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SCAN ME

Research Paper

ARTIFICIAL REARING METHOD OF THE LARVAE OF *Leucinodes orbonalis* GUENEE AND ITS BIONOMICS

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Abstract

An artificial rearing of *Leucinodes orbonalis* Guenee is commonly known as Brinjal Fruit and Shoot Borer (BFSB). The present study of *Leucinodes orbonalis* Guenee is based on artificial rearing by using a synthetic diet and a natural diet – potato. A cage set-up has been developed with proper feeding with ambient temperature. Comparison of its developmental stages - Egg, Larva, Pupa, Adult. Morphometric observations of all development stages on potato tuber Egg length - 0.59 ± 0.045 and duration 3 – 6 days, larvae duration 13 – 14 days, Male length - 8.15±0.65 duration 2 – 3 days, Female length - 9.15±0.45 duration 4 – 5 days. On the Synthetic diet, the length of larvae was slightly changed but the duration was extended for a day, and observed that the easiest way to rear *Leucinodes orbonalis* Guenee was in a natural diet on potato tuber than an artificial diet in a laboratory conditions.

Key words: Leucinodes orbonalis Guenee, Rearing techniques, artificial diet, biological parameters, morphometric, Potato, Developmental stages.

INTRODUCTION

Leucinodes orbonalis Guenee is commonly known as Brinjal fruit and shoot borer (BFSB) was importrayed by Guenee in 1854. *Leucinodes orbonalis* Guenee is essentially monophagous mainly on *Solanum melongena* Linnaeus (eggplant) belonging to the family Solanaceae is accounted for to be the pest of this plant (Muhammad *et al.*, 2018). The variability in their population, period of growth, fertility, duration and development of larvae at different stages can be related to changes in the ambient environment and the changes in abiotic component under agro-climatic conditions. *Leucinodes orbonalis* Guenee can cause various range of damage is 70 to 90 percent to brinjal *Solanum melongena* L. (Dhandapani *et al.*, 2003).

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HISTOLOGICAL AND ULTRASTRUCTURAL STUDY OF PITUITARY GLAND OF PANGAS CATFISH, *PANGASIUS PANGASIUS* (HAMILTON,1822)

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ABSTRACT

Pituitary gland of *Pangasius pangasius* was examined through light microscope and transmission electron microscope (TEM). It is slightly protruding and forwardly directed. Hypophysis showed adenohypophysis and neurohypophysis. The adenohypophysis consists of three parts named viz. Rostral Pars Distalis (RPD), Proximal Pars Distalis (PPD) and Pars Intermedia (PI). Adenohypophysis exhibits lactotropic cells, adrenocorticotropic cells and somatotropic cells in RPD. In PPD, gonadotropic cells, somatotropic cells and thyrotropic cells were detected.

Key words: Pituitary, *Pangasius pangasius*, TEM, RPD, PPD.

Introduction:

Identification and distribution of different cell types in the gland being analyzed using various histochemical and ultrastructural techniques (Rinehart and Farquhar,1953., Batten and Ball, 1977; Balci and Ikiz, 2017., Banerjee et al., 2018).

There is limited available information on structure of pituitary gland of *Pangasius pangasius* (Hamilton,1822), commonly known as Pangas catfish, belonging to family Pangasiidae and order Siluriformes. Present study was undertaken to examine its structural organization. Such information helps to understand hypothalamo-hypophyseal-gonadal control of various physiological and sexual activities in fish, which have important implications for breeding and farming of this species.

Material and Methods:

Pangas catfishes were collected from local fish market and fish farms in and around Nagpur city. They were brought to the laboratory and acclimatized in the well aerated glass aquaria for 8 days. Fishes were cared and treated in accordance with protocol of Institutional Animal Ethics Committee (IAEC), Post Graduate Teaching Department of Zoology, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur (Registration no. 478/01/a/CPCSEA).

Brains along with pituitary glands were dissected out and fixed in the Bouin's fixative and dehydrated in ascending graded series of ethanol, cleared in xylene and embedded in paraffin wax. Sections of pituitary gland were cut on rotary microtome (model- RMT-30) at 8 µm thickness in transverse as well as in lateral planes and stained with Hematoxylene and Eosine (double staining), and Niss'l staining technique (Kluver and Barerra,1953).

The fish was anesthetized utilizing 2-phenoxy ethanol and subsequently underwent perfusion with 0.1M phosphate buffer (PB) (pH 7.4). The pitui3tary glands were then carefully dissected out and fixed in cold 2.5 % glutaraldehyde containing 2 % paraformaldehyde in 0.1M PB (pH 7.4). The tissues were subjected to further processing, including washing in PB, post fixation in 1% osmium tetraoxide for 2 hours at 40°C, and dehydration through ascending grades of ethanol. The tissues were then cleared in

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Odonata (Dragonflies, Damsel Flies) Diversity in an around Sakoli, Bhandara District, Maharashtra

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Abstract: *Dragonflies and damselflies (Odonata) are ecologically important insects, serving as indicators of environmental health and playing crucial roles in predator-prey interactions Insect are most diverse, successful, and dominated taxon of the animal kingdom. They are found in almost every habitat across the globe. It is due to their diverse body size, habit, fecundity, different modes of respiration, food diversity etc, because of these diverse characteristics, they became an important component of our ecosystem. (Fraser, F.C. (1936). The order odonatan is one of the most popular insect groups. Odonata occupies almost all kinds of habitat, running water, rain-pools and lakes, rivers etc. A survey conducted in 2023 found a total of 43 species, of odonates belonging to 06 families, were collected for the present study survey was conducted during May to end November morning to midday when odonates are most active.*

Keywords: Sakoli Tahsil, Odonata, Dragonflies, Damselflies

I. INTRODUCTION

Two of the most varied animals on the planet are dragonflies and damselflies. Of the 5,740 species of odonates that have been identified worldwide, India is home to 474 species across 142 taxa and 18 families (Subramanian, 2014).Beautiful insects called odonates have aquatic larval phases. The food web's top predators and crucial components are present in both the adult and larval phases (Mishra *et al*., 2019; Babosova *et al*., 2019)

The Western Ghats of India, encompassing the Bhandara district, harbor a rich biodiversity of odonates due to diverse habitats and favorable climatic conditions. Odonates, despite their captivating beauty, often remain overlooked in biodiversity assessments.

In Maharashtra total 101 species of odonates are recorded (Kulkarni *et.al.*2012). As skillful predators, they keep populations of mosquitoes and other flying insects in check, acting as nature's pest control vigilantes. Moreover, their intricate roles in pollination and seed dispersal contribute significantly to the health and vibrancy of the ecosystem. They are important predators in the ecosystem,

Study Area:

SakoliTehsil come under Bhandara district of Maharashtra state is home to a diverse range of odonates, or dragonflies and damselflies. Sakoli Latitude is 21.0674 and Longitude is 79.9554.In Sakoli tehsil has many resources and good plant diversity. Such type of climate is favourable to normal development of odonates.

Data Collection:

Field surveys were conducted in diverse habitats across Sakoli, including wetlands, paddy fields, streams, and forest edges, between May and end of November 2023. The observation is carried out by weekly visit during morning and evening time. Species were photographed by using Sony α-600 and identified in their natural habitat.Identification is done by the standard identification key prescribed by Subramanian (2014).

Result:

The survey found a total of 43 species of Odonates in Sakoli district. The most common families were:

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COSMOS IMPACT FACTOR - 7.26

Histological and Biochemical Studies of Different Tissues of Female Channa Striata During Pre-Spawning Phase

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• **Abstract -**

For the present study, female*Channa striata*was selected. Fish store the protein in various organs; particularly in muscles and liver. A great amount of these protein is transferred to different parts of the body to be used for various physiological actions. Present study was carried out to find the protein content of ovary, muscle and liver in pre-spawning phase. Results showed that *Channa striata* were in the pre-spawning phase of their breeding cycle. In the present study, compared to liver and muscle, ovary proteins are gradually lower in *Channa striata* studied the seasonal pattern of protein in the pre-spawning phase.

Keywords : *Channa striata,* ovary, muscle, liver and protein

Introduction -

Fishes are the major components of aquatic fauna, which are the chief source of proteins. Proteins are mainly involved in the architecture of the cell. Fish proteins contain all the essential amino acids. Sea and freshwater fishes which constitute the majority of water products make up an important part of animal food sources for human. Fishes are quite different from the other animal food sources, because they provide low energy and have high-level proteins, which contain all essential amino acids. So, they are beneficial nutrition sources (Weatherley and Gill, 1998).

Biochemistry is the science concerned with various molecules and their chemical reactions that occur in living cells and organisms. In general, the biochemical composition of the whole body indicates the fish quality. Therefore, the proximate biochemical composition of a species helps to assess its nutritional and edible value in terms of energy units compared to other species. A variation of the biochemical composition of fish flesh may also occur within the same species depending upon the fishing ground, fishing season, age and sex of the individual and reproductive status. The spawning cycle and food supply are the main factors responsible for this variation. (Love,1980).

Channa striata, commonly called murrels are very important air-breathing indigenous freshwater fishes of India. They are commonly known as snakehead or serpent-headed fish due to the elongated and cylindrical body, flattened head and presence of eyes on the anterior part of head. The commercially important Murrel species in India are *Channa striatus* (Bloch, 1793), *C. marulius* (Hamilton, 1822) and *C. punctatus* (Bloch, 1793); they fetch high price (Rs. 250-500/kg) in many States like Madhya Pradesh, Bihar, Uttar Pradesh, Haryana, Andhra Pradesh, Karnataka, Tamil Nadu and all North-East States. They have high consumer preference because of nice flavour, meaty flesh with few intra-muscular bones and medicinal value. These fishes are considered as high-value food fishes and marketed in live condition, as they can be kept alive for several hours outside water.

Materials and Methods

Materials - For the present study, adults of female *Channa striata* were selected.

Collection and Maintenance of fish - Mature fishes of *"Channa striata"* were collected around Nagpur city. All the fishes were transported alive to the laboratory in plastic containers and kept in glass aquaria. The body weight of the fishes ranged between 600 g to 2kg.

Histological and Biochemical Methods - The fishes were anaesthetized. The fishes were dissected to remove gonads, liver and muscles and half of the tissues were processed for biochemical estimations

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Status and Distribution of Wetland Birds at Futka Lake, Gondia District

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• **Abstract -**

A bird has been described as a "Feathered Biped." Birds are vertebrate worm blooded animals. The present paper deals with the community of the birds in and around Futka lake (Bodi) in Bhursi village of Gondia district (MS) India.Futka Lake is a potential wetland habitat for resident and migratory birds. This study aims to assess the status of wetland birds in Futka Lake. It is situated between 20° 45' to 21° 2' North latitude and 80° 5' to 80° 15'east longitudes. In present there is no report avifounal diversity from Bhursi village. The study revealed a total 48 species of birds belonging to the 08 families, were recorded, 16 were categorized as very common species,08 were considered as common,03 species were designated as rare and 21 species is uncommon. The findings will contribute to the conservation of Futka Lake's wetland ecosystem and its birdlife.

Keyword – Avifauna, Bhursi Lake, Gondia

Introduction :-

Birds and their diversity constitute a main part of the natural environment and play a functional role as agents of flower pollination, seed dispersal source of food chain and agents in breaking seed dormancy (Nason,1992). Birds are good environmental indicators revealing the state of the ecosystem such as forest edges. Wetlands and major river basin. They also act as dispersal agents in transferring nutrients and spores from one place to another during their migration and local movement (Niemi,1985). The avian habitat is roughly divided into forest, scrub, and wetland although many species require a mixed type of habitat.

Migration is a common response of birds to environmental periodicity (Berphold,2001) and altitudinal migration is for most species that exhibit such behaviour, the sessional movement of individual in a population from non- breeding (wintering) areas at lower elevations to breeding area at higher elevation (Hayes 1995, Dingle and Drake 2007, Rapple 2013), but see cade and Hoffman 1993 and Norbu *et. al* 2013 for example for migration to lower elevation to breed there is no standard terminology for birds' movement between different elevation, and several terms have been used to describe these movement, including regional, altitudinal (Boyle2010), elevational (Blake and Loiceae 2000, Cakaatuwal*et al*2016), and vertical migration or movement of individuals from breeding areas to non-breeding or wintering areas, includingnot short or long-distance movements. We do not consider high elevation mountain crossings, such as trans Himalayan migration.Vidarbha region of Maharashtra more popular for diversity of vegetative ranging from dry mixed forest to rain forest. This southern tropical dry forest is enriched with varied wild life, and is an important conservation unit in central India birds visit this beautiful lake every winter.

Altitudinal Migration is the seasonal altitudinal movement of birds from breeding areas to non-breeding or wintering areas at different elevations. Although this type of migration is widely reported questions remain concerning the number of species that perform altitudinal migration possible variations among different taxa and geographic location in the extent of altitudinal migration and the foregone guilds of altitudinal migrants.

Migration of birds is an adaptation to escape the harsh and cold conditions of their normal habitat in winter to survive migratory birds fly to for away places every year during a particular time because of climate changes, The purpose of migrations of birds is to survive by escaping the extremely cold conditions of their natural habitat and for breeding.Large scale climate changes as have been

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Variations of Protein Content in Commercially Important Fishes Channa Striata and Labeo Rohita

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Abstract: *Fish has been honored as an excellent food source for human beings for centuries throughout the globe. For the present study, Channa striata and Labeo rohita were selected. Fish store the protein in various organs; particularly in muscles and liver. A great amount of these protein is transferred to different parts of the body to be used for various physiological actions. Present study was carried out to find the protein content of two economically precious fishes. Results showed that these fishes are a source of high-quality protein. This quantitative variation of protein content in muscle was discussed with respect to the stages of reproduction.*

Keywords: Channa striata, Labeo rohita, muscle and protein

I. INTRODUCTION

Fish is the cheapest source of animal protein for some communities including those who don't consume red meat, the glutted, immunocompromised, pregnant women, and nursing maters. Several species of fish have been part of the diet of some ethnical groups in all mainland's for a long time. Fishing makes the widest donation to grope meat; marketable fish husbandry is limited. Due to its high protein content, fish is generally used as relish. Fish have a high profitable value deduced through operation of fisheries and monoculture which give employment, recreation, trade, and profitable well- being for those involved in the trade. Products from fishing are an important part of transnational trade, presently worth further than US$ 50 billion (V. Venugopal, 2002).

Water constituents about 71% of the earth's surface and has always been an important actual and potential source of food. There is an increasing demand for aquatic resources and fish products as dietary protein source around the World. (Feldhusen, 2000). Fish has been honored as an excellent food source for human beings for centuries throughout the globe. Fishery products are veritably important for food security, furnishing further than 15 of total beast protein inventories (FAO 2005). This sector is also pivotal not only as a main source of beast protein to ensure food security (Sheikh and Sheikh 2004) but also to ameliorate employment and income for poverty elimination in developing countries including India

Monoculture assiduity gradationally developed in the world as well as in India. Fishes are the major factors of submarine fauna, which are the principal source of proteins. Fishes are relatively different from the other beast food sources, because they've high- position proteins, which contain all essential amino acids and form salutary nutrition sources (Weatherley and Gill, 1998).

Biochemistry is the wisdom concerned with colorful motes and their chemical responses that do in living cells and organisms. In general, the biochemical composition of the whole body indicates the fish quality. thus, the proximate biochemical composition of a species helps to assess its nutritive and comestible value in terms of energy units compared to other species. A variation of the biochemical composition of fish meat may also do within the same species depending upon the fishing ground, fishing season, age and coitus of the individual and reproductive status. The spawning cycle and food force are the main factors responsible for this variation Love (1980).

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Secondary Metabolite Production In Plants: In Response To Biotic And Abiotic Stress Factors

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Abstract

Secondary metabolites (SMs) play vital roles in plant defence mechanisms, adaptation to environmental conditions, and interactions with other organisms. Biotic and abiotic stress factors can significantly influence the production, accumulation, and composition of SMs in plants. Understanding the intricate relationship between stress and SM production is crucial for enhancing plant resilience, agricultural productivity, and the development of novel phytopharmaceuticals. This research provides current knowledge regarding the impact of biotic and also abiotic stress on SMs in plants. Biotic stress factors such as pathogen infection, and herbivore attacks, as well as abiotic stress factors like drought, along with temperature extremes, and also salinity, can profoundly influence the biosynthesis and accumulation of SMs in plants. We discussed the methodology based on secondary sources underlying physiological, biochemical, and molecular mechanisms involved in stress-induced SM synthesis and highlight the potential implications for plant biology, agriculture, and human health. The study also emphasizes the functions of SMs in plants including defence against herbivores, pathogens, and abiotic stresses. The mechanism by which these compounds act as allelochemicals and signalling molecules is also discussed.

Keywords: SMs, Biotic stress, Abiotic stress, Plant defence, Stress response.

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Original Research Paper — Physics

ULTRASONIC STUDY OF MOLECULAR INTERACTION IN AQUEOUS SODIUM LIGNOSULFONATE

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ABSTRACT The ultrasonic study of liquid mixtures helps in understanding the intermolecular interaction of solute-solvent mixtures. The study involves the measurement of the ultrasonic velocity, density, and viscosity of a binary system consisting of sodium lignosulfonate in an aqueous medium at 298.15 K. Sodium lignosulfonate is commonly used as a dispersing agent in industries such as agriculture, ceramics, and construction. It helps to disperse cement particles, improving the work ability of the mixture and reducing water content. The Various thermo-acoustical parameters, such as adiabatic compressibility (ad), free length (Lf), free volume (Vf), acoustic impedance (Z), relaxation time ( ), etc., have been computed. The variations of these parameters with concentration are analysed to gain insights into the molecular interactions between the components of the mixtures.

KEYWORDS : Ultrasonic velocity (u), density ( ) and viscosity ( ), free length (Lf), adiabatic compressibility (ad)

INTRODUCTION

Sodium lignosulfonate ($C_{20}H_{24}Na_2O_{10}S_2$) is a water-soluble compound derived from lignin. The lignin is generally found in the cell walls of plants. Sodium lignosulfonate is a naturally occurring anionic surfactant with a high molecular polymer structure, abundant in sulfo and carboxyl groups. It exhibits superior surfactant properties and excellent dispersion capabilities [1-2]. On the basis of its water-soluble property determined by the sulfonic acid group, lignosulfonate can be widely used in building, agriculture, and light industry [3-5]. It can also be used in animal feed additives due to its antimicrobial and preservative properties [6].

Ultrasonic investigations reveal insights into solvation dynamics, association phenomena, and intermolecular interactions in liquid mixtures [7-8]. This study investigates the ultrasonic properties of a sodium lignosulfonate solution, specifically its ultrasonic velocity, density, and viscosity and calculating its derived parameters at 298.15 K to gain inside the molecular structure and interactions in the liquid medium [9-11].

MATERIAL & METHODS

In the reported study, sodium lignosulfonate with 99.5% purity of analytical grade was obtained from Vedayukt India Private Ltd. Initially, a standard solution of 1–6 % concentration of sodium lignosulfonate in double-distilled water in steps of 1% was prepared. The ultrasonic velocities (U) in the liquid mixtures have been measured by a digital ultrasonic velocity meter supplied by Vi Microsystem Pvt. Ltd., Chennai, at a central frequency of 2 MHz with an accuracy of ± 0.01 m/s. The viscosity (η) of the solution is measured by an Ostwald's viscometer with accuracy ± 0.001Nm ^{2}s. The density (ρ) is measured using a Pycnometer Specific Density Gravity Bottle with an accuracy of ±0.1 kg/m^{3}. The temperature of the solution is maintained constant at 298.15 K using a temperature-controlled water bath with an accuracy of ± 0.01K.

The data measured are used to calculate derived acoustical parameters such as adiabatic compressibility (β_{ad}), intermolecular free length (L_f), free volume (V_f), acoustical impedance (Z) and relaxation time (τ) etc.

Theory

The Density of experimental liquid was measured using the formula

$$\rho_2 = \left(\frac{W_2}{W_1}\right)\rho_1 \quad \text{---------- (1)}$$

Where, w1 & ρ1 = weight & density of distilled water.

w2 & ρ2 = weight & density of experimental liquid. Viscosity of the experimental liquid was determined using relation.

$$\eta_2 = \left(\frac{t_2}{t_1}\right)\left(\frac{\rho_2}{\rho_1}\right)\eta_1 \quad \text{---------- (2)}$$

Where, η1, ρ1 & t1 is viscosity, density & time flow of water. η2, ρ2 & t2 is viscosity, density & time flow of mixture.

Adiabatic Compressibility (βad) has been calculated using the relation

$$\beta ad = \frac{1}{\rho\, U^2} \quad \text{---------- (3)}$$

Intermolecular free length (Lf) has been determined by the equation:

$$L_f = K_T\sqrt{\beta_{ad}} \quad \text{---------- (4)}$$

Where KT is a Jacobsen's constant (93.875 + 0.375 T) X 10-8 and T being the absolute temperature.

Free Volume (Vf) is determined using the equation:

$$V_f = \left(\frac{M_{eff}\,U}{K\,\eta}\right)^{3/2} \quad \text{---------- (5)}$$

Where, Meff = Σ mi xi and K = 4.28 × 109 for all liquids in MKS system.

Specific Acoustic Impedance is calculated using relation:

$$Z = U.\rho \quad \text{---------- (6)}$$

Relaxation Time is calculated from the relation.

$$\tau = 4/3.(\beta ad.\eta) \quad \text{----------(7)}$$

RESULTS AND DISCUSSIONS

The ultrasonic velocity, density, viscosity, and other relevant thermodynamic parameters i.e adiabatic compressibility (βad), intermolecular free length (Lf), acoustic Impedance (Z), free volume (Vf) and relaxation time (τ) of aqueous sodium lignosulphonate were tabulated in Table-1.These parameters

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Physics

PHYSICOCHEMICAL INVESTIGATION OF ACOUSTICAL PARAMETERS OF -TOCOPHEROL ACETATE AND DIETHYL ETHER AT 293 K

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ABSTRACT In this paper, density (ρ), ultrasonic velocity (u) and viscosity (η of binary liquid mixture of -Tocopherol and Diethyl ether have been measured using 2 MHz ultrasonic interferometer at 293 K. These experimental parameters can be used to calculate acoustical parameters i.e adiabatic compressibility, free length, free volume and internal pressure. The finding of results assists the structural changes and association of molecules in the binary liquid mixture of -Tocopherol and Diethyl ether.

KEYWORDS : Ultrasonic velocity, binary liquid mixture, Association.

INTRODUCTION

Ultrasonic technique is an effective tool for investigating the physicochemical properties and molecular interactions in both pure liquids and liquid mixtures[1-3]. Researchers identified associations, molecular motions, interaction types, and their strengths based on the physicochemical properties of various liquid mixtures, which were influenced by the sizes of pure components and mixtures[4-7]. A survey of literature shows that scanty work has been done on binary mixture of -Tocopherol acetate and Diethyl ether. Therefore, the binary system of this mixture is taken into consideration to investigate physicochemical characteristics of acoustical parameters.

This paper reports the ultrasonic velocity, density and viscosity of -Tocopherol acetate with Diethyl ether at 293K at various molar concentrations The acoustical properties, including adiabatic compressibility, free length, free volume and internal pressure of mixtures at 293K have been studied. The variation of these parameters have been attributed to structural changes and association of molecules in the binary liquid mixture.

MATERIAL AND METHODS

The chemicals -Tocopherol acetate and Diethyl ether are used in the present investigation is of Merck grade. The mixture of these chemicals has initially been prepared with different molar concentrations. Ultrasonic interferometer at a fixed frequency of 2 MHz can be used for accurately measured an ultrasonic velocity. The thermostat maintains the steady temperature of experimental solution by circulating water around the liquid cell of interferometer. The Viscosity of the experimental liquid can be measured by Ostwald's Viscometer to an accuracy of ± 0.2%. The electronic stopwatch with a precision of 0.01 s is used to measure flow time of experimental liquid. The pycnometer method is used to measure density of experimental liquid with an accuracy of ± 0.5%. The digital balance of precision ± 0.1 mg measures the mass of liquid mixtures.

RESULTS AND DISCUSSION

The ultrasonic velocity, density and derived acoustical parameters such as adiabatic compressibility(β_a), free volume (V_f), free length (L_f), and internal pressure(π_i) of -Tocopherol acetate and Diethyl ether solution at 293K were shown in Fig-1 to 6.

The variation of ultrasonic velocity with increase in molar concentration of -Tocopherol acetate is shown in Fig.1.

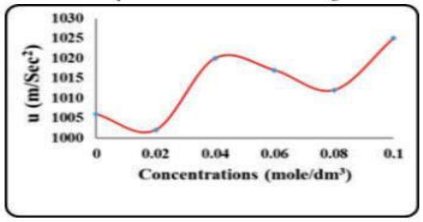

Fig. 1 Variation of Ultrasonic Velocity with Molar Concentrations.

The nonlinear increasing variation of ultrasonic velocity suggests the formation of complexes and weak association may be due to hydrogen bond formation between the interacting molecules[8]. This behavior causes the structural changes that take place in the liquid mixture of -Tocopherol acetate and diethyl Ether. The peak at molar concentration 0.04 indicates the strong hydrogen bond and therefore maximum association of molecules may be possible at this molar concentration, whereas dip at 0.02 and 0.08 molar concentrations indicates weakening of hydrogen bond and hence maximum dissociation of molecules takes place at these molar concentrations.

The nonlinear variation of density with increase in molar concentration of -Tocopherol acetate is shown in Fig.2.

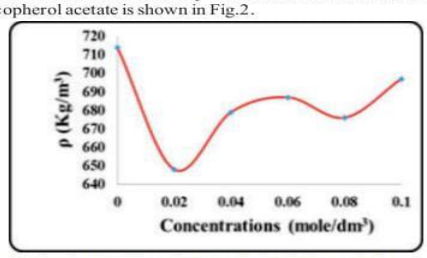

Fig.2 Variation of Density with Molar Concentrations.

The nonlinear variation of density, suggests the structure making (Hydrophilic) and breaking (hydrophobic) property of diethyl ether due to the formation and weakening of Hydrogen-bonds[9].

The variation of adiabatic compressibility with molar concentrations is shown in Fig.3.

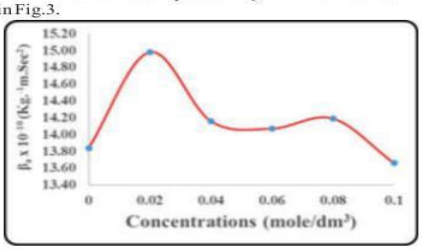

Fig. 3 Variation of Adiabatic Compressibility with Molar Concentrations.

The variation of adiabatic compressibility with molar concentration exhibits nonlinear variation with increase in molar concentration of -Tocopherol acetate. The converse relationship that exists between ultrasonic velocity and adiabatic compressibility clearly indicates association between the -Tocopherol acetate and Diethyl ether molecules[10].

The variation of free length with molar concentration is shown in Fig.-4.

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RESEARCH ARTICLE

THERMODYNAMIC PROPERTIES OF TERNARY LIQUID MIXTURE OF α-TOCOPHEROL ACETATE WITH CHLOROFORM AND DIETHYL ETHER AT 293 K

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Ultrasonic Velocity, Density, Molecular Interaction, Ternary Liquid System

Abstract

The reported study, measured the ultrasonic velocity (u), density (ρ) and viscosity (η) of ternary liquid mixtures of α-Tocopherol acetate with chloroform and diethyl ether in the concentration range (0 to 0.1 M) at 293K. These experimental parameters can be used to calculate various thermodynamic parameters like free volume (V_f), internal pressure (π_{in}), Vander-Wall Constant (b) and Gibb's free energy (ΔG^*) etc. to identify the strength of molecular interaction. The results so obtained support the formation of complex structure and molecular aggregation through intermolecular hydrogen bonding in the ternary liquid system of α -Tocopherol acetate with chloroform and diethyl ether.

Introduction:-

In the past few years, many studies have focused on examining the physio-chemical behaviour and interactions of binary and ternary liquid mixturesbased on their thermoacoustic properties[1-8]. These properties of liquid mixtures can be applied to design calculations and heat absorption pumps[9]. The basic parameters such as density, viscosity, and ultrasonic velocity are useful for equipment and molecular design[10]. Despite these basic parameters, researchers have studied various thermodynamic parameters of binary and ternary liquid mixtures and foundpotential applications in pharmaceutical, medicine, chemical, and biological sciences[11].

A literature review suggested that themajority of research hasbeen doneon the thermodynamic properties of peptides, ligands, bio-materials, polymers, water-soluble vitamins, organic liquids, etc.However, no such significant workhas been recorded on α-tocopherol acetate with chloroform and diethyl ether. Therefore, the present work is undertaken to study their interaction for industrial purpose.

In this report, the ultrasonic velocity, density, and viscosity and related thermodynamic parameters i.efree volume (V_f), internal pressure (π_{in}), Vander-Wall Constant (b) and Gibb's free energy (ΔG^*)of α-Tocopherol acetate in chloroform and diethyl ether at 293K have been studied. These parameters vary according to molar concentrations and areuseful to determine the strength of molecular interaction in the interacting components.

Materials and Method:-

The chemicals, α-Tocopherol acetate, chloroform and diethyl ether, used in this work are 99.9% purified and obtained from the MERCK company. The various concentrations of liquid solution were made and immediately utilised for the measurement of density, viscosity and ultrasonic velocity.An ultrasonic Pulse echo velocity meter

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STRUCTURAL AND MORPHOLOGICAL PROPERTIES OF ZINC OXIDE NANOPARTICLES SYNTHESIZED BY SOL-GEL METHOD

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Abstract
Zinc oxide (ZnO) nanoparticles were generated by simple approach of sol-gel method with zinc acetate as precursor and methanol used as solvent. The structure and morphology of as-prepared ZnO nanoparticles were characterized by X-ray diffraction (XRD) and transmission electron microscopy (TEM). XRD results indicated that the product was highly pure well-crystallized hexagonal phase with space group P63mc of zinc oxide particles. TEM images showed that the product powder consisted of dispersive quasi-spherical particles with an average size around 50 nm.

Keywords: X-Ray Diffraction, Transmission Electron Microscopy, Hexagonal Phase, Space Group, Quasi-Spherical Particles.

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Introduction

Nanostructured materials exhibit more attractive properties compared with the bulk materials, such as very small particle size, large exposed surface areas and high surface energy. These properties can reduce the diffusion distance of Li ions in solid state, enlarge the contact area between the active particles, enhance the electrochemical reaction rate, as well as results in the agglomeration of nanosized particles (Bhat et al. 2010).

Among various nano-oxide particles, zinc oxide nanoparticles have a wide band gap semiconductor of 3.3eV with large exciton binding energy of 70 meV (Asmar et al. 2006; Ding et al. 2005; Alpaslan et al. 2010). This nano-oxide has broad range of applications in the manufacturing of magnetic materials, alkaline battery anodes, dye-sensitized solar cells, semiconductors, solid oxide fuel cells (SOFC), anti-ferromagnetic layers, p-type transparent conducting films, electrochromic films, heterogeneous catalytic materials and gas sensors. ZnO has superior advantage such as facile preparation, morphologic diversity and high chemical stability, prolonged cycle life, safe operation, and high specific energy. Therefore, research towards finding new materials for various applications has been accelerated. This research focuses on structural and morphological properties of zinc oxide nanoparticles which offers promising candidature for many applications such as solar thermal absorber, catalyst for O_2 evolution, photo electrolysis and electrochromic device. Most attracting features of ZnO are: (1) excellent durability and electrochemical stability, (2) low material cost, (3) promising ion storage material in terms of cyclic stability, (4) large span optical density, and (5) possibility of manufacturing by variety of techniques (Kamat and Williams 2009).

Over decades, rapid increase in number of research has been marked. The great attention towards ZnO due to its unique physical and chemical properties especially wide band gap energy which offers electronic transition to occur down to visible region. Also, the binding energy persist the event of excitonic absorption and recombination between electrons and holes even at room temperature. This process is enhanced with the nature of direct type band structure that improved the efficiency of photo generated electron transfer (Rao et al.2003).

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Review paper on flexible rectennas for wireless transfer to wearable applications

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Abstract

The demand for flexible and efficient energy harvesting solutions has surged with the widespread adoption of wearable devices. This review paper provides a comprehensive overview of the current state of research on flexible rectennas, focusing on their application in wireless power transfer to wearable devices. Rectennas, a combination of rectifiers and antennas, play a crucial role in converting radio frequency (RF) energy into usable electrical power. The flexibility of these rectennas is paramount or seamless integration into wearable electronics.

Keywords: Flexible rectenna, wearable applications , wireless power transfer.

Introduction

Most energy resources, such as gas, oil, and nuclear businesses, do not persist indefinitely and their prices fluctuate from time to time. Furthermore, they are not environmentally friendly. To prevent the drawbacks of present energy supplies, alternative ones will be required. There is now a lot of research being done on greener, cleaner, and safer energy resources [1]-[3].

Electronic gadgets have become an integral part of our daily lives in today's globe. However, because to their power consumption, they must be recharged on a regular basis. Furthermore, we must transport the chargers everywhere, which is problematic. An optimised approach is to employ wireless energy harvesting devices, which exploit ambient energy signals in the environment to generate useable electricity. RF radiations are employed for this since they are non-harmful to people and can even reach the ionosphere. As a rlt, this technology is more secure and environmentally friendly. This research examines recent advances in flexible rectennas and their prospective uses in wireless power transmission to wearable devices.

1. Rectenna

A device called "Rectenna" is used to harvest RF energy, which is a combination of a rectifier and an antenna. It essentially transforms electromagnetic energy to direct current (DC). A radiator, an impedance-matching circuit, a rectifier, a DC filter, and a load are all part of it. Rectenna detects electromagnetic (EM) impulses in the environment. Then it transforms them to direct current voltage, which may power low-power devices such as wireless sensors [4]. Rectenna is made up of a radiator, a rectifier, a filter, and a load. Figure 1 shows one example of this. The EM impulses are received by the radiator. There are many different types of antennas, including bipolar, microstrip, helical, dipole, array, planar, and parabolic antennas. Because they have varied design structures and features, they may be used for a variety of purposes.

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KINETICS AND THERMODYNAMIC STUDIES OF PHOTO-CATALYTIC HYDROGEN GENERATION BY Au/Pt/TiO_2

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ABSTRACT

Titania-supported Au-Pt nanoparticles have been prepared by the photo-deposition method employing platinum and gold particles on the titanium dioxide surface. The properties of the developed photocatalysts were characterized by two methods, such as UV-visible diffuse spectrophotometry (UV-Vis) and transmission electron microscopy (TEM). When loaded with gold and platinum particles, titanium dioxide's (TiO_2) photocatalytic activity significantly improved. This beneficial effect was attributed to an augmentation in the segregation of the electron-hole charge carriers generated by the photons. The kinetic and thermodynamic parameters were carried out, and they followed the Langmuir-Hinshelwood (L-H) mechanism. The amount of photo-induced hydrogen fabrication was studied, which depended on the sacrificial agent's concentration. It was found that the constant rate tends to increase as the concentration of ethanol increases. At 100 percent ethanol, there is a departure from the trend due to a change in the reaction mechanism. It was also observed that the rate increased with temperature. The different thermodynamic parameters like enthalpy of activation (ΔH^*), activation energy (E_a), entropy of activation (ΔS^*), and Gibb's free energy of activation (ΔG^*) were estimated for the reaction. Net energy recovery (NER) is a critical criterion for assessing the viability of conducting a photocatalytic process. Additionally, the current investigation revealed that the system containing 80% ethanol exhibited the greatest NER value.

Keywords: Gold-Platinum Doped Titania; Photo-Catalytic Hydrogen Generation; L-H Kinetics; Thermodynamic Parameters; Net Energy Recovery.

INTRODUCTION

Energy is the essential source required for a healthy life on earth. The most significant form of energy needed to balance the ecosystem is solar energy, but it cannot be adapted for application in terms of primary sources. Energy generated from fossil fuels helps in assisting and booming our everyday activities for sustaining life and incorporating industrial events. Researchers from parts of the country are effortlessly working hard to derive an alternative source of energy that is eco-friendly and readily acceptable to the environment. Hydrogen is considered the best option for the fuel needed in the future. Au, Ag, and Cu possess unique characteristics in terms of surface plasmon resonance (SPR). It is mainly the resonant oscillation of the free electron within the metals, as the frequency of the photon incident ties up with the frequency of the surface electron that oscillates in context with the restoring force of positively charged metallic nuclei.[2] Such metals can absorb light in the visible region, enabling them to be the essential component for solar irradiance, and therefore they have gained attraction for applications in photovoltaics and photodetectors.[3,4] Due to its substantial extinction coefficient, the Au particle is predominantly utilized in the configuration of a plasmonic metal.

In contrast, TiO_2 is classified as an electron-accepting n-type semiconductor on account of its attributes, including a substantial density of states (DOS) situated within the conduction band (CB).[5] Platinum plays a crucial role in impeding the recombination process of both electron (e-) and hole (h+) charges, hence functioning as a transient reservoir. The platinum surface facilitates the reaction of electrons with water or photon molecules, resulting in the formation of H* radicals.[6,7,8] It has been found that Pt nanoparticles do not show any visible light absorption, whereas they exhibit excellent catalytic activity. Hence, the utilization of bimetallic nanoparticles composed of gold (Au) and platinum (Pt) on titanium dioxide (TiO_2) holds

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Synthesis of CuO via Sol-gel method and preparation of its Urea formaldehyde Nanocomposite

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ABSTRACT

The current work mainly deals with the development of new method of synthesis of CuO nanoparticles by using Sol-gel method. The obtained CuO was encapsulated in urea-formaldehyde (UF) resin by acid catalysed polymerization process. The characterization of CuO and CuO-UF made by Infra red spectroscopy (FT-IR), X- ray diffraction (XRD) and Field emission scanning electron microscopy (FESEM). FT-IR data gives the information of nature of bonds present in metal oxide CuO and on CuO-UF. Crystalline size of CuO nanoparticle calculated using Debye-Scherer formula found to be 24 nm. SEM and EDX analysis gives the diameter of particles and its elemental composition. From the interpretation of characterization data synthesis of CuO and nanocomposite of CuO-UF is confirmed.

Keywords: Nanoparticle, Nanocomposites, CuO, CuO-UF

I. INTRODUCTION

Various metal elements form a large diverse class of compounds with oxygen called oxides/metal oxides. Metal oxides covers many branches of science and technology including physics, chemistry, material sciences and engineering[1]. Due to their unique properties, nanostructures of transition metal oxides have piqued the interest of material scientists and engineers in recent years, the corresponding bulk counterparts, which in turn provide promising applications in a variety of technological fields. Preparation of high-quality nanostructures with defined, controllable size and morphology is a critical requirement for developing nanodevices and other applications such as catalysts, sensers, and pharmaceuticals[2].

Metal oxide nanoparticles such as TiO_2, SiO_2, iron oxide, zinc oxide (ZnO), gallium oxide (Ga_2O_3), nickel oxide (NiO), copper oxide (CuO), and others have been synthesized. Metal oxide nanoparticles demonstrated exciting results in terms of physical and chemical properties due to their high density and limited size; therefore, it is highly desirable to understand their various aspects in terms of synthesis,

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Methods for eliminating micropollutant from wastewater: A review

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ABSTRACT
The amount of suspended solid and medicinal micropollutants, such as fungicides, personal care products, contraceptive medications, antibiotics and aromatic hydrocarbons are increasing daily and has reached an alarming level. The micropollutant present in wastewater must be treated before its release because it forms adverse effect on mortal health. Because some harmful micropollutants are incredibly difficult to remove from WWTPs because of their nonbiodegradability, poor adsorption capability, complex nature and traditional wastewater treatments are precious or insufficient for decontamination. For the micropollutant declination some of the conventional physicochemical has been used. The use of powdered activated carbon (PAC) for water purification has been proven to be effective without harming the environment. Advanced oxidation technologies (AOTs), typically applied after natural processes have recently emerged as effective tertiary treatments for the withdrawal of micropollutants at high concentrations. Various methods have been developed and studied for the removal of these micropollutants from wastewater. This review aims to provide a comprehensive overview of the different methods employed, including physical, chemical, and biological processes, highlighting their effectiveness and limitations in micropollutant removal. As well as improving treatment efficiency, they can also remove any accumulation of dangerous byproducts produced during treatment.

Introduction

All living creatures need water to survive, and water availability is associated with major causes of mortality, such as domestic use and agriculture. Some contaminants of emerging concern (CECs) from different sources end up in aquatic resources, including ground water, surface water and drinking water, at concentrations ranging from a few nanograms/liter to a few milligrams/liter (Barbosa *et al.*, 2016; Bhutiani *et al.*, 2022; Ahamad *et al.*, 2023). Domestic, agricultural, sanitarium and industrial wastewater; livestock; and aquaculture are among the anthropogenic sources of MPs (Barbosa *et al.*, 2015; Bhutiani *et al.*, 2021). Urban wastewater treatment plants (UWWTPs) release treated backwaters as a significant source of MPs, and conventional physicochemical and biological treatment methods are not designed to eliminate organic composites completely from trace concentrations (Barbosa *et al.*, 2015; Bhutiani and Ahamad, 2018; Sousa *et al.*, 2018). The severe biological effects of these micropollutants have led to years of research on these pollutants (Aschermann *et al.*, 2018; Batel *et al.*, 2020; Gautam *et al.*, 2020). The amount of organic micropollutants, such as fungicides, personal care products, contraceptive medications, antibiotics and aromatic hydrocarbons, is increasing daily and has reached an alarming level (Mailler *et al.*, 2016; Meza *et al.*, 2020). Some harmful micropollutants are incredibly difficult to remove from WWTPs because of their nonbiodegradability, poor adsorption capability, complex nature and traditional wastewater

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RESEARCH ARTICLE OPEN ACCESS

Production of Bioactive Compounds from Vegetable Waste using Microbial Consortia

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Abstract

Utilizing vegetable waste to produce bioactive compounds through microbial consortia represents a holistic solution to waste management challenges. Efficient waste collection systems in major cities ensure proper segregation of vegetable waste and lay the groundwork for resource utilization. Segregating waste at its source enhances waste stream quality and facilitates downstream processing. Research and development efforts investigating tailored microbial consortia seek to optimize waste degradation and bioactive compound yields, thereby unlocking the potential of waste. This approach significantly reduces greenhouse gas emissions by diverting vegetable waste from landfills, thereby mitigating climate change effects and improving air quality. Moreover, it conserves natural resources by reducing the need for virgin materials and promoting biodiversity, conservation, and sustainable resource management. Here, the enzymatic activities and phenolic concentrations derived from the biodegradation of vegetable waste were analyzed over 14 days. Protease activity that plays a vital role in breaking down proteins reached a notable level of 300 µg/ml after 14-day incubation. Lipase activity which is essential for lipid breakdown was observed at a concentration of 6.3 µg/ml. Furthermore, phenolic concentration analysis revealed a significant range, with values ranging from 225 µg/ml to 240 µg/ml after 14 days of incubation. Phenolics are phytochemicals possessing antioxidant properties and potential health benefits. These findings provide valuable insight into the efficacy of utilizing vegetable waste as a substrate for enzymatic and phytochemical production. The observed enzymatic activities and phenolic concentrations highlight the potential of vegetable waste as a valuable resource for the sustainable production of industrially relevant compounds.

Keywords: Waste Management, Microbial Consortia, Enzymes, Biodegradation, Bioactive compounds

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OPTIMIZATION OF SOME FERMENTATION CONDITIONS FOR THE PRODUCTION OF EXTRACELLULAR AMYLASES BY USING ASPERGILLUS SPECIES

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ABSTRACT:
Amylolytic fungal isolates were obtained by starch-agar plate method from soil sample collected from santra market of Nagpur. Various amylolytic fungi were isolated and out of which three *Aspergillus species*, named as *Aspergillus niger, Aspergillus flavus* and *Aspergillus oryzae* were selected based on clear zone ratio. Amylase production was optimized using basal media. The maximum level of amylase production was achieved from *Aspergillus niger, flavus* and *oryzae* after 72 h of cultivation. The optimal temperature for amylase production was in the range of 40 to 45 ° **C** and pH of the media in the range 7 to 7.5.Under the optimized fermentation conditions Aspergillus species produced almost the similar amount of amylase with organic agro-wastes compared to the basal media. Results reported herein support the notion that all *Aspergillus species* can be used to produce industrially important amylases by utilizing agro-wastes.

Keywords :- Aspergillus niger, Aspergillus flavus, Aspergillus oryzae, Amylase production and agro-wastes.

INTRODUCTION :

In recent era, the applications of microorganisms has great importance in food, textile and detergent industries and has gained great interest into the exploration of enzyme activity in microorganisms (Sivaramakrishnan *et al.*, 2006). Amylases are industrially important enzymes which hydrolyze starch a homopolysaccharide to give various products like dextrin and smaller polymers of glucose unit (Gupta *et al.*, 2009). Amylases are extracellular enzymes which are most important for biotechnology with great significance and contribute approximately 25% of the world enzyme market. Amylases can be obtained from several sources, such as plants, animals and microorganisms. However, a large number of microbial amylases are available commercially and completely replaced chemical hydrolysis of starch,a substrate for amylase in starch processing industry. Major benefit of using microorganisms for the production of amylases is the economical bulk production capacity and they are easily manipulated to obtain enzymes of desired characteristics (Karnwal and Nigam, 2013). Amylase can be obtained from various sources like fungi, yeast, bacteria and actinomycetes; however, especially fungi, have gained highest attention because of the availability and high productivity of fungi, which are also amenable to genetic manipulation. Many fungi had been found to be good sources of amylolytic enzymes. Many studies indicated that amylases of fungal origin are more stable than those of bacterial origin (Sanghvi *et al.*, 2011). Starch is the best substrate for production of yeast cells in a large scale due to its low price and easily available raw material in most regions of the world. Because most of yeasts from environments are safe (GRAS) compared to bacteria, interest in amylolytic yeasts has increased in recent years

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A COMPARATIVE STUDY OF CUSTOMER ATTITUDE TOWARDS BRANDED FOOD OUTLETS AND UNBRANDED FOOD OUTLETS IN NAGPUR CITY

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ABSTRACT:

This research paper presents a comparative study of customer attitudes towards branded and unbranded food outlets in Nagpur City. With the food industry experiencing rapid growth and diversification, understanding customer preferences and behaviors is essential for businesses to remain competitive. The study employs a mixed-method approach, combining surveys and interviews to gather data from customers visiting both types of establishments. Findings reveal distinct differences in customer perceptions, with branded outlets being associated with consistency and quality, while unbranded outlets are favored for their authenticity and personalized service. The implications of these findings for businesses in the food industry are discussed, along with recommendations to enhance customer satisfaction and loyalty. Overall, this research contributes to a deeper understanding of consumer behavior in the context of branded and unbranded food outlets in Nagpur City.

KEYWORDS: *Customer Attitude, Branded Food Outlets, Unbranded Food Outlets, Nagpur City, Comparative Study.*

INTRODUCTION

The food industry in Nagpur City has experienced remarkable growth, marked by the emergence of both branded and unbranded food outlets catering to diverse consumer preferences. In this dynamic landscape, understanding customer attitudes towards these outlets is paramount for businesses aiming to formulate effective strategies and maintain competitiveness in the market.

Nagpur City, located in the central Indian state of Maharashtra, boasts a vibrant culinary scene characterized by a wide array of dining options ranging from traditional street vendors to upscale restaurants. In recent years, the city's food industry has witnessed a surge in the establishment of both branded and unbranded food outlets, reflecting the evolving tastes and preferences of consumers.

Branded food outlets, typically associated with recognizable chains and franchises, have proliferated in Nagpur City, offering standardized menus, consistent quality, and familiar branding.

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CRITICAL ANALYSIS OF EMOTIONAL INTELLIGENCE AND OCCUPATIONAL STRESS AMONG PRIVATE SECTOR BANK EMPLOYEES IN NAGPUR CITY

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ABSTRACT:

This research paper presents a critical analysis of the relationship between emotional intelligence (EI) and occupational stress among employees in private sector banks operating in Nagpur City. The study aims to investigate the influence of emotional intelligence on managing and coping with the occupational stress experienced by bank employees. Through a mixed-methods approach involving surveys and interviews, data were collected to examine the levels of emotional intelligence, identify common occupational stressors, and explore coping mechanisms utilized by employees. The findings highlight the significance of emotional intelligence in mitigating occupational stress and provide insights into strategies for enhancing emotional intelligence among bank employees to foster a healthier work environment. This research contributes to the understanding of organizational psychology and human resource management within the banking sector, offering practical implications for promoting employee well-being and organizational effectiveness.

KEYWORDS: *Emotional Intelligence, Occupational Stress, Private Sector Banks, Nagpur City, Coping Mechanisms*

INTRODUCTION

This research paper presents a critical analysis of the relationship between emotional intelligence (EI) and occupational stress among employees in private sector banks operating in Nagpur City. The study aims to investigate the influence of emotional intelligence on managing and coping with the occupational stress experienced by bank employees. Through a mixed-methods approach involving surveys and interviews, data were collected to examine the levels of emotional intelligence, identify common occupational stressors, and explore coping mechanisms utilized by employees. The findings highlight the significance of emotional intelligence in mitigating occupational stress and provide insights into strategies for enhancing emotional intelligence among bank employees to foster a healthier work environment. This research contributes to the understanding of organizational

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AN ANALYTICAL STUDY OF CUSTOMER RELATIONSHIP MANAGEMENT (CRM) PRACTICES IN THE TOURISM SECTOR IN NAGPUR DISTRICT

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ABSTRACT:

This research paper aims to investigate the Customer Relationship Management (CRM) practices in the tourism sector specifically in Nagpur District. The tourism industry plays a vital role in economic development, and effective CRM practices are essential for sustaining and enhancing customer satisfaction and loyalty. This study employs a mixed-methods approach, combining qualitative and quantitative techniques to gather data from both tourists and tourism businesses. The qualitative aspect involves in-depth interviews with tourists to understand their perceptions and experiences with CRM practices, while the quantitative aspect utilizes surveys distributed among tourism businesses to assess the implementation and effectiveness of CRM strategies. The findings of this study will contribute to a better understanding of CRM practices in the tourism sector and provide insights for improving customer satisfaction and loyalty in Nagpur District's tourism industry.

KEYWORDS: *Customer Relationship Management, CRM Practices, Tourism Sector, Nagpur District, Customer Satisfaction, Loyalty*

INTRODUCTION:

The tourism sector is a significant contributor to economic growth and development in various regions worldwide, including Nagpur District. As competition within the tourism industry intensifies, the importance of effective Customer Relationship Management (CRM) practices becomes increasingly evident. CRM is a strategic approach that focuses on building and maintaining long-term relationships with customers by understanding their needs and preferences and delivering personalized services and experiences.

Nagpur District, located in the Indian state of Maharashtra, is renowned for its rich cultural heritage, historical landmarks, and natural attractions. With its diverse offerings ranging from wildlife sanctuaries and religious sites to adventure tourism opportunities, Nagpur District attracts a significant number of domestic and international tourists each year. As the tourism industry in Nagpur District continues to expand, tourism businesses face challenges in meeting the evolving needs and expectations of customers.

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IMPACT OF PRODUCT QUALITY MANAGEMENT ON CUSTOMER SATISFACTION IN SELECTED MSME INDUSTRIES IN NAGPUR DISTRICT

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ABSTRACT:

This research paper examines the impact of product quality management on customer satisfaction within Micro, Small, and Medium Enterprises (MSMEs) in the Nagpur district. Employing a quantitative research approach, data was collected from a sample of MSMEs through surveys and subjected to statistical analysis. The study aims to elucidate the relationship between effective product quality management strategies and heightened levels of customer satisfaction, thus contributing to the competitiveness and success of MSMEs in the region. The findings underscore the significance of robust quality management practices in fostering positive customer perceptions and loyalty, with implications for enhancing the overall performance of MSMEs in Nagpur district.

KEYWORDS: *Product Quality Management, Customer Satisfaction, MSMEs, Nagpur District*

INTRODUCTION:

Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in driving economic growth, fostering innovation, and generating employment opportunities in both developed and developing economies. In the context of the Nagpur district, MSMEs form a significant portion of the industrial landscape, contributing to the region's economic vitality and development. However, amidst increasing market competition and evolving consumer preferences, MSMEs face challenges in maintaining and enhancing their market position, particularly concerning product quality management and customer satisfaction.

Effective product quality management is integral to the success and sustainability of MSMEs, as it directly impacts customer satisfaction, brand reputation, and overall business performance. In the dynamic business environment of Nagpur district, MSMEs must continually strive to meet or exceed customer expectations regarding product quality to remain competitive and thrive in the marketplace.

Despite the acknowledged importance of product quality management in MSMEs, there remains a gap in understanding the specific impact of quality management practices on customer satisfaction within the context of Nagpur district. Identifying and addressing this gap is essential for MSMEs in the region to enhance their competitiveness, improve customer loyalty, and achieve sustainable growth.

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A KEY ROLE OF 'VOCAL FOR LOCAL' IN THE MISSION OF SELF-RELIANT INDIA (ATMANIRBHAR BHARAT)

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ABSTRACT

Vocal for local in India, it is not a brand-new idea. Gandhiji pioneered this idea during a time when Indian products were prioritised above British ones in order to preserve India's economy and morals. The "Vocal for Local" is subsequent widespread slogan to begin amid the Covid-19 outburst. The thought behind this movement, whereas, is not brand-new. It has its origins in the Swadeshi movement, which gained national attention in 1905 during the war for Indian independence. Swadeshi was created and promoted by Mahatma Gandhi and the other outstanding liberation fighters as a means of instilling nationalism and patriotic pride among Indians. In past two years the Covid-19 pandemic was indeed having a previously completely unnoticed impact on global economies. The Indian government has announced and changed many policies to aid in the nation's response to the pandemic. The Atmanirbhar Bharat Abhiyaan (Self-reliant India campaign) was launched by our PM on May 12, 2020. The vision of the new India that the Honourable Prime Minister Shri Narendra Modi has in mind is the Atmanirbhar Bharat Abhiyaan or Self-Reliant India campaign. Making the nation and its people independent and self-sufficient is the goal. A special economic and comprehensive package of INR 20 lakh crores was declared to combat the Covid-19 pandemic in India. Atmanirbhar Bharat is supported by five pillars: economy, infrastructure, system, vibrant demography and demand. Vocal for Local is an initiative aimed at improving domestic manufacturing and usage, for which government have created numerous strategies like "Make in India, Start-up India, and Digital India." Vocal for local offers small businesses and domestic industries clear priority. India has a chance to develop into a manufacturing powerhouse and can help to maintain international trade by campaigning for Vocal for Local. The present study overviews the Self-reliant India campaign (Atmanirbhar Bharat Abhiyaan). The study also attempts to assess the role of 'Vocal for Local' campaign in the mission of Self-Reliant India.

Keywords: *Self-Reliant India (Atmanirbhar Bharat), Make in India, Vocal for Local.*

Introduction

Indians have recently changed their focus to domestically produced items in order to replace imported goods and accomplish their resolution. Vocal for local In India, it is not a brand-new idea. Gandhiji pioneered this idea during a time when Indian products were prioritised above British ones in order to preserve India's economy and morals. The "Vocal for Local" is subsequent widespread slogan to begin amid the Covid-19 outburst. The thought behind this movement, whereas, is not brand-new. It has its origins in the Swadeshi movement, which gained national attention in 1905 during the war for Indian independence. Swadeshi was created and promoted by Mahatma Gandhi and the other outstanding liberation fighters as a means of instilling nationalism and patriotic pride among Indians.

In previous two years the Covid-19 pandemic was certainly having a previously completely unnoticed impact on global economies. The Indian government has announced and changed many policies to aid in the nation's response to the pandemic. The vision of the new India that the Honourable

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DIGITAL TRANSFORMATION: A CATALYST FOR SUSTAINABILITY OF BUSINESS MODELS

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Abstract :

The exponential growth of digital techniques lately, have induced business firms to adopt digital transformations to improve business efficiency, survive the competition, attain cost savings, and also in achieving the strategic objective of sustainability. This concept of rigorous digital transformation refers to integration of the cybernetic technology into large business practices after analyzing their impact on our environment, social, and economy. Adoption of such creative digital technologies calls on the business firms to cautiously evaluate the impact of environment, maximize the consumption of energy, and reduce the generation of e-waste which could eventually help in supporting social development. Digitalization provides business organisations the correct approach to a huge web of unused data, that possesses the prospect to have a beneficial impact on the society as well as the environment. Digitalization not only has the power of making a business organization more resilient and profitable in their operations but also more brisk and smarter, helping them to be able to adjust to consumer needs and the dynamic market conditions. By adopting sustainable practices in order to acquire innovative digital technologies, business firms can also make a huge contribution towards the society by lowering down their carbon footprint. So, this research paper attempts to analyze the digital transformations embraced by the business organizations for long term sustainability.

Keywords: digital transformation; sustainable development, digital technology; innovation, economy, business models.

Introduction :

The recent revolution of digital transformation has drawn significant attention of the business organisations. The term digital transformation encompasses the unique procedure of any business organization wherein they adopt and implement digital technology in order to create new or modify the existing products, services, and operations by the means of translating business processes into a digital format. Such technologies help organisations to accept new and modern applications and create value for the firms. Meanwhile, companies nowadays are also embracing sustainable business models (SBMs), with a view to merge the novel considerations of sustainability and help raise competitive advantage.

With reference to global economic growth, mounting social discriminations, and

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CONTRIBUTION OF SCIENCE FICTION AND SCI- FI MOVIES TO DIGITAL LITERATURE

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ABSTRACT

Science fiction deals with fantastic ideas and futuristic themes related to science and technology borrowing abundant knowledge from the real world. Forrest Ackerman first used the term "sci-fi" for science fiction in 1954 (Ackerman,2008).The elements used in these thrillers are robots, space, extraterrestrials and advanced technology.The present paper aims to study in detail a few important novels and sci-fi movies. The novel taken up for the study is The War of the Worlds. Some path-breaking movies have been made on similar themes. One of them is "Avatar". Various digital games have been developed from these novels and movies.

Keywords: Extraterrestrials, Sci-Fi, Aliens, Robots, Futuristic

Introduction-

Digital literature, also known as electronic literature, is a genre of writing consisting of creative pieces that have been crafted exclusively for digital devices such as computers and mobile phones.It is a new medium that acts like a bridge between the digital world and the traditional ways of storytelling. It has taken storytelling to unknown heights. This new form can have multiple conclusions controlled by the reader. It gives a more active role to the reader who becomes more involved in the development of the plot. Most of the video games developed today are on the theme of science fiction, a highly popular genre.

The types of digital literature are hypertext fiction, network fiction, interactive fiction, code work and flash poems. Hypertext literature like *Califia* by M.D Coverley, *Twelve Blue* by Michael Joyce are very popular amongst the youngsters.

Science fiction is an important genre of fiction which deals with the imaginative concepts related to advanced science and technology. Forrest Ackerman first used the term "sci-fi" for

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THE ROLE OF HUMAN RESOURCES MANAGEMENT IN PROMOTING CORPORATE SOCIAL RESPONSIBILITY INITIATIVES AND THEIR IMPACT ON ORGANIZATIONAL REPUTATION AND PERFORMANCE

Dr. Trupti Sakhare

Assistant Professor, Department of Management, Dada Ramchand Bakhru Sindhu Mahavidyalaya Nagpur.

ABSTRACT: This study looks at how important it is for Human Resources Management (HRM) to support Corporate Social Responsibility (CSR) programmes and how they affect the performance and reputation of businesses. .....

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THE ROLE OF TECHNOLOGY IN HUMAN RESOURCES MANAGEMENT

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ABSTRACT:

Human resources management (HRM) has changed as a result of the use of technology, producing more effective, efficient, and strategic operations than before. This essay looks at the various ways that technology has affected HRM, including learning and development, performance management, employee engagement, recruiting, and strategic planning. It highlights how tools like applicant tracking systems, digital communication platforms, performance management software, e-learning solutions, and HR analytics are reshaping the HR landscape. Additionally, the paper addresses the benefits such as increased efficiency, improved decision-making, enhanced employee experience, and cost savings, while also considering the challenges related to data privacy, technology adoption, system integration, and potential over-reliance on digital tools. The study concludes by exploring future trends in HR technology, emphasizing the ongoing evolution and its implications for HR professionals and organizations.

KEYWORDS: *Human Resources Management (HRM), Technology Integration, Recruitment Automation, E-learning, Artificial Intelligence (AI)*

INTRODUCTION:

Human resources management (HRM) is significantly impacted by technology in the digital age, as manual procedures are replaced with ones that are more data-driven, effective, and consistent with business goals. Payroll, benefits administration, and compliance were among the administrative tasks that HRM concentrated on in the past. However, because of technological improvements, HRM today encompasses talent acquisition, employee engagement, performance management, learning and development, and strategic planning.

Technological advancements have revolutionized the recruitment and selection process, enhancing the candidate experience and reaching a wider pool of applicants. Employee engagement and communication have also been transformed by digital platforms, fostering a more connected workforce. Performance management has also benefited from modern tools, such as performance appraisal systems, 360-degree feedback tools, and continuous tracking solutions.

Learning and development have become more accessible and customizable through e-learning platforms, virtual classrooms, and mobile applications. HR analytics tools have significantly enhanced strategic planning by providing actionable insights into workforce trends, employee turnover, and productivity.

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"Recent Trends in Sports: Innovations, Technologies, and Societal Impact"

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(28)

Abstract:

The landscape of sports is undergoing a paradigm shift, driven by rapid technological advancements, and shifting societal dynamics. This research paper delves into the recent trends in sports, focusing on the integration of cutting-edge innovations and technologies that are redefining how sports are played, experienced, and perceived. From wearable technology to virtual reality and artificial intelligence, this paper explores the impact of these innovations on athlete performance, fan engagement, and the broader societal implications. Additionally, it addresses the evolving societal perspectives in sports, emphasizing inclusivity, diversity, and sustainability. By examining the fusion of technology and sports, this research sheds light on the trajectory of the sports industry and its transformative influence on society at large.

Keywords: Sports, Innovations, Technologies, Societal Impact, Virtual Reality (VR), Augmented Reality (AR), Advanced Equipment

Introduction:

Sports transcend national and cultural barriers because they are inextricably linked to human civilization. From ancient athletic competitions to modern sporting events, sports' fundamental goal of providing a showcase for physical prowess, talent, and entertainment hasn't changed. Due to significant developments in methodology, technology, and social context, sports today take place in a dynamic and ever-evolving setting. Sports have a long history and started out as simple physical contests that encouraged collaboration and highlighted both individual and collective talents. Sports have changed throughout time from local contests to global spectacles that have sparked the enthusiasm and fervour of millions of people. This development has been significantly impacted by technology integration, which has altered how sports are played, enjoyed, and governed.

Technological advancements in areas like materials science, biomechanics, communication, and information processing have completely changed how sports are played today. Technology has played a significant role in the development and appeal of sports, from the development of athletic equipment to the assessment of player performance and audience engagement. This study's objective is to look at contemporary sports trends and provide light on how important innovations and technology have become. By analysing these tendencies, we want to comprehend how technology is altering the sports industry and, therefore, how this alteration is influencing society.

Objectives of the Study:

1) To investigate the latest advancements in technology that are shaping the sports landscape, focusing on wearable technology, virtual reality, artificial intelligence, and advanced equipment.
2) To evaluate how these technological trends are impacting society, including aspects such as fan engagement, inclusivity, diversity, ethical considerations, and sustainability.
3) To provide insights into potential future trends at the intersection of sports and technology, envisioning the direction in which the sports industry is heading.

Literature Review:

The integration of technology and innovation within the realm of sports has been a subject of extensive study and research. Scholars and researchers have explored various aspects of this integration, focusing on technological advancements, their impact on athlete performance, fan engagement, and the broader societal implications.

1) Wearable Technology:

Wearable technology has garnered significant attention due to its potential to enhance athlete performance and provide valuable insights for training and recovery. Research by James et al. (2016) delves into the applications of wearable devices in monitoring athlete health, tracking physical activity, and optimizing training routines. Their study highlights the potential of wearable technology in preventing injuries and improving overall performance.

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The Role of Physical Education and Physical Education Teachers in the National Education Policy of India

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Abstract: *This research paper explores the role of physical education and teachers within the National Education Policy (NEP) in India, focusing on its holistic approach to education. The study provides an overview of the NEP's objectives, historical context, and literature review, incorporating theoretical perspectives on holistic development and international best practices. It examines the objectives of physical education, focusing on its role in comprehensive student development and promoting inclusivity. Challenges in implementing physical education, such as infrastructure, resources, and teacher training, are identified, and recommendations for improvement are presented. The paper also highlights the role of physical education teachers in curriculum design, implementation, and strategies for student engagement and motivation. The paper proposes future directions for refining physical education policies, including enhancing inclusivity, improving infrastructure, and prioritizing teacher training. It also advocates for continued research and evaluation to measure the impact of physical education on student outcomes, aligning these programs with the broader goals of the NEP. This research contributes to the ongoing discourse surrounding education reform in India, providing insights and recommendations for policymakers, educators, and stakeholders.*

Keywords: National Education Policy, Physical Education, Holistic Development, Teacher Training, Inclusivity, Curriculum Design, Student Engagement

I. INTRODUCTION

Education is a dynamic sphere that continually adapts to societal needs and aspirations. In the context of India, the National Education Policy (NEP) serves as a visionary document, outlining the transformative journey of the education system. As the NEP seeks to redefine the contours of learning, its emphasis extends beyond traditional academic achievements, recognizing the importance of holistic development. Central to this paradigm shift is the role of physical education and the educators who impart it – the physical education teachers.

Physical education stands as an integral pillar within the NEP, advocating for the holistic well-being of students. The NEP recognizes that a comprehensive education system should not only nurture intellectual capacities but also attend to the physical, emotional, and social dimensions of a student's growth. Against this backdrop, this research paper aims to scrutinize the multifaceted role of physical education and its practitioners within the ambit of the National Education Policy of India.

Historically, physical education in India has undergone evolutionary phases, from an emphasis on military training during ancient times to its contemporary role in fostering a healthy and well-rounded citizenry. Understanding this historical context provides insights into the nuanced development of physical education policies and practices in the country.

The NEP unveiled in [year], serves as a comprehensive blueprint for the transformation of the education landscape. At its core, the NEP envisions an education system that instils not only knowledge but also essential life skills, ethical values, and physical fitness. Physical education emerges as a critical component in achieving these broader objectives. While the NEP outlines the significance of physical education, the translation of policies into effective practices presents a complex challenge. This study aims to bridge this gap by delving into the actual role played by physical

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परसाई जी के व्यंग्यों में सामाजिक व सांस्कृतिक चेतना

डॉ. सपना तिवारी[2]

सारांश :

जीवन की जर्जरता पर तेज़ाबी प्रहार करने वाला व्यंग्य व्यंजनास्त्र है, जो सामाजिक सांस्कृतिक, राजनैतिक व आर्थिक चिंतन की रूग्णता को काट फेंकने के लिए तत्पर रहता है। यह सामाजिक दायित्व बोध के प्रति जागरुक, प्रतिबद्ध, सतर्क व सोद्देश्य, सार्थक सृजन कर्म है। व्यंग्य सामाजिक विद्रुपताओं का विवेचक है। जीवन से यथार्थ साक्षात्कार करते हुए विसंगतियों पर प्रहार करना तथा मिथ्याचारों, दुमुँहों आचरण पर आक्षेप करना यही व्यंग्य का प्रथम दायित्व है। हास्य के झीने-झीने वस्त्रों में मंडित होने वाला व्यंग्य सत्य का शोधक, न्याय का पोषक, समता का समर्थक बनकर युग जीवन की संपूर्ण विद्रुपताओं को ललकारता है। यह कोरा उपदेश नहीं, मनोरंजक नहीं, मूक व तटस्थ दर्शन नहीं बल्कि जीवन की हर सच्चाई से स्पंदित होकर गतिशील होता है। अतः व्यंग्य सामाजिक व सांस्कृतिक चेतना का सर्जनात्मक प्रहरी है। हरिशंकर परसाई जी हिन्दी के पहले ऐसे रचनाकार हैं जिन्होंने व्यंग्य को विधा का दर्जा दिलाया और हल्के-फुल्के मनोरंजन की परंपरागत परिधि से उबारकर समाज के व्यापक प्रश्नों से जोड़ा है। उनकी व्यंग्य रचनाएँ हमारे मन में गुदगुदी नहीं करती बल्कि हमें सामाजिक वास्तविकताओं के आमने-सामने खड़ी करती हैं। परसाई जी ने मानव मन और उसके आस-पास की व्यवस्था और परिवेश की विसंगति को गहराई से परखा है।

बीज शब्द : रचनाधर्म, समाज, राजनीति, चिंतन

"व्यंग्य की उत्पत्ति का मूल कारण संगतियों, सामंजस्यों एवं अनुपातों में उत्पन्न गड़बड़ी को मानते हुए उन्होंने "तिरछी रेखाएँ" की भूमिका में लिखा है- "परंपरा से हर समाज की कुछ संगतियाँ होती है, सामंजस्य होते हैं, अनुपात होते हैं। जब यह संगति गड़बड़ होती है, तब चेतना में चमक पैदा होती है। इस चमक में हँसी भी आ सकती है और चेतना में हलचल भी पैदा हो सकती है।"[1] राजनीति परिवेश तथा व्यवस्था की समस्त विसंगतियों पर परसाई जी ने अपनी लेखनी चलाकर सभी राजनीतिक पार्टियों की शल्प चिकित्सा की है। शशिभूषण सिंह ने अपनी पुस्तक में परसाई जी के व्यंग्य की चर्चा करते हुए लिखा है - "इन्होंने हर विसंगति के विरूद्ध आवाज उठाई है। उनके लेखन के केंद्र में राजनीति तत्व है, राजनीतिक दृष्टि है जो आधुनिक युग में मनुष्य और समाज की नियति को निर्धारित करती है। उनके व्यंग्य का जन्म ही मनुष्य की रचनात्मक पक्षधरता से होता है। वे मनुष्यता के प्रति किए जाने वाले हर षड़यंत्र के विरूद्ध दिखाई पड़ते हैं। अपने लेखन में वे उस सिस्टम या व्यवस्था को बदलना चाहते हैं जिसमें मनुष्य अर्थहीन हो चुका है।"[2]

पराधीन देश को आज़ाद कराने के लिए लोगों ने बड़े-बड़े बलिदान दिए थे, इस आशा के साथ कि स्वतंत्रता प्राप्ति पर तपस्या का फल मिलेगा। लोगों ने ऐसे साम्राज्य की कल्पना की थी जिसमें कोई भूखा, नंगा और बेघर नहीं रहेगा। जनता ही शासक होगी किंतु हुआ इसके विपरित। भारतीय सत्ताधारियों ने अंग्रेजों से भी एक कदम आगे बढ़ाकर अंधेरगर्दी का कार्य किया। अपने एक व्यंग्य में परसाई जी लिखते हैं - "अंग्रेज छुरी-काँटे से प्लेट में रखकर खाते रहे। देशी साहब बचे भारत को खाने लगे। देश 1947 में स्वतंत्र हो गया। अहिंसक क्रांति कहलाई। विदेशियों ने ट्रांसफर आफ पॉवर सत्ता का हस्तांतरण कहा। वास्तव में ट्रांसफर ऑफ डिश हुआ। परोसी थाली एक के सामने से दूसरे के सामने आ गई। वे देश को पश्चिमी सभ्यता के सलाद के साथ खाते थे और देशी सत्ताधारी जनतंत्र के आचार के साथ खाते हैं।"[3]

विकृत राजनीति परिवेश के प्रति परसाई जी के मन में अत्याधिक आक्रोश है, जिसकी खीझ और भड़ास को उन्होंने व्यंग्य के शिल्प, माध्यम और साधनों का भरपूर प्रयोग करते हुए निकाला हैं। पाखंडी झूठे सत्तालोलुपों पर इन्होंने अपने वृतांत 'लंका विजय के बाद में वानर राज्य' अपकर्षात्मक व्यंग्य योजना द्वारा खिल्ली उड़ाई है -"हे भारद्वाज इस समय वानरों ने बड़े-बड़े

[2] एसोसिएट प्रोफेसर, दा.रा.बा. सिंधु महाविद्यालय, नागपुर, मोबाइल: 9960606844, Email: profsapna1234@gmail.com

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डॉ. कृष्ण कुमार मिश्र के वैज्ञानिक साहित्य में सामाजिक सरोकार

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वर्तमान युग एक ऐसा युग है जहाँ विज्ञान मानव जीवनशैली का एक अभिन्न अंग बन कर मानव जीवन के प्रत्येक क्षेत्र में दस्तक दे चुका है। आज विज्ञान और प्रौद्योगिकी के विकास के साथ-साथ सूचना क्रांति व वैश्वीकरण के दौर में दूरियाँ तेजी से सिमट रही हैं। आज भारतीय समाज भी विकसित देशों की पंक्ति के साथ दृष्टिगोचर होने अग्रसित है। ऐसे में हिंदी लोक वैज्ञानिक साहित्य का महत्व व प्रासंगिकता और अधिक बढ़ जाती है। प्रौद्योगिकी के दौर में वैज्ञानिक प्रगति से जुड़े अच्छे-बुरे पहलुओं को समाज के समक्ष आम भाषा में पहुँचाना नितांत आवश्यक है। आम जनता उनकी ही भाषा में लिखे वैज्ञानिक साहित्य से सहजता से जुड़ पाती है और तभी वैज्ञानिक साहित्य जन-जन तक पहुँचकर अपना सामाजिक दायित्व निभाने में सक्षम हो पाता है। निस्केवर के वैज्ञानिक एस.सी.एम. श्री गोहर रज़ा के शब्दों में – "विज्ञान के विचारों का संचार यदि हमारी संस्कृति, अपनी भाषा में रचा-बसा नहीं होगा, तो इसमें सफलता नहीं मिल सकती।" जो परंपरा, मानवता के खिलाफ है, हमें उन्हें जड़ से उखाड़ फेंकना चाहिए और समाज के विभिन्न वर्गों के बीच वैज्ञानिक सोच के पुल बनाने चाहिए।[1]

वास्तव में एक रचनाकार की वैज्ञानिक सोच और उसकी साहित्य परिणति ही साहित्य की लोकमंगल भावना है। जिससे समाज उन्नति की ओर बढ़ता है। वैज्ञानिक युग में वहीं दूसरी ओर दिशाहीन अवैज्ञानिक साहित्य धारणाएँ कूप-मंडूक बना कुंठाओं और विकृतियों के जाल में फँसा देता है।

वैज्ञानिक साहित्य की अवधारणा वैज्ञानिक तथ्यों, शब्दावली, सिद्धांतों को जानकर लेखनी से उतारना नहीं बल्कि उससे ऊपर विज्ञान संबंधी यथार्थ, आदर्श व मानवीय संबंधों की भावनाओं को जोड़कर लिखा जाने वाला साहित्य है। लोक मंगल की भावना वैज्ञानिक साहित्य का सबसे महत्वपूर्ण बिंदु है। समाज कल्याण की भावनाओं से परिपूर्ण वैज्ञानिक डॉ. कृष्ण कुमार मिश्र हिंदी वैज्ञानिक साहित्य में अपनी सतत लेखनी चला रहे हैं। होमी भाभा विज्ञान शिक्षा केंद्र में ऐसोसिएट प्रोफेसर के पद पर कार्यरत डॉ. मिश्र जी लगभग 25-26 वर्षों से हिंदी विज्ञान साहित्य के मौलिक लेखन में अनवरत हैं। आपकी विज्ञान विषयक लगभग 25 पुस्तकें तथा 300 से अधिक लोकोपयोगी आलेख विभिन्न पत्र-पत्रिकाओं में प्रकाशित हुए हैं। वैज्ञानिक साक्षरता को प्रोत्साहित करने एवं विज्ञान के लोकव्यापीकरण हेतु आप 2008 से ई-लर्निंग पोर्टल भी संचालित कर रहे हैं।

21वीं सदी की सबसे बड़ी चुनौति यह है कि ज्ञान-विज्ञान को वैज्ञानिक ढंग से तार्किक तथा विश्वसनीयता के साथ प्रस्तुत किया जाए, तभी हम अपने राष्ट्र, समाज की भावी पीढ़ी को वैज्ञानिक दृष्टि से युक्त विश्व समाज में जोड़ सकते हैं। मिश्र जी के संपूर्ण वैज्ञानिक साहित्य में यह बात मूलभूत रूप से चरितार्थ होती है। अपनी वैज्ञानिक लेखनी को समाजोपयोगी व लोक कल्याणकारी मानते हुए उसे जन सशक्तिकरण से जोड़ते हैं - उनके ही शब्दों में - "लोकविज्ञान वह कुंजी है जो जनोपयोगी, ज्ञान-विज्ञान का ताला खोलकर विज्ञान की जानकारी और वैज्ञानिक दृष्टिकोण जनता के द्वार तक पहुँचा सकती है और उसे विज्ञान व प्रौद्योगिकी के क्षेत्र में हो रहे नए विकास के प्रति जागरुक बना सकती है। ताकि वे सामाजिक जीवन में भय, भूख, आपदा, अज्ञान और अंधविश्वास का मुकाबला बेहतर तरीके से, ज्यादा साहस तथा आत्म विश्वास से कर सके। अर्थात लोकविज्ञान का अभीष्ट जन सशक्तिकरण से जुड़ा है।"[2]

डॉ. मिश्र जी ने अपने वैज्ञानिक आलेखों में जनहित हिताय, जनहित सुखाय को केंद्र में रखकर समाज की भावी पीढ़ी को एक दिशा प्रदान की है। तभी तो 'ओज़ोन विघटन का संकट' (लोक कल्याण विषयक) 'जल है तो जीवन है, (पर्यावरण विषयक) 'जल जीवन का आधार' (लोकोपयोगी) 'स्वास्थ सबकी आवश्यकता', 'योग: विश्व को भारत का अनुपम उपहार' जैसे लोकमंगल की भावना से ओत-प्रोत तथा विद्यार्थियों में वैज्ञानिक चेतना जागृत करने हेतु आपके वैज्ञानिक आलेख महाराष्ट्र, म.प्र., गुजरात, राजस्थान, कर्नाटक, बिहार, श्रीलंका आदि देश-विदेशों में स्कूलों व कॉलेजों के हिंदी पाठ्यक्रम में शामिल किए गए हैं। शोषित और शोषक दो वर्गों में बटे भारतीय समाज में वैज्ञानिक साहित्य दोनों वर्गों के समान होने की बात करता है। यह आँख बंदकर रूढ़ी और अंधविश्वासों को पनपने नहीं देता। वह जन चेतना को जागृत करता है।

इस वैज्ञानिक युग में वैज्ञानिक तार्किकता के स्थान पर समाज में रूढ़िवादिता और अंधश्रद्धा भक्ति, अंधविश्वास बढ़ता जा रहा है, जो मानव समाज को संवेदनहीन घोषित कर रहा है। 'वैज्ञानिक चेतना और हमारा समाज' आलेख में मिश्र जी का कथन है -