognized that indoor radon is a largest single source of exposure to ionizing radiation in the environment[2]. For the population as a whole, the average effective radiation dose from radon is estimated to the greater than the dose from all other natural sources of radiation combined, greater than the dose from industrial activities including nuclear power and the dose from medical treatments including x-ray. It is well known that inhalation of the short lived decay products of radon and their subsequent deposition along the walls of various airways of the bronchial tree, provides the main pathway for radiation exposure to the lungs. Indoor radon and its decay products are assumed to be health hazardous for human.

The environmental radon concentration changes significantly and rapidly with time and also it is a function of weather conditions. SSNTDs are passive, low cost, long term method, most widely used for measuring radon concentration and can be used for site assessment both indoors and outdoors. These detectors are sensitive to alpha particles in the energy range of the particles emitted by radon. The emitted alpha particles damage the tracks in the detector surface. When a charged nuclear particle enters the plastic it creates a trail of radiation damage along its path, known as a latent track. The CN-85 solid state nuclear track detector has good ionization sensitivity, high degree of optical clarity and stability against various environmental conditions. Because of these characteristics, CN-85 has become the state-of-the-art track detector for the monitoring of environmental radon concentration[3,4,5,6]. Public exposure to radon and its radioactive daughters present in the environment results in the largest contribution to the average effective dose received by human beings (Fleischer et. al. 1981). The main objective of this work is to determine the calibration factor for the measurements of radon concentration through the passive method with CN-85 (LR-115) detectors[7,8,9,10].

II. Experimental Technique

Although several active and quick methods are known for short term radon measurement, it is preferred to make long term time integrated measurements using passive alpha sensitivity plastic detectors[11]. This preference is due to the fact that the radon concentration inside dwellings and also in the open atmosphere are found to vary with several factors viz. the ventilation rate, presence and direction of winds, seasonal and weather

To Dr Arshad Zaidy (7)

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Incomplete Fusion Reaction in ^{20}Ne + ^{159}Tb System

Abstract

This paper presents to study more complex and interesting phenomenon of incomplete fusion (ICF) reactions induced by ^{20}Ne on ^{159}Tb have been measured at several beam energies range of 4.3-8.2 MeV/A by using catcher foil technique followed by the gamma-ray spectrometery. The measured excitation functions have been compared with statistical model based computer code PACE-2. The alpha emission products shows higher cross-section than that predicted by the complete fusion product. This enhancement in the measured cross-section is attributed to the fact that these residues are formed not only by complete fusion but also through the incomplete fusion. The excitation functions measurements indicate significant contributions from incomplete fusion at 4.3 MeV/A for some alpha channel. To the best of our knowledge, these measurements have been reported for first time.

Keywords: Heavy Ion Collisions, Complete Fusion and Incomplete Fusion

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Introduction

In the last couple of years, study of the heavy ion induced reaction has raised the new interest especially about the Complete fusion (CF) and incomplete fusion (ICF) at energies near the vicinity of coulomb barrier[1-4]. For energy of the projectile increases to well above the coulomb barrier, projectile enters into the nuclear field of the target nucleus, varities of the nuclear reaction takes place for e.g; elastic, inelastic scattering (CF & ICF), transfer reaction, deep inelastic collision (DIC) and direct reaction (DR) because of the complex nature of the ions. Predominant among them are CF and ICF. Heavy ion reaction mechanism can under stood by several ways. One way is based on impact parameter, at large value of the impact parameter, ions elastically or inelastically scattered by the coulomb field. Further, impact parameter is progressively reduced, direct reaction takes place associated few nucleon transfer from projectile to target and vice versa. If the impact parameter is still reduced deep inelastic (DIC) is playing an important role in HI-induced reaction. If impact parameter is further reduced, CF and ICF is the dominant mode of the reaction mechanism. It has been observed that at energies above the Coulomb barrier [5] CF and ICF are considered as the dominant reaction mechanisms. In the CF-reaction, nuclear field is too strong to hold all the nucleonic degree of the freedom with target nucleus, forms the excited composite system, which statistically decays by particle and/ or gamma emission. However in case of ICF, nuclear field is no longer hold to involve all the nucleonic degree of freedom of projectile and supposed to be break up into the fragments (for e.g; ^{20}Ne is break-up into ^{16}O and α-particle; ^{8}Be and ^{12}C etc.) and one of the fragments fuses with the target nucleus while remnant part of the projectile moves as a spectator in the forward direction of large flux with less or undeflected velocity as that of the projectile. This outgoing particle with large cross-section is called projectile like fragments (PLFs). The PLFs were first observed by Britt and Quinton[6] as the break up of projectile like, ^{11}C, ^{14}N and ^{16}O in an interaction of projectile with the surface of target nucleus. More experimental evidence for ICF was found by Inamura et al [7] by measurement of forward peaked alpha particles in coincidence with prompt gamma rays. The important features of the incomplete fusion reactions are (i) It is observed in case of low Z projectile (ii) outgoing particles have forward peaked angular distribution and energy spectrum peaked at beam velocity [8] (iii) recoil range distribution of the evaporation residues show low range component suggesting incomplete momentum transfer (iv) ICF associated with mass-asymmetric system (v) spin distribution of the CF-product is distinctly different than that of the ICF-product. By measuring the excitation function in heavy ion induced reactions have indicated that ICF is an important reaction mechanism at moderate excitation energy.

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ORIGINAL ARTICLE

Energy Harvesting Through Piezoelectric Material at Micro Scale Level

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ABSTRACT

Energy harvesting has been a topic of discussion and research since three decades. With the ever increasing and demanding energy needs, unearthing and exploiting more and more energy sources has become a need of the day. In the current era, wireless data transmission techniques are commonly used in electronic devices. For powering them connection needs to be made to the power supply through wires else power may be supplied from batteries. Batteries require charging, replacement and other maintenance efforts. For example, in the applications such as villages, border areas, forests, hilly areas, where generally remote controlled devices are used, continuous charging of the microcells is not possible by conventional charging methods .So, some alternative methods needs to be developed to keep the batteries full time charged and to avoid the need of any consumable external energy source to charge the batteries. To resolve such problems, Energy harvesting technique presented in the current work is the best alternative. There exists variety of energy harvesting techniques but mechanical energy harvesting happens to be the most prominent. This technique utilizes piezoelectric components where deformations produced by different means are directly converted to electrical charge via piezoelectric effect. Subsequently the electrical energy can be regulated or stored for further use. The work presented in this paper recommends Piezoelectricity as an alternate energy source. The motive of the work is to obtain a pollution-free energy source and to utilize and optimize the energy being wasted. Current work also illustrates the working principle of piezoelectric crystal and various sources of vibration for the crystal.

Key words: *Piezoelectric material, mechanical energy, electrical energy, piezoelectricity, energy harvesting*

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INTRODUCTION

Energy harvesting is the process by which energy is derived from external sources and utilized to drive the machines directly, or the energy is captured and stored for future use. In the current era, which is witnessing a skyrocketing of energy costs and an exponential decrease in the supplies of fossil fuels, there arises a need to develop methods for judicious use of energy which lay emphasis on protecting the environment as well. One of the novel ways to accomplish this is through energy harvesting. Energy harvesting, or energy scavenging, is a process that captures small amounts of energy that would otherwise be lost as heat, light, sound, vibration or movement. It uses this captured energy to improve efficiency and to enable new technology, like wireless sensor networks. Energy harvesting also has the potential to replace batteries for small, low power electronic devices. Piezoelectric materials can be used as a means of transforming ambient vibrations into electrical energy that can then be stored and used to power other devices. With the recent surge of microscale devices, piezoelectric power generation can

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Regular Article – Experimental Physics

Sensitivity of low-energy incomplete fusion to various entrance-channel parameters

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Abstract. The disentangling of incomplete fusion dependence on various entrance channel parameters has been made from the forward recoil range distribution measurement for the $^{12}C + ^{175}Lu$ system at ≈ 88 MeV energy. It gives the direct measure of full and/or partial linear momentum transfer from the projectile to the target nucleus. The comparison of observed recoil ranges with theoretical ranges calculated using the code SRIM infers the production of evaporation residues via complete and/or incomplete fusion process. Present results show that incomplete fusion process contributes significantly in the production of αxn and 2pαxn emission channels. The deduced incomplete fusion probability (F_{ICF}) is compared with that obtained for systems available in the literature. An interesting behavior of F_{ICF} with Z_PZ_T is observed in the reinvestigation of incomplete fusion dependency with the Coulomb factor (Z_PZ_T), contrary to the recent observations. The present results based on (Z_PZ_T) are found in good agreement with recent observations of our group. A larger F_{ICF} value for ^{12}C induced reactions is found than that for ^{13}C, although both have the same Z_PZ_T. A nonsystematic behavior of the incomplete fusion process with the target deformation parameter (β_2) is observed, which is further correlated with a new parameter ($Z_PZ_T\beta_2$). The projectile α-Q-value is found to explain more clearly the discrepancy observed in incomplete fusion dependency with parameters (Z_PZ_T) and ($Z_PZ_T\beta_2$). It may be pointed out that any single entrance channel parameter (mass-asymmetry or (Z_PZ_T) or β_2 or projectile α-Q-value) may not be able to explain completely the incomplete fusion process.

1 Introduction

The investigation of the incomplete fusion (ICF) process is still an active area of research due to the non-availability of proper theoretical models below 8 MeV/nucleon energies. The role of entrance channel parameters on incomplete fusion (ICF) could not be established explicitly in this energy region due to complexity in the mass transferred. Recent studies show that the ICF process competes with complete fusion (CF) at lower projectile energies around the Coulomb barrier and well beyond it [1–19]. It is now a well established fact that in the ICF process, the projectile partially amalgamates with the target nucleus as compared to the CF process where complete projectile amalgamation takes place. It leads to the formation of an incompletely fused composite system with less mass, excitation energy and charge. The involvement of various degrees of linear momentum transfer (LMT) from the projectile to the target may give rise to different recoil ranges in the stopping medium. Moreover, owing to the linear momentum transfer, the ICF products are observed to be trapped at shorter depth in the stopping medium than that of CF products [2,15,17–19]. For the first time, Britt and Quinton [20] pointed out the experimental features of ICF in the break-up of projectiles like ^{12}C, ^{14}N, and ^{16}O into α-clusters. Later on, the break-up of projectiles was also observed by Galin *et al.* [21], who called such reactions "ICF reactions". The advancement in the ICF study was provided by Inamura *et al.* [22] on the basis of information extracted from the particle-particle angular correlation measurements. Udagawa and Tamura [23,24] by using the distorted-wave Born approximation (DWBA) explained the projectile break-up into α-clusters in the target nuclear field. Existing theoretical models [23–28]

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Statistical Characteristic of Pc4 Magnetic Micropulsation at Low Latitude in India

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Abstract

Magnetic Pulsations recorded on the ground are the signatures of the integrated signals from the earth's magnetosphere. Pc4 geomagnetic pulsations are quasi-sinusoidal variations in the earth's magnetic field in the period range 45-150 seconds. The magnitude of these pulsations ranges from fraction of a nano Tesla (nT) to several nT. Although these pulsations can be observed in a number of ways, yet the application of ground-based magnetometer arrays has proven to be the most successful methods of studying the spatial structure of hydromagnetic waves in the earth's magnetosphere. The solar wind provides the energy for the earth's magnetospheric processes. The source of Pc4 magnetic pulsations can either be internal to the magnetosphere (endogenic) or external to it, transmitted through the magnetopause (exogenic). Most of the Pc4 studies undertaken in the past have been confined to middle and high latitudes.

The present study is undertaken for describing the dependence of low latitude Pc4 occurrence on the Kp values and the Interplanetary Magnetic Field (IMF) over the period range 01 January to 31 December, 2005 employing an array of three low latitude recording stations at Hanley, Nagpur and Pondicherry. Analysis of the data for the whole year 2005 provided similar patterns of Pc4 occurrence for Kp at all the three stations. Although Pc4 occurrence was reported for Kp values, yet the major Pc4 events occurred for range 5≤ Kp ≤ 8. The results suggest that the solar wind controls Pc4 occurrence through a mechanism in which Pc4 wave energy is convected through the magnetosheath and coupled to the standing oscillations of the magnetospheric field lines.

Keywords: Pc4 Magnetic Pulsations, MHD Waves and Instabilities, Solar Wind-IMF Control of Pc4 Pulsations

Introduction

Examples of exogenic sources of Pc4 are surface waves produced at the magnetopause by Kelvin Helmholtz in-stability and waves produced at the bow shock or in the magnetosheath, all of which eventually propagate into the magnetosphere. The internal generation occurs by means of plasma instabilities within the magnetosphere. Free energy internal sources include pressure gradients, velocity shears and rapid changes in the magnetospheric geometry associated with sub-storms. Greenstadt et al [1] have presented the first direct evidence for the propagation of external Pc3-4 wave energy into the magnetosphere. Using a few individual events from ISEE 1-2 spacecrafts, they have verified that the same frequencies in the 10 – 100 mHz band were observed in the magneto-sheath and also in the magnetosphere but lower power was seen there. Tomonura et al [2] have also observed similar results from six months of ISEE data in the 3-30 mHz band. These researchers further demonstrated that the compressional oscillations dominated in the magneto-sheath around local noon while transverse Alfven waves were observed within the magnetosphere. The study will be very effective in investigation of magnetic field variation of earth. This will ultimately provide an insight in future atmospheres.

Magnetic Indices Kp

The intensity of magnetic disturbances, recorded on the magnetic chart of a magnetic observatory is measured by a figure Kp between 0 and 9 for an interval of 3 Greenwich hrs. 0-3, 3-6 etc. This they include many local effects such as the systematic variations in magnetic activity. To overcome this problem, a new index Kp is used to measure planetary variations in magnetic activity. This

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WEARABLE TECHNOLOGY FOR HEALTHCARE PROVISION AND MEDICAL EDUCATION-GOOGLE GLASS

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ABSTRACT

Developments in digital and communication technology are now reaching the realms that border on science fiction. Wearable technologies are extending these opportunities in ways that may have only seemed possible in science fiction movies. Wearable technologies -a networked device that can gather and store data to be transferred or synchronized to other devices that are literally wearable -is the newest emerging trend. Think of a smart-watch, a fitness band worn on your wrist or in your running shoes, a chip embedded in clothing, glasses with powerful computing capabilities. All these devices can gather data from your body movements or the surrounding environment and likewise provide you with information on location, in context with simple user interfaces. Many of us are already using wearable technologies on a daily basis. They are emphasizing the benefits of the hands-free capability to look up facts with a gesture, such as a nod, and simultaneously getting access to real-time patient information. This article focuses on this development. In doing so, it explores old and recent developments in wearable technology with a focus on their current and potential use in the field of healthcare and medical education. It also highlights the challenges that are likely to face this technology. Moreover, it attempts to provide some insights into the prospects of this technology from the theoretical perspective of the theory of disruptive innovations as proposed by Clayton Christensen and his colleagues from Harvard Business School.

Keywords: Disruptive innovations, e-Health, Healthcare, Medical education, Google glass

INTRODUCTION

Google Glass is a brand of smart glasses - an optical head-mounted display designed in the shape of a pair of eyeglasses. It was developed by X (previously Google X) with the mission of producing a ubiquitous computer. Google Glass displayed information in a smartphone-like, hands-free format. Wearers communicated with the Internet via natural language voice commands. Wearable technology is not a new phenomenon. There were many attempts during the last decades to design and develop a series of wearable devices that served many purposes. Most of the wearable technology devices that were developed during the 2010s focused on fitness. However, interest in wearable technology surged during the last few years. The new devices that emerged were more sophisticated than the previous ones with a potential to be used to perform a variety of tasks and enhance the operations of some professions. In this article, the potential and challenges of using wearable technologies in the healthcare domain is examined within the framework of the theory of disruptive innovations. This approach is helpful as it will shed some light on the process, implications and future direction of this technology with relation to healthcare.

WHAT IS GOOGLE GLASS?

The advancements in technology have allowed Google to include many of the same features that can be found in a standard Smartphone into a lightweight, compact device. For connectivity Glass includes 802.11b/g and Bluetooth for tethering to a Smartphone. Glass runs on Android 4.0.4 ("Ice Cream Sandwich"). It also includes 1GB of RAM in version 1 and 2GB of RAM in version 2 and 16 gigabytes of internal storage (12 GB available) for saving any photos taken with the built-in 5 megapixel camera which also records HD 720p videos. Glass uses a Texas Instruments OMAP System on a Chip 1.2 GHz dual-core

Cyber Crime as a Technical Issue

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Abstract

Cybercrime investigations are important for standardizing terminology, defining requirements, and supporting the development of new techniques and tools for investigators. In this paper a some investigations is presented which combines the existing knowledge, generalizes them, and extends them by explicitly addressing certain activities not included in them. Unlike previous study, this stud represents the information flows in an investigation and captures the full scope of an investigation, rather than only the processing of evidence. The results of an evaluation of the study by practicing cybercrime investigators are presented. This study is compared to some important existing models and applied to a real investigation.

KEYWORD: Cloud Computing, Cyber Terrorism, Fraud and Financial Crime

Introduction

Crime is directly or indirectly affects the society. In today's world, there is immense increase in the use of Internet in every field of the society and due to this increase in usage of Internet, a number of new crimes have evolved. Such crimes where use of computers coupled with the use of Internet is involved are broadly termed as Cyber Crimes.

In its most simple form, cyber-crime can be defined as any illegal activity that uses a computer as its primary means of function. The U.S. Department of Justice broadens this definition to include any illegal activity that uses a computer for the storage of evidence [1]. The term 'cyber-crime' can refer to offenses including criminal activity against data, infringement of content and copyright, fraud, unauthorized access, child pornography and cyber-stalking.

There are two main categories that define the makeup of cyber-crimes. Firstly those that target computer networks or devices such as viruses, malware, or denial of service attacks. The second category relate to crimes that are facilitated by computer networks or devices like cyber-stalking, fraud, identity-theft, extortion, phishing (spam) and theft of classified information.

Cyber-crimes have expanded to include activities that cross international borders and can now be considered a global epidemic. The international legal system ensures cyber criminals are held accountable through the International Criminal Court [2]. Law enforcement agencies are faced with unique challenges and the anonymity of the Internet only complicates the issues. There are problems with gathering evidence, cross-jurisdictional issues and miscommunication related to reporting.

It is widely known that victims of Internet crimes are often reluctant to report an offence to authorities. In some cases the individual or organization may not even be aware a crime has been committed. Even though facilities for reporting incidents of cyber

Touch Screen Technology

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Abstract

A touch screen includes a transparent, flexible substrate; a first conductive layer located on the flexible substrate; a flexible transparent cover sheet having integral compressible spacer dots; and a second conductive layer located on the flexible transparent cover sheet, when a force is applied to the touch screen at the location of one of the compressible spacer dots, the compressible spacer dot is compressed to allow electrical contact between the first and second conductive layers.

A touch screen which uses light sources at one or more edges of the screen which directs light across the surface of the screen and at least two cameras having electronic outputs located at the periphery of the screen to receive light from said light sources. A processor receives the outputs of said cameras and employs triangulation techniques to determine the location of an object proximate to said screen. Detecting the presence of an object includes detecting at the cameras the presence or absence of direct light due to the object, using a screen surface as a mirror and detecting at the cameras the presence or absence of reflected light due to an object. The light sources may be modulated to provide a frequency band in the output of the cameras.

KEYWORDS: Technology, Computers, Phones, Surface acoustic wave

Introduction:

Touch screen technology is the direct manipulation type gesture based technology. A Touch screen is an electronic visual display capable of detecting and locating a touch over its display area. This is generally refers to touching the display of the device with a finger or hand. This technology most widely used in computers, user interactive machines, smart phones, tablets etc to replace most functions of the mouse and keyboard. Touch screen technology has been around for a number of years but advanced touch screen technology has come on in leaps and bounds recently. Companies are including this technology into more of their products. The three most common touch screen technologies include resistive, capacitive and SAW (surface acoustic wave). Most of low end touch screen devices contain on a standard printed circuit plug-in board and are used on SPI protocol. The system has two parts, namely; hardware and software. The hardware architecture consists of a stand-alone embedded system using an 8-bit microcontroller, several types of interface and driver circuits. The system software driver is developed using an interactive C programming language [1][2].

Why we use this Technology:

- It is very easy to use
- It increases the speed of tasks
- It is valuable in accommodating users with physical issues that might make a traditional mouse and keyboard setup difficult to use
- It reduces the size of components

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Role of input angular momentum and target deformation on the incomplete-fusion dynamics in the $^{16}O + ^{152}Sm$ system at $E_{Lab} = 6.1$ MeV/nucleon

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Spin distributions of nine evaporation residues ^{164}Yb(4n), ^{163}Tm(pxn), ^{160,162}Er(2pxn), $^{161-164}$Ho(apxn), ^{164}Dy(α2pxn), and ^{160}Dy(α2αxn) produced through complete- and incomplete-fusion reactions have been measured in the system $^{16}O + ^{152}Sm$ at projectile energy = 6.1 MeV/nucleon using the in-beam charged-particle ($Z = 1,2$)–γ-ray coincidence technique. The results indicate the occurrence of incomplete fusion involving the breakup of ^{16}O into $^{4}He + ^{12}C$ and/or $^{7}Be + ^{9}Be$ followed by fusion of one of the fragments with target nucleus ^{152}Sm. The pattern of measured spin distributions of the evaporation residues produced through complete and incomplete fusion are found to be entirely different from each other. It has been observed from these present results that the mean input angular momentum for the evaporation residues produced through complete fusion is relatively lower than that of evaporation residues produced through incomplete-fusion reactions. The pattern of feeding intensity of evaporation residues populated through complete- and incomplete fusion reactions has also been studied. The evaporation residues populated through complete-fusion channels are strongly fed over a broad spin range and widely populated, while evaporation residues populated through incomplete-fusion reactions are found to have narrow range feeding only for high spin states. Comparison of present results with earlier data suggests that the value of mean input angular momentum is relatively higher for a deformed target and more mass asymmetric system than that of a spherical target and less mass asymmetric system by using the same projectile and the same energy. Thus, present results indicate that the incomplete-fusion reactions not only depend on the mass asymmetry of the system, but also depend on the deformation of the target.

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I. INTRODUCTION

The study of heavy ion (HI) induced reactions, particularly complete-fusion (CF) and incomplete-fusion (ICF) dynamics at projectile energy just above the Coulomb barrier [1–9], has been an important area from the past few decades. Several reaction channels may open in the interaction of two heavy ions and a transfer of cluster of nucleons may take place. Britt and Quinton [10] were the first to observe the production of "fast α particles" in the breakup of projectiles ^{12}C, ^{14}N, and ^{16}O into α clusters in an interaction with the surface of the target nucleus at bombarding energies ≈10.5 MeV/A. Subsequently, Galin *et al.* [11] also observed the breakup of projectiles and called such reactions, leading to the emission of "fast" α particles, "ICF reactions" or "breakup fusion reactions." However, major advances in the study of ICF dynamics has taken place after the measurement of charged-particle–γ-ray coincidence by Inamura *et al.* [12] for the $^{12}N + ^{159}Tb$ system at beam energy ≈7 MeV/nucleon. The studies by Parker *et al.* [13], Tom[illegible] *et al.* [14,15], Sharma *et al.* [16], and Singh *et al.* [17] showed the onset of the ICF process just above the Coulomb barrier at bombarding energies around 5–7 MeV/nucleon. Morgenstern *et al.* [18] showed that ICF reactions significantly contribute to the total reaction cross section for mass asymmetric systems at the same relative velocity, and hence observed the effect of entrance channel mass asymmetry on ICF fraction. Earlier studies carried out on a large number of projectile target combinations have brought out the entrance channel mass asymmetry dependence of ICF reaction, with ICF probability being higher in a mass asymmetric system than in a mass symmetric system [19–22]. Gavron *et al.* [23], Westerberg *et al.* [24], and Geoffroy *et al.* [25] reported the studies based on light ions in coincidence with prompt γ rays of evaporation residues. Siwek-Wilczynska *et al.* [26] provided a [illegible] picture to understand the ICF dynamics. Yamada *et al.* [illegible]nowski *et al.* [28] pointed out that the projectile [illegible] (PLFs) are emitted during the interaction of a projectile [illegible] on a target based on charged-particle ($Z = 1,2$) [illegible]dence with prompt γ rays. Semiclassical theory of HI [illegible]ion [illegible]arizes the CF and ICF processes on the basis of [illegible] angular momentum ℓ imparted in the system.

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Annexure (1)

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EXPLOITATION OF LINSEED OIL IN THE DEVELOPMENT OF ECO- FRIENDLY PRODUCTS: AN OVERVIEW

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ABSTRACT
Exploitation of natural renewable resources for the formulation of useful technical materials has been receiving the attention of academicians and scientific researchers now-a-days. Renewable resources especially those are obtained from the agricultural origin have ability to grow again and again. This ultimately cut down the dependency on petrochemicals, a finite resource which is going to deplete day by day. Vegetable oils especially those obtained from different seeds have attracted the attention of researchers, due to their unique properties and environment friendly characteristics. Linseed oil, abundantly available throughout the world and its production can enhance enormously by easy cultivation. It has been largely used in the different forms such as in cooking food, as a raw material for chemical industries and medicinal component for the ancient time. In present communication efforts have been made to overview the significant utilization of linseed oil in different arena of practicable utility.

Keywords: Linseed oil, Polyester, Polyesteramide, Urethane, Renewable resource

INTRODUCTION
Utilization of renewable resources especially these are derived from agricultural resources in the development of various practicable materials has received significant attention now-a-days [1-3]. Such developments not only provide an alternative to petrochemicals going to deplete day by day but also reduce the emission of green house gasses. The biotransformation from the petrochemical based economy to bio-based green economy necessitates a novel exploitation of natural materials that are transformable into high value added product [4, 5]. Numerous renewable resources bestowed by the nature like starch, cellulose, lignin, protein, wool fibers, cashew nut, vegetable oil and many others have been utilized for the syntheses of various useful materials of viable applications in the daily life [6,7]. Vegetable oils, structurally triglycerides composed of saturated and unsaturated fatty acids, represent a promising class of raw materials for polymer industries owing their abundant availability, sustainability and biodegradability. The presence of various reactive sites, like esters, double bonds, allylic, vinylic carbons provides ample opportunities to tailor numerous materials with small efforts [8].

Linseed oil generally obtained from the dried and ripe seeds of flax plants (*Linum usitatissimum*) is a small herbaceous annual plant of family *Linaceae* [9]. Chief constituting fatty acid of the linseed oil is linolenic acid (more than 50% of total fatty acids). Furthermore, it contains tocopherol (antioxidant), sterols, phosphotides [10, 11]. The iodine value of the oil is high, hence categorized as drying oil in literature [12]. Due to this character, linseed oil has been used to protect the metals and woods from the ancient time. In view to improve the properties of end-products to make them more versatile numerous modifications were carried out in additions to their use as starting materials in many polymeric recipes. In present communication efforts have been made to overview the advancement and modifications of linseed oil as useful starting material for different useful industrials recipes.

COMPOSITION AND CHARACTERISTICS
Linseed contain about 26-455 % triglyceride oil. Physicochemical properties and fatty acid compositions of the oil slightly vary according to nature of soil, extraction and purification methods, climatic conditions etc. Linolenic acid containing three isolated double bonds is the major constituting fatty acid (44-60 %) [11, 13]. General structure of linseed oil and major constituting fatty acids are depicted in Figure 1. Iodine value of oil is directly proportional to its unsaturation and largely governing property and can be determine volumetrically by measuring the amount of gram iodine reacted with double bonds of 100 gram of oil sample under standard condition [12,14]. The iodine value of linseed oil reported to about 180 [11, 12, 14]. On the basis of iodine value it is classified as drying oil in the literature. Balanikas *et al.* analyzed the fatty acid composition and other functionalities by FT-IR, ^{1}H-NMR and Gas Chromatography-Mass spectroscopy (GC-MS) analyses. With the help of the various types of signals for different types of protons, areas of the singles caused by them and the peaks for the terminal methyl groups of the different fatty acids, fatty acid composition of the linseed oil was established [11]. The same was also analyzed with the help of GC-MS using standard fatty acid as the reference. It has been reported that methyl group of linolenic acid appears at δ = 0.97 ppm, where as methyl group of other fatty acids appears at δ = 0.88 ppm [11].

Annexure-2

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ANTICANCER ACTIVITIES OF CATHARANTHUS ROSEUS AND AZADIRACHTA INDICA: AN OVERVIEW

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ABSTRACT

There has been a long history of traditional medicine for serving living being all over the world. In the last few decades there has been an exponential growth in the field of herbal medicine in developing as well as in developed countries, because of their natural origin and minimum side effects. India is an agriculture based country crowned with numerous herbs and plants, the largest producer of medicinal herbs consequently called as botanical garden of the world. The phytochemicals present in the medicinal plants are vitamins, carotenoids, terpenoids, flavonoids, polyphenols, alkaloids, tannins, saponins, enzymes, minerals and many others. These phytochemicals possess antioxidant activities, which can be used in the treatment of many diseases, especially cancer. There are the several medicinal plants and herbs those have been utilizing traditionally for the prevention and treatment of cancer for the many decades. In the present communication efforts have been to overview the potential of Catharanthus roseus and Azadirachta indica in curing different types of carcinomas.

Keywords: Anticancer activity, Azadirachta Indica, Cancer, Catharanthus roseus, Medicinal plants.

INTRODUCTION

Cancer is a one of the major public health problem throughout the world and only modest progress has been made in reducing the morbidity and mortality of this disease (Bhanot et. al. 2011). Every year, millions of people are diagnosed with cancer and reported to among the leading cause of death globally (Lawania and Mishra, 2013; Nigam and Rana, 2016). In its report, Indian Council of Medical Research (ICMR) reported that in 2016 the total number of new cancer cases is expected to be around 14.5 lakh and it may likely to reach nearly 17.3 lakh new cases in 2020. Over 7.36 lakh people are expected to succumb to the disease in 2016, while the figure is estimated to shoot up to 8.8 lakh by 2020. Data also revealed that only 12.5 per cent of patients come for treatment in early stages of the disease. According to report, among females, breast cancer topped the list and among males, mouth cancer is more prominent. (http://www.midday.com/articles/over17 lakhs new cancer cases in India by 2020 ICMR; Khan et. al 2015; Safarzadeh et. al. 2014). Cancer is a group of diseases characterized by the uncontrolled growth and spread of abnormal cells, which begins with mutation in DNA, which instruct the cells how to grow and divide. Normal cells have the ability to repair most of the mutations in the DNA. However, certain mutations which are not repaired, causing the cells to grow and becomes cancerous (Dixit and Ali 2010). If the spread is not controlled, it can result in death. Cancer is caused by both external factors, such as tobacco, infectious organisms, an unhealthy diet and internal factors, such as inherited genetic mutations, hormones, immune conditions. The environmental factors include smoking (active and passive tobacco smoking), exposures to toxic chemicals, different types of radiations at home and work places, toxic chemicals thorough our food as well as drinking water and pollution in air (Balchandran et al., 2005 Quazi and Molvi 2014). These factors may act together or in sequence to cause cancer. Ten or more years often pass between exposure to external factors and detectable cancer. Today human beings are suffering from numerous types of cancers such as cancer of blood, skin cancers, cancer of digestive system, cancers of urinary system, cancers specially related to women and many others (Paul et. al. 2011; Higgins and Baelga 2011, Sadeghnia et. al. 2014). Cancer continues to be a mysterious challenge for cancer biologists and medical practitioners. Several tantalizing claims for discovering a sure cure for cancer have been made by scientific community from time to time. However, a trustworthy cure against most of the cancer is still a challenge even nowadays. One of the key reasons for this is the multiple pathways of their survival adopted by the cancer cells. Blockings of few pathways of their survivals do not ensure their targeted eliminations. Complete removal of the cancer without damage of the rest part of the body is goal of the treatment. This can be achieved by the surgery, chemotherapy, radiation therapy and many other methods. Now-a-days solids tumors are surgically removed and patients received adjuvant radiation treatment and chemotherapy (American Cancer Society. Cancer Facts & Figures 2016, Atlanta: American Cancer Society; 2016). However these methods are tedious, costly and also lead to several side effects which ultimately change the quality of life. Furthermore, the toxicity of some treatments restricts their uses and effectiveness.

Nature bestowed large number of plants and herbs. The traditional systems of medicines - Ayurveda, Siddha and Unani are based on the experiences in the use of plant products in amelioration of common diseases. Majority of our population, particularly those living in villages depend largely on herbal remedies (Gupta,

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ANTIBACTERIAL, ANTIFUNGAL AND ANTIOXIDANT ACTIVITIES OF *AEGLE MARMELOS*: AN OVERVIEW

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ABSTRACT
In the recent past due to their low cost easy availability and low toxicity, exploration of plant for their medicinal importance has been increased enormously. Aegle marmelos (bael) is renowned as one of the important plants used in the Indian traditional medicare practices against various diseases. Numerous active phytochemicals including alkaloids, flavonoids, coumarins, terpenoids, fatty and amino acids has been extracted from different parts of this plant and reported to possess several pharmacological, anti-inflammatory, anti-pyretic, antibacterial, antifungal, anticancer, antidysentric, antidiabetic and antioxidative activities against the wide range of microorganisms. In present communication efforts have been made to overview the antibacterial, antifungal and antioxidant activities of the plant in view to arrange the scattered information to a single place which will ultimately be convenient to further study.

Keywords: Bael, Human health, Medicinal Values, Pharmacological Activities

INTRODUCTION
The ethnic people of the world live in the areas which are greatly rich in biodiversity and beneficially India is vastly rich in numerous herbs and plants bestowed by the nature. The plants that exert advantageous pharmacological effects on the animals are commonly designated as medicinal plants (Yadav et. al., 2015). World Health Organization (WHO) has listed over 21000 plant species used for medicinal purposes throughout the world. In India, there are 45,000 species of wild plant out of which 9,500 species are ethno botanically important species. Out of these 7,500 species are used for medicinal purposes in indigenous health practices (Sharma et. al. 2007). Plants derived materials for their medicinal values have been increasing among different section of world societies as they possess less toxicity and side effects (Nigam and Nambiar, 2015).

Aegle marmelos (bael) is one of the most important medicinal plants of India (Srivastva et. al., 1996) reported to have various medicinal properties in traditional medical systems against various diseases and many bioactive compounds have been isolated from this plant (Anonymous 1995; Dhiman 2003; Sharma et al 2011). Bael belongs to angiospermic family Rutaceae, which commonly known as wood plant or holy fruit (English) and Bael (Hindi). Bael is a subtropical species and grows best in swamps, alkaline or stony soils having a pH range from 5 to 8. In India flowering occurs in April and May and the fruit ripens in 10 to 11 months after (March to June) of the following year. Bael is medium sized, slow-growing tree; reaches up to 12 to 15 m tall with short trunk having thick, soft, flaking bark and sometime spiny branches. A peculiar fragrance emitted from the leaves when brushed. Fruit is spherical in shape with generally a diameter of 2 to 4 inch. Shell of the fruit is thin, hard but woody in nature. Young fruit is green in colour which becomes yellow on maturity. A clear, gummy sap, resembling gum arabic, exudes from wounds branches (Sudharameshwari 2007, Sekar 2011).

The different parts of bael are used for various therapeutic purposes, such as for treatment of Asthma, Anaemia, Fractures, Healing of Wounds, Swollen Joints, High Blood Pressure, Jaundice, Diarrhoea, and Typhoid Troubles during Pregnancy. Bael has been used as an herbal medicine for the management of diabetes mellitus in Ayurvedic, Unani and Siddha systems of medicine in India. Poultice made of leaves are used for ophthalmia and ulcers. The leaves are used to lowering the blood glucose levels. Other actions like antifungal, antibacterial, antiprotozoal, antispermatogenic, anticancerous, antioxidant and anti-inflammatory are also reported (Solanki et. al. 2012, Saha et al 2016, Chaudhary, 2017, Tripathi and Singh 2017). In the present communication efforts have been made to overview the antibacterial, antifungal and antioxidant activities of the plant.

CHEMICAL CONSTITUENTS
Extracts of bael in different solvents were extensively studied by the different researchers and revealed that leaves, stem, root and fruit pulp contain significant amount of tannins, alkaloids, coumarins, steroids, terpenoids, saponins and flavonoids (Dutta et.al 2014, Mujeeb et.al. 2014). Seed oil is bitter in taste and contains palmitic acid (15.6%), Stearic acid (8.3%), linoleic acid (28.7%) and linolenic acid (7.6%), whereas the seed residue has about 70% protein. Reducing sugars such as galactose, arabinose and L-rhamnose are also found in fruit. Various carotenoids present in fruit are responsible for characterislics color of fruit. Root of bael tree contains psorulin, xanthotoxin and scopoletein (Maity et. al. 2009; Brijyog 2017). Different bioactive compounds (chemical structures are depicted in Figure 1) isolated from different parts of the bael are summarized in table 1.

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EXOGENOUSLY - APPLIED TRIACONTANOL PROMOTES GROWTH, PHYSIOLOGICAL ACTIVITIES AND YIELD CHARACTERISTICS OF *CORIANDRUM SATIVUM* L.

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ABSTRACT
Coriander (Coriandrum sativum L.) leaves are rich source of Vitamins C, K and proteins and small amounts of various nutrients. Coriander is an essential bearing medicinal herb that contains numerous medicinal properties. The spicy herb is explored for its curative role in various types of disorders including digestive, respiratory and urinary systems. It is considered as curative agents due to its properties of diaphoretic, diuretic, carminative and stimulant. Hence, it was hypothesized that triacontanol (TRIA), a potent plant growth promoting substance for various medicinal and agricultural crops, could enhance production of essential oil of coriander. The plants were sprayed with deionized water (Control), 10^{-8}, 10^{-6} and 10^{-5} M of TRIA at 30 days after sowing. The present study indicated that the foliar application of TRIA applied on coriander plants enhanced growth characters, enzymatic activities, and yield attributes including essential oil content. Of the four concentrations, 10^{-6} M of TRIA proved to be the significantly optimum for all studied parameters.

INTRODUCTION
Triacontanol (TRIA), a long chain primary alcohol ($C_{30}H_{61}OH$), has been recognized as a pivotal plant growth regulator for a number of crops (Reis and Houtz 1983; Reis 1991; Naeem et al. 2012). TRIA has improved growth, yield, quality and physiological processes of several medicinal plants (*Artemisia annua, Coriandrion sativum, Cymbopogon flexuosus, Mentha arvensis, Papaver somniferum*) as reported by various workers (Misra and Srivastava 1991; Srivastava and Sharma 1991; Khan et al. 2007; Aftab et al. 2010). Its efficiency has also been proved for high yield in a number of horticultural crops like barely, rice, tomatoes, maize, lettuce, cucumber, potatoes, cauliflower, brinjal, chillies, opium and hyacinth bean as reported by various workers (Reis and Houtz 1983; Reis 1991; Naeem et al. 2009, 2012).

Coriander (*Coriandrum sativum* L.; Apiaceae family) is widely adapted to a variety of climate and soil types in India. It occupies 0.42 million ha with an annual production of 0.25 million tons of seed and is mainly grown during the winter season on the northwestern plains of the country. The productivity of coriander seed is 595 kg ha^{-1} in India, which is very low. One of the main reasons for the low productivity is that this crop is grown in areas characterized by light soils with medium fertility (Diederichsen 1996; Kumar et al. 2008). The plant reaches up to 50 cm. The flowering stem, which is slender and smooth, reaches a height of 20-120 cm. The fruits are nearly globular, 3-4 mm in diameter and are yellow-brown when ripe. The fruits consist of two halves, single-seeded mericarps (The Wealth of India 2001). The coriander plant yields two primary products that are used for flavoring purposes: the fresh green herb and the spice (The Wealth of India 2001). Keeping the economical as well as medicinal importance of coriander in mind, a study was conducted to find out the growth promotive effect of TRIA on physiological activities and plant productivity including essential oil content.

MATERIALS AND METHODS
Experimental setup
A simple pot experiment was conducted in the natural growth environment of the net house. Prior to seed spreading, each pot was maintained with 5 kg soil and manure in ratio of 4:1. The soil was maintained at proper moisture to ensure better growth of the plants. The seeds were sown directly at a depth of 2 cm in each earthen pot. TRIA was applied as foliar spray at 10 days interval on plants to find out the best performance of plant. The plants were sprayed with deionized water (control), 10^{-8} M, 10^{-6} M and 10^{-5} M of TRIA at 30 days after sowing (DAS). Each treatment was replicated four times. Plants were sampled at 70 days after planting (DAP). The pots were watered as and when required.

Growth characteristics
The growth parameters viz. shoot and root lengths, fresh and dry weights of plants were determined at 70 DAP. Potted plants from each pot were evacuated carefully to measure various growth parameters. Water content of the plant was excluded using drying oven at 80° C for one day to record dry weight of the plants.

PHYSIOLOGICAL PARAMETERS
Total chlorophyll and carotenoids contents
Total content of chlorophyll and carotenoids in the leaves was estimated using the method of Lichtenthaler and Buschmann (2001). The contents were expressed as mg g^{-1} FW.

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EFFECT OF GIBBERELLIC ACID SPRAY ON GROWTH, ENZYMATIC ACTIVITIES, YIELD AND ESSENTIAL OIL CONTENT OF CORIANDRUM SATIVUM L.

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ABSTRACT

Coriander (Coriandrum sativum L.) plant bears numerous medicinal properties. The essential oils present in the herb are known to stunt bacterial production and multiplication. It is explored for it curative role in various type of disorders including digestive, respiratory and urinary systems. Coriander is considered as curative agents due to its properties of diaphoretic, diuretic, carminative and stimulant. Gibberellic acid (GA_3) plays an important role in modulating diverse physiological processes throughout the period of plant growth and development. The plants were sprayed with different concentrations (10^{-8}, 10^{-6} and 10^{-3} M) of GA_3 at 30 days after sowing. Control plants were sprayed with deionized water.

Among the applied treatments, a foliar spray of 10^{-6} M of GA_3 proved to be optimum and promoted the values for all studied parameters including growth (shoot and root lengths, plant fresh and dry weights), physiological and biochemical (total chlorophyll and carotenoid content, activities of nitrate reductase and carbonic anhydrase, leaf-nitrogen, phosphorus and potassium content) parameters, and yield and quality characteristics (number of umbel per plant, number of fruits per umbel, 100-seed weight, seed-yield and essential oil content). The results indicated that foliar applied GA_3 is highly effective for crop productivity and essential oil production.

INTRODUCTION

Gibberellic acid (GA_3) is a potent plant hormone, which promotes growth and elongation of cells. Since GA_3 regulates growth, applications of very low concentrations have a profound effect while too much have the opposite effect but eventually plants develop tolerance to it (Sadowska et al. 1984; Yamaguchi, 2008). GA_3 have also a number of effects on plant development including stimulate rapid stem growth, induce mitotic division in the leaves of some plants and increase seed germination rate (Riley 1987; Tipirdamaz and Gomurgan 2000). Earlier studies (Ohlsson and Berglund 2001; Srivastava and Srivastava 2007) suggested that GA_3 increases the production of active constituites in all plant parts but mirimize the total biomass production which result in decreased overall production of secondary metabolites such as alkaloid and essential oil.

Among aromatic plants, the coriander has much importance due to its versatile use as an herb as well as a spice. Coriander (*Coriandrum sativum* L.; Apiaceae family) is a culinary and medicinal plant and is widely adapted to a variety of climate and soil types in India. It occupies 0.42 million ha with an annual production of 0.25 million tonnes of seed and is mainly grown during the winter season on the northwestern plains of the country. Coriander seed oil is included among the 20 major essential oils in the world market. The productivity of coriander seed is 595 kg/ha in India, which is very low. One of the main reasons for the low productivity is that this crop is grown in areas characterized by light soils with medium fertility (Diederichsen 1996; Kumar et al. 2008). The plant reaches up to 50 cm. The flowering stem, which is slender and smooth, reaches a height of 20-120 cm. Hermaphrodite and staminate flowers occur in each umbel. The fruits are nearly globular, 3-4 mm in diameter and are yellow-brown when ripe. The fruits consist of two halves, single-seeded mericarps (The Wealth of India 2001). The fruits of coriander produce a normalizing action, and the related preparations containing ethereal oils are used to improve the appetite and digestion. The coriander plant yields two primary products that are used for flavoring purposes: the fresh green herb and the spice (Pruthi 1980; The Wealth of India 2001). Coriander fruits were also recommended as an antiseptic, expectorant and pain- relieving remedy in cases of gastritis and gastric ulceration. These fruits enter into the compositions of well-known bile- expelling and laxative herbal teas. Besides, it is a rich source of Vitamin C, K, minerals and proteins. Keeping the economical as well as medicinal value of coriander in mind, the study was conducted to find out the positive effect of GA_3 on growth, enzymatic activities, yield and quality characters including essential oil content.

MATERIALS AND METHODS

Experimental setup, growth and yield analyses

An earthen pot experiment was conducted in the natural condition of the net house. Prior to seed spreading, each pot was maintained with 5 kg soil and manure in ratio of 4:1. The soil was maintained at proper moisture to ensure better growth of the plants. The seeds were sown directly at a depth of 2 cm in each earthen pot. Treatment of GA_3 was applied as foliar spray at 10 days interval on plants to find out the agricultural response of plant. The plants were sprayed with deionized water (control), 10^{-8} M, 10^{-6} M and 10^{-3} M of GA_3 at 30 days

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INTERACTIVE EFFECT OF THERMAL POWERPLANT WASTEWATER, COAL FLY ASH AND DIFFERENT NITROGEN LEVELS ON GROWTH AND YIELD ATTRIBUTES OF CHICKPEA (CICER ARIETINUM L. cv. BG-256)

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ABSTRACT

The use of thermal power plant wastewater (TPPW) and coal fly ash in agriculture for irrigation need specific studies to evaluate their effect on different soils, crops and agro-climatic conditions. This study was therefore conducted to observe the suitability of wastewater for irrigation, and Cicer arietinum L.cv. BG-256 was used as a test crop. The experiment was conducted in the winter season of 2000–2001 to evaluate its effect together with the basal application of four doses of nitrogen (N_0, N_{10}, N_{20}, N_{30} kg ha^{-1}). Fly ash (@ 10%) selected from previous study, conducted in the year 1999 was amended with soil to make the final weight 7 Kg ha^{-1}. Wastewater irrigation resulted in the increased growth and yield of the crop. Lower fertilizer dose of nitrogen @ 10 Kg ha^{-1} together with wastewater irrigation and fly ash amended soil (FA_{10}) proved optimum, resulting in greater leaf area, plant fresh weight, dry matter (DM) and leaf NPK content, number of pods per plant, 100 seed weight and protein content relative to control which is found to be at par with higher N doses (N_{20} and N_{30}). Thus fertilizer rates could be lowered without reducing yields when using wastewater for irrigation and fly ash (FA_{10}) as an amendment to the soil.

Keywords: Thermal power plant wastewater, fly ash, yield, chickpea, nitrogen.

I. INTRODUCTION

In most parts of the developing world, fresh water supply is becoming increasingly limited due to over consumption by the fast growing population of these countries. More than 60% of the valuable water used each year is diverted for irrigating crops. For Asia, which has two third of the world's irrigated land, the figure is still higher (85%) due to unscientific irrigation. The colossal wastage of our scarce freshwater resources can be reduced by various ways, important being the reuse of wastewater in agriculture which is gaining importance nowadays because of its value as a potential irrigation source and a nutrient supplier. In addition to the manorial ingredients, it effectively augments the supply of water, the most important requirement of cultivated crops. Wastewater not only offers an alternative water irrigation source, but also the opportunity to recycle plant nutrients (1). Its application might ensure the transfer of fertilizing elements, such as nitrogen (N), phosphorous (P), potassium (K+), organic matter, and meso and micro-nutrients, into agricultural soil and has been reported to increase crop yield (2, 3, 4, 5, 6, 7, 8 & 9). Hence, wastewater nutrients can contribute to crop growth (10). Wastewater rich in organic materials and plant nutrients is finding agricultural use as a cheap way of disposal (11). Application of wastewater e. g. thermal power plant wastewater (TPPW) to cropland is an attractive option for disposal because it can improve physical properties and nutrient contents of soils (12). Thus, its use would help in water conservation recycling nutrients (NPK) in wastewater, reducing direct fertilizer inputs and minimizing pollution loads to receiving water bodies (13, 14 & 15).

Similarly, Disposal of high amount of fly-ash from thermal power plants absorbs huge amount of water, energy and land area by ash ponds. In order to meet the growing energy demand, various environmental, economic and social problems associated with the disposal of fly-ash would continue to increase. Every year thermal power plants in India produce more than 100 million tonnes of fly ash, which is expected to reach 175 millions in the near future (16). Disposal of this huge quantity of fly ash is posing a great problem due to its limited utilization in the manufacturing of bricks, cements, ceiling and other civil construction activities. This would further bring changes in land-use patterns and contribute to land, water and atmospheric degradation, if proper management options for handling ash are not undertaken (17, 18 & 19). Therefore, fly-ash management would remain a great concern of the century. Fly-ash has great potentiality in agriculture due to its efficacy in modification of soil health and crop performance. The high concentration of elements (K, Na, Zn, Ca, Mg and Fe) in fly-ash increases the yield of many agricultural crops. But compared to other sectors, the use of fly-ash in agriculture is limited.

While, the most important role of N in the plant is its presence in the structure of protein and nucleic acids which are the most important building and information substances of every cell. In addition, N is also found in chlorophyll that enables the plant to transfer energy from sunlight by photosynthesis. Thus, the supplies of N to the plant will influence the amount of protein, amino acids, protoplasm and chlorophyll formed. Consequently,

EVALUATION OF TWO VARIETIES OF CHICKPEA GROWN UNDER THERMAL POWER PLANT WASTEWATER AND COAL FLY ASH APPLICATION

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ABSTRACT

A field experiment was conducted to investigate the effect of thermal power plant wastewater (TPWW), ground water (GW) and coal fly ash (FA) on the growth and seed yield of chickpea at Department of Botany, Aligarh Muslim University, Aligarh. Two chickpea varieties (BG-256 and Avarodhi) were evaluated against TPWW, GW and four fly ash-soil amendments (0, 10, 20 and 40%). Uniform dose of NPK fertilizers were applied and the seeds were sown. The results revealed that all growth and yield traits of chickpea were significant at ($P<0.05$) and positively influenced by TPWW and fly ash soil amendments; and chickpea varieties also responded differently. TPWW proved better as compared to GW, while fly ash (10%) showed better response in comparison to control i.e. FA_0 whereas, FA_{20} and FA_{40} proved deleterious for both the varieties of chickpea However, least performance was resulted by the crop at control. In case of varieties, BG-256 showed its superiority over Avarodhi. It was concluded that the growth and seed yield of chickpea varieties improved with the application of TPWW and FA (10%); while chickpea variety BG-256 showed its superiority over Avrodhi for all the growth and yield traits. Hence, variety BG-256 may preferably be cultivated and along with TPWW, FA (10%) may be applied for maximizing the chickpea yields.

Keywords: Chickpea, thermal power plant wastewater, fly ash, NPK, yield.

INTRODUCTION

Grain legumes are a major source of protein in human and animal nutrition and play a key role in crop rotations in most parts of the world. Chickpea (C. arietinum L.) is the third most widely grown grain legume in the world after bean and soybean. The agronomical significance of chickpea depends on its high protein content (approx. 19.3– 25.4%) for the human and animal diet, being utilized increasingly more as an elective protein source. Moreover, Growth is generally a function of environmental factors (such as temperature and solar radiation) and mineral nutrition, along with genotype and production practices (Alam and Haider, 2006). Growth analysis is one way to verify the crops ecological adaptation to new environments, the competition between species, crops management effects and the identification of the productive capacity of different genotypes. The elements of dry matter distribution to different plant organs, their yielding and efficiency might be described by utilizing various indices of growth analysis (Zajac et al., 2005; Kibe et al., 2006). Growth investigation is as yet the most straightforward and exact strategy to assess the commitment of various physiological procedures in plant development. It provides a considerable insight into the functioning of a plant as depends on genotype or environment. The motivation behind growth analysis is the assurance of the expansion in dry matter alluded to a reasonable reason for photosynthetically active tissue, leaf area and measure of leaf protein (Ali et al., 2004; Gupta and Gupta, 2005; Alam and Haider, 2006; Yasari and Patwardhan, 2006).

Fly ash is produced by burning coal in thermal power plant and it poses a serious environmental hazard. Disposal of the huge amount of ash produced by burning of coal for energy purpose in different industry is a major concern today (Gautam et al. 2012). The disposal of fly ash by conventional methods leads to degradation of arable land and contamination of ground water therefore, development of proper technologies for disposal of this solid waste in an eco-friendly manner becomes essential to derive maximum benefit from its heterogeneous nature, since it is a store house of readily available plant macro and micronutrients (Gupta et al 2002). In combination with organic manure, microbial inoculants or fertilizers, fly ash can be used to design a soil benefaction strategy, which can help in improving soil properties and enriching its nutrient status. The presence of almost all essential plant nutrients in ionic form and the ameliorating effect on the physical, chemical and microbial nature of soil makes fly ash an important input for biomass production, especially on various degraded soils and wasteland (Gupta et al 2002). Lower amendment levels of fly ash caused enhancements of both growth and yield while adverse effects at higher levels were observed for several crops including maize, soybean barley, cabbage, apple, alfalfa, beet (Kumar et al, 2002; Marten, 1971).

Water is visibly so much that its value is accounted low as it is believed that the water resources are inexhaustible or at least more than sufficient for all our needs. However, the habitable land areas have only limited fresh water resources, and only about 0.5% is present either as ground water or surface water in lakes, rivers, ponds and dams etc. (Cunningham and Saigo, 1995). Contrarily, enormous amount of waste water is

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MUTATION BREEDING ON *VICIA FABA* – A REVIEW

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Mutations are inherited changes in the genetic material which produce new genetic variation that allows organisms to evolve. They have been employed to improve morphological, physiological, disease resistance and quantitative characters including yield and yield contributing traits. Hugo-de Vries in 1901 for the first time used the term mutation for the appearance of a new type in evening primrose *(Oenothera)* plants. He published the book entitled "The Mutation Theory". In this he showed that if humans learn command over origin of mutations, superior strains of plants and animals can be produced. In his first paper, Muller (1927) on 'Artificial trans mutation of gene' hoped that practical breeders need no longer lie on the mercy of the existing limited genetic variability. He found that X-rays considerably enhance mutation rate in *Drosophila*. Success with X-rays was achieved by Stadler (1928a, b) in barley and maize. Indications about the possibility of induction of mutations by the use of chemical mutagens started appearing within a decade after discovery of the phenomenon. The first elaborated report was presented by Auerbach and Robson (1942) who showed that mustard gas (dichloro-ethyl sulphide) could induce chromosomal breaks in *Drosophila*. These studies opened a flood gate to research into the mutagenic effects of a variety of chemicals. In 1969, the joint FAO/IAEA Division started to organize course for plant breeders on the induction and use of mutation and in the same year published first edition of the manual and mutation breeding may, therefore, be justified to consider 1969, as they earth at marked the establishment of mutation breeding as a practical tool available to plant breeder in their endeavors to develop more productive cultivars with better resistance to stresses, pathogens, and pests, and with improved quality characteristics for plant products used as food, feed or industrial raw material. Brock (1970) considers that induced mutations are as an alternative to naturally occurring variations, as the source of germplasm for plants improvement programmes and as an alternative to hybridization and recombination in plant breeding programmes.

2.1. INDUCTION OF MUTATIONS BY HYDRAZINE HYDRATE

Studies the genotoxicity of hydrazine hydrate in different organisms confirmed the induction of reverse gene mutation (de Flora, 1981; Parodi et al., 1981; Bayer, 1989), chromosome aberration (Khursheed et al., 2015; Amin *et al.*, 2017), while the carcinogenicity of hydrazine hydrate was confirmed by Steinhoff and Mohr (1988, 1990) and as for mutagenecity hydrazine hydrate induces methylation of guanine into 7- methylguanine and O^6 methylguanine (Leakakos and Shank 1994). There is a certain amount of evidence about the mutagenic action of hydrazine in both prokaryotes and eukaryotes. It was sometimes classified as an inactivating agent with weak mutagenic activity (Fishbeain *et al.*, 1970) but studies with bacterial species suggested that it can fairly be a potent mutagen with little or no toxic effect (Kimballand Hirsch, 1975). A useful review of the earlier work with special emphasis on the chemical basis of mutagenesis of hydrazine was given by Brown *et al.* (1966). Hydrazine was reported to induce a variety of morphological, physiological and colour mutants in several crop plants such as barley (Shangin Berezovsky *et al.*, 1973), Maize (Chandra shekhar and Reddy, 1971), potato (Upadhya *et al.*,1974), rice (Ratho and Jachuck, 1971; Reddy and Reddy, 1972; Reddy *et al.*,1973), tomato (Jain and Raut, 1996; Jain *et al.*, 1969; Raut, 1969; Yakovleva, 1966) and chickpea (Parveen, 2006). In general, hydrazine in these studies appeared to be a successful as the other potent mutagens. However, it appeared to differ in two ways.

i. It produced a number of mutations detectable in M_2 generation whereas the other mutagens produced fewer or none,

ii. The spectrum of mutational changes (phenotypic classes) for hydrazine was generally very different from that of other mutagens (Kimball, 1977).

Hydrazine has been reported to react with the pyrimidines in DNA to saturate the 5,6 double bond, especially of thymine from N4-amino cytosine and to open up the pyrimidine ring with consequent loss of pyrimidines from DNA or through intermediate radical reactions including the formation of hydrogen peroxide depending upon the hydrazine derivatives involved (Kimball, 1977). There are some unexpected features concerning time of detection and locus specificity that are not yet explained. The mutations produced by hydrazine seen to be mainly or entirely single locus changes (Parveen, 2006). It is known in microorganisms that the base-specific chemical mutagen, hydrazine directly acts on thymine, pH8.5, one of the four bases of deoxyribonucleic acid (DNA), which might bring about mutations (Frease, 1963). In higher organism like *Drosophila* and *Lycopersicon*, hydrazine is known to induce homozygous recessive mutations in the first generation (Jain

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Anti-microbial and Anti-oxidant Properties of *Solanum nigrum*: An Overview

Abstract

There has been long history of traditional medicine for serving living being all over the world.

In the recent past there has been an exponential growth in the field of herbal medicine in the developing as well as in developed countries owing to of their natural origin and minimum side effect. *Solanum nigrum* (makoi) plants belong to solanaceae family largely used in the Indian traditional medicare practices against various diseases. It is reported for various biological activities such as antibacterial, antifungal, anti-inflammatory, anticancer, anti-oxidant, antipyretic and cytotoxic activity. Chemical constituents commonly found in *S. nigrum* are glycoalkaloids, glycoproteins, polysaccharides, polyphenolic compounds such as gallic acid, catechin, protocatechuic acid, caffeic acid, epicatechin, rutin. Reddish brown coloured fruits are used for edible purpose. In present communication efforts have been made to overview the antimicrobial and antioxidant activities of the plant in view to arrange the scattered information to a single place which will ultimately be convenient to further studies.

Keywords: Anti-microbial Activity, Anti-oxidant Activity, Chemical Constituents, Medicinal Values, Pharmacological Activities, *Solanum nigrum*.

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Introduction

In recent years there has been a gradual revival of interest in the use of traditional herbal medicines all over the world as these are reported to safe and less or without any adverse effect in comparison to synthetic drugs (Shaikh et. al. 2016). According to an estimate around 70,000 plant species, from lichens to tall trees have been used for medicinal purposes; among them higher plants play a significant role since ancient times (Farombi, 2003). Ayurveda, the most ancient and scientific treaties on medicines and diseases which dates back to 1500-800 BC has mentioned the role of plants in treating diseases (Manoharachary and Nagaraju, 2016). Today about 80 % population of the world rely on the use of traditional medicines for the treatment of several diseases because of its safe nature in comparison to synthetic drugs that are regarded unsafe to human and environment in long terms of use (WHO, 2002). There are about 45,000 plant species in India. The officially documented plants with medicinal potential are 3000 but traditional practitioners use more than 6000. India is the largest producer of medicinal herbs and is appropriately called as the Botanical Garden of the World (Ahmedullah and Nayar 1999; Bent and Ko 2004). In rural India, 70% of the population is dependent on the traditional system of medicine (Farombi, 2003). In fact, plants are reported to possess diverse range of bioactive phytochemicals which are responsible for biological activities such as anticoxidant, antimicrobial, anticancer, antidiarrheal, anti-inflematory and anti-HIV activities (Pandey et. al. 2010, Pandey et. al. 2012). It is estimated that approximately one quarter of prescribed drugs contain plant extracts or active ingredients obtained from plants (Shashank and Pandey 2014). Many medicinal products derived from plants are easily available in the market such as aspirin, atropine, artimesinin, colchicine, digoxin, ephedrine, morphine, physostigmine, pilocarpine, quinine, quinidine, reserpine, taxol, tubocurarine, vincristine and vinblastine (Sekar et. al. 2010).

Among different plants of medicinal values, *S. nigrum* commonly known as Black Nightshade or "Makoi" possess significant place in Ayurvedic medication and generally grows as weeds in moist habitats in

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Anti-microbial and Anthelmintic Activities of *Calotropis procera*: An Overview

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Abstract

Herbal medicines have been used from the earliest times to the present day which shows a remarkable therapeutic diversity. Nowadays, its importance is increasing nowadays at global level because of its negligible side effects. *Calotropis procera* (Asclepiadaceae) commonly known as a giant milk weed is a renowned Ayurvedic plant and used in the Indian traditional medicare practices since ancient time. The extracts from different parts of the plant have significant therapeutic value which is used in several traditional medicines to cure various diseases. The plant is a very promising source of anticancerous, ascaricidal, schizonticidal, anti-microbial, anthelmintic, insecticidal, anti-inflammatory, anti diarrhoeal, larvicidal activities with many other beneficial properties. Numerous active phytochemicals including calotropin, calotropagenin, calotoxin, calactin, uscharin, amyrin, amyrin esters, uscharidin, coroglaucigenin, and calotropagenin extracted from different parts of the plant and used in many therapeutic applications and made this plant of scientific attraction for centuries. In present communication efforts have been made to overview the antimicrobial and anthelmintic activities of the plant in view to arrange the scattered information to a single place which will ultimately be convenient to further study.

Keywords: Antimicrobial and anthelmintic activities, *Calotropis procera*, Ethnomedicine, Pharmacological properties, Phytochemicals.

Introduction

The human race started using plants and plant products as a mean of treatment of diseases as useful and effective therapeutic tools from the early days of civilization (Ghani, 2003). In recent years, a gradual revival of interest in the use of traditional herbal medicines has been shown all over the world as these are reported to have negligible adverse effect in comparison to synthetic drugs (Shaikh et. al. 2016). According to an estimate around 70,000 plant species, from lichens to tall trees have been used for medicinal purposes, among them higher plants play a significant role since ancient times (Farombi, 2003). Ayurveda, the most ancient and scientific treaties on medicines and diseases which dates back to 1500-800 BC has mentioned the role of plants in treating diseases (Mancharachary and Nagaraju, 2016). As per an estimate, today about 80 % population of the world rely on the use of traditional medicines for the treatment of several diseases because of its safe nature in comparison to synthetic drugs that are regarded unsafe to human and environment in long terms of use (WHO, 2002). There are about 45,000 plant species in India. The officially documented plants with medicinal potential are 3000 but traditional practitioners use more than 6000. India is the largest producer of medicinal herbs and is appropriately called as the Botanical Garden of the World (Ahmedullah and Nayar 1999). In rural India, 70% of the population is dependent on the traditional system of medicine (Farombi 2003). In fact, plants are reported to possess diverse range of bioactive phytochemicals which are responsible for biological activities such as antioxidant, antimicrobial, anticancer, anti-diarrheal, anti-inflamatory and anti-HIV activities (Pandey et. al. 2012). It is estimated that approximately one quarter of prescribed drugs contain plant extracts or active ingredients obtained from plants. Many medicinal products derived from plants are easily available in the market such as aspirin, atropine, artimesinin, colchicine, ephedrine, morphine, quinine, reserpine, taxol, vincristine and vinblastine (Sekar et. al. 2010).

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Plant originated colour pigments used in traditional arts

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Abstract
Keeping in mind as one of the leading arts and paintings and their dependency upon colour for its impact, mood and depth, colour played a very important role. The effect of colour on the viewer visual senses is highly potent and even one tiny dab of brightly coloured pigment in an otherwise monochromatic picture can transform the work. Even the earliest exponents of prehistoric cave painting (30,000-12,000 BC) were experts in the use of primitive pigments, obtained from the plants. Traditional plant originated pigments used by prehistoric cave painters and artists from Ancient Antiquity, as well as colours which appeared in palettes of the Renaissance, Baroque, Rococo and Impressionist periods. Since the late-19th century, the majority of pigments employed by most painters are improved synthetic variants of traditional older colours. Malus (Apple) bark used for yellow colours, while Rubus berries for pink, Areca catechu for deep pink colour and many more plants are used in traditional arts.
But nowadays, most natural colourants are obsolete. Modern artificial colours tend to be more lightfast, more permanent, more intense and considerably cheaper and safer to use. It's amazing how many of the older pigments (both natural and early synthetic variants) were highly toxic compounds containing lead, mercury, chrome and arsenic - even cyanide. The total 35 plant genus belonging to 36 species are listed in the table 1 which are used for obtaining colours from various parts.

Keywords: plant parts, colour pigments, traditional arts, suggested mordant

Introduction
Pigments are the raw materials of painting and art. They are insoluble particles that impart colour and some degree of hiding power over the surface to which they are applied [1]. Pigments, and advances in their technology, have influenced the development and history of Western art since its earliest forms. Pigment creation has been paralleled to some extent by the development of paints and binders into which the pigments could be dispersed. This paper reviews the history of art from the perspective of the pigments used to create that art and the development and influence of science and technology in art.

Primitive Pigments
Primitive man used pigments from his natural environment in painting, thus the pigments found in different areas of the world tend to vary [1]. It is thought that pigments were applied by two methods [2, 3]. The first was to mix pigment with animal fat and apply it as a paint with the fingers or a reed. The second method was to blow pigment powder onto the painting surface using a hollow tube.
Many early dyes were discovered by the ancient Egyptians such as blue woad (*Isatis tinctoria*), indigo (*Indigofera tinctoria*) and red madder (*Rubia tinctorum*), which al... from plants, and red carmine, which was produced from the kermes beetle [3, 4]. These dyes were converted into pi... by making lakes, a technology pioneered by the Egyptians. Laking is the precipitation of a dye onto p... of an insoluble, colourless binder such as chalk or white... The Egyptians may have also produced lakes by comple... the dye molecules with metal salts such as aluminum from alum.
Wood and indigo were extracted from the leaves of their respective plants with hot water, and the laked pigments were made by scraping off the foam that formed on top of the extraction and purple were extracted from the root of the plant by an aqueous filtration process. The dried ground roots were mixed with water and treated in a series of stages with alkali, then filtered through meshes to extract the colouring matter. The red dye was converted into a lake pigment by precipitation onto a binder, although it is not clear whether the Egyptians actually used madder lake as a pigment.
Carmine, a red colorant mentioned in the Old Testament and by Pliny [3, 4], was probably first used as a lake pigment as early as Egyptian times. It was obtained from the kermes beetle, which is native to Europe and Asia, and found on various types of oak trees [3]. The female insect attached itself to the oak tree to lay eggs, and then both were collected just before hatching and killed with vinegar. The colour was extracted by pouring boiling water onto the dried insects to ... the water soluble kermesic acid, which was then ... with iron-free alum to give an insoluble lake ...
... pigments of note were introduced to Europe from ... around 1600 [3]. European links with the Near and ... East were just beginning to expand [3], and in England ... items were imported by the East India Company. ... first of these pigments was gamboge5, an organic ... made from the gum of the *Garcinia* evergreen tree.

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Novel Green Synthesis of Graphene Layers using Zante Currants and Graphene oxide

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ABSTRACT

The present work shows a facile route for the preparation of graphene layers and for the first time Zante currants extract used for the effective deoxygenation of graphene oxide has been reported. Zante currants (ZC) extract reduce effectively GO into few layered structures of graphene (FLG). The morphology of few layers graphene and graphene oxide (GO) were investigated by SEM and TEM. Reduction effect on graphene oxide confirm by other technique like Raman, FTIR, XRD and UV spectrophotometry. This procedure keep away the use of hazardous chemicals, thus providing a new hope for large scale production of chemically reduced graphene.

Keywords: Zante currants (ZC), Graphene oxide (GO), Few layers graphene (FLG) and Green synthesis.

INTRODUCTION

Graphene has attracted a great attention of researchers in the current era of emerging nanochemistry field due to its optical, electronic, thermal, and mechanical properties[1]. Among several methods "chemical reduction method" is one of the well-known methods that has been used extensively for the reduction of graphene oxide (GO) to few layer graphene (FLG). Generally, it is performed by applying some reducing agents like hydrazine hydrate, hydrogen-bromide, p-toluene sulphonic acid, and sodium borohydride[2-4]. There is no doubt it is the simplest process but, this procedure has few drawbacks like, toxicity nature of reducing agents as well as its cost[5]. Sometimes formation of agglomeration of graphene layers limit the implementation of this procedure. To avoid all these drawbacks, many eco-friendly pathway and bio-reduction procedures are being adopted, where microorganisms or plants extracts perform as deoxygenating agents[6,7]. Therefore, it is more beneficially to reduce GO by using natural based reductants[8]. There are several studies in which natural based reducing agents Ficus carica[9], vitamin C[10,11], Gallic acid[12], tea solution[13,14], bacteria[15] and alanine[16]

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Synthesis and Evaluation of Some 2-Aryl-3-[substituted pyridin-2-yl]-amino/methylamino thiazolidin-4-ones

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ABSTRACT

A series of compounds incorporating thiazolidinone moiety has been synthesized and screened for their antifungal activity. 2-Aryl-3-[substituted pyridin-2-yl]-amino/methylamino thiazolidin-4-ones have been synthesized by cyclocondensation of [substituted pyridin-2-yl]-araldehydehydrazone and N-Methyl [substituted pyridin-2-yl]-araldehydehydrazone with mercapto acetic acid in dioxane. The initial reactants required for the synthesis were obtained by refluxing 2-hydrazino substituted pyridine and 2-[N-methylhydrazino]-substituted pyridine with different substituted aldehydes. These newly synthesized compounds were then screened for their fungicidal activity against *Rhizoctina solani* and *Fusarium oxysporum*. Structures of all these compounds were confirmed by ^{1}H NMR, IR and mass spectrum analysis. Some compounds exhibited excellent fungicidal properties.

Keywords: Thiazolidinones, Fungicidal activity, *Rhizoctina solani*, *Fusarium oxysporum*.

INTRODUCTION

The pyridine ring is associated with diverse biological activities viz: antibacterial, herbicidal, fungicidal and plant growth regulators[1-3]. Union of pyridine ring with N-containing heterocycles provide compounds of enhanced herbicidal activity[4]. The investigations of new pyrazine and pyridine derivatives showing antimicrobial activities have been carried out. They appeared to be of elevated activity towards the aerobes[5]. At 100 mgL^{-1}, bioassays indicated that some multi-substituted pyridine derivatives have good herbicidal activity on the roots of oilseed rape and barnyard grass[6].

The thiazolidine ring by virtue of presence of toxophoric - N=C-S linkage and a cyclic >C=O function in the five membered ring is associated with diverse biological activities[7-16]. Reports pertaining to the pesticidal activities to the ring have also been reported[17-19]. Coumarin, thiazole and their respective derivatives have been reported to exhibit significant biological activity and are used as pharmaceuticals[20,21]. They are capable of imparting antimicrobial properties[22]. Amino and urea substituted thiazoles exhibited *in vivo* activity on duckweed (*Lemna paucicostata*)[23].

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PHYTOCHEMICAL AND ANTIMICROBIAL ANALYSIS OF NYCTANTHES ABBOUR-TRITIS

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ABSTRACT

The present study was undertaken to investigate the phytochemical and antimicrobial analysis of *Nyctanthes arbor-tristis*. *Nyctanthes arbor-tristis* contains phenolic compounds, glycosides, carbohydrates, proteins, saponins and alkaloids. Triterpenoids, tannins and anthraquinone were absent. Antimicrobial activity of methanolic extract showed that *Escherichia coli* and *Staphylococcus aureus* were highly sensitive.

Key words: Agar well diffusion, *Escherichia coli*, *Nyctanthes arbor-tristis*, Phytochemicals.

INTRODUCTION

Nyctanthes arbour-tritis is commonly known as night flowering jasmine (Parijat). It is native to Southern Asia from Pakistan, India, Nepal and Thailand. Its seeds, leaves and flowers are useful as medicine. They are used for chronic fever, bronchitis, asthma, constipation, greyness of hair, skin diseases, sciatica, rheumatism and baldness. The seeds of *N. arbor-tristis* are used in treatment of piles. From its leaves three new benzoic esters of Loganin and 6- β-hydroxyloganin, namely arborside-A, arborsideB, and arborside-C were isolated. Leaves also contain the alkaloid nyctanthine along with nannitol, βAmyrin β-Sitosterol, hentriacontane, benzoic acid, astragalin, nicotiflorin, oleanolicacid, nyctanthic acid, friedelin and lupeol[1, 2]. Many research groups have also reported such studies throughout the world [3, 4]. Phytochemicals previously with known pharmaceutical activities have been investigated as a source of medicinal agents [5]. It is well known that phytochemicals with adequate antibacterial, antifungal efficacy will be used for the treatment of bacterial and fungal infection. Yadav et al., 2018 and Yadav, 2018 tested the antimicrobial activity of plants and showed that plants are a potential source of innovative antibiotic prototype [7, 8]. The present study was undertaken to investigate the phytochemical and antimicrobial analysis of Nyctanthes arbor-tristis and secondary metabolite present in it.

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COMPARATIVE ANTIMICROBIAL ACTIVITY OF GARLIC AND BLACK PEPPER

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Abstract

Antibacterial activity of *Allium sativum* (garlic) and *Piper nigrum* (pepper) extracts has been evaluated against against *Staphylococcus aureus, Pseudomonas aeruginosa* and *Escherichia coli*. Among all methanolic extracts evaluated for antimicrobial activity garlic extracts showed excellent antimicrobial activity against almost of all pathogens tested.

Key words: Antimicrobial activity, *Allium sativum, Piper nigrum, Staphylococcus aureus*.

I. INTRODUCTION

As a developing country India is represented by rich culture, tradition and natural biodiversity and it offers a unique opportunity for drug discovery research. The spices have a unique aroma and flavour which are derived from compounds known as phytochemicals or secondary metabolites (Avato et al., 2002). According to Jachas, 2007 and Singh, 2002 number of traditional natural products have been increased and much work has been done on selected ethno medicinal plants for antibacterial activity against pathogenic strains of Gram negative and Gram positive bacteria. Further, natural products as an alternative to conventional treatment in healing and treatment of various diseases have been on the rise in the last few decades. Recently Kaur et al., 2017, Yadav et al., 2018, Yadav (2018), Ved and Mohsin (2018), and Ashish and Mohsin(2018) worked on antimicrobial activity of Indian medicinal plants. This investigation was performed to evaluate. Antibacterial activity of *Allium sativum* (garlic) and *Piper nigrum* (pepper) extracts against against *Staphylococcus aureus, Pseudomonas aeruginosa* and *Escherichia coli*.

II. MATERIALS AND METHODS

The plant materials were collected from local area of District Shahjahanpur of Uttar Pradesh, India.

Bacterial Strains

Staphylococcus aureus (NCIM-2079)

Escherichia coli (NCIM-2064)

Pseudomonas aeruginosa (NCIM-5210)

Solvent and Media: Methanol and Nutrient Agar

Powdered plant material was used for methaloic extract through Soxhlet apparatus. Then extract was evaporated to remove methanol and dried extract was stored at 4° C for analysis.

Fluorescence study of cationic gemini surfactant 1, 4- bis(dimethylcetylammonium bromide) in the presence of alcohols

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Abstract

A fluorescence study has been performed to study the surface properties of cationic gemini surfactant butanediyl- *1, 4*-bis(dimethylcetylammonium bromide) (16-4-16) in the presence and absence of primary linear alcohols. The method fluorescence quenching has been used to calculate the micelle aggregation number (N_{agg}) of mixed system, the micropolarity of the mixed system gemini/alcohol systems have been calculated from the ratio of intensity of peaks (I_1/I_3) of the pyrene fluorescence emission spectrum. The above method is very important to calculate the micropolarity.

Keywords: Gemini surfactants, Alcohols ,Mixed micelles Synergism

Introduction

Surfactants are the surface active agents. So we can say that a surfactant is characterized by its tendency to adsorb at surfaces or interfaces, and of altering to marked degree the surface or interfacial free energy of those surfaces[1]. There are mant applications of surfactants in almost every chemical industry, including detergents, paints, dyestuffs, cosmetics, pharmaceuticals, agrochemicals, fibres, and plastics. therefore, surfactants have a great role in the oil industry, for example, in enhanced and tertiary oil recovery.

A surfactant mainly has two parts i.e. hydrophilic (water loving) and hydrophobic (water hating). The surfactants can be clasified as cationic, anionic, nonionic and zwitterionic. Alcohols and fatty acids mainly used for the preparation of surfactants. Gemini surfactants play a major role in the field of surface chemistry. Gemini term was discovered by Menger. Gemini surfactants have two hydrophilic and two hydrophobic parts and their hydrophilic parts are connected by a spacer (most commonly a methylene spacer or an oxyethylene spacer).

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IN VITRO ANTIMICROBIAL ACTIVITY OF INDIAN MEDICINAL PLANTS

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Abstract

As a developing country India is represented by rich culture, tradition and natural biodiversity and it offers a unique opportunity for drug discovery research. The present investivation was performed for invitro analysis of antibacterial activity of *Saraca indica, Azadirachata Indica and Ocimum sanctum against Staphylococcus aureus, Pseudomonas aeruginosa* and *Escherichia coli.* Results shows that plant extracts were effective against all bacterial strains.

Key words:- Antibacterial activity, *Saraca indica, Staphylococcus aureus, Pseudomonas aeruginosa.*

I. INTRODUCTION

India has rich culture, tradition and natural biodiversity and it provides opportunity for drug discovery research. According to Jachas, 2007 and Singh, 2002 number of traditional natural products have been increased and much work has been done on selected ethno medicinal plants for antibacterial activity against pathogenic strains of Gram negative and Gram positive bacteria. Further, natural products as an alternative to conventional treatment in healing and treatment of various diseases have been on the rise in the last few decades. Recently Kaur et al., 2017, Yadav et al., 2018, Yadav (2018), Ved and Mohsin (2018), and Ashish and Mohsin(2018) worked on antimicrobial activity of Indian medicinal plants. The present investivation was performed for invitro analysis of antibacterial activity of *Saraca indica, Azadirachata Indica and Ocimum sanctum against Staphylococcus aureus, Pseudomonas aeruginosa* and *Escherichia coli.*

II. MATERIALS AND METHODS

The plant materials were collected from local area of District Shahjahanpur of Uttar Pradesh, India.

Bacterial Strains

Staphylococcus aureus (NCIM-2079)

Escherichia coli (NCIM-2064)

Pseudomonas aeruginosa (NCIM-5210)

Solvent and Media: Methanol and Nutrient Agar

Extract Preparation: Powdered plant material was used for methaloic extract through Soxhlet apparatus. Then extract was evaporated to remove methanol and dried extract was stored at 4° C for analysis.

Agar Well Diffusion Method: Bacterial cultures were swabbed over solidified nutrient agar medium. The wells were prepared using cork borer. Test samples were dissolved in different

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Review

Cellulose an ageless renewable green nanomaterial for medical applications: An overview of ionic liquids in extraction, separation and dissolution of cellulose

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ABSTRACT

Cellulose is a renewable natural fiber, which has gained enormous and significant research interest and evolved as the prime and promising candidate for replacing synthetic fibers. The various sources of cellulose, which is one of the world's most ubiquitous and renewable biopolymer resources, include trees, plants, tunicate and bacteria. The renewable biomaterial in the form of nanocellulose and its composites have been included in this review having the broad range of medical applications, viz.; tissue engineering, cardiovascular surgery, dental, pharmaceuticals, veterinary, adhesion barriers and skin therapy. These grafts are being fabricated from biodegradable materials. Bacterial cellulose is also an emerging renewable biomaterial with immense potential in biomedical field. The fabrication methods, characteristic properties and various overwhelming applications of cellulosic composites are explicitly elucidated in this review. The crux of this review is to exhibit the latest state of art, development in the field of cellulosic nanocomposite science and technology researchs and their applications towards biomedical field. Among the fourteen principle of green chemistry the two key principles i.e. using environmentally preferable solvents and bio-renewable feed-stocks covers in dissolution of cellulose in ionic liquids (ILs). In addition, this review covers about the comprehensive extraction and dissolution of cellulose and nanocellulose using ILs.

Contents

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जनपद शाहजहाँपुर में विकसित कृषि तकनीकी का सामा आर्थिक प्रभाव–एक भौगोलिक अ

डॉ० एन०यू० खान नवीन जायसवाल

सारांश :

कृषि भारतीय अर्थव्यवस्था की रीढ़ है तथापि भारतीय कृषि की यह विडम्बना रही है कि भारत में अधिकांशतः जीविका एवं गुजारे की फसल का उत्पादन होता रहा है। अगर हम जीविकोपार्जन कृषि के साथ अधिक लाभ

देने वाली फसलों के उत्पादन में वृद्धि करें तो न केवल किसानों की आय में वृद्धि की जा सकती है बल्कि देश की अर्थव्यवस्था में भी तेजी आ सकती है। हालांकि कृषि को लाभदायक बनाने हेतु निरन्तर प्रयास हुए हैं लेकिन हम कृषि का कोई ऐसा मॉडल विकसित नहीं कर पाए है जिससे किसानों को कृषि में रोजगार अथवा लाभ का लक्ष्य दिखाई दे। हालांकि सरकार द्वारा किसानों को प्रोत्साहित करने के लिए कई योजनाएं चलाई जा रही है। गत 70 वर्षों में आधुनिक कृषि प्रौद्योगिकी जैसे संकर बीज, रासायनिक उर्वरक, कीटनाशक एवं नवीनतम कृषि यन्त्रों की सहायता से खाद्यान्न उत्पादन में कई गुना वृद्धि हुई है। कृषि उत्पादन को ध्यान में रखकर सरकार की ओर से किसानों के लिए कई महत्वपूर्ण कार्य क्रम चलाए जा रहे है। आधुनिक खेती में बढ़ती लागत एवं जहरीले कीटनाशकों के चलते किसानों को जैविक खेती की ओर भी प्रेरित किया जा रहा है। कृषि विज्ञान सम्बन्धी नवीनतम व अत्याधुनिक जानकारियों के प्रचार–प्रसार में इन्टरनेट महत्वपूर्ण भूमिका निभा रहा है। इसके माध्यम से न केवल किसानों की मानसिकता में क्रान्तिकारी परिवर्तन आ रहे है बल्कि वे सामाजिक–आर्थिक रूप से पहले से सम्पन्न हुए है।

अध्ययन क्षेत्र:

जनपद शाहजहाँपुर रूहेलखण्ड भौगोलिक क्षेत्र का एक अभिन्न भाग है, जो रूहेलखण्ड सम्भाग के पूर्वी भाग में अवस्थित है। अध्ययन क्षेत्र का अंशांशीय विस्तार 270,35। उत्तरी अंशांश से 280,29। उत्तरी अंशांश तक तथा देशान्तरीय विस्तार 790,37। पूर्वी देशान्तर से 800,23। पूर्वी देशान्तर के मध्य स्थित है। जनपद शाहजहाँपुर का भौगोलिक क्षेत्रफल 4581 वर्ग किलोमीटर है। अध्ययन क्षेत्र की उत्तरी सीमा पर पीलीभीत जनपद तथा दक्षिणी सीमा पर फर्रूखाबाद और हरदोई जनपदों का विस्तार है। जबकि पूर्वी सीमा पर जनपद लखीमपुर खीरी द्वारा होता है तथा पश्चिम में बरेली एवं सीतापुर जनपद का विस्तार पाया जाता है।

प्रशासनिक दृष्टिकोण से जनपद में 06 जनपद मुख्यालय शाहजहाँपुर, 04 तहसील मुख्यालय (तिलहर, पुवायां, जलालाबाद एवं शाहजहाँपुर सदर), 15 विकासखण्ड मुख्यालय, 126 न्यायपंचायत मुख्यालय पंचायत मुख्यालय और 2331 सकल राजस्व ग्राम सभा स्थानीय निकायों एवं प्रशासन के दृष्टिकोण से 03 नगर परिषद (जलालाबाद, तिलहर और शाहजहाँपुर), 01 छ (शाहजहाँपुर कैण्ट) एवं 07 टाउन एरिया स्थित है। वर्ष जनगणना वर्ष के अनुसार जनपद की कुल जनसंख्या व्यक्ति है, जिसमें 1606403 पुरुष एवं 1400135 स्त्रिया हैं। जनघनत्व की दृष्टि से 695 व्यक्ति प्रति वर्ग किलोमी करते हैं। जनपद में पुरुषों की साक्षरता 68.18 प्रतिशत की साक्षरता 49.57 प्रतिशत है जबकि कुल साक्षरता 59 है। लिंगानुपात की दृष्टि से 872 स्त्रियां प्रति हजार पुरु कुल कार्यशील जनसंख्या 32.25 प्रतिशत है। विगत द 2001–2011) में जनसंख्या वृद्धि की दर +20.55 प्रतिशत

ऐतिहासिक परिपेक्ष्य में देखने से स्पष्ट होता है शाहजहाँपुर का निर्माण 1813–14 में हुआ, इसके पूर्व य बरेली जनपद के अन्तर्गत सम्मिलित था। 1637 में शाह नाम पर बसाये गये नगर शाहजहाँपुर के नाम से ही जनपद क की नींव पड़ी। जिसका भाग शाहजहाँपुर के सियालसालार एवं सरवदल खाँ को जाता है। यह क्षेत्र पांचाल क्षेत्र के सम्मिलित है जिसका विस्तार उत्तर में हिमालय से लेकर चम्बल तक था जिसकी राजधानी अहिछत्र (वर्तमान जनप में थी। इस क्षेत्र का प्राचीन इतिहास पुराणों में वर्णित पुरुरा

जनपद बरेली में मृदा गुणवत्ता का कृषि उत्पादकता पर प्रभाव का भौगोलिक विश्लेषण

डॉ० एन०यू० खान   पंचम सिंह

सारांश : मृदा एक आधारभूत संसाधन है। मनुष्य की मूलभूत आवश्यकतायें यथा भोजन, वस्त्र, गृह आदि मृदा से एवं परोक्ष रूप से सम्पूरित होती है। आदि मानव से लेकर मानव तक की लम्बी यात्रा में मानवीय विकास, किसी न रूप से मिट्टी से जुड़ा रहा है। कहा जा सकता है कि मिट्टी संस्कृति और सभ्यता की जननी है। मानव सभ्यता के विकास –शिला कृषि का सीधा सम्बन्ध मिट्टी की हजारों वर्ष पूर्व समाज को आकर्षित किया और कालान्तर में नदी घाटियाँ की क्रोड बन गई। भारत का बड़ा समुदाय मिट्टी को माता में पूजता है। औद्योगिक संस्कृति के बावजूद कृषि का प्रभाव है, क्योंकि भोजन सभी के लिए आवश्यक है। सोना पैदा वाले देशों को भी अन्न, फल, दूध और माँस की आवश्यकता है मिट्टी की देन है। स्पष्ट है कि मृदा एक ऐसी आधारभूत संसाधन है जो मानव अस्तित्व के लिए परमावश्यक है।

अध्ययन क्षेत्र:

प्रस्तुत शोध–प्रबन्ध का अध्ययन क्षेत्र जनपद बरेली है जो खण्ड भौगोलिक क्षेत्र का अभिन्न अंग है। जनपद बरेली का विस्तार 280° 10' उत्तरी अक्षांश से 280° 54' उत्तरी एवं देशान्तरीय विस्तार 780° 58' पूर्वी देशान्तर से 790° 47' देशान्तर के मध्य स्थित है। अध्ययन क्षेत्र का कुल भौगोलिक 4120 वर्ग किलोमीटर है। जनपद की उत्तरी सीमा का ऊधम सिंह नगर (उत्तराखण्ड) जनपद एवं दक्षिणी सीमा पर बदायूँ स्थित है। इसकी पूर्वी सीमा पर पीलीभीत एवं शाहजहाँपुर का विस्तार है जबकि पश्चिमी सीमा पर जनपद रामपुर स्थित

प्रशासनिक दृष्टि से जनपद बरेली में 01 मण्डल मुख्यालय, जनपद मुख्यालय (बरेली) 06 तहसील मुख्यालय (बहेड़ी, मीरगंज, आंवला, नबावगंज एवं फरीदपुर), 15 विकासखण्ड मुख्यालय, न्याय पंचायत, 1008 ग्राम पंचायत एवं 2072 राजस्व ग्राम है। स्थानीय प्रशासन एवं निकायों की दृष्टि से 01 नगर 04 नगर पालिका परिषद, 15 टाउन एरिया स्थित है। वर्ष जनगणना के अनुसार कुल जनसंख्या 44,48359 व्यक्ति है 23,57,665 पुरूष एवं 20,90,964 स्त्रियाँ सम्मिलित है। जनघनत्व से 1080 व्यक्ति प्रति वर्ग किलोमीटर निवास करते हैं।

शोध के उद्देश्य:

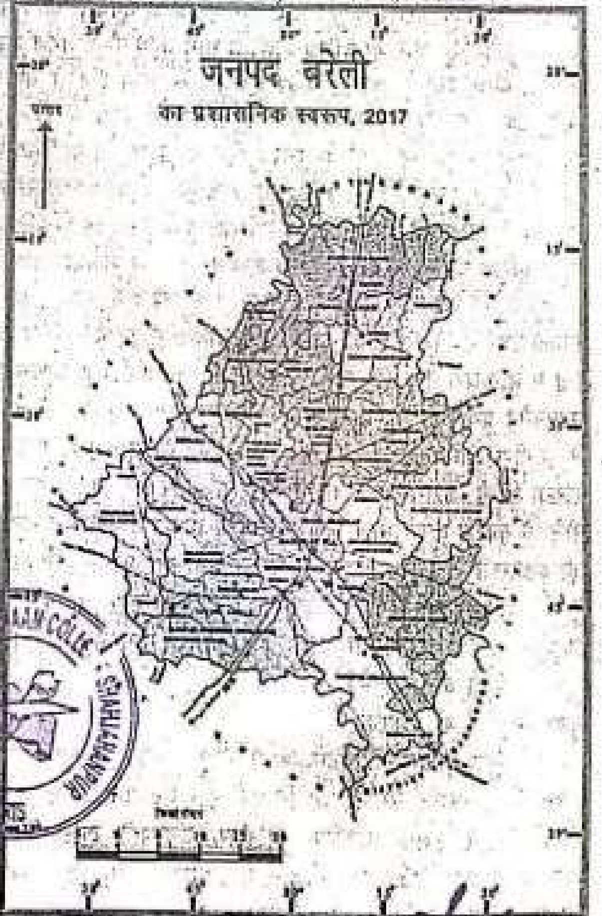
जनपद बरेली एक कृषि प्रधान क्षेत्र है जहाँ कृषि अर्थव्यवस्था स्रोत है। कृषि उत्पादन में उपजाऊ मृदा का विशेष महत्व मिट्टियों की पर्याप्त उपलब्धता के फलस्वरूप यहाँ की स्थिति में है। कृषि क्रिया–कलापों पर पड़ने वाले मृदा गुणवत्ता के प्रभाव का अध्ययन करना प्रस्तुत शोध–पत्र का मुख्य उद्देश्य है।

विधि तन्त्र:

प्रस्तुत शोध–पत्र को पूर्ण करने के लिए आंकड़ों का एकत्रीकरण प्राथमिक एवं द्वितीयक आंकड़ों के माध्यम से किया गया है। प्राथमिक आंकड़े जैसे मृदा की संरचना एवं संगठन और गुणवत्ता तथा उनकी विशेषताओं से सम्बन्धित आंकड़े मृदा परीक्षण केन्द्रों से परीक्षण के माध्यम से तथा उनकी उपयोगिता को प्रश्नावलियों एवं साक्षात्कार के माध्यम से ज्ञात किए गए है। इसके साथ ही द्वितीयक आंकड़ों को जनगणना पुस्तिका जिला सांख्यिकीय पत्रिका तथा सम्बन्धित विभागीय कार्यालयों से प्राप्त किए गए है।

परिकल्पना:

मृदा एक महत्वपूर्ण संसाधन है जो प्रकृति द्वारा निःशुल्क प्राप्त सर्वसुलभ है। कृषि कार्य में मिट्टियों का महत्वपूर्ण योगदान है। अध्ययन क्षेत्र में निम्न परिकल्पनायें उभर कर आई है–



सिंचाई एवं कृषि विकास– जनपद पीलीभीत का एक भौगोलिक अध्ययन

डॉ० एन०यू० खान — रमाकान्त

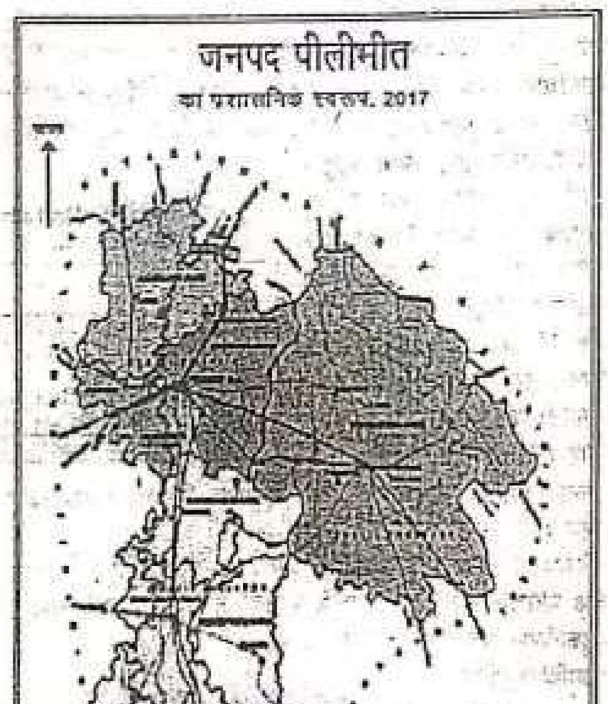
अलग–अलग भौगोलिक स्थितियों, जलवायु और ला विभिन्न जैव विविधताओं से भरा देश है। देश में य भूमि लगभग 18.5 करोड़ हेक्टेयर है मौजूदा समय भग 17.2 करोड़ हेक्टेयर जमीन पर खेती होती है देश बादी का 70 प्रतिशत हिस्सा अपनी आजीविका के सीधे तौर से निर्भर है। लिहाजा, भारत में कृषि हमेशा हैं और भविष्य में भी रहेगी देश में कृषि मुख्य तौर र है। इसलिए भारत में जल का वितरण बेहद असमान का वितरण असमान और अनिश्चित होने की वजह सूखा पड़ते रहते है। देश में वर्षा आमतौर पर साल में ही होती है। इस दौरान पूरे पानी का इस्तेमाल नहीं अप्रयुक्त पानी बह जाता है। दूसरी ओर बाकी मौसमों लक तंगी रहती है। देश में एक ओर तो नदी प्रणालियों जल संसाधन है और दूसरी तरफ विशाल प्यासे भूखण्ड ते ने ही देश में सिंचाई के विकास को जरूरी बना दिया और सूखे की समस्याओं से सिंचाई के जरिए ही निपटा विभिन्न फसलों के लिए पानी की जरूरतें अलग–अलग सिंचाई सुविधाओं से ही पूरा किया जा सकता है।

त शोध–प्रबन्ध अध्ययन का क्षेत्र जनपद पीलीभीत है। भीत का अक्षांशीय विस्तार 280° 6' उत्तरी अक्षांश से त्तरी अक्षांश एवं देशान्तरीय-विस्तार 790° 57' पूर्वी 0° 27' पूर्वी देशान्तर के मध्य विस्तृत है। अध्ययन क्षेत्र क्षेत्रफल 3765.40 वर्ग किलोमीटर है। जनपद की का निर्धारण नैनीताल जनपद (उत्तराखण्ड) एवं नेपाल होती है। जबकि दक्षिणी सीमा का निर्धारण जनपद रा होता है। अध्ययन क्षेत्र की पूर्वी सीमा लखीमपुर एवं पश्चिमी सीमा का निर्धारण जनपद बरेली द्वारा

सनिक दृष्टिकोण से जनपद पीलीभीत में 01 जनपद लीभीत), 03 तहसील मुख्यालय (पीलीभीत, पूरनपुर एवं विकासखण्ड, 78 न्यायपंचायत, 599 ग्राम पंचायत एवं ग्राम है। स्थानीय एवं निकायों की दृष्टि से 03 नगर द एवं 06 टाउन एरिया हैं। वर्ष 2011 की जनगणना र जनपद पीलीभीत की कुल जनसंख्या 2031007 में 1072002 पुरुष एवं 959005 स्त्रियां सम्मिलित है। यों से स्पष्ट होता है कि पीलीभीत के बारे में यह भी प्रचलित है कि हाफिज रहमत खाँ ने यहां पीली दीवार बनवाई थी। इस कारण इसको पीलीभीत कहा गया। लेकिन पीलीभीत का अस्तित्व उनसे बहुत पहले था। कुमायूँ गढ़वाल के कत्यूरी शासन ब्रह्मदेव ने पन्द्रहवीं शताब्दी के प्रारम्भ में रुहेलखण्ड के उत्तरी भाग में अधिकार कर लिया और पीलीभीत को प्रान्तीय राजधानी बनाया। पीलीभीत रुहेलखण्ड मण्डल का सबसे छोटा जनपद है। यह 1879 में जिला बना था। इससे पहले इसका कुछ भाग बरेली में तथा कुछ भाग शाहजहाँपुर में शामिल था इसमें पीलीभीत, पूरनपुर तथा बीसलपुर तीन तहसीलें है।

अध्ययन के उद्देश्यः

'सिंचाई' कृषि क्षेत्र में एक महत्वपूर्ण प्रभावशाली तकनीकी



कारक है, जो क्षेत्र विशेष के कृषि विकास पर अपना स्पष्ट प्रभाव छोड़ता है। भारत जैसे कृषि-प्रधान राष्ट्र में तो सिंचाई जैसे तकनीकी कारक कृषि भूमि उपयोग तथा कृषि उत्पादकता दोनों को ही विशेष

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जनपद हरदोई में जल संसाधनों का भौगोलिक अध्ययन

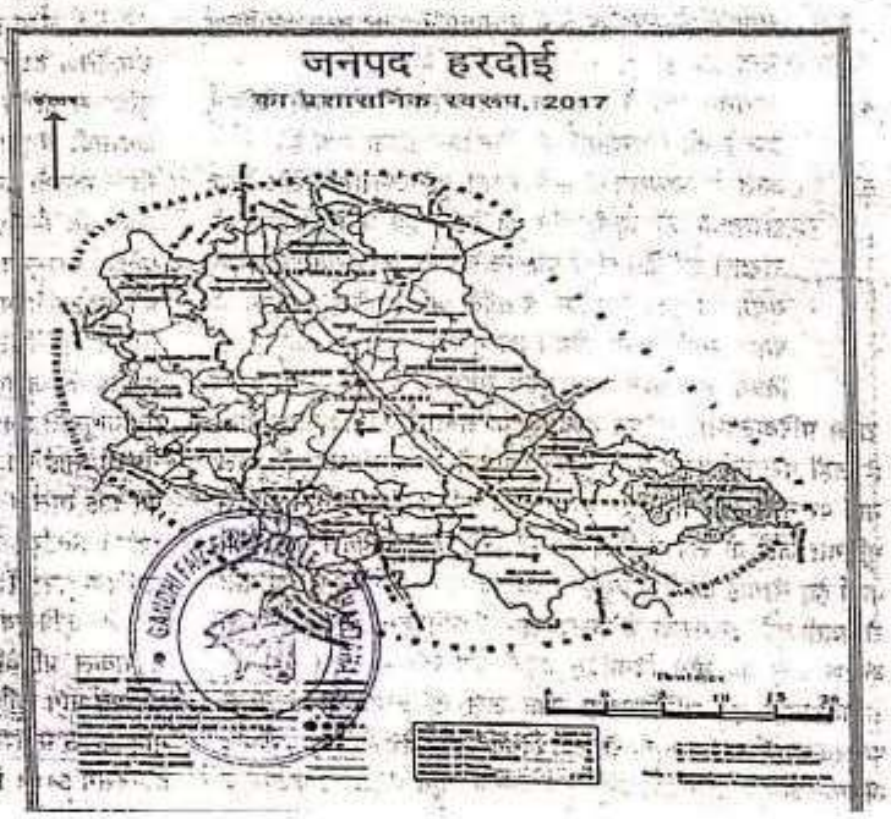
डॉ0 एन0यू0 खान एवं अशफाक अहमद

व में एक अमूल्य संसाधन है, जिसके बिना जीवन
कई क्रियायें सम्भव ही नहीं है। मानव सभ्यता का
ल की उपलब्धता एवं न्यूनता पर निर्भर करता है।
स्पति के जन्म एवं विकास, मृदा निर्माण, जलवायु
विदोहन, औद्योगिक विकास, परिवहन व्यवस्था,
य पदार्थ, मनोरंजन पर्यटन, कृषि उत्पादन एवं
बहिर्वाह, मत्स्य व्यवसाय आदि में जल संसाधनों
ग रही है। पृथ्वी पर जल की कुल उपलब्ध मात्रा
ज मण्डल कहते है। पृथ्वी के इस जलमण्डल का
। समुद्रों में खारे जल के रूप में है और केवल 2.
ग पानी है, उसका भी दो-तिहाई हिस्सा हिमनद
में हिमचादरों और हिम टोपियों के रूप में जमा है।
मीठा पानी मुख्यतः जल के रूप में पाया जाता है,
क छोटा सा भाग भूमि के ऊपर धरातलीय जल के
में वायुमण्डलीय जल के रूप में है।

जल संसाधन की उपलब्धता क्षेत्रीय स्तर पर जीवन
ति के साथ जुड़ी हुई है। साथ ही इसके वितरण में
ता भी मौजूद है। एक अध्ययन के
में 71 प्रतिशत जलसंसाधन की मात्रा
शत क्षेत्रफल में सिमटी है और बाकी
फल के पास देश के 29 प्रतिशत जल
उलब्ध है। वर्ष 2008 में किए गए एक
ताद्य देश में कुल जल उपलब्धता
यूबिक मीटर थी और तत्कालीन कुल
यन बयूबिक मीटर। केन्द्रीय जल-साध
त जल का दोहन पीने के 125 लाख
अन्य साधनों से भूमिगत जल का
के पानी के रूप में तथा सिंचाई एवं
र्यों से हो रहा है। अकेले देश के
ों में सिंचाई हेतु 50 प्रतिशत तथा
ए 80 प्रतिशत जल ट्यूबिंग सैट्स एवं
माध्यम से निकाला जा रहा है। इस
ोक सम्पदा के अवैज्ञानिक एवं अन्धाध
देश के 215 जनपदों में पानी का स्तर
ढ़ा जा रहा है। इनमें से करीब 76
गत जल स्तर 5 मीटर से भी नीचे गिर
यह गिरावट लगभग 20 सेन्टीमीटर प्रति
ो निरन्तर जारी है। वर्तमान समय में

जनसंख्या वृद्धि, तीव्रतर औद्योगीकरण, सिंचित भूमि के विस्तार के कारण जल संसाधनों के शोषण का क्षेत्र भी तीव्र गति से बढ़ा है। अध्ययन क्षेत्र: प्रस्तुत शोध-प्रबन्ध का अध्ययन क्षेत्र जनपद हरदोई है जो भौगोलिक दृष्टिकोण से गंगा के मैदान का एक लघु भू-भाग है। जनपद हरदोई का अंक्षाशीय विस्तार 260ए 53ष उत्तरी अक्षांश से 270ए 47ष उत्तरी अक्षांश एवं देशान्तरीय विस्तार 790ए 41ष पूर्वी देशान्तर से 800ए 49ष पूर्वी देशान्तर के मध्य स्थित है। अध्ययन क्षेत्र का कुल भौगोलिक क्षेत्रफल 5987 वर्ग किलोमीटर है। जनपद की उत्तरी सीमा पर शाहजहाँपुर एवं लखीमपुर खीरी जनपदों का विस्तार पाया जाता है। जबकि दक्षिणी सीमा का निर्धारण कानपुर एवं उन्नाव जनपदों के द्वारा होता है। अध्ययन क्षेत्र की पूर्वी सीमा पर सीतापुर एवं लखनऊ जनपद स्थित है तथा पश्चिम में जनपद फर्रूखाबाद का विस्तार है।

प्रशासनिक दृष्टिकोण से जनपद हरदोई में 01 जनपद मुख्यालय (हरदोई), 05 तहसीलें (हरदोई, शाहाबाद, सवायपुर, सण्डीला, बिलग्राम) एवं 19 विकासखण्ड सम्मिलित हैं। जनपद में कुल राजस्व ग्रामों की संख्या 2070 है। स्थानीय प्रशासन एवं निकायों के दृष्टिकोण से 07 नगर पालिका परिषद एवं 07 टाउन एरिया सम्मिलित हैं। वर्ष 2011 की जनगणना के अनुसार कुल जनसंख्या 4092845 व्यक्ति हैं,



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Remarking An Analisation

Consumer Satisfaction towards LIC of India in District Shahjahanpur

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Abstract

Human Life is a most important asset and life insurance is the most important type of insurance which provides financial protection to a person and his family at the time of uncertain risks or damage. Life insurance provides both safety and protection to individuals and also encourages savings among people. Life Insurance Corporation of India (LIC) plays a vital role in the welfare of human well-being by providing insurance to millions of people against life risks such as uncertain death or accident. LIC has registered a six per cent increase in market share to 78% during the current financial year. LIC's market share at the end of March 31, 2018, had stood at 7% of all new policies sold during the last financial year (2017-18). LIC has 53 products in his portfolio and sold around 86 lakh policies till the end of July 2018. After the successful implementation of economic reforms in Life insurance sector in India, LIC has made several positive efforts to triumph over the hearts of the people. To achieve this LIC of India has adopted a number of new trends in marketing strategies for introducing innovative technologies. LIC also has the lowest outstanding claims ratio. LIC had settled 99.8% of death claims while the Private Sector Companies had settled 96.8% of such claims. In this research paper we studied Customer Satisfaction towards Life Insurance Corporation of India (LIC) in district Shahjahanpur, because Consumer Satisfaction is the first step to Achieve Consumer Loyalty. If the customers of LIC are Satisfied and Happy, they may be Loyal to the LIC.

Keywords: Life Insurance, LIC of India, Consumer Satisfaction, Loyalty, Premium, Products, Policies, Claim, Investment.

Introduction

The Life Insurance Corporation of India was founded in 1956 when the Parliament of India passed the Life Insurance of India Act that nationalised the private insurance industry in India. Over 245 insurance companies and provident societies were merged to create the state owned Life Insurance Corporation. Life Insurance Corporation of India (LIC) is an Indian state owned insurance group and Investment Company headquartered in Mumbai. It is the largest insurance company in India with an estimated asset value of Rs. 1,500,492 crore. As of 2016 it had total life fund of Rs.1433103.14 crore with total value of policies sold of 367.82 lakh that year. LIC offers a variety of insurance products to its customers such as insurance plans, pension plans, unit-linked plans, special plans and group schemes. Today, the LIC has 8 zonal offices, around 113 divisional offices, 2,048 branches and 1381 satellite offices and corporate offices. It also has 54 customer zones and 25 metro-area service hubs located in different cities and towns of India. It also has a network of 1,337,064 individual agents, 242 Corporate Agents, 89 Referral Agents, 98 Brokers and 42 Banks for soliciting life insurance business from the public. LIC's slogan 'Yogakshemam Vahamyaha'' is in Sanskrit language which translates in English as "Your welfare is our responsibility". This is derived from ancient Hindu text, the *Bhagavad-Gita*'s 9th chapter, 22nd verse. The slogan can be seen in the logo, written in *Devnagari* script. Main Products of LIC of India are Insurance Plans, Pension Plans, Unit Linked Plans, Term Assurance Plans and Whole Life Plans. Main modes of premium are Monthly, Quarterly, Half Yearly and Annual. Customers can pay their premium through online mode, offline mode or through agents.

Insurance give you protection against the possible chances of generating uncertain losses. It eliminates worries and miseries of losses or destruction of property and death. Life insurance is a contract between you and a life insurance company which provided you death benefits

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Shashi Deshpandey's Novel, *The Dark Holds No Terrors*: A Novel of Conflict of Individual Identity and Space

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ABSTRACT

Shashi Deshpandey's intense fascination with human relationship and the family is reiterated by the fact that almost every novel explores in a compassionate manner the complexities that concern every individual living within families and within relationships. Her fictional world begins and ends with families, the mimetic which she delivers into her narrative allowing the reader an opportunity to contemplate on the family an institution so core to our lives that it is often taken for granted. In the numerous critical studies that have been directed towards Shashi Deshpandey's novels, critics have generally provided insights that comment on the mother daughter relationships, portrayal of women, recurrent symbols and images the feminist stance and postcolonial perspective (for instance, Joshi, Palker, Sahi, Sebastian etc.) as revealed in her novels. These themes are no doubt significant in providing an in depth understanding of her novels. However one also needs to realize that the novelist invites the reader to an intense understanding of her work in terms of the milieu of the family within which they have been set. Her plots and characters are shaped within this familial milieu which in turn points towards the various practices within the middle class Hindu view and revealing the politics and cultural ideologies which act as hegemonic structures influencing the collective thought processes of an entire society.

Keywords: Individual, space, cultural and institutional hegemony, familial conflict.

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Remarking An Analisation

Grammar Debate before the Emergence of Modern Linguistics

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Abstract

The debate at philosophical level, various opposing views, controversies at conceptual level have been debated in a chronological order beginning from Greece to Nineteenth Century. The Greeks are the cardinal part of this debate because their masters' devotion and dedication for the development of the grammar gave birth to philosophical debates.

Before the emergence of linguistics, the study of grammar at the philosophical level could be traced back to Greek notions such as logic and syllogism, Naturalist versus conventionalist, Anomaly versus Analogy. These concepts gave rise to controversies in the Roman Age which effected a change in our old assumption that grammar is a part of rhetoric rather than logic. But Greek's endeavour was not entirely undermined by the new concept of Romans. Analytical study began and enveloped whole Europe because Romans had started to analyze Latin language and its grammar with Greek. These analyses were at philosophical as well conceptual level that continued throughout.

It was only in the 18^{th} – 19^{th} century that the old Greek – Latin tradition was remoulded in the light of the discovery of the Indian tradition and the trends of comparative and historical linguistics of the 19^{th} century.

The emergence of the Neo-grammarians, provided the scientific basis to historical linguistics premised on more and more data collection from actual languages, besides a series of historical events and previous trends in grammar studies that were carried over to the 20^{th} century. What we call modern grammar is the gift of philosophy propounded by such great masters of the 1^{st} half of the 20^{th} century such as De Sassure, Bloomfield, Edward Sapir, and Noam Chomsky.

Keywords: ELT- English Language Teaching, Philosophy, Philosophic, logic, Anomaly, Analogy, Convention, Greece, Greek, Syllogism, Syllogistic, Emergence, Tradional and Modern, Semantics, Entities

Introduction

In this phase grammar was basically studied as a part of logic, rhetoric or philosophy. The developments in the area of grammar studies in this phase show that it has been a favourite discipline for the civilizations in general and the Greeks in particular. So much so that philosophically the following three opposing views emerged among the Greek masters and they still remain cardinal points of discussion among linguists: Logic and Syllogism; Naturalist Vs. Conventionalist and Analogy Vs. Anomaly.

Aim of the Study

The aim of the research paper is to bring new ideas at the level of philosophic grammar the study of grammar, though originated in the ancient Greece, later proliferated through centuries and through various civilizations. Such a spread in time and space, as a consequence, brought in a series of new ideas, philosophies, views, concepts, trends and approaches, premised on which the grammarians and linguists studied the role and significance of grammar in the use of language for various purposes. That means these philosophies, concepts and theories relating grammar were either, developed, continued, refuted or even revived by the next generations/civilizations. The term 'philosophical' will include the major concepts/trends, theories and views regarding grammar.

Logic and Syllogism

The word 'logic' has been derived from Greece. It was used in Greece as a branch of philosophy which is used to distinguish between right and wrong, correctness and incorrectness, on the basis of reasoning.

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Origin and Development of Grammar in Greece and Rome

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Abstract

This Paper intends to study the origin and development of 'grammar' through the ages especially of Greece and Rome. It is proposed to list the contributions with regard to grammar studies made by major grammarians and linguists of the world through centuries and civilizations. Before the emergence of linguistics, the study of grammar at the philosophical level could be traced back to Greek notions such as logic and syllogism, Naturalist versus conventionalist, Anomaly versus Analogy. These concepts gave rise to controversies in the Roman Age which effected a change in our old assumption that grammar is a part of rhetoric rather than logic. But Greek's endeavour was not entirely undermined by the new concept of Romans. Analytical study began and enveloped whole Europe because Romans had started to analyze Latin language and its grammar with Greek. These analyses were at philosophical as well conceptual level that continued throughout.

Keywords: Greece, Greek, Rome, Latin, Philosophical, Analogy, Logic, Syllogism, Rhetoric, Grammar, Graphein, Grammata.

Introduction

The study of grammar begins with the origin and development of 'grammar' through the ages especially of Greece and Rome. It is proposed to list the contributions with regard to grammar studies made by major grammarians and linguists of the world through centuries and civilizations.

Dykema (1961) cited in Nancy, G. Patterson (1999: 1) "The Role of Grammar in the Language Arts Curriculum"

> The origin of the word grammar can be traced to the Greek *gramma*, or letter, as in an alphabetic letter. This is a development of the word *graphein* which means to *draw* or *write*. The plural form of the word is *grammata* which evolved at one point to mean the rudiments of writing, and eventually to mean the rudiments of learning. Eventually the adjective form of the word, *grammatike*, was combined with *techne* and meant the *"Art of knowing one's letters."*[1]

Aim of the Study

In this Paper an attempt has been made to highlight a historical overview on grammar from Greece to Rome.

The first attempt to study grammar began in about 5th century B.C. with Plato's dialogue *Cratylus* and in 4th century B.C in India with Panini's grammar of Sanskrit. Later, the Romans approached the study of grammar for the study of their own language. At this stage grammar was mainly learnt and taught as a tool for the analysis of the languages used for producing and for analyzing literatures, or even for deciphering the rules of ancient languages of the holy books. Grammar was initially studied as a part of philosophy, logic and rhetoric. This can be evidenced in the following discussion on the Greek masters and their followers [illegible] Romans and the Medieval grammarians until the 17th and the 18th centuries:

The Greeks

The study of grammar was initiated by the Ancient Greeks. They started to study grammar as a tool by which they could understand their own language. In those days, even common people were keenly interested in knowing the internal structure of language. They wanted to make it more practical not only in spoken form, but also in their writing. Plato, Aristotle, Apollonius, and Dionysius Thrax

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Historical Overview on Grammar: A Journey of Seventeenth to Nineteenth Century

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Abstract

From the 13th to the 15th centuries, grammarians and philosophers only explained certain rules of grammar. Universal grammar came into being as a great achievement of the mid 13th to 14th century. It provided learners as well as scholars with an understanding of grammar. In 17th century, Port-Royal group worked hard and modified logic based thoughts of the Greeks and translated it into Latin. Along with these French and English grammars were also written. So from these points of view this age is very important and impressive. English grammar was not in an original form but borrowed from Latin. Traditions had changed the trends towards analyses and observation of language as well as grammatical modification. Grammarians of this age were keenly interested in presenting general grammar for all but they could not ignore universal grammar's concept. These developments were held by the support of Port-Royal group. They did not studied literary language but paid much attention to dictation of usage by actual speech. They showed their interest in parts of speech and logical categories. These kinds of achievements were made valuable in this century.

Grammarians of this century were very conscious about grammatical analysis. As they moved into the 18th century, they paid attention to phonetics, historical linguistics and semantic etymology.

Keywords: Grammar, Greek, Latin, Syntax, Historical, Phonetics, Linguistics, Port-Royal Group, Etymology, Phonetics, Semantics, Prescriptive And Descriptive Approach Normative, Neo-Grammarians.

Introduction

This paper highlights the origin and development of grammar from seventeenth to Nineteenth century. Syall and Jindal (1998:41) describes that:

> Seventeenth century, interest aroused in modern European languages, with an emphasis on French as a language of elegance and beauty, leading to the establishment of the Port-Royal school of grammars. This school expounded a general theory of grammar based on logic through the medium of languages such as Latin and French. During this time too, English grammars were written.[1]

From the 13th to the 15th centuries, grammarians and philosophers only explained certain rules of grammar. Universal grammar came into being as a great achievement of the mid 13th to 14th century. It provided learners as well as scholars with an understanding of grammar. In 17th century, Port-Royal group worked hard and modified logic based thoughts of the Greeks and translated it into Latin. Along with these French and English grammars were also written. So from these points of view this age is very important and impressive. English grammar was not in an original form but borrowed from Latin. Traditions had changed the trends towards analyses and observation of language as well as grammatical modification. Grammarians of this age were keenly interested in presenting general grammar for all but they could not ignore universal grammar's concept. These developments were held by the support of Port-Royal group. They did not studied literary language but paid much attention to dictation of usage by actual speech. They showed their interest in parts of speech and logical categories. These kinds of achievements were made valuable in this century.

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Grammar Debate after the Emergence of Modern Linguistics

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Abstract

This paper highlights the grammar debate at philosophical level after the emergence of modern linguistics. The Nineteenth century witnessed the emergence of new revolutionary ideas and philosophies that brought in a change in the very perspective of grammar studies. Languages and then grammatical rules started to be freshly defined and categorized. Though by the Nineteenth century many, books pertaining to grammar had been developed, Ferdinand de Saussure came up with his new concepts about language and its structure. His concepts of 'langue' and 'parole', 'synchronic' and 'diachronic' and 'syntagmatic' and 'paradigmatic' introduced a new outlook to grammar studies and attracted many followers. The idea of 'structuralism' propounded by de Saussure was later extended by Bloomfield and Chomsky. Though they followed the structural school, they also came up with their original and philosophical points of views about language and grammar.

Keywords: Modern Linguistics, Nineteen Century, Philosophic Grammar, Structuralism, Psyche, Competence and Performance, Neo-Grammarian, Communicative Grammar.

Introduction

The origin of Modern Grammar linguistics has its deep root into the long western tradition of grammar studies, starting with the Greek and later expanding over the Roman and European countries. That is, it was the Greek language which was first attempted to be described to decipher its rules; following this tradition the Romans analyzed the Latin language which was later applied to other European languages. Philosophically/conceptually it was mainly the Greek thoughts which were extended/ continued all through. It was only in the 18th – 19th century that the old Greek – Latin tradition was remoulded in the light of the discovery of the Indian tradition and the trends of comparative and historical linguistics of the 19th century.

The emergence of the Neo-grammarians, who gave the scientific basis to historical linguistics premised on more and more data collection from actual languages, besides a series of historical events and previous trends in grammar studies that were carried over to the 20th century. What we call modern grammar is the gift of philosophy propounded by such great masters of the Ist half of the 20th century as De Sassure, Edward Sapir, Trubetzkoy, Bloomfield and Jakobson.

The most important change that was brought by these linguists was the introduction of descriptive linguistics as opposed to historical linguistics. The most significant figure who provided the philosophical change in the outlook from the 19th to the 20th century was Ferdinand De Sassure. The lecture notes collected and published by his students in 1916 as *Cours de-Linguistique Generale* revolutionized the whole scenario. Some of the basic concepts that De Sassure has put forth are as follows.

Aim of the Study

In this paper an attempt has been made to track the major shifts in grammar over the centuries at the philosophical level. It was observed that the grammarians, rhetoricians and the philosophers in the initial phase of grammar studies in the ancient Greece argued, discussed and debated on the issues pertaining to origin of language and its scope. The Greeks looked at language as a part of logic and philosophy and mainly congregated to maintain the sanctity and purity of the language. The Nineteenth century witnessed the emergence of new revolutionary ideas and philosophies that brought in a change in the very perspective of grammar studies. Languages and then grammatical rules started to be freshly defined and categorized. Though by the Nineteenth century many, books pertaining to grammar had been developed.

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मुक्तिबोध की काव्य-संवेदना

डॉ. फैयाज़ अहमद

हिंदी साहित्य में आधुनिक और प्रगतिशील चेतना के साथ सर्जना करनेवालों में गजाननमाधव मुक्तिबोध का नाम सबसे प्रमुख है। मुक्तिबोध का रचना-संसार एक संपूर्ण मानवीय संस्कृति है, जिसे कवि ने हृदय और मस्तिष्क के रक्त और गारे-चूने से निर्मित किया है। हृदय और मस्तिष्क का द्वंद्व प्रारंभ से अंत तक उनके साथ रहा। यह द्वंद्व ही उनकी अच्छाई-बुराई या सफलता-विफलता का मूल रहा है। हिंदी साहित्य का एक ऐसा ही अनूठा व्यक्तित्व है मुक्तिबोध का। मुक्तिबोध ने राजनीति और संस्कृति के उद्योग को समझा था और यह सब समझकर ही वे समतामूलक समाज की रचना पर बल देते है।

संस्कृति समाज के साथ अन्योन्याश्रित रूप से संयुक्त होती है और रचना परिवेशजन्य होती है। तात्पर्य यह है जिस वातावरण में रचनाकार भोक्ता की तरह रहता है, उसे निरंतर अपने भीतर समेट कर चलता रहता है। इस तरह कविता अपनी रचनाप्रक्रिया में समाज और संस्कृति को न केवल संवेदनात्मक स्तर पर अभिव्यक्ति देती है, वरन् उसे प्रभावित और परिवर्तित भी करती है। समाज द्वारा ही व्यक्ति के संस्कार निर्मित होते है तथा मानव मानोविज्ञान भी सामाजिक प्रभाव से अछूता नही रहता है। समवतः इसीलिए मुक्तिबोध काव्यरचना को केवल व्यक्तिगत मनोवैज्ञानिक प्रक्रिया मानते है। उनके अनुसार वर्तमान पतन का मुख्य कारण संस्कृति और संस्कारों का पतन होगा।

नई कविता में सांस्कृतिक मूल्यों के विघटन की बात प्रायः उठाई जाती रही है। आधुनिक युग में वैज्ञानिकता और भौतिकता का जिस तीव्रता से विकास हुआ है, उतनी ही तीव्रता से असुरक्षा बोध भी बढ़ा है। और इसी असुरक्षा बोध ने मूल्यहीनता की स्थिति को जन्म दिया है। आधुनिक समाज की विसंगतिओं से सीधा साक्षात्कार कर कवियों की रचनाओं में दिखाई देता है विशेषकर मुक्तिबोध की रचनाओं में आधुनिक समाज की मूल्यहीनता के प्रति गहरा आक्रोश व्यक्त हुआ है।

कविता को एक सांस्कृतिक प्रक्रिया माननेवाले मुक्तिबोध का संपूर्ण रचना संसार ज्ञानात्मक संवेदन की प्रमाणिक अभिव्यक्ति है। उनकी रचनाधर्मिता की एक बड़ी उपलब्धि यह है कि उनकी कविताएँ उनके चिंतन का प्रामाणित दस्तावेज है। रचनाप्रक्रिया कविता के समाजशास्त्र अथवा सौदर्यशास्त्र, साहित्यकार के सामाजिक दायित्व आदि के संबंध में उन्होंने सैद्धांतिक रूप से जो कुछ कहा है उनकी कविताएँ ही उसका सहज साक्ष्य प्रस्तुत करती है।

"कुछ पलों बाद- हिये में प्रकाश-सा होता है / खुलती है दिशाएँ उजला आँचल पसारे हुए / रास्ते पर रात होते हुए भी।"[1]

सांस्कृतिक चेतना का अनिवार्य संबंध कलाकार की सौंदर्याभिरुचि से होता है। मुक्तिबोध ने रचनागत ईमानदारी के लिए जीवनानुभवों को उनके संपूर्ण बाह्य संदर्भों के साथ उपस्थित करने पर बल दिया है। रचना अपना सांस्कृतिक दायित्व

अमृतलाल नागर के उपन्यासों की हिंदी इतर शब्दावली

डा. शमशाद अली

साहित्य के क्षेत्र में अपने भावों के प्रकटन अथवा विचारों के मौखिक, लिखित, आदान-प्रदान हेतु भाषा विशेष का प्रयोग किया जाता है। अपनी रुचि अथवा क्षमता के अनुरूप साहित्यकार ऐच्छिक विधा अथवा भाषा चयन कर उसके माध्यम से अपने विचार व्यक्त करता है। गद्यात्मक एवं पद्यात्मक विधा में रुचि एवं चयन के पश्चात् ही युग विधा में अपनी लेखनी के चमत्कार प्रस्तुत करना लेखक अथवा कवि का साहित्यिक धर्म बन जाता है। गद्यकार सामान्यतः भाषा, कहानी, नाटक, उपन्यास, संस्मरण, जीवनी, आत्मकथा, निबंध एवं अनुच्छेद आदि की भाव अभिव्यक्ति विधा के रूप में चयनित कर किसी भाषा विशेष में दर्शाता है। गद्य की विभिन्न विधाओं में कथा-साहित्य के अंतर्गत उपन्यास का अपना विशेष महत्त्व है। किंतु भाषा एक ऐसा तत्त्व है जिसके अभाव में उपन्यास की कल्पना भी नहीं की जा सकती। हिंदी साहित्य में उपन्यास के उद्भव एवं विकास का अपना एक इतिहास है आज़ादी से पूर्व और आज़ादी के बाद स्वातंत्र्योत्तर कथासाहित्य का भी विशेष महत्त्व है। अमृतलाल नागर एक ऐसे उपन्यासकार हैं जिन्हें अहिंदी भाषी उपन्यासकार कहा जाता है, किंतु इस विशेषण को स्वयं नागर जी स्वीकार नहीं करते। नागर जी के अनुसार, "गुजराती मेरी मातृभाषा अवश्य है पर दूसरी माँ हिंदी भी है। सच पूछिए तो मेरा पालन-पोषण तो दूसरी माँ ने किया है। मेरी चिंतन प्रक्रिया केवल हिंदी में ही होती है। इसलिए हिंदी की दूसरी भाषा को मैं साहित्य रचना का माध्यम बना ही नहीं सकता। मैं घर में गुजराती बोल जरूर लेता हूँ यदि कोई मुझे अहिंदी भाषी हिंदी लेखक मानकर पुरस्कृत करना चाहे तो वह पुरस्कार मैं कदापि स्वीकार नहीं करूँगा, क्योंकि मैं अपने आपको अहिंदी भाषी नहीं मानता।"[1]

भाषा वाक्य आधारित होती है और वाक्यों का आधार सार्थक शब्दावली है। अमृतलाल नागर का शब्द चयन उनके शब्द भंडार की समृद्धि और उनके सजीव होने का प्रमाण है। शब्दों को स्रोत, रचना, अर्थ एवं प्रयोग के आधार पर परखा जाता है। इस प्रकार भाषा में तत्सम, तद्भव, देशज, विदेशी, संकर, रूढ़, यौगिक, योगरूढ़, एकार्थी, अनेकार्थी, पर्यायवाची, विकारी अथवा अविकारी सभी प्रकार के शब्दों का प्रयोग किया जाता है। यौगिक शब्दावली के अंतर्गत संधि, समास तथा उपसर्ग-प्रत्यय आदि से निर्मित शब्द आते हैं। सामान्यतः भाषा प्रयोग में स्रोत एवं रचना आधारित शब्दावली की प्रधानता बनी रहती है। नागर जी ने स्रोत आधारित शब्दावली का ही अधिक प्रयोग अपने उपन्यासों की भाषा में किया है। इसलिए नागर के शब्द भण्डार के प्रकाशन हेतु उनकी तत्सम, तद्भव, देशज एवं विदेशी शब्दावली पर विचार करना अधिक संगत प्रतीत होता है।

तत्सम शब्द : 'तत्सम' शब्द तत्+सम से मिलकर बना है। जिसका शाब्दिक अर्थ है उसके (संस्कृत के) समान। तात्पर्य यह है कि संस्कृत के मूल शब्द। इन शब्दों का ... ही लिया जाता है। बिना किसी प्रकार के विकास, व ... अथवा

प्रयोग किये जाते हैं उन्हें तत्सम शब्द कहते हैं। नागर जी ने अपनी औपन्यासिक कृतियों में आवश्यकतानुसार तत्सम शब्दावली का प्रयोग किया है। संक्षेप में उपन्यासगत तत्सम शब्दावली निम्न रूप में दर्शनीय है-

महाकाल भूख : आत्मा, उत्साह, ऋण, ऋषी, कृष्ण, धर्म, नारायण, भाग्य, राम, विद्या, संस्कार, संस्कृत, स्वर्ग, स्वामी।

सेठ बाँकेमल : गुरु, बाल, भक्ति, राम, साधु।

बूँद और समुद्र : अग्नि, अन्तराम, अवसाद, उत्तेजना, उत्तम, उत्साह, उषा, कर्म, कुरुक्षेत्र, ग्रह, नक्षत्र, प्रतिक्रिया, भक्ति, मध्यम, वर्षा, वायु, संयम, सर्प, स्वर्ग, श्रद्धा।

शतरंज के मोहरे : कंठ, कर्म, कक्षा, कथा, ग्रीष्म, दुःख, धर्म, ध्यान, पति, पत्नी, पुरुष, बाल, माता, राग-राग, विद्या, स्त्रियाँ, सुख।

सुहाग के नूपुर : अंक, अंतर, अनंत, अतिरिक्त, अन्य, अस्त, अक्षर, उत्तर, कंठ, कर्म, कक्ष, तीव्र, दर्शनीय, पश्चिम, पक्षी, प्रणय, प्रतिनिधित्व, प्रतिष्ठा, पात्र, पुरुष, मत्स्य, मीन, योग, रुद्र, श्वसुर, शून्य, समस्त, स्पर्श, सप्तमी, सायं, सौंदर्य।

अमृत और विष : अनशन, अपेक्षाकृत, अनु... अक्षर, उच्चाकांक्षा, दृश्य, नदी, पार्थिव, प्रतिक्रिया, माध्यम, विक... बुद्धिजीवी, सत्ताधारी, सम्मान।

सात घूँघट वाला मुखड़ा : अर्द्ध, अनु... क्रोध, धर्म, देवता, पति, पुत्र, फल, स्वर्ग, श्रद्धा।

एकदा नैमिषारण्ये : अन्न, अभिभूत, ... तर्पण, पशु, प्रविष्ट, पुष्प, मंत्र, मनुष्य, माता, वसंत, सम्राट, सुख, ... श्रद्धा।

मानस का हंस : अंतर, अश्विनी, आग्रह, आत्मलीन, जर्जर, जीवन, नक्षत्र, प्रतिवाद, प्रतिष्ठा, भावनिष्ठ, मंथर, रेवती, विद्वतजन, समदृष्टि।

नाच्यौ बहुत गोपाल : अवसाद, अक्षर, नेत्र, प्रज्ञा, बाल, ब्राह्मण, राम, संस्कार, संस्कृत, स्पर्श, सूर्य।

खंजन नयन : अंतर्द्वन्द्व, अंध, अग्नि, अगोचर, अतिथि, अव्यक्त, आवरण, ऋषि-मुनि, औषधि तथा कर्म, क्रमशः, जल, ज्येष्ठ, दया, दर्शनार्थी, दिशा-निर्देश, निश्चय, नेत्र, ब्रह्मचर्य, मधुर, यशोलक्ष्मी, यज्ञ, विद्या।

बिखरे तिनके : आत्मा, क्रोध, ग्रह, पण्डित, ब्राह्मण, मित्र, राम, साधु, शेष।

अग्निगर्भा : आत्म-महत्ता, कलश, कक्षा, क्रम, कृपा, ध्यान, पण्डित, परीक्षा, नाल, भाग्य, यज्ञ, पुत्र, विद्या, विश्वविद्यालय, करवट और पीढ़ियाँ आदि रचनाओं में भी इसी प्रकार की तत्सम शब्दावली का प्रयोग हुआ है।

तद्भव, देशज और विदेशी आदि शब्दों के दर्शाने के लिए समस्त रचनाओं से अलग शब्द चयन न कर सामूहिक रूप में वे प्रस्तुत किये जायेंगे जो सामान्यतः इन सभी रचनाओं में प्रयुक्त हुए हैं।

तद्भव शब्दावली : 'तद्भव' शब्द तद्+भव के सहयोग से बना यौगिक शब्द है जिसका अर्थ है ... - उससे (संस्कृत से) उत्पन्न या जन्मा शब्द। संस्कृत के मूल शब्द जब समाज में अपने विकृत या परिवर्तित रूप में प्रयोग में आते हैं तो उन्हें तद्भव

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भारत की भावात्मक एकता और हिंदी साहित्य

—मोहम्मद साजिद खान

भारत एक सामासिक संस्कृति का देश है। साझी–शहादत और साझी–विरासत का जो श्रेष्ठ पाथ हमको मिला है, वह आज राजनीतिक कुचालों और दूषित मानसिकता के कारण विभाजित हो गया है। बाजारवादी–अवसरवादी राजनीति इसे आघात पहुँचाने में अपनी मुख्य भूमिका अदा कर रही है। 'वसुधैव कुटुम्बकम्' की भावना से युक्त, धर्म, राजनीति और अध्यात्म की सकारात्मक उन्नति तथा उत्कर्ष की पवित्र भावनाओं वाला यह देश आज सांस्कृतिक–सामन्जस्य और एकता की माँग करता है। भारत की भावात्मक एकता में साहित्य के अवदान की चर्चा से पूर्व यह आवश्यक है कि इसके एकत्व की पूर्व पीठिका पर विचार कर लिया जाए।

इस देश में शक आए, हूण आए, मुसलमान आए और अपनी भाषा, बोली तथा संस्कृति के वैभिन्न्य के बावजूद भारतीय संस्कृति में ऐसे घुल–मिल गए, जिसे अलगाया नहीं जा सकता।

जहाँ तक हिंदू और मुस्लिम संस्कृति की एकता का प्रश्न है, सृष्टि के आदि–पर्व में ही इसके संकेत मिल जाते हैं। हिंदू माइथोलॉजी के अनुसार देव–संस्कृति के अवशेष मनु (आदि पुरुष) इस सृष्टि की वंशबेलि के पल्लवनकर्ता हैं—जहाँ श्रद्धा (नारी) उसकी सहायिका है। वहीं मुस्लिम माइथोलॉजी के अनुसार सृष्टि की वंशबेलि को आगे बढ़ाने वाले आदम (पुरुष) और अर्द्धांगिनी हव्वा (नारी) हैं। चूँकि भारतीय परिदृश्य में हिंदू और मुस्लिम, दो बड़ी संस्कृतियाँ हैं। अतः इनके आपसी समन्वय से सामूची भारतीय संस्कृति का नक्शा खींचा जा सकता है।

संस्कृति के निर्धारक तत्वों जैसे, वेश–भूषा, रहन–सहन, तीज–त्योहार, खान–पान, भाषा–बोली, रस्म–रिवाज इत्यादि की एकता के संदर्भ में इसका विश्लेषण किया जा सकता है।

भारतीय मुसलमानों का पहनावा कुर्ता–पाजामा, शेरवानी और लुंगी आदि है, यही हिंदुओं का पहनावा भी बन गया है—यद्यपि भारतीय मूल का पहनावा धोती–कुर्ता है। दाढ़ी रखने की परंपरा भारतीय और मुस्लिम संस्कृतियों में आदि समय से रही है; यद्यपि मुसलमानों का यह धार्मिक [illegible] है। पूर्व भारत की मुस्लिम महिलाओं का साड़ी पहनना, सिंदूर भरना इत्यादि [illegible]–संस्कृति का अंग रहा है। हिंदू स्त्रियों में चूड़ीदार शलवार और कुर्ती का पहनना मुस्लिम [illegible] देन कहा जाएगा। रहन–सहन के स्तर पर भी इन्हें अलगाया [illegible] जा सकता।

گاندھی جی کا نظریۂ عدم تشدد

ڈاکٹر نسیم احمد

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"چار پانچ سال ہوئے میں نے اپنے چند عزیز رفیقوں کے کہنے سے اپنی زندگی کے حالات لکھنے کا ارادہ کیا۔ ابتدا تو میں نے کر دی مگر اس کا پہلا ورق الٹنے کی بھی نوبت نہ آئی تھی کہ بمبئی میں بلوے شروع ہو گئے۔"

(تلاش حق (مہاتما گاندھی کی آپ بیتی)، مترجم: ڈاکٹر سید عابد حسین، مکتبہ جامعہ اسلامیہ دہلی، ص ۳)

"بالآخر میں قارئین سے رخصت ہوتا ہوں اور ان سے دعا میں شرکت کا طالب ہوں کہ حق تعالیٰ مجھے خیال، قول و فعل میں اہنسا (عدم تشدد) کی توفیق عطا کرے۔"

مذکورہ بالا دونوں اقتباسات گاندھی جی کی خود نوشت سوانح حیات "تلاش حق" سے ماخوذ ہیں۔ ایک اس کا ابتدائی اقتباس ہے اور دوسرا اختتامی۔ مگر ان دونوں میں ان کے افکار کا پرتو پوری طرح ابھر کر آجاتا ہے۔ پہلے اقتباس میں مخصوص لفظ "بلوے" کی طرف توجہ مرکوز کرانا چاہوں گا جو ہنسا، دنگا، فساد اور تشدد وغیرہ کے معنی میں آتا ہے اور اس دوسرے پیراگراف میں لفظ "اہنسا" کی توثیق کی بات کی گئی ہے۔ گاندھی جی نے تا عمر "ہنسا" کے خلاف جہاد کیا اور "ستیہ اہنسا" کے فلسفے کو عام کیا۔

معروف امریکی مورخ مائکل ہرٹ نے اپنی مشہور کتاب "The 100:A Ranking of the Most Influential persons in History" میں محمد ﷺ کو سر فہرست رکھتے ہوئے دلیل دی تھی کہ وہ مذہبی اور سیکولر دونوں محاذ پر بے حد کامیاب شخص تھے اور پوری تاریخ انسانی میں سب سے زیادہ موثر سیاسی رہنما بھی۔ اگر ہم اسی کو نظیر بنا کر گاندھی جی کی زندگی، ان کے نظریات اور کاوشوں کا احاطہ کریں تو معلوم ہوتا ہے کہ گاندھی جی بھی نہ صرف ایک مذہبی اور سیکولر انسان تھے بلکہ ایک عظیم سیاسی رہنما بھی تھے۔ گاندھی جی نے اپنے افکار کو عملی جامہ پہنانے کے لیے ایک Grand Narrative یا مہا بیانیہ تیار کیا جس کو انھوں نے "ستیہ گرہ" کا نام دیا۔ جس کے دو مضبوط ستون تھے۔ ستیہ اور اہنسا یعنی حق اور عدم تشدد۔ اسی لیے گاندھی جی کو حق اور عدم تشدد کا امام کہا جاتا ہے۔ مخصوص طور پر ان کا فلسفہ انھیں دو نظریات کے گرد گھومتا ہے اور یہی ان کے فلسفے کی اساس تسلیم کی جاتی ہے۔ [illegible] "ستیہ گرہ کا آغاز" باب میں گاندھی جی ستیہ گرہ [illegible] میں فرماتے ہیں:

Renewable Energy Sources and Climate Change and their Management

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Abstract

Energy consumption increases day by day as more appliances used in today's home. Increasing energy demand and limitations of fossil fuels, time to use the renewable resources for energy generation in domestic areas. This paper proposes renewable energy management system architecture for smart homes in which energy consumption and generation simultaneously for efficient energy, minimization of cost and environment friendly. Microcontroller based energy management module with ZigBee is used to control and monitor the energy consumption of smart home. The propose system is used the solar and wind resources as these are not always available, also introduce water resources to generate the electricity. The charge controller, battery bank, and battery level monitoring are used to provide stable energy module for smart home. Energy consumption should be minimized by users, can access home energy information through smart devices. The propose system save the limited fossil fuels, generated efficient energy and minimize energy consumption.

KEYWORDS: - Renewable Energy Sources (RES), Renewable Energy Management System (REMS), Charge Controller, Battery Level Monitoring

Introduction

Today's energy crisis becomes global problem for the world. We need to reduce the wastage of electricity in day to day life. But the consumption of electricity increases year to year as more home appliances are installed. So, today's the energy saving becomes first priority. Because of the limited fossil fuels, these generations have started the use of different ways of electricity generation like using the renewable energy sources. Solar, wind and water sources [illegible] available anywhere on earth. Renewable Energy Sources (RES) as an [illegible] approach to meeting rural energy needs, reducing pollution, and promoting economic development. A Smart Home is a house that uses new technologies to monitor the [illegible] nature, out-house climate changes, control and monitor the home [illegible] nicates with the worldwide. Smart homes have the potential for increasing [illegible], decreasing costs of energy use, decreasing the carbon footprint [illegible] resources, and trans-forming the role of the occupant[1][2][3]. This [illegible] a novel model of smart homes for rural areas where reaching or 24*7 power [illegible] is one big question till date.

Several projects have proposed to minimize the electricity consumption using Home Energy Management System (HEMS). Efficient HEMS [5], [6] include the support of automatic and manual scheduling and control of the devices, continuous [illegible] and efficient notification. This work considers a device control module to [illegible] appliances; it does not consider the energy generation. A [illegible] compares, and controls home appliances has been proposed [7], [8]. It does not

Importance of Cloud Computing

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(5)

Abstract

Cloud computing has significant advances in Information and Communications Technology (ICT) over the last half century. This computing has recently emerged as a new paradigm for hosting and delivering services over the Internet. Cloud computing is attractive to business owners as it eliminates the requirement for users to plan ahead for provisioning, and allows enterprises to start from the small and increase resources only when there is a rise in service demand. The application services hosted under Cloud computing model have complex provisioning, composition, configuration, and deployment requirements. Evaluating the performance of Cloud provisioning policies, application workload models, and resources performance models in a repeatable manner under varying system and user configurations and requirements is difficult to achieve. In this paper we present a survey of cloud computing, highlighting its key concepts, architectural principles, and state-of-the-art implementation as well as research challenges. The aim of this paper is to provide a better understanding of the design challenges of cloud computing and identify important research directions in this increasingly important area.

KEYWORDS: Cloud computing; modeling and simulation; resource management;

Introduction:

Cloud is a collection of Computers and Servers that are accessible publicly via the internet. The complete network is owned and operated by a third party on a consolidated basis in one or more data center locations. It is one of the most vague technique terminologies in history. One reason is that cloud computing can be used in many application scenarios, the other reason is that cloud computing are hyped by lots of companies for business promotion. Cloud computing is a kind of computing technique where IT services are provided by massive low-cost computing units connected by IP networks. Cloud computing is rooted in search engine platform design. There are 5 major technical characteristics of cloud computing: (1) large scale computing resources (2) high scalability & elastic (3)shared [illegible] (virtualized and physical resource) (4)dynamic resource scheduling [illegible] [1][2]

Cloud Infrastructure:

A cloud infrastructure is the [illegible] that [illegible] and software that enables the essential characteristics of cloud computing. The cloud infrastructure can be viewed as containing both a physical layer and an abstraction layer. The physical layer consists of the hardware resources that are necessary to support the cloud services being provided, and typically includes server, storage and network components. The abstraction layer consists of the software deployed across the physical layer, which manifests the essential cloud characteristics. Conceptually the abstraction layer considers above the physical layer.

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Systematic study of incomplete-fusion dynamics below 8 MeV/nucleon energy

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An attempt has been made to provide crucial information about the dependence of incomplete-fusion dynamics on various entrance channel parameters below 8 MeV/nucleon energy. The forward recoil range distributions of several evaporation residues produced in the $^{11}C + {}^{159}Lu$ system have been measured at ≈88-MeV energy and examined in the framework of the code SRIM. Owing to the fractional linear momentum transfer from the projectile to the target nucleus, incomplete-fusion (ICF) products are observed to be trapped at lower cumulative thickness than that of complete fusion products. In order to study the incomplete-fusion behavior with various entrance channel parameters, the incomplete-fusion fraction (F_{ICF}) has also been deduced and compared with those obtained for the systems available in the literature. The reinvestigation of the Coulomb factor (Z_pZ_T) dependence of incomplete fusion indicates that it is somehow projectile structure dependent. No systematic trend is observed with the target deformation parameter (β_2) dependent study of ICF. A systematic linear growth in the incomplete-fusion probability function (F_{ICF}) is observed with increasing the parameters $Z_pZ_T\beta_2$ and $Z_pZ_T/(1-\beta_2)$, but separately for α- and non-α-cluster structured projectiles with different targets. The present findings explore the role of Coulomb interaction on ICF dynamics more effectively. Moreover, the projectile α-Q value is found to be a suitable parameter which explains effectively the observed trend in the study of ICF with the above-mentioned parameters. The incomplete-fusion existence below critical angular momentum (ℓ_{cr}), i.e., $\ell \leqslant \ell_{cr}$, is also observed for the present $^{11}C + {}^{159}Lu$ system.

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I. INTRODUCTION

...s are continuously being made to investigate the ...plete-fusion (ICF) process in collisions of heavy ions ... projectile energies [1–5]. In the interaction of two ... ions, several reaction channels may open up, which ... leads to the transfer of cluster of the nucleons. Fu... suppression based studies have also explored the ICF ..., using weakly bound projectiles around the barrier ... Nevertheless, the study of ICF is still an active area ...rch due to complexity in the mass transferred from ...jectile to the target. Thereby, it requires further inv... ...to unfold the ICF dependence on various ent... ...f parameters. It is now a well-understood fact that the ...ocess is also one of the dominant reaction mod... ...mplete fusion (CF) at energies near and well above the ...b barrier (V_{CB}), which contributes significantly to the ...ion cross sections [10–13]. In the case of CF, the ... ...ile fuses with the target nucleus. On the other hand, the ...t projectile may break up into its fragments in the case ... ...wherein only one of the parts fuses with the target and ...ment may act as a spectator.

The experimental features of the ICF in the breakup of projectiles like ^{12}C, ^{14}N, and ^{16}O into α clusters were first observed by Britt and Quinton [14]. However, Inamura *et al.* [15] provided the major advances in the study of the ICF process from the extracted information based on the particle-γ coincidence measurements. Udagawa and Tamura [16] explained the projectile breakup into α clusters in the vicinity of the target nuclear field. Several theoretical models [16–20] were proposed using tightly bound projectiles to explain the ICF process. The CF and the ICF processes have also been categ... ...on the basis of imparted angular momentum (ℓ) in the ... For the ICF process, the attractive nuclear potential is ... ...rong enough to capture the projectile entirely by ... ...nucleus and the CF gives way to the ICF process. ... ...ctions of the SUMRULE model of Wilczynski ... ...the ICF process exists only for input angular ... ...values (ℓ) greater than critical angular momentum ... ...). However, in contradiction to the SUMRULE model ... ...n, a substantial contribution of ICF ... ...has also been observed in recent studies [12,13,21] ... ...ile partially fuses with the target, less nucl... ...the projec... freedom participate in the case of ICF. Hence, ...car momentum transfer (LMT), the ICF products are observed to traverse the shorter path in the stopping medium compared with that of CF products [4,12,22,23]. The studies available in the literature show noticeable ICF contribution in the

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Variability of phytoplasma associated with few ornamental crop species in Uttar Pradesh, India

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ABSTRACT

The economic importance of ornamentals has been advancing significantly in many countries due to continuous international demand. Like other crops, ornamental plants are also affected by a number of pathogens and the phytoplasmas diseases are equally important group of pathogens which is responsible for damaging the different ornamental plant species and thereby affecting their market value. In the present investigation, total 24 symptomatic leaf samples of 8 ornamental plant species (*C. roseus, R. rubiginosa, C. variegatum, Z. elegans, J. gendarusa, T. erecta, H. rosa sinensis, J. sambrac*) were analyzed which were found positive in nested PCR assays with R16F2n/R16R2 primers. The phytoplasma associated with ornamental plant species collected from different districts of UP in the present investigation are belongs to 16Sr I, II, VI and XIV group.

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KEYWORDS
Ornamental plant; phytoplasma; detection; diversity; PCR; Nested PCR; phylogenetic analysis

Introduction

The floriculture sector is making rapid progress in India with 2.49 lakh ha of land under floriculture and production of 1659 million tons (MT) of loose flowers and 484 million tonnes of cut flowers. India has exported of Rs. 460.75 crores (22,947.23 MT) that included dry flowers, cut flowers, foliage and branches, grasses etc., which is increasing day by day. All the segments of floriculture encounter significant manifestation of viruses, viroids and fastidious prokaryotes which are of major concern as they are easily vectored by insects and very difficult to manage once established (Chaturvedi et al. 2010). Due to inadequate awareness among the growers and stakeholders, many a times the affected plants are further propagated with a mistaken premise that the plants are novel varieties. The lack of awareness and indiscriminate propagation of infected another plants augment faster spread of phytoplasma diseases.

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Article

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Biosynthesis, Characterization and Biological Activities of Silver Nanoparticles from *Pogostemon cablin* Benth. Methanolic Leaf Extract

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This study reports the biosynthesis of silver nanoparticles (AgNPs) using methanolic leaf extract of *Pogostemon cablin* Benth. (Patchouli) as a reducing agent, and their potent biological (antibacterial, antioxidant and anticancer) activities. The *P. cablin* extract when exposed to silver nitrate reduced silver ions to form crystalline AgNPs within 1 h of incubation at room-temperature. UV-visible spectra showed a sharp surface plasmon resonance (SPR) at around 430 nm for the biosynthesized AgNPs and the XRD pattern indicated the crystalline planes of the face centered cubic silver. The FE-SEM analysis revealed the occurrence of predominant spherical shaped AgNPs with a huge disparity in their particle size distribution with an average size of 25 nm, while, the FTIR data confirmed the bio-reduction and capping of AgNPs by several phytocompounds present in the methanolic leaf extract. AgNPs effectively inhibited the growth of all the tested human pathogenic bacterial strains (*Bacillus subtilis*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Escherichia coli*), while, the methanolic leaf extract failed to inhibit the growth of *S. aureus* and *P. aeruginosa*. AgNPs showed the highest free radical scavenging activity (79.0 ± 0.76%) compared to methanolic leaf extract (68.3 ± 0.68%) at 100 μg/ml. Further, the cytotoxicity study using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) confirmed that AgNPs successfully inhibited the human colon adenocarcinoma cell line (HT-29) in a dose dependent manner. At higher concentrations (500 μg/ml), only 4% of cells survived after 72 hrs of exposure with IC_{50} value of 120 μg/ml. Thus, these findings offer a new source of biomolecules with diverse biological activities.

Keywords: Anticancer Activity, Biosynthesis, Cytotoxicity, Free Radical Scavenging Activity, Nanoparticles.

1. INTRODUCTION

Nanobiotechnology is an emerging field of contemporary modern research that involves the manipulation of materials at the atomic or molecular level to exhibit diverse properties.[1–3] Nanomaterials find their applications in several fields of biomedical sciences, such as drug delivery, biosensing, image analysis, and drug delivery. Nanostructures, such as silver, gold, CuO, and ZnO possess the therapeutical potential and hence, used for various biomedical applications including as antimicrobial materials.[4–10] Recently, they are applied in cancer therapy because of their unique ability to check the growth of selectively malignant cells.[3,11–13] Thus, nanoparticles are the basic molecule that acts as building blocks for the synthesis of different kinds of nanostructures or nano-devices. The physical, chemical and biological properties of nanoparticles greatly depend on several factors, such as composition, size, structure, shapes and also on the used starting materials.[2,14] To date, several research efforts have been

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Effect of Shaking on Multiplication and Growth of Shoot Cultures in Sugarcane

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Abstract: An experiment was conducted to study the effect of shaking of cultures on shoot multiplication and growth. Five sets each of 20 bottles, containing shoot cultures of sugarcane varieties CoSe 01235 and CoS 99259 on liquid MS medium were made. Four sets of each variety were kept on separate illuminated rotary shakers and agitated at various speeds (i.e. 60, 90, 120 and 150 RPM) for initial 7 days. The 5th set of cultures containing liquid medium was kept stationary on the growth racks without shaking. The data on number of shoots per culture and shoot length was recorded 15 days after incubation. The results revealed that shaking of cultures enhanced the rate of multiplication in terms of number of shoots per culture, shoot length and shoot vigor. In variety CoSe 01235, maximum 28.3 shoots per culture could be counted in bottles shaken at 120 RPM followed by 25.7 shoots per culture in bottles shaken at 90 RPM. The mean shoot length in cultures shaken at 120 rpm was highest (6.2 cm) as compared to the cultures kept stationary (5.4 cm). Almost similar trend was observed in case of sugarcane variety CoS 99259 which produced the highest number of shoots (31.1) with maximum average length (6.4 cm) in cultures shaken at 120 rpm. The shoots produced in cultures shaken at 120 RPM were vigorous than those receiving other treatments in both the test varieties. On comparison of responses in both varieties, it was found that CoS 99259 showed better responses regarding rate of shoot multiplication and shoot growth as compared to CoSe 01235, irrespective of shaking treatments.

Keywords: Shaking cultures, stationary cultures, sugarcane, multiplication rate, tissue culture.

INTRODUCTION

In the past few years many Indian laboratories, involved in sugarcane research programmes, have utilized tissue culture technique in sugarcane improvement. Plant tissue culture offers the best methodology for production of quality planting material of sugarcane in a shorter period of time through micropropagation. The main advantage of micropropagation is the rapid multiplication of new varieties, improved plant health and its usefulness in germplasm storage. It is the best method for propagation as it produces plants phenotypically similar to the mother plant and gives much more rapid multiplication rate. Shaw (1990) reported that micropropagation is being used in several sugar industries, for the development of disease free clones, mostly to facilitate their safe and speedy movement through quarantine. It has now become a valuable alternative to the conventional clonal propagation methods for seed production in many plants. Tissue culture can increase the propagation potential by 20-35 times (Geijskes et al., 2003 and Snyman et al., 2006). Newly released varieties due to different genetic and physiological nature show different requirements of nutrient media, plant growth regulators and environment for proper development under *in vitro* condition. Various protocols for *in vitro* micropropagation of sugarcane have been described by several investigators during the past decades (Sauvaire and Glazy 1979, Hendre et al., 1983, Lee 1987, Sreenivasan and Sreenivasan 1992, Lal and Singh 1994, Shukla et al., 1994, Ramesh et al., 2004, Nayak et al., 2009). Earlier studies have indicated that in vitro morphogenetic responses in plants being under the influence of plant growth regulators, are cultivar

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GOODS AND SERVICE TAX IN INDIA: GLIMPSE ON SOCIAL AND ECONOMIC CHANGE

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ABSTRACT

The Goods and Services Tax (GST) is the latest kind of Indirect Tax which has been implemented from 1st July, 2017. GST is already in force in many countries around the world and they all were considering it as their Soles Tax system. The GST will be levied on the manufacture, sale of goods and services in India. It can be said that this is the biggest form of reform in the indirect taxation aspect ever since 1947. GST council is headed by the Union Finance Minister that is currently Shri Arun Jaitley. The main purpose of Goods and Service Tax(GST) is to bring about the single tax system for the sale and the manufacture of goods at the both central and the state level in the country. GST helps to remove all other taxes like VAT (Value-Added Tax), Excise Duty and Sales Tax. For the consumers, the tax will be very much useful in the aspects of payment of taxes that is, we all have to pay separate tax at state level and at central level for the goods and services purchased and after the GST there will be paid only one tax for the goods and services consumed which is GST. This paper attempts to bring out about an overview of the concepts of GST and its impact and implications on the various industries in the Indian Economy. The paper is based on secondary data & data has been collected from various authentic sources such as research journals, magazines, newspapers, government websites, books, various benefits and opportunities of GST are also attempted in this paper.

Keywords: *GST, Tax, Impact, Future of GST, Various Industries, Indian Economy*

INTRODUCTION

GST known as Goods and Services Tax levied by the Government in a move to replace all of the indirect taxes. The idea of GST in India was contemplated in 2004 by the Task Force on implementation of the Fiscal Responsibility and Budget Management Act, 2003. The Kelkar Committee was of the conviction that dual

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Development and Importance of Shopping Malls and Customer Perceptions towards IT

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Abstract – The dimension of competition in the retail market is high and demands a need to oversee shopping malls properly and understand the general consumer behavior amid visits at shopping mall as far as their principle explanations behind visiting the mall and attitude so as to pull in shopping mall guests to visit these malls. Till date it is being commanded by small and unorganized entrepreneurs like Khirana shops, standalone stores, boutiques, traditional family business stores and so on. The sorted out retail industry in India is to grow 40 percent every year and would significantly increase or multiple times in size. The purchase of goods or services incorporates various factors that could influence every choice. Customer satisfaction is progressively perplexing and much more significant for retailers today than in past. Be that as it may, with the developing global economic forces, new economic policies, FDI relaxations and one of a kind marketing techniques the new sort of retailers like shopping malls will in general snare the consumers even in Tier II and Tier III towns. While the progress is going on at global dimension in different structures, the shopping behavior of consumer is additionally prone to change with the developing decisions and trends. Shopping in malls has turned into a noteworthy recreation action. Composed retail sector is developing at fast speed, more occupations are being made, town plans are getting modernized, and therefore the consumer behavior as well. In this Research Study, we studied about the development of shopping malls recently, their importance and the Consumer Perceptions towards them.

Keywords: *Shopping malls, customer perceptions, development etc.*

-X-

INTRODUCTION

Large shopping focuses have turned into a significant component of the urban landscape and a noteworthy contender with different types of retail retail. Their large offer, including a wide assortment of products and services, uncommon offers and tasting efforts, large car parks, and possess brand fuel stations just as different services focuses situated in shopping focuses effectively win customers. Shopping malls are quick turning into a focal piece of life in urban India. Demand projections for mall space in India are worthwhile; be that as it may, development of malls in India in the course of the most recent decade has experienced issues, for example, the staggering expense of land and development, poor foundation, a non-favorable arrangement structure, and the inaccessibility of good aptitude in mall advancement and the board. This has brought about undifferentiated malls, [illegible] levels, and diminished profitability for occupants and malls. Shopping mall improvement in regional towns commonly [illegible] the guarantee of increments in contemporary Australia they are regularly invited along these lines, and the brands, chain stores, marvelousness and/or less expensive costs they bring.

The shopping Center exists in three essential sorts. Shopping malls, neighborhood focuses of a couple of grapple supermarkets and a couple of stores, and single store hypermarkets, superstores and bulky goods outlets [1]. The last two utilize a car [illegible] as opposed to a person on foot environment [illegible] essential sorting out component of [illegible] and are practical environments, [illegible] to the instrumental appropriation of [illegible] to a lesser degree services. Then again, the mall offers an option in contrast to the instrumentality of the neighborhood Center and [illegible] store on the grounds that it endeavors to make passerby environment and [illegible] where the open can 'go out to shop' as opposed to simply 'do the shopping' in an environment offering individual and social attractions.

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Anthology : The Research

Introduction of Literary Language at College Level is Fruitful to Teach/Understand the Mythology and Psychology of Literature to the Students

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Abstract

In literature the writer tries to communicate his vision or idea in a highly individualized medium by restoring to a particular method and, in part a unique use of language. Literature is a product of communication and the norms regulating the process of production and reception of literature are largely shared by the people participating in it i.e. writer and reader. In principle we can say that every literary text may provide an aesthetic experience to the recipient. Creative literature can be called an aesthetically organized language, a specialized mode of expression, or a particular kind of speech. Creative writers use language (words) to create a subtle and complex effect thereby cultivating the ambiguity inherent in the multiple or shaded meanings of words.

Keywords: Mythology,Psychology,Juncture,Receipient,Aesthetically, Exploited

Introduction

Every language is used to convey meaning so as English Language. So, communication skill, generally termed as language which is one of the most important characteristics of a culture. Raymond Chapman (1982) speaks :

> *"A language can conveniently be divided into Vocabulary or lexis and grammar or syntax. The Division is not one that can effectively be sustained forLong in using or learning the language."*

The psychology behind teaching literary language is not only to help students comprehend the meaning that writer tries to express but also to enhance students thinking and language abilities ,as well as language skills(*LSRW*).Students have to learn vocabulary ,evaluate evidence individually and in group discussions, form judgments based on synthesis and analysis, and develop a coherent argument in support of a position. *Brumfit and Carter* (1986) feel that a literary text is an authentic piece in which real language is used and capable of supporting a discussion and exploration of language. At this juncture, this should be noted that language literature are considered as one coin that has two sides. Some examples of the use of literary language to assist in language learning can be found in *Bassnet and Grundy* (1993),Carter and Long (1991),*Collie and Slater (1987),Duff and Maley(1990).*

Literature uses striking modes of speech differing from, and transcending the established ones. Thereby, it can be understood as a deviation from the norms of the standard language.

The literary artist uses the words just like the painter uses colours. Words do have overtones ; they stir up complex reverberations in the mind that are ignored in their ordinary meaning or dictionary definitions and these subtitle overtone and associations of meaning are exploited by the literary artist. As Wittgenstein says : (1984)

> *"In the actual use of this language, one men calls out the word as orders, the other acts according to them. But learning and teaching this language will contain this procedure. The child just 'names'*

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A STUDY ON FISHING CONDITION OF CHILIKA LAKE

DR. MASIHULLA KHAN* AND MR. MD. AFTAB ALAM**

Declaration

The Declaration of the authors for publication of Research Paper in SAARC: International Journal of Research ISSN 2347-8373 Six-monthly Journal of all Research: We, *Masihulla Khan and Md. Aftab Alam* the authors of the research paper entitled A STUDY ON FISHING CONDITION OF CHILIKA LAKE declare that, We take the responsibility of the content and material of our paper as We ourself have written it and also have read the manuscript of our paper carefully. Also, We hereby give our consent to publish our paper in SAARC Journal, This research paper is our original work and no part of it or it's similar version is published or has been sent for publication anywhere else. We authorise the Editorial Board of the Journal to modify and edit the manuscript. We also give our consent to the Editor of SAARC Journal to own the copyright of our research paper.

Abstarct

The Chilika lagoon is one of the largest water lagoon which is brackish in nature in Odisha state on the east coast of India, at the mouth of the Daya River. It is the largest coastal lagoon in India and the second largest brackish water lagoon in the world after The New Caledonian barrier reef. It has been listed as a tentative UNESCO World Heritage site. Net Fishing (Bahani) is one of the traditional methods of fishing contributing nearly 50 to 66 percent of fish catch from the Chilika lagoon annually. The values presented in the above table shows that the production of fish and prawn in Chilika varied from5169 tonnes in the year 1979-80 to 7250 in the year 1983-84 with a slight decrease in the year 1984-85 to 5999 tonnes.

Key Words: Fishing, Economy, Chilika Lake, Inland Ecosystem, Community

Introduction

Fish and fishery have been with us since time immemorial. World fish production has increased manifold in the last decade roughly crossing 168,429,000 million tonnes during 2005-06. India has witnessed a higher growth of fishery and ranks 7th among fish producing nations of the world. At present, fishery sector in India is providing gainful employment to 5.97 million people of which 2.40 million are full-time fishermen. Fishery plays an important role in Indian economy, but the economic conditions of the fishermen are very poor. Orissa ranks 6th in inland fish production, whereas its position is 8th in marine fish production in India. Due to lack of mechanized fishing, socioeconomic condition and technical illiteracy among the fishermen, Orissa is lagging behind as compared to other States.

The fishermen are separated into a different community. They are one of the backward communities in India. They spend their whole life in poverty due to uncertain prospects of income (Nandi & Parmanik 1994). The total community can be classified into two groups.

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AN ASSESSMENT OF THE PERFORMANCE OF MGNREGA IN INDIA

MR. MD. AFTAB ALAM* AND DR. MASHIULLA KHAN**

Declaration

The Declaration of the authors for publication of Research Paper in The Indian Journal of Research Anvikshiki ISSN 0973-9777 Bi-monthly International Journal of all Research: We, *Md. Aftab Alam and Mashiulla Khan* the authors of the research paper entitled AN ASSESSMENT OF THE PERFORMANCE OF MGNREGA IN INDIA declare that , We take the responsibility of the content and material of our paper as We ourself have written it and also have read the manuscript of our paper carefully. Also, We hereby give our consent to publish our paper in Anvikshiki journal , This research paper is our original work and no part of it or it's similar version is published or has been sent for publication anywhere else.We authorise the Editorial Board of the Journal to modify and edit the manuscript. We also give our consent to the Editor of Anvikshiki Journal to own the copyright of our research paper.

Abstract

MGNREGA , the largest employment generation in Asia, was implemented in two phases. In first phase which started from 2005 covered 200 identified districts and second phase in 2008 covered all the districts of India. The scheme has brought many social upliftment in rural areas of our country. It also controlled seasonal migration from rural to urban area in off season. This scheme mainly emphasis on women empowerment. There is certain initiative taken for women so that maximum participation can be made from women. The story of successful implementation across the country is various because of level of good governance, people participation and corporation etc.

Key Words: MGNREGA, Employment generation, Implementation, Social Upliftment.

Introduction

Success of any sustainable poverty alleviation programme is based on increasing productive employment opportunities along with growth. The focus of government of India relates to providing employment guarantee of 100 days of wage employment to every rural household, whose adult members are willing to do unskilled manual work.

Accordingly the parliament has passed the historic National Rural Employment Guarantee Act (NREGA) in the year 2005 that guarantees 100 days of wage employment in a year, to every rural household. This act was introduced with an aim of improving the purchasing power of the rural people,

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विचार की आदानप्रदानी में संप्रेषण में अवरोध उत्पन्न हो जाता है। सफल संप्रेषण के
आवश्यक है की उपर्युक्त सभी बाधाओं और समस्याओं का निवारण करने के लिए
सभी प्रयत्न किए जाए।

कार्यों:, संप्रेषण संप्रेषक और संदेश ग्रहणकर्ता के बीच अंतःक्रिया होती है, जिसमें
द, संकेत, चिह्न तथा चिह्नों के माध्यम से विचार, भावना, सूचना तथा अर्थों का
न होता है। संप्रेषण एक मनोवैज्ञानिक प्रक्रिया होने के कारण इसका प्रमुख आधार
मझ और मनोदशा ही होती है। इसलिए मनुष्य का सोचना, संवेदना और उसका
र संप्रेषण के अंतर्गत हो आता है। संप्रेषण एक सहभागी अनुभव होने के कारण
रिक रूप से एकत्रित होकर एक-दूसरे के विचार-व्यवहार में परिवर्तन नहीं ला
लिए आवश्यक है कि हम एकत्रित होकर संवाद, आपसी समझ और परस्पर
ध्यम से एक-दूसरे से जुड़ें।

संदर्भ

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लोककवि नजीर अकबराबादी के काव्य में पर्वों एवं त्योहारों का चित्रण

डॉ॰ कैयाज अहमद

नजीर अकबराबादी 18वीं-19वीं शताब्दी के कवि हैं। यहाँ तक आते-आते हिंदू-मुस्लिम संस्कृतियों में पूर्ण सामंजस्य स्थापित हो चुका था, क्योंकि शताब्दियों तक साथ रहते-रहते वह एक दूसरे को प्रकृति से पूर्णतः परिचित हो गए थे। सामंजस्य ने समन्वय का भाव स्थापित कर दिया था। फलस्वरूप दोनों एक-दूसरे की सामाजिक एवं धार्मिक आस्थाओं एवं अन्य क्रियाकलापों में भाग लेकर आपसी समन्वय स्थापित कर रहे थे।

समाज पारस्परिक संबंधों का जाल होता है और नजीर युगीन समाज इन्हीं पारस्परिक संबंधों के कारण उसी प्रकार एक संकर समाज बन गया, जिस प्रकार दो विभिन्न भाषाओं के शब्दों को जोड़कर एक सार्थक संकर शब्द बन जाता है। इस मिश्रित समाज में दोनों धर्मावलंबी अपनी रीतियों एवं आस्थाओं के साथ जीवनयापन कर रहे थे।

समाज-दर्शन के तत्त्वों में समाज में प्रचलित विभिन्न पर्वों अथवा त्योहारों की महत्ता एवं उपयोगिता को नकारा नहीं जा सकता। भारत में सामाजिक धरातल पर हिंदू-मुस्लिम दोनों विभिन्न त्योहारों का आयोजन करते थे। भारत पर्वों का देश है किंतु मुख्य रूप से यहाँ होली, दीवाली, रक्षा-बंधन, ईद, शबे-ए-बरात आदि दोनों धर्मावलंबी मनाते हैं। इन मुख्य त्योहारों का अलग ही आकर्षण एवं आनंद है।

प्रत्येक कलाकार अपने भावों एवं विचारों को अपनी कला के माध्यम से प्रदर्शित करता है। वह समाज का अवलोकन एवं अध्ययन करता है और तथ्य अथवा यथार्थ में अपनी कल्पनाओं का पुट देकर अपनी कला को आकर्षक बनाता है। इन समस्त कलाकारों में कवि सर्वाधिक संवेदनशील कहा जाता है। नजीर अकबराबादी एक कवि होने के साथ समाजद्रष्टा भी थे। उनकी रचनाएँ इस तथ्य का साक्ष्य हैं कि उन्होंने समाज का एक-एक कोना झाँक रखा है। समाज संबंधी उनकी काव्य रचनाएँ यह प्रमाणित करती हैं कि वे समाज से जुड़े और समाज में रचे-बसे एक उच्चकोटि के कवि थे। भारतीय त्योहारों का सर्वांचित वर्णन नजीर की रचनाओं में पूर्णतः दृष्टिगत होता है। उन्होंने हिंदू-मुस्लिम दोनों समाजों के प्रचलित प्रमुख त्योहारों के मनोरम चित्र अंकित किए हैं। उनके इस चित्रांकन को त्योहारगत निम्न रूप में प्रस्तुत किया जा सकता है–

शब-ए-बराअत को मुस्लिम समाज का सामान्य वर्ग शबबरात, शबरात या शुबरात कहता है। जनसामान्य में प्रचलित इस रूप को त्योहार का नाम दिया जाता है, जबकि इस्लाम धर्म के अनुसार शब-ए-बराअत कोई त्योहार नहीं। नजीर लोककवि हैं और लोकप्रचलित मान्यताओं को

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...प्रेषण में समस्याएँ उत्पन्न करती हैं। ... इसके अतिरिक्त ...और चुनौतीपूर्ण प्रक्रिया है। संप्रेषण-प्रक्रिया के संघटन तत्व में ...माध्यमों में संप्रेषण ...अवरोध उत्पन्न हो जाता है। सफल संप्रेषण के ...को उपयुक्त सभी ...और समस्याओं का निवारण करने के लिए ...।

...संप्रेषक और ...कर्ताओं के बीच अंत:क्रिया होती है, जिसमें ...तथा चिह्नों के माध्यम से विचार, भावना, सूचना तथा अर्थों का ...प्रेषण एक मनोवैज्ञानिक प्रक्रिया होने के कारण इसका प्रमुख आधार ...ही होती है ...मनुष्य का सोचना, संवेदना और उसका ...अंतर्गत ही आता है। संप्रेषण एक सहभागी अनुभव होने के कारण ...प्रभावित होकर एक-दूसरे के विचार-व्यवहार में परिवर्तन नहीं ला ...है कि हम एकत्रित होकर संवाद, आपसी समझ और परस्पर ...से जुड़ें।

संदर्भ

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लोककवि नजीर अकबराबादी के काव्य में पर्वों एवं त्योहारों का चित्रण

डॉ॰ फैयाज अहमद

नजीर अकबराबादी 18वीं-19वीं शताब्दी के कवि हैं। यहाँ तक आते-आते हिंदू-मुस्लिम संस्कृतियों में पूर्ण सामंजस्य स्थापित हो चुका था, क्योंकि शताब्दियों तक साथ रहते-रहते वह एक दूसरे की प्रकृति से पूर्णत: परिचित हो गए थे। सामंजस्य ने समन्वय का भाव स्थापित कर दिया था। फलस्वरूप दोनों एक-दूसरे की सामाजिक एवं धार्मिक आस्थाओं एवं अन्य क्रियाकलापों में भाग लेकर आपसी समन्वय स्थापित कर रहे थे।

समाज पारस्परिक संबंधों का जाल होता है और नजीर युगीन समाज इन्हीं पारस्परिक संबंधों के कारण उसी प्रकार एक संकर समाज बन गया, जिस प्रकार दो विभिन्न भाषाओं के दो शब्दों को जोड़कर एक सार्थक संकर शब्द बन जाता है। इस मिश्रित समाज में दोनों धर्मावलंबी अपनी रीतियों एवं आस्थाओं के साथ जीवनयापन कर रहे थे।

समाज-दर्शन के तत्वों में समाज में प्रचलित विभिन्न पर्वों अथवा त्योहारों की महत्ता एवं उपयोगिता को नकारा नहीं जा सकता। भारत में सामाजिक धरातल पर हिंदू-मुस्लिम दोनों विभिन्न त्योहारों का आयोजन करते थे। भारत पर्वों का देश है किंतु मुख्य रूप से यहाँ होली, दीवाली, रक्षा-बंधन, ईद, शबे-ए-बरात आदि दोनों धर्मावलंबी मनाते हैं। इन मुख्य त्योहारों का अलग ही आकर्षण एवं आनंद है।

प्रत्येक कलाकार अपने भावों एवं विचारों को अपनी कला के माध्यम से प्रदर्शित करता है। वह समाज का अवलोकन एवं अध्ययन करता है और तथ्य अथवा यथार्थ में अपनी कल्पनाओं का पुट देकर अपनी कला को आकर्षक बनाता है। इन समस्त कलाकारों में कवि सर्वाधिक संवेदनशील कहा जाता है। नजीर अकबराबादी एक कवि होने के साथ समाजद्रष्टा भी थे। उनकी रचनाएँ इस तथ्य का साक्ष्य हैं कि उन्होंने समाज का एक-एक कोना झाँक रखा है। समाज संबंधी उनकी काव्य रचनाएँ यह प्रमाणित करती हैं कि वे समाज से जुड़े और समाज में रचे-बसे एक उच्चकोटि के कवि थे। भारतीय त्योहारों का यथोचित वर्णन नजीर की रचनाओं में पूर्णत: दृष्टिगत होता है। उन्होंने हिंदू-मुस्लिम दोनों समाजों के प्रचलित प्रमुख त्योहारों के मनोरम चित्र अंकित किए हैं। उनके इस चित्रांकन को त्योहारगत निम्न रूप में प्रस्तुत किया जा सकता है–

शब-ए-बराअत को मुस्लिम समाज का सामान्य वर्ग शबबरात, शबरात या शुबरात कहता है। जनसामान्य में प्रचलित इस रूप को त्योहार का नाम दिया जाता है, जबकि इस्लाम धर्म के अनुसार शब-ए-बराअत कोई त्योहार नहीं। नजीर लोककवि हैं और लोकप्रचलित मान्यताओं को

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Correlation of MHD Waves observed at equatorial latitudes with magnitude of Interplanetary Magnetic Field

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Abstract

The earth's environment is widely affected by sun and most of the earth's magnetospheric processes are related with the solar wind parameters. This study is carried out for a sub-group of MHD waves known as Pc4 magnetic pulsations (period range 45-150 seconds) recorded simultaneously at three very low latitude recording stations in India, viz. Pondicherry (Magnet. lat. 2.50°N), second one Nagpur (Magnet. lat. 11.72°N) and Hanle (Magnet. lat. 23.38°N), which were distributed over a geomagnetic latitudinal range of about 21° and its relation with interplanetary magnetic field (IMF). The relation of observed MHD wave parameters with the solar wind and parameters of IMF may become useful for theory prediction for excitation and spreading processes. The recording stations having fluxgate magnetometers were operated by IIG, Navi Mumbai, India. The work for dependence of Pc4 MHD wave's occurrence on the strength of interplanetary magnetic field was carried out for complete year 2005. The bulk of MHD Pc4 signatures occurred with a narrow range, 2-10 nT, of IMF magnitude however its dependence spread up to 22 nT. For the different months of whole year 2005, nearly common behavior of Pc4 events with IMF magnitude was found at each station. This study shows that peak of occurrence for IMF range 3-5 nT.

Keywords: *MHD waves, magnetic micro-pulsations, interplanetary magnetic field, Ultra-low frequency waves, Magnetohydrodynamic Physics*

I. INTRODUCTION

It is common that waves are generated when physical systems experience disturbance. In plasma, magnetohydrodynamic (MHD) waves are created due to the association of mechanical stresses (which is due to plasma's gaslike properties) and electromagnetic interactions (because of the charged particles). These are the least [illegible] waves that happen in plasma. The research on these ultra-low-frequency magnetohydrodynamic waves recorded near to the earth has attracted considerable attention since last cent[illegible]. These naturally happening quasi-sinusoidal fluctuations (1–1000 mHz) in magnetic field of the earth are named geomagnetic pulsations. The later theories and interpretation of these geomagnetic field oscillations was mostly based on the theory related to the hydromagnetic waves spearheaded by Alfvén [1-3]. The magnetohydrodynamic geomagnetic oscillations in the 6.7- 100 mHz frequency range, termed as Pc3 and Pc4, are mostly observed in [illegible] to have connection with the waves created by reflection of energetic ions [illegible] which causes the wave excitation at the boundary of magnetosphere [4-6]. Russell and Hoffman [7] suggested the source of ultra-low frequency (ULF) pulsation energy is related to IMF and reported flux-transfer events which happen with the southward orientation of interplanetary magnetic field. The dependence of occurrence and some other properties of Pc3-4 geomagnetic micropulsations on solar wind conditions and

(2)

Study of Relative Alpha Activities Produced by Different Building Materials in Ambient Air by Using Cylindrical Can Technique

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ABSTRACT

The study of relative alpha activity produced by the different building material has been carried out by cylindrical can technique. Different types of building materials such as White Cement, Black Cement, Sand, Fly Ash (RTPS), Fine Aggregate, Bricks, Coarse Aggregate and Coal Slag. Equal amount of all building materials sample (about 500gm) was taken for the study purpose. It was found that the building materials like fine aggregate produces approximately10 times more relative alpha activity in the ambient air than produce by an equal amount of black and white cement under the similar conditions. The relative alpha activities produce by the different building materials used in the construction work are 1.02 for white cement, 0.98 for black cement, 2.29 for sand, 1.60 for fly ash, 10.02 for fine aggregate, 4.67 for bricks,2.10 for coarse aggregate and 1.35 for coal slag (RTPS). The building material like cement shows the least amount of alpha activity whereas the fine aggregate shows the largest amount of alpha activity in the ambient air. The least amount of alpha activity in case of cement is due to the fact that the cement already releases the least amount of radon. The main objective of this research work is to measure the relative alpha activity produced by different building materials in the ambient air.

Keywords: Different type building materials, Alpha activity, SSNTD

1.1 INTRODUCTION

It has been found that many building materials such as cement, concrete, bricks(fired and unfired), fine sand, fly ash, coal slag, coarse aggregate etc that are used in construction work contains some radioactive elements. These radioactive elements are Uranium (U-238), Radium (Ra-226) and Thorium (Th-232) and their decay products as well as ^{40}K. Radon is a radioactive gas (alpha emitting gas) (Turhan, et al., 2008). It is a daughter product of Radium (Ra-226) and decay with a half life of 3.82 days by emitting alpha particle of energy 5.49MeV. ^{218} Po and ^{214} Po are the short- lived daughter products of radon. These daughter products of radon emits alpha particle of energies approximately 6.0eV and 7.7eV respectively. These short-lived daughter products are solid and have a tendency to attach themselves to aerosols in ambient air. When we breathe then along with the normal air we also inhale radon and its short-lived daughter products. It is well known that the inhalation of short-lived decay products of radon is hazardous

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RESEARCH ARTICLE

ASSESSMENT OF AVERAGE ANNUAL EFFECTIVE DOSE AND STUDY OF RADON CONCENTRATION IN DIFFERENT TYPES OF WATER SAMPLES

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Annual Effect Dose, Cr-39 Detector, Radon Concentration, Water Samples

Abstract

Radon and its decay products are the main source of natural radiation exposure. Alpha particle emissions of radon in drinking water increase the absorbed dose by the respiratory and gastrointestinal systems, which can lead to cancer. In the present study, annual effective dose and radon concentration measurement has been carried out in four different types of water samples i.e. (mineral water, distilled water, tape water and surface water) in Shahjahanpur city of Uttar Pradesh by using sensitive plastic track detector (CR-39). It is observed that our results are less than the maximum contaminant level of 11Bq/L (300pCi/L) and 1-10mSv/y for annual effective dose for the US Environmental Protection Agency.

Introduction:-

Radon is a naturally occurring radioactive gas and highly soluble in water. Radon in water enters the human body by two different paths, Firstly escape from household water and become a source for indoor radon, secondly from drinking water enters directly through the gastro-intestinal (GI) [1]. Most public water supply have very low levels, even if the water comes from municipal wells not be considered a public health concern. This is primarily because such wells tend to tap sand and gravel ground water aquifers with low levels of radon. Public water supplies also stand for a period before they are consumed and some decay of the radon takes place in that time. Radio-nuclides emit "ionizing radiation" when they naturally decay [2]. In 1991, the United States Environmental Protection Agency (EPA) proposed a National Primary Drinking Water Regulation (NPDWR) for ^{222}Rn with a maximum contaminant level (MCL) of 11 Bq L^{-1} (300 pCi L^{-1}) [3, 4]. The aim of present stu dy is to measure the average annual effective dose and radon concentration in different types of water by sensitive plastic track detector (CR- 39).

Experimental Technique:-

For the measurement of radon concentration and assessment of average annual effective dose in different types of water (mineral water, distilled water, tape water and surface water) sensitive plastic track detector (CR- 39) was used. The Technique to determine the alpha intensity of water samples by CR-39 detector is shown in figure 1.Taking 200 ml from each type of water put in plastic cup then fixed the plastic detector (CR-39) in the bottom of the cover 5 cm above the surface of the sample as shown in fouire 1. Two samples for each type of water were used, and taking the average. When alpha particles strike the CR-39 cause damage tracks. After a period of thirty days 30 days all the detector films are collected and then etched with 2.5N NaOH solutions for a period of 90 minutes at 60°C in a water bath. When alpha particles strike the detector films, it creates narrow trails called tracks. The tracks produced by alpha particles in the detector films were counted by using a spark counter. The radon concentration in different types of water was calculated by using the formula [2].

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RESEARCH ARTICLE

MEASUREMENT OF RADON PERMEABILITY THROUGH DIFFERENT MEMBRANE MATERIALS BY USING SURFACE BARRIER DETECTOR (SBD) TECHNIQUE.

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Radon Permeability, SBD Detector, Membrane Materials, Radon.

Abstract

The measurement radon permeability through different membrane materials has been carried out by using surface barrier detector (SBD) technique. The permeability constant K and the relative radon permeability $R = n_1/n_2$ for 12 different types of membrane materials (Polyethylene, Cellulose Acetate, Cellulose Nitrate, Polyvinyle Chloride-I, Polyvinyle Chloride-II, Hydrate Cellulose, Polycarbonate, Polyethylene-Terephthalate, Makrofol DE, Makrofol N, Aluminized Polycarbonate and Aluminized Mylar) have been measured. Observed results were found in good agreement with previously reported data for similar membrane materials. The permeability constant for a given commercially available materials vary considerably due to the difference in manufacturing procedures and physical properties of the same material.

Introduction:-

Radon is a radioactive gas that is produced by the decay of uranium. In several studies, it has been confirmed that the inhalation of radon and its progeny is a well-known risk factor for lung cancer at uranium underground miners (Lubin et al., 1994). Radon generated radiations comes in our environment from two major sources (soil and water) by diffusion and transportation processes. The fraction of the radon which escapes depends upon the depth at which it is formed and the permeability of the ground to radon. Radon, being a gas can move from geological environment to human environment through different process, forced or diffusion and convectional flow of fluids in the earth crust. Diffusion of radon in geological and human environment can take place by Gram's law of diffusion. The diffusion of the radon gas through membranes is function of the permeability constant of the membrane materials. In general, the permeability constants for different materials are not widely available in the literature. However, published values (Abdel Fattah et al., 1986; Bigu, 1986; Giridhareial., 1982; Pohl-Ruling et al., 1980; Ramachandran et.al., 1987; Wojcik, 1991) for a given commercially available material vary considerably due to the difference in manufacturing procedures and physical properties of the same material.

In order to measure the radon gas concentration, solid state nuclear track detectors were used. It is extremely sensitive to alpha particles emitted from the two isotopes of the radon ^{222}Rn and ^{220}Rn from their decay products and from any other alpha emitters that may exist near the detector. There are few applications in which special membranes are used to separate radon (^{222}Rn) from thoron (^{220}Rn). The characteristics of these membranes is to delay ^{222}Rn and ^{220}Rn gas (Tanner, 1978). This results a large percentage of the long lived radon i.e. ^{222}Rn will pass through the membrane while a large percentage of the short lived radon i.e. ^{220}Rn will decay during

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RESEARCH ARTICLE

DETECTION EFFICIENCY OF ALPHA PARTICLES EMITTED BY ^{222}Rn AND ^{222}Rn PROGENY (^{218}Po AND ^{214}Po) IN THE AIR OF THE DIFFUSION CHAMBER UNDER THE INFLUENCE OF AN ELECTRET

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LR-115 detector,
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ABSTRACT

Detection efficiency of alpha particles emitted by radon-222 in the air of the diffusion chamber under the influence of an electrets have been carried out by using solid state nuclear track detector LR-115, type II. Electrets are the electrostatic equivalent of permanent magnet, having a permanent surface charge resulting in a surface potential that may be several KV. Electrets were used to attract radon progeny formed in a cylindrical shape diffusion cup where solid state nuclear track detector LR-115, type II was placed for the measurement of radon concentration. In this way the sensitivity of detector could be increased by bringing progeny just in front of detector in more convenient measuring geometry. It was found that the detection efficiency of α-particle emitted by radon only in the air of diffusion chamber increases with the distance at 5.45 Mev for five hours and ten hours respectively where as the detection efficiency of α-particle emitted by radon progeny in the air of diffusion chamber decreases with the distance at 6.49MeV and7.59MeV for five hours and ten hours respectively. Influence of distance between electret and detector on sensitivity of such equipment has been investigated theoretically. It was also found that in the analysis that the radon progeny ^{218}Po and ^{214}Po just have the same detection efficiency of 25% when the electret is closed to the LR-115 detector.

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INTRODUCTION

Radon (^{222}Rn) monitoring has become a global phenomenon due to its health hazard effects on population and therefore more attention has been paid in the recent years to the problem of ^{222}Rn. It is a radioactive gas that is present in trace amounts almost everywhere on the earth. It emanates from rocks, soils and gets distributed in the groundwater as well as in the lower atmosphere. Recent epidemiological evidence suggests that inhalation of radon decay products in domestic environments could be a cause of lung cancer (ICRP, 1993; UNSCEAR, 1993; Lubin *et al*., 1995; NRC, 1999; WHO, 2007, 2008). It gives rise to considerable awareness of the ^{222}Rn problem. Various methods are available for the measurement of radon (^{222}Rn) concentration. A traditional technique used to measure the radon abundance is the diffusion chamber. Diffusion chamber were often used for the measurement of radon concentration by using the solid state nuclear track detector CN-85(LR-115, type II) LR-115, type II SSNTD is considered more suitable and more advantageous than other commonly used solid state nuclear track detector (CR-39) known as Allyl diglycol-carbonate ($C_{12}H_{18}O_7$). The use of CN-85 (LR-115, Type II) detector with diffusion chambers is the most reliable nuclear track methodology to measure the radon concentration. In order to prevent the entry of radon progeny, dust and humidity within the chamber, a filter membrane was used at the top of the chamber and making it pure radon measuring device. Detection efficiency of radon measurements with CN-85 LR-115, Type II) detector depends on different parameters such as detector size, manufacturing, chamber dimensions, shape of the chamber, detection and etching conditions (Nikezic *et al*., 2004). Electrets are the electrostatic equivalent of permanent magnet, having a permanent surface charge resulting in a surface potential that may be several KV. Electrets ion detectors which contain an electro-statically charged Teflon disk are widely used for long-term radon measurement. Ions generated by the decay of radon strike and reduce the surface voltage of the Teflon disk. By measuring the voltage reduction, the radon concentration can be calculated. The amount of voltage drop on the electret provides an accurate correlation to the number of ions collected and hence the concentration of the alpha emitting isotope like radon (Khan 1975) and hence the concentration of the alpha emitting isotope like radon (Kasper, 1999). Electrets enable passive collection of progeny atom, making radon measurements independent on active devices. In this paper the detection efficiency of alpha particles emitted by radon (^{222}Rn) and radon progeny (^{218}Po and ^{214}Po) in air of the diffusion chamber under the influence of an electrets have been studied.

Experimental technique: The block diagram of the diffusion chamber is shown in figure 1. It is conical in shape and closed

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RESEARCH ARTICLE

MEASUREMENT OF THE THICKNESS OF THE REMOVED ACTIVE-LAYER OF CELLULOSE NITRATE CN-85(LR-115, TYPE II) SOLID STATE NUCLEAR TRACK DETECTOR

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CN-85(LR-115, type II),
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FTIR.

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ABSTRACT

The measurements of the thickness of the removed active layer of a cellulose nitrate-85 (LR-115, type II) detector have been carried out by using surface profilometry method through Fourier transform infrared (FTIR) system with the spectroscopic wave number at 1598 cm^{-1} corresponding to the O–NO_2 bond of a CN-85 (LR-115, Type II) SSNTD. Due to chemical reaction between the etching solution (etchant) and the detector material, some molecules of the detector are removed. The final effect is the removal of the material from the detector surface. During etching, the material is removed layer by layer and the thickness of the detector becomes smaller and smaller. It was found that the bulk etch rate or removed active layer of CN-85 (LR-115, Type II) detector could not controlled by temperature easily during chemical etching and is significantly affected by the presence and amount of stirring. Therefore actual layer monitoring of the active layer thickness is necessary when using CN-85 (LR-115, Type II) solid state nuclear track detector (SSNTD). For the standard etching condition of CN-85 (2.5 N aqueous solution of NaOH kept at 60 °C temperature) detectors, the bulk etched rate under magnetic stirring and no stirring condition was found respectively 6.61± 0.32 μm h^{-1} and 3.50 ± 0.12 μm h^{-1}. Also there is some variation have been found in the initial thickness of the active layer in CN-85 (LR-115, type II) detector of 12 μm.

Citation: Khan, M. S. A., 2019. "Measurement of the Thickness of the Removed Active-Layer of Cellulose Nitrate CN-85(LR-115, Type II) Solid State Nuclear Track Detector", *International Journal of Current Research*, 11, (08), 6063-6065

INTRODUCTION

Radon is present in trace amounts almost everywhere on the earth, being distributed in the soil, the groundwater and in the lower atmosphere. Radioactive radon can migrate from soils and rocks and accumulate in surrounding enclosed areas such as homes and underground mines. It is important that sources of radon as well as radon infiltration mechanisms be understood before making attempts to control the indoor radon. Recent epidemiological evidence suggests that inhalation of radon decay products in domestic environments could be a cause of lung cancer (ICRP, 1993; UNSCEAR, 1993; Lubin *et al.* 1995; NRC, 1999; WHO, 2007, 2008). It gives rise to considerable awareness of the ^{222}Rn problem. Various methods are available for the measurement of radon (^{222}Rn) and its concentrations by using the solid state nuclear track detector (SSNTD), LR115. The alpha particles emitted by radon and its progeny strike the detector leaving a track within the film called latent track. The tracks produced in the detector film can be made visible by using etching process called chemical etching. CN-85(LR-115, type II) plastic detector is considered more suitable and more advantageous than other commonly used solid state nuclear track detector as CR-39. Due to chemical reaction between the etching solution (etchant) and the detector material, some molecules of the detector are removed. The final effect is the removal of the material from the detector surface. During etching, the material is removed layer by layer and the thickness of the detector becomes smaller and smaller. Yip *et al.* (2003a) showed that for the CN-85 (LR-115, Type II) detector, the bulk etch rate or removed active layer could not controlled by temperature easily during chemical etching and is significantly affected by the presence and amount of stirring(Vanuda et. al. 1998). Therefore actual layer monitoring of the active layer thickness is necessary when using CN-85 (LR-115, Type II) solid state nuclear track detector (SSNTD). Various methods have been used to measure the thickness of the removed active layer of the detector CN-85 (LR-115, Type II). Nikezic *et al.* (1997 & 2002) proposed a new method to measure the thickness of the removed active layer called surface profilometry method. The same method was also used by us. But there is some draw back with this method because it is a destructive method and can be used only after the completion of etching. Yip et al. (2003b) proposed a non-destructive method to measure the active layer thickness of LR 115 SSNTD. This method was based on the absorption of fluorescence x-ray photons by the active layer. But there is a some risk also with this method because the x-ray radiation affects the track and bulk etching velocities. In the present work the thickness of the removed active layer of CN-85 (LR-115, Type II) SSNTD was measured by IR absorption method (Barillon *et al.*, 2002).

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(2)

Measurement of Gross Alpha Contamination in Soil Sample by Using Solid State Nuclear Track Detector (SSNTD) Technique

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Abstract: *The measurements of gross alpha contamination(or radiation) in soil samples collected from various locations in the environment of shahjahanpur District was carried out by using LR-115 type II solid state nuclear track plastic detector. Observed result shown that the overall average value of gross alpha contamination was found varies from 20.10Bq/m^3 to 36.90Bq/m^3 with an average value of 29.06Bq/m^3 and standard deviation is 8.53 Bq/m^3. The value of gross alpha contamination was found maximum (34.32Bq/cm^3) at location P and minimum (21Bq/m^3) at location R. The present study indicates that the nature of soil in the study area has a very low level radiation. Measured values of gross alpha contamination in soil samples collected from different locations in the study area were found below the world action level (137Bq/m^3). Thus the study area is safe from radiation protection and as far as the health hazard effect point of view.*

Keywords: Soil sample, LR-115 type II plastic detector, gross alpha contamination, Radon

1. Introduction

Naturally occurring radiation can be found all around us. Radiation can be found in soil, in our air and water and in us. Because it occurs in our natural environment, we encounter it every day through the food we eat, the water we drink and the air we breathe. It is also in building materials and items we commonly use. The radiation in the soils and rocks, called primordial or terrestrial ([1], [2]). Next to air and water, soil is generally considered as the third main environmental component. In practice soil provides basis, also in literal sense, of a substantial part of the collected life on the earth via the capture of sun's energy by green plants. Soil pollution could be typified as a malfunctioning of soil as an environmental component following its contamination particularly as a result of human activates. The determination of pollutants in soil is of great importance owing to the facts that plant roots are one of the ways of incorporating them into the food chain. Most of the radiation dose we receive is from naturally occurring sources- most of this is from radon. Radon is a colorless and odorless radioactive gas and its decay product are the main source of natural radiation exposure ([3], [4]). On a global scale, about 80% of the radon emitted in to the atmosphere comes from the soil that derived from rocks. Radon gas can enter a home from the soil under the house by process of diffusion through concrete floors and walls, and through cracks in the concrete slab, floors, or walls, construction joints and cracks or pores in hollow-block walls. The emanation from the soil allows radon to diffuse into buildings directly from the ground, on which the building is located. Many houses are built with a concrete foundation with enclosed soil covered with a thick concrete pad. The measurement of radon in man's environment is of interest because of its alpha emitting nature ([5]-[7]). There have been many surveys to determine gross alpha contamination levels of radionuclides in soils, which can in turn be related to the absorbed dose rates in air. The decay product of radon of ^{222}Rn (^{218}Po, ^{214}Pb, ^{214}Bi, and ^{214}Po) attach to a surface, typically of aerosols, which can be inhaled. They then deposit on epithelial surfaces within the lung, and shortly decay because of its half life. The result is that the sensitive surfaces of the bronchi are irradiated by these decays, the most energetic and destructive of which are the heavily ionizing, short range particles from the polonium isotopes ^{214}Po and ^{218}Po. As the chronic (long-term) exposure to radium and indoor radon concentration in humans being is hazardous to health. Therefore, the measurement of gross alpha contamination in soil sample is important to take care of the inhalation indoor radon dose to the general population of the region. The measurement of gross alpha contamination in soil samples in the study area is helpful to study radon health hazard such as lung cancer due to alpha radiation internally and gamma radiation from soil externally.

2. Study Area

The measurement of gross alp alpha contamination (Radiation) in soil sample was carried out in Shahjahanpur District of Uttar Pradesh. Shahjahanpur is a city and headquarters of the District. Geographically, it is situated at 27.35 N latitude and 79.37 E longitudes. Its geographical area is 4575 sq. kilometers with an elevation of 472 feet above sea level. The different locations that we have taken in the study area are Banagaon, Rosa, Chandapur, Shahjahanpur, Jalalabad, Tilhar, Powayan, Allaganj, Khudaganj and Nigohi. These locations are respectively called as B, R, C, S, J, T, P, A, K and N in the observation table.

3. Experimental Technique

The experimental setup for the measurement of gross alpha contamination (^{222}Rn) in the soil sample is shown in figure 1. LR-115 type-II solid state nuclear track plastic detector was used for the measurement of gross alpha contamination

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Study of break-up fusion process from forward recoil range distribution measurement

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In the present work, the break-up fusion or incomplete fusion (ICF) process has been studied from the forward recoil range distribution measurement for ^{16}O + ^{175}Lu system at ≈ 96 MeV energy. The measured forward recoil range distributions are analyzed in the framework of code SRIM. The present analysis shows clearly the role of linear momentum transfer and also the break-up of projectile ^{16}O into its fragments (^{12}C + ^{4}He and/or ^{8}Be + ^{8}Be). Any systematic trend is not observed with the target deformation parameter (β_2) dependent study of ICF. It is observed that projectile structure also affects the ICF dynamics. The projectile α-Q-value is found to be a suitable parameter which explains effectively the observed projectile structure effect on ICF.

Keywords: Incomplete fusion, Activation technique, Linear momentum transfer, Target deformation, Projectile α-Q-value

1 Introduction

The projectile break-up or incomplete fusion (ICF) reaction dynamics has been a subject of experimental and theoretical interest in heavy-ion (HI) induced reactions. In last few years, considerable experimental efforts are made to understand and explore the ICF process at energies above the Coulomb barrier and well beyond it[1-3]. Different fusion processes may take place in the collisions of heavy ions (HIs) at these energies. The direct complete fusion (DCF) is one of the possible reaction modes, where the projectile fuses entirely with the target nucleus. In addition to this the projectile may also break-up into its fragments near the target nuclear field. The sequential complete fusion (SCF) may take place when all the fragments fuse with the target one after the other. On the other hand, the fusion of only one fragment with the target, leads to the ICF process and in case of non capture break-up process, both the break-up fragments may escape without getting fused with the target nucleus. Moreover, in ICF process, the projectile partially fuses with the target nucleus as compared to the CF process, leading to the formation of incompletely fused composite (IFC) system with less mass, excitation energy and charge. Owing to the partial linear momentum transfer (LMT), the ICF products traverse the shorter path in the stopping medium than that of CF products. Britt and Quinton[4] first time pointed out the experimental features of ICF in the break-up of projectiles like ^{12}C, ^{14}N, and ^{16}O into α-clusters. The additional but concrete information for the ICF was provided by Inamura *et al*[5]. The CF and the ICF processes are also categorized on the basis of imparted angular momentum (ℓ) into the system. The ICF process is assumed to exist only for ℓ values greater than critical angular momentum values (ℓ_{crit}). A substantial contribution of ICF below ℓ_{crit} has also been observed in recent studies[6-9]. Apart from this, the effect of projectile structure on the ICF process has also been observed[10]. However, several theoretical models[11-13] have been proposed to explain the ICF process but none of them is available to reproduce the experimental ICF data satisfactorily below 10 MeV/nucleon energies, which makes the ICF study still a relevant problem. The mass transferred from projectile to the target also adds the complexity in the study of ICF.

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Role of alpha cluster over non alpha cluster projectile in low energy incomplete fusion reaction dynamics

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Continuous efforts are being made to comprehend the process of low energy incomplete fusion (ICF) reaction dynamics. The lack of proper theoretical model below 8 MeV/nucleon, which could reproduce the experimentally measured ICF data satisfactorily, makes it the topic of great interest. Another important motivation is to look for some systematic dependence of ICF on various entrance channel parameters. Keeping the aforementioned aspects into consideration, the experiment has been performed using ^{12}C ion beam on ^{165}Ho target by employing the stacked foil activation technique. The experimentally measured cross sections of the populated evaporation residues have been measured and compared with the complete fusion code PACE4. It has been observed that the measured cross sections for evaporation residues populated via xn and pxn emission channels are well reproduced by PACE4 code. However, in the α-emission channels (observed in the projectile break-up), the significant enhancement in the measured cross sections over PACE4 predictions is observed which is accredited to ICF process. In the present work, ICF dependence on the target deformation and the combined parameter $\mu * Z_p Z_T * (1-\beta_2)$has been studied. The ICF fraction has also been found sensitive to projectile Q_α- value.

Keywords: Complete and incomplete fusion, Incomplete fusion fraction, Target deformation, Projectile Q_α value

I Introduction

The study of heavy ion (HI) fusion reactions is of great interest for both theoretical and experimental nuclear physicists. Depending upon the mass and energy of the interacting nuclei, such reactions may lead to the formation of super-heavy elements. The study of such nuclear reactions may also provide explicitly some important information related to nuclear astrophysics. In the energy region of ≈ 4-7 MeV/nucleon, various processes can take place for tightly bound projectile induced reactions with heavy mass targets[1]. The incident projectile may completely fuse with the target nucleus known as direct complete fusion (DCF). There is also a probability that projectile may break-up into fragments in the vicinity of target nuclear field and all the fragments may fuse with the target nucleus sequentially, known as sequential complete fusion (SCF). The third process is that one of the break-up fragments may fuse with the target nucleus known as break-up or incomplete fusion (ICF). The unfused fragment in incomplete fusion moves in the forward direction as a spectator with almost the incident beam velocity[2-4]. There is also a probability that none of the break-up fragments may fuse with the target nucleus, which is known as non capture break-up (NCBU) process. Figure 1 shows these different reaction processes that may take place with ^{12}C as projectile. Experimentally the SCF cannot be distinguished from the DCF[5] hence, CF cross section is the sum of SCF and DCF.

Many efforts are being made to comprehend the phenomenon of complete and incomplete fusion nuclear reaction dynamics. The current interest is to understand the dependence of incomplete fusion on (a) incident projectile energy, (b) projectile-target mass asymmetry, (c) coulomb effect, (d) target deformation, (e) projectile structure and to search some new entrance channel parameters on which incomplete fusion process may depend. Further, the lack of proper theoretical model, which could reproduce the experimentally measured incomplete fusion reaction cross sections appropriately, is also a

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Signature of incomplete fusion reaction in $^{20}Ne + ^{159}Tb$ system: Entrance channel parameters effect

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More complex and interesting phenomenon of incomplete fusion (ICF) reactions induced by ^{20}Ne on ^{159}Tb have been measured at several beam energies range of 4.3 - 8.2 MeV/A by using catcher foil technique followed by the gamma-ray spectrometry. The cumulative cross-sections of evaporation residues produced in above reaction have been measured and deduced independent cross-sections have been compared with statistical model based computer code PACE-2. The complete fusion (CF) channels pair agrees well with PACE-2 predictions after the subtraction of precursor contribution. The alpha emission products show higher cross-section than that predicted by the complete fusion product, which is attributed to the presence of incomplete fusion of projectile with target at lower energies. This enhancement in the measured cross-section is attributed to the fact that these residues are formed not only by complete fusion but also through the ICF of ^{20}Ne into α clusters, i.e., ^{20}Ne into $^{16}O+\alpha$ and/or $^{12}C+2\alpha$ etc. For the better understanding of ICF, the incomplete fusion fraction has also been deduced and its sensitivity with various channel parameters like projectile energy, entrance channel mass-asymmetry, α-Q value, Coulomb effect (Z_pZ_t), deformation parameter (β_2) have been observed.

Keywords: Complete and incomplete fusion reactions, Excitation function measurements, Mass-asymmetry, Projectile structure effect, α-Q-value systematic

I Introduction

In the last couple of years, study of the heavy ion induced reaction has raised the new interest especially about the complete fusion (CF) and incomplete fusion (ICF) at energies near the vicinity of coulomb barrier[1-4]. For energy of the projectile increases to well above the coulomb barrier, CF and ICF are dominant modes of the reaction. At large value of impact parameter, ions elastically or inelastically are scattered by the coulomb field. If impact parameter is progressively reduced, direct reaction takes place associated few nucleon transfers from projectile to target and vice versa. Moreover, impact parameter is further reduced, CF and ICF are the dominant modes of the reaction mechanism. It has been observed that at energies near or above the Coulomb barrier[5], CF and ICF are considered as the dominant reaction mechanisms. In the CF-reaction, nuclear field is too strong to hold all the nucleonic degree of the freedom with target nucleus, forms the excited composite system, which statistically decays by particle and/ or gamma emission. However in case of ICF, nuclear field is no longer hold to involve all the nucleonic degree of freedom of projectile and supposed to be break up into the fragments (for e.g., ^{20}Ne is break-up into ^{16}O and α-particle; ^{8}Be and ^{12}C etc.) and one of the fragments fuses with the target nucleus while remnant part of the projectile moves as a spectator in the forward direction. This outgoing particle is called projectile like fragments (PLFs). The PLFs were first observed by Britt and Quinton[6] as the breakup of projectile like, ^{12}C, ^{14}N and ^{16}O in an interaction of projectile with the surface of target nucleus. More experimental evidence for ICF was found by Inamura by measurement of forward peaked alpha particles in coincidence with prompt gamma rays. The study of entrance channel mass-asymmetry dependence of ICF by measuring the velocity spectra of residues in different mass-asymmetric systems were done by Morgenstern *et al.*[8,9] and Chakrabarty *et al.*[4]. Their study shows that more mass-asymmetric system has higher ICF contribution than that of

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Systematic study of the break-up fusion process in the $^{12}C + ^{165}Ho$ system and interplay of entrance channel parameters

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To understand the low-energy incomplete fusion (ICF) reaction dynamics, the excitation function measurements of $^{12}C + ^{165}Ho$ system has been performed in the energy region of ≈ 4–7 MeV/nucleon, by employing the stacked foil activation technique. The cross sections of the measured evaporation residues are compared with the theoretical predictions of statistical model code PACE4, which takes into account only the complete fusion (CF) reaction cross section. It is observed that residues populated via xn and pxn channels are in good agreement with the PACE4 predictions, implying that these residues are populated via CF process. However, in the case of α-emission channels a significant enhancement from the PACE4 predictions is observed even after the deduction of precursor contribution, which is accredited to ICF process. The projectile break-up probability is found to increase with increment in the incident projectile energy. Further, the dependence of incomplete fusion dynamics on entrance channel parameters like mass asymmetry, Coulomb effect (Z_pZ_T), and projectile Q_{gg} value is systematically studied. The present results reveal that a single entrance channel parameter does not oversee the ICF reaction dynamics but have varying contributions depending upon the projectile-target combination. Moreover, the effect of projectile break-up on complete fusion cross section at energies above the Coulomb barrier is also studied. The suppression in fusion cross section is observed when compared with the universal fusion function.

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I. INTRODUCTION

Fusion reactions induced by heavy ions (HIs) play an utmost role in nuclear physics, as they enable us to study the properties of super-heavy nuclei near and away from the stability line. At projectile energies above the Coulomb barrier, complete fusion (CF) and incomplete fusion (ICF) are the two most dominant reaction modes [1–3]. Study of such fusion reactions has remained the subject of great interest for both theoretical and experimental nuclear physicists over the past two decades. In the case of CF, the incident projectile completely fuses with the target nucleus and leads to the formation of highly excited compound nucleus (CN), which de-excites via emission of light nuclear particles and γ rays. In ICF (also known as break-up fusion process), the incident projectile breaks in the vicinity of target nucleus and one of the fragment fuses with the target nucleus giving rise to a composite system of low mass, excitation energy, charge, and momentum transfer. The excited composite system also de-excites via emission of light nuclear particles and γ rays. The unfused fragment moves as a spectator in the forward direction, with nearly the projectile velocity and have no impact on the way the reaction proceeds [4,5]. Semiclassically, the CF and ICF phenomenon in heavy-ion (HI) interactions can be explained on the basis of driving input angular momentum (ℓ) imparted into the system [2,3,6]. For the values, with $\ell < \ell_{crit}$, there is a pocket in an effective potential energy curve, (the attractive nuclear potential dominates the sum of repulsive Coulomb and centrifugal potential) hence the incident projectile is completely assimilated by the target nucleus-CF. However as the energy of incident projectile increases $\ell > \ell_{crit}$, the fusion pocket in the effective potential energy curve subsequently vanishes, hence to provide the sustainable amount of input ℓ, the incident projectile breaks into clusters, leading to the fusion of one of the fragment with the target nucleus-ICF [1–3]. Some studies have also reported the existence of ICF well below the ℓ_{crit} [7–10]. To understand the phenomenon of ICF reaction dynamics various theoretical models have been put forth, but none of them is able to reproduce satisfactorily the experimentally measured ICF data below 8 MeV/nucleon [3,5,7], this has revived the interest in exploring the low-energy ICF reaction dynamics. The another unresolved question which is also of large interest is to understand the systematic dependence of ICF on various entrance channel parameters such as projectile energy, mass asymmetry, Coulomb effect (Z_pZ_T), projectile structure, and input ℓ values. In the present work, with an incentive to comprehend the systematic dependence of ICF on

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Incomplete momentum transfer in $^{16}O + ^{148}Nd$ system [at energy ≈ 5.8 MeV/nucleon]

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Measurements of the forward recoil ranges of the evaporation residues ^{159,155}Er (xn), ^{160,156}Ho (pxn), ^{157,155}Dy (αxn) and ^{155}Tb (αpxn) formed in the interaction of ^{16}O with ^{148}Nd at energy = 5.8 MeV/nucleon have been done. Measured forward recoil range distributions of these evaporation residues show population of several incomplete fusion channels in addition to complete fusion. The entire and incomplete linear momentum transfers inferred from these recoil range distributions have been used to identify the evaporation residues populated through complete and incomplete fusion dynamics. The forward recoil range distributions of evaporation residues populated via α-emission channels show two composite peaks, one associated with complete fusion and other peak corresponds to the incomplete fusion. Further, the relative contributions of CF and/or ICF components have also been separated out from the present measurements. The contribution of ICF channels has been found to be ≈ 9 % of total fusion. The present results clearly indicate the presence of break-up of the projectile ^{16}O into ^{12}C + α at low projectile energy.

Keywords: Complete and incomplete fusion, Composite system, Offline γ -ray spectrometry, Recoil catcher activation technique, Recoil range distributions

1 Introduction

The dominant modes of heavy ion interactions are compound nucleus (CN) and direct reactions at projectile energies close to Coulomb barrier. The probability of formation of compound nucleus gets hindered with increasing the projectile energy and incomplete fusion (ICF) starts dominating with complete fusion (CF). In ICF reactions, only a part of the projectile fuses with the target while the remaining part moves at forward angles with approximately same velocity of projectile. A schematic diagram of CF and ICF reactions is shown in Fig. 1. These reactions were first observed experimentally by Britt and Quinton[1] and Cindro *et al.*[2]. Later on, remarkable studies based on particle-gamma coincidence technique by Inamura *et al.*[3] contributed a lot to understand the dynamics of ICF reactions. Various dynamical models have been proposed to explain the mechanism of ICF reactions. In the sum rule model of Wilczynski *et al.*[4], ICF is considered as arising from peripheral collisions in the angular momenta range just above the critical angular momentum (ℓ_{crit}) for CF. Udagawa & Tamura[5] explained ICF as breakup of the projectile followed by fusion of one of the fragments with the target. The promptly emitted particle (PEP) model[6], hot spot model[7], multistep direct reaction model[8], etc., are also some of the widely used theoretical models. All these models have been used to reproduce the experimental data at energy above 10 MeV/nucleon. There are many important aspects of ICF reactions at low projectile energy that should be clarified such as, how the ICF dynamics depends on various entrance channel parameters and the angular momenta involved in these reactions. Morgenstern *et al.*[9] have reported that ICF is more dominant for more mass asymmetric system at same relative velocity. Several investigators have made efforts to understand the role

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CERTAIN NEW EXTENSION OF WHITTAKER FUNCTION AND ITS PROPERTIES

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The main object of the present investigation is to propose a new extension of Whittaker function by making use of the extended confluent hypergeometric function defined by Ghayasuddin et al. [7]. Moreover, some integral representations, integral transforms (like Laplace and Hankel transforms) and a differential formula for our introduced Whittaker function are also pointed out.

1. Introduction

Since the last four decades, various extensions of the classical special functions such as beta function, hypergeometric function, Whittaker function, Appell's functions and Lauricella's hypergeometric function have been introduced and investigated by a number of authors, namely, Chaudhry et al. [2], Chaudhry et al. [3], Lee et al. [10], Özergin et al. [15], Choi et al. [1], Parmar [17], Liu and Wang [11], Khan and Ghayasuddin [8], Pucheta [16], Shadab et al. [20], Mubeen et al. [13] and Ghayasuddin et al. [7]. Motivated by the

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2010 Mathematics Subject Classification: 33C15, 33C05, 33B15.

Key words and phrases: Whittaker function; confluent hypergeometric function; extended confluent hypergeometric function; Gauss hypergeometric function; extended Gauss hypergeometric function; gamma function; beta function.

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A STUDY OF EXTENDED BETA, GAUSS AND CONFLUENT HYPERGEOMETRIC FUNCTIONS

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Abstract: In the present research note, we define a new extension of beta function by making use of the multi-index Mittag-Leffler function. Here, first we derive its fundamental properties and then we present a new type of beta distribution as an application of our proposed beta function. Moreover, we present a new extension of Gauss and confluent hypergeometric functions in terms of our newly introduced beta function. Some interesting properties of our extended hypergeometric functions (like integral representations, differential formulae, transformations and summation formulae and a generating relation) are also indicated in the last section.

AMS Subject Classification: 33B15, 33B20, 33C05, 33C15, 33E12
Key Words: Beta function; extended beta function; Gauss hypergeometric function; extended Gauss hypergeometric function; confluent hypergeometric function; extended confluent hypergeometric function; multi-index Mittag-Leffler function

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Degenerate Hermite poly-Bernoulli numbers and polynomials with q-parameter

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Abstract. In this paper, we introduce a new class of degenerate Hermite poly-Bernoulli polynomials with q-parameter and give some identities of these polynomials related to the Stirling numbers of the second kind. Some implicit summation formulae and general symmetry identities are derived by using different analytical means and applying generating functions. These results extend some known summations and identities of degenerate Hermite poly-Bernoulli numbers and polynomials.

Mathematics Subject Classification (2010): 11B68, 11B73, 11B75, 33C45.

Keywords: Hermite polynomials, degenerate q-poly-Bernoulli polynomials, degenerate Hermite q-poly-Bernoulli polynomials, summation formulae, symmetric identities.

1. Introduction

The special polynomials of more than one variable provide new means of analysis for the solution of wide class of partial differential equations often encountered in physical problems. The importance of multi-variable Hermite polynomials has been recognized [6] and these polynomials have been exploited to deal with quantum mechanical and optical beam transport problems.

It happens very often that the solution of a given problem in physics or applied mathematics requires the evaluation of infinite sums, involving special functions. Problems of this type arise, for example, in the computation of the higher-order moments of a distribution or to evaluate transition matrix elements in quantum mechanics. In [7], [8], [9], [19], [20], [21], [22], it has been shown that the summation formulae of special functions, encountered in applications ranging from electromagnetic process can be written in terms of Hermite polynomials of more than one

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ON CERTAIN INTEGRAL TRANSFORM INVOLVING GENERALIZED BESSEL-MAITLAND FUNCTION AND APPLICATIONS

MUSHARRAF ALI, WASEEM A. KHAN AND IDREES A. KHAN

ABSTRACT. In this article, we establish a new integral formula involving the generalized Bessel-Maitland function defined by Khan et al. [9], which is expressed in terms of generalized (Wright) hypergeometric function. Some interesting and special cases of our main result are also considered.

1. INTRODUCTION

In recent years, many authors (see, e.g., [1-4] have developed numerous integral formulas involving a variety of special functions. Also many integral formulas associated with the Bessel functions of several kinds have been presented (see, e.g., [6-9]). Those integrals involving Bessel-Maitland functions are not only of great interest to the pure mathematics, but they are often of extreme importance in many branches of theoretical and applied physics and engineering (see [20]). Several methods for evaluating infinite or finite integrals involving Bessel-Maitland functions have been known (see, e.g.,[4] and [19]). However, these methods usually work on a case-by-case basis.

Currently, Ghayasuddin and Khan [4], Khan et al. [6-9] gave certain interesting new class of integral formulas involving the generalized Bessel-Maitland function, which are expressed in terms of the generalized (Wright) hypergeometric function. In the present sequel to the aforementioned investigations, we present two generalized integral formulas involving generalized Bessel-Maitland functions, which are expressed in terms of the generalized (Wright) hypergeometric function. Some special cases and the (potential) [illegible] of our main results are also considered and remarked, respectively.

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Key words and phrases. Generalized Bessel-Maitland function, Wright hypergeometric function and integrals, Mittag-Leffler function.
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Some integral involving extended Bessel-Maitland function with Jacobi polynomial

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Abstract

Motivated by Ghaynsuddin and Khan [1] introduced generalized Bessel-Maitland function. In the present paper, authors establish a new interesting integral formulas involving the Wright generalized Bessel-Maitland function with Jacobi polynomials, which are also expressed in terms of generalized hyper geometric function. Further, some special cases of our main results are also considered.

2010 Mathematics Subject Classification: 33C10, 33C15, 33C70, 33E12.

Keywords: Mittag-Leffler function, Jacobi polynomial, Hypergeometric function, Wright generalized Bessel-Maitland function.

1 Introduction

Bessel type functions have received an importance due to their frequent use in mathematics and physical applications. In physical applications, the modified Bessel type functions of the third kind appear as solutions of certain radial Schrodinger equations and as Dirichlet problems with boundary conditions on a wedge. Besides, they play an important role in diffraction and hydrodynamics problems and are the approximant in certain uniform asymptotic expansions as well.

In last decade, many authors (see, e.g., [1-19] have developed numerous integral formulas involving a variety of special functions. Also many integral formulas associated with the Bessel functions of several kinds have been presented (see, e.g., [1-8]). Those integrals involving Bessel-Maitland functions are not only of great interest to the pure mathematics, but they are often of extreme importance in many branches of theoretical and applied physics and engineering (see [10]). Several methods for evaluating infinite or finite integrals involving Bessel-Maitland functions have been known (see, e.g.,[1] and [18]). However, these methods usually work on a case-by-case basis.

The well known Mittag-Leffler function $E_{\alpha}(z)$ (which is the generalization of exponential function), occurs as the solution of fractional order differential and integral equation is defined by (see [8]):

$$E_{\alpha}(z) = \sum_{n=0}^{\infty} \frac{z^n}{\Gamma(\alpha n + 1)} \qquad (1.1)$$

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A note on q-analogue of Hermite-poly-Bernoulli numbers and polynomials

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ABSTRACT. In this paper, we introduce the Hermite-based poly-Bernoulli numbers and polynomials with q-parameter and give some of their basic properties including not only addition property, but also derivative properties and integral representations. We also define the Hermite-based λ-Stirling polynomials of the second kind and then provide some relations, identities of these polynomials related to the Stirling numbers of the second kind. We derive some symmetric identities for these families of special functions by applying the generating functions.

1. INTRODUCTION

Throughout this paper, we use the following notations, $\mathbb{N} = \{1, 2, 3, \ldots\}$ denotes the set of natural numbers, $\mathbb{N}_0 = \{1, 2, 3, \ldots\}$ denotes the set of non negative integer, $\mathbb{Z}$ denotes the set of integers and $\mathbb{C}$ denotes the set of complex numbers respectively.

The 2-variable Kampé de Fériet generalization of the Hermite polynomials [3] and [8] are defined by

$$H_n(x, y) = n! \sum_{r=0}^{[\frac{n}{2}]} \frac{y^r x^{n-2r}}{r!(n-2r)!}.$$

These polynomials are usually defined by the generating function:

$$e^{xt+yt^2} = \sum_{n=0}^{\infty} H_n(x, y) \frac{t^n}{n!}, \tag{1.1}$$

and reduce to the ordinary Hermite polynomials $H_n(x)$ (see [1]), when $y = -1$ and x is replaced by $2x$.

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Certain integrals involving extended Bessel-Maitland function associated with Jacobi polynomials

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Abstract: The intent of the paper is to establish some interesting integrals involving the product of generalized Bessel-Maitland function with Jacobi polynomial, which are expressed in terms of generalized hypergeometric function. Some special cases are deduced.

Keywords: Jacobi polynomial, generalized hypergeometric function, Wright generalized Bessel-Maitland function.

1 Introduction

In the last decade, many authors (see, e.g., [1-19] have developed numerous integral formulas involving a variety of special functions. Also many integral formulas associated with the Bessel functions of several kinds have been presented (see, e.g., [1-7]). Those integrals involving Bessel-Maitland functions are not only of great interest to the pure mathematics, but they are often of extreme importance in many branches of theoretical and applied physics and engineering (see [12]). Several methods for evaluating infinite or finite integrals involving Bessel-Maitland functions have been known (see, e.g.,[1] and [17]). However, these methods usually work on a case-by-case basis.

Currently, Ghayasuddin and Khan [1], Khan et al. [2-4, 7], Ali et al. [4-6] gave certain interesting new class of integral formulas involving the generalized Bessel-Maitland function, which are expressed in terms of the generalized (Wright) hypergeometric function. In the present sequel to the aforementioned investigations, we present two generalized integral formulas involving generalized Bessel-Maitland functions, which are expressed in terms of the generalized (Wright) hypergeometric function. Some special cases and the (potential) usefulness of our main results are also considered and remarked, respectively.

The Bessel-Maitland function $J_\nu^\mu(z)$ [18;Eq.(8.3)] defined by the following series representation:

$$J_\nu^\mu(z) = \sum_{n=0}^{\infty} \frac{(-z)^n}{n!\,\Gamma(\mu n+\nu+1)} = \phi(\mu,\nu+1;-z). \tag{1}$$

Singh et al. [17] introduced the following generalization of Bessel-Maitland function as:

$$J_{\nu,\gamma}^{\mu,\gamma} = \sum_{n=0}^{\infty} \frac{(\gamma)_{\gamma n}(-z)^n}{\Gamma(\mu n+\nu+1)n!}, \tag{2}$$

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Beta type integral operator involving generalized Bessel-Maitland Function

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Abstract: The main object of the present paper is to establish integral involving generalized Bessel-Maitland functions $J^{\mu,\rho,\gamma,\delta}_{\alpha,\beta,\nu,\sigma,\delta,\rho}(z)$ defined by Khan et al. [6], which are expressed in the terms of generalized (Wright) hypergeometric functions. Some interesting special cases involving generalized Mittag-Leffler functions are deduced.

Keywords: Generalized Bessel-Maitland function, Generalized (Wright) hypergeometric function and integrals, Mittag-Leffler function.
2010 Mathematics Subject Classification. 26A33, 33C45, 33E12.

1. Introduction

The special function of the form defined by the series representation

$$J^{\mu}_{\nu}(z)=\sum_{n=0}^{\infty}\frac{(-z)^n}{n!\Gamma(\mu n+\nu+1)}=\phi(\mu,\nu+1;-z), \tag{1.1}$$

is known as Bessel-Maitland function, or theWright generalized function (see [10;Eq.(8.3)]).It has a wide application in the problem of physics, chemistry, biology, engineering and applied sciences. The theory of Bessel functions is intimately connected with thetheory of certain types of differential equations. A detailed account of applications of Bessel functions are given in the book of Watson [17].

The generalized hypergeometric function represented as follows (see [20]):

$$pF_q\left[\begin{matrix}(\alpha_p);\\(\beta_q);\end{matrix}z\right]=\sum_{n=0}^{\infty}\frac{\prod_{j=1}^{p}(\alpha_j)_n}{\prod_{j=1}^{q}(\beta_j)_n}\frac{z^n}{n!} \tag{1.2}$$

provided $p\le q;\ p=q+1$ and $|z|<1$ and $(a)_n$ is well known Pochhammer symbol.

The Fox-Wright generalization $p\Psi q(z)$ of hypergeometric pFq function is given by (cf [13, 19, 20]):

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Study on double integral operator associated with generalized Bessel-Maitland function

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MSC 2010 Classifications: 33C45, 33C60, 33E12.

Keywords and phrases: Generalized Bessel-Maitland function, Generalized (Wright) hypergeometric function and integrals, Mittag-Leffler function.

Abstract In this article, we establish double integral operator involving generalized Bessel-Maitland function defined by Khan et al. [9], which is expressed in terms of generalized (Wright) hypergeometric function. Some special cases are deduced.

1 Introduction

In last decade many authors namely, Choi and Agarwal [1, 2, 3], Khan et al. [7-10], Ghayasuddin and Khan [4] have introduced integral formulae associated with Bessel function. It has a wide application in the problem of Physics, Chemistry, Biology, Engineering and Applied Sciences. The theory of Bessel functions is closely associated with the theory of certain types of differential equations (see [21]).

The Bessel-Maitland function $J_\nu^\mu(z)$ [13;Eq.(8.3)] is defined by means of the following series representation:

$$J_\nu^\mu(z) = \sum_{n=0}^{\infty} \frac{(-z)^n}{n!\Gamma(\mu n + \nu + 1)} = \phi(\mu, \nu+1; -z). \tag{1.1}$$

Singh et al. [20] introduced the following generalization of Bessel-Maitland function:

$$J_{\nu,q}^{\mu,\gamma} = \sum_{n=0}^{\infty} \frac{(\gamma)_{qn}(-z)^n}{\Gamma(\mu n + \nu + 1)n!}, \tag{1.2}$$

where $\mu, \nu, \gamma \in \mathbb{C}, Re(\mu) \geq 0, Re(\nu) \geq -1, Re(\gamma) \geq 0$ and $q \in (0,1) \bigcup \mathbb{N}$ and $(\gamma)_0 = 1, (\gamma)_{qn} = \frac{\Gamma(\gamma+qn)}{\Gamma(\gamma)}$ denotes the generalized Pochhammer symbol.

Recently, Ghayasuddin and Khan [4] introduced and investigated generalized Bessel-Maitland function defined as

$$J_{\nu,\gamma,\delta}^{\mu,q,p}(z) = \sum_{n=0}^{\infty} \frac{(\gamma)_{qn}(-z)^n}{\Gamma(\mu n + \nu + 1)(\delta)_{pn}},$$

where $\mu, \nu, \gamma, \delta \in \mathbb{C}, \Re(\mu) \geq 0, \Re(\nu) \geq -1, \Re(\gamma) \geq 0, \Re(\delta) \geq 0; p, q > 0$ and $q < \Re(\alpha) + p$.

In particular, Khan et al. [10] introduced and investigated a new extension of Bessel-Maitland function as follows:

$$J_{\alpha,\beta,\nu,\sigma,\delta_p}^{\mu,\rho,\gamma,q}(z) = \sum_{n=0}^{\infty} \frac{(\mu)_{\rho n}(\gamma)_{qn}(-z)^n}{\Gamma(n\beta + \alpha + 1)(\delta)_{pn}(\nu)_{n\sigma}}, \tag{1.4}$$

where $\alpha, \beta, \mu, \rho, \nu, \gamma, \delta, \sigma \in \mathbb{C}; \Re(\sigma) \geq 0, \Re(\beta) \geq 0, \Re(\rho) \geq 0, \Re(\mu) \geq 0, \Re(\nu) \geq 0, \Re(\alpha) \geq -1, \Re(\gamma) \geq 0, \Re(\delta) \geq 0; p, q > 0$, and $q < \Re(\alpha) + p$.

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ORIGINAL ARTICLE

Bioconversion Efficacy and Reproductive Performance of *Coccinella septempunctata* Linnaeus (Coleoptera: Coccinellidae) on Different Aphid Species

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ABSTRACT

The observations on reproductive performance showed that seven potted ladybird beetle, *Coccinella septempunctata* L. consumed significantly ($F_{4, 14}$ = 2.23; p < 0.01) maximum number of *L. erysimi* (1117.33±12.98 aphids) followed by *H. coriendri* (934.00±3.46 aphids), *A. craccivora* (872.67±7.51 aphids), *R. nymphae* (838.33±3.76 aphids) and *M. rosae* (825.00±4.36 aphids). The potential fecundity of *C. septempunctata* was also recorded highest on *L. erysimi* (162.67±1.45 eggs) followed by *H. coriendri* (129.33±1.76 eggs), *R. nymphae* (114.33±2.33 eggs), *A. craccivora* (103.33±1.20 eggs) and *M. rosae* (96.67±2.91 eggs). In addition, progeny loss was recorded significantly ($F_{4, 14}$ = 4.91; p < 0.01) low on *L. erysimi* (3.28±0.18 %) and high on *M. rosae* (22.04±0.70 %). A marked variation in pre-reproductive ($F_{4, 14}$ = 1.00; p < 0.01), reproductive ($F_{4, 14}$ = 3.06; p < 0.01) and post-reproductive ($F_{4, 14}$ = 0.00; p < 0.01) period was observed with respect to different aphid species. The longest reproductive period were recorded on *L. erysimi* (18.00±0.58 days) and shortest on *M. rosae* (12.00±0.58 days), respectively. The reproductive time ratio also observed significantly ($F_{4, 14}$ = 5.09; p < 0.01) high on *L. erysimi* (0.45±0.00) and low on *M. rosae* (0.36±0.02). Moreover, reproductive rate of *Coccinella septempunctata* was recorded significantly ($F_{4, 14}$ = 1.97; p < 0.01) maximum on *L. erysimi* (9.05±0.21) and minimum on *A. craccivora* (6.90±0.21), respectively. Among different aphid species, highest bioconversion efficacy was recorded with respect to *L. erysimi* (14.56±0.06) followed by *H. coriendri* (13.85±0.14), *R. nymphae* (13.64±0.36), *A. craccivora* (11.84±0.15) and *M. rosae* (11.72±0.41), respectively. The variation in the bioconversion efficacy is due to either choice of food either of seven spotted ladybird beetle or variation in nutritional value aphid species.

Key Words: *Aphis craccivora, Hyadaphis coriendri, Lipaphis erysimi, Macrosiphum rosae, R. nymphae*

INTRODUCTION

Coccinella septempunctata is the most common ladybird in India and Europe. It has red colour elytra with three black spots on each side of elytra and one spot on the junction of elytra and therefore, making a total of seven spots, which reflects its name seven spotted ladybird beetle. It has a broad ecological range including [illegible] parkland, gardens, forests etc. Generally feed on aphids and termed as aphidophagous beetle but it can also feed on thrips, whiteflies, on the larvae of psyllids and leafhoppers, and sometime on the eggs and larvae of some beetles and butterflies. Moreover, due to target specificity it became dominant natural enemy or top predator of aphid and other plant lice. Therefore, in present time *C. septempunctata* has been successfully introduced as biological control agents of many soft bodied insects.

The extensive studies on essential food require for the development and reproduction and some nonessential food which serves only as an energy source to the coccinellids have also been done by various workers (Hodek, 1960; Hodek and Honek, 1996; Omkar and Pervez, 2000; [illegible] Wiedenmann 2004; Berkvens *et al.*, 2008; Lundgren, 2009; Seago *et al.*, 2011; Guedes and Almeida, 2013; [illegible] 2015; Castro *et al.*, 2016). Moreover, several successful studies on food suitability and reproductive performance have been carried out by Blackman (1967), [illegible] Hazzard and Ferro (1991), Rogers *et al.* (1994), Omkar and Srivastava (2003), Agarwala and Bhattacharya (2004), Omkar and James (2004), Pervez and Omkar (2004), Ali and Rizvi, (2007), Solano *et al.*, (2016) and Castro *et al.*, (2016). But present study is designed on bioconversion efficacy of different aphid species for egg production and also to observe the high reproductive performance of *C. septempunctata*.

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