Rayat Shikshan Sanstha's

Dr. Patangrao Kadam Mahavidyalaya, Ramanandnagar (Burli)

Research Promotion Committee

Research Papers Published by teachers in referred journal

(2021-2022)

Sr, No.	Title of paper	Name of the author	Department	Name of journal Year of publication ISSN number
1.	Concentration modulated vanadium oxide nano structured for NO_2 gas sensing	Dr. L.D. Kadam	Physics	Elsevier Sensors and Actuators: B. Chemical ISSN -0925-4005 19th October, 2021
2.	Overview of molybdenum disulfide based electrodes for super capacitors: A short review	Dr. L.D. Kadam	Physics	Elsevier Journal of Energy Storage ISSN -2352-152X September 2021
3.	Study of Structural And Electrochemical Properties Of 3D Microflower like Nickel Hydroxide	Dr. L.D. Kadam	Physics	Indian journal of research ISSN -2250-1991 November 2021
4.	Structural And Electrochemical Properties Of Chemically Deposited Copper Doped Nickel Hydroxide	Dr. L.D. Kadam	Physics	Indian journal of research ISSN -2250-1991 November 2021
5.	Effect of time and temperature on adsorption of persulphte ions for developing 2D nanosheers to 3D micro flowers for development of y nickel hydroxide and its super capacitor performance	Dr. L.D. Kadam	Physics	Applied Physics A Material Science & Processing June 2022
6.	Ultrasound assisted green and efficient synthesis of ferrocene- appended azo-phenothioazines	Dr. P. B. Piste	Chemistry	Current research in green and sustainable chemistry2021, ISSN -2666-0865
7.	Nanocrystalline spinel zinc – Substituted cobalt ferrite thick film an efficient ethanol sensor	Dr. P. B. Piste	Chemistry	Materials Today Chemistry , 2021, ISSN -2468-5194
8.	Nano Silica sulfuric acid catalyzed facile synthesis of azothiadiazoles under co-grinding and solvent-free technique	Dr. P. B. Piste	Chemistry	Indian journal of Chemistry, June 2022

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10.	Efficient microwave assisted synthesis os 4-(substituted fluoro-phenyl)- substituted-6h-1-thia-5,7,9a-ttraazacyclopenta (e) azulenes and their microbial activity	Mr. V. R. Bhosale	Chemistry	IJBPAS, 2021 ISSN -2277-4998
11.	Concept of Structuralism: A Review	Dr. U.V. Patil	English	Akshara Multidisciplinary Research Journal 2022 E- ISSN 2582-5429
12.	Vocabulary Development in ESL Class through Text Book: An Action Research Approach	Dr. U.V. Patil	English	Indian Institute of Education and Society UGC Listed Periodical, 2022 ISSN 2278-6864
13.	Feminist Sensitivity and Burden of Language in Diaspora Depicted in the Poetry of Meena Alexander	Dr. U.V. Patil	English	Kanpur Philosophers (UGC Care Listed) 2021 ISSN- 2348-8301
14.	Subaltern Voice in the Poetry of Meena Alexander	Dr. U.V. Patil	English	Akshara Multidisciplinary Research Journal 2022. E- ISSN 2582-5429
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17.	Immigrant Women and Racialized Existence Depicted in Meena Alexzender's Poetry	Dr. U.V. Patil	English	Langlit ISSN2349-5189 November 2021
18.	Effect of Glyphosate based herbicide Roundup on gill structure of a Freshwater Crab	Dr. T. S. Bhosale	Zoology	Utter Pradesh Journal of Zoology. ISSN 0236-971X.
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Committee Chairperson

Principal

Principal,
Dr. Patangrao Kadam Mahavidyalaya,
Ramanandnagar (Burli)
Tal. Palus, Dist. Sangli.

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Concentration modulated vanadium oxide nanostructures for NO_2 gas sensing

B.M. Babar [a], K.B. Pisal [a], S.H. Mujawar [a], V.L. Patil [b], L.D. Kadam [c], U.T. Pawar [d], P.M. Kadam [d,*], P.S. Patil [b,*]

[a] Department of Physics, Yashwantrao Chavan Institute of Science, Satara, Maharashtra 415 001, India
[b] Thin Film Materials Laboratory, Department of Physics, Shivaji University, Kolhapur, Maharashtra 416 004, India
[c] Arts, Science and Commerce College, Ramanandnagar, Sangli, Maharashtra 416 308, India
[d] Smt. Kasturbai Walchand College, Sangli, Maharashtra 416 416, India

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Hydrothermal method
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ABSTRACT

Vanadium Oxide (V_2O_5) nanostructures have been prepared via a simple and inexpensive hydrothermal method using ammonium metavanadate as a vanadium precursor along with oxalic acid. Present work demonstrates the effect of concentration (0.1–0.4 M) variation on gas sensing performance of hydrothermally prepared vanadium pentoxide. The structural, morphological, functional group, and optical properties of V_2O_5 nanostructure have been investigated by using different characterization techniques like X-Ray Diffraction (XRD), Scanning Electron Microscopy (SEM), Fourier Transform Infra-Red (FTIR) Spectroscopy, Raman spectroscopy, and Diffused Reflectance Spectroscopy (DRS) studies respectively. The structural analysis revealed orthorhombic V_2O_5 phase formation with the c-axis orientation along (001) plane. The SEM images revealed platelet-like nanostructures, agglomerated nano structure, and clusters of elongated nano structure. The variation in band gap from 2.06 to 2.14 eV is observed with a change in precursor conc. The BET study indicates good specific surface area and optimum pore diameter. The Photoluminescence shows a centered peak arising at characteristic wavelength 709.25 nm and some other peaks observed at 540.91 nm, 470.86 nm and 391.50 nm which is good for gas sensing application. The sensing selectivity was high for NO_2 gas detection at 150 °C. All samples revealed good response with fast response and recovery time. Sample prepared with 0.3 M concentration exhibited the best response attributed to optimum pore size and high surface area which governs superior sensing features. The response of V_2O_5 is found to be 13% towards 100 ppm NO_2 gas, while response and recovery time is 4 and 55 s respectively. The present work depicts the results of NO_2 gas sensing with fast response and recovery time at relatively low working temperature (150 °C). Hence it explores the use of this material as a potential candidature for the fabrication of vanadium oxide-based gas sensors.

1. Introduction

In recent years, due to vast industrialization and vehicle transportation air pollution in urban as well as in rural areas increased drastically. Such poisoning atmosphere creates serious problems to the respiratory system of a human being [1]. Nowadays many countries facing the problem regarding air pollution. Clean air is a major requirement of all countries, and its supply is essential to our health and the environment. The human nose serves as an advanced sensing system that may differentiate between hundreds of smells but fails if absolute gas concentrations or odorless gases. So there is a need for gas detection. The demand for detecting toxic and deleterious gases is accordingly urgent to support or replace the human nose [2]. In today's world, the demand for developing simple yet reliable gas sensors is huge for the application in areas such as environment monitoring, agriculture, medical diagnosis, and industrial wastes. The detection of gas molecules such as nitrogen dioxide (NO_2), ammonia (NH_3), Carbon monoxide (CO), etc is necessary [3]. Out of all toxic gases, NO_2 is evolved in a tremendous amount from the industrial sector and vehicle transportation. Apart from these sources, NOx and SOx is also evolved from coal fire plant which creates acid rain, global warming and smog [4]. In the field of nanotechnology, the advancement still continues which

* Corresponding authors.
E-mail addresses: kprakash5229@rediffmail.com (P.M. Kadam), psp_phy@unishivaji.ac.in (P.S. Patil).

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Overview of molybdenum disulfide based electrodes for supercapacitors: A short review

Komal B. Pisal [a], Bapuso M. Babar [a], Sarfraj H. Mujawar [a], Laxman D. Kadam [b,*]

[a] Department of Physics, Yashavantrao Chavan Institute of Science, Satara, Maharashtra 415001, India
[b] Arts, Science and Commerce College, Ramanandnagar, Sangli, Maharashtra 416308, India

ARTICLE INFO

Keywords:
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ABSTRACT

In recent years, transition metal dichalcogenides (TMDs) have gained significant attention in the field of supercapacitors due to their unique properties. Different TMDs like MoS_2, WS_2, $MoSe_2$, WSe_2 have been studied in the past few years. In this review we focus on different synthesis approaches and supercapacitive performance of MoS_2 based electrodes. Nanocomposites of MoS_2 offering various advantages like high electrical conductivity and improved electrochemical performance due to synergistic effects. This review provides the detailed information about the development of MoS_2 based nanocomposites (with carbon derivatives, conducting polymers, metal sulfides and other materials) in the field of electrochemical energy storage. Future perspectives and challenges faced by MoS_2 electrodes are discussed.

1. Introduction

In the post-world war era, rapid industrialization has resulted in an exponential increase in energy demand worldwide. Combined with the rising living standards that raise energy demand for personal use and hence industrialization induced demand has contributed to the growth of power requirement. Until the end of 19th century, the power demand was mostly met with the help of fossil fuel related resources. As it is worldwide known, that these crude oil resources are limited and depleting rapidly due to their high rate of extraction, it is evident to focus on other sources of energy [1]. There are serious environmental implications related to the use of fossil fuel related energy resources. These multiple factors posed a worldwide threat to the use of fossil fuels as an energy source in the future. To fulfil energy demand worldwide, scientific community is consistently making efforts to develop advanced devices so that maximum benefit of renewable energy sources can be taken. The most prominent renewable energy sources such as solar, wind, tidal energy are weather dependent and hence along with these energy conversion devices, efficient energy storage devices are also required. This has given a way to the development of energy storage devices. The scientific community has recognized batteries and electrochemical supercapacitors as the most important electrochemical energy storage devices. Long cycle life, wide operating temperature range and high power density induced by fast charging and discharging rates attracted the attention of researchers as well as industry experts towards electrochemical supercapacitors commonly known as ES.

Electrochemical supercapacitors are classified into three basic categories based on energy storing mechanisms viz, electrochemical double-layer capacitors (EDLCs), pseudocapacitors, and hybrid capacitors [2]. Similar to conventional capacitors the charge storage mechanism of EDLCs is electrostatic and non-Faradic i.e., no charge transfer between electrode and electrolyte takes place. When supercapacitor is charged, due to potential gradient electrons from positive electrode move towards the oppositely charged negative electrode. As a result, electrolyte ions diffuse across the separator and concentrates on the surface of oppositely charged electrodes. Formation of EDL at electrode surface avoids recombination of charges. As the charge storage mechanism is non-Faradic, there is no redox reaction involved and therefore electrode does not undergo any volume and morphology change, this increases the stability of the electrode. Due to high surface area and abundancy, various carbon-based materials like carbon nanotubes, activated carbon, carbon aerogels, etc. are used as electrode materials in EDLCs [3,4]. Despite that, EDLC has low performance in aqueous and organic electrolytes because the double layer and physically stored charges are fewer. Pore size distribution, pore volume, surface area, and conductivity of the material are the key parameters which affects the performance of EDLCs [5,6]. Pseudocapacitors stores charge faradically due to fast and reversible redox reactions and are non-electrostatic in nature. In

* Corresponding author.
E-mail address: ldkadamphysics@gmail.com (L.D. Kadam).

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ORIGINAL RESEARCH PAPER

Physics

KEY WORDS: Nickel hydroxide, Microflower, deposition time variation, supercapacitor, marigold flower.

STUDY OF STRUCTURAL AND ELECTROCHEMICAL PROPERTIES OF 3-D MICROFLOWER-LIKE NICKEL HYDROXIDE

D.B. Mane — Department Of Physics, Lal Bahadur Shastri College of Arts, Science And Commerce, Satara 415002

L.D. Kadam — Department of Physics, Arts, Commerce And Science College, Ramanadnagar Burli 416308

R.V. Dhekale — Department of Physics, Kisan Veer Mahavidyalaya, Wai 412803

G. M. Lohar* — Department of Physics, Lal Bahadur Shastri College of Arts, Science And Commerce, Satara 415002. *Corresponding Author

ABSTRACT

Recent work reported on nickel hydroxide chemically synthesized by simple cast effective chemical bath deposition method at room temperature. During reaction, nanoflakes developed and time enhance nanoflakes interlinked to form marigold like microflower which reveals from SEM. Structural properties analysis by XRD and FT-IR gives hexagonal crystal structure and presence of Ni-O bond to confirmation of deposition of Ni(OH)$_2$ material. Highest value of specific capacitance of electrode at deposition time 90 min without aniline from Cyclic voltammetry is 553 Fg^{-1} at scan rate 10 mV s^{-1} and from Galvanostatic charge discharge 215 Fg^{-1} at current density 3 mA cm^{-2} with 6.04 W h kg^{-1} and 1687.5 W kg^{-1} of energy and power density respectively. EIS analysis reveals least charge transfer resistance of 90min deposition time electrode.

INTRODUCTION

Supercapacitor is permissible option in energy storage device. Supercapacitor have versatile nature with different properties like high power density, high stability, durability, fast faradic reaction, low maintenance. Supercapcitor have types i.e. EDLC, pseudocapacitor and hybrid[1,2]. Two main principles used in above types are charge stored electrostatically and charge stored by electrochemically. In EDLC type charge stored electrostatically but in pseudocapacitor charge stored electrostatically. Selection of electrode material from its qualities like high surface area, presence of number of activated site, high electroconductivity, thermal and chemical stability[3,4]. Transition metal oxide and hydroxide turn more attention of researcher for their high specific capacitance, cost effectiveness and stability. Nickel hydroxide is more promising material used as electrode material. Nickel hydroxide a high theoretical specific capacitance of 2082 F g-1, good rate capability, ready availability, lower cost, environmental friendly and good thermal stability[5]. Wu et al. Reported deposited self-assemble three dimensional microflower by hydrothermal method with higher specific capacitance 1111.3 F g-1 for current density 1Ag-1.This self-assemble microflower Ni(OH)2 material have high stability upto 90.6% for 1000cycles[6]. Biny et al. compared structure, morphology and electrochemical properties of nickel hydroxide deposited by chemical precipitation method. Nickel hydroxide confirmed nanopetal-like morphology with a larger specific capacitance of 701 Fg1 at 1 Ag 1 in 2□M KOH aqueous electrolyte [7].Li et al., simple coordination homogeneous precipitation method used to fabricate coin-like nickel hydroxide nanoplates. A specific capacitance of 1532 F g1 is obtained at a current density of 0.2 A g□1[8].

EXPERIMENT

10.54 gm of NiSO4.6H2O, 2.02gm of K2S2O8 and 90mL of DDW used to prepare chemical bath. Stir this solution for few minutes and transparent green colour solution formed. Drop wise add 10 mL of aqueous ammonia (30% NH3) in solution. After addition of ammonia reaction started colour of solution terns green to dark blue and it becomes dense. Preclean stainless steel substrates were immersed in the bath and the bath was place at room temperature without stirring. Substrate coated with nickel hydroxide remove after time intervals 75, 90 and 105 min respectively then washes films several times in double distilled water and kept dry naturally. Film deposited at time 75, 90 and 120 min noted as Ni-1, Ni-2 and Ni-3 respectively.

RESULT AND DISCUSSION

STRUCTURAL AND MORPHOLOGICAL PROPERTIES:

Fig. 1 (a) represent XRD pattern of Ni-2 optimize electrode. Spectrum shows peaks at 32 and 59° corresponding to (1 1 0) and (3 0 0) plane have interatomic spacing 2.73 and 1.55A°. XRD data well matches with JCPDS card 022-0444 which indicate hexagonal crystal structure[9]. Fig.1 (b) shows crystal structure of Ni(OH)2 at deposition to time 90 min. A small number of reflection peaks is an indication of poorly ordered samples. The strong reflection peak at 2□ = 32° had a d-spacing of 11.2 Å.

Fig.1 (c) shows FT-IR analysis of Ni-2 electrode. This experiment run over range 400 to 4000 cm-1 wavenumber. Sharp peak at 403 cm-1 indicate Ni-O stretching mode[10]. Presence of O-H molecule represent by peak values of 3404 and 1634 cm-1 [11]. The S=O bond represent by wavenumber 1121cm-1.

Fig.1 (d) indicates SEM images of Ni(OH)2 material. Images indicates nanoflakes develop during reaction. Initially, some nanoflakes interconnect with each other and form small flower as time increases rate of interconnection of nanoflakes increases and size of flower increases.Fig.1 d) iv) shows marigold like nanoflower deposited on electrode Ni-2.

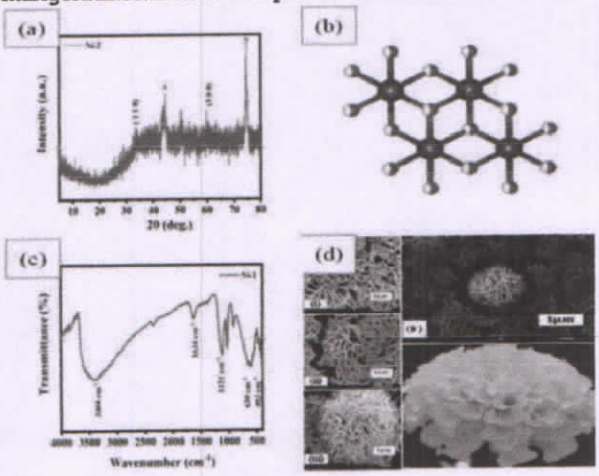

Fig. 1 structural and morphological study (a) XRD pattern (b) Crystal structure (c) FT-IR spectrum (d) SEM image i- iii) growth mechanism iv)SEM image of electrode Ni-2.

ORIGINAL RESEARCH PAPER

Physics

KEY WORDS: CBD, marigold, microflower, supercapacitor, nickel hydroxide.

STRUCTURAL AND ELECTROCHEMICAL PROPERTIES OF CHEMICALLY DEPOSITED COPPER DOPED NICKEL HYDROXIDE

D.B. Mane* Department of Physics, Lal Bahadur Shastri College of Arts, Science And Commerce, Satara 415002. *Corresponding Author

L.D. Kadam Department of Physics, Arts, Commerce And Science College, Ramanadnagar (Burli) 416308

R.V. Dhekale Department of Physics, Kisan Veer Mahavidyalaya, Wai 412803

G. M. Lohar Department of Physics, Lal Bahadur Shastri College of Arts, Science And Commerce, Satara 415002

ABSTRACT

Present work reported, copper doped Ni(OH)$_2$ deposited successfully by chemical bath deposition method on economical stainless steel electrode. The XRD analysis represent hexagonal crystal structure and presence of Ni and Cu confirm by FT-IR study. The surface morphology studied by SEM indicates nanopetals linked marigold like microflowers. The 0.2% Cu doped Ni(OH)2 shows specific capacitance 715 Fg^{-1} at scan rate 10 mV s^{-1}. EIS study interprets that electrode N-0.2% have least charge transfer resistance which improve value of specific capacitance. All results revels cupper is good dopant for improve the specific capacitance.

INTRODUCTION

Conventional energy sources like coal, mineral oils and natural gas have many fatal issues regarding to health and environment. Pollution, global warming, greenhouse effect, diseases related air are serious problems caused by combustion of non-renewable energy sources. These sources of energy are limited. Solar energy, wind energy, ocean energy are nonconventional energy sources possess some advantages and some drawbacks like availability, affected by atmospheric condition[1,2]. It urgent to search for a energy storage device which have high power density, cyclic stability and high specific capacitance. Supercapacitor is better option for these search. Recently many researcher work on electrode material and transition metal oxides and hydroxide give impressive results. Ruthenium oxide, cobalt oxide, iron oxide, vanadium oxide, nickel oxide and nickel hydroxide are many transition metal oxide and hydroxide materials are used in supercapacitor[3][4]. Nickel hydroxide used as in nickel hybrid batteries ,in fuel cell and in many electrochemical sensor. Ni(OH)2 have high theoretical specific capacitance 2055F g-1 and cheap[5]. Electrochemical properties of material depends on morphology and Many type of morphology observed by Ni(OH)2 material. These different nanostructure produced by simple chemical methods [6].

Lokhande et al. synthesise Ni(OH)2 microflower successfully with higher specific capacitance 662 F g-1 at scan rate 10 mV s-1. They also archives α phase of Ni(OH)2[7]. Liu et al. reported 3D self-assemble porous structure have higher specific capacitance 2110 F g-1 for current density 1 A g-1 can deposited by CBD method[8]. Doping of transition elements improve electrochemical properties of supercapacitor. Liu et al. doped cobalt in Ni(OH)2 improve specific capacitance 2879 Fg-1 at current density 1 Ag-1. They also reported doping majorly affected by size of element and electronegativity majorly affect[9].

EXPERIMENTAL

The copper doped nickel hydroxide thin films were deposited by chemical bath deposition method by on cost-effective stainless-steel substrate as a current collector. 1M $NiSO_4 6H_2O$ and 1M $CuSO_4 6H_2O$ was used as nickel source and copper source in double distilled water (DDW). The different concentration of (0.1%, 0.2% and 0.3%) $CuSO_4 6H_2O$ was added into 1M $NiSO_4 6H_2O$ with constant stirring in a beaker. 0.25 M $K_2S_2O_8$ and aq. NH_4 was added into the solution. The precleaned substrates were dipped in the above beaker and kept at room temperature for 2h. After that substrate heated at temp 100°C for 2 hr. For 0.1%, 0.2% and 0.3% Cu doping the obtained films were named as N-0.1%, N-0.2% and N-0.3% respectively.

RESULT AND DISCUSSION

STRUCTURAL AND MORPHOLOGICAL PROPERTIES:

X-ray diffraction analysis and FT-IR study are used to determine structural properties of electrode.

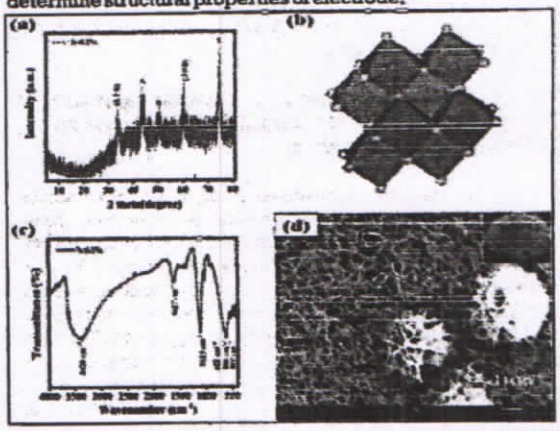

Fig. 1 a represent XRD pattern of N-0.2% optimize electrode. Spectrum shows peaks at 33.38 and 60.24° corresponding to (1 1 0) and (3 0 0) plane. Ni(OH)2 XRD data matches with JCPDS card 022-0444 which indicate hexagonal crystal structure.

Fig. 1 (b) shows crystal structure of Ni(OH)2. Lattice parameter are lattice parameter are a = b = 5.34 Å, c =7.5 Å and α = β = 90°, = 120°.

Fig.1 c shows FT-IR analysis of N-0.2% electrode. This analysis studied at range 400 to 4000 cm-1 wavenumber. Peak at 508 cm^{-1} indicates presence of Cu(OH)$_2$ and 403 cm^{-1} indicate Ni-O stretching mode [10][11]. Presence of O-H molecule represent by peak values of 3420 and 1627 cm^{-1}. The S=O bond represent by wavenumber 1113cm^{-1}.

Fig.1 d shows SEM image of N-0.2% electrode. SEM image shows Marigold like flowers form on surface of electrode. This microstructure increases effective surface area so improvement of electrochemical properties occurs.

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Applied Physics A
Materials Science & Processing

Effect of time and temperature on adsorption of persulphate ions for developing 2D nanosheets to 3D microflowers for development of γ nickel hydroxide and its supercapacitor performance

D. B. Mane[1,2,3] · O. C. Pore[1] · R. K. Kamble[1] · D. V. Rupnavar[1] · S. H. Mujawar[4] · L. D. Kadam[2] · R. V. Dhekale[3] · G. M. Lohar[1]

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Abstract
In the present investigation, Ni $(OH)_2$ microflowers were successfully deposited on a cost-effective stainless steel electrode by a simple chemical bath deposition method (CBD). The optimized deposition time and heating temperature. Potassium persulphate shows an important role as an oxidizing agent and controlled the growth of nanostructure. Deposited $Ni(OH)_2$ shows α phase but due to persulphate ion one hydrogen removes and it converted into γ phase. The $Ni(OH)_2$ deposited using CBD method at 2 h then heated at 100 °C temperature give better specific capacitance. For a current density of 3.0 mA cm^{-2}, the computed highest specific capacitance becomes 669 F g^{-1}. After 1000 cycles, electrode material shows good capacitive retention of about 78% and high coulombic efficiency of 99.3%. The impressive results proffered above indicate that $Ni(OH)_2$ is a promising electrode material with excellent supercapacitor performance.

Keywords Nickel hydroxide · Microflower · Supercapacitor

1 Introduction

As the population grows, the need for energy expands as resources are utilized. Fossil fuels are a conventional energy source that causes pollution that is harmful to the environment. Non-conventional energy sources are non-polluting and non-hazardous to the environment. All non-conventional resources require energy storage systems that have high specific energy, specific power, prolonged life, and compact size due to several constraints [1]. Long-life cycles and high energy density batteries entice buyers, but there are certain drawbacks, such as low power density and higher inner resistance. Recently, a supercapacitor [2] was designed to overcome these difficulties. Amazing properties such as rapid charging and discharging, high power density, superior stability, and long life cycle make supercapacitors a strong contender to batteries. The main impediment to the use of supercapacitors is their low energy density. To improve energy density, preferable research is being pursued all over the world. The electrode material has a significant impact on supercapacitor properties. It categorizes them based on their faradic and non-faradic reaction mechanisms. According to research, ultracapacitors are classified into three types: EDLC, pseudo capacitor, and hybrid supercapacitor [3, 4]. Supercapacitance frequently employs carbon-based materials, metal oxides, metal hydroxides, and polymers. Activated carbon, graphene, ruthenium oxide, manganese oxide, nickel oxide, $Ni(OH)_2$, vanadium pentoxide, and many other materials have been used as electrode materials [5, 6].

$Ni(OH)_2$ is generally utilized as the positive electrode in rechargeable batteries and has outstanding characteristics. The charge storage mechanism in nickel hydroxide involves phase transformation from one phase to another. The characteristics of materials in bulk differ from those in

✉ R. V. Dhekale
rvdhekale2@gmail.com

✉ G. M. Lohar
gauravlohar24@gmail.com

1 Department of Physics, Lal Bahadur Shastri College of Arts, Science and Commerce, Satara 415002, MS, India

2 Department of Physics, Arts, commerce and Science College, Ramanadnagar, Burli, MS 416308, India

3 Department of Physics, Kisan Veer Mahavidyalaya, Wai, MS 412803, India

4 Department of Physics, Yashwantrao Chavan Institute of Science, Satara, MS, India

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nanometers. At constant potential, $Ni(OH)_2$ used in batteries undergoes a phase change, limiting the material's capacity. However, nanostructured materials (particles smaller than 10 nm) have a different CV and GCD curve as compared to bulk [7]. Effective surface area utilization improves at the nanoscale scale, limiting phase change. Diffusion length decreases during this process, resulting in the formation of active charge storage sites on the electrode's surface, causing a modification in the GCD plateau. The bulk form of the battery material $Ni(OH)_2$ was used as the supercapacitor material in this fashion [8]. In comparison to the foregoing material, $Ni(OH)_2$ has better properties such as higher specific capacitance, faster charge–discharge rate, economic depreciation, high energy density, and high stability [9]. The higher theoretical value of specific capacitance 1042 F g^{-1} [4] is the most appealing feature of $Ni(OH)_2$.

Different oxidation states are present in $Ni(OH)_2$, XRD shows α and β phases in the material [5]. $Ni(OH)_2$ is a material that is widely used in the production of supercapacitors, batteries, and sensors [10–12]. Several methodologies have been developed to synthesize $Ni(OH)_2$ material with various morphologies, including CBD, hydrothermal method [13], and SILAR method [14]. The CBD method is an easier task in which material is synthesized at low temperatures and with less instrumentation. This method is competitively priced and employs both conducting and nonconducting substrates. This method can deposit a large number of films [11].

Preparation of conformal and coplanar nanoflakes with $Ni(OH)_2$ on the substrate using CBD methodology has a hexagonal crystal structure with the d value of 2.3 Å, according to Alhebshi et al. conformal $Ni(OH)_2$ and planar $Ni(OH)_2$ have specific capacitances of 1416 F g^{-1} at 1 A g^{-1} and 275 F g^{-1} at 1 A g^{-1}, respectively [11]. Lokhande et al. demonstrated that nanoflakes deposited on nickel foam bind together to form flower-like microstructures. Nanoflower is made up of nanowalls with thicknesses ranging from 50 to 70 nm, which improves the mobility of electrode and electrolyte ions, leading to an improvement in electrochemical properties with a specific capacitance of 1065 F g^{-1} at a current density of 15 mA g^{-1} [15]. Yang et al. [16] produced a $Ni(OH)_2$ nanorod on a modified ZnO electrode. The CBD approach was used by Lokhande et al. to synthesize α-$Ni(OH)_2$ ultrathin nanosheets using Ni foam. The deposited two-dimensional nanosheets were ultrathin, with a thickness of 7–12 nm and a mesoporous aperture of 0.8–1 μm. The mesoporous structure of $Ni(OH)_2$ allows for significant utilization of active mass and a faster rate of electrode–electrolyte ion diffusion. The author [17] reports that the extreme specific capacitance by CV was 562 F g^{-1} at a current density of 10 mV s^{-1}. Patil et al. manufactured $Ni(OH)_2$by CBD method with phase beta and honeycomb-like macroporous morphology showed better capability and specific capacitance, the value of specific capacitance 398×10^3 F kg^{-1} for low scan rate. Electrochemical analysis reveals that specific capacitance declines as scan rate increases; at higher scan rates, diffusion of electrolyte and electrode decreases because it cannot sustain at redox transition[18].

The CBD process has been used to deposit $Ni(OH)_2$microflowers at various deposition times in this study. After the deposition of $Ni(OH)_2$, structural and morphological investigations are carried out for a time utilizing XRD, FTIR, and SEM. The novelty is the transformation of battery material into supercapacitor material and potassium persulphate ions used to develop the 2D nanosheets or nanoflakes. The oxidization process creates activated sites on the surface of nanoflakes or nanosheets. It is the key factor for porous nature which improves electrochemical performance. Uniform growth of nanosheets or nanoflakes allows providing a pathway for electron flow which reduces charge transfer resistance and provides a greater area to charge storage. In addition, the effect of time and temperature have been studied in the development of nickel hydroxide microflower and investigated electrochemical supercapacitor performance. To study the supercapacitor performance EIS, CV, and charge–discharge have been employed. Based on the analysis of the preceding results, the current study concludes that chemically deposited $Ni(OH)_2$ nanostructures are a good candidate for improving specific capacitance.

2 Effect of deposition time

2.1 Experimental Details

In this experiment, a chemical bath deposition method was used to deposit $Ni(OH)_2$ on a conducting substrate of stainless steel. The cleanliness of the substrate is crucial during the reaction. The surface of the substrate provides nucleation sites for the development of nanostructures. The material grows more uniformly when the surface is clean.

2.1.1 Chemicals

All the chemicals used to synthesize $Ni(OH)_2$ thin films were AR grade and used without further purification from Thomas beaker Chemicals Pvt. Ltd., Mumbai. For the deposition of thin films Nickel sulfate hexahydrate ($NiSO_4 \cdot 6H_2O$) was used as a source of Ni ions. Ammonium hydroxide (NH_4OH, 30%) was used as a hydroxide source, Potassium persulphate ($K_2S_2O_8$), and aqueous potassium hydroxide (KOH) as an electrolyte to measure the electrochemical properties.

2.1.2 Bath preparation

The CBD method was used to develop the $Ni(OH)_2$ thin films, with a profitable stainless-steel substrate serving as

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Ultrasound-assisted, green and efficient synthesis of ferrocene-appended azo-phenothiazines

Varsha Kambale [a], Jagannath Jadhav, Ph D [b], Pravina Piste, Ph D [a,*]

[a] PG Department of Chemistry, A.S.G. College Ramanandnagar (Burli), Sangli, 416308, M.S, India
[b] Department of Chemistry, Shivaji University, Kolhapur, 416004, M.S, India

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ABSTRACT

An effortless and highly efficient strategy for the synthesis of ferrocene-appended azo-phenothiazines (PHz's) under ultrasound irradiation has been developed. The said protocol allows for a more environmentally friendly approach, such as operationally simple, tolerates a wide range of functional groups compared to conventional methods, and is applicable on a gram scale without additional purification or other solvent waste. The synthesized compounds 6(aa-ec) were tested for their antimicrobial activity *in vitro*. Off all the compounds tested, 6ca and 6da showed maximum antibacterial against *S. enteric* and *Bacillus cereus* as well as excellent antifungal activity against *A. flavus* and A. *fumigatus*.

1. Introduction

Phenothiazine (10*H*-dibenzo-[*b*,*e*]-1,4-thiazine; PHz) is an important fused tricyclic ring system belonging to the thiazine family. It was first prepared in the laboratory by the German chemist Bernthsen [1] in the course of proving the structure of violet and methylene blue by investigations according to the Lauth's method. Since then, it has played an important role in dye chemistry as the parent compound of thiazine dyes such as methylene green, thionine (Th), azure dye (AZ) and toludine blue [2]. Indeed in the last twenty years, PHz and its derivatives have found numerous applications in other fields of electrochemistry [3], semiconductors [4] and chemical sensors [5], which stimulated further research on these compounds. Further it serves as pharmacophores for many molecules with significant biological and therapeutic value [6]. In particular, azo-phenothiazine and its derivatives have received considerable attention in recent years due to their considerable applications in various fields *viz.* medicine [7], solar cells [8], organic synthesis [9]. Some examples of azo-phenothiazines (Fig. 1) show promising antimicrobial [10], antifungal [11a], anticancer [11b], anti-inflammatory activities, reversal of multidrug resistance and many other effects [12]. Due to the attractive biological properties of azo-phenothiazines, the development of convenient synthetic methods from the readily available starting materials is very reasonable. In this context, the improvement of traditional diazotization and its coupling reaction in designing biologically active scaffolds by using simple, efficient and environment friendly synthetic technique is an important challenge for the synthetic chemist.

In recent decades, ultrasonic irradiation has proven to be a very powerful and efficient bond formation technique in organic chemistry, providing a versatile and facile pathway for a variety of syntheses in the context of green chemistry. It is a promising alternative technique for modern organic syntheses and enables chemical transformations under the phenomenon of "cavitation", where gaseous and vaporous cavities of irradiated liquids expand, forms and implodes through enhancing mass transfer. In repertoire of studies, many diazo coupling reactions have been carried out under ultrasonic irradiation, offering higher yields, shorter reaction times and milder reaction conditions compared to conventional methods [13]. Indeed the diazo functionalization and structural modification on PHz, articulate very useful scaffolds for industrial and biological importance. However, there were no records in the literature where the PHz diazonium functionality was prepared and reacted directly to the metallocene ultrasonically (Scheme 1). Based on the experience of one of our authors [14] for the combined effect of metallocene-containing hybrids of heteroaromatic ring could confer labelled biological properties [15] as well as photoresponsive soft materials based applications. Thus in continuation of our efforts to develop new approaches for the design and synthesis of S/N-containing heterocyclic diazo compounds, we hypothesized rapid, more practical and eco-friendly ultrasonication technique for the preparation of pendant ferrocenyl phenothiazine azo dyes. The key theme of our synthetic strategy is the construction of drug-like molecular libraries through the creative reconstruction of core skeletons with privileged substituents.

For the feasibility of our chosen approach, it is primarily important to find a suitable diazotizing agent that works under ambient conditions for numerous amino compounds and promotes the azo-coupling reaction of

* Corresponding author.
E-mail address: ppiste321@gmail.com (P. Piste).

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Nanocrystalline spinel zinc-substituted cobalt ferrite thick film an efficient ethanol sensor

R.R. Powar [a, h], V.G. Parale [b], V.D. Phadtare [b], S.B. Wategaonkar [c], R.K. Mane [d], J.L. Gunjkar [e], D.R. Patil [f], P.B. Piste [g], H.-H. Park [b] ✉, D.N. Zambare [h] ✉

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Highlights

- An easy and fast synthesis of Zn-substituted $CoFe_2O_4$ nanoparticles via surfactant-assisted chemical co-precipitation method.
- The Zn-substituted $CoFe_2O_4$ thick film exhibits semiconducting nature.
- A Zn-substituted $CoFe_2O_4$ thick film showed flake-like morphology for efficient ethanol sensor.
- The $Zn_{0.25}Co_{0.75}Fe_2O_4$ sensor exhibited excellent long term stability, highest response, and selectivity.

Abstract

This study considered Zn-substituted cobalt ferrite ($Zn_xCo_{1-x}Fe_2O_4$ ($x = 0.0–1.0$) (ZCF)) thick films structural, morphological, and electrical properties; and gas sensing performance. The ZCF thick film sensor was screen printed on a glass substrate and tested for different analyte gases, including H_2, H_2S, CO_2, Cl_2, NH_3, LPG, and C_2H_5OH. We used X-ray photoelectron spectrometry to investigate composition, chemical state, iron/cobalt or zinc ratio, and cation

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Nano silica sulfuric acid catalyzed facile synthesis of azothiadiazoles under co-grinding and solvent-free technique

Varsha Kambale[a,b], Jagannath Jadhav[c] & Pravina Piste[a,*]

[a]PG Department of Chemistry, A.S.C. College Ramanandnagar (Burli), Sangli-416 308, Maharashtra, India

[b]Krishna Mahavidyalaya, Rethare BK, Karad-415 108, Maharashtra, India

[c]Department of Chemistry, Shivaji University, Kolhapur-416 004, Maharashtra, India

*E-mail: ppiste321@gmail.com

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An efficient method for the use of nano silica sulfuric acid as a heterogeneous catalyst in the synthesis of thiadiazole-containing azo dyes *via* diazo coupling of substituted amino thiazole under solvent-free conditions is described. The method presented is effective, green, inexpensive, and satisfactory to give the products in high yield with an excellent purity in short times under mortar–pestle grinding. The environmental friendliness and re-usability of the catalyst make this protocol attractive in organic synthesis.

Keywords: Azo dyes, Nano silica sulfuric acid, Thiodiazole, Rice husk, Mortal-pestle grinding

Over the past decade, substantial progress has been achieved in the organic colour chemistry. Principally aromatic compounds holding 'azo/diazenyl' (R−N=N−R) as a chromophoric functionality are found to be important class in the fields of colour industry and have great applications in high technology domain like linear and non-linear optics, reprography, electronic devices, sensors and biomedical uses[1-4]. Moreover they are well known for their use as colorants in the digital printing and photography[5] textile industries[6], chiral receptors[7], chiral switches in photochemistry[8], new glassy materials[9], liquid crystals[10], in dying of food, cosmetic, drug, biomedicine[11], and molecular recognition[12]. Therefore, due to their versatile skeleton and uses in many practical applications, the development of such compounds received much attention. In fact, it is the area of current research interest where researchers are paid attention to synthesizing these compounds *via* simple and eco-friendly methodologies.

Routine acid-base catalyzed processes are effective for near quantitative formation of the desired azo derivative *via* diazotization of arylamines in the presence of nitrous acid or sodium or potassium nitrites. But the homogeneous characteristics and environmental incompatibility of harmful acidic material limit their usage in conventional processes. Nowadays, heterogeneous solid acid reagents have resolved these problems and improved activity and selectivity rather than individual reagents in the synthesis of azo dyes[13–15]. They also assist to boost the fundamental research and industrial potential of heterogeneous catalysis due to their inexpensive and eco-friendly character. Further, these reagents help to simplify purification processes as well as prevent release of reaction residues into the environment[16]. In this regard, nano structure solid acids such as nano-silica sulfuric acid (nano-SSA), have attracted great interest of scientific community due to their adequate catalytic performance, stability under intense conditions, and extraordinary physical as well as chemical properties, like large surface to volume ratio[17], renders a plurality of active sites. Alternatively, it has excellent activity and selectivity on an industrial scale as well. So, in most cases, it can be recovered from reaction mixtures and reused. In addition, the physicochemical properties such as inertness under the reaction progression and tunable pore structures believe that nano-SSA becomes the best solid support for the organic transformations[17e].

While designing new chemical processes, besides using heterogeneous catalysts we also try to focus one of the thrust areas under the green chemistry principle is to explore alternative reaction media or reaction conditions to furnish the desired chemical

transformations with minimized hazardous waste or to control the use of conventional organic solvents, wherever possible. Accordingly, compared to several newer strategies, the solvent-free and co-grinding technology could ameliorate their efficiency from an economic as well as an ecological point of view[18]. Hence in continuation of our efforts towards the synthesis of heterocyclic azo compounds[19], we report here the use of nano-SSA in the synthesis of azothiazole *via* diazo coupling reaction of anilines with substituted amino thiazoles.

Experimental Details

Materials and Methods

Chemicals were purchased from the local supplier Spectrochem (Mumbai, India) and Merck, India and were used without any additional purification. Melting points were determined on a open capillary and are uncorrected. All reactions were monitored by thin-layer chromatography (TLC) using Merck pre-coated silica gel F254 plates. Respective starting material thiazoles[24] and silica nanoparticles (from rice husk ash)[20] were prepared as per known method and used. IR spectra were recorded with a Perkin-Elmer one FTIR spectrophotometer in which samples were examined as KBr discs~5% *w/w*. The SEM analysis was carried out using a JEOL model JSM with 5 kV and 20 kV accelerating voltage. XRD pattern was taken in the 2θ range of 0–80° with a scan rate of 4°/min on a Bruker D2 Phaser X-ray diffractometer at a wavelength of 1.55060 Å. ^{1}H NMR spectra were recorded on a BRUKER AVANCE (400) spectrometer using TMS (δ = 0 ppm) as an internal standard and DMSO-d_6 as solvent. Chemical shift (δ) values are expressed in parts per million (ppm) units with respect to TMS, coupling constants are expressed in hertz (Hz). C.H.N elemental analyses were performed on EURO EA3000 vectro model. The products were characterized by comparison of their spectral and melting point data with reference.

Synthesis of nano-silica from rice husk ash (RHA)[20]

The raw material, rice husk, was obtained from a rice mill and washed thoroughly with distilled water tap water to remove sand, dust, soluble substances, and other contaminants. It was then dried at 60 °C in air oven. The cleaned RH was burned in open environment to collect rice husk ash (RHA). 50 g of RHA was refluxed with 500 ml of HCl 1N for 2 h and allowed to stand overnight in order to remove metallic impurities in RHA. The acid treated RHA was filtered and thoroughly rinsed with distilled water and dried at 60 °C in air oven. Further it was converted into its sodium salts by stirring with 2.5 N NaOH solution for 14 h to form sodium silicate. Again on neutralized with H_2SO_4 (Merck GR) until the pH equal to 8 gives nanosilica gel. Finally, the received gel was turn into powdery form by pursuing calcination at 700 °C for 2 h in muffle furnace with a ramp rate of ~20 °C/min. The obtained product was nono-silica as a white powder.

Synthesis of nano-SSA[20]

To a clean and dry 500 mL round bottom flask containing nano-silica (90.0 g) in dichloromethane (200 mL), was added drop wisely chlorosulfonic acid (35.0 g) with a constant pressure dropping funnel over a period of 30 min at room temperature. HCl gas was evolved from the reaction vessel immediately. After the addition was complete, the mixture was shaken for 30 min and a white solid of nano-SSA (115.0 g) was collected by filtration and dried.

Typical experimental procedure for solvent-free diazo-coupling by co-grinding of reactants in a mortar with pestle

The mixture of aniline (10 mmol) derivative, $NaNO_2$ (10 mmol) and 0.05 gm of nano-SSA was ground for 3 min., at room temperature. To the obtained diazonium salt, added solution of 2-amino thiazole (10 mmol) coupler in 20% caustic solution (1 mL) and ground vigorously for 2 min. until completion of reaction, monitored on TLC. The obtained dye was dissolved in acetone and filtered to isolate the catalyst. By evaporation of solvent and crystallization in ethanol, the solid dye product was obtained in good to excellent yields (71-91%). The products were identified by characteristic spectroscopic data.

Spectral data for the selected compounds

(1) 2-Amino-5-phenylazo-thiazole (3a)[26a]:

Reddish brown solid. yield 89%; mp 268–270°C. IR (KBr): 3420, 3271 (NH_2), 1640 (C=N), 1240 cm^{-1}; ^{1}H NMR (400 MHz, DMSO-d_6): δ 7.20-7.38 (m, 6H, C4-H, thiazole & -PhH), 8.28 (bs, 2H, NH_2); Anal. Calcd. for $C_9H_8N_4S$ (mol. wt.: 204.24): C 52.92, H 3.95, N 27.43%; Found: C 52.85, H 3.90, N 27.47%.

(2) 2-Amino-5 (4-chloro phenyl) azo-thiazole (3b)[26a]:

Brown Solid. yield 87%; mp: 168–171°C. IR (KBr): 3357 (NH_2), 3051, 1633 (C=N), 1491(N=N), 1367, 1231, 1146, 1011, 830 cm^{-1}; ^{1}H NMR (400 MHz, DMSO-d_6,): δ 7.26 (s, 1H, C–H thiazole), 7.38 (d, 2H,

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Layered MoS_2 for photocatalytic dye degradation

Dhanesh Gawari [a], Vikram Pandit [b,*], Niteen Jawale [c], Pramod Kamble [d]

[a] Dr. Patangrao Kadam Mahavidyalaya, Palus, Sangli 416308, India
[b] Department of Chemistry, Haribhai V. Desai College, Pune 411002, India
[c] Centre for Materials for Electronics Technology, (C-MET), Pune 411008, India
[d] Department of Environmental Science, Savitribai Phule Pune University, Pune 411007, India

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ABSTRACT

In the present study, Lawesson's reagent (LR) is used as a sulfur source for the formation of layered MoS_2 semiconductor nanostructures. MoS_2 layers are prepared using 15 hr. hydrothermal reaction method at 120 °C. X-ray diffraction (XRD), UV–visible (UV), BET analysis and FESEM micrographs of 15 hr. reaction time. After synthesis and characterization, MoS2 nanostructures were checked for its photocatalytic behavior. For photocatalytic study two complex organic dyes (Methylene blue and Crystal violet) degradation experiments were carried out under natural sunlight and in UV lamp. MoS_2 degrades almost 71% and 57% of MoS_2-MB and MoS_2-CV, respectively within 90 min. of irradiation time in natural sunlight. Also, photocatalytic dye degradation found almost 82% and 73% of MoS_2-MB and MoS_2-CV, respectively within 90 min. of irradiation time in lab under artificial lamp. As compared to natural sunlight study the rate of dye degradation found more in UV lamp experiments for both the dyes.

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1. Introduction

Two dimensional multifunctional layered materials like boron nitride, silicon, metal sulfides and graphene-based carbon materials and metal oxides has attracted intense research interests from last couple of decades [1,2]. These are vital group of layered compounds because of best electrical conductivity and high Youngs modulus. But because of absence of direct band gap these graphene-based materials have certain limitations for latest technocrats. On the other side metals when forms compounds with group IV/VI chalcogen elements shows good agreement with properties and applications [3]. Metal sulfides, selenides and tellurides are few supreme compounds which are well discussed from last few years. WS_2 and MoS_2 are reported primarily in photocatalytic or electrochemical, battery materials, pollution control and energy production domains. MoS_2 is a photocatalytic material with both direct and indirect band gap used for various intents. Molybdenum is sandwiched between sulfide atoms to form a MoS_2 [4,5].

In pursuit of good replacement for graphene MoS_2 only candidate with many properties such as thickness of layer, band gap, good ON/OFF current ration, mobility and stability. Considering these superior properties, it is used for optoelectronics applications with comparable outputs [6]. This material is also known for synthesis in all four forms as nanoparticles (0D), nanowires (1D), layered (2D) and flowers (3D). Number of synthetic processes has been discussed with different parameters for the faith generation of MoS_2. Many materials are reported as a Sulphur source such as thiourea, thioacetamide, sodium sulfide, elemental Sulphur, sulfocarbamide and H_2S bubbling. Hydrothermal method, thermal evaporation, solution synthesis, co-precipitation method, Ball-milling method, annealing and CVD methods are reported for the synthesis of MoS_2 nanostructures [7,8]. Keeping in mind all these reports, the Lawesson's reagent ($C_{14}H_{14}O_2P_2S_4$) is a chemical compound have use as a thiation agent in organic reaction conversions. Recently we have reported LR to synthesis CdS for the first time [9]. On the continuation of metal sulfide production research work we have demonstrated the hydrothermal synthesis of MoS_2 nanostructures using LR reagent at 120 °C for 15 h reaction time. X-ray diffraction, UV–visible, BET analysis and FESEM micrographs of 15 hr. reaction time samples confirms the formation of MoS_2 nanostructures.

Keeping in mind the treat of industrial waste i. e. textile dyes MB and CV degradation is also reported using heterogeneous pho-

* Corresponding author.
E-mail address: vikramupandit@hvdesaicollege.org (V. Pandit).

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EFFICIENT, MICROWAVE ASSISTED SYNTHESIS OF 4-(substituted fluoro-phenyl)-substituted-*6H*-1-thia-5, 7, 8, 9a -tetraaza-cyclopenta[*e*]azulenes And Their MICROBIAL ACTIVITY

VIKAS R. BHOSALE[1], VALMIK S. KAPASE[2], KULBHUSHAN A. SASANE[3], LIMBARAJ R. PATIL*[4]

1: Department of chemistry, Dr. Patangarao Kadam Mahavidyalaya Ramanandnagar (Burli), Palus, Dist. Sangli

2: Department of chemistry, Dada Patil Mahavidyalaya Karjat, Dist. Ahmednagar

3: Department of chemistry, Abasaheb Marathe College, Rajapur, Dist. Ratnagiri

4: Department of Chemistry, Maharaja Jivajirao Shinde College, Shrigonda, Dist. Ahmednagar

*Corresponding Author: Limbaraj R. Patil

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ABSTRACT

Organic compounds having heterocyclic ring and fluorine atom are most widely studied in the last decade. Present work focus on the synthesize of 4-(substituted fluoro-phenyl)-substituted-6*H*-1-thia-5,7,8,9a-tetraaza-cyclopenta[*e*]azulenes using microwave irradiation technique. Reported ten derivatives were efficiently synthesized using (2-Amino-5-substituted-thiophen-3-yl)-(fluoro-phenyl)-methanone and (1,3-Dioxo-1,3-dihydro-isoindol-2-yl)-acetic acid. This microwave assisted synthetic protocol is interestingly rapid with good percent yield. Synthesized compounds were screened for microbial activity and 50% of them found good active against tested microorganisms.

Keywords: Microwave assisted, T3P, Hydrazine, Carboxylic acid hydrazide, DMF, Microbial activity

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Concept of Structuralism: A Review

Dr.Ujwala Vijay Patil

Associate Professor, Department of English

Dr.Patangrao Kadam Mahavidyalaya, Ramanandnagar(Burli) Dist:Sangli (MS)416308

email- hiujwalapatil@gmail.com

Abstract

According to structural critics, literary work cannot be understood in the isolation but it needs to be interpreted in the context of larger structures they are part of. Peter Barry writes in his Beginning Theory, "meaning or significance isn't a kind of core or essence inside things; rather meaning is always outside"(40)Meanings are not the core of the things but meanings are attributed to things by human mind. For example sonnet cannot be understood only as an individual poem but it needs to be explained in the context of tradition of sonnet. The structural approach takes us away from interpreting individual literary works and towards understanding the structures which contain those works. However those structures are abstract and not concrete specifics. That's why structural approach caused great controversy in Britain and USA. The so-called 'Cambridge revolution' in English Studies in 1920s had emphasized exactly opposite approach by giving emphasis on study of literary work in isolation and excluding wider questions, abstract issues and ideas. Thus structuralism had turned English studies upside down. The present paper tries to take review of concept of structuralism and the terms related to it.

Keywords: *langue, parole, structures, arbitrary, relational etc.*

Structuralism as an intellectual movement began in France in the 1950s. It was first seen in the works of anthropologists Claude Levi-Strauss and literary critic Roland Barthes. According to structural critics, literary work cannot be understood in the isolation but it needs to be interpreted in the context of larger structures they are part of. Peter Barry writes in his Beginning Theory, "meaning or significance isn't a kind of core or essence inside things; rather meaning is always outside"(40)Meanings are not the core of the things but meanings are attributed to things by human mind. For example sonnet cannot be understood only as an individual poem but it needs to be explained in the context of tradition of sonnet.

The structural approach takes us away from interpreting individual literary works and towards understanding the structures which contain those works. However those structures are abstract and not concrete specifics. That's why structural approach caused great controversy in Britain and USA. The so-called 'Cambridge revolution' in English Studies in 1920s had emphasized exactly opposite approach by giving emphasis on study of literary work in isolation and excluding wider questions, abstract issues and ideas. Thus structuralism had turned English studies upside down.

Structuralism has its roots in the thinking of Swiss linguist Ferdinand de Saussure. Instead of patterns and functions of language Saussure emphasized on how meanings are established and maintained and on functions of grammatical structures. It is essential to understand three pronouncements of Saussure to understand the interrelation between linguistic structures and structuralism. The first pronouncement is, meanings we give to words are totally arbitrary and that these meanings are maintained by convention only. There is no coherent relation between the object and the word it designates. The second pronouncement is, the meanings of words are relational. For example, meaning of night is related to day. The night cannot be explained without referring to day. Night means absence of day. The third pronouncement is, Language constitutes our world, it does not just record or label it. Peter Barry writes, " Meaning is always attributed to the object or idea by the human mind, and constructed by and expressed through language:it is not already contained within the thing."(44)

Vocabulary Development in ESL Class through Text Book: An Action Research Approach

Dr. Ujwala Vijay Patil
Associate Professor
Department of English, Dr. Patangrao Kadam Mahavidyalaya
Ramanandnagar (Burli) Maharashtra 416308
ORCID ID: https://orcid.org/0000-0002-4964-1744

Abstract:

The reading is one of the basic language skills and is generally classified as an important activity in the ELT classroom and outside also. In the twenty first century teaching and mastering English language has become more important than literature. English speaking has become pre-requisite for every profession. In such situation reading is the most useful to acquire communication skills. The reading of textbooks can be the useful tool for inculcating the habit of reading among the students learning English as second language. The present paper is based on a short experiment of reading text book for vocabulary development in ESL classroom. It is a kind of action research project which will help students to improve spoken English. In Action Research, "Action refers to intervention in an existing practice in particular social contexts (for example classroom and school) to bring about improvement and change, whereas 'research' involves the systematic observation and analysis of the change that occurs as a result" (Rui, Icy. l). Action research is a distinctive research done by the teachers to improve their competency. According to Cohen and Manion, action research is done contextually to provide a solution to the current problem.

Origin of the Research Problem:

Reading aloud is a common practice in primary classrooms and is considered as useful tool for vocabulary development. Reading aloud is suggested for building oral language and means of developing vocabulary. Reading exposes the reader to novel and unusual words and rich descriptive language. In the twenty first century teaching and mastering English language has become more important than literature. English speaking has become pre-requisite for every profession. In such situation reading text has to be used as

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39 FEMINIST CONSCIOUSNESS AS CONSCIOUSNESS OF WOMEN'S VICTIMIZATION

Dr. Ujwala Vijay Patil
Associate Professor Department of English
Dr. Patangrao Kadam Mahavidyalaya
Ramanandnagar(Burli)
Dist:Sangli(MS)416308 hiujwalapatil@gmail.com

Simone de Beauvoir observes about anatomy and inferior status of women in 'Introduction to *The Second Sex*':

> Woman has ovaries, a uterus; these peculiarities imprison her in her subjectivity, circumscribe her within the limits of her own nature. It is often said that she thinks with her glands. . . He thinks of his body as a direct and normal connection with the world, . . . whereas he regards the body of woman as a hindrance, a prison, weighed down by
>
> Everything peculiar to it. 'The female is a female by a virtue of a certain lack of qualities,' said Aristotle, 'We should regard the female nature as afflicted with a natural
>
> defectiveness'. (Beauvoir43-44)

In every ideal social structure, woman holds a significant position as a better half of humanity but in reality, she is just lesser half. They are thought as inferior, other, lacking, and wrong. She has never been considered equal to man who is considered as norm, a human being, and the right being. Woman is always thought in terms of her anatomy. She is defined by limiting criteria, without reciprocity.

Feminism is a movement of modern women. It owes its emergence to such biased misconceptions and depressing images of women. These biases and misconceptions work for the subjugation of woman and protection of the interest of patriarchy and male domination. The term 'feminism' designates the movement for the protection of rights of women and implies correlations with the equal social, political, and economic rights of women with men. The term and movement became popular in 20th century with the western women's struggle for 'right for

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Subaltern Voice in the Poetry of Meena Alexander

Dr. Ujwala Vijay Patil
Associate Professor Department of English
Dr.Patangrao Kadam Mahavidyalaya Ramanandnagar (Burli)
Dist :Sangli (MS)
Email- hiujwalapatil@gmail.com

Abstract

Meena Alexander was the prominent Indian diaspora poet. Her multiple migrations ince childhood and final settling in USA has moulded her poetic sensibility. Alexander projects the voice of the subalterns and represents the history of the masses. Though living abroad, Alexander has not abandoned a revolutionary stance. She speaks of the class struggle and the class conflict through her poetry. The poet is the voice of marginalized subalterns and sings of them. The poet is more elaborate in describing her identification with the working class and have-nots. The sun is the symbol of feudal power and colonizers. She aligns with the Marxist idea and sings for the proletariat.

Keywords: subaltern, proletariat, marginalized, colonialist attitude, communist

Meena Alexander was the prominent Indian diaspora poet. Her multiple migrations ince childhood and final settling in USA has moulded her poetic sensibility. Alexander projects the voice of the subalterns and represents the history of the masses. Though living abroad, Alexander has not abandoned a revolutionary stance. She speaks of the class struggle and the class conflict through her poetry. She is a Keralite and spent some formative years at JNU. Therefore, she is influenced by leftist thought and sings for the working class in her poetry, "I sing for all those who work head bent / close against the great red sun" (BBR 15).

The poet is more elaborate in describing her identification with the working class and have-nots. The sun is the symbol of feudal power and colonizers. She aligns with the Marxist idea and sings for the proletariat,"For song being labour". The poem *The Bird's Bright Ring* has been full of sad and gloomy tone reflecting death, devaluation of values and suffering of masses as the major concerns for the poet. She hears the voices of suffering people from the depth of darkness and sorrow(BBR23).The poem compares the birth of these people as 'endless devastation' and 'devastation of mortality', "Fragile as filament of an egg / Your birth / An endless devastation" (BBR 23).

When the poet was in Hyderabad, her office was just across the wall from a police station. During the Emergency, she could hear sounds and cries of prisoners who were being beaten. She wrote poems on it. The poet expresses sorrow on the sufferings of the prisoners in 'Within the Walls' (IRMN 17).The use of brutal force against disenfranchised victims of political oppression during the Emergency and its depiction in the poetry of Meena Alexander shows her understanding of the exploitation of masses by indigenous rulers. The nation brought up on the teaching of Mahatma Gandhi of non-violence and truth, has been tainted with violence and oppression of depressed classes and women. The common suffering people whom poet calls, "My People" are just "genitals of litter bearers" (IRMN19). They carry sorrow from centuries and never know pleasure.

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Portrayal of Motherhood in Meena Alexander's Poetry

Ujwala Vijay Patil
Associate Professor Department of English Dr.Patangrao Kadam Mhavidyalaya
Ramanandnagar(Burli) Sangli 416308(MS) India

Abstract

The feminist consciousness of Meena Alexander is typical Indian and has its indigenous origin rooted in the oppression of women. The women has two extremely opposite images either as 'devi' the incarnation of virtue, devoid of all emotions and deprived of sexual and
family relations like Sita and Savitri or the 'demonic', the villain, the monster full of all evils, allowing no humanity for herself. The awareness of the repression of the self and oppression of women in patriarchal society makes Alexander to ask in her autobiography Fault Lines, If you want me to live as a woman, why educate me? Why not kill me if you want to dictate my life? God, why teach me to write? So in order to subvert the traps of male domination, the poet reclaims the matrilineal tradition of India and celebrates it through her poems. Poet longs for gender free existence of women; however it is the 'utopian' desire. Still her poems encourage the concept of new woman aware of her own 'self'. She tries to negotiate the barrier of gender and the preserves matrilineal connection as a medium of establishing her new feminist identity by speaking about her matrilineal bloodline.

KEYWORDS: Matrilineal tradition, patriarchy, feminism, motherhood, gender

Julia Kristeva, in her Desire in Language describes a mother-centred realm of expression as the semiotic opposed to the symbolic law of the father. Kristeva rejects the psychoanalytic theorizing of motherhood as the model for psychic health. She observes, "A mother is a continuous separation, a division of the very flesh". For her experience of giving birth "wounds but increases" resulting in "the calm of another life, the life that other who wends his way while I remain henceforth like framework" (Kristeva178). Keeping in line with these radical feminists, Meena Alexander describes the relationship between mother and child ironically, "Before that script was set the child was born / but by that script the woman is torn" ('Text from the Middle Earth'IRMN29).

The lives of women have been controlled and manipulated by patriarchy in all cultures, all nations and all ages by setting various norms, values, roles of gender perception and idealism to 'make a woman'. Then the motherhood also becomes kind of imposition as Adrienne Rich writes in Of Woman Born, "Though motherhood is the experience of women, the institution of motherhood is under male control .... This glorious motherhood imposed on women conditions her entire life" (Rich45).

Though childbirth and reproduction has been considered as reason of women's exploitation, Alexander's poetry captures the pangs of waiting motherhood, the joy of being pregnant and a perfect female experience of a body cupping a body and introduces the fourth generation in her poetry. In an interview with Ayisha Abraham, Alexander said

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Structural Devices in the Poetry of Meena Alexander

Dr.Ujwala Vijay Patil
Associate Professor, Department of English, Dr.Patangrao Kadam Mahavidyalaya Ramanandnagar (Burli)
Dist:Sangli (MS) 416308
Affiliated to Shivaji University Kolhapur

Abstract

Meena Alexander was a poet of Indian diaspora born in 1951 and settled in America. She has tackled the questions of exile, race, gender, sexuality, violence, cultural differences, and multiple identities in her poems and novels. She makes use of her various cultural experiences and memories of the past to cope with present. Through an articulation of her multicolored experiences, she provides clue to her complex identity. However the present study aims at the structural devices in the poetry of Meena Alexander. She has more than ten collections of poetry to her credit.In fact the poetry is interpreted to specify the meanings of its language by analysis, paraphrasing and by commentary on the obscure, ambiguous and figurative stanzas. The poetry is interpreted in order to make clear the thematic patterns and technical features by the analysis of poetic devices, imagery, symbolism, and poetic diction. The close reading of the texts helps to analyze the poem in order to see how images, metaphors, poetic devices, poetic diction and symbolism form the poem and give particular meaning. The present paper focuses on structural devices in the poetry of Meena Alexander as hint or clue to the meaning.

Keywords: rhetorical figures, structural devices, sound devices, sense devices

The poet uses rhetorical figures that are some common figures of speech, which deviate or depart from the competent user's standard or literal uses of language. The thematic study is restricted to the study of what poem says, however, the study of techniques intends to understand how a poet expresses himself. According to L. G. Alexander, every poem is unique and has some special qualities of its own that are called as poetic devices.L.G. Alexander has classified poetic devices in three categories: structural, sense and sound. Structural devices include contrast, repetition, and illustration. Simile, metaphor, and personification are sense devices.Sound devices include alliteration, onomatopoeia, rhyme, assonance, rhythm. Except these three main devices, there are other devices, which are to be focused in the study. They are paradox, transliteration, allusions, synesthesia, apostrophe, voices, exaggeration (hyperbole), rhetorical questions, invocation, inversion, antithesis, parallelism.

Structural Devices:

a. Contrast

In order to accentuate the feelings of exile, alienation, lamentation, loneliness, devastation, pain, agony and loss, the poet uses the device of contrast very effectively in the poem *The Bird's Bright Ring*. The blind musician and the cactus man representing darkness and disappointment are contrastingly juxtaposed with Durga of many heads, smiling at flower
and representative of feminine power (BBR 10). The contrast between frog and sun in the poem represents the conflict between the patriarchal male power and a weak female power with its physical limitations (BBR 16, 17). The poem is engulfed by darkness and blackness. Contrastingly,it is replete with description of light and brightness. The poem 'Pictures for the Bhagavatha Purana'(SR32) has contrast as the main device. The various pictures of the degeneration and degradation of values, oil fishing boat, a wooden stool, police station with broken windows, a mongrel, a boy with an extra thumb erect, women pouring water on the tomb are pictures of modern life. Contrastingly, enough the poet calls them as pictures for the Bhagavata Purana.

Delhi is the capital city of India and has historical importance and grace. However, the poem 'Threshold City' (SR 43) presents Delhi in all its degraded and polluted state in spite of its glorious and affluent heritage. Pigeons lurching in football fields, skies shot with acid focus the
degenerated situation of Delhi and present the contrast of the situation.India is such a country where we can see the two extreme ends in social life. There are people who are extremely rich willowing in luxuries and comfort while on the other hand poor people who cannot get enough food to fulfill their hunger. The poem 'The Travellers' portrays the pictures of poverty, black money, corruption in order to specify the contrast between the rich and poor very sarcastically(TS 9).

In poem 'Keeping House' (HoaTD 9) the description of Sabarmati ashram, ablutions and sung prayers, spinning wheels recounts the simple and peaceful way of life which is juxtaposed against the current situation of country where disorder dogs and people have become butchers to spin out the bloodied flesh in the nightmares. Poet expresses the hardships of exiled life through the device of contrast in 'Toxic Petals' (RaB). The exiled space makes poet faceless and selfless sucking up her reflection in a blue hole of sky, so she writes, "From where I sit / summer's blossoms are headless / tearing uphill" (RaB 71).In order

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IMMIGRANT WOMEN AND RACIALIZED EXISTENCE DEPICTED IN MEENA AEXANDER'S POETRY

DR. UJWALA VIJAY PATIL
Associate Professor
Department of English
Dr.Patangrao Kadam Mahavidyalay Ramanandnagar(Burli)
Dist.-Sangli. Maharashtra 416308
Affiliated to Shivaji university Kolhapur

ABSTRACT

Though multicultural society is highly egalitarian policy, the racial discrimination exists in it. When the 'other' cultures tend to be measured against 'dominant', they find themselves placed at the margins of the society. Multicultural society declares itself liberal towards immigrants irrespective of their nationality, religion, and race. However, the third world immigrants have to face the discrimination in subtle manner in various facets of their lives. To emphasize the hierarchization of power in Canadian multicultural mosaic, "multiculturalism" is ironically termed as "multivulturalism" in the novel No New Land (Vassanji 54).The racialized gaze is a thematic pattern that recurs with stress in Alexander's poetry. The poet's creativity is concerned about the cultural marks on the body of immigrant women. While living in gendered, racialized and "multicultural" space, the poet finds it difficult to define her Indian identity. Because race is "used almost synonymously with ethnicity, signifies a complicated imbrication of culture and nationality" (Banerjee 31). Alexander's poetry is a lively response to social and historical realities. The present paper tries to analyse this sense of being born in female and coloured body which is struggling to survive on physical and psychological level as an immigrant as expressed in Meena Alexander's poetry.

Keywords: Multiculturalism, Ethnicity, Culture, Racial Discrimination, Diaspora

Meena Alexander's poetry is a complex interweaving of the Indian and immigrant experiences. Her poetry emerges out of the consciousness of hanging between two worlds, between memory and present experiences. The issues of identity formation and retention are crucial for her. The racism, with reference to immigrant experience, has been more than just expression of hate. The racism evidences "prejudice based on the race, colour, ancestry, ethnicity, religion, or national origin of the victim" (Goldberg 17). It is also "an international postmodern bias based on artificially and scientifically vacuous distinction between biologically conceived racial group" (Goldberg 19).

Webster's dictionary defines race as "one of the major subdivisions of mankind, regarded as having a common origin and exhibiting a relatively constant set of physical traits" while racism is "An excessive and irrational belief in or advocacy of the superiority of

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EFFECT OF GLYPHOSATE BASED HERBICIDE ROUNDUP ON GILL STRUCTURE OF A FRESHWATER CRAB, *Barytelphusa cunicularis* (WESTWOOD 1836)

A. S. SHEWALE [a*] AND T. S. BHOSALE [b]

[a] Department of Zoology & Fisheries, Yashavantrao Chavan Institute of Science, Satara, (MS), India.
[b] Dr. Patangrao Kadam Mahavidyalaya, Ramanandnagar (Burli), (MS), India.

AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Glyphosate is a broad-spectrum herbicide that also has a desiccant effect on crops. This herbicide could build up in it and be leached into groundwater without damaging or affecting agricultural plants. Freshwater organisms, which are not intended to be targets for these detrimental components, are exposed to these substances and may demonstrate a range of changes in their bodies. These toxins may potentially make their way into the human body via the food chain. The extent of gill damage produced by the lethal exposure to roundup of the freshwater crab *Barytelphusa cunicularis* (Westwood 1836) was determined using histological studies. This herbicide could build up in it and be leached into groundwater without damaging or affecting agricultural plants. Freshwater organisms, which are not intended to be target for these detrimental components, are exposed to these substances and may demonstrate a range of changes in their bodies. These toxins may potentially make their way into the human body via the food chain. The extent of gill damage produced by the lethal exposure to roundup of the freshwater crab *Barytelphusa cunicularis* (Westwood 1836) was determined using histological studies. The purpose of this study was to see how the herbicide roundup altered histology in the freshwater crab *Barytelphusa cunicularis* in various tissues. Epithelial lifting, edema, necrosis, fusion of secondary lamellae, bleeding, and vacuolization in the gill stem were all seen in the experimental gills. Over the course of 1 to 4 days of treatment, the experimental crabs subjected to fatal amounts of the roundup revealed significant histological alterations.

Keywords: Necrosis; *Barytelphusa cunicularis*; glyphosate based herbicide roundup; lethal concentration and haemocytes.

**Corresponding author: Email: shewaleashwini20@gmail.com;*

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Review

Promising botanical-derived monoamine oxidase (MAO) inhibitors: pharmacological aspects and structure-activity studies

Tuyelee Das[1,#], Suchismita Chatterjee Saha[2,#], Kumari Sunita[3], Madhumita Majumder[4], Mimosa Ghorai[1], Abhijit Bhagwan Mane[5], Dorairaj Arvind Prasanth[6], Prasann Kumar[7], Devendra Kumar Pandey[8], Abdel Rahman Al-Tawaha[9], Gaber El-Saber Batiha[10], Mahipal S Shekhawat[11], Arabinda Ghosh[12], Javad Sharifi-Rad[13], Abhijit Dey[1,*]

[1] Department of Life Sciences, Presidency University, 86/1 College Street, Kolkata, 700073, West Bengal, India
[2] Department of Zoology, Nabadwip Vidyasagar College, Nabadwip, West Bengal, India
[3] Department of Botany, DDU Gorakhpur University, Gorakhpur 273009, U.P, India
[4] Department of Botany, Raidighi College, West Bengal, India
[5] Department of Zoology, Dr. Panjabrao Kadam Mahavidhyalaya, Ramanandnagar (Burli), Maharashtra, India
[6] Department of Microbiology, School of Biosciences, Periyar University, Salem-636011, Tamilnadu, India
[7] Department of Agronomy, Lovely Professional University, Jalandhar, Punjab, 144411, India,
[8] Department of Biotechnology, Lovely Professional University, Punjab, India
[9] Department of Biological Sciences, Al-Hussein Bin Talal University, Maan, Jordan
[10] Department of Pharmacology and Therapeutics, Faculty of Veterinary Medicine, Damanhour University, Damanhour 22511, AlBeheira, Egypt
[11] Biotechnology Unit, K. M. Government Institute for Postgraduate Studies and Research, Puducherry 605 008, India
[12] Department of Botany, Gauhati University, Guwahati, Assam 781014, India
[13] Phytochemistry Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

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ABSTRACT

Monoamine oxidase (MAO) is capable of catalysing the oxidative deamination of amines and neurotransmitters. MAO plays a pivotal role in maintaining neurotransmitters linked to neurological disorders viz. Alzheimer's disease (AD), Parkinson's disease (PD) etc. Therefore, inhibition of MAO can be implicated to the cure of such diseases. Synthetic MAO inhibitors are known to inhibit MAO activity. However, there are safety issues with synthetic MAO inhibitors and many of their effects are non-selective and irreversible. Contrasting synthetic drugs, plant-derived natural products have been popularized globally owing to their extensive acceptability and applicability, therapeutic potency and minimum side effects which potentiated the possibility of developing reversible, promising MAO inhibitors based on natural products. The present review comprehensively elucidates plant -derived natural reversible MAO inhibitors using the literature from the popular databases such as Google Scholar, Scopus, PubMed and Web of Science. This literature review reports approximately 51 plants that have been evaluated for MAO inhibitory activity. In addition, 93 plant-derived natural compounds were retrieved as MAO inhibitors. Majority of these investigations predominantly utilized an *in vitro* approach to evaluate the MAO inhibitors in relation to the developing treatments of related neurological diseases. However, *in vivo* studies and clinical trials are still lacking in evaluating the botanical-

Abbreviation: 5-HT, 5-hydroxytryptamine; AD, Alzheimer's disease; CNS, Central nervous system; FAD, Flavin adenine dinucleotide; EI-MS, Electron ionization mass spectrometer; ESI-TOF-MS, Electrospray ionization time-of-flight mass spectrometry; GC-MS, Gas chromatography mass spectrometry; H_2O_2, Hydrogen peroxide; HMBC, ^1H-^{13}C Heteronuclear multiple bond correlation spectroscopy; HPLC, High pressure liquid chromatography; HPLC/APCI-MS, High pressure liquid chromatography / atmospheric pressure chemical ionization-mass spectrometry; HPLC-DAD-MS, High pressure liquid chromatography- diode array detection-mass spectrometry; HPLC-ED, High pressure liquid chromatography-electrochemical detection; HPLC-MS, High pressure liquid chromatography-Mass spectrometry; HPLC-NMR, High pressure liquid chromatography - Nuclear magnetic resonance; HPLC-PDA, High pressure liquid chromatography-photometric diode array; HR-MS, High resolution-mass spectrometry; HR-ESI-MS, High resolution- electrospray ionization - mass spectrometry; HSQC, The heteronuclear single quantum coherence; IR, Infrared spectroscopy; MAO, Monoamine oxidase; MAO-A, Monoamine oxidase-A; MAO-B, Monoamine oxidase-B; MS, Mass spectrometry; NMR, Nuclear magnetic resonance; 1D, 2D NMR, One- and two-dimensional nuclear magnetic resonance; 2D-NMR, Two-dimensional nuclear magnetic resonance spectroscopy; ^1H NMR, Proton Nuclear Magnetic Resonance; ^{13}C NMR, Carbon-13 (C13) Nuclear Magnetic Resonance; ^{13}C-DEPT NMR, Carbon-13 (C13)-Distortionless enhancement by polarization transfer- nuclear magnetic resonance; PD, Parkinson's disease; PNS, Peripheral nervous system; RP-HPLC, Reverse phase high performance liquid chromatography; TLC, Thin layer chromatography; UHPLC/HR-TOF-MS, : UPLC-DAD-MS, Ultra-high-performance liquid chromatography–diode array detector–tandem mass spectrometry; UPLC-QTOF-MS, Ultra-high performance liquid chromatography-quadrupole time-of-flight mass spectrometry; UV, Ultraviolet; UV/Vis, Ultraviolet visible spectrophotometry

* Corresponding author.
E-mail address: abhijit.dbs@presiuniv.ac.in (A. Dey).
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Cytokinins: A Genetic Target for Increasing Yield Potential in the CRISPR Era

Sayanti Mandal[1], Mimosa Ghorai[2], Uttpal Anand[3], Debleena Roy[4], Nishi Kant[5], Tulika Mishra[6], Abhijit Bhagwan Mane[7], Niraj Kumar Jha[8], Milan Kumar Lal[9], Rahul Kumar Tiwari[9], Manoj Kumar[10], Radha[11], Arabinda Ghosh[12], Rahul Bhattacharjee[13], Jarosław Proćków[14] and Abhijit Dey[2]**

[1]Institute of Bioinformatics and Biotechnology, Savitribai Phule Pune University, Pune, India, [2]Department of Life Sciences, Presidency University, Kolkata, India, [3]Department of Life Sciences, Ben-Gurion University of the Negev, Beersheba, Israel, [4]PG Department of Botany, Lady Brabourne College, Kolkata, India, [5]Department of Biotechnology, ARKA Jain University, Jamshedpur, India, [6]Department of Botany, DDU Gorakhpur University, Gorakhpur, India, [7]Department of Zoology, Dr. Patangrao Kadam Mahavidhyalaya, Ramanandnagar (Burli), Sangli, India, [8]Department of Biotechnology, School of Engineering and Technology, Sharda University, Greater Noida, India, [9]ICAR-Central Potato Research Institute, Shimla, India, [10]Chemical and Biochemical Processing Division, ICAR-Central Institute for Research on Cotton Technology, Mumbai, India, [11]School of Biological and Environmental Sciences, Shoolini University of Biotechnology and Management Sciences, Solan, India, [12]Microbiology Division, Department of Botany, Gauhati University, Guwahati, India, [13]School of Biotechnology, Kalinga Institute of Industrial Technology (KIIT) Deemed To Be University, Bhubaneswar, India, [14]Department of Plant Biology, Institute of Environmental Biology, Wrocław University of Environmental and Life Sciences, Wrocław, Poland

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University of Gondar, Ethiopia
Rupa Sanyal,
WBSU, India

***Correspondence:**
Jarosław Proćków
jaroslaw.prockow@upwr.edu.pl
Abhijit Dey
abhijit.dbs@presiuniv.ac.in

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Over the last decade, remarkable progress has been made in our understanding the phytohormones, cytokinin's (CKs) biosynthesis, perception, and signalling pathways. Additionally, it became apparent that interfering with any of these steps has a significant effect on all stages of plant growth and development. As a result of their complex regulatory and cross-talk interactions with other hormones and signalling networks, they influence and control a wide range of biological activities, from cellular to organismal levels. In agriculture, CKs are extensively used for yield improvement and management because of their wide-ranging effects on plant growth, development and physiology. One of the primary targets in this regard is cytokinin oxidase/dehydrogenase (CKO/CKX), which is encoded by CKX gene, which catalyses the irreversible degradation of cytokinin. The previous studies on various agronomically important crops indicated that plant breeders have targeted CKX directly. In recent years, prokaryotic clustered regularly interspaced short palindromic repeats (CRISPR)/CRISPR-associated protein 9 (Cas9) system has been increasingly used in editing the CKO/CKX gene and phenomenal results have been achieved. This review provides an updated information on the applications of CRISPR-based gene-editing tools in manipulating cytokinin metabolism at the genetic level for yield improvement. Furthermore, we summarized the current developments of RNP-mediated DNA/transgene-free genomic editing of plants which would broaden the application of this technology. The current review will advance our understanding of cytokinins and their role in sustainably increase crop production through CRISPR/Cas genome editing tool.

Keywords: cytokinin, cytokinin oxidase/dehydrogenase, IPT, CRISPR/Cas, crop improvement

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Review

Advancing urban ethnopharmacology: a modern concept of sustainability, conservation and cross-cultural adaptations of medicinal plant lore in the urban environment

Tusheema Dutta[1,†], Uttpal Anand[2,†], Suchismita Chatterjee Saha[3], Abhijit Bhagwan Mane[4], Dorairaj Arvind Prasanth[5], Ramesh Kandimalla[6,7], Jarosław Proćków[8,*] and Abhijit Dey[1]

[1]Ethnopharmacology and Natural Product Research Laboratory, Department of Life Sciences, Presidency University, 86/1 College Street, Kolkata, 700073, West Bengal, India
[2]Department of Life Sciences, Ben-Gurion University of the Negev, Beer-Sheva, 84105, Israel
[3]Department of Zoology, Nabadwip Vidyasagar College (Affiliated to the University of Kalyani), Nabadwip, West Bengal, 741302, India
[4]Department of Zoology, Dr. Patangrao Kadam Mahavidyalaya, Sangli, (Affiliated to Shivaji University of Kolhapur), Maharashtra, 416308, India
[5]Department of Microbiology, School of Biosciences, Periyar University, Salem, 636011, Tamilnadu, India
[6]CSIR-Indian Institute of Chemical Technology, Uppal Road, Tarnaka, Hyderabad, 500007, Telangana, India
[7]Department of Biochemistry, Kakatiya Medical College, Warangal, 506007, Telangana, India
[8]Department of Plant Biology, Institute of Environmental Biology, Wrocław University of Environmental and Life Sciences, Kożuchowska 5b, 51-631 Wrocław, Poland

***Corresponding author:** Department of Plant Biology, Institute of Environmental Biology, Wrocław University of Environmental and Life Sciences, Kożuchowska 5b, 51-631 Wrocław, Poland. Email: jaroslaw.prockow@upwr.edu.pl
†These authors contributed equally to this work.

The discipline 'urban ethnopharmacology' emerged as a collection of traditional knowledge, ancient civilizations, history and folklore being circulated since generations, usage of botanical products, palaeobotany and agronomy. Non-traditional botanical knowledge increases the availability of healthcare and other essential products to the underprivileged masses. Intercultural medicine essentially involves 'practices in healthcare that bridge indigenous medicine and western medicine, where both are considered as complementary'. A unique aspect of urban ethnopharmacology is its pluricultural character. Plant medicine blossomed due to intercultural interactions and has its roots in major anthropological events of the past. Unani medicine was developed by Khalif Harun Al Rashid and Khalif Al Mansur by translating Greek and Sanskrit works. Similarly, Indo-Aryan migration led to the development of Vedic culture, which product is Ayurveda. Greek medicine reached its summit when it travelled to Egypt. In the past few decades, ethnobotanical field studies proliferated, especially in the developed countries to cope with the increasing demands of population expansion. At the same time, sacred groves continued to be an important method of conservation across several cultures even in the urban aspect. Lack of scientific research, validating the efficiency, messy applications, biopiracy and slower results are the main constrains to limit its acceptability. Access to resources and benefit sharing may be considered as a potential solution. Indigenous communities can copyright their traditional formulations and then can collaborate with companies, who have to provide the original inventors with a fair share of the profits since a significant portion of the health economy is generated by herbal medicine. Search string included the terms 'Urban' + 'Ethnopharmacology', which was searched in Google Scholar to retrieve the relevant literature. The present review aims to critically analyse the global concept of urban ethnopharmacology with the inherent plurality of the cross-cultural adaptations of medicinal plant use by urban people across the world.

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Unravelling the regulatory role of miRNAs in secondary metabolite production in medicinal crops

Shreya Chakraborty[a], Prasann Kumar[b], Rupa Sanyal[c], Abhijit Bhagwan Mane[d], D. Arvind Prasanth[e], Manoj Tukaram Patil[f], Abhijit Dey[a,*]

[a] Department of Life Sciences, Presidency University, 86/1 College Street, Kolkata 700073, West Bengal, India
[b] Department of Agronomy, School of Agriculture, Climate Mitigation and Sustainable Agricultural Laboratory, Division of Research and Development, Lovely Professional University, Jalandhar, Punjab, India
[c] Department of Botany, Bhairab Ganguly College, Kolkata, West Bengal, India
[d] Department of Zoology, Dr. Patangrao Kadam Mahavidhyalaya, Ramanandnagar (Burli), Tal: Palus, Dist: Sangli, Maharashtra, India
[e] Department of Microbiology, School of Biosciences, Periyar University, Salem, Tamilnadu, India
[f] Post Graduate Department of Botany, SNJB's KKHA Arts SMGL Commerce and SPHJ Science College, Chandwad (Nashik), Maharashtra, India

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ABSTRACT

Plant secondary metabolites (PSMs) such as flavonoids, terpenoids, alkaloids etc. have many biological, ecological and pharmaceutical significance Owing to their immense importance, elucidation of their regulatory mechanisms is pivotal. Micro-RNAs (miRNAs), the small, endogenous, noncoding RNA molecules of about 21 nucleotides, capable of regulating gene expression in eukaryotes, are off late gaining attention as potent engineer in regulating plant secondary metabolite synthesis. They have been used in metabolic engineering as they can target mRNAs for cleavage and translational repression thereby regulating key biological processes. However, knowledge on their role in plant secondary metabolite biosynthesis is still in its infancy. The present review comprehensively encompasses the regulatory role of miRNAs in the biosynthetic pathways of major plant secondary metabolites such as alkaloids, terpenoids and flavonoids with notes on their target genes and their biosynthetic products, kinds of regulatory miRNAs with their respective regulatory roles and methods of detection with a note on the future direction of relevant research.

1. Introduction

Plants have been a prime source of food and medicine since time immemorial (Dey et al., 2020). Plants are considered as the storehouse of valuable metabolites owing to their immense benefit and use as food, medicine, nutraceuticals and pharmaceuticals (Modak et al., 2020). Plant metabolites are broadly characterized into primary and secondary types of which primary metabolites are mostly implicated to the e growth and development of the plant. On the contrary, secondary metabolites, although not essential for the plant, are the defense molecules, primarily engaged in combating biotic and abiotic stresses in plants (Patra et al., 2013). An array of diverse plants secondary metabolites viz. alkaloids, flavonoids, tannins, phenolics, terpenoids, saponins, glycosides have been utilized by human for their immense pharmacological potential and health benefits (Debnath et al., 2018).

Off late, plant biotechnology, metabolic engineering and synthetic biology toolkits have been employed successfully to regulate and optimize the production of valuable plant secondary metabolites for human use (Guerriero et al., 2018). Recently, miRNAs have been reported to play crucial roles in modulating many regulatory mechanisms in plants (Samad et al., 2017) including the production of secondary metabolites (Qiao et al., 2017). Additionally, they are flexible enough to be positively and negatively regulated, thus providing scope for increasing production of desired metabolites and limiting production of negative metabolites (Sabzehzati and Naghavi, 2019). Until now, no review on the current topic was noted except one by Gupta et al., 2017, who compiled the reports on the identification and characterization of miRNA in the production of plant secondary metabolites. Since 2017, many works have been performed in the relevant fields and here we have tried to encompass the recent literature mostly keeping in mind the contribution of the older reports with notes on future perspectives.

miRNAs are small (21–23) nucleotide long, non-coding, single stranded ribo-regulators that has the ability to regulate the eukaryotic gene expression post transcriptionally by binding to mRNA (Treiber et

* Corresponding author.
E-mail address: abhijit.dbs@presiuniv.ac.in (A. Dey).

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MINI-REVIEW

Biotechnology for propagation and secondary metabolite production in *Bacopa monnieri*

Rupa Sanyal[1] · Saheli Nandi[1] · Sharmila Pandey[1] · Ujani Chatterjee[1] · Tulika Mishra[2] · Sutapa Datta[3] · Dorairaj Arvind Prasanth[4] · Uttpal Anand[5] · Abhijit Bhagwan Mane[6] · Nishi Kant[7] · Niraj Kumar Jha[8] · Saurabh Kumar Jha[8] · Mahipal S. Shekhawat[9] · Devendra Kumar Pandey[10] · Abhijit Dey[11]

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Abstract

Bacopa monnieri (L.) Wettst. or water hyssop commonly known as "Brahmi" is a small, creeping, succulent herb from the *Plantaginaceae* family. It is popularly employed in Ayurvedic medicine as a nerve tonic to improve memory and cognition. Of late, this plant has been reported extensively for its pharmacologically active phyto-constituents. The main phytochemicals are brahmine, alkaloids, herpestine, and saponins. The saponins include bacoside A, bacoside B, and betulic acid. Investigation into the pharmacological effect of this plant has thrived lately, encouraging its neuroprotective and memory supporting capacity among others. Besides, it possesses many other therapeutic activities like antimicrobial, antioxidant, anti-inflammatory, gastroprotective properties, etc. Because of its multipurpose therapeutic potential, it is overexploited owing to the prioritization of natural remedies over conventional ones, which compels us to conserve them. *B. monnieri* is confronting the danger of extinction from its natural habitat as it is a major cultivated medico-botanical and seed propagation is restricted due to less seed availability and viability. The ever-increasing demand for the plant can be dealt with mass propagation through plant tissue culture strategy. Micropropagation utilizing axillary meristems as well as de novo organogenesis have been widely investigated in this plant which has also been explored for its conservation and production of different types of secondary metabolites. Diverse in vitro methods such as organogenesis, cell suspension, and callus cultures have been accounted for with the aim of production and/or enhancement of bacosides. Direct shoot-organogenesis was initiated in excised leaf and internodal explants without any exogenous plant growth regulator(s) (PGRs), and the induction rate was improved when exogenous cytokinins and other supplements were used. Moreover, biotechnological toolkits like *Agrobacterium*-mediated transformation and the use of mutagens have been reported. Besides, the molecular marker-based studies demonstrated the clonal fidelity among the natural and in vitro generated plantlets also elucidating the inherent diversity among the natural populations. *Agrobacterium*-mediated transformation system was mostly employed to optimize bacoside biosynthesis and heterologous expression of other genes. The present review aims at depicting the recent research outcomes of in vitro studies performed on *B. monnieri* which include root and shoot organogenesis, callus induction, somatic embryogenesis, production of secondary metabolites by in vitro propagation, acclimatization of the in vitro raised plantlets, genetic transformation, and molecular marker-based studies of clonal fidelity.

Key points

- *Critical and up to date records on in vitro propagation of Bacopa monnieri*
- *In vitro propagation and elicitation of secondary metabolites from B. monnieri*
- *Molecular markers and transgenic studies in B. monnieri*

Keywords Micropropagation · Biotechnology · Cell suspension cultures · Elicitation · Saponins · Bacosides · In vitro propagation · Pharmacological activity

Introduction

Bacopa monnieri (L.) Wettst. from the *Plantaginaceae* family is an amphibian plant of the tropical regions that usually grow on the banks of rivers and lakes (Binita et al. 2005). It

✉ Abhijit Dey
abhijit.dbs@presiuniv.ac.in

Extended author information available on the last page of the article

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साहित्य में नारी चित्रण : मैत्रेयी पुष्पा के संदर्भ में

डॉ. काकासो बापूसो भोसले
रयत शिक्षण संस्था का,
डॉ.पतंगराव कदम महविद्यालय, रामानंदनगर (बुर्ली)तह. पलूस, जि. सांगली
bhosalekakasaheb7@gmail.com

उपन्यास विधा मानव जीवन की अभिव्यक्ति का जीवंत दस्तावेज है। प्रेमचदंजी ने कहा है- " मैं उपन्यास को मानव जीवन का चित्रमात्र मानता हुँ, मानव चरित्र पर प्रकाश डालना और उनके रहस्यों कों खोलना ही उपन्यास का मूल उद्देश्य है।" यह सर्वविदित है कि आज स्त्री लेखन ने नारी की ईच्छा शक्ति को क्रांतिकारी पहचान दी है। स्त्री लेखन का उद्देश्य स्त्री जीवन के विभिन्न अध्यायों का सूक्ष्म से सूक्ष्म अध्ययन करना रहा है। जिसमें स्त्री का जीवन के प्रति दृष्टिकोण उसकी इच्छा - आकांक्षाएँ,अपेक्षाएँ, उद्देश्य, जीवन के विभिन्न पहलुओं पर विचार,अपेक्षाएँ आदि को चित्रित करना रहा है।

आज समाज में नारी के विविध रूपों की पहचान है जैसे माता, बहन, पत्नी प्रेमिका, सास, बहू, पुत्री, सखी आदि। स्त्री परिवार में रहकर अपना जीवन सुखपूर्वक बिताती है। रिश्तों को सँभालना नारी के लिए अनिवार्य हैं। शिक्षा के कारण नारी की वैचारिक क्षमता मे परिवर्तन हुआ। वह चार दिवारों से बाहर निकली, उसका संबंध अन्य पुरूषों से आने लगा है। उनका व्यक्तित्व बहुआयामी बनता जा रहा है। हमारे देश में माता का रूप पुजनिय है। वात्सल्य की मूर्ति है। डॉ. धर्मपाल कहते है - "नारी का मातृत्व पुरूष से श्रेष्ठ है, सक्षम समर्थ तथा कल्याणकारी है। मातृत्व के कारण नारी की तुलना पृथ्वी से की जाती है जो बीजरूप पुरूष के संयोग से पुरूष को उत्पन्न करती हैं। माता के रूप में नारी को समुद्र के समान कहा जाता है, जो पुरूष रूपी सूर्य की उर्जा से उर्धरा होती है।"[1]

महिला लेखिकाओं ने संपूर्ण नारी जगत का प्रतिनिधित्व करते हुए साहित्य में उनकी घुटन,तनाव एवं रोष को उजागर करने का प्रयास किया है। मैत्रेयी पुष्पा जी ने अपने उपन्यासों में नारी विमर्ष या चित्रण को नयी वाणी देने का प्रयास किया है। हमारे समाज में मर्दानगी दिखानेवाले पुरूषों की कमी नहीं है। कई नारियाँ पुरूषों के हमले सहन न कर बदला आक्रमण से लेना चाहती है। इसका चित्रण मैत्रेयी पुष्पा ने 'चाक' उपन्यास किया है। इस उपन्यास में सारंग अपनी बहन रेशम की मृत्यु का हत्यारा डोरिया का बदला लेना चाहती है।बदला लेने के लिए पूरे गाँव के खिलाफ पति रंजित को खडा करती है।और अत्याचारी डोरिया के खिलाफ अपना प्रण इन शब्दों में व्यक्त करती है - " डोरिया के हाथों में हथकडी लगेगी तब बालों को समेटूँगी- - - - - चैन की साँस तब लूँगी जब हत्यारे को फाँसी या जन्म कैद होगी। "[2] स्पष्ट है कि सारंग का यह विद्रोह अपनी बहन की मौत के जिम्मेदार डोरिया के खिलाफ है।

जब तक भारतीय नारी ने पुरूष वर्चस्व को स्वीकार किया लेकिन आज वह पुरूषों का एकाधिकार, वर्चस्व, तानाशाही का विरोध करनेवाली दिखाई दी है। 'चाक' उपन्यास में मैत्रेयी पुष्पा ने सारंग को पति रंजित की पुरूषी मानसिकता के खिलाफ दिखाया है।रंजित संतान पर अपना एकाधिकार बनाने के उद्देश्य से चदन को भाई दलवीर के साथ शहर भेजता है परंतु वात्सल्य के भाव से सारंग चंदन को वापस बुलाती है। परंतु सारंग के अवैध संबंधों से त्रस्त पति रंजित प्रतिशोध की भावना से बेटे चंदन को आगरा भेजता है,परंतु सारंग चंदन को रोकती है।रंजित पत्नी सारंग को पीटता है।सारंग रणचंडी,महाचंडी दुर्गा का रूप धारण कर लपकते हूई खूँटी से बंदुक उतारकर चलाती है और शेरनी की भाँति गरजते हुए कहती है - " असल मर्द है तो छू चंदन को ! छू।"[3] इस कथन से स्पष्ट होता है कि ,स्त्री वंशवृदिध का साधन नहीं है,उसकी इच्छा-अनिच्छा का भी ध्यान रखना पडता है।

'चाक' उपन्यास में प्रधानिन का विरोध भी पुरूषी मानसिकता के खिलाफ है।दाम्पत्य मर्यादा से नारी पुरूषी वर्चस्व में दबी हुई है।वह पुरूषी वर्चस्व को त्यागकर अपना स्वतंत्र अस्तित्व बनाना चाहती है। जब सारंग चुनाव के प्रचार हेतू गाँव की महिलाओं का संगठण कर जुलूस निकालती है। उस जुलूस में सारंग का विरोध करने के लिए फत्तेसिंह प्रधान की पत्नी

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21वीं सदी में नारी शोषण के विविध रूप

डॉ.नितिन हिंदुराव कुंभार
हिंदी विभाग
डॉ. पतंगराव कदम महाविद्यालय, रामानंदनगर (बुर्ली), तहसील: पलुस, जिला: सांगली महाराष्ट्र
ई – मेल- nkumbhar98@gmail.com Mob.No.8275377256

भारतीय समाज की आध्यात्मिक और सांस्कृतिक परंपरा बहुत पुरानी रही है। इसमें नारी को देवी का रुप मानकर सम्मान देने की परंपरा थी। मातृत्व के कारण उसे पूजनीय माना जाता था। वैदिक युग तक नारी को समाज में सम्मान प्राप्त था। कालांतर में मनुवादी संस्कृति का जोर और परकीय आक्रमण आदि के कारण नारियों का गौरव धीरे – धीरे छीनते हुए उसका जीवन नारकीय बना दिया। धार्मिक रुढ़ियों का प्रभाव समाज पर ज्यादा होने के कारण बहुत सारे नियम एवं शर्तें बनाई गयी। इसमें अधिकांश नियम नारी को लक्ष्य बनाकर बनाए गए उसे दया, क्षमा और करुणा की मूर्ति बनाकर सब कुछ सहने के लिए विवश कर दिया। उसे चिरबंदिनी बनाया गया। पुरुष द्वारा शोषित अत्याचारित नारी को दोयम दर्जे का स्थान दिया जाता है। उस पर जुल्म – सितम सैंकड़ों वर्षों से किये जा रहे है। इस बदहाली का कारण उसकी परनिर्भरता, दुर्बलता ही रही है। किसी भी परिवार में कमजोर प्राणी के रुप में औरत को ही देखा जाता है। इसीलिए उसे पिता, पति और पुत्र के आदेश, अनुशासन और बंधनों में ही रहना पड़ता है।

21 वीं सदी तक पहुँचते – पहुँचते नारी को सामाजिक सुरक्षा और सम्मान प्रदान करने के अनेक उपाय किए गए। उसे शिक्षा ग्रहण करने की पूरी स्वतंत्रता दी गयी। कुप्रथाओं के विरुद्ध सरकार तथा कानून के द्वारा प्रतिबंध लगाए गए। पुरुषों के समान अधिकार देने का प्रावधान किया गया है। अतः एक ओर नारी को सामाजिक सम्मान, सुरक्षा और समानता देने के प्रयास किए जा रहे हैं तो दूसरी ओर आज भी एक आम भारतीय का विचार वही दकियानुसी ही है। जिसमें नारी को सामाजिक और आर्थिक सुरक्षा नहीं है। यह प्रवृत्ति गाँवों तथा पिछड़े तबकों में अधिक पायी जाती है। समाज की इस पुरातनपंथी मानसिकता पर गौर करती हुई डॉ. जूही शुक्ला कहती है, ''आज का समय बदल चुका है। स्त्रियों ने समाज के प्रत्येक क्षेत्र में अपना दखल दे रखा है। वे सफल राजनीतिज्ञ, उद्योगपति एवं कार्पोरेट जगत में जमकर खड़ी है। लेकिन फिर भी भारतीय ग्रामीण अंचलों में स्त्रियों के लिए जीवन अभी भी बहुत कठिन है। उन्हें अपनी प्राथमिक जरुरतों के लिए भी संघर्ष करना पड़ रहा है। ये अभी भी समाज की बीमार मानसिकता के दंश को झेल रही है। यह अभी भी अलग से देखी जानेवाली जीव है। इन्हें निर्णय लेने एवं परिवार की आय से हिस्सा प्राप्त करने का अधिकार नहीं है। चाहे स्त्री किसी भी आर्थिक संवर्ग की हो वह अभी भी पुरुषों पर आश्रित है।''

अतः स्पष्ट है कि आज के युग में जिसे 'नारी स्वतंत्रता का युग' कहा जाता है, उसमें भी नारी को प्रताड़ित होना पड़ रहा है। व्यंग्य कहानीकारों ने भी नारी की दुर्दशा, पराधीनता, परवशता, असहायावस्था का ही अधिक चित्रण किया है। नारी शिक्षित हो या अशिक्षित परंतु समाज – परिवार में आज भी उस पर एक समान ही बंधन लगाए जाते हैं। शिक्षित नारियाँ अपनी स्वतंत्रता और अधिकारों के प्रति सजग होने के बावजूद भी उसे पुरुषों की गुलामी में रहना पड़ता है। घर - परिवार में उसे 'निकम्मी' ही समझा जाता है। उसका और उसकी पढ़ाई का कोई महत्त्व घरवालों को नहीं होता। वह सब कुछ देख – परखे पर कहीं भी दखलअंदाजी न करें और केवल घर की जिम्मेदारियों को ही सम्हालने तक ही उसका अस्तित्व बनाया जाता है। सुधीर ओखदे की 'परिमार्जन' कहानी के पुरोहित के द्वारा – 'लेकिन मालकिन तो उच्च शिक्षा प्राप्त है ?' इस प्रश्न के पूछे जाने पर शंभू प्रसाद तिलमिला उठते हुए कहता है, ''क्या कहना चाहता है ? शिक्षा – भिक्षा मैके में। यहाँ ससुराल में बुद्धि का क्या काम ! खाए पियें और ऐंश करें। टी .वी पर सिनेमा देखें, सीरियल देखें, विज्ञापन देखें, नारी स्वातंत्र्य देखें, विवाह बाहय संबंध देखें, रक्तपात देखें, साड़ी में लिपटी पाश्चात्य सभ्यता – संस्कृति देखें, सिगरेट, दारू पीती हुई मध्यवर्गीय परिवार की कुलवधू देखें। वह

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भारतीय महिलांवरील अत्याचार - एक सामाजिक चिंतन

प्रा.कोने दिलीप महादू
सहयोगी प्राध्यापक व मराठी विभाग प्रमुख
डॉ.पतंगराव कदम महाविद्यालय, रामानंदनगर (बुर्ली), ता.पलुस जि.सांगली

प्राचीन काळापासून अव्याहतपणे चालत आलेली गोष्ट म्हणजे स्त्रियांवरील अत्याचार. तेव्हाही स्त्री सुरक्षित नव्हती आणि आजही ती सुरक्षित नाही. रामायण आणि महाभारत काळापासून आजच्या कलियुगात सुदधा स्त्रियांवर अन्याय,अत्याचार होत आहेत.कोठेतरी हे थांबले पाहीजे.स्त्री आणि पुरूष ही संसाररूपी रथाची दोन चाके आहेत.ज्याप्रमाणे रथाचे एक चाक निकामी झाले तर दुसरे चाक कितीही सुरक्षित,सुस्थितीत असले तरी रथ पुढे जात नाही.त्याचप्रमाणे या संसाररूपी रथाचे स्त्रीरूपी चाक आज कमकुवत होत आहे. त्यामुळे या संसाररूपी जगाचा रथ इच्छित स्थळापर्यंत प्रवास करू शकेल असे वाटत नाही. मानवजातीच्या सर्वांगीण विकासासाठी स्त्री आणि पुरूष दोघांचीही आवश्यकता तितकीच महत्वाची आहे.नैसर्गिक भेद असला तरी हे भौतिक जग या दोघांपैकी एकाच्या अस्तित्वाशिवाय चालू शकेल अशी वेडी कल्पना आपण करू शकत नाही.तेव्हा हे अटळ सत्य असेल तर आपल्या समाजाने स्त्रियांकडे पाहण्याचा आपला दृष्टिकोन विकृत करून चालणार नाही.

प्रत्येकाने आपल्या विकृत स्वभावाला लपविण्याकरिता बोगस किंवा तकलादू नीतीमत्ता तयार करून त्याच्या आडून स्त्रियांवर अन्याय,अत्याचार करू नयेत. पण आज आपण वर्तमान पत्रातून, रदर्शनच्या बातम्यांतून किंवा सभोवतालच्या सामाजिक वातावरणात डोकावून पाहिले तर भीतीने अंगावर शहारे उभे ठाकतात.मनात अनेक प्रश्न निर्माण होऊन सतावतात की. ही सभ्य संस्कृती म्हणून जगात टेंभा मिरविणाऱ्या स्वतंत्र आणि महासत्ता होऊ पाहणाऱ्या भारतातील पुरूषांची अशी कृत्ये असावीत का?ही अन्याय,अत्याचार आणि शोषण करणारी मंडळी नेमके काय खात असावीत? की त्यामुळे त्यांच्या स्वभावात इतका द्वेष,इर्षा,मत्सर आणि वासना निर्माण झाली आणि शक्तिपात झाल्याप्रमाणे ते त्यांच्या अशा निर्मित वासनेवर नियंत्रण मिळविण्यास अपयशी ठरली.इतर देशांच्या तुलनेत भारत देशात स्त्रियांच्या हक्काचे आणि जिवीताचे संरक्षण करणारे कायदे अधिक आहेत. असे असूनही त्या

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साहित्यातील भटक्या व विमुक्त जाती जमातींचे चित्रण : एक अभ्यास

प्रा. दिलीप महादू कोने
सहयोगी प्राध्यापक व मराठी विभाग प्रमुख,
डॉ. पतंगराव कदम महाविदयालय,रामानंदनगर(बुर्ली) ता. पलूस, जि. सांगली, 416308
dilipkone02@gmail.com मो.नं.99228851

- **प्रस्तावना**

ब्रिटिश राजवटीत काही विमुक्त जाती - जमाती या गुन्हेगारी जाती म्हणून ओळखल्या जात होत्या. त्यासाठी १८७१ चा गुन्हेगारी जाती कायदा ब्रिटिश काळात काही प्रांतात लागू होता. या कायद्यांतर्गत गुन्हेगारीच्या कारणावरून विमुक्त जाती, भटक्या जमातींच्या लोकांना कारागृहात बंदिस्त करण्यात आले होते ब्रिटिश सरकारने गुन्हेगारी करणऱ्या लोंकांचे पुनवर्सन करण्यासाठी सन १९२४ चा पुनवर्सन कायदा जाहीर केला होता. त्या अनुषगांने महाराष्ट्रात पुणे, सोलापूर, अहमदनगर या ठिकाणी केंद्रे सुरू करण्यात आली होती. या जाती - जमाती अतिशय मागासलेल्या असून अजूनही त्यांचा आर्थिक, शैक्षणिक, सामाजिक विकास होऊ शकलेला नाही.

विमुक्त जाती, भटक्या जमातीच्या केंद्र शासनाच्या सोयी सुविधा, आरक्षणाचा लाभ केंद्राने लागू केलेला नाही.या पार्श्वभूमीवर महाराष्ट्र शासनाने १९६१ साली विमुक्त जाती, भटक्या जमाती चा अभ्यास करण्यासाठी 'घाडे समिती' गठीत केली होती.सदर समितीच्या अहवालानुसार राज्यात विमुक्त जातींमधील मूळ १४ आणि भटक्या जमातींमधील मूळ २८ जाती अतिशय भिन्न असून त्यांना सतत पोट भरण्यासाठी भटकावे लागले आहे. त्यासाठी महाराष्ट्र सरकारने विमुक्त जाती, भटक्या जमातींच्या घटकांकडून सतत शासनाकडे मागणी करण्यात येत आहे. पूर्वाश्रमीचे अस्पृश्य आणि सर्व दृष्टीने मागास असूनही भटक्या विमुक्तांना महाराष्ट्रात केंद्राच्या आस्थापनांमध्ये आरक्षणच्या सवलती मिळत नाहीत.फरक पडला नाही. आजही ५४ टक्के भटके विमुक्त स्वतंत्र तांडे, वाड्या, वस्त्या, पालात गावकुसाबाहेर राहतात. हे चित्र कधी बदलणार?

स्वतंत्र्यपूर्व काळात भटक्या-विमुक्तांची सामाजिक परिस्थिती अतिशय भिन्न होती. दलितांना निदान गावाबाहेरची गावकूस तरी होती. मात्र भटक्या-विमुक्तांना ना गाव, ना शिवार, ना गावकूस, ना स्मशान यापैकी आपले असे काहीही नव्हते. भारतातील वसाहतवादी ब्रिटिश राजवटीने कुठल्या शास्त्राचा, तर्काचा विचार न करता इ.स. १८७१ मध्ये जन्मजात गुन्हेगारीचा कायदा करून भारतातील १९८ जमातींना जन्मजात गुन्हेगार ठरविले. जन्माधिष्ठित वर्णव्यवस्थेपेक्षही हा कयदा क्रूर होता. कारण ह्या कायदयामुळे गुन्हेगार जमातीचे सामाजिक, आर्थिक आणि शैक्षणिक जीवन पूर्णपणे उद्ध्वस्त झाले. शिवाय ह्याच कायद्यामुळे गुन्हेगार जमातीतील व्यक्तीच्या पोटी जन्म घेणारे बाळसुद्धा गुन्हेगार ठरले. या जमातीवर वचक ठेवण्यासाठी त्यांना काटेरी तारेच्या कुंपणात (सेटलमेंट) जनावरांप्रमाणे कोंडण्यात आले. कोणत्याही गावात त्यांना तीन दिवसापेक्षा जास्त थांबता येत नव्हते. स्थिरत्व न लाभल्यामुळे त्यांचे जीवन पूर्णपणे अंधकारमय झाले. जातीवर आधारलेल्या ग्रामीण अर्थव्यवस्थेत उदरनिर्वाहासाठी प्रत्येक जातीकडे कोणता न कोणता परंपरागत व्यवसाय होता. परंतु भटके विमुक्त हे गावगाडयाचे घटकच नसल्यामुळे, कोणती ना कोणती सेवा देत, कला दाखवीत, खेळ करीत, प्रसंगी भीक मागीत. दुसऱ्यांच्या मर्जीवर जगत होते. भटके - विमुक्त म्हणजे चोर, लुटारू, भामटे अशीच मानसिकता गावगाडयाची राहिली. भटके - विमुक्तांना या पूर्वग्रहातून बाहेर पडणे आजही अवघड झाले आहे. पुढे भारताला स्वातंत्र्य मिळाले. समता, बंधुता आणि न्यायाची शिकवण देणारी लोकशाही आली. राज्यघटनेने सर्वांना मूलभूत हक्क दिले. व्यक्तीस्वातंत्र्य, मतदानाचा हक्क दिला. अनुसूचित जाती-जमातींना घटनात्मक संरक्षण मिळाले. राजकारण, शिक्षण आणि नोकरीत आरक्षण मिळावे. परंतु त्या काळात भारतातील एक मोठा समूह (१९८ गुन्हेगार जमाती) स्वतंत्र भारतात अजुनही गुन्हेगार म्हणन सेटलमेंटमध्ये बंदिस्त होता. सारा भारत स्वातंत्र्य झाला पण अजुनही

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महिलांवर अत्याचार करणाऱ्यांचे धाडस की मानसिक विकृती !

प्रा. कोने दिलीप महादू
सहयोगी प्राध्यापक व मराठी विभागप्रमुख
डॉ. पतंगराव कदम महाविद्यालय
रामानंदनगर (बुर्ली), पो. किर्लोस्करवाडी
ता. पलूस, जि. सांगली पि. 416 308
मेल ID : dilipkone02@gmail.com मोबाईल नं. 9922885186

* गोषवारा :-

स्त्रियांना संरक्षण देण्याबरोबरच त्यांना छळ थोपविण्यासाठी त्यांच्या विकासासाठी सरकार यंत्रणेकडून सातत्याने प्रयत्न व्हावेत.त्यांची प्रगती होण्यासाठी स्त्रियांची भागीदारी अत्यंत महत्वाची आहे. स्त्रियांना हक्कासंदर्भात जाणीव जागृती निर्माण करून द्यावी आणि त्यासाठी संघर्षातून लढा,चळवळीतून स्त्री सबलीकरणाला वाव मिळावा, त्यामुळे सामाजिक स्वास्थ्य टिकून राहील. समाजाच्या सर्वांगीण विकासासाठी महिलांच्या अधिकाराचा सन्मान व्हावा आणि न्याय प्राप्त व्हावा त्यामुळेच स्त्रीजीवनाला विश्वात्मक रूप प्राप्त होईल. पण अत्याचारी पुरुषांच्या मानसिकतेत बदल व्हायला हवा. हा बदल त्यालाच करावा लागणार आहे. त्याच्या मानसिकतेतील बदल हा महिलांवरील अत्याचार रोखण्यास उपयोगी पडेल.

* प्रस्तावना :-

जागतिक स्तरावरील समस्येमध्ये महिलांवरील अत्याचार ही एक गंभीर समस्या बनलेली आहे. अलिकडे सर्वच क्षेत्रात ताणतणाव वाढत आहे. अत्याचाराचे स्वरूप, प्रकार, कारणे व परिणाम व उपाय याविषयी सतत चर्चा चालू आहे. विषयाची गांभीर्यता अजून म्हणावी तशी आलेली दिसून येत नाही. अत्याचार करणाऱ्याची प्रवृत्ती आणि प्रकृती त्यांच्या मानसिकतेत आहे असे म्हणता येईल. अत्याचार हा येथील व्यवस्थेचा भाग बनलेला आहे. अगदी प्राचीन काळापासून माणूस - माणसाला जनावरापेक्षाही हिनतेने वागविले आहे. येथील माणसाचा स्पर्श हा विटाळ मानलेला होता. त्याची सावलीही वर्ज्य होती. अशा सांस्कृतिक मानसिकतेते वाढलेली पिढी माणसाकडे प्रेम भावनेने पाहण्याऐवजी जातीव्देषाच्या भावनेतून पाहत असल्याने माणसाच्या मनात माणुसकी निर्माण होण्याऐवजी कोणत्या जातीचा माणूस आहे. त्यावर त्याचे वर्णन अवलंबून असते. अशा स्थितीत द्वेष, मत्सरापलीकडे काय साध्य होणार आहे.

* विषय विवेचन :-

ज्या मानसिक संस्कृतीमध्ये जेथे सर्व माणसे समान नाहीत तेथे स्त्रियांना / महिलांना धर्मानेच तुच्छ समजले आहे. स्त्रियांना धर्मात कनिष्ठ दर्जाचे स्थान दिले गेले आहे. स्त्री ही केवळ पुरुषाची भोगवस्तू महणून तिच्याकडे पाहिले गेले. ती केवळ चूल आणि मूल यातच जीवन जगली पाहिजे असा धर्मानेच दंडक घातलेला होता. अशा मानसिकतेत वाढलेले पुरुष स्त्रीला हीन, दीन, दुबळी समजून तिच्याकडून काही अपेक्षा करतो आणि ती पूर्ण होत नाही हे लक्षात आल्यावर तिच्यावर बळजबरी करतो.

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स्त्रियांचे नियतकालिकांतील वैचारिक लेखन

डॉ. तेजस तानाजी चव्हाण
मु. पो. दुधोंडी, ता. पलूस, जि. सांगली, 416308 (महाराष्ट्र)
मो. 7385588335 ईमेल : chavantejast@gmail.com

प्रास्ताविक

एकोणिसावे आणि विसावे ही दोन शतके भारतीय समाजजीवनातील अत्यंत महत्त्वाची शतके आहेत. एकोणिसाव्या शतकामध्ये भारतामध्ये मोठी वैचारिक उलथापालथ झाली. या शतकामध्ये सुरू झालेल्या समाज प्रबोधनाने भारताच्या सांस्कृतिक जीवनाचा कायापालट घडविला. ज्यामध्ये स्त्रीविषयक सुधारणांचा वाटा असाधारण स्वरूपाचा होता. या काळात स्त्रीचे अंतरबाह्य व्यक्तित्व बदलले. तिचे सामाजिक, सांस्कृतिक, कौटुंबिक अस्तित्व बदलले. स्त्री स्वत:च्या अस्तित्वाकडे डोळसपणे पाहू लागली. तिला प्रखरतेने आत्मप्रतिष्ठेची जाणीव होऊ लागली. स्वत:च्या दबलेल्या सुप्त क्षमतांना ती पुनरुजिवित करू लागली. आपल्या अस्तित्वाबद्दल ती गहन विचार करू लागली. व्यवस्थेविषयी प्रश्न उपस्थित करू लागली. जागृकपणे स्वत:चा आवाज इतरांपर्यंत पोहोचावा, यासाठी धडपडू लागली. याचाच परिपाक म्हणून आपणास १८५० ते १९५० या शंभर वर्षांतील स्त्रियांच्या सामाजिक, सांस्कृतिक, वैचारिक प्रवासाची चिकित्सा करता येईल.

समाजप्रबोधनातील नियतकालिकांची भूमिका

इंग्रजी संस्कृतीची ओळख होऊ लागल्यानंतर भारतीयांची पहिली प्रतिक्रिया ही स्तिमिताजन्य होती. काही बुद्धिजिवी मंडळींनी याबद्दल आत्मचिंतन करून भारतीय संस्कृतीची पाश्चात्य संस्कृतीबरोबर तुलनात्मक चिकित्सा करण्यास आरंभ केला. आपले भारतीयत्व सांभाळत सांभाळत समांतरपणे पाश्चात्यांचा विज्ञानवादी जीवनदृष्टीचा स्वीकार करण्याविषयी ते हिरहिरीने प्रयत्न करू लागले. थोडक्यात, वाङ्मयीन इतिहाचे प्रबोधनवादी दृष्टिकोनातून वाचन केल्यास ज्ञानप्रसार आणि समाजप्रबोधन करण्याच्या प्रधान हेतूपोटी तत्कालीन विचारवंतांनी नियतालिकांची निर्मिती केल्याचे आपल्या निदर्शनास येईल. नियतकालिकांतून समकालीन सामाजिक, राजकिय प्रश्न उपस्थित करून, त्यावर साधकबाधक चर्चा घडवून आणून जनजागृती करण्यामध्ये विचारवंत अग्रेसर होते. त्यांच्या या उद्‌बोधनात्मक कार्यात स्त्रियांनीही हिरहिरेने भाग घेतला. यासाठी आवश्यक असणारे बळ त्यांच्या ठिकाणी महाराष्ट्रातील सामाजिक चळवळी आणि स्त्री सुधारणाविषयक संस्थात्मक पातळीवर सुरू असणाऱ्या कार्याने दिले. स्त्रीसुधारणांसाठी महात्मा फुले, दादोबा पांडुरंग, दादाभाई नौरोजी, स्वामी दयानंद सरस्वरती, केशवचंद्र सेन यासारख्या पुरुषांच्या बरोबरीने पं. रमाबाई, रमाबाई रानडे, काशीबाई कानिटकर यासारख्या स्त्रियांही पुढे आल्या होत्या. त्यांच्यासह काही दुसऱ्या फळीतील स्त्रीलेखिकांनी उदारमतवादी सुधारकांच्या प्रेरणेतून आपल्या समस्या नियतकालिकांतून लोकांसमोर मांडल्या होत्या. तेव्हा याविषयकचा संक्षिप्त विचार आपण इथे करणार आहोत.

बालविवाह

भारतीय समाजामध्ये मुलीकडे परक्या घरचे धन म्हणून पाहिले जाते. त्यानुसारच कुटुंबातील लोक जन्मापासून लग्नापर्यंत तिच्याबरोबर व्यवहार करतात. ब्रिटीशांच्या अगमनापूर्वी तर भारतीय समाजात आठ-दहा वर्षांच्या मुलींची लग्ने लावून दिली जात. प्रसंगी पाळण्याला बाशिंग लाऊन लग्न-सोहळे पार पाडण्याचा प्रघात रुढ होता. लग्न म्हणजे काय, नवरा व बायको यांच्यातील नाते काय असते, सासर काय असते, तिथे कोणत्या जबाबदाऱ्यांना सामोरे जावे लागते, यापैकी काहीही ठाऊक होण्याआधी मुलींचे हात पिवळे केले जात. स्त्री म्हणून आपल्याला कोणती उत्तरदायित्त्व पार पाडायची आहेत, हे समजण्याआधी मुलींना परक्याच्या घरी जावे लागे. अशा वेळी एखाद्या बालिकेची, तरुणीची काय भावस्थिती असेल, याबद्दल सीताबाई लांडगे यांनी ऑगस्ट १८९९ च्या 'स्त्रीशिक्षणचंद्रिका'च्या अंकात आपले म्हणणे नोंदविले आहे. आईवडिलांचे मुलीच्या हितापेक्षा स्वत:च्या सोईकडेच अधिक लक्ष असते. म्हणूनच ते लहान वयातच मुलींची लग्ने लावून रिकामी होतात. ज्यामुळे पुढे जाऊन मुलींच्या शरीरावर विपरीत परिणाम होतो. हे सांगताना, मुलींची लग्ने जोपर्यंत लहान वयात होतात, तोपर्यंत

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08 स्त्री जन्मा तुझी हीच कहाणी एक सामाजिक चिंतन

प्रा. स्वाती मगदूम
सहाय्यक प्राध्यापक, मराठी विभाग,
डॉ. पतंगराव कदम महाविद्यालय, रामानंदनगर (बुर्ली), ता. पलूस, जि. सांगली
मो. नं- 96656605803

मध्ययुगीन काळात भारतीय स्त्रियांवर,परंपरा, पुरुष,जात, धर्म व वर्ण इत्यादींचे वर्चस्व होते. डॉ. तारा भवाळकर यांच्या मते, " पुनर्जन्माच्या धर्माधिष्ठित कल्पनेने स्त्रिमनात जन्मजात एक अपराधीपणाची भावना आहे, की स्त्री जन्म म्हणजे पूर्वजन्माच्या पातकांचे फळ आहे आणि या जन्मी त्यापोटी भोगावे लागणारे भोग विनातक्रार भोगणे हे पुण्यपद आहे."१ भारतात पूर्वी मातृसत्ताक पद्धती होती. हे सांगण्यामागे मातृत्वचा गौरव केला जातो; पण त्याचवेळी स्त्रीत्वाची मात्र उपेक्षा करून स्त्री शुद्रांची प्रतिष्ठा पायदळी तुडविली गेली. याबद्दल प्रा. चंदकुमार नलगे व डॉ. गंगाधर पानतावणे म्हणतात, "भारतात स्त्रीला देवता कल्पिले त्याच भारतात स्त्री हे नरकाचे दार समजले आहे. अनेक धर्मग्रंथात तिची निंदा केली असून अज्ञानाचे कोठार, अविश्वासाचे माहेर व पायाची दासी मानले गेले आहे "२

स्वातंत्र्यप्राप्ती नंतर भारताने आधुनिक राष्ट्र बनण्याचा संकल्प केला, पण त्याचवेळी स्वातंत्र्यानंतर जात, जातीनुसार व्यक्तीचा दर्जा, जातीची उतरंड, डोईजड वतनदार मंडळी या गोष्टी निर्माण झाल्या. अन्याय अत्याचाराचे एक पर्व सुरु झाले. याला स्त्रिया जास्त प्रमाणात बळी पडल्या. वेगवेगळ्या समाजामध्ये कधी वंशाच्या,धर्माच्या तर कधी पंथाच्या नावावर उच्चनीचता जोपासली गेली. पण काही अपवाद वगळता जवळजवळ सर्वच समाजामध्ये स्त्री ही शोषित, दुय्यम राहिली आहे. स्त्रीला दुय्यम समजण्याची, तिचा नकार सहन न होण्याची पुरुषी मानसिकता पुरुषांच्या हाडमासी रुजलेली आहे. म्हणून ती घरातही सुरक्षित नाही. कुटुंबामध्ये स्त्रियांवर होणाऱ्या अत्याचारांची संख्या ही दिवसेंदिवस वाढताना दिसत आहे.

स्त्रीधर्म म्हणजे काय?

स्त्री धर्म म्हणजे निरंतर पतीची आज्ञा पाळणे त्याच्या मर्जीप्रमाणे वागणे, नवऱ्याच्या सेवेत हजर राहवे. हा स्त्रीधर्म होय. या स्त्रीधर्माचा आधार म्हणजे पूर्वयुगात होऊन गेलेल्या पतिव्रता होय. स्त्रीसंबंधाने अशा ज्या पुराणकथा सांगितल्या जातात त्याचे मुख्य सूत्र आदर्श पत्नीत्व आहे. पतिनिष्ठा, आज्ञापालन, सेवापरायणता, त्याग, समर्पणशीलता, पतीच्या शरीर सुखाची पूर्तता या गुणांचा परमोत्कर्ष साधणे यातच स्त्रीजीवनाचे साफल्य आहे. असे यांच्या मनावर वारंवार बिंबविले जाते. सर्वसाधारणपणे जे अवैध मानले जाते. ते जरी पतीने करावयास सांगितले तरी 'आदर्शपत्नी' पतीच्या त्या आज्ञेचेही पालन करते कारण स्त्रीधर्म हा योग्यायोग्यतेच्या विवेकावरही मात करतो.

पतीव्रताधर्म म्हणजे काय ?

समाजात स्त्रीच्या बाबतीत जी पारंपरिक मूल्यकल्पना कार्यरत होती तिचे नाव पातिव्रत्य, स्त्रियांची समाजाने लावलेली व्यवस्था म्हणजेच पतिव्रता धर्म किंवा स्त्रीधर्म या व्यवस्थेचे पालन हे त्यांचे कर्तव्य व तोच त्यांचा जीवित हेतू परंपरेने धर्मशास्त्राने तो कायमचाच निश्चत व निःसंदिग्ध केला आहे. त्याचे निमूटपणे बिनतक्रार पालन करणे हेच स्त्रीजीवन होय. स्त्रीवर प्रस्थापित करण्यासाठी पतिव्रता कल्पनेची विचारप्रणाली सर्वाधिक उपयुक्त ठरली आहे.

पातिव्रता संकल्पना - स्त्री शोषणाचा सुलभ मार्ग :

पातिव्रत्यात पतीनिष्ठा हे केंद्र असल्यामुळे पती हाच देव आणि गुरू ठरला. परिणामतः पत्नीकडे दास्यत्व व पतीकडे स्वामीत्व अशी विभागणी आपोआपच झाली. स्त्रीला लैंगिक स्वातंत्र्य उरले नाही. पती हाच सर्वश्रेष्ठ ठरल्याने तो गौरवाचा धनी ठरला. स्त्रीच्या शीलभ्रस्टतेत वस्तुतः पुरुष जबाबदार असलातरी अपराधी मात्र स्त्री ठरली. कारण प्रतिवत्याचे कठोर पोलन तिने केले नाही असे म्हणायला वाव मिळाला.

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शिविम संशोधन पत्रिका

वर्ष-दहावे : अंक अठ्ठाविसावा । ऑक्टोबर ते डिसेंबर २०२१

स्वाता प्रभाकर मगदूम
संशोधक विद्यार्थी, मराठी विभाग शिवाजी विद्यापीठ, कोल्हापूर

समाज आणि साहित्य या दोन्हीमध्ये घनिष्ठ स्वरूपाचा परस्परसंबंध आहे. एखादी साहित्यकृती ही विशिष्ट समाजजीवनाचे प्रतिबिंब प्रगट करत असते. समाजातील लेखक नावाचा व्यक्ती आपल्या कल्पनाशक्तीच्या जोरावर वास्तव घटितांचे एक कल्पित चित्र साहित्यकृतीतून उभे करण्याचा प्रयत्न करत असतो. साहित्याच्या माध्यमातून अनेक गोष्टी एका पिढीकडून दुसऱ्या पिढीकडे हस्तांतरित होत असतात. केवळ रंजन करण्याच्या हेतूने जरी साहित्याची निर्मिती होत असली तरी त्याद्वारे काही सामाजिक, सांस्कृतिक आणि वर्गीय कारणांचाही लेखाजोखा त्यातून प्रतित झालेला असतो. साधारणत: लोकप्रिय साहित्याचा वाचक हा केवळ विरंगुळ्याचे एक माध्यम म्हणून वाचनाकडे वळत असतो. त्यातून त्याला कोणत्याही प्रकारच्या बौद्धिक अपेक्षापूर्तीची कांक्षा नसते. त्यामुळे केवळ करमणुकीच्या हेतूपोटीच जगभरातील रंजनप्रधान वाङ्मयाची निर्मिती झाली आहे, असे म्हटले तर ते चुकीचे ठरणार नाही. अलीकडच्या काळात मनोरंजनपर, करमणूकप्रधान लेखनाचे प्रमाण वाढू लागले.

वस्तुत: केवळ रंजनासाठी, करमणुकीसाठी वाचन करणारा वाचकवर्ग संख्येने विपुल असलेला पाहावयास मिळतो. अलीकडच्या काळात टी.व्ही., संगणक, इंटरनेटसारखी माध्यमे मोठ्या प्रमाणात वाढली आहेत. परंतु, स्वातंत्र्योत्तर कालखंडात वाचन हीच एकमेव करमणुकीची सोय होती. त्यामुळे बहुतांश वाचक गंभीर साहित्यापासून हलक्याफुलक्या रंजक साहित्यापर्यंत नानाविध वाङ्मयप्रकारांचा आस्वाद घेत होता. लोकप्रिय साहित्याचा नेमका वाचक वर्ग कोण? याचा जर शोध घ्यायचा झाला तर आपल्या असे लक्षात येईल की, लोकप्रिय साहित्याचा विशिष्ट वाचकवर्ग असतो. त्याची साहित्याच्या आकलनाची स्वत:ची धारणा असते. कलाकृतीच्या रसास्वादाची, मूल्यमापनाची त्याची स्वत:ची निकषव्यवस्था असते. त्यानुरूप तो वाचनाचा आनंद घेत असतो. विशेष बाब म्हणजे वाङ्मयीन समीक्षाव्यवहारापासून तो पूर्णत: अलिप्त असतो. हलक्या-फुलक्या घटना-प्रसंगातून आनंद मिळवणे आणि जीवन तणावमुक्त करणे इतकेच प्रयोजन त्याचे वाचनामागे असते. त्यानुरूप चटपटीत प्रसंगनिर्मिती, पात्रांचे उदात्तीकरण, घटनाप्रसंगांची नाट्यपूर्ण निर्मिती, हदरवून सोडणारा शेवट, जागोजाग शृंगारिक वर्णने इत्यादींसह नवरसांना आव्हान देणारी रंजक भाषाशैली असणे त्याला अपेक्षित असते. वास्तव जीवनामध्ये आपल्या ज्या इच्छा-आकांक्षा पूर्ण

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STUDY OF GOSAVI SAMAJ LIVING IN UMBRAJ AREA FROM THE POINT OF VIEW OF WOMEN'S EDUCATION AND HEALTH

Asha Budhram Madavi
Assistant Professor, Dr. Patangrao Kadam Mahavidyalaya, Ramanandnagar (Burli) Sangli, Maharashtra

ABSTRACT
Education is a powerful factor for social change. Education it empowers individuals and communities, creates awareness about various fields. This is the need to tell the Gosavi samaj and to create awareness among them about education. There is a society which is deprived of education. Why is the economic, educational, social condition of this society like this? What exactly are the reasons behind his condition? What are the situations they have to face while living human life? The necessary research and study is needed today for the development of the Gosavi samaj. It is the aim of the study. Field Survey, interactions with people, journals and other sources use in methodology. Studies have shown that female education is closely related to socio-economic, and health. Therefore, it is necessary to study the level of education of the women of Gosavi Samaj by doing this type of study that can change them. This study can help identify problem of various factors of areas. The purpose of this research is to find out the current status of education among women. There is an economic component behind the condition of the Gosavi Samaj today. The economic backwardness in their society is clearly visible. To overcome financial problems first they need to be educated. Self-employment should be made available. The schemes of the government should reach them so that their economic condition improves. After studying the Gosavi community, it was concluded that the number of educated people in this society is very less.

Keywords: Education, Health, Educational - economic condition, problem.

INTRODUCTION
Education plays an important role in the progress of a nation. The health of the nation depends on the education policy which should try to reach every person in every corner of the country. The rate of education of women in many villages is very poor. The progress of a country depends on the development of women in that country. There is a need to pay more attention to the education of women. The study of women's education that is required today because education is a powerful factor for social change. It empowers individuals and communities, builds awareness in people about different areas. The root cause of all the problems of women today is illiteracy. If a woman is educated then she will be aware of her rights, which helps in overcoming problems like dowry system, infant mortality rate, female feticide, child marriage etc. This is the need to tell the Gosavi samaj and to create awareness among them about education. There is a society which is deprived of education. Why is the economic, educational, social condition of this society like this? What exactly are the reasons behind his condition? What are the situations they have to face while living human life? The necessary research and study is needed today for the development of the Gosavi samaj. It is the aim of the study.

OBJECTIVES:
1. To Study of women's education.
2. To Study of health information.
3. To Study of Social, Economical and other problems.
4. To find out the reason behind the prevailing problem.
5. To study the trying to come up with solutions to problems.

Study Area: Laxminagar of Umbraj Area, Tal._ Karad, Dist. - Satara.

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A Study Of The Impact Of Digital Marketing In Sustaibale Development Of India

Mrs. Prof. Pratibha Dattatrya Pudale
Dr. Patangrao Kadam Mahavidyala,Ramanandnagar (Burli) Tal- Palus
Dist.- Sangli – 416308

Abstract.

The paper discusses an overview of contribution of digital marketing sustainable development of India. Digital Marketing is that the marketing of products or services using digital technologies on the web, through mobile Apps, display advertising, and the other digital mediums. Digital Marketing channels are systems supported the web which will create, accelerate, and transmit product value from producer to a consumer terminal, through digital networks. It helps in the sustainable development of India. Digital marketing methods are faster, more practical, and versatile than the old traditional ones. Online Advertising, Viral Marketing, Online Shopping, Email Marketing, Social Media, and Mobile Marketing etc. are some of the examples of Digital Marketing. Digital Marketing in India is growing faster than the other medium.

Keywords: Digital marketing, E-commerce, Internet, Internet marketing

Introduction

Commerce has been a serious impetus for survival since the start of recorded history and beyond. The mass adoption of the web has created a paradigm shift within the way businesses are conducted today. The electronic commerce supports selling, buying, trading of products or services over the web. Digital marketing is an umbrella term for the targeted, measurable, and interactive marketing of products or services using digital technologies to succeed in and convert leads into customers. Digital Marketing is also referred to as 'Online Marketing', 'Internet Marketing' or 'Web Marketing'. The rapid development of digital media has created new opportunities and avenues for advertising and marketing.

Definition:

Digital marketing is yet one more term almost like E- marketing. It's a term increasingly employed by specialist digital marketing agencies and therefore the new media trade publications. Digital marketing involves applying the technologies which form online channels to market i.e., Web, E- mail, Databases, Plus mobile/ wireless & Digital TV.

History of Digital Marketing:

The term Digital Marketing was first founded in the 1990s. In the 2000s and therefore the 2010s, Digital marketing became more sophisticated as an efficient thanks to create a relationship with the buyer that has depth and relevance. The development of Digital Marketing, during the 1990s and 2000s, changed the way brands and businesses use technology for marketing. The scope of Digital Marketing in India is growing year by year and it's becoming fastest growing industries today. In Asia, Digital Marketing is the leading trend with over 30% annual growth. As digital platforms became increasingly incorporated into marketing plans and lifestyle and as people increasingly use digital devices rather than visiting physical shops.

1. Objectives of Study:

1. To study marketing activities aimed at achieving profitable acquisition and retention of customers.

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CONSUMER PERCEPTION TOWARDS ONLINE SHOPPING

Pratibha Dattatrya Pudale
Dr. Patangrao Kadam Mahavidyalaya, Ramanandnagar (Burli)
Email-pratibhapudale2904@gmail.com

Abstract

The paper discusses on Consumer Perception towards Online Shopping. Online shopping is the process by which consumers buy products/ services over the Internet. Online shopping is a modern phenomenon in business world. Online shopping is a type of web commerce which allows consumers to purchase products and services from a particular seller through the internet using web browser. Online shopping becomes a modern phenomenon in business world. Online shopping consumers are the people who depends on technologies to buy and sell products, viewing contents online. With the birth of internet and technology, it made every one of us digital consumers. Besides, changes in lifestyle of people clear the way for online shopping which is profitable convenient venture to purchase desired product. While online shopping the consumers can be performed through tablet, smart phone, and personal computer. As traditional shopping is time-consuming that's why consumers prefers online shopping. The perception of online consumers is influenced by consumer attitude, product information, online payment, accessibility, convenience and variety, flexibility, price, consciousness etc. This paper will highlight on consumer satisfaction with regard to online shopping.

Keywords: Consumer, Perception, Online shopping, Cyber laws

Introduction

Online shopping is a new e-commerce innovation that is sure to be a shopping future worldwide. Online shopping is a recent trend in web commerce which allows to directly purchase goods or services from a seller over the internet using a web browser or a mobile app. The term online shopping is also known as online marketing, internet marketing, web marketing. Consumers can buy online using a range of different computers and devices, including desktop computers, laptops, tablet computers and smartphones. An online shop, e-shop, e-store, internet shop, web shop, web store, online store, or virtual shop evokes the physical analogy of buying products or services in a shopping center. In order

Mrs. Prof. Pratibha Dattatrya Pudale
Dr. Patangrao Kadam Mahavidyalaya,
Ramanandnagar (Burli), Tal- Palus Dist. - Sangli – 416308

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Recent Trends and Challenges in Human Resources Management of India

ABSTRACT

The paper discusses on Recent Trends and Challenges in Human Resource Management of India. In modern day organizations Human Resource Management has grown in importance through time. It is because of human resource operations have become more and more complex and even the human resource department of organization is tasked with more responsibilities. Human resources are the human capital and they give life to an organization. They contribute a lot to the organization by being an integral part of the different functional areas of the organization. In order to improve the efficiency and effectiveness of human resource management, it is need to understand the challenges in human resources and the recent trends in human resources management. These steps help to facilitate all the human resource to discover, develop and use their capabilities to their fuller extent not only in promoting individual goals but also organizational goals. This paper will highlight on how the challenges met by an organization and what are the recent trends in human resource management in current business area.

Keywords: Human Resources, Challenges, Opportunities, Management, Organization, HRM.

INTRODUCTION

Human resources are the most valuable and unique assets of an organization. Over the period of course human history society has changed as resources, human development, knowledge, technology, law and culture, have emitted. Human resource plays an important and crucial role in reinforcing, developing and changing the culture of an organization. Human beings are considered as an important resource because these human beings make the best the use of nature to create more resources. Over the years organizations have also changed as they have adapted to labor capabilities, emerging technologies, markets for products and services, and the prevailing view of work and its role in human life, etc. The approach related to managing human people has also changed in response to all of the other changes in society and organizations. The organizations depend highly on its human resources for success and survival. Also the role of the human resources manager is important in the organizations and in this recent trends in management he is evolving with the change in competitive market environment and the realization that human resource management must play a more crucial and strategic role in the success of an organization. It is therefore necessary for all managers to understand and give due importance to the different human resource policies and activities in the organization. The future of work is smart, innovative, and connected. And that's why in this rapidly transforming business there are currently many human resource management challenges that will continue to evolve for years to come. As well as in the current fluctuating economy and local and global advancements the HR must study the recent trends in Human Resource Management.

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Color Consciousness in Wallace Thurman's *"The Blacker the Berry"*

Mr. G. N. Kathare
Assistant Professor, Dept. of English
Balwant College, Vita

Dr. Tatugade Ashwini Pravin
Assistant Professor, Dept. of English
Dr. Patangrao Kadam Mahavidyalaya, Nagar (Burli)

Abstract

Color consciousness is a theory that states equality under the law is not enough. It holds that physical differences such as skin color can have a negative impact upon some people's life opportunities. Emma Lou Morgan's life is an extreme example of this color consciousness. Her dark color prevents her from getting good opportunities. The projector of this character is Wallace Thurman, who is a 1930s prominent novelist, poet, playwright, and critic of the Harlem Renaissance. He was born on August 16, 1902 in Salt Lake City, Utah. He read works of Shakespeare, Plato, Aristotle, Charles Baudelaire et.al., and developed his sense of critical thinking. Langston Hughes once said about him, Thurman is "a strangely brilliant Black boy who had read everything, and whose critical mind could find something wrong with everything he read". Unfortunately, he died in 1934 at the young age of 32.

Thurman's literary world has three novels and several plays. *The Blacker the Berry* is his first novel. The title of the novel is significant as it has been taken from Negro folk saying, *"the blacker the berry, the sweeter the juice"* but here opposite happens in the heroine's life. Her life is like "blacker the berry, bitter the life". Published in 1929, the novel openly comments upon intra-racial prejudices (38). It is a story of discrimination, humiliation, non-acceptance and hatred. It pens the theme of colorism and internalized racism in African-American life.

The present research endeavor is to understand and analyse color consciousness in the novel *The Blacker the Berry*. Emma Lou, the protagonist of the novel, suffers a lot due to her dark skin color. Initially, she was not ready to accept herself, but later on, she realized the importance of self-acceptance and self-respect. This realization emancipated her from all the problems and worries. From this perspective, the novel is a revolutionary attempt as it provides answers to deal with feelings of color consciousness.

Keywords: Color Consciousness, racial discrimination, inner conflict, Emma Lou etc.

Introduction –

Color consciousness is a theory that states equality under the law is not enough. It holds that physical differences such as skin color can have a negative impact upon some people's life opportunities. Emma Lou Morgan's life is an extreme example of this color consciousness. Her dark color prevents her from getting good opportunities. The projector of this character is Wallace Thurman, who is a 1930s prominent novelist, poet, playwright, and critic of the Harlem Renaissance. He was born on August 16, 1902 in Salt Lake City, Utah. He read works of Shakespeare, Plato, Aristotle, Charles Baudelaire et.al., and developed his sense of critical thinking. Langston Hughes once said about him, Thurman is "a strangely brilliant Black boy who had read everything, and whose critical mind could find something wrong with everything he read". Unfortunately, he died in 1934 at the young age of 32.

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Phylogenetic Analysis of Vertebrate Lysozyme

1Prajakta N. Bathe; 2Vinod K. Nagale; 3Sneha W. Wagh and 4Snehal G. Rodge

Assistant Professor, Department of Zoology,

1*Bapumiya Sirajoddin Patel Arts, Commerce and Science College, Pimpalgaon Kale Dist. Buldana (MS) India

prajaktabathe12@gmail.com

vnagale2007@rediffmail.com

ABSTRACT

Lysozyme is a naturally occurring enzyme found in bodily secretions such as tears, saliva, and milk. It functions as an antimicrobial agent by cleaving the peptidoglycan component of bacterial cell walls, which leads to cell death. In present study we chose 20 Vertebrate Species including 1 amphibian, 3 actinopterygii, 7 aves and 9 mammals. Amino acid sequences of Lysozyme from 20 vertebrates were derived from National Center for Biotechnology Information database. Phylogenetic analysis and estimation were performed using MEGA program, and neighbor-joining tree was constructed by this software. In this computational study, the phylogenetic tree of Lysozyme has been investigated. Therefore, dendrograms of lysozyme were depicted. From the result of present phylogenetic study of vertebrate Lysozyme, it concluded that the amino acid sequences among different vertebrate species shows slight to moderate differences without affecting its functions.

Key words: Lysozyme, Antimicrobial activity, MEGA, Phylogeny, Vertebrate

INTRODUCTION

Lysozyme is an antimicrobial enzyme which has been widely found across the animal kingdom as a natural bactericide. Lysozyme was first discovered by Alexander Fleming (1922) in the nasal mucus and subsequently purified from various plant, animal, microbial (bacteria, virus and fungi) materials (Masschalck and Michiels, 2003; Xue *et al.*, 2004; Parisien *et al.*, 2007; Fleming, 1922). Lysozyme (enzyme commission number 3.2.1.17) is also called as N-acetylmuramidase or muramidase, lysozyme is a hydrolyse-type enzyme that catalyses the breakdown of peptidoglycan polymers of bacterial cell wall at the 1-4 bond between N-acetylmuramic (NAM) acid and N-acetylglucosamine (NAG) residues, thereby lysing sensitive bacteria. *In vitro*, lysozyme is generally considered effective against some Gram-positive bacteria, but ineffective against Gram-negative bacteria (Cunningham *et al.*, 1991)

Although lysozyme is important for driving a pro-inflammatory response, lysozyme also plays a role in limiting inflammation systemically, resulting in decreased inflammatory driven pathology (Nash *et al.*, 2006; Ganz *et al.*, 2003) Due to its bacteriostatic, bactericidal, and antiviral properties, lysozyme is currently used as an active pharmaceutical ingredient in medicine and veterinary medicine as well as in the food industry (Leśnierowski and Kijowski, 2007; Aminlari *et al.*,2014). Lysozyme represents one of the most-studied biopreservatives for antimicrobial packaging application. (Silvetti *et al.*,2017)

By applying a specific evolutionary model to explain the amino acid substitutions observed in the multiple sequence alignment, the evolutionary distances between all pairs of proteins can be computed. This evolutionary distance, which reflects the expected mean number of changes per site that have occurred since two sequences diverged from their common ancestor, is used by the so-called distance-methods for phylogenetic inference. One such method is Neighbor Joining (NJ) (Gabaldón, 2007). NJ constitutes a good and fast heuristic algorithm that estimates the "minimal evolution" tree, a phylogenetic tree which minimizes the sum of the lengths (evolutionary distances) of all its branches (Saitou, 1987).

In present study we chose 20 Vertebrate Species including 1 amphibian, 3 actinopterygii, 7 aves and 9 mammals and performed phylogenetic analysis on lysozyme to explore the study of evolutionary relations among groups of organisms. Establishing a relation between structure, function and evolution of this protein is of paramount

importance because it would provide better understanding of further possible mechanisms that the protein involves in.

MATERIAL AND METHOD

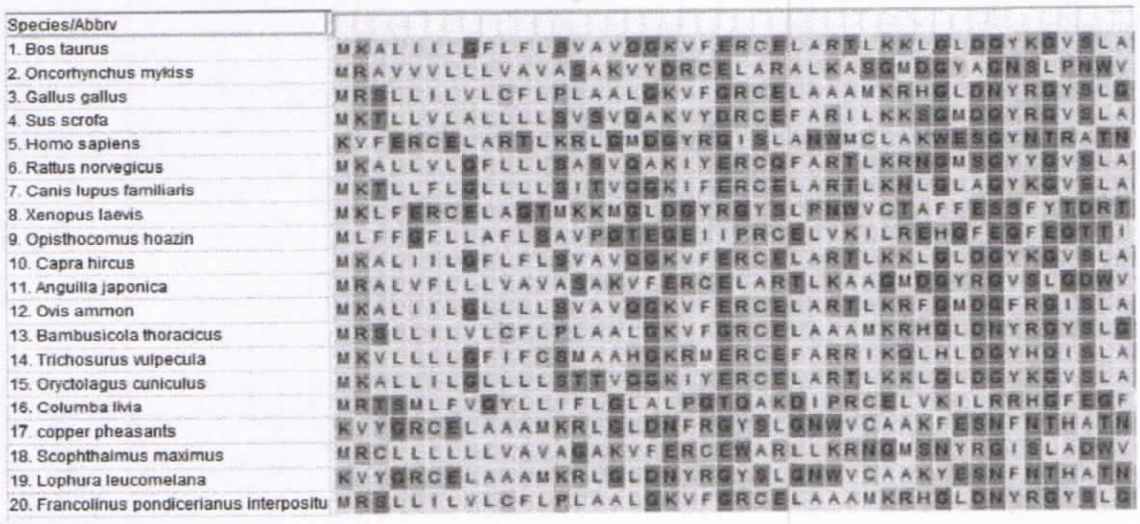
Amino acids sequences for the lysozyme protein of 20 vertebrate species were taken from National Center for Biotechnology Information database (http://www.ncbi.nlm.nih.gov). Alignments were applied in order to build a neighbor-joining phylogenetic tree using the Mega program. A phylogenetic tree was saved and analyzed. Constructed phylogenetic tree is depicted in figure 2

table 1: accession numbers of ncbi entries for lysozyme in different vertebrate species

Accession numbers	Name of vertebrate species
CAA32175.1	*Homosepian*
AAA41551.1	*Rattus norvegicus*
AIE13825.1	*Canis lupus*
ACL81750.1	*Gallus gallus*
AIA09919.1	*Xenopus laevis*
CAA42084.1	*Oncorhynchus mykiss*
AAC37312.1	*Bos taurus*
AAB16862.1	*Sus scrofa*
AAA73935.1	*Opisthocomus hoazin*
AHA61788.1	*Capra aegagrus hircus*
ACE80211.1	*Scophthalmus maximus*
AIZ00421.1	*Anguilla japonica*
AIN76235.1	*Oryctolagus cuniculus*
AHI42590.1	*Ovis ammon*
ACL81752.1	*Bambusicola thoracicus*
AAB97109.1	*Trichosurus vulpecula*
AAB31830.1	*Syrmaticus soemmerringii*
PKK17361.1	*Columba livia*
ACL81754.1	*Francolinus pondicerianus interpositus*
AAB20837.1	*Lophura leucomelanos*

RESULTS AND DISCUSSION

The lysozyme protein sequences of 20 vertebrate species were aligned and analyzed. The phylogenetic analysis was carried out by using distance method and clustering by UPGMA (Unweighted Pair Group Method with Arithmetic Mean). A dendrogram of Lysozyme drawn by using MEGA7multiple sequence alignment of the Lysozyme proteins is depicted in Figure1 and constructed phylogenetic tree is depicted in Figure 2.



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