Establishment : June 1992 Sahajivan Shikshan Prasarak Mandal (Tehu) Sanchalit

Rani Laxmibai Mahavidyalaya Parola

Dist.Jalgaon 425111 Tel:-02597-292665,292666

U.G.C-2F&12B(8-211/2005CPP-1D:2011)

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E-mail:- vasupatil13@gmail.com

3rd Cycle

Assesment and Accreditation

Criterion – III
Research, Innovations and Extension

Key Indicator: 3.3 Research Publications and Awards

3.3.1: Number of research papers published per teacher in the Journals notified on UGC care list during the last five years

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Outward No. Date : / /20

DECLARATION

This is to declare that the information, Reports, true copies of the supporting documents, numerical data etc. submitted / presented in this file is verified by Internal Quality Assurance Cell (IQAC) and is correct as per the records. This declaration is for the purpose of NAAC Accreditation of HEI for 3rd Cycle period 2018-2019 to 2022-2023.

Date: 20/07/2023

Place: Parola

IQAC Coordinator

Coordinator, IQAC
Rani Laxmibai Mahavidyalaya
Parola,Dist.Jalgaon

Rani Laxmibai Mahavidyalaya IQAC PAROLA Dist.Jalgaon

Principal

PRINCIPAL
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Parola,Dist.Jalgaon

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Outward No. Date : / /20

Criterion 3
Research, Innovation & Extension

3.3 Research Publication and Awards

3.3.1 Number of research papers published per teacher in the journals notified on UGC care list during the last five years

Rani Laxmibai Mahavidyalaya IQAC PAROLA Dist.Jalgaon

3.3.1 Number of papers published per teacher in the Journals notified on UGC website during the last five years.

2022-23	2021-22	2020-21	2019-20	2018-19
14	07	14	10	17

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	1.1.4 पंडित श्रीधर शास्त्रीची स्त्री सुधारणावादी भूमिका
	1.1.5 हिंदी साहित्य मे किसान विमर्श
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	1.1.9 १९ व्या शतकातील स्त्री वर्गाचे स्थान आणि स्त्री शिक्षण
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	5.1.13 Selected Bioactive plants from Northern maharashtra have Antimicrobial activity against Bacterial pathogens from infections and Diseases.
	5.1.14 Chemically and thermally radiated Williamson MHD fluid over porous media with heat source - sink

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5.1.1 शिवरायांचे कृषी धोरण आणि महसूल व्यवस्था एक अभ्यास
5.1.2 Highly selective ppm level ammonia gas sensor based on modified MoO3 operable at low temperature
5.1.3 Surface cupricated $Sn_{(0.03)}Zn_{(0.97)}O3$ hybrid structured e.nose for LPG monitoring at trace level
5.1.4 STUDY OF NATURAL PRODUCTS FROM FRESHWATER BIODIVERSITY ISRECENT STRATEGY: AN OVERVIEW
5.1.5 Studies on Sn dopped cadmium sulfide thin films as highly selective green light photo sensor
5.1.6 Lower temperature notch controlled ammonia sensor fabeicated from SnO2-activated thick films of MnO2 doped MoO3
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5.1.12 Thermal radiation and magnetic fields effects on nanofluids flowing through stretch sheet
5.1.13 Selected Bioactive plants from Northern maharashtra have Antimicrobial activity against Bacterial pathogens from infections and Diseases.
5.1.14 Chemically and thermally radiated Williamson MHD fluid over porous media with heat source - sink

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कुळवाडीभूषण छत्रपती शिवाजी महाराज विशेषांक

[भाग-१]

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शिवरायांचे कृषी धोरण आणि महसूल व्यवस्था - एक अभ्यास

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आपल्या राष्ट्राला कृषिप्रधान राष्ट्र म्हणून संबोधले जाते. आपल्या राष्ट्रात आणि राज्यातही शेती हा प्रमुख व्यवसाय गणला जातो. उत्तम शेती, मध्यम व्यापार आणि कनिष्ठ नोकरी असे सूत्र इसवी सनाच्या विसाव्या शतकापर्यंत प्रचलित होते; परंतु एकविसाव्या शतकात हे चित्र पार बदलले. उत्कृष्ट नोकरी, मध्यम व्यापार आणि कनिष्ठ शेती अशी स्थिती निर्माण झाली. या स्थितीला समाज का येऊन पोहोचला याची अनेकविध कारणे आहेत; परंतु कोणत्याही काळाच्या समाजाच्या स्थितीला त्या ठिकाणची प्रशासनव्यवस्था आणि धोरणाची अंमलबजावणी महत्त्वपूर्ण भूमिका पार पाडीत असते. या बाबीची पूर्वमीमांसा करताना शिवशाहीच्या काळाकडे आपल्याला दृष्टिक्षेप टाकावा लागतो. कोणत्याही काळातील प्रशासन चालविणाऱ्यांना मार्गदर्शक ठरेल अशी उत्कृष्ट महसूल व्यवस्थेची निर्मिती आणि अंमलबजावणी छत्रपती शिवरायांनी केली. सदासर्वकाळ मार्गदर्शक ठरेल अशी दीपस्तंभाची भूमिका पार पाडणारी महसूल व्यवस्था, एक आदर्शतम व्यवस्था म्हणून गणली जाते. सतराव्या शतकात आपल्या देशात विज्ञान आणि तंत्रज्ञानाचा लवलेशही नसताना शिवरायांनी अनुसरलेले सारेच धोरण आश्चर्यकारक होते. धर्माधिष्ठित राजपदाला साजेसे गुण राजांच्या व्यक्तिमत्त्वात सामावलेले होते. त्याचाच परिपाक त्यांच्या प्रशासकीय धोरणात ठिकठिकाणी जाणवतो. आपल्या तेजस्वी बुद्धिमत्तेने आणि उत्कृष्ट प्रशासक या नात्याने त्यांनी राबवलेली प्रशासनव्यवस्था साऱ्या जगाला मार्गदर्शक ठरेल अशीच होती. छत्रपती शिवरायांनी प्रशासनात कोणत्याही योजना, धोरण आखताना रयतेला केंद्रस्थानी ठेवले. रयत ही बहुतांशी शेती व्यवसाय करणारी असल्याने शेतकऱ्यांशी निगडित जमीन महसुलाचे धोरण राबवीत असताना शेतकरीहित कधीच नजरेआड होऊ दिले नाही.

शिवरायांची शेतीव्यवस्था-

छत्रपती शिवरायांनी आपले जमीन महसुलाचे धोरण राबवीत असताना सर्वप्रथम राज्यातील जनतेला प्रोत्साहन देत शेती व्यवसायाकडे प्रवृत्त केले. राज्यातील शेती ही लागवडीयोग्य व्हावी यासाठी कसोशीने प्रयत्न केले. संपूर्ण राज्यातील जमिनीची प्रथम मोजणी केली. शिवरायांनी जमीन मोजणीसाठी काठी हे परिमाण निश्चित केले होते. ही काठी पाच हात पाच मुठी लांब असायची. या काठीस शिवशाही काठी असे म्हटले जाते. २० चौरस काठ्यांचा एक पांड, बीस पांडाचा एक बिघा हे जमीन मोजण्याचे परिमाण ठरलेले होते. त्यानंतर जमिनीची प्रतवारीनुसार विभागणी केली. आदर्श राजपदाला शोभेल असे धोरण शेतीव्यवस्थेबाबत राजांनी अवलंबले. परंपरागत अन्याय आणि अत्याचार करणारी जमीनदारी आणि जहागिरी पद्धत प्रथम बंद केली. त्याऐवजी रयतवारी पद्धती सुरू केली. शिवरायांनी शेतीव्यवस्थेबाबत वस्तुनिष्ठतेच्या दृष्टिकोनातून सुधारणा करण्याचा प्रयत्न केला. त्यामुळेच त्यांचे महसूल प्रशासन लोकप्रिय ठरले. शेती व्यवसायाला उत्तेजन देण्यासाठी त्यांनी तगाईची पद्धती सुरू केली. शेतीचो अवजारे बी-बियाणे, पाळीव प्राणी घेण्यासाठी रोख रक्कम सरकारकडून देण्याची व्यवस्था केली. तसेच पडीक जमीन लागवडीखाली आणण्यासाठी सरकारी खजिन्यातून रक्कम दिली. शेतकरीवर्गाला हा पैसा बिगरव्याजाने आणि शेतीचे उत्पादन आल्यावर टप्प्याटप्प्याने भरण्याची मुभा दिली होती. नापीक जमीन लागवडीखाली आल्यानंतर काही वर्षे ती शेती कसणाऱ्या शेतकऱ्याकडून सारा वसूल केला जात नसे. जेणेकरून शेतकरीवर्गाला शेती व्यवसाय करण्यास उत्तेजन मिळावे, हा राजांचा हेतू होता. मुसलमानी सत्तेत दलालांमार्फत

शेतसारा वसूल केला जात असे. त्यामुळे कष्टकरी शेतकरीवर्गावर अन्याय होत असे. म्हणून ही पद्धती महाराजांनी पूर्णपणे बंद केली. राजा आणि शेतकरी असा प्रत्यक्ष संबंध असलेली रयतवारी पद्धती राजांनी हाती घेतली. राजांचा काळ हा धामधुमीचा. युद्धांचा आणि मोहिमांचा. त्यामुळे बळीराजावर नेहमी संकटाची टांगती तलवार असायची. शत्रूचे सैन्य येऊन उभं पीक केव्हा उद्ध्वस्त करील सांगता येत नव्हते; परंतु राज्यांनी आपल्या सैन्याला सक्त ताकीद दिलेली होती की, आपल्या राज्यातील शेतकरीवर्गाचे आणि शेतीमालाचे प्राधान्यक्रमाने संरक्षण करावे. कोणत्याही मोहिमेची झळ शेतकरीराजाला बसता कामा नये याची दखल घ्यावी. शिवरायांनी कृषिव्यवस्था सुरळीत होण्यासाठी प्रामुख्याने तीन गोष्टींना प्राधान्य दिले. नापिक जमिनी लागवडीयोग्य करणे, शेतकरी आणि शेतमालाचे रक्षण करणे, तसेच राज्यातील संपूर्ण जमिनीचे मोजमाप करून प्रतवारी ठरवून कर आकारणी करणे.

शिवरायांचे जमीन महसूल धोरण -

शिवाजीराजांनी आपल्या काळात राज्यातील जमिनीची तीन वेळा मोजणी केली. त्यानंतर जमिनीची प्रतवारी ठरवून त्यानुसार सुपीक, मध्यम आणि नापीक जमीन अशी विभागणी केली. पिकपेरा आणि येणारे उत्पादन लक्षात घेऊन जमीन महसुलाची रक्कम ठरविली जाई. शिवरायांच्या जमीन महसूल व्यवस्थेचे महत्त्वाचे वैशिष्ट्य म्हणजे त्यांनी सुरू केलेली रयतवारी पद्धत होय. जमीन महसूल वतनदार किंवा जमीनदार वर्गामार्फत वसूल न करता त्यासाठी पगारी अधिकारी नियुक्त केले. खेड्यातील महसूल वसुलीसाठी कुलकर्णी, देशमुख, देशपांडे हे पगारी अधिकारी नियुक्त केले. त्यामुळे प्रत्यक्ष प्रशासनाशी रयतेचा संपर्क येऊ लागला. जमीन महसुलात सुरू असलेली दलाली बंद झाली. शिवरायांनी अनुसरलेली जमीन महसूल पद्धत त्यामुळे लोकाभिमुख झाली. भ्रष्टाचाराला वाव राहिला नाही. शिवरायांनी अधिकाऱ्यांना प्रत्यक्ष जमिनीवर जाऊन शेतसारा आकारणीच्या सक्त ताकीद दिलेल्या होत्या. त्यामुळे कोणत्याही शेतकऱ्यावर अन्यायाला सामोरे जाण्याची वेळ येत नसे. प्रशासन चालवण्यासाठी अर्थव्यवस्था मजबूत असणे गरजेचे असते. त्या काळात तर युद्ध मोहिमांसाठी, किल्ले उभारणी, दुरुस्तीसाठी, आरमार उभे करण्यासाठी आर्थिक उत्पादनाची मोठ्या प्रमाणात गरज प्रशासनाला होती. परंतु प्रशासनासाठी लागणारा पैसा हा रयतेवर डाईजड कर लादून वसूल करणे अशा प्रकारच्या धोरणाचा अवलंब करणाऱ्यांपैकी शिवाजीराजे नव्हते, तर माझ्या राज्यातील सर्वसामान्य रयत सुखी, समाधानी आणि आनंदी राहिली पाहिजे या विचारधारेचे राजे होते. म्हणून त्यांनी जकात, अबकारी कर, न्यायालयीन शुल्क, नजराना, युद्धातील लूट, इतर राज्यांकडून मिळणारी खंडणी, सागरी व्यापार, लग्न टका, चौथाई, सरदेशमुखी, तेलपट्टी, इनामदारपट्टी, इत्यादी विविध मार्गांनी प्रशासनासाठी पैसा उभा केला. शिवरायांनी पूर्वीच्या राज्यकर्त्यांचे प्रशासनातील अनुभव लक्षात घेता त्यांच्या त्रुटी, त्यांच्या हातून झालेल्या चुका लक्षात घेऊन त्यावर योग्य त्या उपाययोजना केल्या. शेतीव्यवसायाला उत्तेजन देऊन त्यासाठी विविध योजना राबवल्या आणि त्यानुसार आपले आर्थिक धोरणही राबविले. ओसाड पडलेल्या, नदीच्या पाण्याने वाहून गेलेल्या, जमिनीमध्ये शेतकरी राहावा, त्याने शेती कसावी, त्याला हाताला काम मिळावे, त्याचा उदरनिर्वाह चालावा यासाठी शिवाजीराजांनी पाणी अडवून, जमिनीत मशागत करून पशुधनासाठी जमीन उपलब्ध जमिनी उपलब्ध करून दिल्या. शेतकरी आणि शेतमजूर वर्गाला आधार देऊन त्यांच्यात आत्मविश्वास निर्माण केला. नैसर्गिक आपत्ती, मानवनिर्मित आपत्तीच्या काळातही शेतकरीवर्गाला भरभरून मदत दिली. शेतकरी वर्गाच्या पाठीशी शिवाजीराजे खंबीरपणे उभे राहत असत. त्यामुळे शेतकरी कधी डगमगला नाही. शिवरायांनी प्रशासनात रयतेला केंद्रस्थानी मानले. रयतेच्या सुख आणि समाधानासाठी आपली प्रशासनव्यवस्था राबविली म्हणूनच रयतेचे दुःख जाणणारा आणि त्यानुरूप धोरण आखणारा जाणता राजा म्हणून इतिहासात सुवर्णाक्षरांनी शिवछत्रपतींची नोंद घेतली गेली.

संदर्भ -

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Highly Selective Ppm Level Ammonia Gas Monitor Based on Modified MoO_3Operable at Low Temperature

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Abstract

The nanoscaled MnO_2 and MoO_3 powders were prepared by microwave assisted ultrasonicated technique by employing centrifugation for collection of dry powders of the materials. Fabrication of thick films of pure $MoO_3$and MnO_2doped MoO_3powders were made by simple screen printing, which involves high temperature firing (450°C) for 30 min duration. The morphologies and topographies of surfaces of various samples, constituents of elements present in the synthesized materials and crystallographic structures of the pure and doped MoO_3powders have been investigated by XRD, FE-SEM, EDS, etc. It has been investigated that, the MnO_2doped MoO_3(7wt %) sample exhibits crucial response to 50 ppm NH_3 gas at 50°C. Electrical and gas monitoring characteristics of thick films of pure and ZnO doped Bi_2O_3, have been studied and discussed.

Keywords: MnO_2, MoO_3, Thick Films, Ammonia Sensors

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1.0 Introduction

Literature review proved the applications of MnO_2 and MoO_3 metal oxides in the field of toxic and hazardous gas monitoring [1-8]. Ammonia is very toxic and hazardous and if it leaked out by any means in the environment. Ammonia is having very disastrous effects on living beings upon exposure above threshold limit valuei. e. above 25 ppm. The possibilities of ammonia leakage are in the vicinity of chemicals and fertilizers companies. The living beings around such projects are in a very danger zone. So, to avoid such disastrous effects, we should turn our attention towards ammonia monitoring at trace level.

Few materials found for NH_3 gas sensing are Fe-ZnO [9, 10], Cr-ZnO [11], ferrite [12], Cu-MnO_2 [13], PANI-SnO_2[14], Cu-ZrO_2 [15], Cu_2S thin films [16], $LaAlO_3$ [17], modified ZnO [18], etc.

Surface Cupricated $Sn_{(0.03)}Zn_{(0.97)}O_3$ Hybrid Structured E-nose for LPG Monitoring at Trace Level

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Abstract

Hybrid composite powders of $Sn_{(x)}Zn_{(1-x)}O_3$ are synthesized by microwave assistance to disc type ultrasonication with centrifugation technique. Thick films of synthesized material powders were prepared by simple screen printing technique. The morphologies and topographies of surfaces of the samples, constituting elements of thick films and crystallographic structures of the pure and surface cupricated $Sn_{(x)}Zn_{(1-x)}O_3$ powders have been investigated by XRD, FE-SEM, E-DAX, etc. It has been discovered that, the $Sn_{(0.03)}Zn_{(0.97)}O_3$ hybrid composite thick films exhibit crucial response to 100 ppm LPG at 150°C as well as at 350°C. Electrical and LPG monitoring characteristics of thick films of pure and surface cupricated $Sn_{(0.03)}Zn_{(0.97)}O_3$ hybrid structured composite thick films have been studied and discussed. High response to LPG at 100 ppm, no cross sensitivities to few other target gases, low cost, low power consumption, good repeatability, portable size, low response and recovery time are the main features of this sensor.

Keywords: $Sn_{(0.03)}Zn_{(0.97)}O_3$, Hybrid Composite, Thick films, LPG monitor, E-nose, etc.

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1. Introduction

LPG is utilized tremendously for industrial as well as for domestic purposes. The demand of LPG is increasing day by day for domestic use i. e. in every kitchen all over the world as well as in industrial purposes. Recently, India became the second largest consumer of LPG in the world after Government's Ujjwala push [1]. So, the possibilities of its leakages are also increasing day by day [2]. People have experienced many cruel episodes all over the world due to the leakage of LPG only. Many researchers have already working on LPG sensing, few difficulties persists till today. LPG is often referred as a cooking gas and it is a colorless and odorless gas, which is usually mixed with compounds of sulfur (methyl mercaptan and ethyl mercaptan) of foul smell [3]. Due to this mixing, the leakage of LPG can be easily noticed by human nose. LPG, LNG, VOCs, etc. are fire hazardous because explosion accidents might be

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STUDY OF NATURAL PRODUCTS FROM FRESHWATER BIODIVERSITY IS RECENT STRATEGY: AN OVERVIEW

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ABSTRACT

There is no significance freshwater animals are source of bioactive compounds. Freshwater organisms are totally unpredictable for the study of natural product chemistry of the world wild biodiversity, so *Barytelphusa cunicularis* is major species from freshwater biodiversity, this can be source of the new substances and can be considered largest source of natural compounds and will be use functional constituent in food and pharmaceutical field. This review is attention toward information about the food perspective and medicinal profile of the freshwater crab concentrating on their developing use and human beneficiary.

KEYWORD: Bioactive compounds, unpredictable, *Barytelphusa cunicularis*, natural compounds, food perspective, medicinal profile.

INTRODUCTION

Natural products are the substances synthesized in the living organism that are always beneficial to human life due to their pharmacological and biological activity which is explored in pharmaceutical drug discovery and drug design. Natural products consist of carbohydrates, proteins, lipids, and nucleic acids, etc. They are naturally produced organic compounds and have high complexity. All of these compounds are metabolites that play important role in metabolic activity. Organic chemists always have been oriented toward these substances and their isolation, investigating, their chemical and biological properties which are helpful in new drug design and this is the main strategy of the chemist from the past centuries. Around the world, India is most rich in plant and animal wealth due to the variety of biodiversity. Nowadays, health care practices in India both the traditional way and modern medicinal system have been widely studied. A traditional practice like Ayurveda,

pharmacophore design. In addition of 70 new natural products being introduced and their clinical trials were conducted in 2004, to enhance their bioactivity and search for novel chemical scaffold for drug discovery.[6] The majority drug has been discovered from the natural product also known as secondary metabolites, but in the pharmaceutical field, a natural product is declined due to high-throughput screening (HTS) in the synthetic strategy, it is a smart screening method, robotic separation with structure elucidation, metabolic engineering and synthetic biology offers these techniques to discover the new drug.[7]

Natural products are the largest source of the compounds that are biosynthesized in living organisms. They have a systematic lifestyle to survive. They provide an advantage to the host, compared with organisms that live in the same biodiversity that do not produce. The natural products have unknown activities to their host which leads to important environmental questions. Actually, natural products have been a huge reservoir of bioactive compounds that have been beneficial to mankind.[8]

Natural products provide an enormous source of bioactive compounds for drug discovery, but sustaining their continuation is challenging in the pharmaceutical field due to new discoveries in biodiversity. At the same time, natural products have a positive influence on pharmaceutical development that is being convinced in the current thesis. Almost more than 50% of drugs are derived from natural products; they are safe and beneficial to mankind. Many clinical drugs are derived from natural products; from microbial sources like anti-infective, whereas the drugs that are derived from the plants have shown major contribution such as morphine, vinblastine, vincristine, quinine, artemisinin, etoposide, teniposide etc. Marine-derived drugs raised their contribution with anticancer properties.[9] Research in the plant and marine–based natural products in drug discovery has been going on for the last six decades. It has entered new drugs in combinatorial chemistry which is favourable to the pharmaceutical industry. Natural product chemistry focused on bioactive secondary metabolites plants and marine source compounds, but present thesis attention toward the freshwater biodiversity which has been an unfocused area for drug discovery. For instance, the bioactive compound obtained from a freshwater living being is a great debate for researchers due to the demanding area and is not being explored yet (it remained limited to the local environment).

Metabolic fingerprinting study of natural products discovery process will be beneficial on multiple levels, due to the number of identification and metabolic data that provide the novel

found applications in antitumor, antifungal, anticancer, chemotherapeutic, anticoagulant, anti-AIDS, and male contraceptive pills.[15,16] Marine biodiversity has been an optimum source of novel compounds. So far more than 150 natural products have been contributed to drug discovery. The different chemical extracts showed potential in the anti-HIV activity. It is also shown that the marine biochemical diversity would act as a tremendous source of novel bioactive compounds.[17]

Research of marine natural products has been rapidly increased in the interdisciplinary relevance of chemistry and biology. Aims of the research are detecting, identifying, and eliciting the structure of marine natural products have tended to identify 20,000 novelcompounds characterized on the high physiological activity. Marine biota is so different, lots of natural products are discovered every year, and this ratio tremendously increases in 2007- 2008. Almost approximately 1000 novel compounds have been introduced in pharmaceutical industries; these have been high bioactivity.[18] The discovery of marine natural products has opened up a series of clinical products including the antitumor and antiviral drug. Most ofthe marine natural products introduced to clinical drugs are under trial. Marine biodiversity has vast and developed, due to the obligation of research from the last few decades. Approximately 16000 bioactive compounds have been isolated and 6800compounds have been reproduced with various relevance. Marine natural products are attracted due to special adaptation, metabolic activity, and the majority of bioactive substances it means that increases the range of natural product integrity.[19] Sea occupied 70% of the earth's surface due to the vast biosphere and fantastic biodiversity nearer to 1000 different species surviving in per square meter area.[20] The pharmaceutical field knocks the door of marine biodiversity due to the highest contribution of bioactive compounds. There is a lot of researchon metabolites, their structure elucidation and attribution of bioactivity, and exploration of the drug design by means of a source of structure-activity relationship.[21]

Most of the animals have different biodiversity. The first biodiversity was found in water that resulted in new research studies on marine biodiversity. During this period adaptation of marine animal have been changing and there's a requirement for the development of the bioactive compounds, which are utilized for a different function like growth, reproduction, locomotion, communication, and defence etc. Bioactive compounds have found complex structures which is important for human needs. Thus, from ancient time marine animals are the source of medicine in the pharmaceutical world. Studies of various relevance studies

terrestrial microorganism, consequent attention has been focused on other ecosystems, especially those subjected to extreme environmental conditions such as desert hot springs and the sea. Most of the bioactive compounds were studied from the marine ecosystem. In the addition, the potential contribution of the freshwater ecosystem has been studied the discovery of natural products remains left behind.

Crab is the best source of bioactive compounds after shrimp and lobster to provide protein, vitamins, and fatty acids to improve the health benefits of the human being. The components present in crab showed biological activity such as antioxidant, anticancer, antidiabetic, antimicrobial, and anticoagulant function. The above activity is also shown by the bioactive compounds obtained from the tissue of Portunid crabs.[24]

However, on the basis of recent advances in the research field, the following definition has been proposed for the freshwater ecosystems: "natural products from the freshwater ecosystem that have beneficial effects on the health and wellbeing of hosts".

Freshwater biodiversity is an unpredictable research area due to various reasons. Thepresence of species in this biota traditionally utilized for food purposes. *Barytelphusa cunicularis* (freshwater crab) is major crab species found in freshwater biota and utilized as the food of slum people and due to this reason; the population of this species tremendously increases. When there is starvation or dryness or hot condition occurs, this leads to the death of crabs which ultimately results in the decomposition of dead crab species. According to a literature survey, the freshwater crab has been less predicted than marine crab, but now the scenario has changed and more research attention is given toward the *Barytelphusa cunicularis* from various regions. The work is related to the freshwater crab such as the structure and a property of the exoskeleton of the sheep crab has been showed. The crab oil has a good saponification value i.e., 126 mg KOH/gm. The peroxide value of crab oil is less i.e., 4.3 meq/kg though the crab oil is the source of food.[25] The biochemical and functionalproperty of chitin and chitosan (obtained from *Barytelphusa cunicularis*) has been studied. It has shown the specific applications in drug delivery, tissue engineering, functional food, food preservative, biocatalyst, immobilization, wastewater treatment, molecular imprinting, and metal nanocomposites. Chitin is mainly derived from the shell of *Barytelphusa cunicularis*. The chemical composition of chitin is B-(1-4)2acetamido2-deoxy-β-D-glucose (N-acetyl glucosamine). It is insoluble in an aqueous medium and soluble in acidic medium due to the free portable amino group present in D-glucosamine unit.[26]

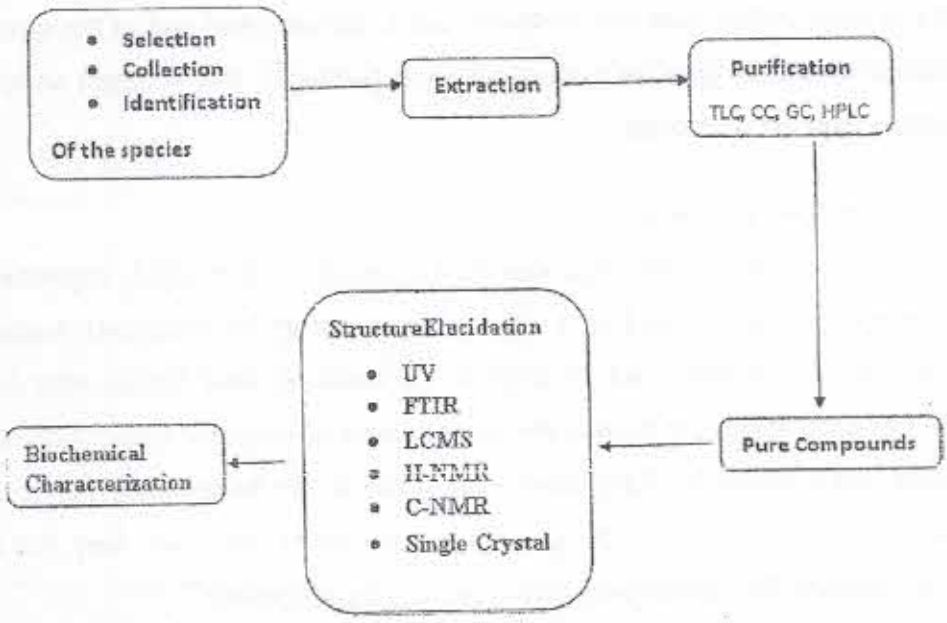


Fig. 2: A brief summaries for natural products isolation of animal species.

Selection of species

The animal beneficiary is depending on its medicinal effect, which has been resulted due to metabolites.[27] The selection of animal material is a very important step in natural product research. The animal material to be analysed based on the folk medicine utilized as a remedy due to bioactive compounds that have been clinically active.[28] From the biochemical point of view, an informative genus of an animal contains a group of bioactive compounds, and the selection strategy forward historical background of the natural product has been extracted and isolated.[29] Biochemical analysis and the data together that contains the knowledge of animal species were analysed for natural product processing.[30]

Collection and identification of species

It was reported that the collection of animal species depending on the known bioactive compounds simulate. This collection of the species is enhanced by the condition of the animal and seasonal environment (rain, winter, and summer).[31] The collected animal species have been identified by zoologists. The correct authentication of the animal (classification), any other aspect should be recorded properly for the feature references.

Drying and grinding

The collected animal species has dissected and all the different parts (i.e., leg abdomen and carapace) proceeded for drying to the microwave at low temperature. However, at high-temperature volatilization of the compounds was observed.[32] The material is kept away from

NTP.[35] The extraction methods like solvent extraction, distillation, compression, and sublimation have been widely used because these methods are the most convenient method. The progression of this method is stepwise i.e., solvent penetrates to solid, dissolution of solute, diffusion of solute, and extraction of solute in the solvent as shown previously.[36] Polar and nonpolar solvents can be used for solvent extraction but mostly organic solvents have been utilized. However, due to longer extraction time, some new techniques are also applied for extraction that has known for less consumption of solvents such as, short extraction methods. Nowadays, the researcher has adopted a short extraction method that is used to increase the extraction yield.[37] Several extraction methods are discussed below.

Cold maceration

Maceration is one of the best and an old technique for the isolation of bioactive compounds. In this method powdered solid sample is placed in the closed vessel in contact with the solvent for a long time with frequent shaking. The solvent diffused through the cell wall to extract the contents in the sample, this is the suitable method for cheap drug and witha high yield of extract.[38]

Percolation

This technique is used for the extraction of fluid in the percolation tube.[39] The sample kept in contact with the solvent for 5 to 8 hours in an airtight container. After that open the vessel and place the sample in situ for 24 hours followed by drained off the supernatant liquid (extract). The resulted extract is clarified with decantation or filtration. If the solvent is water, then the addition of a small amount of alcohol is needed for the prohibition of microorganisms.[40]

Digestion

This is a hot maceration technique, in which the sample is moderately heated between rang 45-50^{0}C for a long time (4-5 Hrs) temperature suddenly rises not affected on the extraction.[41] In this technique material is mix in a solvent using a magnetic stirrer, after a time interval filters the extract and fresh solvent added to the residue. This procedure repeated several times till the appropriate extract materialized.

Infusion

In this technique, the material is short time mastered in boiled water, then dissolved the components of crude drug.[42]

screening (LTS). HTS is a drug discovery process that allows testing a large number of biochemical components to their targets, they explore the targeted investigation on a large number of compounds and quickly screen. In LTS minimum extract allocate to adopt with bioassay but in the pharmaceutical industry, HTS method has been utilized extensively.[47,48]

Isolation of active fraction (bioassay guided fraction)

Identification of active fraction can be carried out by thin-layer chromatography (TLC) method. Bioassay-guided active fraction and the crude extract differentiated by chromatographic technique. After bioassay of the crude extract, each fraction tested then isolated.[49] The schematic representation of bioassay guided active components is shown below (fig. 3). Quantifying the bioactivity of extract during the screening and bioassay-guided fraction involved in the screening of antimicrobial and antioxidative activity. Isolation of compounds is responsible for these activities by a bioassay-guided fraction. There are three main reasons for doing screening studies i.e. (a) to find new compounds for developing the pharmaceuticals, (b) to confirm the medicinal uses of the species, or (c) to develop the biomedicine. Apparently, little efforts went into developing low technology techniques to utilize folk medicine of the species in rural communities. However, in many screening studies, activities are reported non-quantitatively.[50]

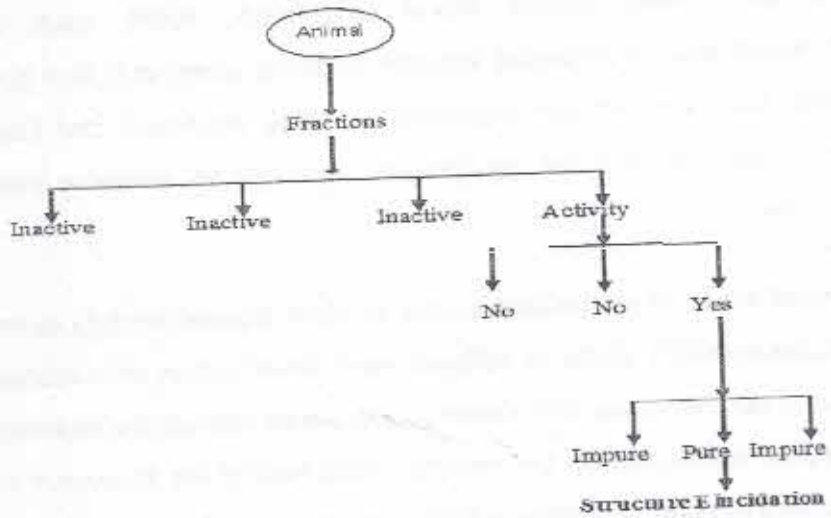


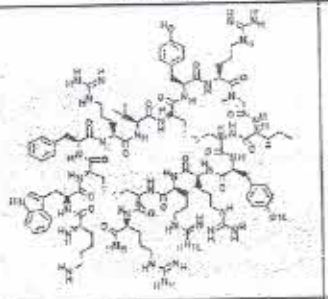
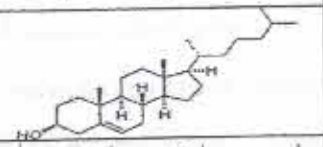
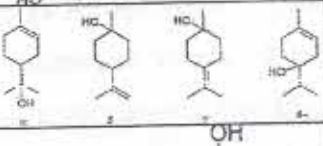
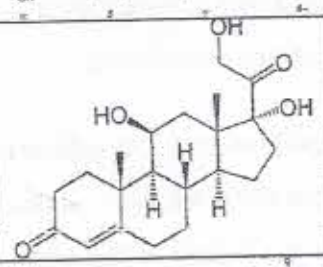
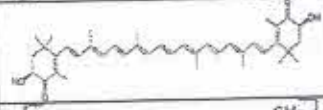
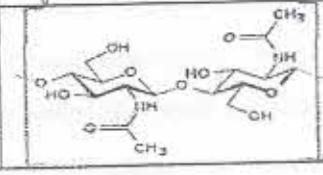
Fig. 3: Schematic representation of bioassay guided active components.

Characterization of isolated compounds

On the basis of bioactivity achievement and the separation of bioactive compounds the structure elucidation and characterization are attempted, which is dependent on spectroscopic databases like UV, FTIR, 1HNMR, 13CNMR, LCMS, elemental analysis.

crab), terpenoids, and steroids that have been foundand shown to be active against *E. Coli, S. aureus,* and *bacillus.*[58] Several bioactive compounds are isolated from arthropods. The bioactive compound Limulus Amoebocyte Lysate (LAL), is an aqueous extract of the blood cell of shoe horse crab *Limulus Polyphemus.* LAL reacts with lipopolysaccharide (LPS), which are membrane components of gram- negative bacteria. The reaction is a basic LAL test that is used for the detection and quantification of bacteria endotoxin.[59] The effect of the Maillard reaction on the crab shell showed antioxidant and antimicrobial activity. In addition, these activities showed a positive correlation with fructose concentration and the pH reaction of the shell. Higher the fructose concentration and pH, higher antioxidant and antibacterial activity in the shell are observed.[60] Some bioactive compounds and steroids are found in Crab species other than above mentioned below (Table.2).

Table 2: Compounds found in crab species.

Name	Main Source	Structure	References
Tachyplesin	*Tochypleus tridetatus*		Miyata et. al. (1989)
Cholesterol	*Carcinoscorpius rotundicauda*		Basu et. al. (1995)
Monoterpenol	*Carcinoscorpius rotundicauda*		Muniarsin et. al. (2005)
Zoosterol	*Carcinoscorpius rotundicauda*		Bhakuni and Rawat, (2005)
Astaxanthin	*Heamatococcus pluvalis*		Spilerand Dewell(2003)
Chitin	All species ofcrab		Rinaudo (2006)

the field of research. The rivers rise in the eastern Satpura range. Satpura range contains 6 orders, 25 families, and 160 different species of fish and crabs. Most of these animals are used for food purposes and the rest of the animals are decomposed into water or mud. In taxonomy crab and shrimp are considered similar animals. Most of the crabs are living in mud or near the river whereas there are some crab habitats they live in freshwater or land. The therapeutic value of the crabs present in the cold is good for the liver and stomach which helps for the detoxification. The bone marrow compliments, support tendon-bone, blood phlegm, dampness jaundice, Lee limb, liver, and AIDS. The effect of the gastric filling for congestion, jaundice, lumbar, leg pain, rheumatoid arthritis has a certain therapeutic effect. Chemodiversity important crabs are the most valuable source of natural products.

Morphometric of *Barytelphusa cunicularis*

CW - 12.6-17.76 (15.18±3.65)

CL – 10.9-14.16 (12.53±2.31)

CH – 5.78-8.26 (7.02±1.75)

The carapace is slightly broader and long. It is slightly convex having a dorsal surface smooth for rogues' epigastric, cristae. The external outer angle, and outer margin is 2.5 times the length of the inner margin, epibranchial tooth distinct, cleft visible, and cervical grooves shallow (ZSI).

DISTRIBUTION

The crab distributed through India from Himachal Pradesh to north of Kerala insouth except North-east India.

Biochemical study

The biochemical aspects from the post-study of chitin and chitosan extracted from the shell have been shown.[61] The crab oil contains cholesterol, acrolein, and vitamin-A has been studied.[38] In freshwater crab, a high amount of selenium has been reported, which acts as a vital role in human antioxidant defence.[62]

Uses

Freshwater crab founds in outstanding crucial conditions like ecological, prudential. It has potential in the field of medicine. Apart from that, they are rich sources of proteins, carbohydrates, and various minerals. So, the bulk of consumed freshwater crabs obtained from wild cached crabs hunted from the natural environment are not at levels that meet the

who are interested to explore the area of natural product processing. The practical applicability of the bioactive compounds would also help in the development of the drug in the pharmaceutical field.

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Studies on Sn doped cadmium sulfide thin films as highly selective green light photosensors

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ABSTRACT Thin films of Tin (Sn) doped Cadmium Sulfide (CdS) have been grown by chemical bath deposition technique. It was observed that all fabricated thin films (doped & undoped) were polycrystalline with nanoscaled crystallites and cubic crystal structure of CdS. SEM micrographs show nanorod structure of CdS and Sn doped CdS. EDS analysis shows the deficiency of sulfur and excess of cadmium in the films. UV-VIS spectroscopy confirms increase in band gap with doping of the films. Microstructural analysis shows that the particle size increases with increasing concentration of the Sn on excitation with 483 nm. The gravimetric analysis shows that the thickness of the pure CdS thin film measured is 134.41 nm, which increases with doping concentrations of tin. Electrical conductivity measurements show that the material switches its Negative Temperature Coefficient (NTC) to Positive Temperature Coefficient (PTC) nature with increase in temperature. TEP measurements show n type semiconducting nature of the films which is highly photo sensitive. The pure CdS thin film was observed to be less sensitive to the green light, however, the Sn (3 wt%) doped CdS thin films exhibit enhanced photo response particularly to green light.

KEYWORDS photosensors, thermoelectric, X-ray diffraction, photodetectors

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1. Introduction

Today's world is facing many problems about the availability of energy in sufficient amount. So, the researchers are focusing their attention towards the generation of green and clean energy, particularly the solar energy. Many solar cells are already available in the market, but their cost is very high, so everyone can not afford them. Intensive work on the solar cell fabrication with low cost materials is needed for increasing of the installations availability. Efforts have been made with earth abundant elements like Cu_2ZnSnS_4 (CZTS) which have direct band gap ($E_g \sim 1.5$ eV) and high absorption coefficient [1–3]. The $Cd_xSn_{1-x}S_3$ films are used in solar cell as they have a relatively wide band gap as compared to the CdS thin films. The high band gap of ternary Sn doped CdS thin film has less window absorption loss, which can be replaced with CdS thin film in the solar cell systems [4, 5].

Meshram et al. have fabricated the CdS thin film using spray pyrolysis method and studied its structural and optical properties [6]. Furthermore, the Sn doped CdS thin films were fabricated by using chemical bath deposition technique by Roy et al. who have studied their optical and electrical properties [7]. It was reported that the effect of Sn doping on the photoluminescence and electrical properties of the CdS thin film changes the properties significantly. The influence of Sn doping on the CdS thin film prepared by ultrasonic spray pyrolysis had been reported by Eygi et al. and their photoluminescence and electrical properties have been reported [8]. But the studies on synthesis of Sn doped CdS thin films and their photo-sensing performance and needs a further attention. For thin film fabrication, various deposition techniques have been used by various resources viz. spray pyrolysis [9], chemical vapor deposition [10], thermal evaporation [11], molecular beam epitaxy [12], RF sputtering [13], chemical bath deposition [14], etc. Out of these techniques, the chemical bath deposition (CBD) technique has been used extensively to fabricate the thin films because it is a low cost simple technique, which does not require high quality substrates, vacuum system, huge instrumentation, large power handling

Lower Temperature Notch Controlled Ammonia Sensor Fabricated from SnO_2-Activated Thick Films of MnO_2 doped MoO_3

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Abstract

Microwave aided ultrasonication technique involving centrifuge was used for synthesis of MnO_2 doped MoO_3 nanocomposites. The dry powders of nanocomposites are converted in to thixotropic pastes which were further allowed to flow through the nylon screen for the fabrication of thick films. After calcinations, these films were surface activated by SnO_2 for different time intervals. The crystallographic structure of MnO_2 doped MoO_3 nanocomposites is a tetragonal, monoclinic and polycrystalline, depicted from XRD analysis. The average crystallite size was observed to be of 26.3 nm. Scanning electron microscopy depicts the non uniform alignment of the grains in the films and film porosity. The elemental compositions of thick films were estimated from energy dispersive analysis by X-rays and thick films were observed to be excess in oxygen and deficient in molybdenum leading the semiconducting nature. Symmetric current-voltage profile of the films depicts the resistive nature and Arrhenius plot indicates negative temperature coefficient of resistance (NTC) from 350°C up to 100°C and positive temperature coefficient of resistance (PTC) from 100°C to low temperature (34°C). Hence, the temperature 100°C is the switching temperature, which switches NTC to PTC nature during cooling and vice versa. It has been observed that, the MnO_2 (5 wt%) doped MoO_3 nanocomposite thick films activated by SnO_2 (15 min) exhibit crucial response to 25 ppm NH_3 at low temperature. The film exhibits the response to NH_3 in the temperature notch of low temperature ranges from 34°C to 100°C. The electrical and gas sensing performances of the nanocomposites have been studied and discussed in detail.

Keywords: Temperature notch; MoO_3; MnO_2; Thick films; Ammonia sensor.
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1.0 Introduction

Ammonia is very toxic and hazardous gas, which is utilized in the fertilizer industries, explosive industries, laboratories, etc. in large extent. It finds the extensive applications in the industries, research, defense, domestic and medical fields. If it is leaked by some means with concentration above threshold limit value

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Highly selective ppm level LPG sensors based on SnO_2-ZnO nanocomposites operable at low temperature

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ABSTRACT

The nanoscaled SnO_2, ZnO and SnO_2-ZnO nanocomposite powders were prepared by microwave aided ultrasonication technique by employing centrifuge for the collection of dried powder of the materials. The fabrication of thick films of the pure ZnO and SnO_2-ZnO nanocomposite powders were made by simple screen printing technique. The crystallographic phases of the pure ZnO and SnO_2 doped ZnO are hexagonal in nature. The average crystallite size of 0 (pure), 1, 3, 5, 7 and 9 wt% of SnO_2 doped ZnO films was found to be 30.2, 30.3, 109.7, 37.9, 36.8 and 45.6 nm, respectively. The SEM micrographs depict the porous nature of the thick films. The EDS analysis reveals that the pure ZnO and SnO_2 doped ZnO films are oxygen deficient and show a semiconducting nature. The symmetric I-V characteristics depict the ohmic and non-ohmic natures of the thick films. The electrical resistivity measurements indicate a negative temperature coefficient of resistance. The gravimetric analysis shows that the average thickness of the pure ZnO thick film is 28 μm. The LPG response versus doping concentration plot suggests that the (1 wt%) SnO_2 doped ZnO thick film exhibits crucial response to 100 ppm LPG at 50 °C and 100 °C. Therefore, the SnO_2 doped ZnO thick film can be applicable in the field of LPG sensing with rapid response and recovery.

1. Introduction

Research on the gas sensors is focused on new aspects, viz. to develop the smart sensors, highly sensitive and selective, most efficient, longer lives, portable in size, low power consumption, low cost, easy availability, etc., which are very important in the electronics industries. Some ceramic semiconductors, such as zinc oxide (ZnO) and tin oxide (SnO_2) containing controlled porous structures show a change in electrical conductivity with the trace amounts of inflammable and toxic gas compounds. The ZnO is one of the first and most widely used ceramic material for gas sensor applications [1]. Gas sensing performance of ZnO is obtained by changing conductivity with operating temperature, doping methods and concentrations, gas concentrations alongwith sintering parameters, such as temperature, period, etc., which may be attributed to the desorption of oxygen adsorbed on the surface and grain boundaries of the metal oxides at high temperature in air [2,3].

The ZnO forms a wurtzite crystal structure showing n-type semiconducting nature [4,5] and has been used in various applications [6–12]. The ZnO has attracted wide attention for UV light emitters, gas sensors, spin functional devices, surface acoustic wave devices and transparent electronic devices [13]. It was reported that the addition of surface additives in the materials affects the response of gas sensing. With this aspect, we are motivated on the properties of the pure and doped ZnO based thick films. The pure ZnO was observed to be less sensitive for various gases, whereas modified ZnO was found to be more sensitive and selective to the few hazardous and inflammable gases. Various additives in ZnO are tested, among all; SnO_2 in ZnO is the most promoting additive in the fabrication of inflammable gas sensors. Butane is found in the majority of contents (55 vol%) of liquefied petroleum gas (LPG) [14,15]. The LPG and liquefied natural gas (LNG) are

Abbreviations: SEM, Scanning electron microscopy; XRD, X-ray diffraction; EDS, Energy dispersive X-ray spectroscopic.

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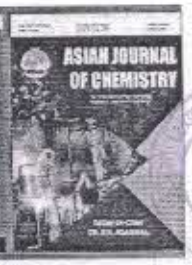

Gas Sensing Properties of Pure and Co Surface Modified Nanocrystalline $SmFeO_3$ Thick Films

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In present work, nanocrystalline $SmFeO_3$ perovskite oxide powder was prepared by sol-gel method. Thick films of $SmFeO_3$ were fabricated onto a glass substrate by screen printing technique and heated at 500 °C for 30 min. As-prepared pure nanocrystalline $SmFeO_3$ thick films were dipped into 0.1 M aqueous solution of cobalt chloride for different intervals of time. Microstructure and surface morphology of both pure and Co surface modified $SmFeO_3$ thick films were investigated by energy dispersive X-ray analysis (EDAX) and field effect scanning electron microscopy (FE-SEM) techniques. The FE-SEM micrograph reveals the porous nature of thick films. EDAX analysis showed that both pure and Co modified thick films are oxygen deficient. Gas sensing performance of these films was tested for different gases. The highest response and selectivity was recorded to 50 ppm NH_3 gas at 200 °C for $SmFeO_3$ thick film dipped into cobalt chloride solution for 3 min. The effect of cobalt doping and its dipping time on microstructure, surface morphology and gas sensing properties of pure $SmFeO_3$ thick film was discussed.

Keywords: $SmFeO_3$, Surface modification, Perovskite, Gas sensor.

INTRODUCTION

Recently, perovskites of type ABO_3 (A: rare earth, B: transition metal) have attracted a great deal of attention due to their variable chemical and physical properties. They have wide range of applications including solid oxide fuel cell [1], catalysis [2], photoluminescence [3] and gas sensors [4-7]. Their properties such as ionic and electronic conductivity, chemical stability can be tuned for particular application by partial substitution at A-site and/or the B-site. $SmFeO_3$ is one of the rare earth orthoferrite extensively studied as chemical gas sensor material. Its conductivity increases with exposure to oxidizing gases and decreases with the exposure to reducing gases. Due to p-type semiconductivity, $SmFeO_3$ have been typically studied for detection of oxidizing gases such as ozone, oxygen and NO_2 [8-11]. But under reducing conditions, $SmFeO_3$ was reported to be chemically unstable due to phase separation of Sm_2O_3 and Fe_2O_3 [12]. Further, at low temperature very poor response was recorded for these sensors under both oxidizing and reducing conditions due to their very low electrical conductivity.

Ammonia is colourless gas and easily reacts with water to form ammonium hydroxide which is highly irritating. Common sources of ammonia are refrigerant gas, pesticides, explosives, dyes, *etc*. Hence most of the people are exposed to ammonia. From breathing, swallowing or skin contact, ammonia enters into human body and reacts with water to form ammonium hydroxide which is very corrosive and damage body cells [13]. Therefore detection of ammonia is essential. In present work, a pure $SmFeO_3$ based gas sensor is fabricated to test its performance for the detection of ammonia. The sensor responds to ammonia gas but showed poor sensitivity at small temperature due to low electrical conductivity. Therefore, it is evident that to use $SmFeO_3$ based gas sensor for the detection of reducing gases like ammonia, there is a need to improve its electrical conductivity.

Generally conductivity is related to the oxygen vacancies presents on the surface. Formation of oxygen vacancies increases by increasing temperature and by incorporating additives [14]. But high working temperature has adverse effect on the stability of a sensor. Therefore, incorporating additives to base material

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CONTRIBUTION OF KHELO INDIA UNIVERSITY GAMES FOR COLLEGE STUDENTS

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CONTRIBUTION OF KHELO INDIA UNIVERSITY GAMES FOR COLLEGE STUDENTS

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Introduction:

The human anatomy is such that management and structure of human body always requires some form physical activities so that human can maintain stamina, flexibility, fitness, and elasticity for better performances. Physical activity is not limited to just walking around, roaming, or jogging, but physical activity includes many factors like sports, games, tracking, and other regular activities through which human body can stay healthy, flexible, fit, and active. The importance of sports to stimulate the human body can be seen from ancient times. Ancient literature and epics of India mention wrestling, chariot, and horse racing as well as chess. By the passing time, along with career, sports have also brought other benefits to human beings. When it was realized that a healthy body could have a healthy mind, people began to struggle to keep their bodies fit and healthy, and when they realize that one way to the healthy body was through the playground, they began to crave sports.

Sports provide exercise, strengthen the body; discipline sports also changes life. Cricket is team game, one cannot think about himself or herself alone, one has to think about the whole team. Sport not only excites the mind of human being but also entertains. After studying for 2 to 4 hours, students get bored, after playing for some time, that boredom passes away and get excited towards their study. Due to this, one cannot forget the fact that mind be concentrated through sports. Therefore, it is important to use sports from school level to university level to create exercise and keep the body strong. Acquisition of sound mind through sports activity nurtures study habit to direct their career. Hence conducting more sports events at university level was the need of the society and this need was fulfilled by conducting Khelo Indian University Games since the year 2020.

Khelo India University Games:

C.C. Chengappa (2022) in his article, 'Khelo India Youth Games and University Games: What's the Difference?' attempted to differentiate the two sports events under the title of Khelo India, being launched by the central government and ministry sports in 2017. Khelo India University Games are meant for specifically for university students across the country. The age group targeted in this game forms is for 18-25 years sportspersons studying at different streams and levels of university education. The aim behind this game form is to train the athletes and for the international events in future. Having reference to NEP 2020, Mr. Anurag Thakur, the youth affairs and sports ministers of India, stated that, 'national education policy 2020 emphasized the importance of sports and physical activity to be a vital part of our education systems. Structural changes are in the pipeline to ensure sports-integrated learning will be undertaken in classrooms.'

This very statement of Mr. Anurag Thakur not only serves the purpose of academic achievement of the students learning higher education institutes but also sparks thirst among the young students across the country to participate enthusiastically in sports events.

The first edition of Khelo India University Games was organized in Bhubaneswar in the year 2020, while the second edition was organized in Bengaluru in the year April 2022. The events in these editions are like, Archery, Athletics, Badminton, Basketball, Boxing, Fencing, Football, Field Hockey, Judo, Kabaddi, Rugby, Swimming, Table Tennis, Tennis, Volleyball, Weight Lifting, Wrestling, Taekwondo, Karate.

The another aim behind the conduction of Khelo India University Games was can be stated in the words of Neeraj Chopra (Indian Athletic); to generate interest among the youths for top-class international meets. Another idea behind the Khelo Indian University Games is to encourage India's youth to balance sports and education and to revive university sports. There is vision behind the conduction of such university level sports events in giving the youngsters a taste of international standard sporting tournaments and inspire them to strive excellence for the nation. (Ayon and Vijay 2020).

Khelo India University Games Events:

As mentioned earlier that Khelo India University Games started from the year 2020 and the second edition of 2021 was postponed due to COVID-19 and held in April 2022.

The first edition of Khelo India University Games was hosted by KIIT University of Bhubaneswar (Odisha). The event took place from February 22 to March 1, 2020. Punjab University stood first among the universities participated by winning 45 medals (17 Gold, 18 Silver, and 10 Bronze). It was followed by Savitribai Phule University Pune (37 medals) and Pujabi University Patiala (32 medals). This first edition of games witnessed 4000 athletes from 100 universities across India in 17 different disciplines. (Arihant, 2020)

The second edition of Khelo India University Games conducted from 24th April 2022 to 3rd May 2022 by Jain University Bengaluru. In this sports event, 20 games were played 3900 students from 210 Universities across India participated in this event. Mallakhamba and Yoga were introduced for the first time in Khelo India University Games 2022. The host University, Jain University, stood first in the medal ranks by winning 20 Gold, 7 silver and 5 bronze. Lovely Professional University stood second with 17 gold, 15 silver, and 19 bronze. While Punjab University won 15 gold, 9 silver and 24 bronze medals. (Disha Publication 2022)

Contribution of Khelo India University Games:

The researcher himself is Director of Physical Education in Higher Education Institute. In his Ph. D. research study he has found numbers of issues among the students learning at university level, especially Schedule Caste girls and their sports participation. Khelo India University Games is an opportunity to overcome the issues. Although the role or goal behind the organization of Khelo India University Games is wide in its range or the inclusion of Indians in international sports is kept in mind, but through this medium, student from the rural level and semi-urban levels are getting a large number of opportunities in university level sports. Through these games, they are getting a different platform for their skills in different games without showing proficiency in a

particular game. A great opportunity for them to play at the national level, at the international level will definitely be available through these games form.

After the success of first edition of Khelo India University Games 2020, Mr. Vikas in his article, 'Indian Sports and Indian Youth', commented that participation of young generation especially, students learning in higher education institutes in sports will definitely increase only when their lazy mentality and perception would be modified. Parents, Physical Directors, Senior Citizens have to contribute more for their active participation in sports. Khelo India University Games has changes the mindset among the students and they are found in coming up from their lazy mindsets.

Shrihari Natrajan, Olympian Swimmer of Jain University Bengaluru, who won 3 gold medals in the second edition of Khelo India University Games 2020, in his interview after the winning three gold medals for his university stated that, 'Khelo India University is not just a game event but a great opportunity to involve students from rural and different areas in sports through this medium.'

Subhot Roy, a final year engineering college athlete from West Bengal State University, participated in the second edition of Khelo India University Games in Bengaluru 2022, in his interview felt nervous as his university could win only a bronze medal in the event but shown optimistic attitude towards sports and participation of young athletes at national level sports events. He further also stated that Khelo India University Games has become a lifeline for Indians and through this many dormant educational institutions are showing their readiness to participate in this game event. (uttarbangasmbad.in)

Conclusion:

Khelo India University Games was launched after the successful three cycles of Khelo India Youth Games. The aim of Khelo India University Games was to prepare and train the capable athletes having age group from 18 to 25 for the Olympic and Asian Games. It is found from the study that twice as many universities participated in the second edition of games in April 2022 as compared to the first edition of 2020. Mallakhamba and Yoga the traditional forms of exercise and physical activities were also included in this game forms to inspire students participate in these forms also. As Mr. Anurag Thakur, the minister of the Parliament stated that Khelo Indian University Games should become youth's movement by actively participating in games; itself indicates the enthusiasm and spirit behind the introduction of this game form. Sports integrated learning in the classrooms will not only develop fitness aptitude among the youths but also improve physical literacy by participating in university sports activities.

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AGGRESSION AND ITS EFFECT ON SPORTSPERSON'S CAREER

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Abstract:
Aim of this study was to investigate the forms of aggression in sports and its effect on the sportsperson's career. Aggression has its own history since it happens both in psychological perspective and in sport psychology. Aggression is cause of frustration among the sports persons. In sports, aggression happens when there is defeat, not performing well, being hurt verbally or physically by the opponents, perceiving unfair circumstances in playfield and because of decisions against. Aggression also serves the common end in the form of inflict pain or injury on the opponent. Different views among the scholars have been registered that signified the effect of aggressiveness on sports in actual and sportsperson's career. What study aims that though behavior of aggression is intent one and is right of person to react, the aggression should be instrumental towards the goal only and assertive towards the opponent.
Keywords: Aggression, Hostile, Instrumental, Assertive, Moral aggression, repercussion.

Introduction:

Human aggression means different things to different people. It is different in the sense that human being behaves differently in different situation. Behaviour of human being here is directed towards another human being carried out with the intention of harm. According to Bushman and Anderson (2001), the behaviour of a person here is a belief; one will certainly harm the target and the target is motivated to avoid the behaviour of the opposite. Adam Morris (2019), in his article Aggression in Sports, states that 'aggression is that kind of behaviour or an activity of a person that have enormous both positive and negative repercussions on the performances of a person. Having reference of definition of Baron and Richardson "any form of behaviour directed towards the goal of harming or injuring another live being who is motivated to avoid such treatment. Definition of Baron and Richardson as well as definition given by Bushman and Anderson are coincidently common with reference to harming and associating with the negative behaviour by the target person. On the other hand, Krishnaveni and Shahin (2014) quotes that, "aggression is any interpersonal behaviour intended to cause physical harm or mental distress to a person or person." Central of all these definition is intent of someone towards the other. Therefore, Adam Morris in this regard states that aggression is a psychological behaviour or negative psychological characteristics. While Widmeyer and Birch (1984) support aggression a component to improve performance of a person.

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According to Berkowitz (1993), 'aggression is labeled when behaviour of a person is ordered with two factors like: behaviour must be aimed at another human being with the goal of inflicting physical harm, while the other factor is that a reasonable expectation that the attempt to inflict bodily harm will be successful. But aggressive behaviour in which there is no chance for intended victim to be injured (aggressor and victim are separated). Such example is just a labeled aggression and not a real aggression indeed. Most of the definitions move around the other element of aggression that an individual not place himself in harm's way. (Russell G. W. 2008)

Aggression has its own history since it happens both in psychological perspective and in sport psychology. Aggression is cause of frustration among the sports persons. In sports, aggression happens when there is defeat, not performing well, being hurt verbally or physically by the opponents, perceiving unfair circumstances in playfield and because of decisions against. According to the psychology, aggression happens when there arouses a feeling of frustration, misread, mistreated, ignored, and difficulties in balancing emotions. More care for professionalism is another cause for aggression found in last two decades.

Objectives of the Study:

There have been number of questions on the behavior of aggression among the sportspersons in different form of sports. Football, Hockey, Ice Hockey, Rugby, Wrestling, Boxing etc. sports has witnessed different behaviors among the players. Another question also remains whether these forms aggression in sports functions as catharsis effect or release stress and frustration of players. What theories are involved in aggression with reference to sports and how do left their impact on individuals or entire team were issues to observed in the study.

Hostile versus Instrumental Aggression:

Hostile and Instrumental aggression are two forms of aggression between which a key difference can be identified and lies in its goal. What differ in these two forms is goal as to harm is a goal of Hostile aggression, while to achieve goal is a goal of Instrumental aggression.

Hostile aggression refers to impulsive, angry aggression intended to harm someone who has in some way provoked an individual. It is seen in the actions of better charging the mound to do battle with the pitcher who has thrown well inside the plate for the third time. In contrast instrument aggression is planned aggression that is motivated by desire to achieve some other goal, for example, achieve a competitive advancement or revenge. (Russell G. W. 2008, p.5)

A good example of Hostile aggression occurs when a baseball pitcher throws high inside fastball at a better who has angered him. In short, the goal is to harm and not to win. Therefore, this aggression is viewed from violence point of view. On the other hand, in Instrumental aggression, the aggressor views the aggressive act as instrumental in obtaining the primary goal. A parallel example of baseball can be when the pitcher has been 'ordered' by his manager to hit a batter in retaliation for some earlier infraction.

Sports and Aggression within it:

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Sports have played significant contribution in the history of nations. In the earliest history, individual nations have shown a preference for sports or games over others. For some nations, combatant sports have taken precedence; for other nations, nonviolent competitions seems more attuned to their national character. Just as nation differs in their preference for combatant sports so too do they differ historically. Therefore, with reference to violence and non-violence in sports it arouses a question whether preference in behavior and history are interrelated? This form of debate directs the form of aggressions in sports with reference to culture. On most occasions, according to Russell religious belief also influences over the theory of aggression among the players in most forms of sports. Therefore, what matters for aggression in sports is a kind of mindset or goal. And from this point of view, Terry and Jackson (1985) defined sports aggression as, 'harm-inducing behaviour bearing no direct relationship to the competitive goals in sports, and relates, therefore, to incidents of uncontrolled aggression outside the rules of sports, rather than highly competitive behaviour within the rule boundaries.' Anderson and Bushman (2002) argued that situational and personal factors play a role in causing a person to behave aggressively. Therefore, players' personalities play a large role in determining whether they are aggressive or not in certain situation. From this very point of Anderson and Bushman, aggression in sports can be a matter of individual and his personality also. Therefore, aggression in sports in views of Russell and Anderson and Bushman has different dimensions like individual, individual nation, history, religion and personality. According to Jamieson and Orr (2014) aggression in sports affects individuals and society physically, verbally, and emotionally; these effects may occur in advance level also.

It is true that aggressive behaviour of an individual outside the sports section is illegal but within sports activities they are supposed to be a part of games. There are different forms of games which can be played without players contact like Cricket, Tennis, or some extent like Football, Basketball as they allow contact in the form sport combat but sports like Judo, Karate, and Wrestling or other team contact sport like American Football, Rugby, and Ice Hockey. These game forms are characterized as high level of aggression and often violent as physical contacts of players in maximum form.

Theories of Aggression:

1. Instinct Theory:

It is based on the writings of Sigmund Freud and Ethnologists such as Konrad Lorenz. Mainly this theory is based on Freud's theory. According to him aggression is an inborn right of person similar to hunger, thirst and sexual desire. He stated that it is an unavoidable behaviour of person since it is innate but can be controlled with reference to discharge and fulfillments. Since human being is innately aggressive, it benefits society to promote athletics, sports and games that provide a socially acceptable outlet of aggression.

2. Social Learning Theory:

It posits that aggression is a function of learning, and that biological drive and frustration are inadequate explanations of the phenomenon. While, the notion of catharsis is an important

component of biological instinct theory; has no place in social learning theory. The behaviour aggression among the human being can only to lay the foundation for more aggression and not result in reduction or purging of the drive to be aggressive.

3. **Frustration-aggression Hypothetical Theory:**

This theory of aggression was introduced by Berkowitz; takes into consideration the observation that frustration does not necessarily result in aggression and proposed that frustration creates a readiness for aggression. For aggression, certainly to occur, certain stimuli associated with aggression must be present.

4. **Moral Reasoning and Aggression:**

This theory of aggression was drawn out by Bredemeier; based on Jean Piaget's theory of cognitive development. His theory related to aggression is in the form engagement of person in moral behaviours. He reasoned that the relationship should exist in the level of moral reasoning and acts of overt athletic aggression. He has supported three moral stages of moral development in his theory. In this stages, individual observed to be engaged in concerning with rewards, punishment and owns welfare (Pre-conventional stage), in another stage, individual is concerned with group or team (Conventional Stage), while in post-conventional stage, individual is guided by moral principles.

Aggression and Career:

It is from the theories and concept of sports aggression, aggression is referred to individual's intent behaviour with different purposes. Aggression in sports for last few decades it at its pick due to high level of professionalism in sports sector, competition and structure of winning tendencies led by the nations and their sports authorities. Since sports has been viewed from economic point of view and from tourism point of view, every nation, whether developed or developing or at poor level, have invested heavily in sports and expenditure on athletes is also at huge amount.

It is true that aggression is innate, it has also been confirmed by behaviour psychologist that aggression is root for play tendencies and every player has a winning instinct when they enter the playfield.

Aggression is always good if it is done with a view to achieve a specific goal and target. But that aggression is ever dangerous if the act is to literally eliminate the front players and establish injury or harm either physically or verbally to the opponent.

Assertive aggression is always good when a sports person behave with intention to establish dominance over the other rather than to harm the opponent.

Sports stressor allows a player to understand what causes an athlete to become frustrated which can lead to aggression and decline in performance. In player's career they will come across number of high-pressured situations where they will have to deal with many stressors. These can range from situation stressors to individual stressor where worry, anxiety, and team related problems

may arise. On many occasion, sports person will experience hard to balance their sports and other communications.

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"नारी के आत्माभिमान और अस्तित्व को नई दिशा देते उपन्यास"

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सारांश :-

नारी-विमर्श का साहित्यकार उसे ही माना जाएगा, जिसके ह्दय में नारी के प्रति सहानुभूति व समानुभूति हो अर्थात जो नारी-ह्दय में पैठ कर सकता हो, जो नारी की कसक को पहचानता हो, जो नारी-भावों की अतल गहराइयों में उतर सकता हो। अर्थात जिसने नारी के जीवन को जिया है या जो ह्दय नारी-सी कोमलता लिए हो। यह जरूरी नहीं कि नारी-जीवन के उजले पक्ष को रेखांकित करने वाला साहित्यकार कहलाए, चाहे वह लेखक पुरूष हो या महिला। नारी संपूर्ण आबादी का आधा भाग है। वह एक ऐसी आधी दुनिया है, जो प्रत्येक कदम पर पुरूष द्वारा नियमित और अनुशासित होती रही है। प्राय: सभी प्राचीन सभ्यताओं में नारी की स्थिती सम्मानपूर्वक थी। अत्यंत प्राचीन वौदिक सभ्यता में आर्य नारी की दशा बहुत ही सम्मानपूर्ण थी। ठीक उस नारी के आत्माभिमान और अस्तित्व को नई दिशा देने का कार्य महिला लेखिकाओं के उपन्यासों के माध्यम से होता हुवा दिखाई देता है।

हिंदी की कई महिला लेखिकाओं ने अपनी लेखनी के माध्यम से अपने क्रांतिकारी विचार प्रस्तुत किए है। इन महिलाओं में मन्नू भंडारी, कृष्णा सोबती, कृष्णा अग्निहोत्री, ममता कालिया, मैत्रेयी पुष्पा, मृदुला गर्ग, प्रभा खेतान, नासिरा शर्मा, चित्र मुदगल, अलका सरावगी, शशिप्रभा, जमा जदवानी, नमिता सिंह, मधु कांकरिया, सुधा अरोड़ा और प्रभा खेतान इत्यादि नाम सुप्रसिद्ध रहे हैं।

महिला लेखिकाओं ने अपने उपन्यासों में नारी विमर्श के माध्यम से नारी अधिकार, उसके आत्माभिमान, अस्तित्व और स्वतंत्रता प्राप्ति के संघर्ष को दर्शाते हुए अपने विचार प्रस्तुत किए है, जो आज भी प्रासंगिक लगते है।

मुख्य संबोध - चिरंतन, लोकप्रियता, विमर्श, उपन्यास, आबादी, आत्माभिमान, अस्तित्व, विचार, रचना, विजेता, प्रासंगिक, उत्पीडन, नवोन्मेष आदि।

प्रस्तावना :-

साहित्य को समाज का आईना कहा जाता है, क्योंकि साहित्य में समाज का यथार्थ चित्रण मिलता है। चाहे वह समाज भारत का हो या भारत के बाहर अन्य किसी भी देश का उसमें चित्रित किया गया समाजजीवन हमारे सामने अपनी यथार्थ झाँकी प्रस्तुत करता है। नारी-पुरूष जीवन को सदैव से ही प्रभावित करती आई है। विश्वामित्र ने मेनका से, दुष्यंत ने शकुंतला से, जहाँगीर ने नूरजहाँ से हार मान ली थी। ये पुरूष नारी की अपार शक्ति के आगे घुटने टेकने के लिए विवश हो चुके थे। वस्तुत: नारी समाज का वह अंग है, जो व्यक्ति और समाज के स्तर पर अनेक भूमिकाओं का एक साथ निर्वाह करती है। एक ही समय में वह एक से अधिक रूपों में जीवंत रहती है। प्रभा खेतान के उपन्यास नारी के आत्माभिमान और अस्तित्व को नई दिशा देते हुए आगे बढ़ते है।

विषय प्रवेश :-

साहित्यिक कृतियों में साहित्यकार का व्यक्तित्व निहित होता है और बडे गहराई तक के विचार पाठक को साहित्यकार अपनी रचना के माध्यम से देने का प्रयास करता है। साहित्यकार समाज का अभिन्न अंग होता है। यही सब विशिष्टताएँ उन्हें एक सफल साहित्यकार सिद्ध करती है। हिंदी साहित्य में अनेक परिवर्तन हुए। साहित्य की धारा नारी विमर्श, दलित विमर्श, आदिवासी विमर्श और अल्पसंख्याक विमर्श के रूप में प्रवाहित होती रही। नारी ने हर काल में अपनी भूमिका का निर्वहन बडी ही प्रामाणिकता के साथ किया हुआ दिखाई देता है। हिंदी उपन्यासों में अभिव्यक्त नारीसंबंधी कालजयी विचारों से यह स्पष्ट होता है।

महादेवी वर्मा कहती है कि, "स्त्री संस्था है। स्त्री को इस सामाजिक सांस्कृतिक भूमि की जरूरत हैं जहाँ वह अपने अस्तित्व का नवोन्मेष महसूस कर सकती हैं। खुली मानसिकता का एहसास कर सकती है। अपनी अस्मिता को पूर्णरूप से अपना सकती है। स्त्री को अपना स्थान, अपना सत्व चाहिए।"[1] अपने आत्माभिमानी स्वरूप को अपने सहअस्तित्व से जुडकर जब उसने अपने आपको पहचाना तो उसे यह एहसास हो गया कि इस पुरूष प्रधान सामाजिक मानदण्डों को तोडकर नारी शक्ति का परिचय देने का अब समय आ गया हैं।

भारतीय उपनिषद काल में गार्गी, मैत्रेयी से इसका सूत्रपात हुआ फिर मीराबाई, यशोधरा, सावित्रीबाई फुले, ॲनी बेझेंट, रमाबाई आदि कई महिलाओं ने अपने अस्तित्व के माध्यम से समाज को दिशा दी और नारी अस्मिता की रक्षा में अपने

आपको न्योछावर कर दिया।

आशारानी व्होरा कहती है कि, "रानी दुर्गावती, माता जिजाबाई, हाडी रानी आदि न जाने कितने नाम है जिन्होंने मातृभूमि और अपनी अस्मिता की रक्षा

करने में अपनी जान की परवाह नहीं की।"[2] बदलते संदर्भों में आत्मसात करती हुई नारी ने अपनी स्वतंत्रता को महत्व दिया क्योंकि इसके माध्यम से ही वह अपने आत्माभिमान और अस्तित्व की रक्षा कर सकती हैं। उसकी चेतना को हिंदी उपन्यासों में नारी विमर्श के रूप में दिशा मिली।

महिला लेखिकाओं के उपन्यास नारीसंबंधी विचारों के लेकर अत्यंत महत्वपूर्ण है। इनमें नारी विमर्श के माध्यम से आत्माभिमान और अस्तित्व को नई दिशा दी है। जिनमें

१. प्रभा खेतान का 'छिन्नमस्ता',
२. चित्रा मुद्गल का 'आँवा',
३. मैत्रेयी पुष्पा का 'चाक',
४. नासिरा शर्मा का 'शाल्मली' इत्यादि

इन उपन्यासों के माध्यम से लेखिकाओं ने नायिका प्रधान कथानक को दिशा देकर मर्दवादी बंधन की जंजीर को तोडकर नारी अस्मिता पर आत्माभिमानी स्वभाव का चित्रण किया हैं। इसमें

१. 'छिन्नमस्ता' की 'प्रिया',
२. 'आँवा' की 'नमिता',
३. 'एक जमीन अपनी' की 'अंकिता',
४. 'चाक' की 'सारंग' और 'शाल्मली' की 'शाल्मली'

इनके माध्यम से नारी अस्तित्व और आत्माभिमान को हम समझ सकते हैं। सच तो यह है कि, यह चारों नायिकाएँ पढी-लिखी और शिक्षित है।

शाल्मली उच्च पदस्थ अधिकारी है, वह पर्यावरण विभाग की डायरेक्टर हैं। 'छिन्नमस्ता' की प्रिया दर्शनशास्त्र की एम.ए. है। अंकिता इंदौर से बंबई व्याख्याता बनने आयी हैं। तो सारंग नैनी गुरूकुल में पढी संस्कृत की विदूषी है। चारों उपन्यास की नायिकाएँ पुरूष-प्रधान संस्कृति और परम्परागत बंधनों को नकारती हुई अपने आत्माभिमानी स्वभाव का परिचय देती हैं। शाल्मली अपने पति नरेश से कहती है कि, "मैं तुम्हारी छाया, तुम्हारी प्रतिध्वनि, तुम्हारा विस्तार नहीं हूँ, नरेश। मैं इस भग्न में नहीं जीती। इसे मेरी कमी कहलो या खूबी कि मैं अपनी अच्छाई और बुराई दोनों को जानती हूँ । यह भी जानती हूँ कि मैं कोरा कागज नहीं थी, जिस पर तुम अपने अधिकार का हस्ताक्षर कर सकते।"[3]

नरेश और उसके संबंधों में एक लक्ष्मण-रेखा सा था। उसे एहसास हो गया था कि, "अपनी सहायता से ही इस टूटती दीवारों से घर को उसे सँवारना हैं। इस विष का पान उसे अकेले ही करना हैं।"[4] 'छिन्नमस्ता' की प्रिया भी अपने चरित्र के माध्यम से सदियों से शोषित-पीडित नारी की पंक्ति से अलक कर के समाज की मर्दवादी जडमूल्य परम्पराओं को चुनौती देकर अपनी पहचान बनाती हैं। बचपन में माता और भाई से प्रताडित प्रिया जवानी में प्रोफेसर मुखर्जी को देह सौंपकर आत्मग्लानी का अनुभव कर पश्चाताप की आग में सुलगती रहती है और विवाह के बाद पति नरेन्द्र से भी आहत होती है। राष्ट्रीय और अन्तर्राष्ट्रीय पूँजी बाजारों में वह जूझती रहती है। हर क्षण हर पाल टूटने-कटने के बाद भी उसका भग्न मन आगे बढते रहने के संकल्पों से भरा हैं। उसे अपनी उपलब्धियों पर गर्व हैं। परम्परागत नारी के दर्द को वह समझती हैं। अपने पति नरेन्द्र से वह कहती है कि, "ईमानदारी, वफादारी, प्यार और समर्पण यह शब्द भ्रमजाल हैं। औरत को यह सब इसलिए सिखाए जाते है कि, वह वह इन शब्दों के चक्रव्यूह से कभी नहीं निकल पाए ताकि युगों से चली आयी हुई आहुति की परम्परा को कायम रख सकें।"[5]

अपने अस्तित्व और आत्माभिमानी स्वभाव को जिन्दापन का एहसास देते हुए वह कहती है कि, "हाँ टूटी हूँ बार-बार टूटी हूँ पर कहीं तो चोट के निशान नहीं, दुनिया के पौरो तले रौंदी गई पर मैं मिट्टी के लौंधे में परिवर्तित नहीं हो पाई। अडतालीस की उम्र में भी एक पूरी की पूरी साबूत औरत हूँ।"[6] राजेन्द्र यादव कहते है कि, "प्रभा जी ने यहाँ नारी पुरानी नारी को स्वतंत्र अपने हाथों अपना सिर काटने वाली और फिनिक्स की तरह बार-बार अपनी ही आग से जन्म लेने वाली महाशक्ति के मिथक से जोडकर नारी के उत्थान-पतन की कथा को नया वौचारिक धरातल दिया हैं।"[7]

'एक जमीन अपनी' की अंकिता फिल्मी और विज्ञापन जगत में अपने आपको सिद्ध करती हैं। अपनी क्षमता का परिचय देकर व्यावसायिक जगत में अपने अस्तित्व को अर्थ प्रदान करती है। सुधांशु उसका प्रेमी और पति भी है परंतु उसकी प्रताडना और अहंकारी पुरूषी स्वभाव और निरंकुश प्रवृत्ति से वह आहत होती जाती हैं। आत्मसम्मान के साथ कहती है कि, "सुधांशु जी औरत बोनसाई का पौधा नहीं है . . . जब जी चाहा उसकी जडे काटकर उसे वापस गमले में रोप लिया . . . वह बौने बनाए रखने

की इस साजिश को अस्वीकार भी तो करती हैं।"[8] इस प्रकार भारतीय नारी अपने अस्तित्व की गरिमा को पहचानकर विवेकशीलता का परिचय देकर अपने कदम बढा रही हैं। आज नारी ने हर क्षेत्र में अपना परचम लहरा दिया है।

सारंग 'चाक' उपन्यास की नायिका हैं। जिसने अपने स्वाभिमानी व्यक्तित्व के माध्यम से नारी शोषण, नारी वर्ग की समस्या तथा मर्दवादी संस्कारों को अपने साहसी व्यक्तित्व के माध्यम से दूर करने का प्रयास किया हैं। वह अपने जीवन रथ की स्वयं सारथी है। ग्राम्य आँचल की साम-दाम-दण्ड-भेद की नीति को वह पहचानती है। सारंग की आँखों मे सपनों की दुनिया है वह आजाद होना चाहती है। उसके ससुर इसलिए कहते है कि, "आज वह भी इलम हो गया है कि तेरा नरम नाजुक बदन लोहे में ढल चुका हैं।"[9] अपनी योग्यता और संकल्प के कारण वह प्रधान पद का चुनाव लड़ती है और चुनाव मे बिजयी भी होती हैं। रंजीत उससे प्रश्न पूछता है कि क्या प्रधान बनकर तुम रामराज्य लाना चाहती हो तो वह कहती है, "रामराज्य लेकर हम क्या करेंगे ? सीता की कथा सुनी तो है। धरती में ही समा जाना है तो यह जद्दोजहद ? अपने चलते कोई अन्याय न हो, जान की कीमत देकर इतनी-सी बात, छोटा-सा संकल्प करके निभाने की इच्छा है बस।"[10] उसका यह आत्मविश्वास सामान्य जन को शोषण से मुक्ति की भावना से भरा हुआ हैं। अंत में कहा जा सकता है की,

"बस एक चाह निस्वार्थ स्नेह, और आत्म-सम्मान,
मेरे अपने अस्तित्व को अक्षुण्ण रखने का मान.
क्यों ये शर्त कि बदल जाओ,
औरो के सांचों में ढल जाओ.
कितनी अग्निपरीक्षाए, कितने ओर युग
नारी की गरिमा से, सज्ज हो लो कलयुग,
अब ना कोई नारायण होंगे, ना ही राम,
नारी तुम स्वयं ही रक्षण करो, दुष्टों का भक्षण करो।"[11]

निष्कर्ष :-

साहित्यकार जीवन एवं जगत के प्रति प्रतिबध्द होने के कारण उन मूल्यों का चित्रण एवं उनकी व्याख्या करता है, जो मानव एवं जगत के अभ्युद्य हेतु आवश्यक होते है। महिला लेखिकाओं ने भी नारी सम्बन्धी उन्हीं धारणाओं को स्पष्ट किया है। हिंदी उपन्यासों में महिला नायिकाओं के माध्यम से अंतिम सदी के यह उपन्यास मर्दवादी दुर्ग को तोडते हुए नारी अधिकार और अस्तित्व को नई दिशा देते हैं। नरेश, नरेन्द्र, सुधांशु और रंजीत ऐसे पात्र है जो नारीगत भावनाओं का अनादर करके पुरूषी सामर्थवादी दृष्टिकोण का परिचय देते है। मर्दवादी साँचे में ढले ये पुरूष उपन्यास के ऐसे पात्र है जो जनजीवन की अभिव्यक्तियों में सहजता से मिल जाते हैं। मर्दवादी अहंकार को चुनौती देने का कार्य लेखिकाओं ने अपने उपन्यासों के माध्यम से अभिव्यक्त करके नारी संघर्ष को अस्तित्व और आत्माभिमान से जोड दिया हैं। महिला लेखिकाओं ने अपने उपन्यासों में नारी विमर्श के माध्यम से नारी अधिकार, उसके आत्माभिमान, अस्तित्व और स्वतंत्रता प्राप्ति के संघर्ष को दर्शाते हुए अपने विचार प्रस्तुत किए है, जो आज भी प्रासंगिक लगते है। अत: यह कहना अनुचित न होगा कि, इन महिला लेखिकाओं के उपन्यास द्वारा नारी के आत्माभिमान और अस्तित्व को नई दिशा देने का सफल कार्य हुआ है।

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RESEARCH PAPER

Thermal Radiation and Magnetic Fields Effects on Nanofluids Flowing Through Stretch Sheet

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Abstract

The purpose of the present study is to observe when the presence of suction/injection, thermophoresis, and Brownian motion effects, this research paper emphasises the combined impact of heat radiation and magnetic field on convective nanofluid flow towards a permeable stretched sheet. The Rosseland approximation is applied to describe the radiative heat flux in the heat convective analysis. The radiative heat transfer is practically applicable in hypersonic flights, nuclear power plants, space vehicles, gas turbines, nuclear reactors, the model of pertinent equipment etc. The boundary wall takes into account stretching and suction/injection circumstances. The dimensionless version of basic governing equations is simplified using a non-dimensionalization method. Runge-Kutta technique is used to solve the final version of the fundamental equations numerically. The changes of velocity, temperature, and concentration fields versus different physical constraints are examined via graphical data demonstrations. The changing trends of heat and mass transfer rates, as well as the skin- friction coefficient, are also studied using numerical data. The proposed model is additionally validated by comparing it to a limited instance of a previously researched issue..

Keywords: Thermal radiation; Magnetic field; Nanofluid; Stretching sheet; Runge-Kutta technique

1. Introduction

Recent research has concentrated on the boundary layer flow of an electrically conducting nanofluid toward a stretched sheet, which has been seen in many experiments. In the context of nanofluids, a fluid composed of a homogeneous suspension of nano/micro-sized solid particles (metal/nonmetal/nanofibers) in a conventional base fluid, with a typical size of less than 100 nm, is defined as follows: (liquid). This includes a variety of techniques such as the adding of minute solid particles to the liquid. Stretching boundary-induced flow has a broad variety of applications in extrusion processes used in the plastic and metal industries, among other things. Lin, Y., et al., [1] developed an unsteady flow and heat transmission across a stretched surface using the heat and unsteady flow of MHD pseudo-plastic nanofluid transmission model into a finite skinny film by internal heat generation. Zhang, C., et al. [2], investigated heat flux and chemical reaction and radiation heat transfer Nanofluids MHD flow of in porous media by variable surface. Radiation impacts on heat transfer and Marangoni convection flow in pseudo-plastic non-Newtonian Variable thermal conductivity discussed by Lin, Y., L. Zheng, and X. Zhang [3].Mabood, F., et al. [4], examined Nanofluids non-Darcian convective flow through a stretching sheet within a micropolar fluid radiation with non-uniform heat source/sink and Soret effects.. Seth, G.S., et al. [5],described the heat-absorbing and

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radiating fluid flowing hydromagnetically across an exponentially stretched sheet with partial slip, viscous, and Joule dissipation. Anjali Devi, S.P. and M. Prakash [6], looked into theTemperature dependent viscosity and thermal conductivity effects on hydromagnetic flow over a slendering stretching sheet. Hayat, T., et al., [7] examined Williamson nanofluid flow in two dimensions was studied in conjunction melting of a nonlinear variable thickness surface heat transfer. Effects of MHD heat transfer flowin Homogeneous-heterogeneous reactions and melting by variable thickness through stretching surface looked by Hayat, T., et al. [8]. Farroq and colleagues [9] investigate the in a MHD flow on nanofluid viscoelastic with non-linear radiation effects. MHD stagnation flow through viscous dissipation and Joule heating of Modified homogeneous-heterogeneous reactions presented by Khan, M.I., et al [10]. Hayat, T., et al. [11], look into Effectiveness of magnetic nanoparticles in Eyring-Powell fluid radiative flow. Hayat, T., et al. [12], observed Effect of magnetonano fluid flow viscous dissipation with variable properties. Hayat, T., et al. [13], discussed Thermal radiation effect of Marangoni convection in the flow of nanofluid carbon–water. Radioactive nonlinear Numerical simulation flow by convective cylinder looked by Hayat, T., et al [14].Tamoor, M., et al. [15], presented Casson fluid magnetohydrodynamic flow over a stretching cylinder. Babu, N., G. Murali, and S. Bhati, [16] discussed Casson fluid performance with Natural convective dissipative couette flow hall current, heat transfer and MHD impact on past an infinite vertically inclined plate filled within porous medium. Murali, G., A. Paul, and N. Babu, [17] used the effects of Unsteady heat absorption hydromagnetic free convective flow of heat and mass transfer embedded over infinite vertical plate in porous medium. Thermal radiation and chemical reaction in an infinite vertical plate of unsteady hydromagnetic mixed convection flow examined by Gadipally, D., M. Gundagani, and N.N. Babu [18]. Mohammadi et al. [19-60] analysed the mechanical nanostructured.

It is concluded based on the literature cited above that the principle of the analysis is to determine the extent to which heat radiation going on a non-linearly stretched sheet using a magnetohydrodynamic model that incorporates Brownian motion and effects of thermophoresis, building on the findings of the aforementioned reference work. The numerical solution of the modified basic governing equations is accomplished used by Runge- Kutta technique, which employs a set of dimensionless variables. Several significant physical embedded parameters for the domains of velocity, temperature, and concentration by using graphical representation in the respective domains. Important Physical quantities, like the local skin-friction coefficient, the local Nusselt and Sherwood numbers, and etc, were determined numerically by referring to online tables of values. Aeronautical, Civil, Mechanical and Marine constructions and designs are all covered by this non-linear stretching sheet.

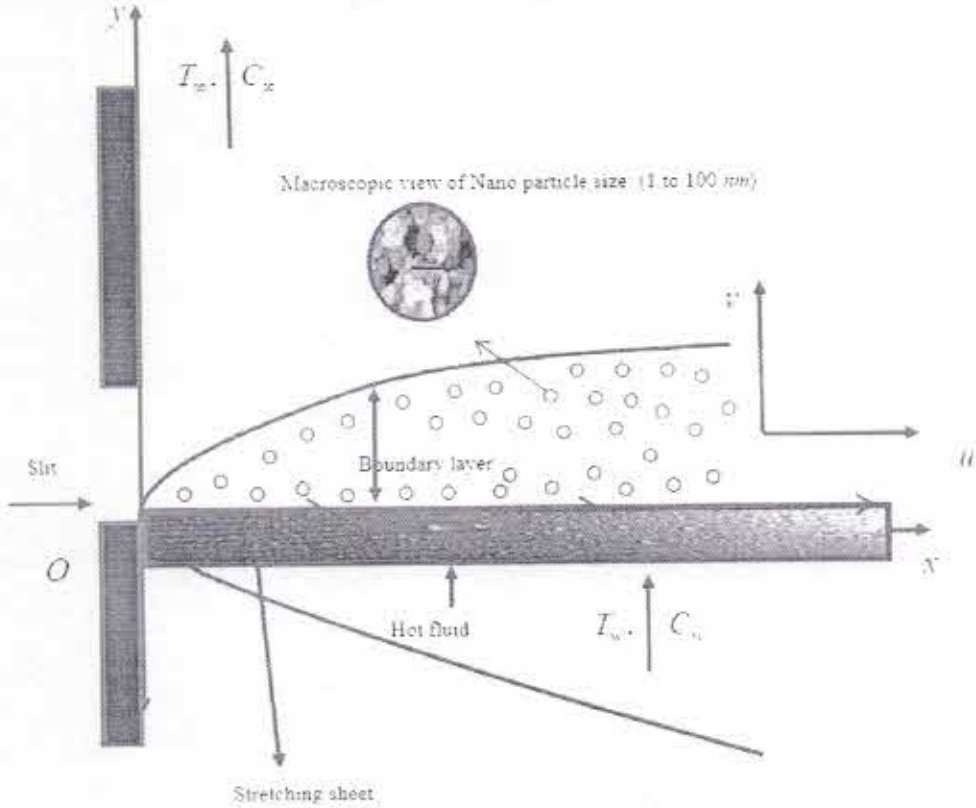

Fig. 1.: The fluid's is represented by geometry.

2. Flow Governing Equations:

In this research work, an incompressible and viscous nanofluid on a two-dimensional, steady, electrical conducting, nonlinearly permeable sheet with thermal radiation is investigated. For this flow, the flow geometry is shown in the Fig1. for this research work, the following assumptions are considered for this investigation:

i. It is assumed that the problem's geometry is represented in the coordinate system has horizontal X-axis and a perpendicular Y-axis

ii. We consider study 2-dimensional boundary layer flow through a stretching sheet.

iii. Additionally, we considered the flow of nanofluids when into the presence of a magnetic field normal to the nanofluids and the flow was placed at $y > 0$; here y is the coordinate measured normal to the stretching surface

iv. The temperature T and volume concentration C of nanoparticles at the boundaries are assumed to be T_w and C_w , respectively, at the wall T_∞ and C_∞ , respectively are far-away from the wall.

v. Also, it is thought that there will be less of a temperature gradient in the flow of viscous fluid so that T^4 temperature can be stated when a linear function. Expansion of T^4 by Taylor's method, move towards on a temperature of free stream T_∞

vi. It is supposed that the sheet shrinks exponentially through velocity $u_w(x) = U_w \exp\left(\frac{x}{L}\right)$.

vii. Moreover, The magnetic field B (x) is supposed

$$B = B_0 e^{\left(\frac{x}{L}\right)} \tag{1}$$

Based on the above assumptions, the incompressible and electrically conducting two-dimensional magneto hydrodynamic nanofluid the equation for the boundary layer flow is as follows:

Continuity Equation:

$$\left(\frac{\partial u}{\partial x}\right)+\left(\frac{\partial v}{\partial y}\right)=0 \tag{2}$$

Equation of Momentum:

$$\left(\frac{\partial u}{\partial x}\right)u+\left(\frac{\partial u}{\partial y}\right)v=\left(\frac{\partial^2 u}{\partial y^2}\right)v-\left(\frac{\sigma B_0^2}{\rho}\right)u \tag{3}$$

Equation of thermal energy:

$$u\left(\frac{\partial T}{\partial x}\right)+v\left(\frac{\partial T}{\partial y}\right)=\alpha\left(\frac{\partial^2 T}{\partial y^2}\right)+\tau_B\left\{D_B\left(\frac{\partial C}{\partial y}\right)\left(\frac{\partial T}{\partial y}\right)+\left(\frac{D_T}{T_\infty}\right)\left(\frac{\partial T}{\partial y}\right)^2\right\}+\left(\frac{16\sigma^* T_\infty^3}{3k^*\rho C_p}\right)\left(\frac{\partial^2 T}{\partial y^2}\right) \tag{4}$$

Equation of species nanoparticle volume concentration:

$$u\left(\frac{\partial C}{\partial x}\right)+v\left(\frac{\partial C}{\partial y}\right)=D_B\left(\frac{\partial^2 C}{\partial y^2}\right)+\left(\frac{D_T}{T_\infty}\right)\left(\frac{\partial^2 T}{\partial y^2}\right) \tag{5}$$

The boundary conditions for this flow are

$$\left.\begin{array}{l} u_w(x)=U_w\exp\left(\frac{x}{L}\right),\ v_w(x)=V_0\exp\left(\frac{x}{2L}\right),\ T=T_w,\ C=C_w \ \ at\ \ y=0 \\ u\to 0,\ v\to 0,\ T\to T_\infty,\ C\to C_\infty \ \ as\ \ y\to\infty \end{array}\right\} \tag{6}$$

Transformations of similarity are presented as follows

$$\left.\begin{aligned} u = U_o \exp\left(\frac{x}{L}\right) f'(\eta),\ v = -\sqrt{\frac{\nu U_o}{2L}} \exp\left(\frac{x}{2L}\right)\left\{f(\eta)+\eta f'(\eta)\right\}, \\ \eta = y\sqrt{\frac{U_o}{2\nu L}} \exp\left(\frac{x}{2L}\right),\ \theta = \frac{T-T_\infty}{T_w-T_\infty},\ \phi = \frac{C-C_\infty}{C_w-C_\infty} \end{aligned}\right\} \tag{7}$$

Equation of continuity is satisfied identically when Eq. (7) is used, and Eqs. (3) to (5), as well as (7), take the form.

$$f''' + ff'' - Mf' - 2\left(f'^2\right) = 0 \tag{8}$$

$$\left(1+\frac{4R}{3}\right)\theta'' + \Pr f\theta' - \Pr f'\theta + \Pr Nb\theta'\phi' + \Pr Nt\left(\theta'\right)^2 = 0 \tag{9}$$

$$Nb\phi'' + LeNb\Pr f\phi' - LeNb\Pr f'\phi + Nt\theta'' = 0 \tag{10}$$

The corresponding boundary conditions (6) be transformed into

$$\left.\begin{aligned} f(0) = S,\ f'(0) = \lambda,\ \theta(0) = 1,\ \phi(0) = 1\ \&\ f'(\infty)\to 0,\ \theta(\infty)\to 0,\ \phi(\infty)\to 0 \end{aligned}\right\} \tag{11}$$

Here physical parameters involved are specified

$$\left.\begin{aligned} M = \frac{2\sigma B_o^2 L}{\rho U_o},\ \lambda = \frac{U_w}{U_o},\ \Pr = \frac{\nu}{\alpha},\ R = \frac{4\sigma^* T_\infty^3}{3\kappa k^*}\ Nb = \frac{(\rho C)_p D_B\left(C_w - C_\infty\right)}{\nu(\rho C)_f},\ Nt = \frac{(\rho C)_p D_T\left(T_w - T_\infty\right)}{\nu(\rho C)_f} \end{aligned}\right\} \tag{12}$$

The local Nusselt number, the local Sherwood number, and the physical parameters of the skin-friction coefficient are the relevant physical quantities.

$$Cf = \frac{\tau_w}{\rho U_w} \Rightarrow \mathrm{Re}_x^{-\frac{1}{2}} Cf = f''(0) \tag{13}$$

$$Nu_x = \frac{xq_w}{\kappa\left(T_w - T_\infty\right)} \text{ Where } q_w = -\left(\kappa + \frac{16\sigma^* T_\infty^3}{3k^*}\right)\left(\frac{\partial T}{\partial y}\right)_{y=0} \Rightarrow \mathrm{Re}_x^{-\frac{1}{2}} Nu_x = -\left(1+\frac{4R}{3}\right)\theta'(0) \tag{14}$$

$$Sh_x = \frac{xq_m}{D_B\left(T_w - T_\infty\right)} \text{ Where } q_m = -D_B\left(\frac{\partial C}{\partial y}\right)_{y=0} \Rightarrow \mathrm{Re}_x^{-\frac{1}{2}} Sh_x = -\phi'(0) \tag{15}$$

Where $\mathrm{Re}_x = \dfrac{U_o x\left\{\exp\left(\frac{x}{L}\right)\right\}}{\nu}$ be the local Reynolds number.

3. Runge-Kutta technique Solutions:

An exact solution does not have seemed to be possible in the case of a full set of Eqs. (8)-(10).Preferred to use numerical methods to resolve the system of ordinary differential equations (8)-(10) and its initial and boundary conditions (11). $[0, \infty)$ has been replaced with the bounded domain $\left[0,\ \eta_\infty\right]$ and here η_∞ be an appropriate a finite real number that must satisfies the domain. Preferred to use numerical methods to obtain a system of ordinary differential equations (8)-(10) and their associated initial and boundary conditions (11). (8)- (10) nonlinear initial boundary value problems for third and second order ODEs. Thus, the supposition in (8)-(10) was reduced to a system of 7 initial problems with 7 unknowns of the first order.

$$\left.\begin{aligned} f = y_1,\ f' = y_2,\ f'' = y_3,\ \theta = y_4,\ \theta' = y_5,\ \phi = y_6,\ \phi' = y_7 \end{aligned}\right\} \tag{16}$$

Thus we used efficient numerical method Runge-Kutta shooting of the fourth order. Symbolic software MAPLE is used to solve the numerical problem. Because we have simply four initial

conditions $f(0)$, $f'(0)$, $\theta(0)$ and $\phi(0)$, and three $f''(0)$, $\theta'(0)$ and $\phi'(0)$ other unknowns to work with, a numerical shooting method is used in which these three preliminary conditions are used to guess what three other initial conditions are needed to solve the system. When running a mathematical simulation, the step size should be $\nabla\eta = 10^{-3}$. The threshold for convergence is 10^{-8}.

4. Program Code Validation

In order to validation of programme code for verification, the current Nusselt number results are compared with published Nusselt number results of Magyari and Keller [61], Bidin and Nazar [62] and El-Aziz [63] in Table-1 in absence of Nanofluid as $S = 0$, $\lambda = 1$ and $R = 0$. As result of this table, data generated by the current code has been found and the data generated by the previous code are comparable in quality Magyari and Keller [61], Bidin and Nazar [62] and El-Aziz [63] show excellent the use of the current numerical code and agreement is justified.

Table-1.: a comparison of the experimentally obtained Nusselt number with the previously published one to see if there has been any variation in it when $S = 0$, $\lambda = 1$ and $R = 0$

Pr	Keller and Magyari [61]	Nazar and Bidin [62]	El-Aziz [63]	Present numerical results
1.0	0.9548	0.9547	0.9548	0.950122586145
2.0	--------	1.4714	--------	1.471020365516
3.0	1.8691	1.8691	1.8691	1.864203220154
5.0	2.5001	--------	2.5001	2.500001315466
10.0	3.6604	--------	3.6604	3.660136267784

5. Results and Discussion:

This research work considers the radiative steady, viscous, incompressible, electrically conducting Non-linearly stretching sheet under the influence of injection/ suction, Brownian motion, and Thermophoresis MHD flow of nanofluid. The numerical solution called Runge-Kutta method is used to solve the governing equations of the flow field. The flow is presided over by the non-dimensional parameters namely, Magnetic field parameter M,Suction/injection parameter S, Stretching parameter λ, Prandtl number Pr, Brownian motion parameter Nb, Thermophoresis parameter Nt, Thermal radiation parameter R and Lewis number Le. Figs. 2- 11 represented the profiles of velocity, temperature and nanoparticle concentration profiles correspondingly. Also,the numerical values of physical quantities such as, the skin friction, Nusselt numberand Sherwood number are also computed and displayed in Tables-2-4 respectively

Fig. 2 Magnetic field parameter (M) effect is observed on velocity profiles. The velocities decrease as M increases in fig.2. Because the magnetic field presence in the system produces Lorenz force, supposed the force to disturb the heat dissipation of the fluid by retarding the rate of the heat transfer in the fluid. This causes the thermal boundary layer to become thicker as M increases.

Fig.3 demonstrates the suction/injection parameter's (S) effect on the dimensionless stream wise velocities (V). The graphs in Fig. 3 demonstrate that the thickness of the boundary layer is strongly influenced by the parameter S. The flow appears to slow significantly as S is raised. With suction/injection, this causes the boundary layer to be pushed closer to the wall, which decreases velocity. The momentum boundary layer's thickness is reduced as a result of the suction/injection.

Stretching rates between both directions y , x are measured by their ratio λ. As can be seen in Figure 4, increasing the stretching rate ratio parameter reduces in x-direction velocity while increasing in y-direction velocity

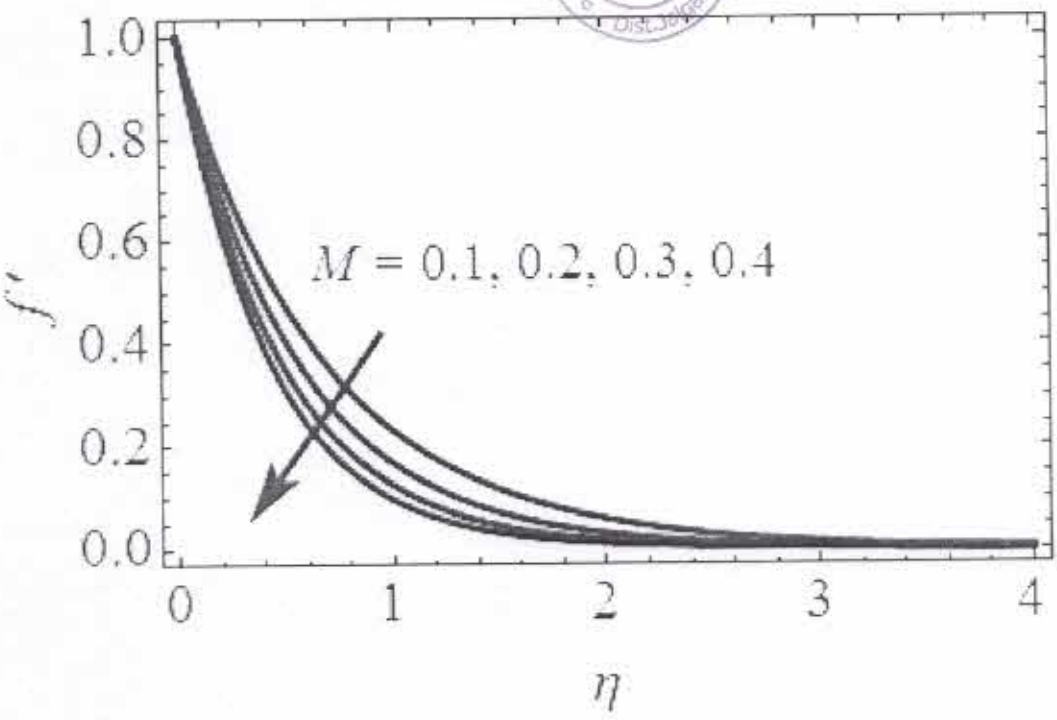

Fig. 2 The M effect is observed on velocity profiles

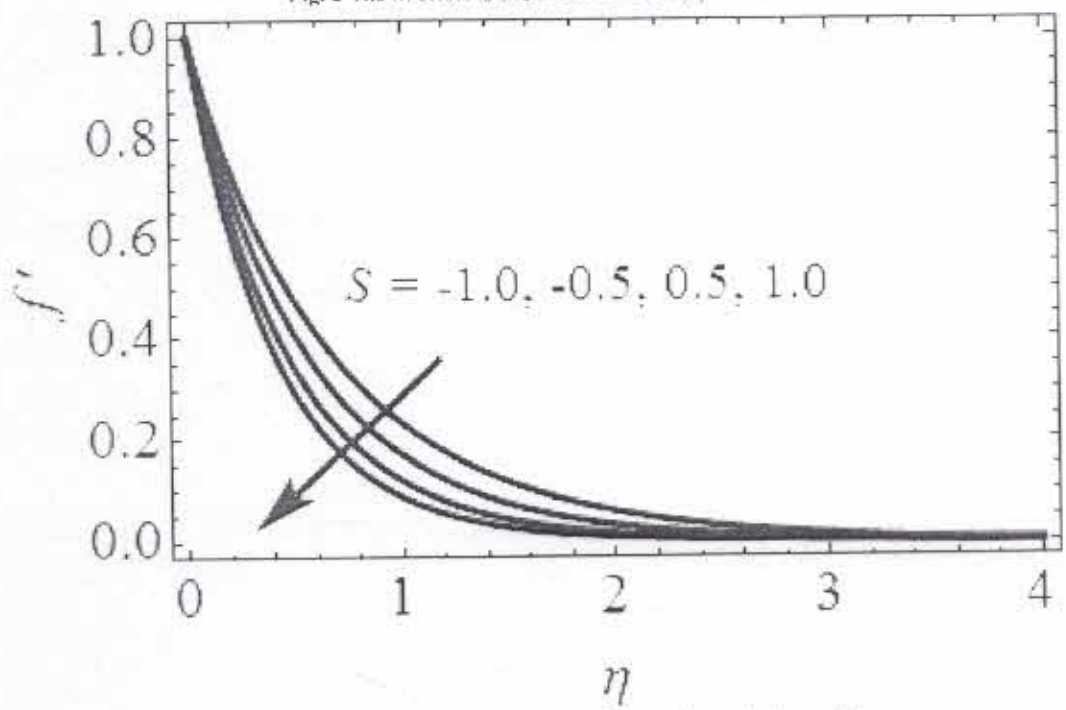

Fig. 3. The S impact is observed on velocity profiles

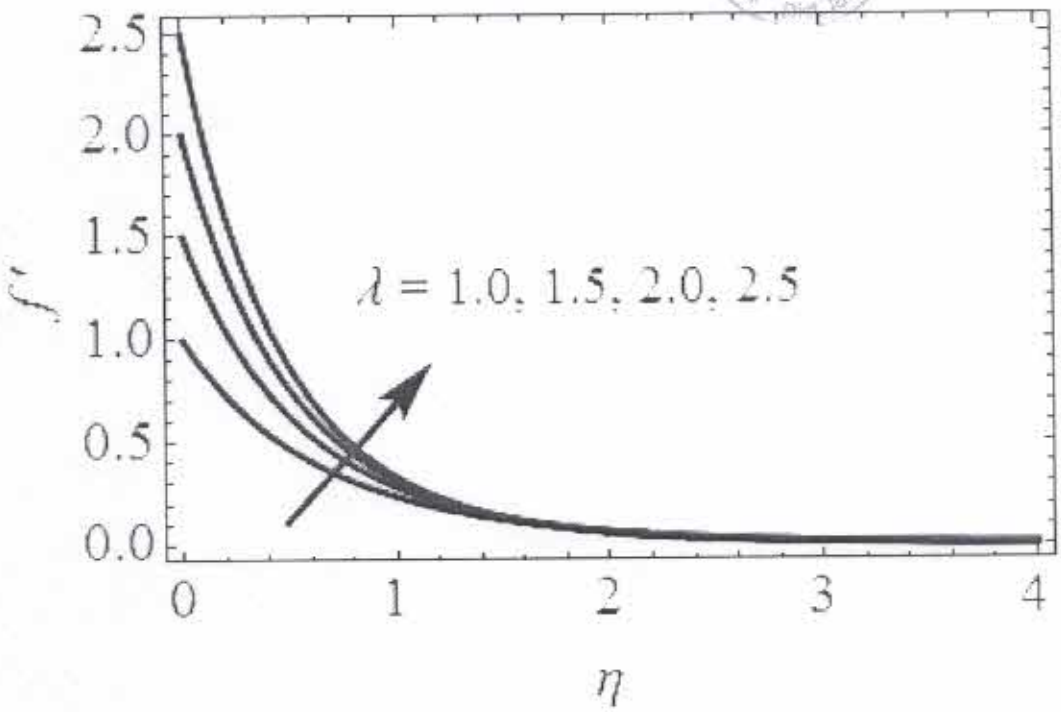

Fig. 4.λ effect on velocity profiles

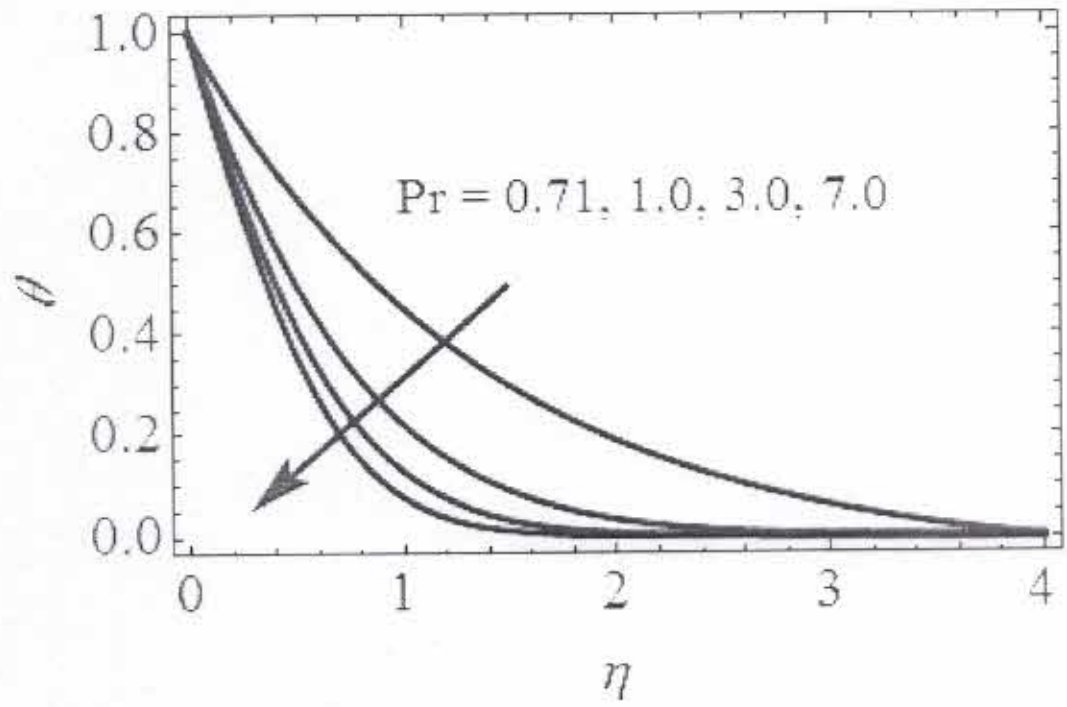

Fig. 5.Pr impact on temperature profiles

Prandtl number (Pr) an effect on fluid temperature in Fig.5 is shown. As Pr value raises, the temperature gradient in the fluid decreases. The thermal diffusivity increases and dominates the thermal diffusivity as Pr rises. The fluid velocity is high enough to help the heat transfer of the fluid. This makes the heat dissipation rate faster and makes the boundary layer to become thinner.

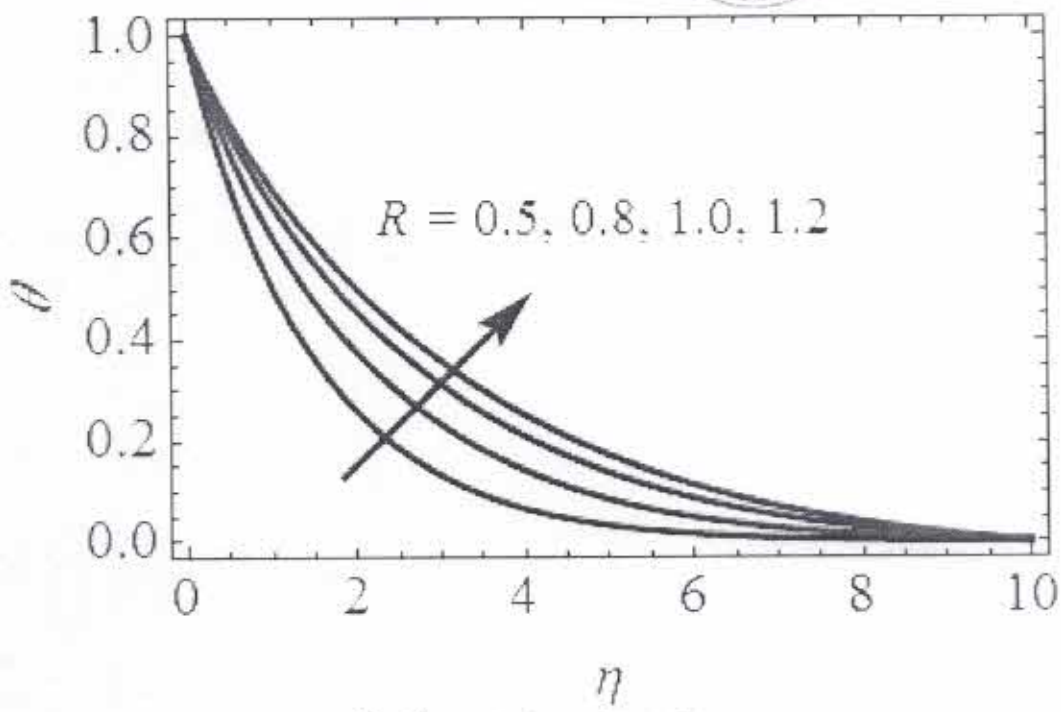

Fig. 6.*R* impact on temperature profiles

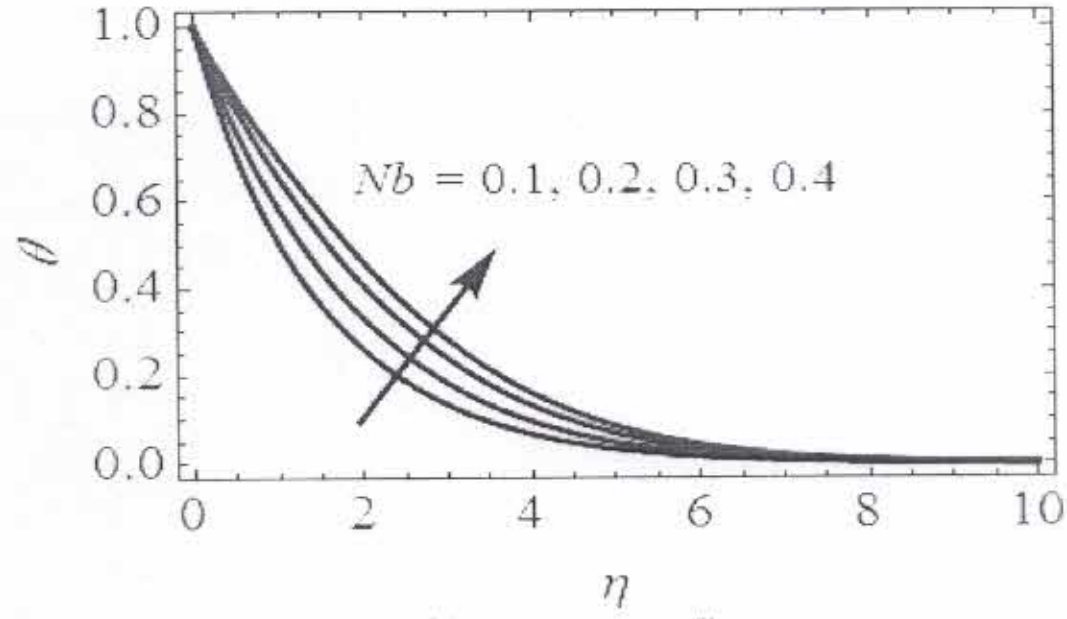

Fig. 7.*Nb* impact on temperature profiles

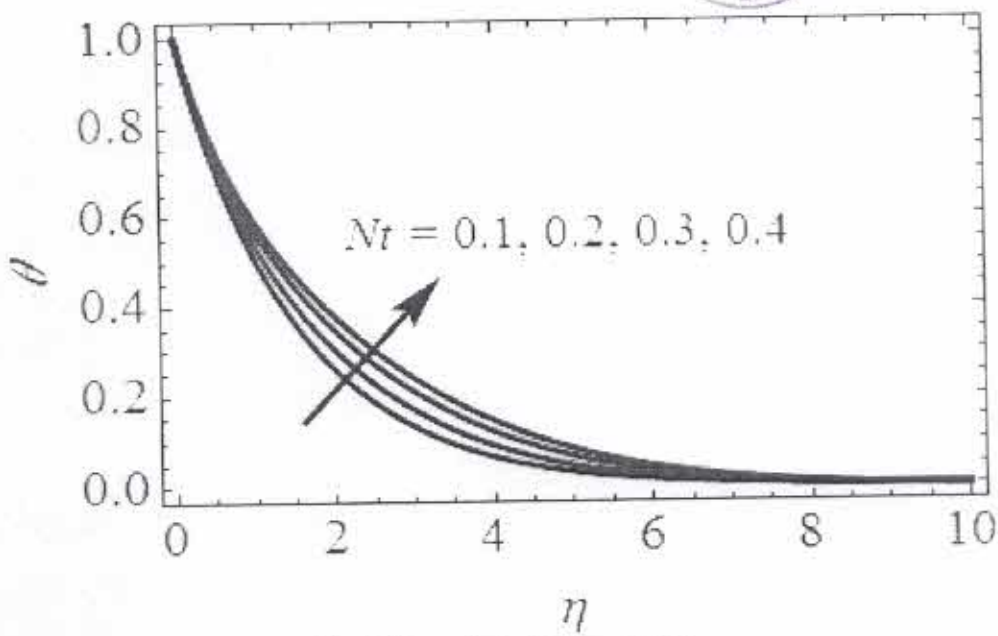

Fig. 8. *Nt* impact on temperature profiles

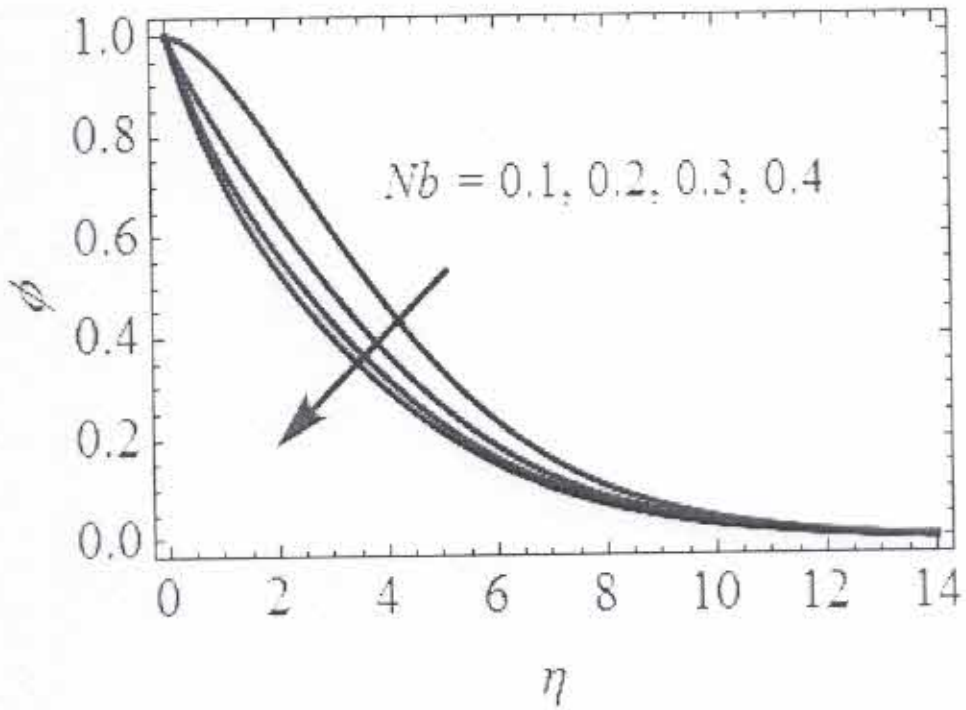

Fig. 9. *Nb* impact on nanoparticle volume Concentration profiles

The impact of thermal radiation parameter (R) on temperature field is illustrated in Fig. 6. It is observed from this Fig. 8 that, temperature of the fluid increases for the raising values of R. The growing values in the radiation parameter improve the conduction effects which as a result enhances the temperature field.

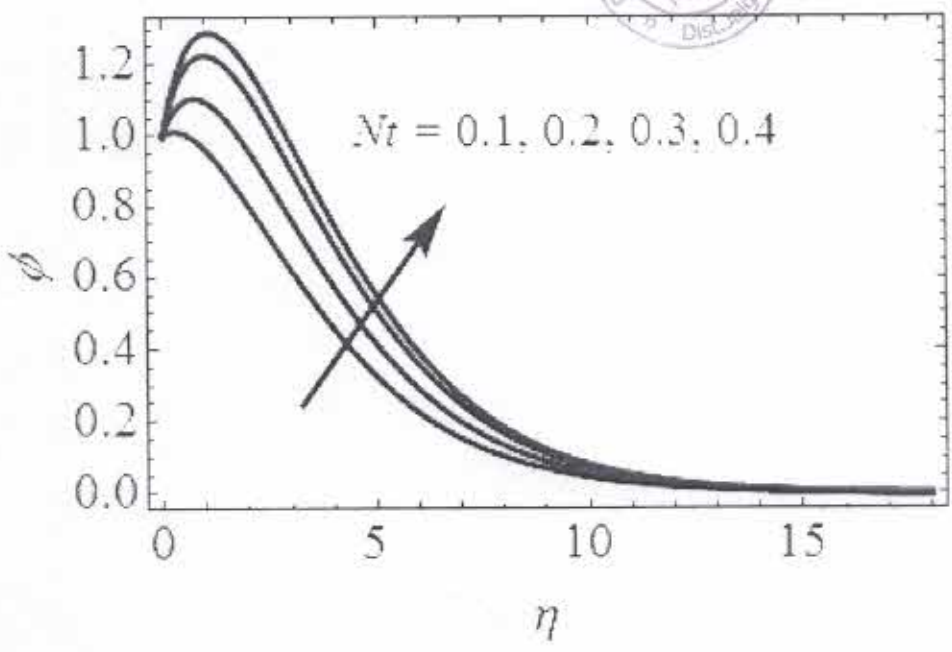

Fig. 10. Nt impact on nanoparticle Volume concentration profiles

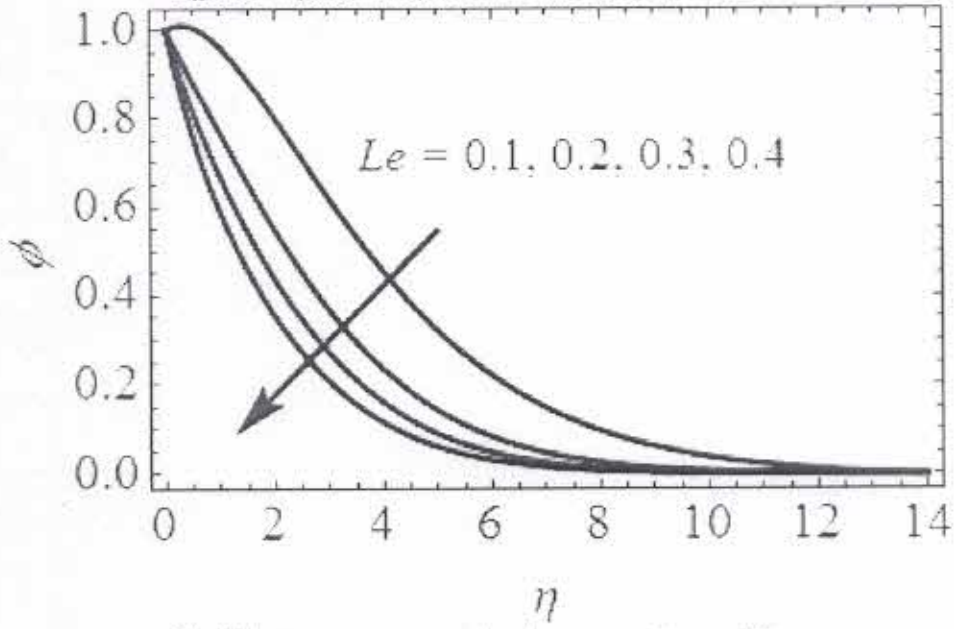

Fig. 11. Le impact on nanoparticle volume concentration profiles

Figs. 7 to 10 illustrate the effects of the Browman motion parameter (Nb) and the Thermophoresis parameter (Nt) on the dimensionless temperature and nanoparticle volume concentration profiles respectively. It is observed that with increasing values of the Brownian motion parameter (Nb), the temperature profile increases and the nanoparticle volume concentration profile decreases. Further, we also notice that by increasing the value of the Thermophoresis parameter (Nt), the dimensionless temperature and nanoparticle volume fraction increase. This is due to the fact that the Thermophoretic force is produced by the temperature gradient and it creates a very high velocity flow away from the stretching sheet. In this way, the fluid is more heated and away from the stretching surface and consequentially, as the Thermophoresis parameter (Nt) increases, the thermal boundary layer thickness increases and the temperature gradient at surface decreases as both Nt and Nb values increase.

Table-2.: Different variations in the coefficient of skin friction are represented numerically. M, S, λ, Pr, Nb, Nt, R and Le

M	S	λ	Pr	Nb	Nt	R	Le	Cf
0.1	- 1.0	1.0	0.71	0.1	0.1	0.5	0.1	1.1823301544
0.2								1.1428851402
0.3								1.1269550396
0.4								1.1106298855
	-0.5							1.1563324011
	0.5							1.1390042516
	1.0							1.1236055042
		1.5						1.2355808967
		2.0						1.2536695482
		2.5						1.2690024785
			1.0					1.1395524846
			3.0					1.1082334755
			7.0					1.0830364757
				0.2				1.2085224687
				0.3				1.2263345051
				0.4				1.2563350245
					0.2			1.2036558597
					0.3			1.2206695421
					0.4			1.2498660326
						0.8		1.2136554708
						1.0		1.2350042186
						1.2		1.2543002697
							0.2	1.1630229501
							0.3	1.1460058218
							0.4	1.1396650244

Fig. 11 depicts the influence of the Lewis number on the dimensionless nanoparticle volume concentration. It is noticed that the nanoparticle volume fraction experiences a strong reduction for larger Le values. The dimensionless Lewis number is defined as the ratio of thermal and mass diffusivity. By increasing the value of Le, the thermal boundary layer thickness is increased whereas the nanoparticle volume concentration boundary layer thickness is reduced.

As shows in table-2 the numerical values of Skin-friction coefficient for variations in values of the engineering parameters such as, M, S, λ, Pr, Nb, Nt, R and Le. From this table, it is observed that the Skin-friction coefficient is increasing with rising values of λ, Nb, Nt, R while it is decreasing with increasing values of M, S, Pr and Le.

For dissimilar values of Pr, R, Nb, and Nt. the numerical values of heat transfer rate coefficient are shown in Table-3. The rate of heat transfer coefficient increases as Nb and Nt values increase, while the reverse effect is observed in increasing values of Pr and *R*.

The effects of *Le*, *Nb* and *Nt* on rate of mass transfer coefficient or in terms Sherwood number coefficient are discussed in Table-4. From this table, it is observed that the rate of mass transfer coefficient is increasing with increasing values of *Nt* and decreasing with increasing values of Le and *Nb*.

Table-3.: Coefficients of heat transfer rates for different Pr, R, Nb, and Nt values

Pr	*R*	*Nb*	*Nt*	Nu_x
0.71	0.5	0.1	0.1	0.5480326154
1.0				0.4893326198
3.0				0.4690221069
7.0				0.4530098557
	0.8			0.5782231096
	1.0			0.6052230144
	1.2			0.6230220987
		0.2		0.5860012497
		0.3		0.6185540234
		0.4		0.6390221441
			0.2	0.5782203475
			0.3	0.5960114232
			0.4	0.6120040322

Table-4.: Different coefficients of heat transfer rates for different types of heat of *Sc* and *Sr*

Le	*Nb*	*Nt*	Sh_x
0.1	0.1	0.1	0.5632919824
0.3			0.5422923154

0.5			0.5132669563
0.8			0.5560399410
	0.3		0.5382201677
	0.5		0.5184487229
	0.8		0.4983326757
		0.3	0.5920031544
		0.5	0.6203995214
		0.8	0.6403329587

6. Conclusion

This study investigates the equilibrium of a viscous, incompressible, and electric fluid -state MHD flow as a result of thermal radiation non-Newtonian nanofluid over a non-linearly stretching sheet influenced through Brownian motion and Thermophoresis. The Runge-Kutta technique, which is a numerical technique, is used to elaborate the results. Some of the important findings in the study can be summarized in the following points.

1) The velocity profiles are increasing with an increasing in the values of Stretching sheet parameter.
2) The velocity profile decreases with rising values of Magnetic field parameter (M) and suction/injection parameters (S).
3) The temperature profile rise as the rising values Thermophoresis(Nt), Brownian Motion parameter(Nb) , Thermal radiation parameters(R).
4) Temperature profiles falling as the value of Prandtl number (Pr) increasing
5) The concentration profiles improve when the Thermophoresis parameter (Nt) is increased, while the Brownian motion parameter (Nb) and Lewis number parameter (Le) are reduced.
6) The present results are equalized with the previous work done by Magyari and Keller [18], Bidin and Nazar [19] and El-Aziz [21] are observed.

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Selected Bioactive Plants from Northern Maharashtra Have Antimicrobial Activity against Bacterial Pathogens from Infections and Diseases

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Abstract— Three different plants from different families were chosen in the current study: Physalis minima (Linn.), Diplocyclos palmatus (L.) Jeffrey and Wrightia tinctoria (Roxb.) R.Br. Escherichia coli, Pseudomonas vulgaris, Bacillus subtilis, and Staphylococcus aureus were some of the pathogenic gram negative and gram positive organisms that different parts of chosen plants were evaluated for their antimicrobial potentials against in ethanol extracts, while Candida albican and Aspergillus niger were tested for antifungal activity. The findings indicated that the extracts used in the study displayed antibacterial activity. By using the disc diffusion method, the in-vitro antibacterial activity was carried out. When compared to other extracts, the seed extract from Wrightia tinctoria and Diplocyclos palmatus shown superior antibacterial activity against the E. coli pathogen. Physalis minima leaf, Wrightia tinctoria seed extract, and Physalis minima exhibited antifungal efficacy against C. albicans and A. niger, respectively. The historical use of these medicinal herbs suggests their potential for use in the creation of antibacterial drugs.

Keywords: Antimicrobial, Antibacterial, Pathogens Ethanol Extracts, Bacteria, Herbs, Plants

I. INTRODUCTION

The economic value of therapeutic plants can be found all around the world. We receive a great deal of botanical wealth from nature. Medicinal plants are recommended for their therapeutic benefits because they are thought to be excellent providers of nourishment and antibacterial agents. Some medicinal plants contain various chemical compounds with vital therapeutic characteristics that can be used to cure human diseases because they are very safe and have few to no negative effects (1). Additionally, synthetic medications are frequently adulterated and have negative effects in developing countries in addition to being expensive and inadequate for the treatment of ailments. Therefore, in order to control microbial infections, it is necessary to look for novel infection-fighting techniques (2). Numerous medicinal plants have been identified as important sources of naturally occurring antimicrobial chemicals as a potential substitute that may be successful in the treatment of these troublesome bacterial illnesses (3). Due to their antibacterial characteristics, plants have recently been employed as antimicrobial agents. These characteristic results from the bioactive substances produced during secondary metabolism in plants (4). The World Health Organization (WHO) claims that the greatest place to get a range of medications is from medicinal plants (5). This study's objective was to assess the antibacterial efficacy of a few bioactive plants utilised in traditional medicine and Ayurveda to treat illnesses brought on by microbes. Consequently, the potential effectiveness of the following three plant extracts from various families against various bacteria was investigated (6). The phytochemical elements play a variety of biological activities and have medicinal significance (17). Numerous Nepalese ethnomedical plants have been identified, and their uses have been verified. These proven botanicals have been utilised for a variety of general treatments, including antibacterial, antifungal, and antiviral effects. However, a thorough scientific examination of the antibacterial effects of medicinal plants from northern Maharashtra is still absent (18). In therapeutic procedures, the utilisation of unprocessed plant parts and phytochemicals with recognised antibacterial activities is crucial. Utilizing a menstruum-based selective solvent, extraction is the process of separating the plant tissues' medicinally active components. The goods include a complex blend of therapeutic plant metabolites, including tannins, lignans, alkaloids, glycosides, terpenoids, and flavonoids. An extract may undergo additional processing to isolate certain chemical components, such as vincristine, vinblastine, hyoscyamine, hyoscine, and codeine, in order to be utilised as a modern medication (19). As a result of their antioxidant qualities and the fact that free radicals are produced by both exogenous chemicals and endogenous metabolic processes in the human body, plant extracts are increasingly being used in the food business. These characteristics of extracts are related to the presence of phenolic chemicals, vitamins, and minerals in plants (19,20).

A Solanaceae family member Physalis minimum (Linn.), a pantropical annual herb that matures at a height of 20 to 50 cm, is grown as a weed in agricultural fields. The leaves are 2.5 to 12 cm long, velvety, and have complete margins. A fruit wrapping veil protects the fruit's interior. Other names for it include pygmy groundcherry, wild cape gooseberry, and native gooseberry. Fruits from the Physalis minima plant are a significant source of vitamin C. As a result, it is applied to inflammations, enlargement of the spleen, ascites, and as a beneficial treatment for bladder ulcers. It is also used as an appetiser, diuretic, and laxative (7,8,9).

Common names for the plant Diplocyclos palmatus (L.) Jeffrey includes Native Bryony, Striped Cucumber, and Lollipop Climber. Shivlingi is another name for it in Marathi due to the seed's lingam-like appearance. It belongs to the Cucurbitaceae family of climbing vines. Rainforests, dry rainforests, and floodplain habitats are the natural habitats of Diplocyclos palmatus. This short-lived, herbaceous, perennial climbing plant scrambles over the ground on its annual, densely branched stems, which can reach a length of 6 metres. Leaves of the lollipop climber are broadly oval, palmate lobed, and measure 3.5–14 x 4–14.5 cm. The lobes are elliptic to lance-shaped and hairless. Fruit grows singly or in groups of two to five. It is 1.5–2.5 cm and ovoid-round (10,11). The traditional healer has employed various portions

and methanol extract of selected plants. Microsoft Excel 2007 was used to examine the results

III. RESULTS AND DISCUSSION

Plants	Plant parts	*E. coli*	*P. vulgaris*	*S. aureus*	*B. subtilis*	*C. albicans*	*A. niger*
W.T.	leaf	-	-	-	-	-	-
	stem	-	-	-	-	-	-
	bark	-	7.44	-	-	-	-
	seed	11.64	7.18	8.65	6.45	6.79	-
P.M.	leaf	-	-	-	-	6.84	-
	stem	-	-	-	7.28	-	-
	seed	7.52	8.14	6.87	-	-	9.11
D.P.	leaf	-	-	-	-	-	-
	stem	-	7.68	-	-	-	-
	seed	10.47	-	-	-	-	-
	DMSO Control	-	-	-	-	-	-
	Chloramphenicol	11.61	15.43	25.47	32.75	NA	NA
	Amphotericin-B	NA	NA	NA	-	9.88	9.21

Table 1: Physalis minima, Diplocyclos palmatus, and Wrightia tinctoria (Roxb.) R.Br. plants' antimicrobial effectiveness against bacterial concentrations of 100 g/disc in various plant components (leaves, stem, seed, and bark) in ethanol extracts: No zone of inhibition, or NA, is indicated by the vernier caliper's measurement of diameter in millimetres.
Wrightia tinctoria- W.T.; *Physalis minima*- P.M.; *Diplocyclos palmatus*- D.P.

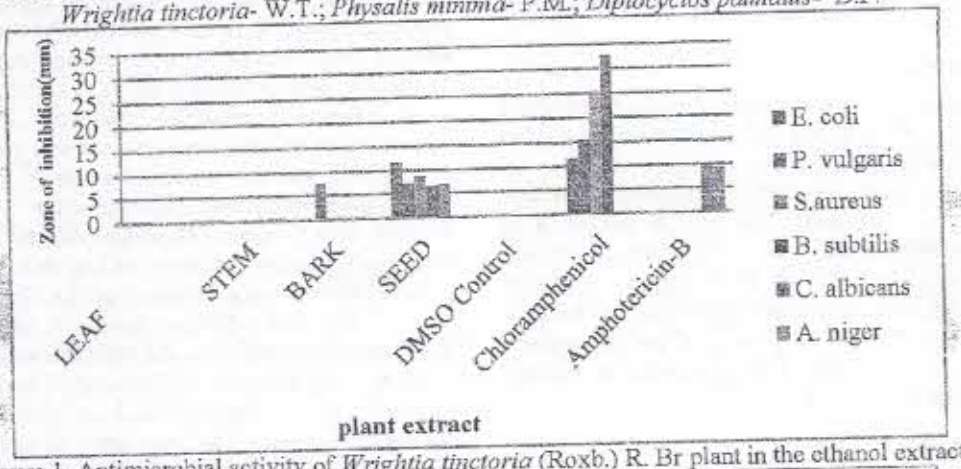

Figure 1. Antimicrobial activity of *Wrightia tinctoria* (Roxb.) R. Br plant in the ethanol extracts.

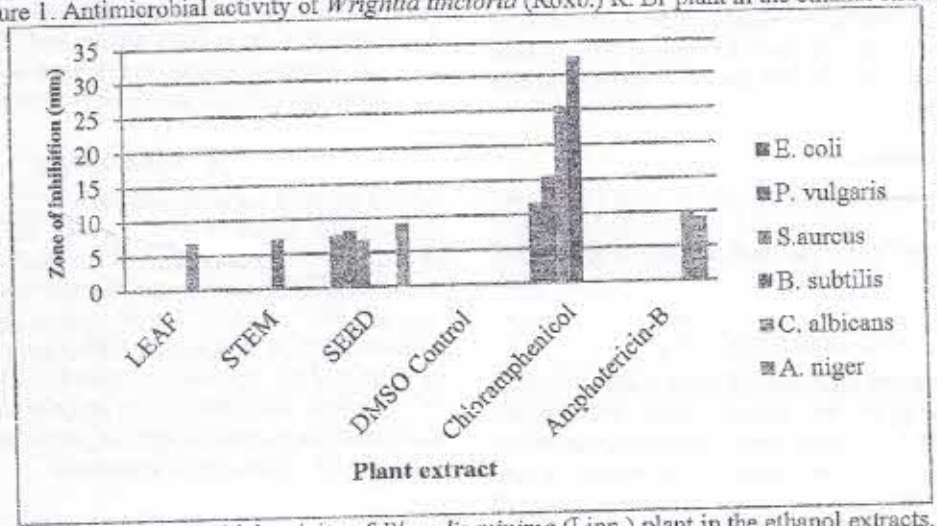

Figure 2. Antimicrobial activity of *Physalis minima* (Linn.) plant in the ethanol extracts.

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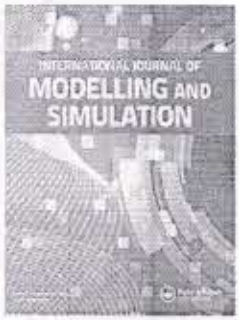

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Chemically and thermally radiated Williamson MHD fluid over porous media with heat source-sink

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Chemically and thermally radiated Williamson MHD fluid over porous media with heat source-sink

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ABSTRACT

The study of the stretching sheet has extensive applications in the field of engineering and technology. Hence, the objective of the present study is to deal with the impact of pertinent parameters on Williamson fluid across a stretchable nonlinear sheet when chemical reaction, varied thermal radiation, and heat source/sink are present. Partial differential equations are used to model the resulting scenario, and after adding the necessary similarity variables, a system of nonlinear ordinary differential equations is formed using flow equations. The reduced ODEs are tackled by applying the fourth-order RK-scheme together with shooting methodology, and the impacts of different system parameters are examined corresponding to the fluid's velocity, energy, and concentration profile. The important findings are discussed using graphics and they are as follows: As magnetism increases, fluid velocity rises but falls with an increment in buoyancy; the temperature falls with a boost in Grashof number but rises with an inclination in Prandtl number; and fluid reaction concentration declines with the boost in chemical parameter and Schmidt number but rises with an increment in thermophoresis, heat source/sink, and Brownian motion parameter.

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KEYWORDS
MHD; porous media; thermal radiation; Williamson fluid

1. Introduction

The motion of a fluid featuring electrically conductive substance with the existence of magnetic strength is the subject of the science known as magnetohydrodynamics (MHD). The MHD boundary layer fluid geometry across an expanding surface has gained recognition recently in domains of engineering, geothermal, mechanical, chemical, and industrial settings. This can be seen frequently in MHD pumps, heat exchanger design, liquid metal fields, high-temperature plasma, power cooling systems, and nuclear reactors. In these instances, the speed of the chilling and stretching processes work together to determine the final product's intended quality. The influence of magnetism over the natural dissipation of heat transfer was presented by Sparrow and Cess [1]. Sandeep at el [2]. examined MHD nanofluid flow across stretching/shrinking surfaces and showed that the magnetic strength is competent for demising the heat exchange rate over a stretched sheet. Motsa & Animasaun [3] analysed numerically the thermophysical properties of magnetised non-Darcy flow on a perpendicular porous plate. Ahamed and Zueco [4] deliberated on mixed convection fluid flow of magnetic and chemically influenced fluid in a porous channel with a heat source. Das et al. [5] reported MHD Visco elastic fluid flow from wall transpiration. Sheikholeslami [6] presented radiative nanoliquid flow with magnetic strength. Bakier [7] analyzed radiative and thermophoresis impact on the magnetic fluid flow over a horizontal plate. Reddy et al. [8] briefed cross-diffusion effects on MHD flow across a stretched surface. Mulinti and Pallavarapu [9] demonstrate the effects of heat and mass transport on an irregular conducting Maxwell fluid flow across a stretching surface with a porous medium and chemical reaction. Effects of thermal radiation, cross-diffusion, and heat source along a stretched sheet on the flow of an upper convected Maxwell nanofluid in three dimensions using magnetohydrodynamic (MHD) theory investigated by Reddy and Lakshminarayana [10]. Using an imposed heat source and non-uniform radiation, the heat transfer of a slip flow across a melting expanding surface is studied by Dadheech et al. [11]. Amala and Dadheech [12] investigated the unstable MHD flow of Powell-Eyring fluid with microorganisms due to permeable extended surfaces embedded in porous media.

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It is common knowledge that all bodies generate thermal radiation, a type of energy that results from temperature changes. The temperature and radiation interaction is direct: as the temperature rises, radiation also rises, so that when a physical body's temperature is different from that of its environs or another body, heat is transferred to the colder body until their temperatures are equal. Radiative heat flow is a major component of most environmental and industrial processes, and it is crucial in industries involving high-temperature operations, such as designing applicable machinery, space technology, thermonuclear fusion, solar power technology, nuclear engineering, and so forth. The radiative flux on the flow of boundary layers due to the stretched surface was characterised by Bidin and Nazar [13]. Raptis et al. [14] discuss the significance of the magnetised heat radiation flow of viscous fluid while taking into account a semi-infinite plate. Mukhopadhyay [15] combines the slip effects on the boundary layer flow across an increasingly stretched surface under radiative heat flux. Hosseinzadheh et al. [16] presented the features of chemical reaction and radiation through porous media on Maxwell fluid flow across a hot plate. Datti et al. [17] presented the MHD viscoelastic moving fluid above an elongated surface. Bhattacharya [18] explored the flow of Casson fluid across a stretched surface in the presence of radiation and magnetism. Seth et al. [19] derived heat transfer and MHD radiative convection fluid flow across a shifting plate. Prasad and Shateyi [20] carried out a computational study of radiative nanofluids' heat transport and MHD laminar boundary layer flow. Utilizing computational methods, Maity and Kundu [21] investigated the radiative flux and slip consequences on the Casson nanofluid system. Rasool and Zang [22] looked at the flow of nanofluid via Riga plates with radiation using the Powell-Eyring model. K Anantha Kumar et al. [23] analyzed the impact of thermal radiation on MHD Casson fluid flow across an exponentially stretching sheet by assuming laminar and time-dependent fluid motion. Reddy et al. [24] investigated the heat and mass transfer properties of Maxwell nanofluid MHD convective flow with the Cattaneo-Christov heat flux model and a porous stretched sheet under the influence of thermal radiation, viscous dissipation, suction/injection, and higher-order chemical reaction. Amala and Dadheech [25] performed an entropy study on Newtonian and non-Newtonian fluids due to melting stretched surfaces in the presence of angled MHD, non-linear chemical reactions implanted in porous media, and non-uniform radiations. To determine an exact numerical solution, numerous writers have studied the nonlinear thermal radiation model [26–29].

Different areas of science and engineering deal with non-Newtonian fluids. Stress and strain relationships are used to describe these fluids. Due to their wide-ranging uses in many branches of modern science and industry, such as crystal growth, continuous casting, shot rolling, paper manufacturing, production of glass fibre, and oil recovery, non-Newtonian fluids are a topic of an intense research field. Numerous models, including the power-law model, the Ellis model, Williamson model have been developed to describe the behavioral characteristics and practical relevance of such fluids. The most common model, power law, depicts the correlation between shear widening and shrinking but is unable to show how normal stress variations in fluid flow fluctuate from one flow to the next. Nadeem et al. [30] handled Williamson fluid flow due to stretched sheet. Khan et al. [31] studied the features of radiation and magnetism of Williamson nanofluid. Chemically and magnetically influenced Williamson fluid flow past a flat surface in the existence of a heat source-sink is presented by Kumar et al. [32]. Dadheech et al. [33] examined Williamson fluid flow and velocity slip for entropy formation by non-linear chemical reaction through the permeable and vertical plate. Reddy and Reddy [34] analysed unsteady Williamson nanoliquid flow due to slip effects. The influence of non-linear radiation and irregular heat source/sink on MHD micropolar fluid was presented by Kumar et al. [35]. Humane et al. [36] considered features of magnetism, chemical reaction and radiation on the Casson-Williamson nanoliquid due to a porous stretched sheet. Mishra et al. [37] derived magnetized Williamson micropolar flow in a non-Darcian porous medium. Recently, Almaneea [38] studied heat and mass transport improvement of magnetized Williamson hybrid nanofluid. Reddy et al. [39] explain a numerical solution for an unstable magnetohydrodynamic flow of a Maxwell fluid on an elongating surface with radiation and higher-order chemical in consideration of a heat source/sink. Dadheech et al. [40] determined the numerical effects of a non-Newtonian Maxwell fluid flow past a permeable and melting surface with non linear thermal radiation, sloped magnetic field, chemical reaction, and variable heat sources. The literature has several significant analyses of the Williamson model that take into account the essential properties [41–44].

The term 'thermophoresis of particles' refers to the movement of tiny particles along a temperature gradient in a decreasing direction. Simply said, thermophoresis aids in the collection of tiny particles on surfaces that are cold or less heated. According to the Aitken phenomenon, the gas molecules move from the hotter zone with a higher velocity than they do from the colder region. The molecules that

move more quickly can collide with the particles more violently. The particles' achieved speed is therefore known as thermophoresis velocity and the force they encounter as an output of the thermal gradient is known as thermophoretic force, which is directed in the opposite direction of the energy gradient. Noor et al. [45] took into account the impact of thermophoretic hydromagnetic flux over an isothermal-inclined radiating plate. When Joule heating and thermophoresis are present, Hayat and Qasim [46] explored the 2-D magnetohydrodynamic flow with mass and heat transport across a stretched sheet. Shateyi [47] investigates the MHD Maxwell fluid flow across a vertically extended surface in the presence of chemical reaction and thermophoretic parameters. Khan et al. [48] investigate how thermophoresis, Joule heating, and chemical reaction affect the magnetohydrodynamic Powell-Eyring fluid flow above a lateral elongated surface. Thermophoresis has been used by Sheikh and Abbas [49] to assess the impact of chemical reaction, and heat generation/absorption on magnetised fluid flow over an oscillating extended sheet. In their analysis of a mixed magnetonanofluid convective flow limited by a vertical stretchable surface, Mustafa et al. [50] take into account the influence of thermophoretic diffusion and Brownian motion. Bakier [51] examined the effect of thermophoresis molecular diffusion, radiant energy, and magnetic force on the flow, heat, & mass transfer properties above a stretched vertical plate. Murthy et al. [52] examined the effects of thermophoresis and Brownian motion on the heat and mass transfer over an exponentially extending sheet for the three-dimensional slip flow of a conducting Casson nanofluid. The majority of authors have recently looked into the impact of thermophoresis and chemical reactions in various flow scenarios, which are listed in the references [53–56].

The innovation of existing analysis is to study the effects of chemically and thermally radiated Williamson fluid past stretched surface subjected to porous media. The novel parameters studied under the current analysis include thermophoretic body force, nonlinear radiation, heat source/sink and the Magnetized Williamson fluid over a stretched surface. Nonlinear stretching sheet plays an extensive role in almost all engineering, industrial, and manufacturing operations. Paper production, crystal manufacturing, aerodynamic extrusion of plastic sheets, preserving processes, and extrusion of polymer sheets are some examples of these operations.

The main aim of this study is as follows:

- Extension of the current model to nonlinear radiation with thermophoretic force.
- Impact of the Williamson Fluid on the heat transfer process
- To deal with a correlation analysis with minimising errors.

2. Problem formulation

Taking into account the viscous flow of magnetohydrodynamic Williamson fluid across a curved sheet which is concurrent at the y-axis in a porous media. To maintain the origin stationary, the flow is constrained to $y>0$ and equal and opposing forces are adapted in the direction of the x-axis (Figure 1). In the centre of the porous media, these forces maintain the symmetric boundary conditions. The Cauchy stress tensor [30], which is completely controlled by the extra stress tensor, is embodied by Williamson fluid. The sheet is subjected to the magnetic field $B = B_0 x^{\frac{n-1}{2}}$ in a normal direction. A thermally stratified media with a fluctuating ambient temperature $T_\infty(x)$ is used to measure the temperature of the sheet $T_w(x)$. The wall temperature and the nanoparticle friction T_w and C_w respectively are considered constant at the stretching surface and assumed to be higher than the ambient temperature T_∞ and nanoparticle fraction C_∞. After this, we presented the mathematical model which is introduced in the form [30].

The governing boundary layer equations in the Cartesian coordinate system corresponding to the above flow geometry are expressed as:

$$\frac{\partial u}{\partial x}+\frac{\partial v}{\partial y}=0 \tag{1}$$

$$u\frac{\partial u}{\partial x}+v\frac{\partial v}{\partial y}=\vartheta\frac{\partial^2 u}{\partial y^2}+\sqrt{2\vartheta}\Gamma\frac{\partial u}{\partial y}\frac{\partial^2 u}{\partial y^2}-\frac{\sigma B_0^2(x)}{\rho_{nf}}u-\frac{\vartheta}{k}u+g\beta(T-T_\infty)+g\beta(C-C_\infty) \tag{2}$$

$$u\frac{\partial T}{\partial x}+v\frac{\partial T}{\partial y}=\frac{k}{\rho C_p}\frac{\partial^2 T}{\partial y^2}+\frac{\mu}{\rho C_p}\left(\frac{\partial u}{\partial y}\right)^2-\frac{\partial q_r}{\partial y}+\frac{Q_0(T-T_\infty)}{\rho C_p} \tag{3}$$

$$u\frac{\partial C}{\partial x}+v\frac{\partial C}{\partial y}=D_B\frac{\partial^2 C}{\partial y^2}+\frac{D_T}{T_\infty}\left(\frac{\partial^2 T}{\partial y^2}\right)-R(C-C_\infty)-\frac{\partial}{\partial y}[V_T(C-C_\infty)] \tag{4}$$

Boundary conditions [55]:

$$u=u_w, v=0, T=T_w, C=C_w \text{ at } y=0$$

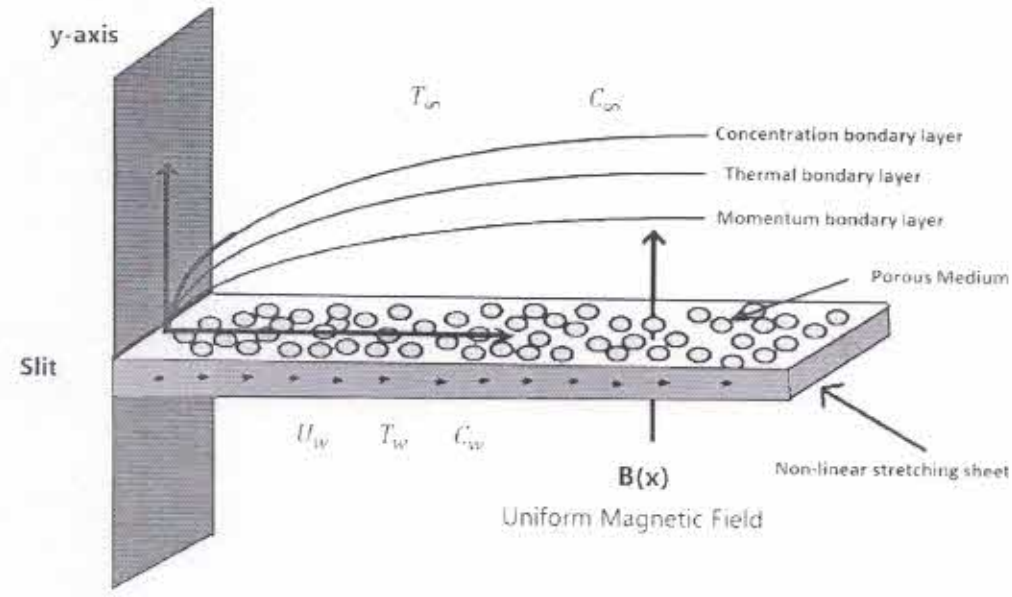

Figure 1. Problem coordinates and geometry.

$$u \to 0, T \to T_\infty, C \to C_\infty \text{ as } y \to \infty \tag{5}$$

where u and v represent the velocity elements along the x- and y-axes, respectively, ϑ: kinematic viscosity, k: thermal conductivity, C_p: specific heat at constant pressure, ρ: fluid density, q_r: radiative heat flux, g: acceleration, T: fluid temperature, T_∞: ambient fluid temperature, B_0: magnetics field, Γ: time constant, β: volumetric coefficient of thermal expansion, D_B, D_T, R, C, C_∞ and V_T are Brownian diffusion coefficient, thermophoresis diffusion coefficient, reaction rate, the concentration of Williamson fluid, ambient fluid concentration, and thermophoretic velocity of fluid, respectively.

The Rosseland approximation is often used to determine and simplify the radioactive heat flux in the temperature expression as follows:

$$q_r = -\frac{4\sigma^*}{3k^*}\frac{\partial T^4}{\partial y}$$

where σ^* and k^* are Stefan Boltzmann constant and average absorption coefficients, respectively. Following [54], Equation 3 becomes

$$u\frac{\partial T}{\partial x} + v\frac{\partial T}{\partial y} = \frac{k}{\rho C_p}\frac{\partial^2 T}{\partial y^2} + \frac{\mu}{\rho C_p}\left(\frac{\partial u}{\partial y}\right)^2 + \frac{16\sigma^*}{3k^*}\frac{\partial}{\partial y}\left(T^3\frac{\partial T}{\partial y}\right) + \frac{Q_0(T - T_\infty)}{\rho C_p} \tag{6}$$

The subsequent similarity factors are being introduced:

$$\eta = y\sqrt{\frac{a(n+1)}{2\vartheta}}x^{\frac{n-1}{2}}$$

$$u = ax^n f'(\eta)$$

$$v = -\sqrt{\frac{(n+1)a\vartheta}{2}}x^{\frac{n-1}{2}}\left[f(\eta) + \frac{n-1}{n+1}\eta f'(\eta)\right]$$

$$T = T_\infty + (T_w - T_\infty)\theta(\eta)$$

$$C = C_\infty + (C_w - C_\infty)\phi(\eta) \tag{7}$$

The following set of ordinary D.E. is constructed by converting the set of partial D.E. (1), (2), (4) and (6) using similarity variables and dimensionless functions:

$$f''' + ff'' - \alpha(f')^2 - \lambda f'' - Mf' - Kf' + Gr\theta + Gn\phi = 0 \tag{8}$$

$$\left(1 + \frac{1}{R}[1 + \theta(\theta_w - 1)]^3\right)\theta'' + \left(\frac{3}{R}(\theta_w - 1)[1 + \theta(\theta_w - 1)]^2\right)(\theta')^2 + Prf\theta' + PrEc(f'')^2 + S\theta = 0 \tag{9}$$

$$\phi'' + Scf\phi' + \frac{Nt}{Nb}\theta'' - Sc\left(\frac{2}{n+1}\right)Kc\phi + Sc\tau[\theta'\phi' + \phi\theta''] = 0 \tag{10}$$

The transformed boundary restrictions are:

$$f = 0, f' = 1, \theta = 1, \phi = 1 \text{ at } \eta = 0$$

$$f' \to 0, \theta \to 0, \phi \to 0 \text{ as } \eta \to \infty \quad (11)$$

Here $\alpha = \frac{2\mu}{a^{n+1}}$, $\lambda = \Gamma a^2 x^n \sqrt{\frac{2a}{\mu}}$ is Williamson fluid parameter, $c = \frac{a(n+1)}{2} x^{n-1}$, $M = \frac{\sigma B_0^2}{\rho a}$ is Magnetic parameter, $K = \frac{\mu}{k_1}$ is permeability parameter, $Gr = \frac{g\beta_1(T_w - T_\infty)}{a^2 x^n}$ is local temperature Grashof number, $Gm = \frac{g\beta_2(C_w - C_\infty)}{a^2 x^n}$ is local mass Grashof number, $R = \frac{16k^* k}{16\sigma^* \rho C_p T_\infty^3}$ is radiation parameter, $Pr = \frac{\mu C_p}{k}$ is Prandtl number, $Ec = \frac{a^2 x^{2n}}{C_p \Delta T}$ is Eckert number, $S = \frac{2Q_0 \vartheta}{ka(n+1)x^{n-1}}$ is heat source/sink parameter, $Sc = \frac{\vartheta}{D_B}$ is Schmidt number, $Nt = \frac{\tau D_T (T_w - T_\infty)}{\vartheta T_\infty}$ is thermophoresis parameter, $Nb = \frac{\tau D_B (C_w - C_\infty)}{\vartheta}$ is Brownian motion parameter, $Kc = \frac{R}{ax^{n-1}}$ is Chemical reaction parameter and $\tau = -\frac{\Delta T K_{th}}{T_{\infty \vartheta}}$ is a thermophoretic parameter.

The local skin friction coefficient (Cf_x), the local Nusselt number (Nu_x) and local Sherwood number (Sh_x) are as follows:

$$Cf_x = \frac{\tau_w}{\rho u_w^2}, Nu_x = \frac{x q_w}{(T_w - T_\infty)k}, Sh_x = \frac{x q_m}{(C_w - C_\infty)D_B} \quad (12)$$

where

$$\begin{aligned} \tau_w &= \left\{1 + \Gamma\sqrt{\frac{1}{2}\frac{\partial u}{\partial y}}\right\}\mu\frac{\partial u}{\partial y}, q_w \\ &= k\left(-\frac{\partial T}{\partial y}\right)_{y=0} - \frac{4\sigma^*}{3k^*}\left(-\frac{\partial T^4}{\partial y}\right)_{y=0}, q_m \\ &= D_B\left(-\frac{\partial C}{\partial y}\right)_{y=0} \end{aligned} \quad (13)$$

By using Equation 18, we get

$$\begin{aligned} Cf_x\sqrt{\mathrm{Re}_x} &= f''(0) + \frac{\lambda}{2}(f''(0))^2, \frac{Nu_x}{\sqrt{\mathrm{Re}_x}} \\ &= -(1 + R\theta_w^3)\theta'(0), \frac{Sh_x}{\sqrt{\mathrm{Re}_x}} = -\phi'(0) \end{aligned} \quad (14)$$

3. Numerical solution with validation

To find a numerical solution for the current investigation, we first convert the flow geometry PDEs (1), (2), (4), and (6) to a set of ODEs (8), (9), and (10) by inserting similarity variables (7). The current boundary conditions (5) are changed to take on new forms (11). Then, to solve the reduced ODEs, we employ the fourth-order Runge-Kutta method and the shooting strategy. In this regard, all the ODEs are written as an initial boundary value problem by introducing the new variables in the following manner:

$$f = X_1, f' = X_2, f'' = X_3, \theta = X_4, \theta' = X_5, \phi = X_6, \phi' = X_7 \quad (15)$$

$$X_3' = \frac{-X_1 X_3 + \alpha(X_2)^2 + MX_2 + KX_2 - GrX_4 - GmX_6}{(1 + \lambda X_3)} \quad (16)$$

$$X_5' = \frac{R\,Pr\,X_1 X_5 - N_b(1 + \theta(\theta_w - 1))^2(\theta_w - 1))(X_7)^2 - R\,S\,X_4 - R\,Pr\,Ec\,(X_3)^2}{(R + 3(1 + \theta(\theta_w - 1))^3)} \quad (17)$$

$$\begin{aligned} X_7' &= -Sc\,X_1 X_7 - \left(\frac{Nt}{Nb}\right)X_5' + Sc\left(\frac{2}{n+1}\right)Kc\,X_6 \\ &\quad - \tau\,Sc\left(X_5 X_7 + X_6 X_5'\right) \end{aligned} \quad (18)$$

The initial boundary conditions are:

$$\begin{aligned} X_1(0) = 0, X_2(0) = 1, X_3(0) = A, X_4(0) = 1, X_5(0) \\ = B, X_6(0) = 1, X_7(0) = C, \end{aligned}$$

$$X_2(\infty) = 0, X_4(\infty) = 0, X_6(\infty) = 0 \quad (19)$$

where A, B, and C are unknown values calculated by assigning the finite set of values of η_∞ and using some initial guesses. The transformed initial condition of Equation 18 is tackled with the Equation 18. To get a better physical insight and simulations, the system is written in unknowns as $X_3(0), X_5(0)$and$X_7(0)$ with initial assumption at η_∞. Started initial guesses of $X_3(0), X_5(0)$and$X_7(0)$ for faster convergence. The required accuracy level is set to 10^{-5} with $\delta n = 0.0001$.

For validation and accuracy of the obtained results, we compared our results with published work by Magahed [27] which is shown in Table 1. We found that the comparison in this table is in good agreement with the results available in the literature.

Table 1. Comparison of Nusselt number for different values of Pr with $Gr = Gm = \lambda = M = Nt = Nb = Sc = S = \tau = Kc = 0$ and $n = 1$.

Pr	Megahed [27]	current investigation
0.07	0.065531	0.065539
0.2	0.169117	0.169125
2.0	0.911358	0.911371
7.0	1.895453	1.895460

4. Results and discussions

The impact of multiple parameters on the fluid's velocity, energy, and concentration profile is discussed here. These parameters include the magnetic parameter (M), Williamson fluid parameter (λ), Grashof numbers (Gr

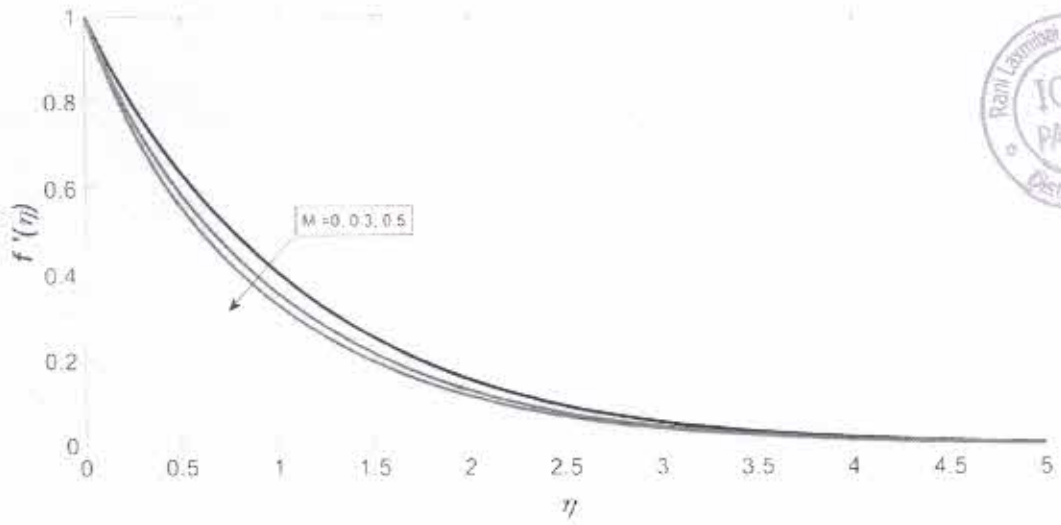

Figure 2. Magnetism v/s velocity of a fluid.

and Gm), radiation parameter (R), Prandtl number (Pr), heat source/sink parameter (S), Schmidt number (Sc), chemical reaction parameter (Kc), thermophoresis parameter (Nt), and Brownian motion parameter (Nb). Figure 2 represents the influence of magnetism on the velocity of a fluid. A higher Lorentz force results from applying the magnetic force perpendicular to the flow. As a result, there is less drag within the fluid particles, which reduces the random movement of the particles. This ultimately causes the flow velocity to decrease.

The impact of Williamson parameter λ on the fluid's velocity profile is presented in Figure 3. It can be seen that the velocity decreases as λ increases. As the Williamson parameter rises, the fluid is seen to have greater flow resistance, which causes the velocity profile to fall. The impact of Gr on the fluid's velocity and energy profile are pictured in Figures 4 and 5. The thermal buoyancy parameter (Gr) greatly increases the velocity dispersion by mobilizing stronger thermal convection currents close to the wall. However, in the case of temperature dispersal, the presence of this characteristic causes the fluid to lose energy, hence diminishing the girth of the thermal boundary layer, which further accelerates the heat transfer rate.

Figures 6 and 7 reveal that the thickness of the momentum boundary layer and the velocity profile both grow as the mass Grashof number Gm rises, although the temperature profiles exhibit the opposite tendency. Figure 8 shows a progressive rise in fluid temperature as a result of greater Eckert number values. This occurs when external energy rather than internal energy drives the convective motion due to higher

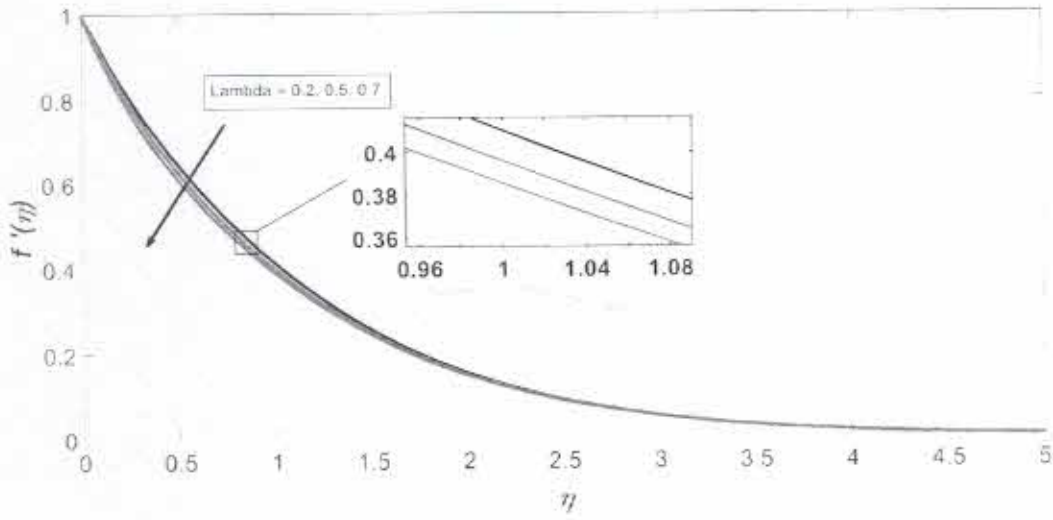

Figure 3. Williamson parameter v/s velocity of a fluid.

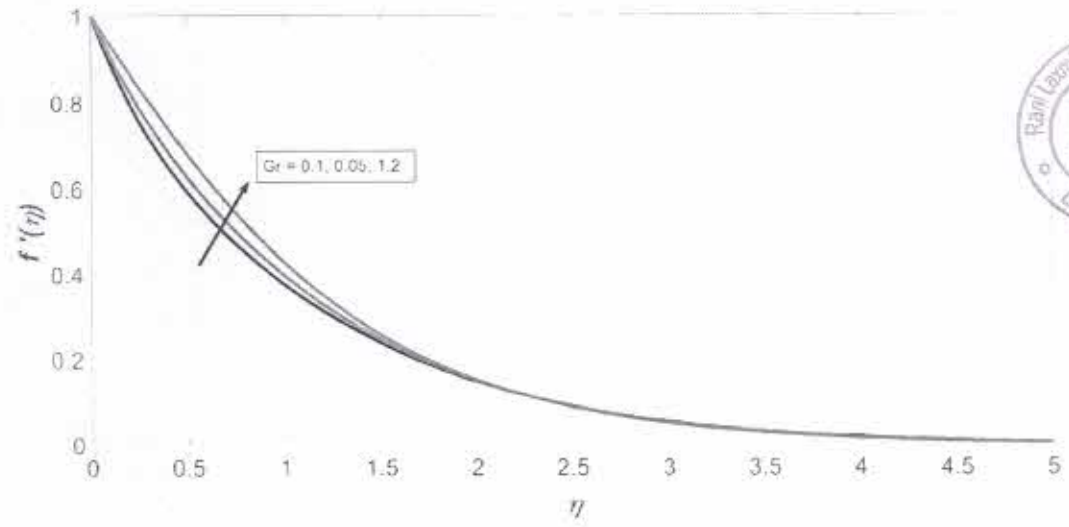

Figure 4. Local Grashof number (Gr) v/s velocity of a fluid.

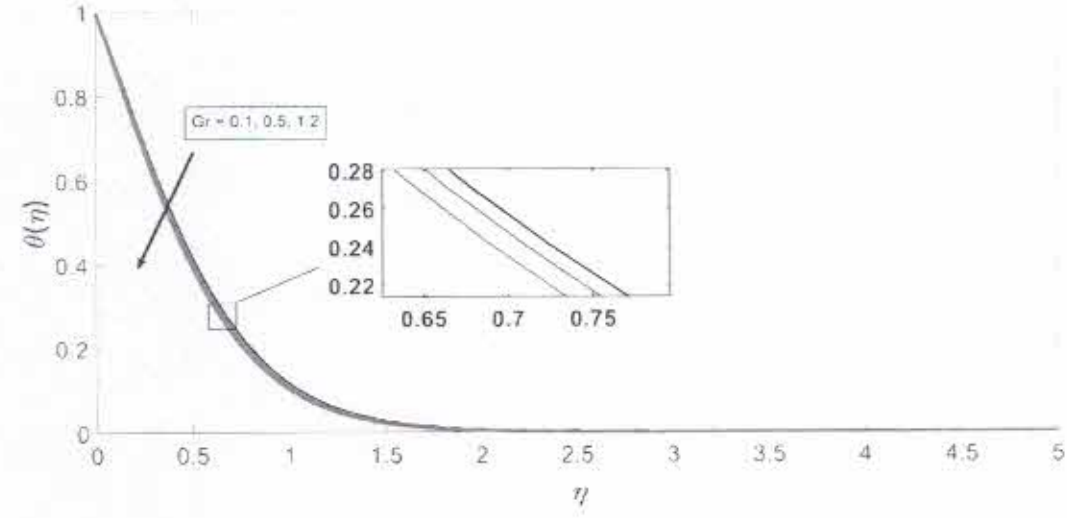

Figure 5. Local Grashof number v/s temperature of the fluid.

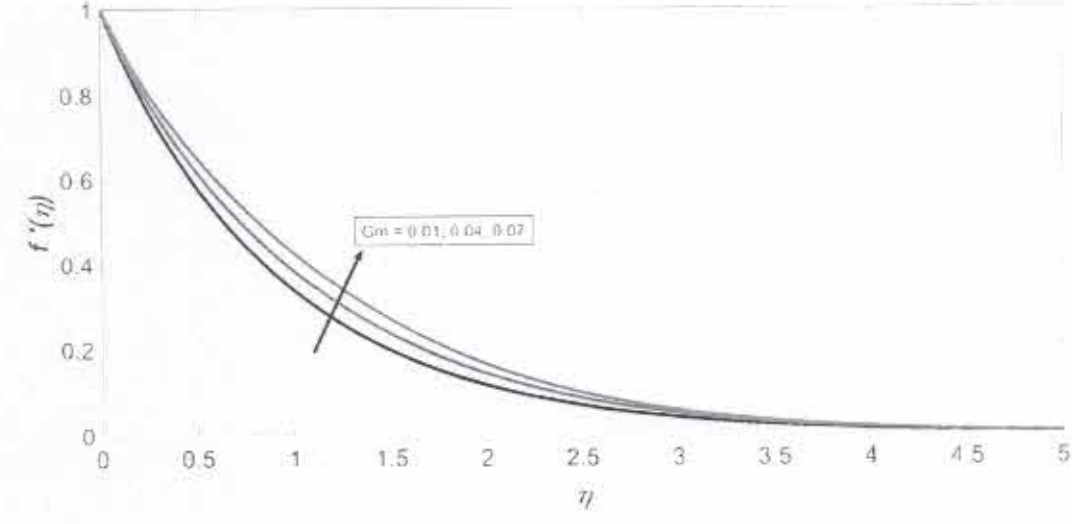

Figure 6. Local Mass Grashof number v/s velocity of a fluid.

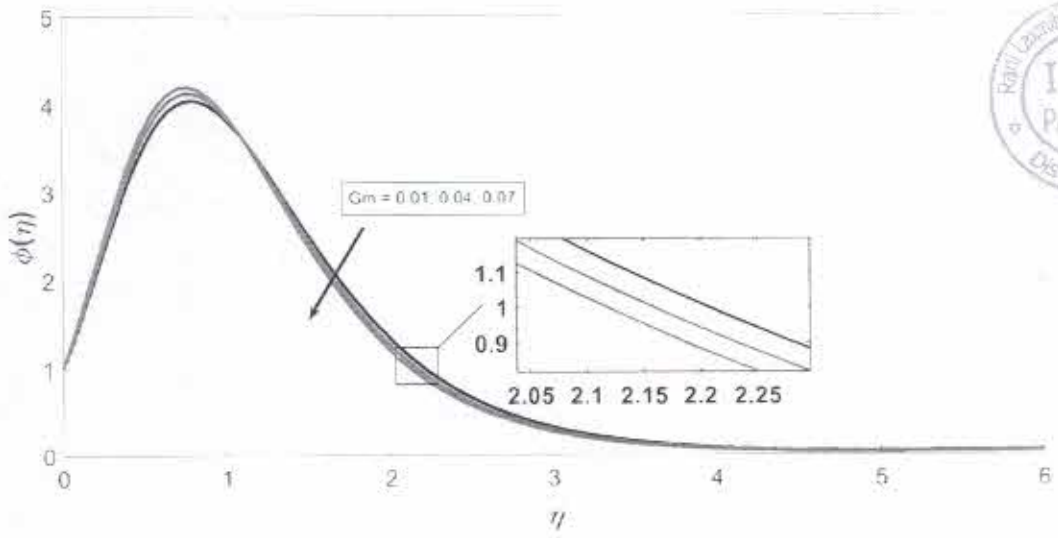

Figure 7. Local Mass Grashof number v/s fluid concentration.

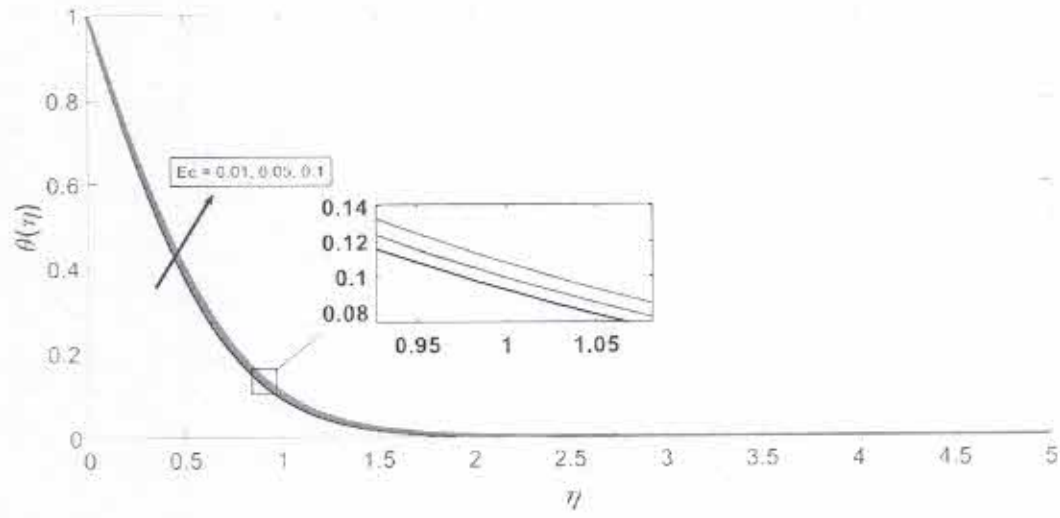

Figure 8. Eckert number v/s fluid temperature.

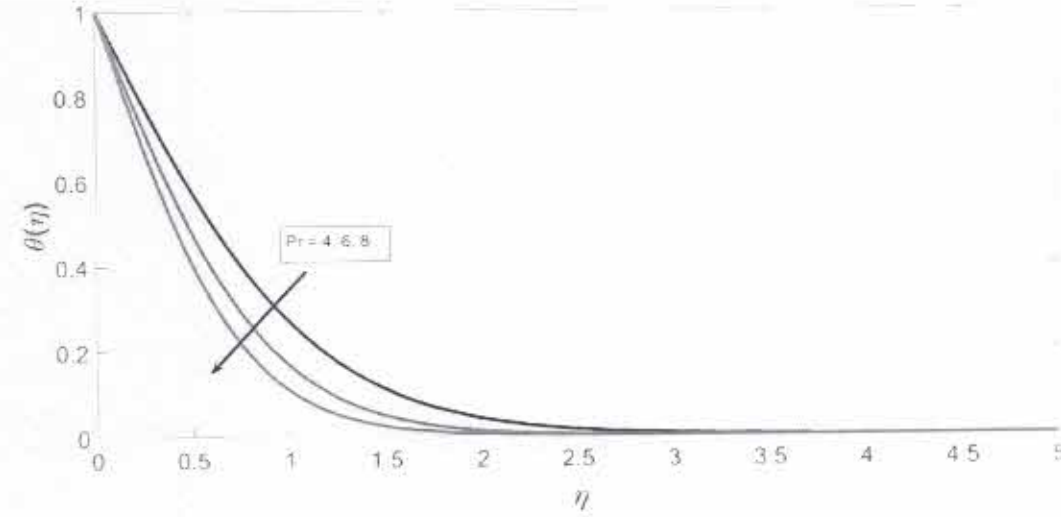

Figure 9. Prandtl number v/s fluid temperature.

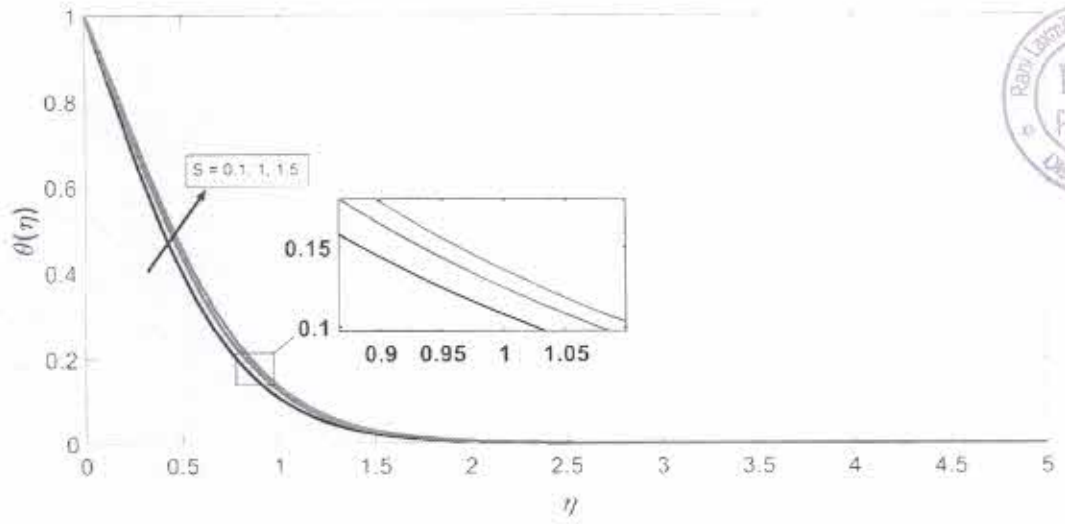

Figure 10. Heat source/sink v/s fluid temperature.

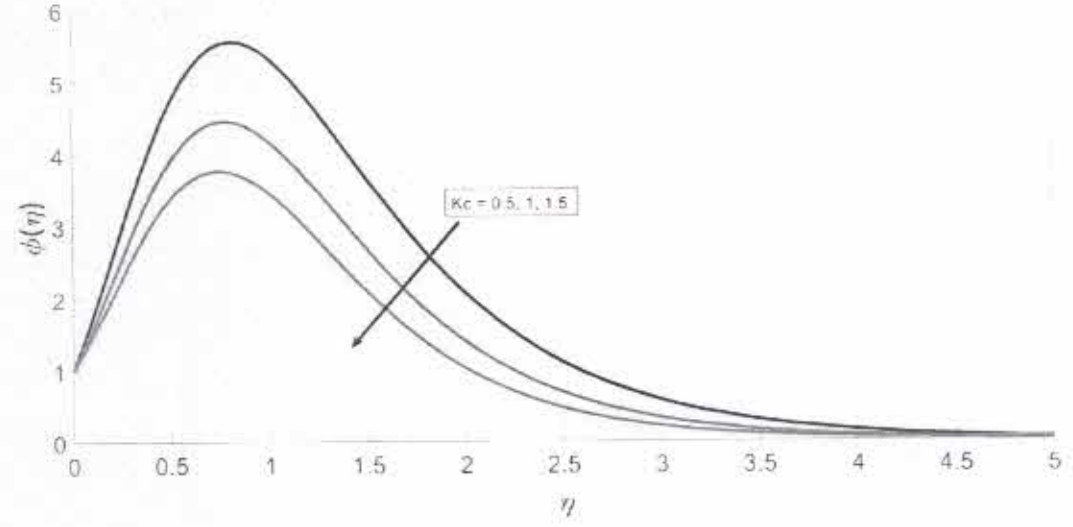

Figure 11. Chemical reaction parameter v/s fluid concentration.

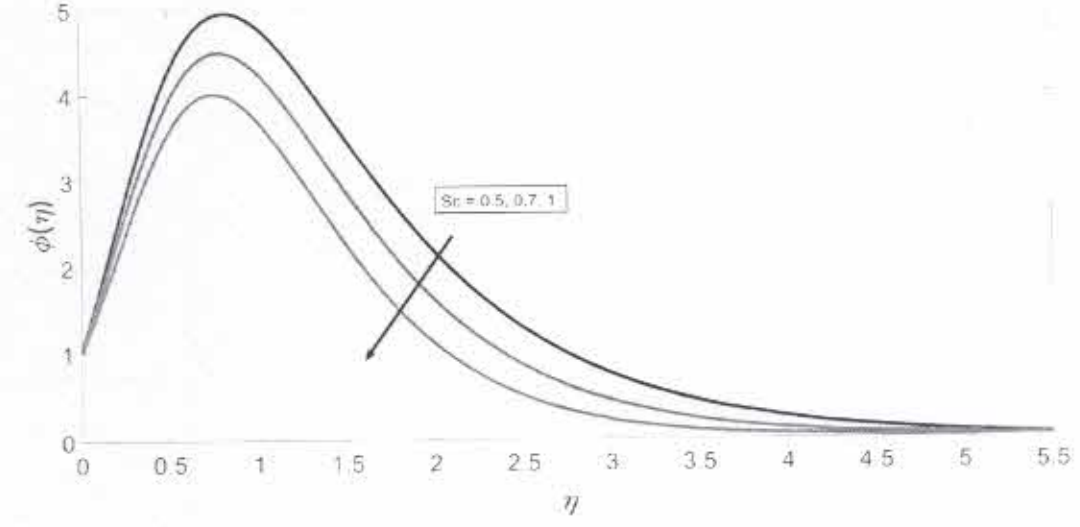

Figure 12. Schmidt number v/s fluid concentration.

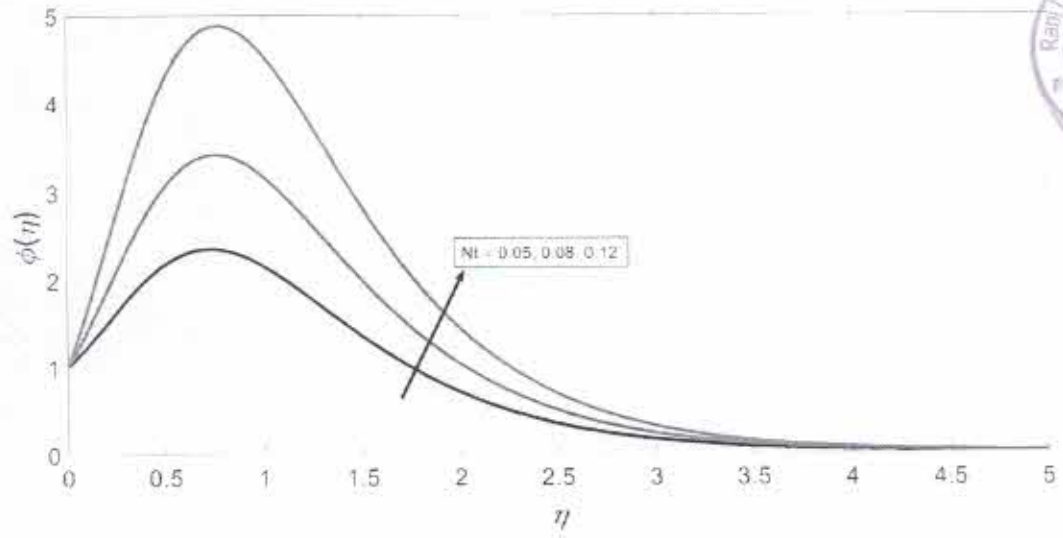

Figure 13. Thermophoresis parameter v/s fluid concentration.

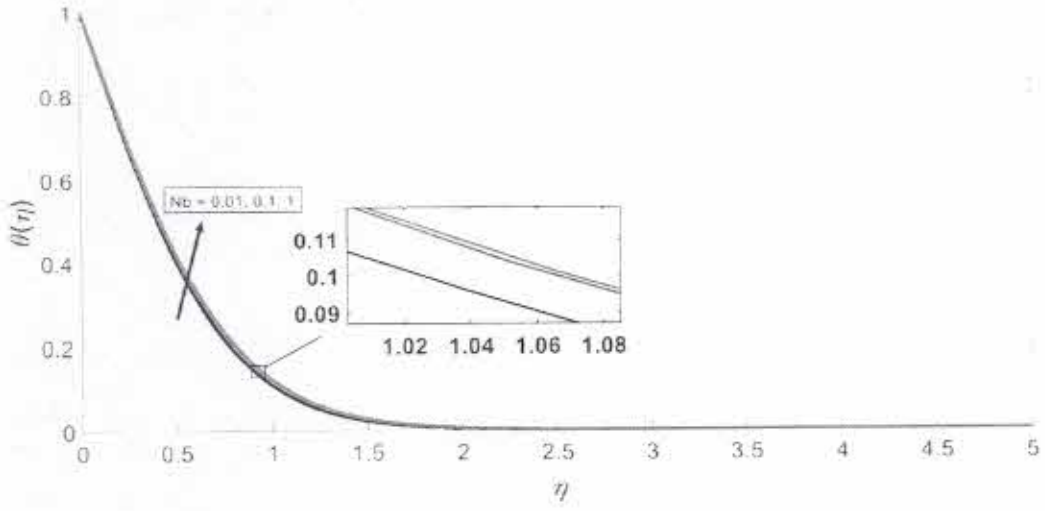

Figure 14. Brownian motion parameter v/s fluid temperature.

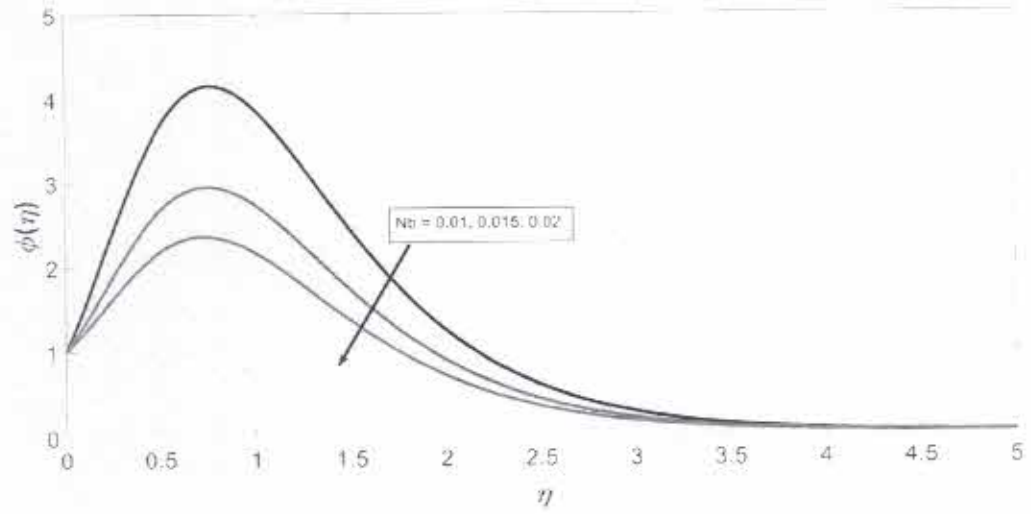

Figure 15. Brownian motion parameter v/s fluid concentration.

kinetic energy. The Eckert number has a greater impact on the thermal field even at extremely low values. The effect of the Prandtl number on heat diffusivity is demonstrated in Figure 9. With an increasing Prandtl number, the flow dimension profile shrank. As the Prandtl term is increased, the heat boundary layer contracts, which causes the physical behavior. The system had high heat dispersion due to the lower boundary viscosity layer, which resulted in a decreasing temperature profile. The impact of a non-uniform positive heat source/sink parameter on the fluid's temperature is plotted in Figure 10. It is noticeable that raising the value of S causes the temperature profile to behave more aggressively. The elements that cause the temperature profile to rise are the positive values of S, which are the heat generators that discharge heat energy to fluid flow.

The devastating chemical reaction parameter, which is depicted in Figure 11, causes a rapid compression of fluid concentration. Since Kc produces higher molecular mobility in flow media, the concentration of the fluid reduces as a result of the accelerated transportation process. Physically, the thickening of the momentum barrier layer is caused by the stronger chemical reaction. Figure 12 demonstrates the influence of Schmidt number on the species' diffusivity. As the physical term Sc is increased, the reaction concentration drops. This is because as the mass border viscosity thins, mass diffusion climbs and the rate of reactant mixture falls. Figure 13 illustrates how thermophoresis can control energy and concentration gradients. The fluid concentration significantly improves with the added value of Nt, which in turn produces more heat energy and leads to a noticeable increase in concentration. Brownian motion (Nb) is shown to have an impact on the dimensionless energy and concentration profiles in Figures 14 and 15. A higher

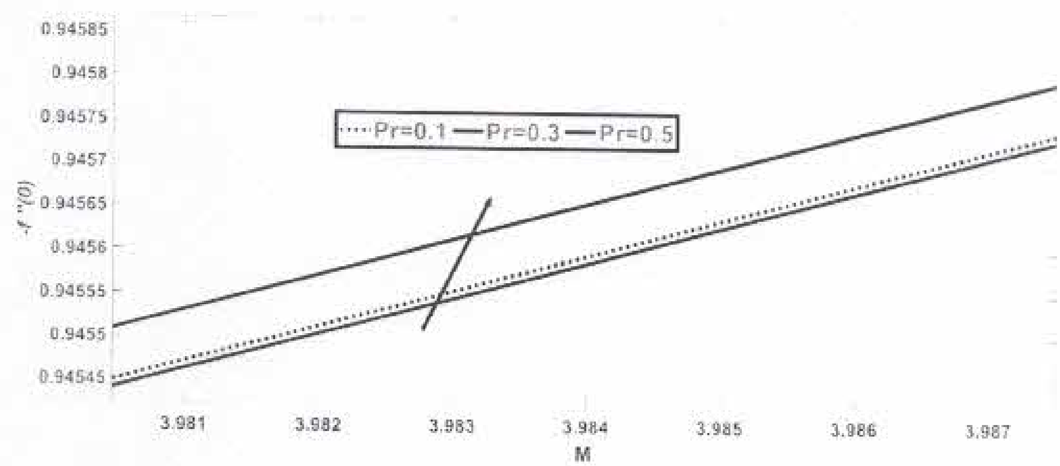

Figure 16. The skin friction coefficient for different values of M and Pr.

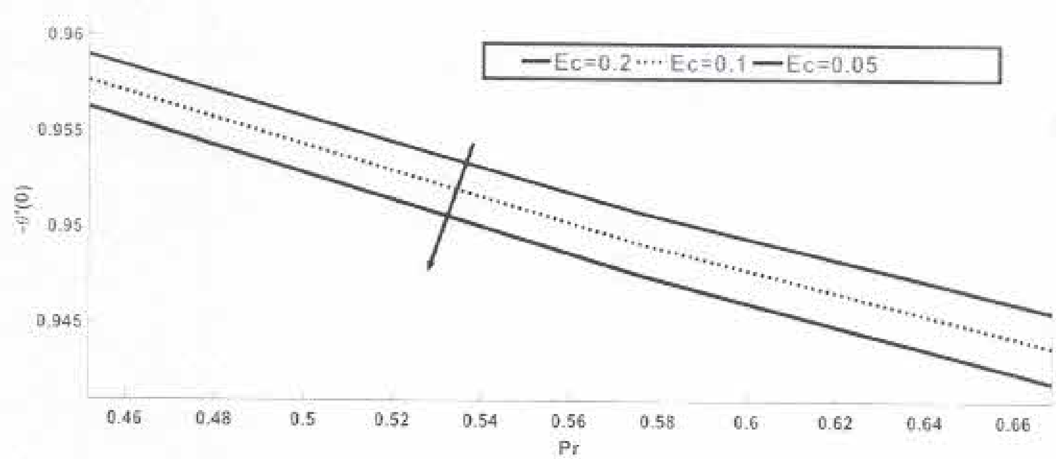

Figure 17. The Nusselt number for different values of Ec and Pr.

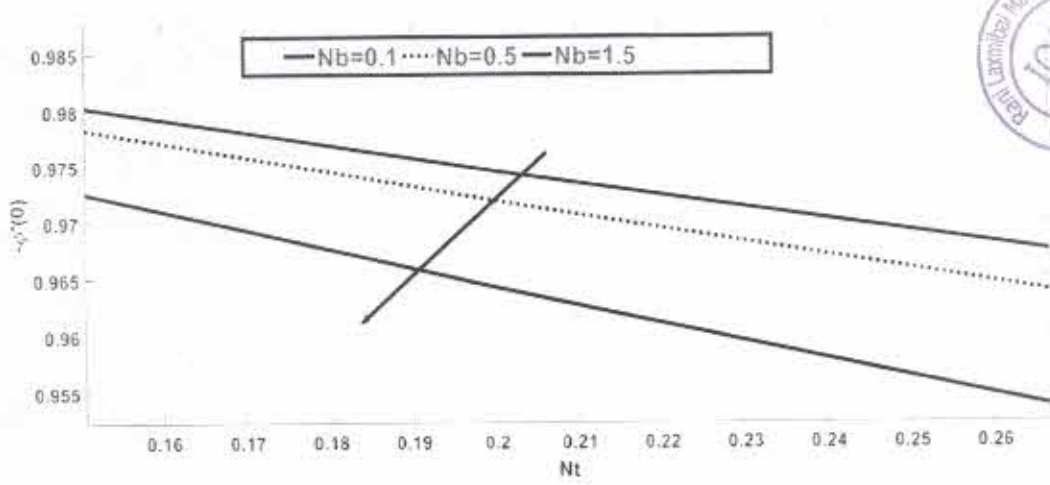

Figure 18. The Sherwood number for different values of Nt and Nb.

concentration of Nb causes fluid particles' kinetic energy to accelerate, creating heat in the system, which causes a rise in the temperature of a fluid and the concentration in the boundary layer region decreases.

The effects of various factors on skin friction, the Nusselt number, and the Sharewood number are shown in Figures 16–18. Figure 16 illustrates how skin friction increases as the Prandtl number values increase. Figure 17 looks at how the Prandtl number Pr and the Eckert number Ec affect the Nusselt number. For higher values of Ec, the Nusselt number shows a decline. The effect of the Brownian motion parameter Nb on the Sherwood number is seen in Figure 18.

5. Conclusion

The computational investigation of the magnetized boundary layer flow for Williamson fluid past a nonlinear stretching surface through a porous media with radiation, a heat sink/source, and a chemical reaction has been carried out. The current investigation has led to the following important conclusions:

(1) Increased magnetism has a negative influence on the fluid's velocity. This is a result of the drag force generated due to magnetism that operates against the flow.
(2) The Williamson parameter thins the boundary layer, which causes the fluid's velocity to drop, whereas the thermal buoyancy parameter has the exact opposite effect.
(3) Rising the Mass Grashof number increases the fluid's velocity, while for the concentration profile, the consequences are exactly the opposite.
(4) The thermal boundary layer thickness is positively impacted by the Eckert number and the Heat source/sink parameter, whereas the Prandtl number exhibits negative impacts.
(5) The concentration profile of fluid falls as the Chemical reaction parameter, Schmidt Number and Thermophoresis parameter lift.
(6) The presence of chemical parameter in the concentration equation is useful for working with engineering processes when fluid is chemically reactive.
(7) An increase in the values of the Prandtl number causes a rise in the local Nusselt number coefficient.
(8) The temperature of the fluid rises as the Brownian motion parameter increases, on the other hand, the fluid's concentration profile drops.

Nomenclature

a, c	Stretching constants [1/s]
C_w	Surface concentration
C_f	Dimensionless drag force
D_B	Brownian coefficient [m^2/s]
g	Acceleration due to gravity [m/s^{-2}]
Gr	Thermal Grashof number
k	Thermal conductivity [$Wm^{-1}K^{-1}$]
Kp	Porosity parameter
M	Magnetic parameter
Nt	Thermophoresis parameter
Pr	Prandtl number
R	Thermal radiation parameter
t	Time [s]
T_w	Temperature at the wall [K]
u, v	Velocity components [m/s]
X	The distance along the surface [m]

B_0	Uniform magnetic field
T_∞	Ambient concentration
U_W	Specific heat [J/Kg K]
Y	Thermophoresis coefficient [m^2/s]
K_c	Chemical reaction
Gm	Mass Grashof number
K^*	Mean absorption coefficient
Le	Lewis number
NB	Brownian motion parameter
Nu_x	Local Nusselt number
q_r	Radiative heat flux [W/m^2]
Re_X	Local Reynolds number
T	Fluid temperature [K]
T_∞	Ambient temperature [K]
U_w	Stretching velocity [m/s]
y	Distance normal to surface [m]
Greek symbols	
α	Angle of inclination
β^*	Volumetric solutal expansion
ρc_p	Heat capacity
η	Similarity variable
ϕ	Dimensionless concentration
τ	The ratio of effective heat capacitance
β	Volumetric thermal expansion
ρ_f	Fluid density [kg/m^3]
σ^*	Stefan-Boltzmann constant
θ	Dimensionless temperature
ν	Kinematic viscosity
μ	Coefficient of viscosity
Subscripts	
W	Quantities at wall
∞	Quantities far away from the surface

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Criterion 3: Research, Innovations & Extension

Academic year -2021-22
4.1.1 Ordinary functional differential equations with periodic boundary conditions involving caratheodory condition
4.1.2 Sport Participation on the Performance College Student
4.1.3 Extraction and analysis of bioactive compound from freshwater crab tissue
4.1.4 Synthesis and characterisation of Titanium oxide nano particles
4.1.5 Nanocrystlline spinal zinc-substituted cobalt ferrite thick film and efficient ethanol sensor.
4.1.6 Hetrostructured Ga2O3-activated Bi2O3 sensors for chlorine monitoring Fundamentals of sensors, materials and methods: A review
4.1.7 Synthesis and characterisation of Titanium oxide nano particles

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Ordinary Functional Differential Equations With Periodic Boundary Conditions Involving Caratheodory Condition

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Abstract: *In this paper, we proved an existence theorem for ordinary functional differential equations with periodic boundary conditions via a fixed point theorem in Banach algebras, some mixed generalized Lipschitz and caratheodory conditions.*

Keyword and Phrases: *Ordinary functional differential equation, periodic boundary conditions, fixed point theorem, Lipschitz and caratheodory condition.*

Subject classifications: 34K10

1. Introduction

In last few years, the study of nonlinear differential equations in Banach algebras is received the attention of several authors and at present, there is a considerable literature available in this way. See Dhage and O'Regan[5]. Dhage et.at. [1] and the references therein. In this article, we proved the existence results for first order ordinary functional differential equation in Banach algebras with periodic boundary condition under Lipschitz condition and caratheodory condition. We apply the fixed point theorem of Dhage[2,3.4] for proving existence results of our problem. The nonlinear differential equations as well as the existence results of this are new to the literature on the theory of ordinary differential equations. Our method of study is to converts the ordinary functional differential equation into equivalent integral equation and apply the fixed point theorem of Dhage[2,3.4] under suitable conditions on the nonlinearities f and g.

2. Statement of problem

Let $\mathbb{R}$ be the real line and $I_0 = [-\delta, 0]$ and $I = [0, T]$ be two closed and bounded intervals in $\mathbb{R}$. Let C be the space of continuous real valued functions on I_0. Given a function $\phi \in C$. We have studied the following periodic boundary value problem (In short PBVP) of first order ordinary functional differential equation

$$\frac{d}{dt}\left[\frac{x(t)}{f(t,x(t))}\right] = g\left(t, x_t, \int_0^t k(s,x_s)ds\right), \quad t \in I$$
$$x(0) = x(T), \; x_0 = \phi \qquad 2.1$$

Where $f: I \times \mathbb{R} \to \mathbb{R} - \{0\}$ is continuous and $k: I \times C \to \mathbb{R}$, $g: I \times C \times \mathbb{R} \to \mathbb{R}$,
$x_t = I_0 : \to C$ is continuous function defined by $x_t(\theta) = x(t+\theta)$ for all $\theta \in I_0$.

When $f(t,x) = 1$ on $I \times \mathbb{R}$. By a solution of the PBVP (2.1) we means a function $x \in AC(I, \mathbb{R})$ that satisfies

i. The function $t \mapsto \left(\frac{x(t)}{f(t,x(t))}\right)$ is absolutely continuous on I and

ii. x Satisfies the equation (2.1).

where $AC(I, \mathbb{R})$ is the space of continuous functions whose first derivatives exists and is absolutely continuous real valued function on I. The periodic boundary value problem (2.1) is quite general in the sense that it includes several known classes of periodic boundary value problem as special cases, for example, if $f(t,x) = 1$ on $I \times \mathbb{R}$ then PBVP (2.1) reduce to the PBVP

$$\frac{d}{dt}(x(t)) = g\left(t, x_t, \int_0^t k(s,x_s)ds\right), \text{ a.e. } t \in I$$
$$x(0) = x(T) \qquad 2.2$$

which further, when $g(t, x_t, y) = g(t, x_t)$ on $I \times C \to \mathbb{R}$, includes the following PBVP

Kalyan Bharati

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SPORTS PARTICIPATION ON THE ACADEMIC PERFORMANCE OF COLLEGE STUDENT

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Abstract
The purpose of this study was to analyses the sports participating in extracurricular sporting sports has on educational performance amongst college students in better training. A prior study in this subject matter has yielded contradictory consequences: while some authors find a positive effect of sports activities participation on academic effects, others file a terrible effect. Accordingly, the authors seek to offer a greater rounded expertise of those combined findings. The evaluation reinforces the concept that aside from their health blessings for practitioners, sporting sports result in the attainment of the performance dreams to which better training institutions aspire. This observe, however, concluded that, sports participation has no terrible results on students-athletes' educational performance in arithmetic. What this finding implies is that, parents and arithmetic teachers should no longer seize students from taking part in wearing activities with the fear that participating in sports activities worsens academic overall performance.

Keywords: sports participation, academic performance, college student

Introduction

Sports participation mentioned in an effective dating with health and educational achievement. Sports participation may additionally improve cognitive fitness main to stepped forward academic achievement. Some different factors will also be involved in this regard inclusive of parental assist and vanity. Sports involvement and academic achievement of student-athletes were a topic of discussion long time in the past. Critics observed that participation in sports may reduce the time to be had for analyzing and gaining knowledge of seeing that college students-athletes were having problems in handling their time between anxious schedules of sports education and requirements of instructional topics.

However, sports activities fanatics claimed that sports activities participation can motivate pupil-athletes to acquire harder, increase scholastic ambition, can hold them attending college, can enhance college students' educational grades, broaden cognizance the advantages of exact health, fitness and exercising, and expertise the spirit of group work, sportsmanship and camaraderie. In addition, researches confirmed pieces of proof that student collaborating in sports and physical sports lead to developed intellectual and physical alertness, mentally and physically alert college students continually stepped forward their performances, performed greater, and possibly to maintain attending classes in school Majority of the previous researches were performed with high college student-

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athletes participants, their instructional fulfillment had been measured based totally on their GWA (general weighted average) on standard topics inclusive of English, math, and technology.

The present study tested the relationship among sports activities participation and academic success of collegiate student-athletes. Participants had been from engineering, education, criminology, information generation, lodge restaurant management, food generation, and agriculture, fishery, and forestry publications within the different universities. Student-athletes were additionally asked concerning their perceptions on their improvement concerning instructional excellence, mental procedures, common sense, persistence, and sophistication attendance. It is likewise an eye fixed opener for school administrator and different critics that participation in sports activities are not just for a laugh, amusement, nor predicament to the future academic fulfillment of the scholar-athletes, as a result, it will likely be a superb assist for them to push more difficult, become extra energetic in school, extra wonderful in existence, to increase self-control, promote fitness and wellness, friendship and camaraderie.

Physical Education additionally includes sport education. Physical Education is also the techniques via which exercise, out of doors journey sports, dance, gymnastics, aquatics and games are utilized by Physical Educators to assist college students examine motor competencies and to find out about and achieve physical fitness where this is viable. Physical Education sports activities also help the university to increase personal and social capacity in university students. Therefore, the making plans and control of the Physical-Education Curriculum in Schools ought to usually have youngsters as the focus of hobby, with the general motive of presenting rich and varied stories.

Sports Participation

Sports participation Emphasizes personal success and self-advertising; it includes playing video games that don't produce any vital items or offerings in themselves, despite the fact that vital social occasions may be created around sports activities. In many methods, exercise participation is a self-targeted, self-indulgent hobby; despite the fact that training regularly involves non-public sacrifices and ache, it is actually centered on the athlete's improvement and show of physical skills in meets, suits, and video games. Realizing this can create a disaster of which means for athletes who has dedicated their lives to sports. Ironically, this crisis of that means is on occasion skilled by individuals who make tens of thousands and thousands of bucks and are regarded up to buy tens of millions of people.

One way humans can justify, deal with, and provide a cause of most of these gadgets is to define sports activities participation and achievements in sports as acts of worship, avenues for giving witness, or manifestations of God's normal plan for his or her lives. This allows athletes to "sanctify" their commitment to recreation. Through their spiritual beliefs sports activities participation is converted into an activity finished "for the honor of God", to deliver God's phrase to others, or to look at God's will. In India the sports stars are better recognized than the main politicians of the U. S. A. The lifestyle of a country is contemplated by way of using its participation in numerous video games and triumphing laurels to its country. Strong state can be constructed via the use of its wholesome and strong people. Strong military preparedness relies upon its human useful resource and accurate human resource may be fashioned through sports activities. Sports bring a nation together with extraordinary nations without bloodshed. Sports provide one of the few bits of glue that each one preserve our society collectively. It is best the sports that can develop moral values and built one's person.

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Sports have a simple position in a society, as society adjustments so do the sports activities. Sports have usually pondered improvement in society. "Sports, certainly were a reflect of society". Sports people are the made from a way of life promoted with the useful resource of a particular society in a particular era of the history. No society can produce squad dies without the effect of sports. Thus the relation among sports activities and society isn't always one sided but the ones are carefully interrelated. Sports are intricately interwoven into the material of the society, the two are inseparable. A society can be wealthy in natural resources, advanced in technology and technology, expand in exchange and business enterprise, however it is lags in improvement of human person, fitness and spirit, it'd ultimately fail as a social device and fail from the galaxy of the community of nations. Sports assist in the development of human resources in three methods: first, sports activities sports result in physical health, secondly, they increase mental fitness by producing highbrow alertness, they infuse purpose-orientation and success-orientation, and finally, they assist within the formation of man or woman thru inculcating group-spirit, loyalty and altruism. Thus, sports activities are the fields in which seeds of high individual are sown and a harvest of better guy is reaped. Thus, we will say that the extra a society is recreation loving, the extra disciplined it is. Sports have become a new weapon in the arsenal international relations.

REVIEW OF RELATED LITERATURE

MOHAMMED ABOU ELMAGD ETAL (2016)

The socio-financial reputation makeup of a person impacts everyday physical interest and performs a crucial position in an unmarried's achievements in each trouble of lifestyles, which includes average performance in sports activities. The contemporary check aimed to evaluate the effect of socio-monetary reputation determined with the resource of parental training and circle of relative's profits at the effective university college students' participation in bodily interest schooling at RAK scientific& health Sciences College.

NAMARTA VADHERA (2018)

The passage of identify education Amendments to the Civil Rights Act, changed right into an excellent revolution in the state of affairs of sports activities and specifically for ladies. Women sports activities participation raised dramatically each following the enactment of title and next to enhancements to its enforcement. Whilst name benefited girls through using growing the opportunity to play sports activities sports sports, those advantages were disproportionately reaped via manner of the use of the ones at the top of the earnings distribution. Earlier than title girls and women had been surely excluded from maximum athletic opportunities in schools Since the law surpassed, women and girls were able to take part in athletics at a good buy higher costs.

BRANDI RAYBURN ETAL (2015)

Forty years later below the provisions of identify there are nonetheless many criticisms regarding the dearth of actual gender equality in girl athletics. This observe tested sixty three NCAA department-I female athletes' belief of the effectiveness of name gender stereotypes related to their athletic enjoy thru a qualitative survey. The consequences indicated that female athletes despite the fact that professional common overall performance- and behavioural-related stereotypes and biases, even as collaborating in athletics. Individuals additionally expressed the existence of gender differences in how athletic fulfilment was perceived and identified. Researchers tried to detail the want to

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continuously reduce the winning stereotypes and biases and supplied sensible recommendations for pursing more gender equality.

JAYABHARATHI A (2017)

Game is broadly regarded as a social appropriate – some issue that contributes to both the fitness and social capital of more youthful human beings. In modern-day years, sport and bodily interest as a technique for the empowerment of girls and women has been gaining recognition worldwide. Game and bodily hobby have now not but been used on a large scale as a technique within women's movements. Girls's advanced involvement in sports activities can sell super improvement in recreation by using supplying opportunity norms, values, attitudes, understanding, talents and evaluations. Women in India are though no longer able to take a stand for themselves.

NEELAM KUMARI (2017)

The described in relation and assessment to guys and masculinity. Sports activities and the sports international have been tied with the masculine area and there has been a legacy of biasness against the lady athlete. Inside the past few a long term this style has been faced and challenged. The capacity to challenge restrictive notions about women's physical appearance, athletic capability and participation in sports activities, is apparent through their extended involvement in sports activities. Conventional stereotypes for girls have slowly been changing however there is nevertheless an extended manner to transport.

JOSEPH BAKER AND JEAN CÔTÉ (2003)

The position of workout-particular exercise inside the development of selection-making knowledge inside the sports activities of issue hockey, netball, and basketball emerge as tested. Fifteen professional desire-makers and 13 skilled non-professional athletes provided specific records about the quantity and type of game-precise and one of a type associated workout activities they had undertaken in the course of their careers. Professionals accrued extra hours of endeavour-particular workout from age 12 years onwards than did non-specialists, spending on common a few thirteen years and 4,000 hours on targeted pastime-precise practice in advance than accomplishing worldwide fashionable.

METHODOLOGY

A student was the participants of this study and selected using convenience sampling. These students were purposively decided on and categorized by using researchers to sports. Student-athletes on this study talk over with students who participated in sports activities competitions earlier than the midterm examination. On the opposite hand, non-athletes seek advice from college students that did now not take part in any sports activities competition before the midterm examination. The selected criteria had been formulated to avoid the instructor and situation elements and control the other factors that were no longer blanketed in this observe however could have an effect on the respondents' academic performance. This observes used a validated survey questionnaire and midterm rating to degree the instructional performance of participants.

Results and Discussion

Research shows that participation in sports has extremely good cognitive and physical advantages. Physically, exercise promotes coronary heart fitness, weight control, healthy blood pressure, sugar tiers, and increase mental sharpness. In the prevailing examine, though the midterm scores of non-

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athletes were better in comparison to the athlete, the statistical effects confirmed that there was no widespread distinction in the midterm scores, which supports the claims that taking part in sports activities had no poor effect on the instructional overall performance of athletes (midterm ratings in the case of this observe) in spite of the brand new training system.

This result consents with other research that trust athletic sports do not just beautify your talents, stamina, and endurance however additionally assist promote cognitive characteristic so that pupil-athletes can hold their grades up. This end result is also regular inside the take a look at of that concluded in their examine that participation in sports activities had no destructive results on the academic performance of pupil-athletes in mathematics. Sports participation developed and more advantageous academic excellence, strength of mind, cognitive abilities, and sophistication participation of pupil-athletes This query was answered inside the survey questionnaire, which tackles their each day activities inside and outside the faculty that may determine the coping techniques of athletes and in comparison it to the non-athletes.

This result means that athletes did no longer use sports as an excuse for punctuality and keep away from being undisciplined and unfair to other class contributors. The outcomes of the present research are consistent within the study of that athlete finished better in the school room and encouraged to attend classes. ETC mentioned that the attendance and punctuality coverage simply state that "ordinary and punctual attendance is of paramount significance in making sure that all college students have complete get admission to the curriculum. Valuable gaining knowledge of is lost whilst college students are absent or late" Commonly, college students encountered a trouble which include lacking the willingness to wait training and observed inside the present examine in which a number of the scholars who had been now not athletes had been skipping lessons.

However, this was an awful lot observable in the athlete in whom the best percent located in those who spoke back they "every now and then skip instructions for training," which turned into expected and understandable. This end result supported their midterm scores; though the end result was no longer full-size, the fashion showed that athletes had lower midterm scores than non-athlete. However, when they were inside the school room, athletes should atone for this via actively contributing in class. This remark supported the existing outcomes that each athletes and non-athletes were lively in class discussions wherein the percentage of folks who answered "continually" ruled compared to the alternative answers in each sport. This end result concurs with the examiner of that stated athletes give their first-rate efforts to take part in-elegance sports and discussions. Most college students benefit extra expertise and enjoy themselves within the magnificence in the event that they actively make a contribution to class.

Sports Participation and
Academic Achievement

Sports Participation and
Academic Achievement

Sports participation of the respondents were measured based on the number of years the pupil-athletes participated of their respective sports activities whilst the instructional achievement measured primarily based on their preferred weighted common from academic 12 months. Shows that nearly 25% of the variance of the number of years the student-athletes participated in sports became

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predictable from the variance of the general weighted common the scholar were given in four semesters.

CONCLUSION

It became concluded that greater sports participation must be concerned in sports and that the presence of women in all areas of sports activities is a pressing need and a vital phenomenon. The fashionable phenomenon can be visible through the collective responses at the statements regarding own family, discrimination on the idea of gender and caste, centers available for girls sports in college and locality and the social environment in which our respondents are dwelling.

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21-2

Extraction and analysis of bioactive compound from freshwater crab tissue

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S. V. Chavan, A. A. Patil, S. S. Rajput, R. P. Borale, R. S. Dhivare, et al.

materials in many industries such as food, garment, packaging, medication and pharmaceutical. Biopolymers perform important roles while products are in close contact with body tissue [7]. In addition to human drugs, working on marine natural resources in the last three decades has also seen the discovery of many chemically and biologically fascinating compounds, which have been invaluable techniques in biochemical research and have played a vital role in the recent development in life sciences [8, 9].Hence, the present study aims to extract the bio-active compound from freshwater crab shell and prediction the chemical compound structure with the characterization crystal study data and test the antimicrobial potencies.

2. MATERIAL AND METHODS

The spectroscopic analysis of the compounds was carried out by UV, IR, NMR, and LC-MS. IR was obtained by Shimadzu IR affinity spectrometer, ^{1}HNMR spectrums were obtained by Bruker Advance II 400 MHz at Savitribai Phule Pune University, Pune (MS) and LC-MS spectrum was obtained at Wockhart R and D Aurangabad (MS) India, and single crystal analysis were obtained from University of Hyderabad (telagana state), India

3. EXPERIMENTAL PROCEDURE

3.1 Sample Collection

The *Berytephusa Cuniclaris* was collected from northern region of Maharashtra state, India. The adult species was used for extraction, isolation and proximate study because adult species has more bioactive compounds as compare to juvenile [10]. After collection, the species were transfer alive in refrigerated containers to the laboratory. Crab was then euthanized by thermal shock for 15 min at -30°C. From each collected species dissect individual and collect the tissue of abdomen cavity of the crab, the crude extract was prepared from this tissue [11]. Then the extract was store in dip freezer and use whenever need.

3.2 Extraction of Sample

The tissue material was transfer to the microwave to complete dry and make in powder form, then powder was dipped in to 500 mL of ethanol for 21 day's this is called as cold maceration process because all bioactive compounds are stable at low temperature [12]. This method performed at room temperature, the material dipped in air tight container. Occasionally stirring was given due to raised speed of extraction. The compounds are diffuses from cell to extract, until equilibrium reached. After 21 days the extract were filtered and extract differentiate from the bulk , immediately fresh ethanol was added to the bulk, then repeated the procedure many time to ensure the maximum extraction yield. All extract was concentrated with rotator evaporators to remove excess amount of ethanol. However this method is best for thermally unstable compounds.

3.3 Isolation of Sample

Bioactive compounds were isolated by using solvent extraction process [13]. Macerated ethanol extract was isolated, first ethanol extract was immersed in water for 15 min. and hexane wad also added after that (2:1) in separating funnel. It was shacked and allows standing for 10 min two layers are separated, top hexane layer was removed and more hexane was added, this process was repeated 5-6 time. All collected hexane were rotary evaporated to obtained hexane fraction. Remaining aqueous layer was subjected to the same procedure with solvent like ethyl acetate, chloroform, ether, ethyl alcohol. But each time organic layer was cleared then next often crude extract.

Table-1: Solvents used for extraction

Extract in solvent	Hexane	Ethyl acetate	Chloroform	Ether	Ethanol
Quantity	30 mL	28 mL	22 mL	30 mL	30 mL

5. ANTIMICROBIAL ACTIVITIES OF EXTRACTED COMPOUND FROM CRAB

The extracted bio-active compound from crab shell was evaluated *in-vitro* for antibacterial activity against bacterial strain gram negative *Escherichia coli* at the concentrations of 100µg/mL, 200µg/mL and 300µg/mL by disc diffusion method using DMSO as solvent and nutrient agar was employed as culture media. Subsequently the 48 hrs of incubation at 37°C, the result was found by clearing zone after the incubation time was finished. The zones of inhibitions were measured and the data were commenced in Figure 2.

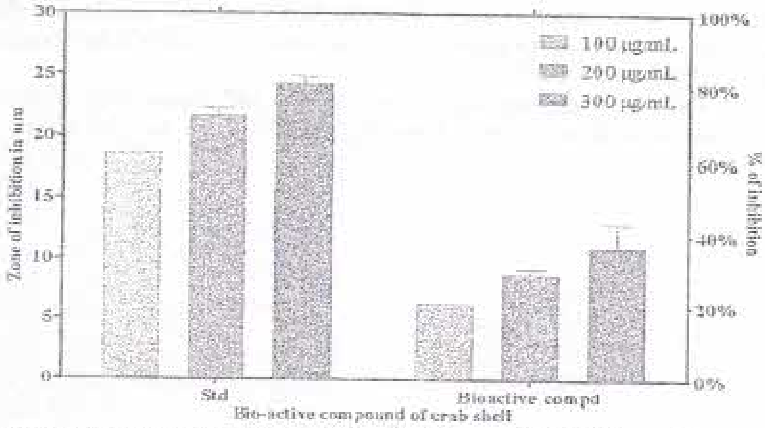

FIGURE 2. Antibacterial activities of Bioactive Compound (E.C.) Mean ± SD.

6. RESULT AND DISCUSSION

In the result view point, the extracted bio-active compound got from the fresh water crab shell the structure was predicted by using the spectral analysis viz. UV, FTIR, NMR, LCMS and crystal study and were corrected by the single crystal structure analysis. Crab harvesting is one of the fastest expanding markets, with enormous influence for crab kernel recognitions to its unique taste and strong nutritional values. Many crab species are safe for human consumption and many other crab species are economically important for the fishmeal industry. The freshwater and aquatic products globally using for human consumption and freshwater and aquatic foods, including crustaceans such as crabs, were used for their health-supporting qualities.

7. CONCLUSION

The structure of bio-active compound of fresh water crab shell was confirmed spectral analysis specially crystal structure study. The bio-active compounds were found considerably moderately active against bacterial strains gram negative *Escherichia coli* against the standard Ampicillin standard drug.

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

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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.

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Heterostructured Ga_2O_3-Activated Bi_2O_3 Sensors for Chlorine Monitoring[1]

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ABSTRACT

The nanocrystalline Bi_2O_3 powder was synthesized by ultrasonicated microwave irradiation by employing centrifugation technique at all normal conditions. Fabrication of thick films of pure Bi_2O_3 powder was made by screen printing and firing at 400°C for 30 min. Surface activations of the films involved the dipping of pure films into 0.01M aqueous solution of Gallium Nitrate for different intervals of time. The morphologies, surface topographics, constituents of elements present in the synthesized materials and crystallographic structures of the pure and surface activated films have been investigated by XRD, FE-SEM, E-DAX, etc. It has been investigated that, the Ga_2O_3 activated Bi_2O_3 (30 min) sample exhibits crucial response to 20 ppm Cl_2 gas at 250°C. Electrical and gas monitoring performance of thick films of pure and activated Bi_2O_3 have been studied and discussed.

Keywords: *Heterostructure, Nanocrystalline Bi_2O_3, Ga_2O_3, Thick films, Cl_2 Sensor*

1. Introduction

The research and development in the gas sensing field have emerges the new challenges for the researchers, scientists and industrialists. Hence, there is a great scope of innovations for this material to fabricate gas sensors [1]. Metal oxides such as Ga_2O_3, ZnO, SnO_2, WO_3, CuO, ZrO_2, etc. have attracted great deal of interest as their electrical and optical characteristics get changes on the exposure of reducing or oxidizing gases [2-8]. Metal oxide thick films offer good possibilities in tailoring the gas response and selective nature of the gas sensors, by changing the various parameters. Gallium oxide (Ga_2O_3) is a versatile wide band gap semiconducting metal oxide with wide applications such as transparent conducting electrodes, phosphors, dielectric gates, gas sensors, etc. [9]. Ga_2O_3 is very promising materials in oxygen sensing, but at high temperatures from 600-1000°C which is not desirable [10-11].

Water disinfection processes, paper and pulp industries, drinking and wastewater treatment plants, bleaching processes, etc. use chlorine widely. Long and continuous exposure to chlorine can be detrimental for humans [12-14]. Chlorine has excellent bleaching ability, but once it is discharged in aquatic systems, it interacts with other industrial effluents to produce a host of chlorinated organic such as dioxin. Dioxin persists in the environment for prolonged periods and has a tendency to bio-accumulate in the food chains, which elicit toxic effects to humans, viz. skin infection, psychological disorders and even liver damage. Gas chromatography, chemical detecting tubes and electrochemical sensing techniques are available for the detection of chlorine gas in the environment, but they are inconvenient techniques to monitor chlorine gas at low temperature [15-18]. It is therefore, necessary to monitor chlorine gas and to develop the efficient chlorine gas sensors.

2. Materials and Methods

2.1 Synthesis of Nanocrystalline Bi_2O_3

Nanocrystalline Bi_2O_3 powder was synthesized by ultrasonicated microwave irradiation by employing centrifugation technique at normal conditions. For the

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Fundamentals of Sensors, Materials and Methods: A Review[1]

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ABSTRACT

The number of materials, methods and monitors are available for monitoring hazardous, toxic and inflammable gases. Bulk and nanoscaled material powders were utilized for fabricating the gas monitors, out of which, the nanoscaled materials show the challenging response to such gases. Thick film sensors exhibit the crucial response to such polluting gases which can be attributed with the porous nature of the film. This review paper shows the detailed study about the materials and monitors already available in the field.

Keywords: *Nanoscaled Material, Thick Films, Gas Monitor, etc.*

INTRODUCTION

The advancement and development of Science and Technology has been explosively enhanced all over the world, which has made available the easy and comfortable survival of human beings. However, the environment has not been preserved properly by man. During the competition of qualitative and quantitative production under development, many toxic and hazardous gases are released in the environment. Increasing industrialization results in unsustainable heights of pollution [Fig. 1]. Nearly, half of the population of the world is exposed to increasing air pollution as a result of which, 4.2 million deaths have been estimated annually due to particulate matters $PM_{2.5}$, declared WHO in 2016 [1-7]. In China alone, 1.2 million premature deaths occurred during 2010-2015, due to pollution [8]. The pollutants, so sadly affected all the components of environment such as air, water, soil, noise, etc. that the entire environment has become polluted and affected the living beings [9-11].

[1] *How to cite the article:*
Patil S.D., Nikam H.A., Sharma Y.C., Salunkhe D.B., Jagtap U.S., Girase S.V., Patil D.R., Fundamentals of Sensors, Materials and Methods: A Review, IJRST, Apr-Jun 2022, Vol 12, Issue 2, 25-40, DOI: http://doi.org/10.37648/ijrst.v12i02.005

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SYNTHESIS AND CHARACTERIZATIONS OF TITANIUM DIOXIDE NANOPARTICLES

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ABSTRACT

Nanostructured TiO_2 thin film has been prepared by simple spray pyrolysis technique. was employed to prepare. To prepare nanocrystalline TiO_2 thin film by using solution of AR grade Titanium chloride ($TiCl_3$, 0.05 M). The solution was sprayed on quartz substrate heated at 350^0C temperature to obtain the film. This thin film was annealed for a one hours at 600^0C. As prepared thin film was characterized by X-ray diffraction, Microstructure properties study was conducted using Transmission Electron Microscopy. The sensing performance of this thin film was tested for various gases such as LPG, H_2, CO_2, Ethanol, NH_3 and Cl_2 (500 ppm). Gas response, selectivity, response and recovery time of the sensor were measured and presented.

KEYWORDS: *Spray pyrolysis techniques, TiO_2 thin film, gas sensor, sensitivity, bandgap.*

1. INTRODUCTION

Gas sensor researches are focused on new studies to developed smaller and most efficient device, which are very important in the electronic industry and are pursued with increasing demand. There is great attention has been focused on the titanium dioxide (TiO_2) thin films over the last few years. Because TiO_2 is an excellent material in many applications such as in the field of sensors, antireflection coatings, solar cells, gas sensors.[1-13] There are many methods that can be used to prepare TiO_2 thin films with desired properties including sol-gel[14], sputtering[15], anodic oxidation[16], pulsed laser deposition (PLD)[17] and spray pyrolysis.[1-12] Of all the afore-mentioned thin film fabrication methods, spray pyrolysis is widely used because of its simplicity, cheap chemical deposition procedure, allowing the growth of rough-surface films at atmospheric pressure, on large area.

2. EXPERIMENTAL

2.1 Preparation of pure TiO_2 thin film

The spray pyrolysis technique was employed to prepare TiO_2 thin film. Aqueous solution of Titanium chloride was used as precursor ($TiCl_3 \cdot 6H_2O$, 99.9% pure, Merck made, Germany) with concentrations of 0.05 M, were prepared in double distilled water. The solution was sprayed onto quartz substrate heated at 350^0C to obtain the film. This thin film was fired for a one hour at 600^0C and termed as S.

2.2 Optimized parameters

The optimized parameters used for preparation of nanocrystalline TiO_2 thin film using spray pyrolysis techniques were presented in Table 1.

Table 1: Optimized parameters for preparation of nanocrystalline TiO_2 thin film.

Parameters	Optimization
Solution delivery	Syringe gun
Nozzle diameter	0.001mm
Compressed Air	2.5 Kg/cm^2
Solution flow rate	4.9 ml/min
Distance from nozzle to substrate	27 cm
Carrier gas	Air
Solvent	Double distilled water
Precursor	Titanium chloride ($TiCl_3$)
Concentration	0.05 M
Substrate	quartz
Deposition time	10 min.
Deposition temperature	350^0C
Firing temperature	600^0C
Annealing time	60 min

3. MATERIALS CHARACTERIZATIONS

The structural analysis of nanocrystalline TiO_2 thin films was carried out by XRD (Rigaku DMAX 2500) with CuKα radiation at a wavelength of 1.5418 Å. Electron diffraction patterns of nanocrystalline TiO_2 thin films were obtained using a Transmission Electron Microscopy [Philips, CM 200 (200 KV HT)]. A UV-Visible spectrophotometer (Shimadzu 2450 UV-VIS) was used to study the optical properties of nanocrystalline TiO_2 thin film.

3.1 Structural properties: X-ray diffraction studies

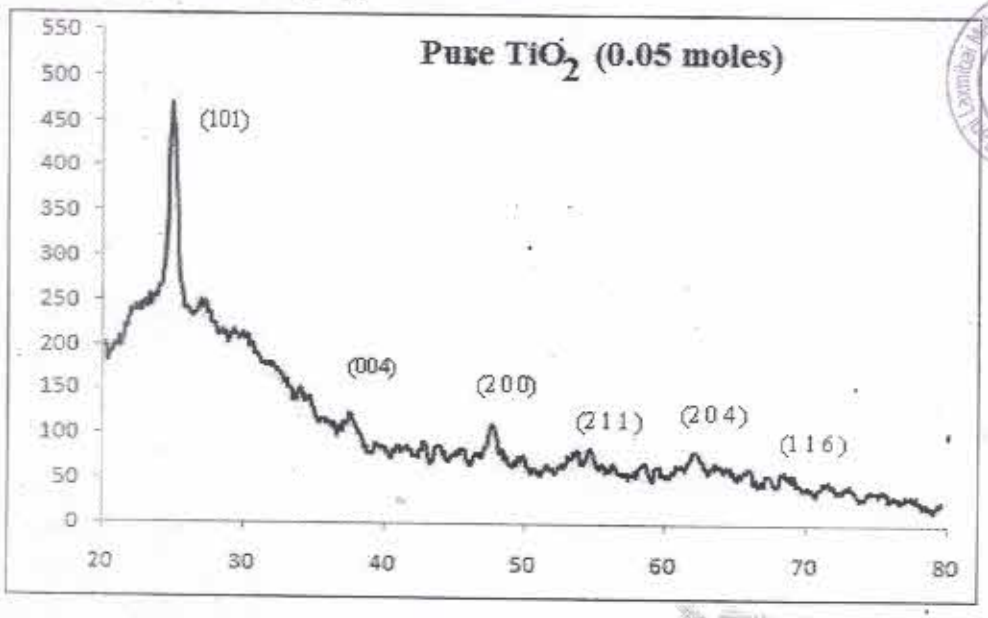

Figure 1: X-ray diffraction spectra of sample S.

Figure 1 shows XRD spectra of sample S. The observed "d" values of TiO_2 films confirmed that the deposited films are of TiO_2 anatase phase with tetragonal structure matched well with the ASTM data book.[18] In the XRD pattern, the (101) peak has the most distinct reflection. So, the mean crystalline size is calculated with the line broadening of the (101) reflection using well known Scherrer Eq. (1)

$$d = 0.9 \lambda / \beta \cos\theta \quad (1)$$

Where, d is crystallite size, β is the full width at half maxima in radians and λ the wavelength of X-ray (1.5418 Å). The crystallite size was observed to be 10.27 nm.

3.2 Microstructure and electron diffraction using TEM

Figure 2 show the Transmission Electron Micrograph [CM 200 Philips (200 kV HT)] of powder obtained by scratching the thin film sample S and powder was dispersed in ethanol. TEM uses Copper grid to hold the powder. The sample particles on the grid were scanned in all the zones before the picture was taken. Figure 2 shows that the grains are ellipsoidal in nature with an average grain size of 12 nm. XRD and TEM studies confirmed pure tetragonal structure of TiO_2 as evidenced from figure 1 and figure 2 respectively. XRD and TEM studies confirmed pure tetragonal structure of TiO_2 as evidenced from figure 1 and figure 2 respectively. Table 2 show the comparison of grain size from Transmission Electron Micrograph and X-ray Diffraction.

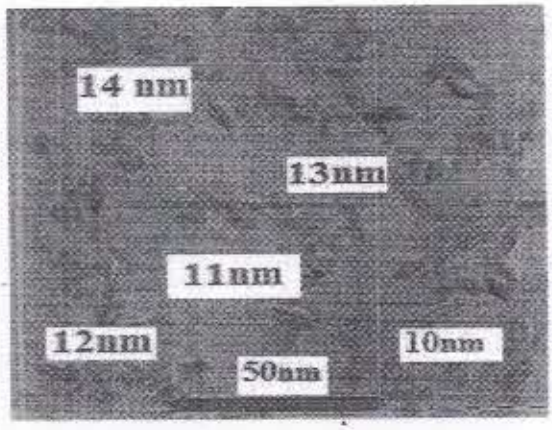

Figure 2: TEM image of sample S.

Table 2: Grain size calculated from XRD and TEM.

Sample	Grain size calculated from XRD(nm)	Grain size calculated from TEM (nm)
S	10.27	12.00

3.3 Optical absorption

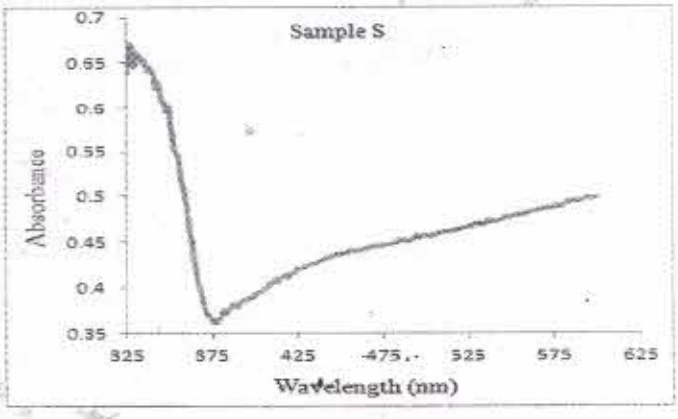

Figure 3: Absorption spectra of samples S.

Figure 3 show the variation of absorbance with wavelength of nanocrystalline TiO_2 thin films in the range of 300-600 nm. The band gap energy of the samples was calculated from the absorption edges of the spectra.[19] The band gap was observed to be 3.28 ev.

4. SENSING PERFORMANCE OF TIO_2 THIN FILM

4.1 Gas sensing performance of thin film resistors

The thin film sensors mounted in static gas sensing system were tested on exposure of ethanol, carbon dioxide, LPG, ammonia, chlorine and hydrogen. Values of currents before

and after exposure of gas were measured and gas responses at various operating temperatures were determined.

4.2 Measurement of gas response and selectivity

Gas response (S) is defined as the ratio of the change in conductance of the sensor on exposure to the target gas to the original conductance in air. The relation for S is as:

$S = (G_g - G_a) / G_a$

where, G_a and G_g are the conductance of sensor in air and in a target gas medium, respectively.

Selectivity or specificity is defined as the ability of a sensor to respond to a certain gas in the presence of other gases.

4.3 Variation of gas response with operating temperature for different gases

Figure 4 shows the variation of gas responses with operating temperature. It is clear from the figure 4 that the gas response increases with operating temperature, reaches to maximum [for LPG (S=397) at 250^{0}C for 500 ppm] and falls with further increase in operating temperature. Sensor S is most sensitive to LPG at 250^{0}C.

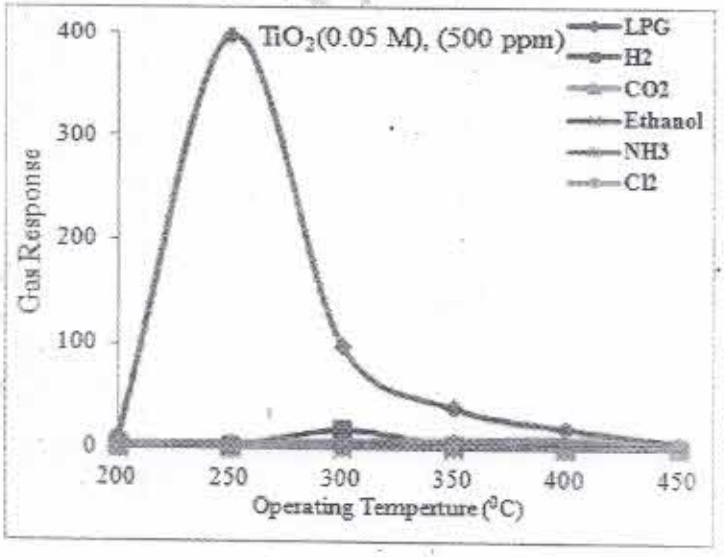

Figure 4: Variation of gas responses with operating temperature.

5. DISCUSSION

Gas sensing mechanism is generally explained in terms of conductance either by adsorption of atmospheric oxygen on the surface and/or by direct reaction of lattice oxygen or interstitial oxygen with the test gases. In case of former, the atmospheric oxygen adsorbs on the surface

by extracting an electron from conduction band, in the form of super-oxides or peroxides, which are mainly responsible for the detection of the test gases. At higher temperature, the adsorbed oxygen captures the electrons from conduction band as.

$O_2(air) + 2e^-$ (cond. band) $\rightarrow 2O^-$ (film surface).

It would result in decreasing conductivity of the film. When LPG reacts with the adsorbed oxygen on the surface of the film, it gets oxidized to CO_2 and H_2O by following series of intermediate stages. This liberates free electrons in the conduction band. The final reaction takes place as.

$$C_4H_{10(gas)} + 13O^-_{(film\ surface)} \rightarrow 4CO_{2(gas)} + 5H_2O_{(gas)} + 13e^-_{(cond.\ band)}$$

This shows n-type conduction mechanism. Thus generated electrons contribute to a sudden increase in conductance of the thin film. Therefore, the higher response was obtained to 500 ppm LPG. .

6. CONCLUSIONS

1. Simple spray pyrolysis technique was observed to useful for the preparation of nanostructure film of TiO_2.
2. The grain size calculated from XRD match well with the grain size observed from TEM.
3. Nanocrystalline TiO_2 thin films were observed to be sensitive to LPG at 250^0C.
4. Nanocrystalline nature was observed to be useful in gas sensing.

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Criterion 3: Research, Innovations & Extension

Academic year -2020-21
3.1.1 Development in Agricultural Tools in Rural Area of Nashik District Maharashtra (1995 -2015)
3.1.2 BIOCHEMICAL (PROXIMATE AND ELEMENTAL) ANALYSIS OF FRESHWATER CRABS BARYTELPHUSA CUNICULARIS WHICH ENHANCE TOFOOD DOMAIN
3.1.3 Effect of Zinc substitution on magnesium ferrite Nano particles: structural, electrical magnetic and gas sensing Properties.
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Rani Laxmibai Mahavidyalaya IQAC PAROLA Dist. Jalgaon

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Development in Agricultural Tools in Rural Area ofNashik District, Maharashtra (1995 -2015)

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Introduction:-

Rural agricultural toolsused for agricultural cultivation change of Nasik district by using the data 1995-2015 sample survey, in Nasik district were selected for the study. Indian economy can be still said to be an agrarian economy. The study was undertaken to identify various traditional tools used by farmers for agricultural operations in the Nasik district. These tools were made up by using locally available materials like stone, wood, etc. Traditional tools are handling easily without any special skills. By considering the need of modern agriculture, it is essential to design and manufacture number of modern agricultural new implements. We wish to point out that these implements are designed, manufactured, sold and in use in various parts of our country and through that the modern cultivation are very effectively and successfully implemented and thereby the yields are increased in a highest percentage of appreciation. By using these implements, labour cost can be reduced.

Selection oftheTopicand theStudy Area:

Nashik District occupies the northwestern part of the Maharashtra lies between18° 34' N to 20° 54' N latitude and 73° 15' E to 75° 16' E longitude.The area of Nasik district is 15531SqKms.The district is the third largest in the state and with an average elevation of 566meters above mean sea level. Thedifferent physical characteristic it's differ from the other district of Maharashtra.At present Nashik District comprises of a total of fifteen tehsils. The Nashik District is bounded by Dhule District in the north, Jalgaon and Aurangabad districts in the east, Ahmednagar District in the south, Thane District in the south - west and the Gujarat State in the north – west

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BIOCHEMICAL (PROXIMATE AND ELEMENTAL) ANALYSIS OF FRESH WATER CRABS BARYTELPHUSA CUNICULARIS WHICH ENHANCE TO FOOD DOMAIN

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ABSTRACT

The biochemistry of tissue of *Barytelphusa Cunicularis* freshwater crab analyzed the proximate composition and elemental content from inner part of the abdominal cavity. The focus of study was to outline chemical characteristics and edible property of *Barytelphusa Cunicularis*. On principle component analysis show the significant and non significant variants in the moisture and ash content were observed. Protein content was higher as compare to rest of the composition. Carbon content significant lower than Ca, K, and Mg respectively. Among the micro elements B, Ba, Cd, Cr, Cu, Li, Pb and V show extremely lower concentration that is traceable amount. Zn and Sr characterized higher composition. The analysis of crab data interpret on practical basis, but lack of availability of literature of *Barytelphusa Cunicularis* mean while data compare with other species to elaborated information on their macro and micro elemental composition. The study of chemical substances and vital process occurring in *Barytelphusa Cunicularis*, the chemical composition of fresh water species destined for human consumption influenced for nutritional preference according there variety and environmental condition. Constancy of product quality commercial market requires constant supply of the substantial quantity of crab for which harvestable area must be identified. Hence the objective of this study was to access chemical composition of the fresh water crab.

KEYWORD: *Biochemistry, freshwater, food domain, proximate, fingerprinting.*

transfer alive in refrigerated containers to the laboratory. Crabs were then euthanized by thermal shock for 15 min. At -30^{0}c from each collected species dissect individual and collect the tissue of abdomen cavity of the crab, the crude extract was prepared from this tissue.[2] The extract was store in dip freezer and use whenever need.

2.2. Proximate analysis

The proximate compounds were analysed using reputed literature procedure.

Moisture: The tissue of the crab was oven dried at 135^{0}c and weighed; this method was repeated until constant weight was obtained. (AOAC 2019).

Ash: weighed 2 gm of sample in to porcelain crucible and placed in temperature controlled furnace preheated to 600^{0}c. Hold at this temperature 2 hours. Transferred crucible directly to dedicator, cool and weighed immediately % of ash.(AOAC 2019).

Total carbon and nitrogen: The freeze-dried tissue was on combustion by using elemental analyser (thermo scientific flash 1112).

Protein 100 mg tissue + 5 ml Distilled water + 5 ml 30% TCA → the protein precipitate → centrifuged at 3000 rpm→ discard supernent liquid + 0.1 N NaOH→ precipitate dissolved + 4ml $CuSO_4$ + 0.4 ml foline reagent→ **Blue coloration of the solution indicated presence of protein.**

2.3. Elemental analyzer

The tissue were mixed with 4 ml H_2O_2 and 6 ml HNO_3 at 180^{0}c for 10 digestion solvent system in microwave, cooled sample and diluted with double distiiled water to make volume 25 ml filtered through Whitman no. 42 paper measured elements by ICP- AES (SHIMATDZU ICPE-9800 Series). Results expressed as mg 100 g^{-1} (Raab. et. al.2005).

2.4. Statistical analysis

Principal component analysis (PCA) and Permutational multivariative ANOVA (PERMANOVA) were used to multivariative data analysis and find the exact elemental composition of this species. In principle composition analysis matrices were constructed and performed fix factor *p* from PERMANOVA analysis these all values were calculated from raw data. PCA and PERMANOVA analysed were performed by using software (PAST326B.PCA Germany) were performed data of the species like proximate composition,

Potassium (k) has highest macro element, then sodium (Na) 242.10 has second prior calcium (ca) 235.01 third prior and magnesium (Mg) 48.10 these macro elements has highest composition, carbon (C) and Nitrogen (N) has 8.37 and 3.14 respectively less composition but ferrous (Fe) has 0.44 negligible composition. When micro-elements resulted data was observed zinc (Zn) and strontium (Sr) highest composition in freshwater crab tissue copper (Cu) and Manganese (Mn) also showed low composition while Boron (B), Barium (Ba) and Vanadium (V) has lest one but Lithium (Li), Nickel (Ni) and lead (Pb) were resulted negligible composition.

The present study concluded that the tissue of freshwater crab has good nutritional value due to protein content. The macro elements Ca, K, Mg, and Na has enriched they make vital role in living system of the human body, micro-elements like Zn and Sr most abounded, these are all biologically active elements. It means that freshwater crabs always beneficial to human life and make important role in drug design leads.

4. Principle component analysis

There are various explanatory variables in data they are correlates with other so by principle component analysis method that's components are identified from database, make standard linear method. PCA is very important tools of assessment because variable data study were large number of differences, so PCA sorted out data into groups of variable. It is also data reduction method.

4.1. One way anova test.

Test for equal means	Sum of sqrs	df	Mean square	F	p (same)
Between groups	7.286E06	3	2.42867E06	0.8778	0.4692
Within groups	5.5337E07	20	2.76685E06	-	-
Total	6.2623E07	23	0.2876	-	-

4.2. Permutation p (n=99999)

One way ANOVA test gives the value of fixed factor *p*, it was unrestricted raw data.

4.3. Components of variance (only for random effects)

Var (group) : -65809

Var (error) : 2.76685E06

ICC : -0.0243643

Omega2 : 0

Fig.3. score plot of the first two components of the principle components analysis conducted with the proximate elements are characterizing. The most significant correlation with biometric data is shown. Fig.4. score plot of the PCA of third and forth component conducted with the macro and micro elements composition data characterizing of tissue of the *Barytelphusa Cunicularis.* The most significant correlation both chemical elements are shown.

The tissue of *Barytelphusa Cunicularis data* was analysed, there were variable components, but protein has most abundant due to fact this freshwater crab species utilize to food which characterized in fig.3. When analysis of fresh water crab point to be noted that most of the difference in chemical elements that's while differs macro and micro or trace elements. The protein content was estimated using total nitrogen concentration from standard AOAC method, it is more effective method. In general the proximate parameters of the *Barytelphusa Cunicularis* observed moisture was 78.70% due to this weight of the crab is 302.56 gm for this composition study adult crab was used. In adult species protein content has most abundant (Ozogul et.al. 2013 Baklouti.et.al, 2013).

The PCA analysis performed elemental concentration of *Barytelphusa Cunicularis* major four principle components are explained first at 85.71% and second was 50% consequently *Barytelphusa Cunicularis* was indicated in PCA plot (Fig.4) it is proved by PERMANOVA test (F=1.728, p=0.3321). Further bivariance comparison indicated that significant multivariate occurs. Among, macro element significant of carbon has lower content comparison to Ca, Mg & Na respectively. In micro-elements B, Ba, Cd, Cu, Li, Ni, V & Pb has negligible, while Zn and Sr have higher content.

5. CONCLUSIONS

Here presented data was description about tissue of the *Barytelphusa Cunicularis* from abdominal cavity. The analysis focused a wide proximate composition and elemental content. Aims of this study also incorporate study of the elemental finger printing of the macro and micro elements, which provide advance biochemical screening method based on H^1NMR metabolomics and provide the standard profiling procedure towards investigation of freshwater food domains.

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Effect of zinc substitution on magnesium ferrite nanoparticles: Structural, electrical, magnetic, and gas-sensing properties

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ABSTRACT

In this study, we fabricated zinc-substituted magnesium ferrite ($MgFe_2O_4$) (ZMF) nanoparticles with the general formula $Zn_xMg_{1-x}Fe_2O_4$ (x = 0.00–0.75) using a surfactant-assisted co-precipitation method and evaluated their H_2S gas-sensing performance. Fourier-transform infrared and X-ray diffraction analysis results reveal the formation of a cubic spinel ferrite structure. The effect of zinc substitution on the physico-chemical properties of $MgFe_2O_4$ was studied and is discussed herein. The polycrystalline ZMF nanoparticles are magnetic and showed advantageous gas-sensing performance, the results of which reveal that they are sensitive to and selective for hydrogen sulfide (H_2S) gas. The ZMF gas sensors exhibited good sensing of various test gases/vapors, such as H_2S, H_2, Cl_2, carbon dioxide, liquid petroleum gas, ammonia, and ethanol while working at room temperature to 400 °C. The $Zn_{0.5}Mg_{0.5}Fe_2O_4$ composition produced the highest response toward 10 ppm H_2S gas at 400 °C operating temperature.

1. Introduction

Nowadays, gas sensors have garnered tremendous attention due to human safety concerns and environmental monitoring requirements. Recently, the daily air pollution has increased enormously due to rapid industrialization and many automobiles yielding numerous pollutants such as gases, volatile organic compounds, suspended particulate matter, etc. Therefore, researchers, engineers, and technocrats are determined to reduce air pollution by using different methods to detect, control, and reduce pollutants at their sources [1,2]. H_2S (hydrogen sulfide) is a highly toxic gas produced by various industrial effluent treatment plants, oil refineries, oil and natural gas drilling, Kraft paper mills, tanneries, thermal power plants, etc. and natural activities such as volcanic eruptions and anaerobic decomposition of organic waste [3,4]. The precise detection of H_2S gas during oil and gas drilling is needed to reduce the possibility of health hazards and explosions. Hence, developing gas sensors that can detect low concentrations of H_2S at around a few ppb or ppm is necessary to avoid the dangers of toxic gases.

Recently, the cubic spinel structure with the general formula AB_2O_4 (A^{2+} are divalent metal cations and B^{3+} are trivalent metal cations) of mixed metal oxide nanoparticles have produced the most promising materials due to their versatile and widespread application in the fields of biomedicine, electrochemical energy storage, magnetic recording media, high-frequency transformers, telecommunications, etc. [5–8]. Technologists are looking for easy, simple, efficient, and effective ways of synthesizing nanomaterials with large volume-to-size ratios and different shapes, sizes, compositions, and morphologies [9–11]. Choodamani et al. [12] reported the structural, morphological, dielectric, and magnetic properties of single cubic spinel zinc-substituted magnesium ferrite ($MgFe_2O_4$) synthesized using a solution-combustion method at a high sintering temperature of 1050 °C. Magnesium-doped zinc ferrite is a promising material suitable for a variety of applications, such as in transformer cores, magnetic sorbents, biomedicine, photocatalysts, and gas and humidity sensors [13–15]. Various spinel ferrite nanoparticles have been synthesized in modern times using various techniques such as chemical co-precipitation [17,18], microwave combustion [19], hydrothermal [20], sol–gel [21], microemulsion [22],

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Environmental Impact of Irrigation Transformation in Nasik District (M. S.)

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Abstract:

Environmental impact of Irrigation facilities requirement of water to crops is fulfilling. The various sources of water for irrigation are wells, ponds, lakes, canals, tube-wells, and even dams. The study area some former diverted to modern irrigation system and cash crap. This can be done by two methods, traditional irrigation method and modern irrigation method. Traditional irrigation method is done manually. The main advantage of this method is that it is cheap but efficiency is very poor because the distribution of water is not properly. The modern irrigation method involves two systems: Drip irrigation and Sprinkler irrigation.

Keywords: *Irrigation facility traditional, modern, sample survey's*

Introduction:

Rural area in Nasik district, the economy is primarily based on agricultural activities and impact of environment. The part of the district in which irrigation facility is available is more productive than the dry farming area. Those areas facing water scarcity this area modern irrigation system is much advisable in that area. In Drip irrigation system, water supply is drop by drop exactly as roots using a pipe. This method can also be used in regions where water availability is less. Nasik district were selected for the study. In the study region different occupations are observed at the time of survey. The primary data of 1995-2015 were collected by sample survey method with the help of questionnaires through personal interview.

Objectives of the research:

1. To find out the recent trends in irrigation transformation.
2. To evaluate the types of irrigation system in the agriculture.
3. To evaluate the economic progress and environmental impact of the region.

Hypothesis:

1. There are spatiotemporal variations in irrigation transformation in study region.
2. Tribal farmers with lower level of irrigation transformation.

Data collection and research methodology:

While studying the irrigation transformation in Nasik district the researcher has collected the data from primary. There are 1948 villages in the study region. Data have been collected from farmers with the help of intensive field- work through well prepared questionnaires. Considering the huge population, about 10 percent households, 20 percent villages were selected from the study region.

For calculating transformation, the data of 1995 and 2015 are compared. For this, the data of the year 1995 is considered as base, i.e. 100 percent. The increase of decrease observed in the year 2015 is calculated in percentage.

Use of Irrigation Facilities in Agriculture:

In rural area of Nasik district, the economy is primarily based on agricultural activities and environmental impact of transformation in irrigation facilities. The part of the

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Effect of zinc substitution on magnesium ferrite nanoparticles: Structural, electrical, magnetic, and gas-sensing properties

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ABSTRACT

In this study, we fabricated zinc-substituted magnesium ferrite ($MgFe_2O_4$) (ZMF) nanoparticles with the general formula $Zn_xMg_{1-x}Fe_2O_4$ (x = 0.00–0.75) using a surfactant-assisted co-precipitation method and evaluated their H_2S gas-sensing performance. Fourier-transform infrared and X-ray diffraction analysis results reveal the formation of a cubic spinel ferrite structure. The effect of zinc substitution on the physico-chemical properties of $MgFe_2O_4$ was studied and is discussed herein. The polycrystalline ZMF nanoparticles are magnetic and showed advantageous gas-sensing performance, the results of which reveal that they are sensitive to and selective for hydrogen sulfide (H_2S) gas. The ZMF gas sensors exhibited good sensing of various test gases/vapors, such as H_2S, H_2, Cl_2, carbon dioxide, liquid petroleum gas, ammonia, and ethanol while working at room temperature to 400 °C. The $Zn_{0.5}Mg_{0.5}Fe_2O_4$ composition produced the highest response toward 10 ppm H_2S gas at 400 °C operating temperature.

1. Introduction

Nowadays, gas sensors have garnered tremendous attention due to human safety concerns and environmental monitoring requirements. Recently, the daily air pollution has increased enormously due to rapid industrialization and many automobiles yielding numerous pollutants such as gases, volatile organic compounds, suspended particulate matter, etc. Therefore, researchers, engineers, and technocrats are determined to reduce air pollution by using different methods to detect, control, and reduce pollutants at their sources [1,2]. H_2S (hydrogen sulfide) is a highly toxic gas produced by various industrial effluent treatment plants, oil refineries, oil and natural gas drilling, Kraft paper mills, tanneries, thermal power plants, etc. and natural activities such as volcanic eruptions and anaerobic decomposition of organic waste [3,4]. The precise detection of H_2S gas during oil and gas drilling is needed to reduce the possibility of health hazards and explosions. Hence, developing gas sensors that can detect low concentrations of H_2S at around a few ppb or ppm is necessary to avoid the dangers of toxic gases.

Recently, the cubic spinel structure with the general formula AB_2O_4 (A^{2+} are divalent metal cations and B^{3+} are trivalent metal cations) of mixed metal oxide nanoparticles have produced the most promising materials due to their versatile and widespread application in the fields of biomedicine, electrochemical energy storage, magnetic recording media, high-frequency transformers, telecommunications, etc. [5–8]. Technologists are looking for easy, simple, efficient, and effective ways of synthesizing nanomaterials with large volume-to-size ratios and different shapes, sizes, compositions, and morphologies [9–11]. Choodamani et al. [12] reported the structural, morphological, dielectric, and magnetic properties of single cubic spinel zinc-substituted magnesium ferrite ($MgFe_2O_4$) synthesized using a solution-combustion method at a high sintering temperature of 1050 °C. Magnesium-doped zinc ferrite is a promising material suitable for a variety of applications, such as in transformer cores, magnetic sorbents, biomedicine, photocatalysts, and gas and humidity sensors [13–16]. Various spinel ferrite nanoparticles have been synthesized in modern times using various techniques such as chemical co-precipitation [17,18], microwave combustion [19], hydrothermal [20], sol–gel [21], microemulsion [22],

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RESEARCH ARTICLE

Petiolar Anatomy as an Aid in Taxonomy of the Genus Ixora L. (Rubiaceae)

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ABSTRACT

The present authors investigated petiolar anatomy of 12 species of the genus *Ixora* L. (Rubiaceae). The petioles (in T.S.) are horse shoe-shaped, planoconvex or circular in outline. They are usually winged and channeled adaxially. The extent of development of various tissues and their distribution, besides the cell inclusions, are observed. The vasculature is resolved into a conspicuous central arc, besides few other vascular bundles. The central arc is horse shoe-shaped, heart-shaped, circular, lunar or crescent shaped. The vascular arcs or bundles are capped abaxially by few sclerenchymatous layers, except few. The shapes of petiole, petiolar wings, features of epidermis, patterns of vascular supply and association of sclerenchyma with it, cell contents, etc. are thought systematically important. All these features are employed to prepare a key helping identification of the taxa investigated.

Keywords: *Ixora*, Petiole, Anatomy, Taxonomy.

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Self Attested

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६. समाजव्यवस्थेवर झालेले दूरगामी परिणाम : एक अभ्यास

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राणी लक्ष्मीबाई महाविद्यालय, पारोळा, जि. जळगाव.

प्रस्तावना

आज अखिल जगतात कोरोना व्हायरस ने थैमान घातले आहे .या महामारी मुळे दररोज हजारो निरपराध लोक बळी जात आहेत. या जीवघेण्या आजाराने जणू सारे विश्वच पादाक्रांत केले आहे. सारा मानवी समाज हवालदिल झालेला आहे. जागतिक महा सत्तेत अग्रस्थानी असलेल्या राष्ट्रां पासून छोट्या-मोठ्या राष्ट्रा पर्यंत... नव्हे गाव वस्त्यांत पर्यंत कोरोना ने हाहाकार माजविला आहे. सारा मानवी समाज ढवळून निघाला आहे. कोरोनाच्या प्रादुर्भावामुळे सारी समाजव्यवस्था कोलमडून पडते की काय अशी भीती वाटायला लागली आहे. मानवी जीवनाच्या सर्वांगीण क्षेत्रांवर कोरोना ने लक्ष्यवेधी परिणाम केल्याचे दिसून येते.

कोरोनामुळे निर्माण झालेला स्थलांतराचा प्रश्न

कोरोनाच्या प्रादुर्भावामुळे सगळ्यात भयावह प्रश्नाला सामोरे जावे लागले तो म्हणजे स्थलांतराचा प्रश्न होय. यामध्ये अगदी अत्याधुनिक तंत्रज्ञानाचे उच्चशिक्षण घेण्यास गेलेल्या तरुण वर्गापासून ते परदेशात नोकरी-व्यवसायाच्या निमित्ताने असलेल्या उच्चभ्रू वर्गापर्यंत... त्याचप्रमाणे पोटाची खळगी भरण्यासाठी परप्रांतात वास्तव्यास असलेल्या मजूर वर्ग या साऱ्यांनाच स्थलांतरामुळे निर्माण झालेल्या परिस्थितीला वेगवेगळ्या पातळ्यांवर सामोरे जावे लागले .कोरोनाचा वाढता प्रादुर्भाव रोखण्यासाठी प्रशासनाने टाळेबंदी जाहीर केली .या टाळेबंदी मुळे समाजाचा रंगच पालटून गेला. प्रशासनाचा हा निर्णय कोरोना चा प्रादुर्भाव रोखण्यासाठी स्वागतार्ह होता ....नव्हे ती काळाची गरज होती. परंतु याची ची दुसरी बाजूही लक्षात घेतली पाहिजे समाजातील बहुतांशी वर्गावर या निर्णयाचे विपरीत परिणाम झाले . सारं काही सुरळीत सुरू असताना दैनंदिन जीवनक्रमाचे चक्र अचानक थांबले. नोकरी व्यवसायाच्या वाटा बंद झाल्या. चाकरमनी ,मजूर वर्ग चार भिंतीच्या आत बंदिस्त झाला .या निर्माण झालेल्या जीवघेण्या परिस्थितीवर कशी मात करावी हा यक्षप्रश्न निर्माण झाला. नोकरी-व्यवसायासाठी घराबाहेर पडता येत नाही .रोजंदारीवर काम करणाऱ्यांचा रोजगार बंद झाला. घरकाम करणाऱ्या महिलांना घरमालकांनी कामावरून काढून टाकले. ज्या घरात झोपडीत ते वास्तव्यास होते त्यांना त्यांचे घर भाडे देणे शक्य नाही म्हणून काही घरमालकांनी त्यांना घराबाहेर काढले. हाताला काम नाही आणि पोटाला भाकरी नाही. अशा विचित्र स्थितीला त्याला सामोरे जाणे भाग पडले. डोळ्यादेखत पोटची मुलं आणि पत्नी उपाशीपोटी कावराबावरा झालेली पाहणे त्याच्या नशिबी आलं. या सार्‌यातून त्याच्या नजरेसमोर एकच आशेचा किरण दिसला आणि तो म्हणजे गावाकडे स्थलांतर करणे हा होय. त्यानंतर त्याची जीवघेणी कसरत सुरू झाली. प्रशासनाने टाळेबंदी जाहीर केलेली असल्याने गावाकडे जाण्याचा त्याचा मार्ग बंद झाला. घराबाहेर महामारीचे संकट ,घरात उपाशीपोटी बायका- मुलं अशा भयानक

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DNA-based identification and control of disease spreading mosquito species: A review

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Taxonomy.

ABSTRACT

Harms caused by parasites such as mosquitoes are one of the severe health problems of people, particularly in those areas where unhygienic environmental conditions exist. The diseases caused by these insects lead to many severe diseases and even deaths affecting public health along with social economy and welfare. Consequently, the development of the successful implementation of identification and controlling strategies of these parasite species is one of the challenges of health departments of many nations in the globe. However, effective eradication of disease-causing mosquito specimens, especially immature or damaged individuals, is possible by molecular identification. As a result, cytochrome oxydase c subunit I (COI) gene-based method can play a role in identifying and assigning taxa to mosquito species and has worldwide importance. In sequence, in this review, we assessed the occurrence, spread of diseases, and COI gene-based identification status of mosquito species (*Anopheles annularis, Armigeres subalbatus, Mansonia annulifera, Mansonia uniformis, Aedes aegypti, Aedes albopictus, Culex tritaeniorhynchus, Culex quinquefasciatus, Anopheles culicifacies, Anopheles subpictus, Culex gelidus, Ochlerotatus* sp., and *Anopheles fluviatilis* T) as well as their control measures along with role of DNA barcoding on global scale

1. INTRODUCTION

Suffering of humans by blood-consuming parasites is a major issue on the global scale from many years. In addition, scientific communities have been always engaged in overcoming this problem through various ways, although they failed to solve the problem completely. In addition, mosquitoes attracted wide range attention of researchers since they are carriers of multiple bacterial, viral, and protozoan diseases among animals including humans as well as plants such as commercially valuable crops. Moreover, diseases caused by these dipterans lead to severe illness, in which death cases also occur if diagnosis and treatment are not performed within time. Moreover, these can be reduced with efficient controlling strategies detecting disease-carrying mosquito species in the infected regions.

However, for successful control of such diseases, the mosquito species responsible for their outbreak and spread are required to be analyzed through detection and identification processes, which need the development of comprehensive identification strategies that are unproblematic for their implementation. Nevertheless, the morphology-based identification system has certain limitations. Among them, unavailability of characters that are used for identification such as genital, color pattern, especially, in case of larval, immature and damaged stages or availability of only body fragments of the specimen are under study. Nevertheless, this problem can be solved with a greater extent using mitochondrial cytochrome oxydase c subunit I (COI) gene sequence with help of existing DNA sequence database, which can support for the development of vector born disease control operations.

In this review, we assessed the biodiversity, geographical distribution, and dominance of infectious mosquito species (*Anopheles annularis, Armigeres subalbatus, Mansonia annulifera, Mansonia uniformis, Aedes aegypti, Aedes albopictus, Culex tritaeniorhynchus, Culex quinquefasciatus, Anopheles culicifacies, Anopheles subpictus, Culex gelidus, Ochlerotatus* sp., and *Anopheles fluviatilis* T). In addition, we analyzed eruption and transmission of diseases due to them, their COI-based identification strategy, and their control measures in infected areas. Furthermore, we assessed the probabilities of DNA barcoding technique for effective eradication of disease spreading mosquito species in the globe making human life free from mosquito-borne infections.

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RESEARCH ARTICLE

Effects of nonlinear thermal radiation over magnetized stagnation point flow of Williamson fluid in porous media driven by stretching sheet

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Abstract

In this study, the stagnation point flow of a magnetized Williamson fluid past a stretching sheet in the presence of nonlinear thermal radiation and buoyancy effect is studied. The present situation is remodeled using similarity transformation that transforms the flow model of partial differential equations into the set of nonlinear ordinary differential equations. The fourth-order Runge-Kutta scheme and shooting method are employed to solve these reduced equations. The effects of various associated parameters over the velocity and temperature profiles are plotted and the outcome of each associated parameter is discussed through graphs. The key findings are noted as follows: the velocity profile declines with an increase in the magnetic force number, and an increment in buoyancy parameter leads to the increase in the boundary layer thickness and decrease in the thickness of the thermal boundary layer.

KEYWORDS

MHD, nonlinear radiation, Porous media, Williamson fluid

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Extraction, Isolation and Characterization of Bioactive Compound from Tissue of Fresh Water Crab *Barytelphusa cunicularis* from Northern Region of Maharashtra

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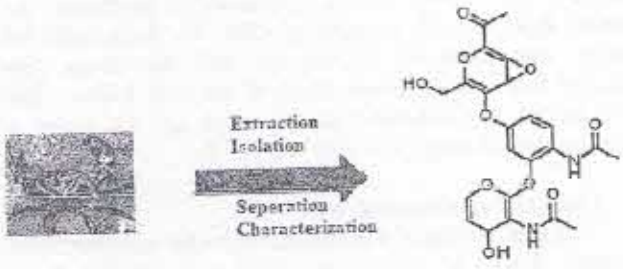
Abstract:-



The fresh water biodiversity is an unpredictable for natural product research from northern region, India, *Barytelphusa cunicularis* is major species, the Ethanol crude extract of tissue has been utilized for this study the isolation, separation and Characterization by using reputed methods. The biological activity of the crude ethanol extract was examined then this fresh water crab was resulted antibacterial and antifungal activity it means the bioactive compounds have been present in this crab. TLC was performed to set the solvent system for column chromatography while purity level to be checked by HPLC, it is 93% pure compound. Then the characterization of the pure compound by elemental analysis, UV, FTIR, ^{1}HNMR, ^{13}CNMR, LC-MS spectroscopy data analysis was revealed to found N-(2-((3-acetamido-4-hydroxy-4H-pyran-2-yl) oxy)-4-((2-acetyl-4-(hydroxymethyl)-3,7 dien-5-yl) oxy) phenyl) acetamide.

Keyword:- Barytelphusa Cunicularis, Freshwater Crab, Unpredictable, Bioactive Compounds, Crude Extract.

I. INTRODUCTION

Most of the animals have different biodiversity. The first biodiversity was found in water that resulted in new research studies on marine biodiversity. During this period adaptation of marine animal have been changing and there's a requirement for the development of the bioactive compounds, which are utilized for a different function like growth, reproduction, locomotion, communication, and defence etc. Bioactive compounds have found complex structures which is important for human needs. Thus, from ancient time marine animals are the source of medicine in the pharmaceutical world. Studies of various relevance shown that the extracts of marine animals cure the disease. The structure and function of bioactive compounds become known in the pharmaceutical field. Due to the fact, the majority of pharmaceutical companies are engaging to isolate the bioactive compounds from marine biota.

Marine non-chordates are important sources for drug design due to their fewer side effects, this enhanced their production on a large basis. However, this strategy is not sufficient for drug discovery. Thus, researchers have to follow the semi-synthetic pathway and need to utilize artificial compounds for medicine. Marine biodiversity provides the novel compound; enhances drug design and development to the new therapeutic drugs. It is a great success of the natural product field to lead the drug discovery (1). The drug approval between 1981 to 2014 of natural products and structure determination, which have the lead important role in drug development. The review summarises the role of natural products in hepatoprotective drug derived (1). The result shows that there is an increase in novel drug discovery from marine natural products reported every year, where 1340 new compounds were reported in 2015 (2).

Marine biodiversity provides an enormous source of bioactive compounds. These compounds are active against different therapeutic diseases. The marine environment is a prolific resource for the isolation of less exploited organisms and microorganisms. There are actually untapped habitats in the sea with unique characteristics. After intensive studies on the terrestrial microorganism, consequent attention has been focused on other ecosystems, especially those subjected to extreme environmental conditions such as desert hot springs and the sea. Most of the bioactive compounds were studied from the marine ecosystem. In the addition, the potential contribution of the freshwater ecosystem has been studied the discovery of natural products remains left behind. Crab is the best source of bioactive compounds after shrimp and lobster to provide protein, vitamins, and fatty acids to improve the health benefits of the human being. The components present in crab showed biological activity such as antioxidant,

recovered by rotary evaporated to obtain hexane fraction. The remaining aqueous layer was subjected to the same procedure with a solvent like an ethyl acetate, chloroform, ether. Further process was guided by bioassay fractions (18).

2.d. Column chromatography:

The column chromatography technique was used for the separation of compounds obtained from the extraction process mentioned above. The extract was adsorbed on silica gel (60-120 Mesh) and the column was eluted by n-hexane. The slight polarity was increased by adding ethyl acetate. 40 fractions were collected and stored in a 500 ml reagent bottle (borosilicate). Each fraction was subjected to TLC using a solvent system (ethyl acetate and diethyl ethyl ether). Total 100 ml fraction was passed over the column using solvent system (9.5:0.5, 9.0:1.0, 8.5:1.5, 4:1). These fractions were separately analysed in HPLC analysis to check the purity level of the isolated compound (19).

III. RESULT AND DISCUSSION

3.a. TLC analysis result of ethanol extract under UV light (370 nm):

The ethanol extract was analyzed by thin layer chromatography (TLC) on analytical plates above the solvent system were utilized for analysis on the basis of polarity, in each solvent system spot were visualized under UV light (370 nm). When TLC analysis maximum spots were visualized in seven solvent systems in ethanol extract of *Barytelphusa Cunicularis* (freshwater crab), the compounds were separated in that solvent systems.

3.b. HPLC analysis of isolated compound:

The analytical HPLC chromatogram of isolated compound S_1 showed 93% purity level, meaning that highly pured. The chromatogram was obtained by compound S_1 with acetonitrile solution with requisite time.

3.c. Elemental Analysis of isolated compound:

Elements showed in isolated compound C, H, O and N. The elemental chromatogram was obtained by isolated compound S_1 with retention time.

Calculated Anal: C- 56.79; H- 4.56; N- 5.76, O, 32.89
Found. C- 55.99; H- 5.403; N- 5.142

3.d. UV analysis of isolated compound:

The UV-visible analysis of the isolated compound S_1 (fig. 3.5.1.3), revealed that, 771.50 nm at 0.0022 abs, 322.00 nm at 0.5889 abs, 308.50 nm at 0.3983 abs, 253.00nm at 0.1664 abs, 212.00 nm at 0.1396 abs. In the UV-visible analysis the red colour absorbed at the wavelength of light 771.50 nm absorbed in which green colour experimentally observed. 212 nm indicates the presence of ketonic >C=O group, 253.00 nm indicates the –NHCOCH$_3$, 308.50 nm indicates –OH group involved in the parent chromosphere.

3.e. IR spectroscopic data of isolated compound

The FTIR (ATR) spectral data of isolated compounds of isolated compound frequencies indicated. Aromatic ring (3-Peaks): 1460.16 cm^{-1}, 1535.39 cm^{-1} and 1648.23 cm^{-1}, Ar-OH: 3634.01 to 3580.97 cm^{-1}, stretching of N-H: 2954.08 cm^{-1}to 2850.88 cm^{-1}, conjugated ketone >C=O: 1710.92 cm^{-1}, strong C-O stretching aromatic ester: 1260.52 to 1311.64 cm^{-1}, aromatic compound C-H bending 2016.92 cm^{-1} weak overtone, 1116.82 to 1081.44 cm^{-1} strong C-O stretching secondary alcohol (fig. 3.5.1.4). In the view of IR bands at 1460.16 cm^{-1}, 1535.39 cm^{-1} and 1648.23 cm^{-1} indicated the presence of aromatic ring, 2954.08 cm^{-1}to 2850.88 cm^{-1} shows the stretching of N–H group, strong C–O stretching aromatic ester: 1260.52 to 1311.64 cm^{-1}, aromatic compound C–H bending 2016.92 cm^{-1} weak overtone, 1116.82 to 1081.44 cm^{-1}strong C–O stretching secondary alcohol are observed in the compound.

3.f. ^{1}HNMR spectroscopic data of isolated compound:

The ^{1}HNMR (400MHZ DMSO-d^6 δ ppm) spectra of the isolated compound S_1 showed the peaks 7.86-6.84 (m, 6H, Ar-H); 2.51-2.50 (s, 2H, -NH); 8.26-8.23 (s, 1H, -OH); 1.62 (s, 3H, Ar-CO-R); 1.08-1.05 (s, 6H, -NH-CO-CH$_3$); 3.39 (s, 2H, CH$_2$)(fig.3.5.1.5).In the observation of NMR spectrum in 6.86-7.84 δ values, six protons found multiplets which indicate Ar-H; 2.51- 2.50 δ, two proton found singlet shows -NH group; 8.26-8.23 δ, two proton found singlet that confirms -OH group; 1.62 δ, three protons designated singlet of Ar-CO-Ar; 3.39 δ two protons found singlet that that indicate -CH$_2$; 1.08-1.05 δ, six proton found singlets that shows NH-CO-CH$_3$ groups.

3.g. ^{13}CNMR spectroscopic data of isolated compound:

The ^{13}CNMR (400MHZ DMSO-d^6 δ ppm) spectroscopic data of isolated compound S_1 reveled as19.05, 26.31, 39.38, 39.59, 40.02, 40.44, 40.65, 56.50, 127.46, 128.45, 129.29, 131.28 and 175.66.

Prediction of ^{13}C NMR spectrum, the chemical shifts when carbon is coupled to their hydrogens, carbon follows N+1 rule. The chemical shifts observed in the range of 19.05-26.31ppm indicates -CH$_3$ group, 56.50 ppm shows -CH$_2$, 127.46 – 131.28 ppm indicates unsaturated -C=C-and aromatic ring carbon and 175.66 ppm >C=O carbonyl carbon.

3.h. LC-MS spectroscopic data of isolated compound:

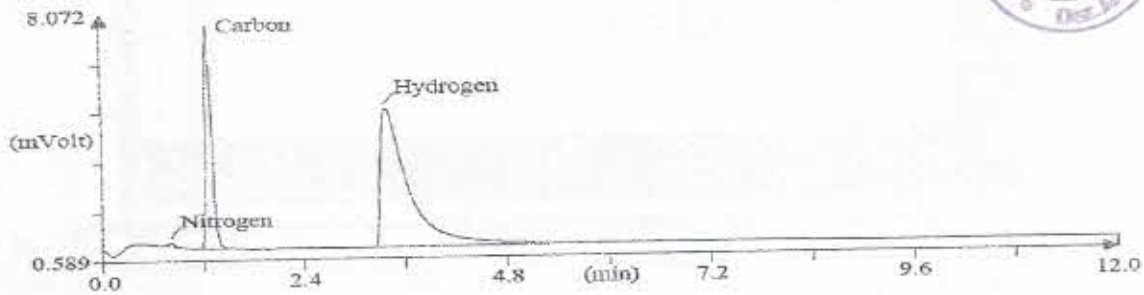
The mass spectra of the isolated compound S_1 shows projected structure molecular weight, indicated as LC-MS (ES+, 8.78e4): m/z = 485.40 (M$^+$) for $C_{23}H_{22}N_2O_{10}$

Considering all predicted data of the isolated compound, structure of the organic compound was elucidated and IUPAC name as

N-(2-((3-acetamido-4-hydroxy-4H-pyran-2-yl) oxy)-4-((2-acetyl-4-(hydroxymethyl)-3,7 dien-5-yl) oxy) phenyl) acetamide.

CHN Lab , Panjab University , Chandigarh

Company name:	ThermoFinnigan
Method filename:	C:\SAIF\CHNS\User - 2019\May\1-5-2019\N C H S systemmmmmmmmmmm
Method name:	NCHS
Analysed:	01-05-2019 15:43
Printed:	05-01-2019 19:17
Sample ID:	S_1
Analysis type:	UnkNown
Chromatogram filename:	C:\SAIF\CHNS\User - 2019\May\1-5-2019\21.DAT
Calibration method:	K Factors
Sample weight:	1.856



Retention Time (min)	Component Name	Element %
0.808	Nitrogen	5.142
1.258	Carbon	55.99
3.375	Hydrogen	5.403
		66.535

Figure.3 Elemental analysis results for compound S_1 isolated from *Barytelphusa Cunicularis* tissue.

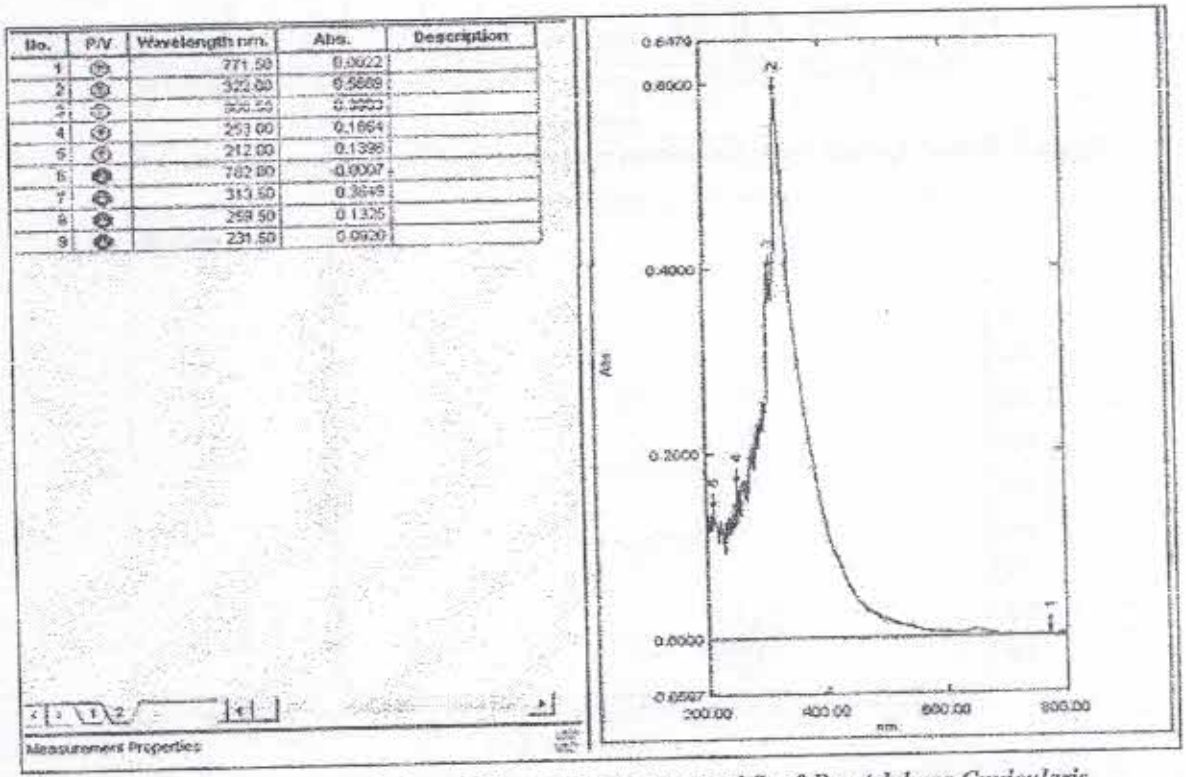


Figure.4 UV-visible analysis result for isolated compound S_1 of *Barytelphusa Cunicularis*.

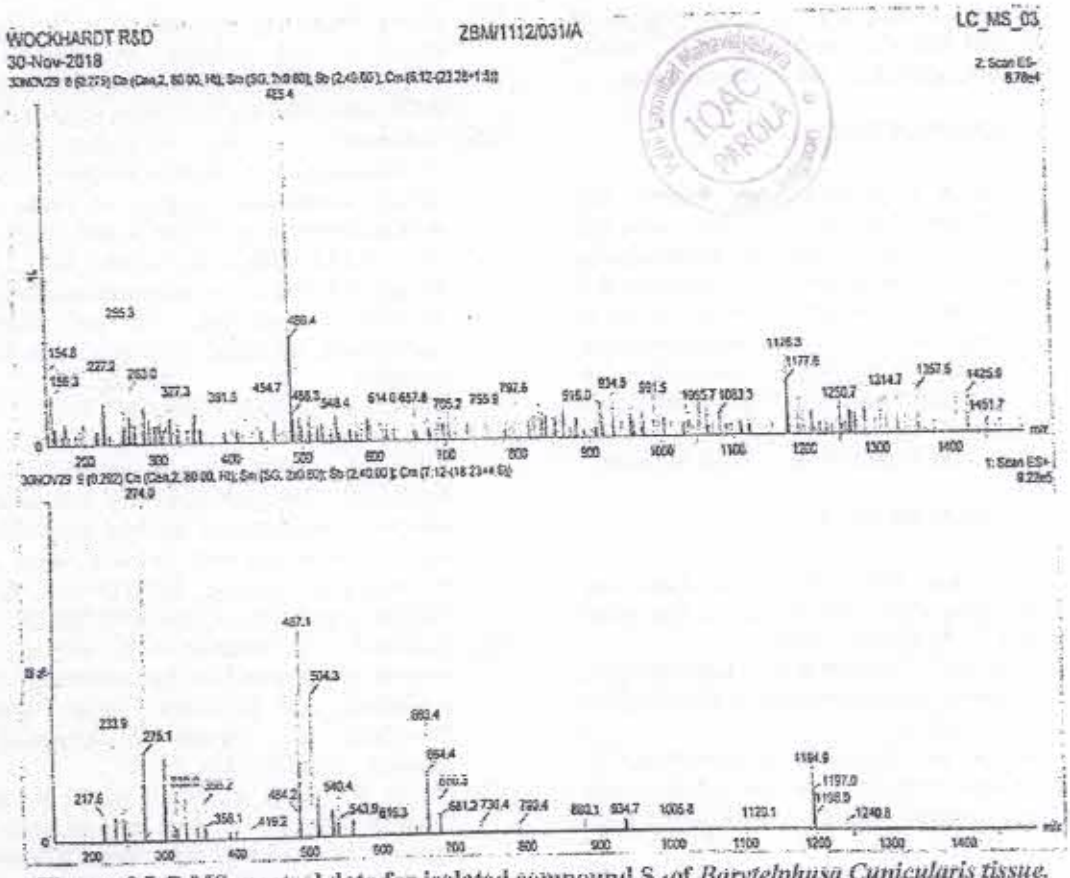
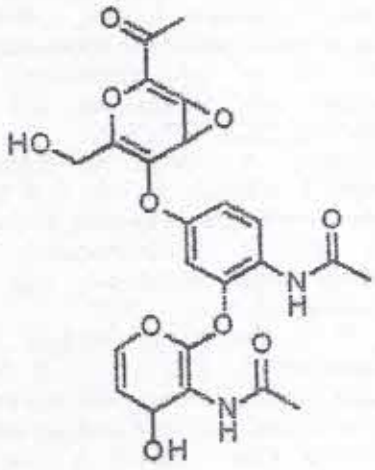


Figure. 8 LC-MS spectral data for isolated compound S 1of *Barytelphusa Cunicularis tissue.*

V. STRUCTURE OF ISOLATED COMPOUNDS



VI. CONCLUSION

The above discussion gives a detailed literature survey on the bioactive compounds from marine biodiversity, which has been a major contribution in drug development. It also explains that the active ingredients are present in bioactive compounds, its application in medicinal chemistry and new drugs were added every year and most drugs being discovered form secondary metabolites. The isolation of bioactive compounds is possible due to the HTS-advanced technique, which has been used in the pharmaceutical field. The study was continuing due to the relationship between combinatorial chemistry and natural product chemistry, which highlights the importance of the work. Furthermore, throughout the survey of the literature, many examples have shown by a systematic study on metabolic fingerprinting analysis and Bioinformatics tools have been a strong backbone of drug development from secondary metabolites and millions of drugs has been incorporated in the world. Now the aim of this thesis is attended to, the freshwater ecosystems have been more unpredictable to researcher bioactivity research and this study will help in the future the great debates conferences will be arranged by researchers in this remote research area. Although it has been presented widely, still many challenges are to be answered and it is natural product isolation gave the unpredictable results, so present review shows the semisynthetic pathway is important for drug development, but without isolation of natural product synthesis or semi synthesis is impossible. Therefore, extraction and isolation are important in drug design and emitting the novel compounds which can be used for the clinical trials for feature drug. The results of bioactivity and molecular docking give the confirmation that, the crude ethanol extract from tissue of *Barytelphusa cunicularis* showed antibacterial and antifungal activities while molecular docking study of the isolated compound shows different binding interaction with the protein DNA gyrase. The present study, all the spectral data revelled the bioactive compound N-(2-((3-acetamido-4-hydroxy-4H-pyran-2-yl) oxy)-4-((2-acetyl-4-(hydroxymethyl)-3,7 dien-5-yl) oxy) phenyl) acetamide is present in tissue of fresh water

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A Review Article on Zirconia based Thick Film Gas Sensors

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Abstract: ***Pollution has raised its ugly head high in the global environment. It created tremendous disasters of global warming. To face such disasters, is a very challenging for mankind. Many gases released by the vehicles and industries contribute the pollution and ultimately the global warming. Gases beyond certain limit can affect the living beings. So, there is a need to detect the gaseous pollutants in the environment, even at trace levels. Many researchers are working already to detect the hazardous gases in the environment and hence to develop the gas sensors at their best level. Researchers are well known about the hazards of different gases released by any means in the open environment. Still, the action has not been initiated in the desired portion to save the environment from the pollution and its hazards. Also, the researchers have the responsibility to aware the society from the pollution hazards. The aim of the present study is, to well acquaint about the thick film ZrO_2 and their nanocomposite gas sensors. Gas sensors can be fabricated and developed the by utilizing the pure and surface activated ZrO_2 and their nanocomposites so that, they could be able to detect various gases at trace levels (ppm / ppb).***

Keywords: Nanostructured ZrO_2, Synthesis, Thick Films, Gas sensors, Characterizations, Polluting gases, etc.

I. INTRODUCTION

There is a strong interest in the development of wide band gap semiconductor gas sensors for monitoring the gaseous species in the open environment, volatile and inflammable fuel leak in various fields, exhaust diagnosis and emissions from industries, etc. In 1950s, it was discovered that the electrical properties of some metal oxides get changed [1] when they are exposed to oxidizing or reducing gases. In 1962, Seiyama et al. [2] proposed the concept of gas monitoring using ZnO in the form of thin films. During the same year, Taguchi [3] put forth his concept that the SnO_2 also acts as a gas sensor. Figaro Engg. Inc. [4] made efforts in fabrication of gas sensors and has made available these sensors for commercial use, since 1968. Taguchi gas monitor was fabricated from partially sintered SnO_2 bulk device whose resistance in air is very high and falls down when exposed to reducing gases and combustible gases, viz. H_2, CH_4, VOCs, etc. To study and develop the fundamentals of the gas sensing mechanism, the semiconducting sensors are modified by simple mechanochemical addition, either salt of metals (viz. Bi, Sr, Al, In, Cu, Sn, Fe, Ru, Pt, Pd, etc.), or their oxides in the base materials which is referred to as doping. Metal oxides viz. SnO_2, ZrO_2, ZnO, Fe_2O_3, TiO_2, WO_3, etc. have also been used as gas sensors. The concentration of the gas in the environment which produces an undesirable and disastrous change in the physical, chemical or biological characteristics of air, soil and water that can harmfully affect the living things is called as pollution. Heavy industrialization, uncontrolled urbanization and careless application of technology can cause pollution [5-10]. The main culprits behind all such hazards are the toxic, inflammable and explosive gases. Gases play the key role in many industrial or domestic activities. In the last twenty years, the demand for gas detection and monitoring has increased. Particularly, the awareness of the need to protect the environment has grown.

II. TYPES OF SENSORS

Table 1: Types of sensors and their particulars

	Types of Sensors		Detection Capability
SENSORS	PHYSICAL	Magnetic	Magnetic moment, magnetic flux density, etc.
		Mechanical	Strain, stress, torque, flow, displacement, force, pressure, acceleration, etc.
		Thermal	Flux, thermal conductivity, heat flow, specific heat, temperature, etc.
		Electrical	Conductivity, voltage, resistance, charge, current, inductance, etc.
		Optical	Refractive index, reflectivity, polarization, light intensity, wavelength, etc.
		Acoustic	Wave (amplitude, phase polarization), spectrum, wave velocity, etc.
	CHEMICAL	Biological	Concentration of gaseous species in additives, food freshness, disease diagnosis, etc.
		Humidity	Concentration of moisture content in environment or in industries.
		Gas	Concentration of gaseous species in the environment.

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Asymptotic Attractivity Result For Neutral Functional Differential Equation

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Abstract: *In this paper an existence result for local asymptotic attractivity of the solutions is proved for a nonlinear neutral functional differential equation in Banach space under the mixed generalized Lipchitz's and caratheodory conditions which gives the existence as well as asymptotic stability of solutions.*

Keyword and Phrases: *Neutral functional differential equation, fixed point theorem, asymptotic attractive solutions mixed generalized Lipchitz's, caratheodory conditions.*

I. Introduction

Let $\mathbb{R}$ denote the real line and let $I_o = [-r, 0]$ and $I = [0, a]$ be two closed and bounded intervals in $\mathbb{R}$. Let $J = I_o \cup I$, then J is a closed and bounded intervals in $\mathbb{R}$. Let $\mathbb{C}$ denote the Banach space of all continuous real valued functions ϕ on I_o with the supremum norm $\|.\|_c$ defined by

$\|\phi\|_c = \sup_{t\in I_o}|\phi(t)|$,Cleary $\mathbb{C}$ is a Banach algebra with this norm.

Consider the functional differential equation (in short FDE)

$$\frac{d}{dt}\left[\frac{x(t)}{f(t,x(t),x_t)}\right] = g(t,x(t),x_t) \qquad a.e.\ t \in I \qquad (1.1)$$

$$x(t) = \phi(t), \qquad t \in I_o$$

Where $f: I \times \mathbb{R} \times \mathbb{C} \to \mathbb{R} - \{0\}$, $g: I \times \mathbb{R} \times \mathbb{C} \to \mathbb{R}$ and for each $t \in I$, $x_t: I_o \to \mathbb{C}$ is a continuous function defined by $x_t(\theta) = x(t+\theta)$ for all $\theta \in I_o$.

By a solution of FDE (1.1), we means a function $x \in (J, \mathbb{R}) \cap BC(J, \mathbb{R}) \cap C(J_o, \mathbb{R})$ that satisfies the equations in (1.1), where $BC(J, \mathbb{R})$ is the space of all bounded and continuous real valued functions on J. The functional differential equations have been the most active area of research since long time. See Hale[8], Henderson[9] and the references therein. But the study of functional differential equations in Banach algebra is very rare in the literature. Very recently the study along this line has been initiated via fixed point theorems. See Dhage and Regan [4] and Dhage[2] and the references therein. The FDE (1.1) is new to the literature and the study of this problem definitely contribute immensely to the area of functional differential equations. See Dhage, Salunkhe and R.Verma [7] and the references therein. In this paper, we prove the uniform local asymptotic attractivity via a classical hybrid fixed point theorem of Dhage[8] which gives the asymptotic stability of the solutions for the FDE (1.1).

II. Auxiliary Results

Let $X = BC(J, \mathbb{R})$ be the space of continuous and bounded real valued functions on I, and let Ω be a subset of X. Let $Q: X \to X$ be an operator and consider the following operator equation in X,

$$x(t) = (Qx)(t) \quad \text{for all} \quad t \in I \qquad (2.1)$$

Below we give different Characterizations of the solutions for the operator equation (2.1) on I.

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1HNMR BASED METABOLIC FINGERPRINTING ANALYSIS OF *BARYTELPHUSA CUNICULARIS* (FRESHWATER CRAB) TO EXPLORE THE MEDIOMIC PROFILE

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ABSTRACT

Freshwater crabs (Barytelphusa cunicularis) have been extensively studied due to their medicinal applications and effectiveness to human health. In this study fingerprinting analysis of crude ethanol extract of abdominal cavity tissues, based on 1HNMR spectroscopy and multivariate data analysis has been used for mediomic profiling. Ethanol extracts were characterized by the abundance of cortisol, androsterone, isoleucine and estradiol while dexamethasone, testosterone, and norethisterone are least abundant. These results are well supported to human health and enhance commercially in India with valuable steroidal source species.

Keywords: *Barytelphusa cunicularis, metabolic fingerprinting, mediomic.*

Introduction

In metabolic fingerprinting analysis, conclusions are drawn based on assumptions that express a metabolic profile[1, 5]. Characterization expresses metabolites which are an important way to isolate compounds[3]. NMR spectroscopy has been employed widely in metabolic research for quantitative nature and broad coverage of metabolites. NMR measurements exhibit higher reproducibility than other tools generating data with less variability that could attribute instrumental variation[9, 11]. 1HNMR based metabolic fingerprinting can be applied for a variety of the sample, particularly crab tissue; it makes more effective data to analyze the bioactive compounds[20, 21, 22]. Freshwater crab generally used as supplementary food; it is an interactive strategy to increase the nutritive value of freshwater crab species and their application to improve the human health. [35]

As per available information of *barytelphusa cunicularis* from the ancient peoples, the tissue is active against hepatitis but literature is not available and researchers are not oriented there due to the low sampling area. 1HNMR study plays an important role in finding the species medicinal importance[31]. Omics studies of the *barytelphusa cunicularis* are available and are histological and physiological[33]. Biochemical study is a major research gap, in food chemistry proximate composition and biochemical analysis important towards food domains, investigating the food domain in parallel with nutritional domain to optimize human health. [35] Although last decade 1HNMR analysis combined with multivariate data, important analytical tools provide the most delightful information metabolic profile in plant and animal species [12]and in *Barytelphusa Cunicularis* (freshwater crab) metabolomics and medicinal approaches.[14]

The aims of the present study to outcome advance resolution of barytelphusa *cunicularis* mediomic approach. Metabolic approach is a past scenario and NMR based approach which set the metabolic profile irrelevant foodomic quality of the animals, they are beneficial to human health[36] the basis of this scenario aims to be developed to biologically activate the animals by this advance 1HNMR, 13CNMR fingerprinting analysis against the diseases. *Barytelphusa cunicularis* is an edible crab species in the northern region of Maharashtra, India.[36] Particularly this region is situated in Satpura Mountain ranges, peoples belong to slums or adivasi, they have traditional medicine knowledge but lack literacy, and peoples did not keep records in writing. It is proven practically that *Barytelphusa Cunicularis* also shows hepatoprotective activity. This inauthentic principle was proved by this experiment and data was interpreted, results may encourage mediomic exploration in the tissue of *Barytelphusa cunicularis.*

which particular variables explore the Y - variable and P (corr.) represent the loading scale.

Results and Discussion

Interpretation of 1HNMR spectra of extract of *barytelphusa cunicularis* in fig.1, several molecules are identified in 1HNMR spectra, data are reported in table.1. The molecules reported of the ethanolic extract were studied by 1HNMR spectral data and multivariate analysis. The possible differences among the molecules using unsurprised (PCA) and surprised (PLS-DA) enhancing statistical data was developed. PCA creates the natural data grouping. The original data regretted and new multivariate coordinate space was obtained, the dimension order decreased and an assay to explain variance data. The principle component showed score set (PC), highlights the clustering or unproductive and set of loadings (P) which pressurized the input variables of principle components of spectra. Seven principle components were enough to describe the 98.797% of the active data variance. In particular, components PC1 and PC2, PC2 explained 57.639, 31.668, 5.5397, 3.5903% respectively. Meanwhile components of the molecule aldosterone, Dexamethasone, testosterone, cortisol and norethisterone were separated from each other. The *barytelphusa cunicularis* extract has steroid molecules, showed this study.

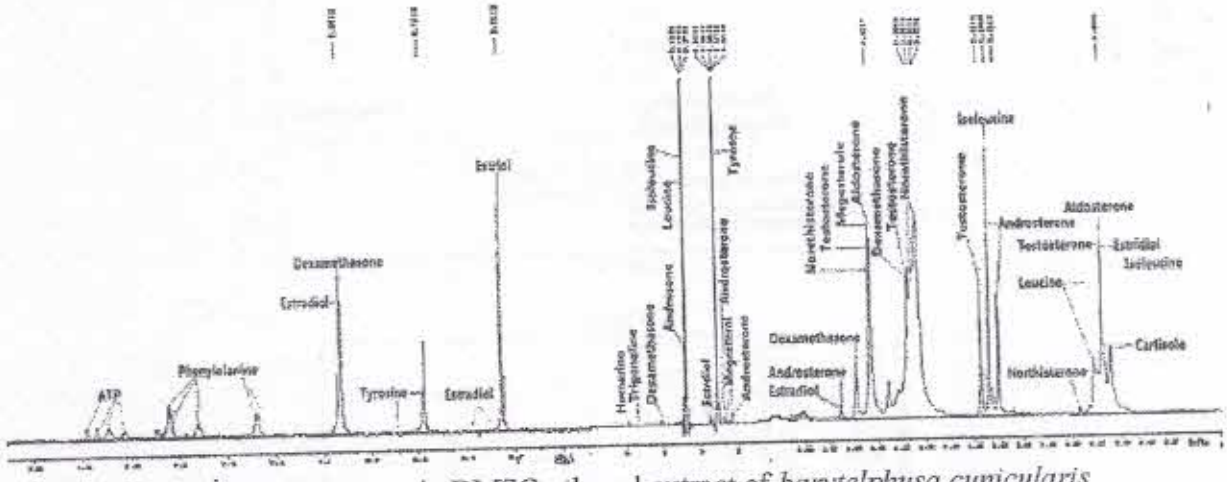

Fig.1 ^{1}HNMR spectra in DMSO ethanol extract of *barytelphusa cunicularis*

Table. 1. Chemical shifts and assignments of steroids vibrancy in 1HNMR spectra of ethanol extract.

Steroid	δ (ppm)
Megestrol	2.4121(dd)1H, 2.4301(dd)1H, 2.4511(ddd)1H, 0.9391(d)3H, 1.4127(dt)1H
Dexamethasone	6.96449(d)1H, 4.187(s)1H, 1.4942(s)3H, 1.4051(dtd)1H
Testosterone	1.4127(dtd)1H, 1.3342(ddd)1H, 0.9391(s)3H, 1.3342(dq)1H, 1.1871(s)3H
Cortisol	0.991(s)3H
Norethisterone	0.99(s)3H, 1.3150(s)3H, 1.3188(s)3H, 1.3274(s)3H, 1.4127(s)3H
Androsterone	1.4127(dddd)1H, 1.4331(dddd)1H, 1.4021(dddd)1H, 1.1696(ddd)1H, 1.1521(ddd)1H, 3.4532(tt)1H, 2.1(dddd)1H, 2.5724(dddd)1H
Estradiol	1.449(ddd)1H, 1.498(ddd)1H, 6.692(dd)1H, 6.638(dd)1H, 2.705(ddd)1H, 2.709(ddd)1H, 6.9644(dd)1H, 0.9391(s)3H
Leucine	0.9391(d)6H, 3.4219(t)1H
Isoleucine	3.4219(d)1H, 1.1696(dq)1H, 1.1696(dq)1H

***Letters in brackets indicate the spin multiplicity s. Singlet, d.doublet, t.triplet, q.quartate, m.multiplet**

On interpretation NMR spectra indicate that, the given spectra in three different regions that are 0.9391 - 1.4127 ppm is first region 2.5724 - 3.4532 ppm second region and 6.6273 - 6.9644 ppm is third region, the region 5.0 - 6.5 ppm has no any spectra. Cortisol showed peak at

Fig. 5

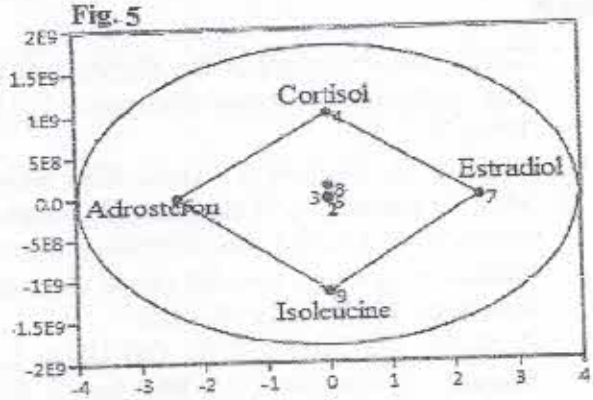

Fig. 6

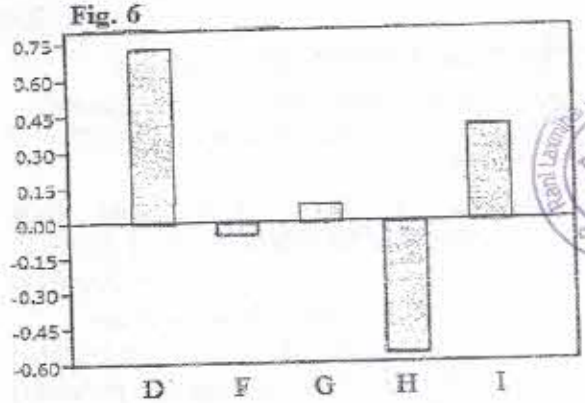

Fig.5 Partial Least Square (PLS) analysis plot it shows the components isolet corelation.
Fig.6 PLS loading score plot it shows seperation corelation D - Cortisol, F - Androsterone, G - Estradiol, H - Leucin, I - Isoleucine

Extraction of medicinal components from the animal is a challenging task (Wheelok, A. M. and Wheelock, C. E. 2013),however research being going on for the better health and immunization against the therapeutic diseases of the human body to synchronize the PCA and PLS data, recognize the novel compounds from the ethanolic extract. The principle components PLS and loading score most important for components identification. Ion PLS plot cortisol, androsterone, isoleucine and estradiol were separated from each other while dexamethasone, testosterone and norethisterone were from cluster and leucine is closer to that cluster, separation of these compounds were difficult. The identification with subsequents NMR data highest exploration mode with the help of corresponding analysis data in particular cortisol, testosterone, estradiol and leucine are mostly separated from the cluster, the described compounds are medicinally important and they were steroids mostly therapeutically active against, compounds were actively participate in hepatoprotective dieses. Corresponding analysis data of the tissue of crab showed specific medicinal property.

Finally on analysis of *Barytelphusa cunicularis* research, the tissue is medically important found in this study in ethanol extract , this is very important indications and novel research , this information provide the good medicinal value which effect on the therapeutic action against the diseases, then compounds are enhance to drug design.

Conclusion

Barytelphusa cunicularis is a non targeted species to fishery; it is local, edible species but not to utilize as a proper food domain. The present study reported first time in India with help of advanced analytical tool like 1HNMR and multivariate analysis that the crab beneficial to human as well as medicinal source due to presence of steroid like cortisol, androsterone, isoleucine and estradiol with the most isolated compounds dexamethasone, testosterone, and norethisterone are present in cluster form.

Although lots of research on the animals and many things are investigated, the present study reported for the first time contributing to adaptation of the mediomic approach in the pharmaceutical area, in chemistry this is a new entity and freshwater ecosystem attracted to novel research.

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Criterion 3: Research, Innovations & Extension

Academic year -2019-20
2.1.1 खान्देशातील आदिवाशी भिल्ल समाज : एक दृष्टीक्षेप
2.1.2 Advancement in structural, electrical and sensing performance of surface modified SnO2 metal oxide
2.1.3 Approximation method for hybrid functional differential equations
2.1.4 Synthesis and characterization of nanostructured SnO2 thick films and their microstructural analysis
2.1.5 Synthesis and characterisation of pure and surface functionalised nano structured SnO2 thick film
2.1.6 Gas sensing performance of pure and modified nanostructured screen printed Zirconia thick films
2.1.7 A scalable screen printed high performance ZnO-UV and gas sensor effect of solution combustion
2.1.8 भारतातील समाज माध्यमे आणी प्रसारमाध्यमे
2.1.9 MHD boundary layer flow and heat transfer in porous medium past an exponentially stretching sheet under the influence of radiation
2.1.10 Synthesis of Sn Doped TiO2 thin films and their applications to H2 gas sensing properties

Rani Laxmibai Mahavidyalaya IQAC PAROLA Dist. Jalgaon

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३. खानदेशातील आदिवासी भिल्ल समाजः एक दृष्टीक्षेप

डॉ. रावसाहेब भिमराव नेरकर
इतिहास विभाग, राणी लक्ष्मीबाई महाविद्यालय, पारोळा, जि. जळगांव.

प्रस्तावना

खानदेशातील विविध जाती - जमातीचे लोक वास्तवास असल्याचे निर्दशनास येते. खानदेशनातील या विविध जाती - जमातींच्या रुढी, परंपरा, विवाह पद्धती, खानपान, वेशभुषा, अलंकार, सण, उत्सवाची स्थिती वैशिष्टपुर्ण होती. निसर्गाच्या सानिध्यात राहणारे, निसर्गाची पुजा करणारे, कष्टकरी, काटक असणारा भिल्ल समाज खानदेशाच्या संपूर्ण परिसरात विखुरलेला आहे. भिल्ल समाज हा मुळात धाडसी, लढाऊ वृत्तीचा होता. परंतु प्राचीन आणि मध्ययुगीन काळात या बाणेदार समाजाला गुन्हे करणारी, लूटमार करणारी मागसलेली जमात म्हणून शिक्का मारला गेला. परंतु काळानुरुप त्यांच्या लढाऊ, प्रामाणिकपणाच्या आधारावर या समाजात सुधारणा घडून आल्या. जंगलात वास्तव्य करणाऱ्या भिल्लापासून ते कष्ट करुन शेती व्यवसाय करणाऱ्या भिल्ल समाजापर्यंत २० व्या शतकात मार्गक्रमण या समाजाने केले.

भिल्ल समाज पुर्वपिठीका

भिल्ल समाज हा मुळात डोंगरदऱ्यांमध्ये राहणारा वर्ग आहे. मध्यपुर्वेकडून प्राचीन काळात आलेल्या प्रोट्रो - ऑस्ट्रलॉईड लोकांचे भिल्ल हे वंशज असल्याचे मानववंश शास्त्रज्ञाचे मत आहे. प्राचीन महाकाव्य रामायण, महाभारतातही भिल्लाचा उल्लेख दिसून येतो. द्राविड भाषेत बिलु म्हणजे धनुष्य आणि भिल्लांचे धनुष्य हेच प्रमुख शस्त्र आहे. त्यावरुनही त्यांना भिल्ल नाव पडले असावे असे मानले जाते. इतिहासकार टॉलेमीने इ. स. पू. दोनशे ते शंभरच्या काळात खानदेशात भिल्ल लोकांची राज्ये होती असे म्हटले आहे. भिल्लांचे मूळ वस्ती स्थान हे अबू आणि आशिरगड या परिसरांतील डोंगराळ भागातील आहे. ब्रिटीश काळात गुजरात आणि खानदेशात प्रामुख्याने भिल्लाची वस्ती दिसुन येते. भिल्ल जमात ही मुळात लढाऊ बाण्याची, काटक शरीरयष्टी लाभलेली धाडसी वृत्तीची आहे. परंतु या जंगलात राहणाऱ्या जमातीत गुन्हे करणारी, चोरी लूटमार करणारी जमात मानले गेले. त्यातूनच ब्रिटीश काळात त्यांच्या गुन्हेगारी प्रवृत्तीला आळा घालण्यासाठी दडपशाहीचा मार्ग अनुसरला गेला.

भिल्ल समाज जाती आणि पोटजाती

भिल्ल समाजाचे ते कोणत्या प्रदेशात राहतात यावरुन प्रकार पडतात. त्यांत प्रामुख्याने मैदानी प्रदेशात राहणारे, पर्वतीय प्रदेशात वास्तव्यास असलेले आणि तिसरे म्हणजे अन्य प्रदेशात राहणारे होत. यामध्ये मैदानी प्रदेशात राहणारे भिल्ल हे इतर भागात राहणाऱ्या भिल्ल लोकांपेक्षा पुढारलेले असतात. त्यांच्या राहणीमानात, आचारविचारात थोडा सुधारणावादी दृष्टीकोन दिसून येतो. डोंगराळ भागात राहणाऱ्या भिल्लाच्या बरडा, डोंगची, धानमा, धोरेपो, गावोत, खोतील, पठवाडी, मावची, नहाल इत्यादी प्रमख जाती आहे. भिल्लामध्ये काही हिंदू धर्मीय तर काही चेतनावादी ख्रिश्चन धर्मीय असलेले आढळून येतात.

Self Attested

Advancement in Structural, Electrical and Gas Sensing Performance of Surface Modified SnO_2 Metal Oxides

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Abstract : Metal oxide based solid state gas sensors are the best selection to the development of commercial gas sensors for a wide range of applications. The great interest of industrial and domestic solid state gas sensors comes from their versatile advantages like portable size, high sensitivity in detecting very low concentrations (ppm, ppb or sub ppb level). Tin Oxide (SnO_2) powder is one such challenging material for the fabrication of gas sensors. Bulk Tin Oxide (SnO_2) powder in the form of thick film was observed to be less sensitive to the polluting gases. So, synthesized nanostructured SnO_2 powder was fabricated by simple screen printing technique followed by the calcinations at 500°C for 1 hr. Thick films of pure nanostructured SnO_2 powder were surface activated by dipping them into 0.01 M aqueous solution of Strontium Chloride and / or Bismuth Chloride for different intervals of time followed by calcinations at 500°C for 30 min. The films exhibit the semiconducting nature due to non-stoichiometry and respond to various gases. Optimizing the particular conditions, the thick films can be used for gas sensing to detect hazardous gases, viz. H_2, H_2S, Cl_2, NH_3, C_2H_5OH, LPG, etc. The surface morphology, chemical composition, crystal structure, electrical and thermal properties of the bulk and nanostructured SnO_2 have been investigated by Field Emission Scanning Electron Microscope (FE-SEM), Energy Dispersive Analysis by X-rays (E-DAX), X-Ray Diffraction (XRD), etc.

Keywords - **Bulk and Nanostructured SnO_2, Synthesis, Thick Films, Polluting gases, etc.**

I. Introduction

The concentration of the gas in the environment which produces an undesirable and disastrous change in the physical, chemical or biological characteristics of air, soil and water that can harmfully affect the living beings leads to a pollution. Heavy industrialization, uncontrolled urbanization and careless application of technology can cause pollution [1-6]. Air pollution is a major threat for modern society. Current burning issues are global warming, the cruelest episodes like Bhopal gas tragedy, etc. are the effects of air pollution. Along with this, some domestic threats are also occurring all over the world. The main culprits behind all such hazards are the toxic, inflammable and explosive gases. Gases play the key role in many industrial or domestic activities. In the last twenty years, the demand for gas detection and monitoring has increased. SnO_2 along with additives, viz. Bi_2O_3 and SrO_2 are the most easily available and low cost materials. These materials are found suitable for the gas sensing applications.

II. Objectives

- To synthesize the nanostructured semiconducting oxide by one of the simplest and cheapest process known as disc type ultrasonicated microwave assisted centrifuge technique.
- To prepare the thick films of pure and modified nanostructured SnO_2 by screen printing technique, one of the simplest and low cost techniques.
- To ensure longer life by maintaining proper thixotropy and rheology of the thick films.
- To analyze the synthesized pure and modified materials by different characterization techniques.
- To achieve a suitable surface modification by dipping the thick films of SnO_2 into SrO_2 and / or Bi_2O_3 for enhancing the gas response and selectivity.
- To investigate the electrical and gas sensing performance of pure and modified SnO_2 thick films.
- To investigate and modify the response and recovery profile of pure and modified SnO_2 thick films.

19-20

Approximation Method for Hybrid Functional Differential Equations

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ABSTRACT: *In this paper existence theorem for the Extremal solutions is proved for an initial value problem of nonlinear hybrid functional differential equations via constructive methods.*

Keywords: *Extremal solution, lower and upper solution, nonlinear hybrid functional differential equations, fixed point theorem*

INTRODUCTION

It is well known that the Banach contraction mapping principle is the only fixed point theorem in the nonlinear analysis which provides a useful method for approximating a unique solution for the initial and boundary value problems of ordinary differential equations via successive iteration. The best of our knowledge, there is no fixed point theorem or other method developed so far for hybrid functional differential equations without further assumptions on the nonlinearities involved in the equations.

In this paper, we using the ideas from Lakshmikantham and leela(2) and Ladde et.al(1). We establish the approximation results for extremal solutions of the hybrid functional differential equation between the given lower and upper solutions.

1. *STATEMENT OF PROBLEM*

Let $\mathbb{R}$ denote the real line and let $I_o = [-r, 0]$ and $I = [0, a]$ be two closed and bounded intervals in$\mathbb{R}$. Let$J = I_o \cup I$, then J is closed and bounded interval in $\mathbb{R}$ Let C denote the Banach space of all continuous real valued functions ϕ on I_o with supremum norm $\|.\|_C$ defined by

$\|\phi\|_C = \sup_{t\in J}|\phi(t)|$ and $(x.y)(t) = x(t).y(t)$, $t \in J$ then C is a Banach algebra with this norm. Consider the Hybrid Functional Differential equation (In short HFDE)

$$\frac{d}{dt}\left[\frac{x(t)}{f(t,x(t),x_t)}\right] = g(t,x(t),x_t) \text{ a.e } t \in I$$

$$x(t) = \phi(t) \quad , \quad t \in I_o \tag{1.1}$$

Where $f: J \times \mathbb{R} \times C \to \mathbb{R} - \{0\}$, $g: J \times \mathbb{R} \times C \to \mathbb{R}$ and for each $t \in I$, $x_t: I_o \to C$ is continuous defined by $x_t(\theta) = x(t+\theta)$ for all $\theta \in I_o$.

By a solution of HFDE (1.1) we means a function $x \in C(J, \mathbb{R}) \cap AC(J, \mathbb{R}) \cap C(I_o, \mathbb{R})$ such that

i) The function $t \mapsto \frac{x}{f(t,x_t)}$ is absolutely continuous for each $x \in \mathbb{R}$ and

ii) x satisfies the equations in (1.1)

where $AC(J, \mathbb{R})$ denotes the space of absolutely continuous real valued functions defined on J.

The functional differential equations have been the must active area of research since long time; see Hale (8), Henderson (9) and the references there in. The study of functional differential equations in Banach algebra

19-20

Approximation Method for Hybrid Functional Differential Equations

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Abstract

In this paper existence theorem for the Extremal solutions is proved for an initial value problem of nonlinear hybrid functional differential equations via constructive methods.

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Keywords

Extremal solution, lower and upper solution, nonlinear hybrid functional differential equations, fixed point theorem

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RESEARCH ARTICLE

SYNTHESIS AND CHARACTERIZATIONS OF NANO STRUCTURED SnO_2 THICK FILMS AND THEIR MICRO STRUCTURAL ANALYSIS

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Synthesis, Nanostructured SnO_2,
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Thick Films, etc.

ABSTRACT

This paper presents synthesis, thick film fabrication and characterizations of the nanostructured SnO_2 powder by disc type ultrasonicated microwave assisted centrifuge technique. The selected material is low cost and readily available. Synthesis procedure is quite simple. The obtained SnO_2 particles are in nanometer scale and dispersed with very large surface areas. Nano-scaled grains exhibit high surface to volume ratio. Thick films of as synthesized powder were fabricated by simple screen printing technique followed by the calcinations at 500°C for 1 hr. Optimizing the particular conditions, the thick films can be used for gas sensing applications. The film samples were characterized by X-ray diffraction (XRD), energy dispersive analysis by X rays (EDAX), field emission scanning electron microscopy (FE-SEM), etc.

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INTRODUCTION

Tin is principally found in the ore cassiterite (tin oxide). Tin(IV) oxide crystallizes with the rutile structure. As such the tin atoms are six coordinate and the oxygen atoms are three coordinate (Greenwood *et al.*, 1984). It has tetragonal symmetry. Each tin atom is surrounded by distorted octahedron of six oxygen atoms and each oxygen atom has three tin nearest neighbors at the corners of an almost equilateral triangle. SnO_2 is usually regarded as an oxygen-deficient n-type semiconductor (Lesley Smart *et al.*, 2005). Hydrous forms of SnO_2 have been described as stannic acid. Such materials appear to be hydrated particles of SnO_2 where the composition reflects the particle size (Holleman *et al.*, 2001). It is obtained commercially by reducing the ore with coal in a furnace. SnO_2 is a wide band gap semiconducting oxide having energy gap of 3.59 eV (Reimann and M. Steube, 1988; Frohlich *et al.*, 1978). Tin(IV) oxide has been used as an opacifier and as a white colorant in ceramic glazes (Searle, 1935). The use of tin(IV) oxide has been particularly common in glazes for earthenware, sanitary ware and wall tiles (Bourry, 1926). Tin oxide increases the opacity of the glazes (Parmelee and Harman, 1973). SnO_2 is used in sensors of inflammable and toxic gases, viz. CO, H_2, H_2S, LPG, NH_3, C_2H_5OH, Cl_2, etc. (Joseph Watson). In these, the sensor area is heated to a constant temperature (few hundreds of degrees Celsius) and in the presence of a combustible gas the electrical resistivity drops.

EXPERIMENTAL

Synthesis of Nanostructured SnO_2 Powder: Microwave treatment followed centrifuge technique Tin dioxide powders have been synthesized by various synthesis methods such as sol-gel, spray pyrolysis, gel combustion technique, hydrothermal synthesis, etc. Among these methods, conventionally accepted method is the synthesis of tin dioxide particles from precursor hydroxides precipitated by the direct addition of aqueous alcohol solution to tin chloride aqueous solutions. In the present study, the pure nanostructured SnO_2 powder has been synthesized by disc type ultrasonicated microwave treatment followed by centrifuge technique (Jun Zhang *et al.*, 2009; Kapse *et al.*, 2012; Khamkar *et al.*, 2012; Patil *et al.*, 2006 & 2007; Gawas *et al.*, 2011). Fig. 1 (a) shows disc type ultra-sonicator and Fig. 1 (b) shows microwave treatment followed centrifuge technique. Distilled water and propylene glycol is taken in the ratio of 1:1, and an initial aqueous alcohol solution was prepared. This solution was then mixed with aqueous solution of tin chloride with the alcohol to water ratio as 1:1. The special arrangement was made to add drop wise aqueous ammonia (0.1ml / min.) with constant stirring until the optimal pH of solution becomes 8.3. After complete precipitation and centrifugation, the hydroxide was washed with distilled water until chloride ions were not detected by $AgNO_3$ solution. Then the precipitate was allowed for ultrasonication and then placed in a microwave oven for 10

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Gas Sensing Performance of Pure and Modified Nanostructured Screen Printed Zirconia Thick Films

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Abstract: Metal oxide based solid state gas sensors are the best selection to the development of commercial gas sensors for a wide range of applications. The great interest of industrial and domestic solid state gas sensors comes from their versatile advantages like portable size, high sensitivity in detecting very low concentrations (ppm, ppb or sub ppb level). Zirconium Oxide (Zirconia) powder is one such challenging material for the fabrication of gas sensors. Bulk Zirconium Oxide (ZrO_2) powder in the form of thick film was observed to be less sensitive to the polluting gases. So, synthesized nanostructured ZrO_2 powder was fabricated by simple screen printing technique followed by the calcinations at 500°C for 1 hr. Thick films of pure nanostructured ZrO_2 powder were surface activated by dipping them into 0.01 M aqueous solution of Strontium Chloride and Bismuth Chloride separately for different intervals of time followed by calcinations at 500°C for 30 min. The films exhibit the semiconducting nature due to non-stoichiometry and respond to various gases. Optimizing the particular conditions, the thick films can be used for gas sensing to detect polluting and hazardous gases, viz. H_2, H_2S, Cl_2, NH_3, C_2H_5OH, LPG, etc. The surface morphology, chemical composition, crystal structure, electrical and thermal properties of the bulk and nanostructured ZrO_2 have been investigated by Field Emission Scanning Electron Microscope (FE-SEM), Energy Dispersive Analysis by X-rays (E-DAX), X-Ray Diffraction (XRD), etc.

Keywords - Bulk and Nanostructured ZrO_2, Synthesis, Thick Films, Polluting Gases, etc.

I. INTRODUCTION

An oxygen sensor is an electronic device that measures the concentration of oxygen (O_2) in the medium to be analyzed. Oxygen sensors are used to measure the respiratory conditions, at the production of oxygen as well as oxygen analyzers which find a lot of use in medical applications such as anesthesia monitors, respirators and oxygen concentrators in the gases or liquids. Oxygen sensors are also used in hypoxic air fire prevention systems to monitor continuously the oxygen concentration inside the protected volumes [1-11]. Hydrogen sulfide has characteristic of rotten egg like odor and also it is a colourless gas. It appears naturally as a byproduct of decomposition. Hydrogen sulfide is a highly toxic gas [12-18]. It reacts with the enzymes in the blood stream which inhibit cell respiration. In other words, high concentrations of hydrogen sulfide can shut off the lungs. Even low concentration exposure of the H_2S gas can burn the respiratory track and cause swelling around the eyes [19-24]. Prolonged exposure of H_2S gas renders the sense of smell inoperative. Many gas sensors are already available by Figaro-Engg. Inc., Sierra Monitors Inc., IST, etc. However, many problems persist till today. These problems can be minimized by varying different parameters in the measurement of gas sensing. The different parameters, viz. operating temperature, type of gas, gas concentrations, ageing (long term), type of materials, crystallite size, film thickness, dopants, activators, calcination temperature, activation time, etc. affect the gas response of the sensor. However, the devotion is paid in fabricating the ZrO_2 and its compositions based low cost gas sensors. Hence, the effects of all above mentioned parameters are studied on the gas sensing performance of the nanostructured base materials and their compositions. The present work explains the comparative study of the sensors fabricated in the form of thick films.

II. OBJECTIVES

1) To synthesize the nanostructured ZrO_2 by one of the simplest and cheapest process known as disc type ultrasonicated microwave assisted centrifuge technique.
2) To prepare the thick films of nanostructured ZrO_2 by screen printing technique. This is one of the simplest and low cost technique.
3) To ensure longer life by maintaining proper thixotropy and rheology of the thick films.
4) To achieve a suitable surface activation by dipping the thick films of ZrO_2 into SrO_2 and Bi_2O_3 for enhancing the gas response and selectivity.
5) To analyze the synthesized pure and modified materials by different characterization techniques.
6) To investigate the electrical and gas sensing performance of pure and surface activated ZrO_2 thick films.
7) To investigate and modify the response and recovery profile of pure and surface activated ZrO_2 thick films.

III. LITERATURE REVIEW

Table 1: Literature Review

Sr. No.	Material	Technique	Gas / Investigation	Year	Ref. No.
01	ZrO_2	Thick films	H_2	2009	25
02	HfO_2, ZrO_2	Thin films	N_2	2006	26
03	ZrO_2-Y_2O_3-TiO_2	Thick films	Synthesis	1999	27

Synthesis and Characterizations of Pure and Surface Functionalized Nanostructured SnO_2 Thick films

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Abstract:

It is observed that, pure stoichiometric SnO_2 is expected to be insulating.However, the synthesized powder of SnO_2 is not exactly stoichiometric and hence is not insulating. So, nanostructured SnO_2 powder was synthesized by disc type ultrasonicated microwave assisted centrifuge technique. Thick films of nanostructured pure SnO_2 powder were fabricated by screen printing technique. These films were surface functionalized by strontium chloride for different intervals of time followed by firing at 450°C for 30 min. The surface morphology, chemical composition, crystal structure, and electrical characteristics of the unmodified and surface functionalized nanostructured SnO_2 powder by SrO_2 have been investigated by FESEM, E-DAX, XRD, etc.

Keywords-Characterizations, Nanomaterials, Synthesis,Thick films, etc.

1. INTRODUCTION

Tin is principally found in the ore cassiterite (tin oxide). It is obtained commercially by reducing the ore with coal in a furnace. SnO_2 is a wide band gap semiconducting oxide having energy gap of 3.6 eV. It crystallizes in the rutile structure. Its unit cell contains two tin and four oxygen atoms. It has tetragonal symmetry. Each tin atom is surrounded by distorted octahedron of six oxygen atoms and each oxygen atom has three tin nearest neighbors at the corners of an almost equilateral triangle. SnO_2 is used as a polishing powder and is sometimes known as putty powder. Tin oxide is used for ceramics and gas sensors[1-6]. SnO_2 wires are commonly used as the detecting element in carbon monoxide detectors.The aim of the present work is to synthesize the nanostructured SnO_2 powder by disc type ultrasonicated microwave assisted centrifuge technique. The synthesized material can

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A scalable screen-printed high performance ZnO-UV and Gas Sensor: Effect of solution combustion

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ABSTRACT

In the present study, scalable screen-printed Zinc Oxide (ZnO) based sensor was demonstrated to sense ultraviolet irradiation and gases such as ammonia (NH_3), ethanol (C_2H_5OH), liquefied petroleum gas (LPG), chlorine (Cl_2) and hydrogen sulphide (H_2S). A facile solution combustion synthesis (SCS) route was adopted to synthesize high purity, homogeneous, nanocrystalline and highly reactive ZnO with favourable morphologies, microstructural parameters for the sensing performance using low-cost and less-violent fuels such as urea, citric acid and glycine. Fuel impacts on uniform particle size distribution, bond length, grain size, lattice strain enhanced the gas sensing potential in the synthesized powders. Films were fabricated by depositing synthesized powders on the glass substrate via screen printing approach using Na-carboxy methyl cellulose as a binder, water as a solvent and annealed at 500 °C for 2 h in ambient. Non-stoichiometric, phase pure and adhered thick films with optical band gap (3.17-3.25 eV) imparted gas sensing properties because of recombination of an electron-hole pair and intrinsic defects. ZnO films obtained from glycine-fuel system exposed to 100 ppm of NH_3, C_2H_5OH, Cl_2 and 50 ppm of H_2S, exhibited good gas sensitivity of ~8, 5, 3 and 10 at an operating temperature of 50, 100, 200 and 100 °C respectively with a faster response and recovery speed. But, high sensitivity ~6 to 100 ppm of LPG at 350 °C in ZnO films from citric acid fuel-system. ZnO films obtained from glycine fuel system showed a high response to UV irradiation for exposing time of 90s. Low cost, high-performance sensor can be fabricated for the dual applications - alarming to prolonged exposure to harmful UV radiation and detection of a series of toxic and damaging gases.

1. Introduction

With the rapid and massive development of industrialization in the past few decades, mainly by chemical, fertilizers, pharmaceuticals, explosives, pesticides, cosmetics, fabrics and petrochemical industries severely contributed to the air pollution. Health-related problems, causalities, property damages due to leakage and explosion of harmful gases become too much threat to the survival of living creatures. So, potent real-time detection of the toxic and damaging gases using gas sensors -low cost, versatile incorporated with production, user-friendly and ability to detect a wide range of gases are needed [1]. Semiconductor metal oxides based conductometric gas sensors have dragged the great attention around the world as result of its high gas responsivity, less-toxic, good selectivity and portability [2].

Sensitivity and stability of the metal oxide conductometric gas sensors are influenced by many parameters such as oxide phase, crystal structure, grain size, grain boundaries, lattice distortion, residual stress effective specific area, the density of defects, porosity etc., [3,4]. Sensitivity greatly relies on the grain size, when the grain size is equal or smaller than twice the depth of the space charge layer known as Debye length; otherwise contact potential barrier controls the gas sensing apart from the grain size [5]. Further, oxygen vacancies in ZnO as electron donor are favourable to the enhancement of the conductivity leads to high response at lower operating temperature. Regardless, suitable surface modification helps in reducing operating temperature to a certain level in metal oxide sensors [6]. In spite of all parameters, the porosity of the films entertains the target gas to come in contact with all the nanostructures; thereby optimum sensing mechanism is achieved.

Zinc oxide (ZnO), a wide band gap semiconductor with unique properties such as excellent chemical and thermal stability, high

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भारतीय समाज व्यवस्था व प्रसारमाध्यमे

19-20

डॉ. रावसाहेब भिमराव नेरकर
इतिहास विभाग
राणी लक्ष्मीबाई महाविद्यालय, पारोळा

प्रस्तावना :-

भारतीय समाज व्यवस्थेतील प्रसारमाध्यमे हा घटक म्हणजे त्यातील अविभाज्य अंग झालेले आहे. समाज विकासात प्रसार माध्यमांची भुमिका अतिशय महत्वपूर्ण ठरते. आपण आदी मानवाच्या काळापासून तर थेट २१ व्या शतकाच्या पुढारलेल्या, वैज्ञानिक दृष्ट्या सक्षम झालेल्या मानवाच्या विकासाचा अभ्यास केला तरी त्यातील प्रसार माध्यमांची भुमिका निश्चितच मोलाची वाटते. आधुनिक युगातील मानवी समाजाचा सर्वांगिण क्षेत्रात झालेला विकास हा प्रसारमाध्यमाद्वारे झालेल्या जागृतीचाच परिणाम आहे. प्राचीन काळात जीवघेण्या आजारांना देवाकदिकांचा प्रकोप असे मानणाऱ्या अशिक्षित, मागासलेल्या समाजात प्रबोधन करून त्यांचे नाहक जाणारे बळी थांबवून अशा आजारांपासून वैद्यकीय इलाज करून दुरूस्त होऊ शकतो हे प्रसार माध्यमांनी सर्व सामान्य माणसापर्यंत पोहोचविण्याचे काम केले. प्रसारमाध्यमे ही समाज विकासाचे व समाज प्रबोधनाचे प्रभारी साधन मानले जाते. आपली भारतीय समाजव्यवस्था थेट २० व्या शतकाच्या पुर्वाधीपर्यंत अंधश्रद्धा, रूढी परंपरांच्या शृंखलेत बंदिस्त झालेली होती. समाजात अतिशय चुकिच्या आणि वाईट प्रथा-परंपरांचे प्राबल्य होते. धर्मभेद, जातीभेद, लिंगभेदाच्या विचारांनी सारी समाज व्यवस्था जखडली गेली होती. अशा समाज व्यवस्थेत वैज्ञानिक दृष्टी देण्यांचे महत्वपुर्ण कार्य प्रसारमाध्यमांनी केलेले आहे. समाजव्यवस्थेतील वर्गभेदाच्या आणि लिंगभेदाच्या विरोधात प्रबोधनाची महत्वपुर्ण भुमिका प्रसारमाध्यमांनी पार पाडली. समाजव्यवस्थेच्या सर्वांगिण अंगाचा विकास हा प्रसारमाध्यमांच्याद्वारे होणाऱ्या प्रबोधनामुळेच शक्य झाले.

प्रसारमाध्यमांची भुमिका :-

प्रसारमाध्यमांची समाज व्यवस्थेतील भुमिका कशी असायची होती. ती आज कशा प्रकारची आहे. या विषयी निश्चितच विचार मंथन होणे गरजेचे आहे. पुणे याठिकाणी नुकतीच माणुस घडवणारे शिक्षण या विषयावर एक शिक्षण परिषद घेण्यात आली. या प्रसंगी शिक्षण आयुक्त श्री. विशाल सोलंकी यांनी केलेले विधान पुढारलेल्या प्रगत समजणाऱ्या समाजव्यवस्थेला आत्मपरिक्षण करण्यास भाग पाडणारे आहे. ते म्हणाले, उच्चशिक्षित समाज घडवून उपयोग नाही, तर तो समाज त्या शिक्षणाचा वापर कोणत्या उददेशाने करणार आहे. यावर त्या देशाचे भविष्य अवलंबुन असते. म्हणूनच चारित्र्य संपन्न समाज निर्मिती हे आपले उद्दिष्ट असले पाहिजे. समाजव्यवस्थेत प्रसार माध्यमे महत्वपुर्ण भुमिका पार पाडतात. नव्हे ते त्यांचे कारण कर्तव्य मानले तर निश्चितच चारित्र्य संपन्न समाज निर्मिती हे त्यांचे उद्दिष्ट असलेच पाहिजे. प्रसारमाध्यमांद्वारा कशा चारित्र्य संपन्न समाजाची निर्मिती होते का हा एक संशोधनाचाच विषय आहे. या बाबतीत आम्ही प्रसारमाध्यमांना दोष देत बसायचे कि प्रसारमाध्यमांचा आम्ही किती आणि कसा वापर करतो या विषयी आत्मपरिक्षण करायचे हे समाजव्यवस्थेतील प्रत्येक घटकांने ठरवायचे आहे. विज्ञान आणि वैज्ञानिक दृष्टी विकसित होण्याआधीच्या कालखंडात अनाकलनीय वाटणा भोवतीच्या घटनांचा किंवा वस्तुस्थितीचा आपल्या परीने अन्वयार्थ त्याकाळातील कथा गीतांच्या माध्यमातून केला. १९ व्या शतकाच्या समाज सुधारणा आंदोलनाच्या माध्यमातून वृत्तपत्र, मासिके तसेच सभा-संमेलनातुन समाज प्रबोधन केले गेले. राजाराम मोहनरॉय, महात्माफुले, डॉ. आंबेडकर, महर्षी कर्वे, पंडीता रमाबाई अशा असंख्य सुधारकांनी आपल्या लेखनीच्या जोरावर समाज जागृती करण्याचे कार्य केले. जुलमी अत्याचारी ब्रिटीश सत्ता उचलून टाकण्यासाठी लोकमान्य टिळक, महात्मा गांधी यांसारख्या नेत्यानी ब्रिटीश प्रशासनाविरुध्द स्वातंत्र्यांची भावना निर्माण केली. राष्ट्रवादाची-राष्ट्रप्रेमाची भावना जागृत केली.

भारतीय समाज व्यवस्थेच्या सामाजिक, सांस्कृतीक, राजकीय, अशा सर्वांगीण क्षेत्रात समाजमाध्यमांची भूमीका प्रत्येक कालखंडात प्रभावी ठरलेली आहे. समाजात आत्मभान निर्माण करण्याचे महत्वपूर्ण कार्य प्रसारमध्यामे करीत असतात. समाज व्यवस्थेला प्रसारमध्यामांद्वारा आदर्श रूप देण्याचे कार्य होऊ शकते.

प्रसारमाध्यमांचे बदलते रूप आणि समाज व्यवस्था :-

काळाच्या ओघात भारतीय समाज व्यवस्थेत क्रांतीकारी बदल होऊ लागले. अंधश्रद्धा रूढी-परंपरामध्ये गुरफटलेल्या समाजाने शिक्षणाची आस धरली. त्यातुनच वैज्ञानिक दृष्टी समाजाला लाभली. जादू टोणा, भुत-पिश्याच्य जाऊन वैद्यकिय क्षेत्रात विलक्षण प्रगती झाली. परंपरागत जातीव्यवस्था नष्ट होऊन सामाजिक समता निर्माण होऊ लागली. समाजातील प्रत्येक घटकांला शिक्षण घेण्याचा मुलभूत अधिकार प्राप्त झाला. भारतीय समाज व्यवस्थेच्या विविध क्षेत्रातील बदलणाऱ्या रूपात प्रसारमाध्यामाचा मोलाचा वाटा होता. विसाव्या शतकात सुरू झालेल्या विज्ञान आणि तंत्रज्ञान युगावर प्रसारमाध्यमाचा मोठा प्रभाव दिसून आला. प्रसारमाध्यमाचे हे बदलते रूप जितके प्रभावी तितकेच मोहजाला सारखे घातकही ठरू लागले. डिजीटल तंत्रज्ञानात समांतर पणे घडवून आलेल्या तिन प्रवाहांच्या त्रिवेणी संगमामुळे सर्व सामान्य माणसांचे दैनदिन आयुष्य पूर्णपणे बदलूनच गेले. आज आपल्या हाताशी असलेले फेसबुक, ईस्टाग्राम या सारखी समाजमाध्यम व्हॉटसॲप सारखी संपर्क साधने आणि त्यासोबत असेलेली ४जी/५जी तंत्रज्ञानाधारीत इंटरनेटची सुविधा क्षणोक्षणी त्यावर होणाऱ्या माहीतीची योग्य पदधीतीने व अंत्यत कमी पैशात साठवण करण्यासाठी डेटाबेस व क्लाऊड तंत्रज्ञानात झालेली प्रगती तर तिसरा प्रवाह म्हणजे या सर्वत्र विखुरलेल्या माहीतीच्या प्रसारांची सागड

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Magnetohydrodynamics boundary layer flow and heat transfer in porous medium past an exponentially stretching sheet under the influence of radiation

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Abstract

Buoyancy forces result from the cooling or heating of a continuous stretching sheet, which causes a change in the resulting flow and thermal fields, and hence the heat transfer behavior in the manufacturing process. The study of the thermal buoyancy induced in boundary layer flow is important due to its recent advances in the areas of nuclear energy, electronics, and space technology. In this perspective, the aim of the present study is to investigate the effect of the buoyancy parameter on the magnetohydrodynamics boundary layer flow over an exponentially stretched sheet in the presence of nonlinear thermal radiation and porous media. Using similarity transformation, the flow model of partial differential equations is transformed into a set of coupled nonlinear ordinary differential equations. The efficient fourth-order Runge-Kutta scheme with the shooting method is used to solve the reduced equations. The impact of various associated parameters on velocity and temperature profiles were analyzed and computed through graphs. The major outcome of the present study shows the enhancement in the velocity distribution with the increase in the buoyancy parameter. Also, the increase in thermal buoyancy and

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Synthesis Of Sn Doped TiO_2 Thin Films And Their Application To H_2 Gas Sensing Properties

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Abstract—**Spray pyrolysis technique was employed to prepare Sn-doped TiO2 thin films of different composition. To prepare Sn-doped TiO2 thin films, the solutions of AR grade Titanium chloride (TiCl3, 0.05 M) and Tin chloride (SnCl4·5H2O, 0.05 M) were mixed in volume % of 99: 1, 97.5: 2.5 and 95: 5 and termed them as: ST1, ST2 and ST3 respectively. The solutions were sprayed on quartz substrate heated at 3500C temperature to obtain the films. These thin films were annealed for a one hours at 5500C. As prepared thin films were characterized by X-ray diffraction, surface morphology of thin films were studied using Field Emission Scanning Electron Microscopy and Microstructural studies were conducted using Transmission Electron Microscopy. The sensing performance of these thin films was tested for various gases such as LPG, H2, CO2, Ethanol, NH3 and Cl2 (100 ppm). Gas response of the sensor were measured and presented.**

Keywords— **Spray pyrolysis techniques, TiO2 thin films, gas response.**

1. INTRODUCTION

Sensor is the important element in automation technology and gains an increasingly greater significance as structural element of the systems. Hazardous and toxic gases from auto and industrial exhausts are polluting the environment. In order to measure and control these gases, one should know the amount and nature of gases present in the environment. This has led to research and development of wide variety of sensors using different materials and technologies. To increase the efficiency and capability of the instruments in measurement and detection technology, to reduce the cost, shape, size, weight etc, it is necessary to introduce the sensor units at the input parts of domestic, industrial and scientific instruments.

In recent years, the preparation and characterization of titanium oxide (TiO2) nanostructures have attracted much interest due to their unique properties and potential applications in catalysis [1], photo-catalysis [2], sensors [3-11], solar cells [12–14], energy storage [15], and gene therapy [16-17]. It has been demonstrated that the physical and chemical properties of TiO_2 nanostructures and hence their potential applications depend strongly on their crystalline structure, morphology and particle size [18]. TiO_2 is the stable form of titanium.

2. THIN FILM PREPARATION

2.1. PREPARATION OF TIO2 THIN FILMS

The spray pyrolysis technique was employed to prepare TiO2 thin films. AR grade solution of TiCl3 (0.05 M) was used as precursor. The solution was sprayed on to glass substrate heated at 3500C to obtain the films and termed them as S. These thin films were fired for one hour at 5500C.

2.2. PREPARATION OF SN-DOPED TIO2 THIN FILMS

Sn - doped TiO2 thin films were prepared using spray pyrolysis techniques. Solutions of AR grade Stannic Chloride SnCl4.5H20 (0.05 M) and Titanium chloride (TiCl3) (0.05 M) were mixed in the proportion of 1: 99, 2.5: 97.5 and 5: 95 and termed them as: ST1, ST2 and ST3 respectively. The solutions were sprayed on to glass substrate heated at 350°C to obtain the films. These thin films were fired for one hour at 550°C.

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3. PMATERIAL CHARACTERIZATION

3.1. STRUCTURAL PROPERTIES (X-RAY DIFFRACTION STUDIES)

The structure of the films was analyzed with X-ray diffractogram (RIGAKU DMAX 2500) using CuKα radiation with a wavelength 1.5418 Å. Fig.1 represents the X-ray diffractograms of pure TiO2 (S) and Sn-doped TiO2 (ST2) thin films. The observed peaks are matching well with ASTM reported data of pure TiO2 (21-1272). There are no prominent peaks of SnO associated in XRD pattern. It may be due to the smaller % of Sn doped in TiO2. It reveals from XRD that the films are nanocrystalline in nature with anatase phase. All the peaks are corresponding to tetragonal TiO2 with strongest (101) peak. The average crystallite sizes calculated from (101) and (200) peaks, using Scherer formula and i.e. 17nm for sample S1 and 19 nm for sample ST2.

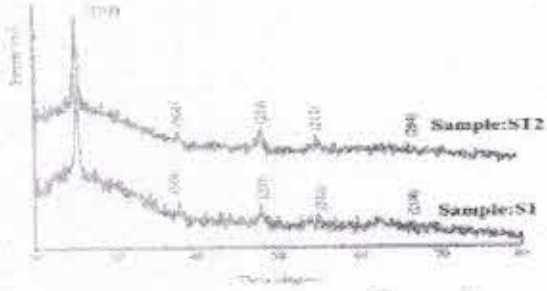

Fig.1. (a) XRD pattern of sample S1 and ST2.

3.2. ELEMENTAL COMPOSITION OF PURE AND SN DOPED TIO2 THIN FILMS

The quantitative elemental composition of pure TiO2 and Sn doped TiO2 thin films were analyzed using an energy dispersive spectrometer and atomic % of O, Ti, Sn is represented in Table 1. Sn doped samples were observed to be nonstoichiometric in nature. It is clear from Table 1 that, the atomic % of Sn increases by increasing doping percentage of Sn.

Table 1: Elemental analysis of pure TiO2 and Sn doped TiO2 thin films.

Element at. %	[S]	ST_1	ST2	ST_3
O	81.73	77.80	81.40	90.31
Ti	18.27	16.28	12.50	03.25
Sn	00.00	05.93	06.10	06.44
Total	100.00	100.00	100.00	100.00

3.2. 3.3. SURFACE MORPHOLOGY OF PURE TIO2 THIN FILMS

Fig. 2 FE- SEM image of nanocrystalline pure TiO2 (S) thin film.

Fig.2 depicts the FE- SEM of pure TiO_2 thin film fired at 550°C for 60 min. Pure TiO_2 thin film consists of uniformly distributed grains having average crystallite size of 24 nm.

3.4. SURFACE MORPHOLOGY OF SN DOPED TIO_2 THIN FILMS

Fig. 3 show FE-SEM image of Sn-doped TiO2 thin film of sample ST2 consists of uniformly distributed grains having average crystallite size of 26 nm.

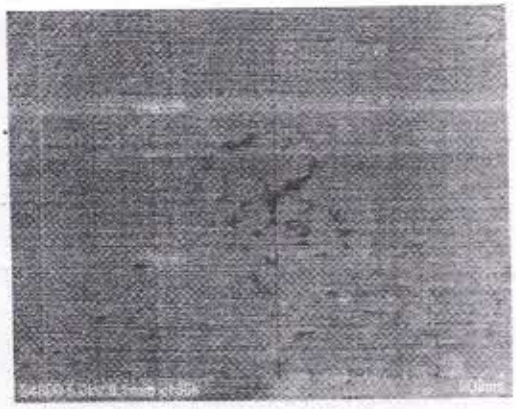

Fig. 3. FE- SEM image of sample ST2.

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3.5. TRANSMISSION ELECTRON MICROSCOPY OF PURE AND SN DOPED TIO2 THIN FILMS

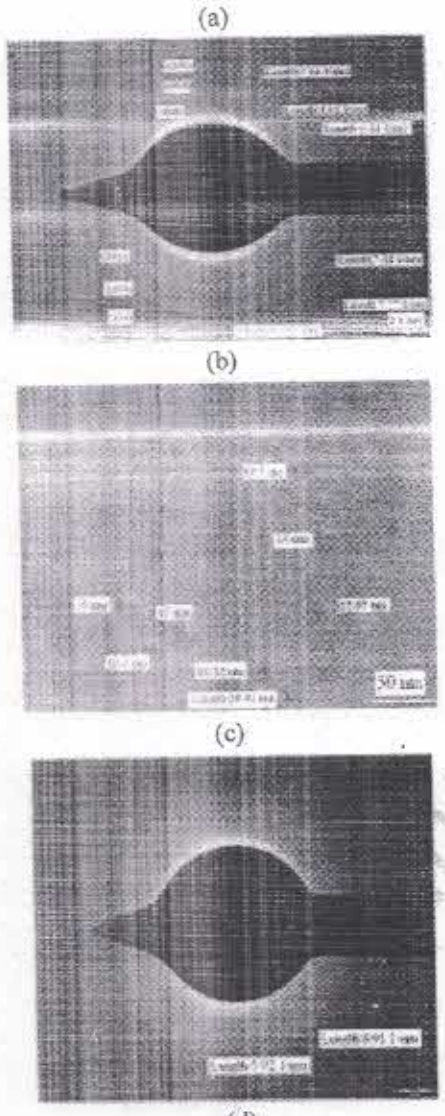

Fig.4. TEM and Electron diffraction images: (a-b) Sample S, (c-d) Sample ST2.

Fig. 4 (a) and (c) shows the Transmission Electron Microscopy [CM 200 Philips (200 kV HT)] of powder obtained by scratching the thin films of sample S and sample ST2. The powder was dispersed in ethanol. Copper grid was used to hold the powder. It is clear from TEM images that the grains are spherical in shape and nanocrystalline in nature and average crystallite size of sample S is 12 nm and sample ST2 is 19 nm.

Additional structural characterization was carried out by electron diffraction shown in fig.4 (b) and (d). Spherical rings in electron diffraction patterns suggest that the nanopowder has good crystallinity. The images shows the clear fringes corresponding to the (101), (004), (200), (211), (204) and (116) lattice planes of TiO2.

4. GAS SENSING PERFORMANCE

4.1. SENSING PERFORMANCE OF PURE TIO2 THIN FILMS

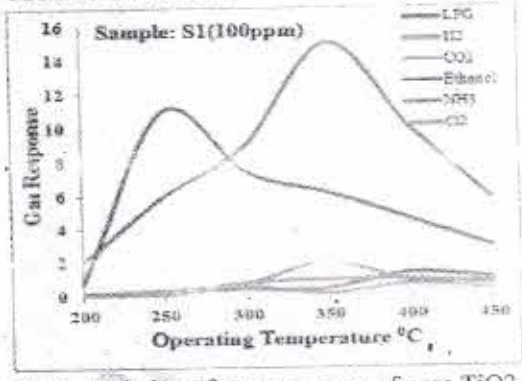

Fig.5. Variation of gas responses of pure TiO2 thin films.

Fig. 5 shows the variation of gas (100 ppm) responses of pure TiO2 thin film (S1). The film shows highest response to LPG at 3500C (~15) and to H2 at 2500C (12). The same sensor responded to LPG and hydrogen when it was operated respectively at 3500C and 2500C.

4.2. SENSING PERFORMANCE OF SN DOPED TIO2 THIN FILMS

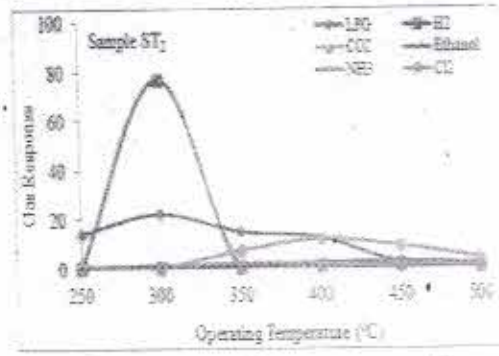

Figure 6. Variation of gas response with operating temperature.

The variation of H2 gas (100 ppm) response of Sn doped TiO2 thin film of ST2 sample with operating temperature is represented in Fig.6. It is clear from figure that the gas response increases with increasing operating temperature; reaches to maximum (77) at 3000C and falls with further increasing operating temperature. It is clear from

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figure that, the gas response to H2 increases due to doping of Sn.

5. H_2 SENSING

It is well known that oxygen molecules are adsorbed on the surface of TiO_2 to form O_2, O, and O_2 ions by abstracting electrons from the conduction band of TiO2 depending on temperature. The oxygen species are O2 molecules below 1000C, O_2− between 100 and 3000C, and O_2− above 3000C [19].

H_2 (ads) + O− (ads) $\rightarrow$ H_2O (gas) + e−

When the Ti O_2 thin films are exposed to H_2 gas, the H_2 gas reacts with the adsorbed O− ions on the surface of Ti O_2 thin films according to equation (4.6). Then, electrons are returned back to the films. Increase of electrons decreases the resistance of the TiO_2 thin films and conductivity increases upon exposure to H_2.

6. CONCLUSIONS

The conclusions are summarized as follows.

1. Pure TiO2 thin films are observed to be sensitive to LPG gas at 3500C (24) and to H2 at 2500C (27).

2. Sn doped TiO2 (ST2) sensors gives higher response to H2 (77) at 3000C as compared to pure TiO2.

3. The gas response of TiO2 based sensors was found to be changing with operating temperature.

4. By controlling the distribution and amount of activator in the semiconductor oxide, it could be possible to fabricate the sensor with good sensing properties

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Criterion 3: Research, Innovations & Extension

Academic year- 2018-19
1.1.1 अमळनेर तालुक्यातील निस्पृह कामगार नेता दाजीबा पाटील
1.1.2 खान्देशातील सांस्कृतिक परंपरा जपणारा लेवा पाटीदार समाज
1.1.3 Role of Sport in School Education
1.1.4 पंडित श्रीधर शास्त्रीची स्त्री सुधारणावादी भूमिका
1.1.5 हिंदी साहित्य मे किसान विमर्श
1.1.6 लीला चरित्र मधील समाज जीवन
1.1.7 भारतातील जात व वर्ण व्यवस्था : एक अभ्यास
1.1.8 राजर्षी शाहू महाराजांचे सामाजिक,शैक्षणिक आणि शेती विषयक धोरण.
1.1.9 १९ व्या शतकातील स्त्री वर्गाचे स्थान आणि स्त्री शिक्षण
1.1.10 शाहू महाराज आदर्श राजा व आदर्श व्यक्तिमत्व
1.1.11 प्रवाशी भारतीय साहित्यकार तेजेंद्र शर्मा कि कहानियोंका कथ्य
1.1.12 Effect of iron doping on structural, microstructural and gas sensing properties of nano crystalline ZnSnO3 thin films prepared by spray pyrolysis tech.
1.1.13 माझे गांव माझा इतिहास -पारोळा ऐतिहासिक, सांस्कृतिक व अध्यात्मिक नगरी
1.1.14 Improvement of H2S sensing performance of SnO2 based thick film gas sensors surface activated by Cuo.
1.1.15 Hydrogen gas sensor based on nano crystalline Titanium dioxide thin film prepared by simple spray pyrolysis techniques
1.1.16 Preparation, characterisation of nano structured Zno powder and sensing performance its thick film sensor
1.1.17 Plant invasion in india as revealed from Tantrasarah

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विद्येविना मति गेली, मतीविना नीति गेली
नीतिविना गति गेली, गतिविना वित्त गेले
वित्तविना शूद्र खचले, इतके अनर्थ एका अविद्येने केले

-महात्मा ज्योतीराव फुले

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अमळनेर तालुक्यातील निस्पृह कामगार नेता - दाजिबा पाटील

प्रा. डॉ. सुनिल सी. अमृतकर
विद्यावर्धिनी महाविद्यालय, धुळे, जि. धुळे.

प्रा. मनिष आर. करंजे
राणी लक्ष्मीबाई महाविद्यालय, पारोळा, जि. जळगांव.

पूर्वायुष्य -

प्रास्ताविक

दाजिबा पर्बत पाटील यांचा जन्म दि. २३ सप्टेंबर १९२५ रोजी लोहारी ता. पाचोरा येथे पर्बत पाटील व सौ. अनुसयाबाई पाटील यांच्या पोटी झाला. घरची परिस्थिती अतिशय गरिबीची होती. परंतू मनात मोठे होण्याची स्वप्न बाळगली होती. या स्वप्नपूर्ती करिताच त्यांनी विद्यार्थीदशेत अनेक ठिकाणी नोकरी केली तसेच कॉंग्रेस कार्यालयाची कामे करून आपले शिक्षण त्यांनी पूर्ण केले. पुणे विद्यापीठाची बी.ए. पदवी संपादन केली. पित्याचे छत्र जास्त काळ त्यांना लाभू शकले नाही. पण माता -अनुसयाबाई यांनी प्रताप मिल मध्ये कामास लागून पुत्राचे पालन केले. आई गिरणीत कामाला असल्याने कामगारांचे प्रश्न काय असतात, याची ओळख बालपणापासूनच दाजिबांना होती हे प्रश्न सोडविण्याकरिताच भविष्यात त्यांनी कामगार संघटनांमध्ये विविध जबाबदारीची पदे भुषवुन एक ख्यातनाम कामगार नेता म्हणून आपली ओळख निर्माण केलेली दिसून येते. रा.मि. मजूर संघटनेचे सेक्रेटरी, महाराष्ट्र इंटकचे अध्यक्ष, महाराष्ट्र राज्य ग्रामिण कापड कामगार महासंघाचे अध्यक्ष, प्रताप मिलचे डायरेक्टर, विविध संस्थेचा पदाधिकारी एवढेच नव्हे तर आमदार म्हणून दोन वेळा निवडून येऊन महाराष्ट्र विधान परिषदेच्या उपसभापती पदाचा बहूमान तीन वर्ष मिळाला. ध्येयाच्या वाटचालीत आनंददायक क्षण अमळनेर प्रताप गिरणीतील कामगार व मातेचा सुपूत्र या दृष्टीकोनातून प्रताप गिरणीतील कामगारांना व त्याचप्रमाने नागरिकांना व अमळनेर तालुक्याला अभिमान आहे.

कामगार संघटनेत सहभागी -

अमळनेरच्या कामगार चळवळीला बराच मोठा इतिहास आहे. आणि ह्या कामगार चळवळीच्या इतिहासात माननिय दाजिबा पाटील यांनी स्वकर्तृत्वाने एक महत्त्वाचे स्थान निर्माण केले आहे.१

१९४७ पूर्वी अमळनेर प्रताप मिल कामगारांची संघटना कम्युनिस्ट प्रेरित गिरणी कामगार युनियनच्या नेतृत्वाखाली होती. गिरणी मालकाशी असहकार व असंतोषाचे वातावरण नेहमी असायचे. ७ मे १९४७ रोजी अमळनेरला इंटक प्रणित राष्ट्रीय मिल मजूर संघाची स्थापना झाली. कामगारात राष्ट्रीय भावनेची प्रेरणा निर्माण करून कामगारांचे कोणतेही प्रश्न सलोख्याने शांततेच्या मार्गाने सोडविण्याचे धोरण ठेवले. गिरणी कामगार युनियनच्या कामगारात प्रताप मिल जूनी व नवी सोसायटीत जे वर्चस्व व पगडा होता. त्यास दाजिबा पाटील यांनी धैर्याने तोंड देऊन कामगारांचे प्रश्न सलोख्याने व शांततेच्या मार्गाने संपाचा व असहकाराचा अवलंब न करता कामगारांच्या मागण्या पदरात पाडून घेतल्या. प्रताप मिल जुनी व नवी सोसायटी राष्ट्रीय मिल मजदूर संघाच्या नेतृत्वाखाली आणल्या.

कार्यक्षेत्र -

कामगारांचे प्रश्न सोडवत असतांना दाजिबांच्या लक्षात आले की, 'विना सहकार - नाही उद्धार' आणि म्हणूनच त्यांनी सहकार चळवळीकडे आपले लक्ष केंद्रीत करून 'जळगांव जिल्हा मध्यवर्ती सहकारी बँकेचे डायरेक्टर पदाच्या चुरशीच्या निवडणुकीत सन १९७३, व त्यानंतर सन १९७८ मध्ये निवडणूकीला सामोरे जाऊन यश प्राप्त केले.२

स्वातंत्र्योत्तर काळात बदलत्या आर्थिक स्थितीला सामोरे जाण्यात प्रताप मिल अपयशी ठरली. प्रताप मिलची आर्थिक स्थिती ढासळू लागली. सन १९६३ मध्ये प्रताप मिल बंद पडली असता, कामगार चळवळ उभारून माजी संपर्क मंत्री ना. मधुकरराव चौधरी यांच्या नेतृत्वाखाली इंटकचे शिष्टमंडळ सरकारला भेटले. ना. यशवंतराव चव्हाण यांनी पुढाकार घेऊन प्रताप मिलवर अवलंबून असणारा अमळनेर तालुक्याचा विचार करून एप्रिल १९६३ मध्ये अमळनेरची प्रताप मिल केंद्र सरकारला द्यावयास भाग पाडले. पुढे महाराष्ट्र शासनाच्या ताब्यात प्रताप मिल देण्यात येऊन महाराष्ट्र शासनाने महाराष्ट्र राज्य वस्त्रोद्योग महामंडळाच्या ताब्यात मिलचा कारभार सोपवला. मिलला लिक्वीडेशन मधुन बाचविण्यात कामगारातर्फे दाजिबा पाटील व त्यावेळेचे प्रताप मिलचे प्रशासक टेक्सटाईल तज्ञ एस.ए. खेर साहेब यांनी सर्वतोपरी सहकार्य देऊन जे नेतृत्व व पुढाकार घेऊन दाजिबा पाटील यांनी कामगारांप्रति बहुमोल सहकार्य केले. हे अमळनेर व प्रताप मिलचे कामगार कधीही विसरू शकणार नाही.३

११० कामगार व बेघर लोकांसाठी जागा उपलब्ध करून दिली आहे. आणि आजही 'दाजिबा नगर' मध्ये लोक आनंदाने राहत आहे.९

निष्कर्ष -

जळगांव जिल्ह्याने स्वातंत्र्य चळवळीत सर्वार्थाने योगदान दिले आहे. या चळवळीतूनच अनेक राजकीय सामाजिक नेतृत्व उदयास आले. त्यापैकीच एक दाजिबा पर्वत पाटील हे होते. दाजिबांनी जे कामगारांचे आयुष्य जवळून पाहिले त्यामुळेच कामगारांप्रती कळवळा त्यांच्या मनात निर्माण होऊन त्यांनी त्याकरिता इंटक संघटना व मजुर संघटना इ. संघटनांमध्ये हिरिरिने सहभाग नोंदवला. कामगारांचे प्रश्न सोडवण्याबरोबरच त्यांनी तळागाळातल्या लोकांचे प्रश्न सोडवण्याकरिता नगरपालिका, सहकारी सोसायट्या व विधान परिषदचे आमदार म्हणून त्यांनी आपली जबाबदारी जनहितार्थ पार पाडली. त्याचीच फलश्रुती म्हणून त्यांना विधान परिषदेचे उपसभापती म्हणून काम पाहण्याचा सन्मान मिळाला. हा सन्मान संपूर्ण अमळनेर तालुक्यातील जनतेच्या व कामगारांचा होता असे म्हणावे लागेल. एकंदरीत साने गुरूजींपासून सुरू झालेली कामगार चळवळ दाजिबा पाटलांनी पुढे चालू ठेवलेली दिसून येते.

संदर्भ :-

१) अमळगांवकर मधुकर, 'अमळनेर वार्ता' दादासो दाजिबा पाटील शुभेच्छा विशेषांक - संपादक राजकुमार छाजेड, दि. २३ सप्टें १९८९, पृ. ६.

२) कित्ता, पृ. ६.

३) कित्ता, पृ. ६.

४) दैनिक लोकमत बुधवार दि. २५ मार्च २०१५.

५) उपरोक्त, पृ. ७.

६) पाटील प्रकाश आर, 'अमळनेर वार्ता' दादासो दाजिबा पाटील शुभेच्छा विशेषांक - संपादक राजकुमार छाजेड, दि. २३ सप्टें १९८९, पृ. ४.

७) कित्ता, पृ. ४.

८) पाटील मनोज भाऊराव, मुलाखत, दि. १९/११/२०१७.

९) खराटे राजाराम सोनू, 'अमळनेर वार्ता' दादासो दाजिबा पाटील शुभेच्छा विशेषांक - संपादक राजकुमार छाजेड, दि. २३ सप्टें १९८९, पृ. १५.

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लोकसभा निवडणूक व महिलांचा राजकीय सहभाग

प्रा.विजय एस.कांडलकर

सहाय्यक प्राध्यापक

संताजी महाविद्यालय, वर्धा रोड, नागपूर

सारांश:

स्वातंत्र्यप्राप्ती नंतर महिलांचा राजकिय सहभाग वाढविण्याच्या दृष्टिने अनेक प्रयत्न करण्यात आले. उदा. शासकिय धोरण, आरक्षण, सबलीकरण, स्त्री–पुरूष समानता, सांविधानिक प्रयत्न इत्यादी तरीसुध्दा महिलांचा राजकिय सहभागाच्या दृष्टिने पाहिजे त्या प्रमाणात सहभाग वाढविता आला नाही. लोकसभा निवडणूकीच्या संदर्भात पाहता त्याचे प्रमाण अतिशय अल्प असेच म्हणावे लागेल. प्रथम लोकसभा निवडणूकीपासून तर २०१४ च्या सोळाव्या लोकसभा निवडणुकीपर्यंत दृष्टिक्षेप टाकल्यास महिलांचा राजकिय सहभाग त्यातही निवडणूकीच्या संदर्भात ही टक्केवारी महिलांच्या एकूण लोकसंख्येच्या प्रमाणात कमीच आहे असे स्पष्ट दिसते. लोकशाही शासन व्यवस्थेत समानतेच्या तत्वाचा अवलंब करून सुध्दा प्रत्यक्षात असमानता दिसून येत आहे. वर्तमान काळात भारताला स्वातंत्र्य प्राप्त होऊन अनेक वर्षे झाली. तरीसुध्दा महिलांकडे पाहण्याचा दृष्टिकोन तसेच त्याकरीता करण्यात आलेले प्रयत्न कमीच पडत आहे. लोकशाही शासन व्यवस्थेच्या दृष्टिने ही बाब योग्य नव्हे. महिलांचा राजकिय सहभाग (निवडणुकीच्या संदर्भात) वाढविण्याच्या दृष्टिने व त्यांना पक्षात सामिल करून घेण्याचा जितका प्रयत्न झालेला नाही. केवळ आरक्षणाचा कोटा पूर्ण करणे असे नसून लोकशाही बळकट करण्यासाठी महिलांना राजकिय प्रवाहात आणणे व राजकारणात

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२. खानदेशातील सांस्कृतिक परंपरा जपणारा लेवा पाटीदार समाज

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प्रस्तावना

खानदेशातील विवीध जाती- जमातीचे लोक या प्रदेशाची सामाजिक सांस्कृतिक परंपरा संवर्धनाचे काम करतांना दिसतात. खानदेशातील विवीध समाजाच्या प्रथा, रुढी वेगवेगळ्या असल्या तरी त्यांना एका धाग्यात बांधण्याचं काम या प्रदेशातील सांस्कृतिक मुल्ये करतात. खानदेशाला मोठा सांस्कृतिक, अध्यात्मिक वारसा लाभलेला आहे. आपल्या प्रदेशाला लाभलेल्या सांस्कृतिक वारसा जतन करण्याची भूमिका सर्वच समाजांची असल्याचे दिसून येते. देशाच्या विवीध भागातून वास्तव्यास आलेले आणि पिढ्यांपिढ्या या प्रदेशात स्थायित झालेले हे जाती-जमातीचे लोक या मातीशीच एकरुप होऊन गेले. या प्रदेशाच्या सांस्कृतिक जडणघडणीत त्यांनी मोलाची भर घातली यामध्ये लेवा पाटीदार समाजाचा महत्त्वपुर्ण वाटा आहे. लेवा पाटीदार समाज मुळात कोणत्या भागात वास्तव्यास होता आणि खानदेशात कोणत्या मार्ग त्यांचे आगमन झाले या विषयी इतिहासकारांमध्ये मतभेद आहेत.

लेवा पाटीदार समाजाचे मुळ वस्तीस्थान आणि खानदेशातील आगमन

'लेवा' या शब्दाच्या आधारावर काहींच्या मते लेवा पाटीदार हे मुळचे राजस्थानातील रहिवासी होते. त्याचप्रमाणे पंजाब व मध्यप्रदेशात ही लेवा पाटीदारांची संख्या मोठ्या प्रमाणात होती. राजस्थानातील स्थानिक राजपुतांनी त्यांना हुसकावून लावल्यानंतर ते गुजरात मधील 'रेवा' नदीच्या काठी वास्तव्यास राहिले. त्यानंतर त्याच भागात स्थायिक झाले. रेवा नदीच्या काठी स्थायिक झालेले 'रेवा' आणि अपभ्रशांने तेच 'लेवा' झाले असा एक विचार प्रवाह आहे. लेवा पाटीदारांचे गुजरात मधून खानदेशात संवत ११०० मध्ये आगमन झाल्याचा उल्लेख सापडतो. महाराष्ट्राच्या इतर भागात दिसून न येणारा लेवा पाटीदार समाज मात्र खानदेशाच्या पूर्व भागातच विशेष करुन वास्तव्यास असल्याचे निर्दशनास येते. खानदेशातील जळगांव जिल्ह्यातील जळगांव, भुसावळ, यावल, रावेर, मुक्ताईनगर (एदलाबाद) तालुक्यामध्ये आणि बुलढाणा जिल्ह्यातील मलकापुर, मोताळा व नांदुरा तालुक्यात लेवा पाटीदार समाज वास्तव्यास आहे. 'लेवा' शब्दाप्रमाणेच 'पाटीदार' शब्दाच्या पाठीमागे मोठा अर्थ दडलेला दिसुन येतो. 'पाट' म्हणजे शेत आणि 'पट्टा' म्हणजे तो धारण करणारा तो 'पाटीदार' असा शब्दानुरुप अर्थ लावला जातो. १८ व्या शतकात पाटीदार सारा वसूल करुन शासन दरबारी भरीत असल्याचा उल्लेख सापडतो.

लेवा पाटीदार समाजातील रुढी व प्रथा

महाराष्ट्राच्या इतर प्रदेशाच्या प्रमाणेच खानदेशातील जवळपास सर्वच जातो-जमातीमध्ये परंपरागत रुढी परंपराचे पालन केले जात होते. एवढेच नव्हे तर ह्या प्रथा- परंपरा एका पिढीकडुन दुसऱ्या पिढीकडे संक्रमीत केल्या जात असत. प्राचीन अनिष्ट रुढी - परंपराचा पगडा समाज मनावर पक्का बसलेला होता. खानदेशातील लेवा पाटीदार समाजही यापासून सुटलेला नव्हता. या

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Role of Sports in School Education

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Abstract :
This article explores the scientific evidence that has been generated on the contribution of sports in school education for both students and children and for education system. The researcher has received evidence in terms of literary works and psychological reference published in different books and articles. This articles aims to put the role of sports in children's all round development like physical, social, linguistic, lifestyle, and cognitive levels. Different articles and literary works suggested that physical education i.e. sports have the potential to make distinctive contribution to the development of children's fundamental movement skills and physical competences by nurturing different school activities and by adopting psychological platforms. There is an introduction fantasy games in this article that promotes students in the world of fantasy and develop their imaginative world as well as psychomotor abilities. Sports in school education provide opportunities of social and emotional abilities to develop and make students to make their minds free. This article also finds role of Psychologist and their pedagogies in developing students all round development by implementing school activities. Maria Montessori, John Piazzi, Sigmund Freud.

Introduction :

In the magic world of sports, there are different games and each of them has their own rules. These games are involved with different physical activities which are being performed either by an individual or in a team in order to pursue leisure, entertainment or compete the opposite team or an individual. The concept of sports is very vast as it can serve the purpose of therapy as well tool in different aspects of life which can help to change world. Sports are also beneficial for schools going children by which they can achieve fitness and skill of doing different physical exercises.

There is no unanimity between the philosophers and learning experts about what the sports really means. But this matter should be the matter of children only. If given an opportunity, children will be in touch with nature. Any how, to identify the importance of sports in children, is difficult to understand for old and young people and there is also a social and cultural difference.

The significance of the sports of young children in Western culture has been recognized since the nineteenth century. In India, game and work are different from each other, especially, from educational perspective. The developmental phase of childhood development is limited in Indian education system. [1]Since early childhood, study in India is conducted on the theory of Western education/studies. Fredrick Frobel, the western educationalist of early 19th century, is considered the father of child pedagogical movement. He insisted that when children play, self-motivated with nature and objects, they are very much excited to learn the way. He had planned to play games that encouraged his childish curiosity to get education through the way of its own search process. He also strongly convinced the importance of human interaction development and environmental care from children's development prospective [2]

How does a child learn? In the ninetieth century, many scholars, have reported the importance overall development of children and education. John Piazzi, Bruner, Lew Waygostick are the most important scholars among them. Piazzi has given attention to the two major issues related to child education and they are recognized all over the world. He explained that children have an intense learn and what is the meaning of what children learn, their sense of knowledge arises. For this, they take care of the ecosystem of the around and take it seriously. The small children's game develops very fast in the initial years, this development of games is directly related to child's intellectual development. However, Piazzi didn't say much about whether there would be any impact due to social and cultural context. His contemporary, Vygotsky and Bruner, who come after him, however, focused on the social interaction and cultural environment education. How does a child be able to learn while it is small, and surrounded by a social emotional environment and elderly people around him have a vast majority of population to him.

Maria Montessori, the educationalist had very faith in learning from children's self-motivation. Similarly, she thought that the action program planned for this purpose would be very beneficial. The practice of thinking, rout to thinking is increased in the planned action program and sureties' of learning through the explicit action program are the tools and features of Montessori's pedagogy and learning program. But in terms of sports, her opinion was different from her contemporaries. According to her, when everything else is not to be done by the children, they are created in the sports.[3]

Concept of Sports: To understand the role of sports in school education, it imperative to understand the concept like

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game, play, and sports. Although, sports involves play which may be seen a useless activity, it has a very important function. Play is a learning process and has different importance according to the culture of a child. But what is to say is about that play performance important role in children's development indicated form energy point of view. According to the Bill Harper a play philosopher, play is a voluntary, spontaneous light and one of the tradition sources of pure pleasure of human' According to Loy (1968), game is 'any form of competition whose outcome is determined by physical strategy, skill, or chance employed singly or in combination." Furthermore, a sport is a form a game, played by children and adult, alike where the players train for physical skills. [4]

What does Sports bring in Children? Western nations, now, have accepted game as an integral part of education. Children participate in both physical and social sports. Body movements are a major cause of physical activity, so breathing is carried out in large amount, which helps in concentrating and increasing concentration. In addition, the benefits of sports that increase bones in body, sine the movement in body is large, and physical skills are easily acquired. Self-confidence in children with physical abilities and skill is greatly increased and hence, the risk of physical activity of any kind increases. Playing on the ground on the hand gives students the opportunity to interact and behave with other. Students get an experience of sharing of experience with each others and expressing their feeling to others. Games play an important role even in the development of language transactions. In the educational institutes, that don not have a little space to interact and play with each other, alternatively, the development of such education instructions is limited to the education. When students get the opportunity to freely interact with other, they are in the true sense of language development, and through different sports activities, the students also get the opportunity to freely communicate. By giving suggestions, asking questions, giving instructions, or receiving skill from other teammates of inside or outside, the language of the students develops.

Playing fantasy game is a key step in personality development. When two or more children come together and interact with each other, they experience the experience of life by creating a fantasy world. Such fictional games have been edited through television, school campuses, texts, and surrounding. In this form of play, they perform their role of either younger person or an adult. This form of fantasy game develops their language at high level. In this form of sport, a large of intangible concepts and the problems solving concept is involved.

The role of such games is also extraordinary for the emotional development of school going students. Some research studies have found direct connection between these type of sports and writing, reading skill of students. It is important to organize such games for educational development of the finically backward children in school life. Sigmund Freud, a German Psychologist, researched much pedagogy, while Freud has not worked in form of fictional sports. But has mentioned the need of this form of game is to improve the mind of children. When children play sports, there is not pressure on their mind and such an open mind is needed to face the annoying emotions of life. Children have to face many situations in school life like examination stresses, fear of doctor, scolding of parents and teachers, decision making, applying new things etc. in such saturation, free mind is essential and practice of making mind free is done through sports.[5]

Sports and education: Schools are generally defined to be an institute meant of academics for developing language proficiency and exploration of scientific and geometric concepts. But especially, with the advent of technology, there are lot of ways to custom information and education itself. So if the only reason a student goes to schools is for academic experience. But there are so many efficient way to learn in school. And physical activity, that is sports, is one of these ways. According to the report presented in 'journal of school health', "The Relationship between Youths and Sports Participation and Selected Health Risk Behaviors 1999 to 2007." It has been observed that sport at education level brings weight control, problem solving, skills, self-esteem, social competences, and academic achievements and reduces the rate of juvenile arrests, teen behavior, and school drop-out.

In addition to this we have observed emotional benefits, intangible benefits of school and community as a whole. Sports enable students to participate in communal activities for contributing school in social as well as community activity and that bring a prior relationship towards the society. It brings the society to know values and identification. (Richard Duglas 2004.)

Sports avoid sexual bares i.e. sex equality in teen girls of school levels have chance to see the social benefits by participating in team sports. The psychical activities combined with the camaraderie and purpose lead to a winning combination for girls. According to Anderson, "Girls who compete in sports get better grades, graduate at higher rate and have more confidence.'

Sports at school level develop team work. Team work is a form that gather people towards common goal, by creating a positive atmosphere of learning and supporting each other to combine individual strength. When an event of sports is conducted at school level, a team work is observed especially in the form of team play like kabaddi, kho-kho, Cricket, Football and Volley Ball.

In short, it can be said that sports has an immense role in school and for school going children, even for teachers and society because, by this, it is simple to study the nature of growing students in different form sports and the company which

a child learns and plays together. There is positive influence on the psychology of children by participating in different school sports activities. An emotional attachment of students is easily empowered by keeping them in continuous physical activities in group and in team.

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पं. श्रीधरशास्त्रींची स्त्री सुधारणावादी भूमिका

– डॉ. रावसाहेब भिवराव नेरकर
इतिहास विभाग
राणी लक्ष्मीबाई महाविद्यालय, पारोळा जि जळगांव

प्रस्तावना :–

स्त्रियांच्या सबलीकरणात 'शिक्षणाची' भूमिका महत्त्वपूर्ण आहे. स्त्री साक्षर झाली म्हणजे तिला तिच्या अस्तित्वाची जाणीव होईल. आपल्यावर होणाऱ्या अन्याय, अत्याचारापासून सुटका करण्यासाठी ती सज्ज होईल. अशी धारणा सुधारणावादी विचारसरणीच्या विद्वानांची होती. म्हणूनच समाज सुधारणा चळवळीत स्त्री शिक्षणाला त्यांनी अग्रक्रम दिला. महात्मा फुले, सावित्रीबाई फुले सारख्या व्यक्ती समाजाचा प्रखर विरोध पत्करुन स्त्री शिक्षणाचे काम हिरिरीने करीत होत्या. सनातनी वर्ग मात्र स्त्रीशिक्षणाच्या कार्यात अडथळे निर्माण करीत होते. स्त्रियांना शिक्षणाचा अधिकारच नाही अशी त्यांची धारणा होती. धर्मशास्त्राचा चूकीचा आधार घेऊन स्त्री शिक्षण धर्मबाह्य कृत्य आहे असा प्रचार सनातनी मंडळी करीत होते. 'स्त्रियांना शिक्षण दिले तर मोठे अनर्थ होतील, घरसंसार उध्वस्त होतील आणि संसारातून त्यांचे मन उडेल अशा भ्रामक कल्पना बाळगणाऱ्यांनी धर्मशास्त्राचे आधार पुढे करुन या काळात अडथळे आणले'.१ धर्मभोळ्या जनतेचा फायदा घेऊन धर्मशास्त्राधाराचा चुकीचा अर्थ लावून स्त्री शिक्षणाला विरोध केला जात होता. कर्मठ विचारसरणीच्या ब्राह्मणांना मुलींना शिक्षण देणे ही कल्पनाच हिंदू समाजाला विलक्षण धक्का देणारी वाटत होती, हे काहीतरी विपरीत घडते आहे असे त्यांचे ठाम मत झाले होते. त्या कारणाने धर्मभावनेला डावलून आणि जनमनाचा कौल झुगारून देऊन मुलीला शाळेत पाठविणे ही गोष्ट अन्यायकारक असल्याचा दावा त्यांनी केला होता'.२.

पं.श्रीधरशास्त्रींची स्त्री साक्षरतेविषयी भूमिका –

सनातनी वर्गाचा स्त्रीशिक्षणाला असलेला विरोध मोडून काढण्यासाठी पं. श्रीधरशास्त्रींनी धर्मशास्त्रीय आधार दिले. स्त्रीशिक्षणात धर्मशास्त्रीय मान्यता असल्याचे त्यांनी स्पष्ट केले.

पं. श्रीधरशास्त्रींचे शिष्य गो.नी. दांडेकरांनी आपल्या 'स्मरणगाथा' या पुस्तकात शास्त्रीजींच्या आठवणी नमूद केलेल्या आहेत. उपनिषदाचे अध्यापन करताना एका ठिकाणी गर्भोत्पत्तीचा विषय आला.

'पुरूषे ह वा अयमादितो गर्भो भवति !'

हे चैतन्य पुरूषामध्ये गर्भरूपाने असतं. तो त्याचे स्त्रीमध्ये सिंचन करतो, आणि ती त्याची धारणा करते. तो चैतन्याचा प्रथम जन्म.

आम्ही सरधोपट वाचीत गेलो. काका थांबले, डोळे मिटीत, स्मित करीत म्हणाले, 'स्त्रियांना उपनिषदांच्या अध्यायनाचा अधिकार होता याचं प्रबळ प्रमाण इथ आहे'. आश्चर्याने आम्ही त्यांच्याकडे पाहू लागलो. काकांनी म्हटले, 'तिथं खाली टीप दिली आहे, ती वाचा'. मी टीप पाहिली, ती होती

अपक्रामन्तु गार्भिण्यः !

प्रश्नार्थक मुद्रेने काकांकडे पाहू लागलो ते बोलले,

'अभिप्रेत असं आहे की, ज्या गर्भवती स्त्रिया असतील, त्यांनी उठून जावं. गर्भसंभवाचा विचार सुरू आहे म्हणून त्यांनी परत यावं, असाही उल्लेख आहे. जर उपनिषद्काळी स्त्रिया या चर्चांना उपस्थित नसत्या, तर हा उल्लेख कशासाठी केला असता?' ३ म्हणजेच स्त्रियांना धर्मशास्त्रांचे अध्ययन करण्याचा, शिक्षण घेण्याचा अधिकार हा शास्त्रसंमत होता. ही बाब स्पष्ट होते. जो अधिकार आपल्या वैदिक संस्कृतीने स्त्रियांना दिलेला होता तो त्यांच्याकडून हिरावून घेणे पूर्णपणे चुकीचे आहे असे शास्त्रीजींचे स्पष्ट मत होते. त्यांनी 'रामदास आणि रामदासी' या मासिकात लिहिलेल्या 'स्त्री समर्थांचा सदाचाराचा विमर्श' या लेखात म्हटले आहे की, 'पतिदेव गुरु स्त्रीणाम्' हे मनुस्मृतीतील वाक्य उपोद्बलक म्हणून दिले आहे. परंतु हे वाक्य स्त्रियांनी विवाहाला उपनयन समजून वेदाध्ययन कर्तव्य असता पतीजवळच वेदाध्ययन करावे इतरांकडे करु नये या अर्थाचे आहे. याचेपूर्वी पूर्वकल्पांत स्त्रियांना उपनयन, वेदाध्ययन, गायत्रीचा दुसऱ्याला उपदेश करण्याचा अधिकार होता. प्रमाण वाक्य – 'पुराकल्पे तु नारीणां मौञ्जीबन्धनमिहाते । अध्यापनंच वेदाना सावित्रीवाचनं तथा । पुढे मौंजीची चाल बंद होऊन मुलींच्या विवाहाला मौज समजू लागले. त्यावेळी पतीजवळ वेदाध्ययन करावे अशा अर्थाचे वरील वाक्य आहे. यामुळे स्त्रियांनी केलेल्या नाममंत्राकरिता गुरुत्वाचा निषेध संभवत नाही व तसेच त्यांनी नाममंत्रांचा उपदेश दुसऱ्यास करण्याचा निषेधही संभवत नाही'. म्हणजेच आपण स्त्रीला रूढी आणि परंपरांच्या जोखडात बंदीस्त केले. प्राचीन धर्मशास्त्राने शिक्षण घेण्याचा आणि अध्यापनाचा दिलेला अधिकार आपण हिरावून घेतला. स्त्री शिक्षणास धर्मशास्त्राचा अडसर नसल्याने स्त्रियांना शिक्षणापासून वंचित ठेवणे हे धर्मविरोधी कृत असल्याचे पं. श्रीधरशास्त्रींचे म्हणणे होते. शिक्षणाच्या क्षेत्रात स्त्री पुरुष असा कोणताही भेदभाव केला जाऊ नये. त्यांच्या मते, मुल व मुलगी यांस कायद्याने सारखे लेखीत जावे. मुलगा व मुलगी दोहोंसही द्रव्यार्जनास योग्य असे शिक्षण देण्यात यावे'. ५ म्हणजे स्त्री-पुरुष असा भेद न करता जे त्यांना भावी जीवनात व्यवहारोपयो होईल अशा शिक्षणाचा लाभ प्रत्येकाला घेऊ द्यावा अशी भूमि श्रीधरशास्त्रींची स्त्रीशिक्षणाविषयी होती. आपल्या विविधांगी लिखाणा आणि वक्तृत्वातून त्यांनी स्त्री शिक्षणाचा पुरस्कार केला. सनात मंडळींचे स्त्री-शिक्षण विरोधी विचार खोडून काढून स्त्री शिक्षण धर्मशास्त्रीय आधार असल्याचे त्यांनी स्पष्ट केले. 'प्राचीन काळात स्त्रिया अध्ययनाप्रमाणेच अध्यापनाचेही काम करीत असत व स त्यांना 'उपाध्याय' म्हणून ओळखीत असे. उच्च प्रकारच्या शिक्षण शास्त्रांमध्ये पुरुषांप्रमाणेच त्या वेळच्या स्त्रियाही वेद, ब्राह्मणे व उप यांचे अध्ययन करीत असत. मुंडक उपनिषदात (१.१.५) उल्लेख

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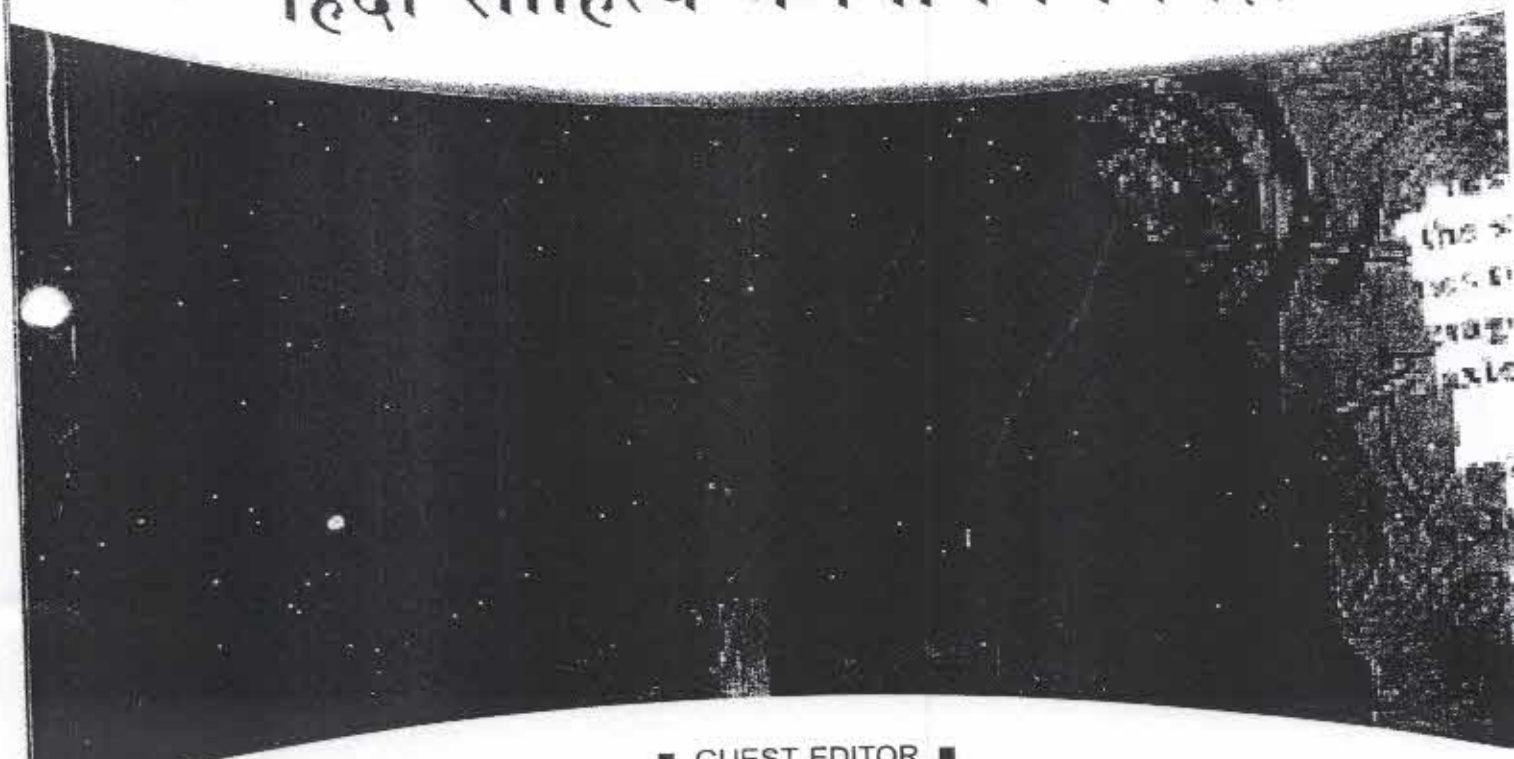

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प्रा.डॉ. विजय घुगे
राणी लक्ष्मीबाई महाविद्यालय, पारोला.

भारत किसानों का देश है। किसान हमारा अन्नदाता है। हिन्दी साहित्य में भारतीय किसानों की खूब चर्चा हुई है। युगोंसे शोषित, पीड़ित किसान आज हमारे साहित्यिक विमर्ष में कहाँ है? यह प्रश्न मन में उठता है। पिछले कुछ सालों में कही किसान खेती छोड़कर दूसरे कामों में उलझ गये है। कुछ अपनी खेती किराए पर दे रहे है तो कुछ दूसरों की खेती कर रहे है। अस्सी प्रतिषत किसान कर्ज में डुबे हुए है। किसानों में निरंतर आत्महत्याएँ रुकने का नाम नहीं ले रही है। विमर्षो के इस दौर में किसानों पर बहुत कुछ पढ़ने में आता है। परिस्थिति, प्रकृति का मारा किसान अपनी खेती और फसल को लेकर सपनों की उड़ान भरता है। किन्तु वास्तविक हालात उसे न कर्ज से उबार पाते है, न बेटी का विवाह करने देते है। साहुकारी, बैंकवालों का तगादा, दो जून के भोजन की चिंता उसे निराषा के घोर अंधेरे में झोंक देती है। अंत में आत्महत्या का आखिरी रास्ता वह अपनाता है। आज ऐसे भी किसान है जिनके पास पचास-सौ एकड़ कृशि भूमि है। महंगी गाड़ियाँ है, महंगे ट्रैक्टर है लेकिन नई पीढ़ी में जन्मे इनके बच्चे खेती के अलावा नौकरी करना चाहते है। राजनीति में रुचि रखते है। सरकार की ओर से बिजली, टैक्स, कर्ज, कृशि उपकरणों मे कुछ प्रतिषत रियायत देने के बावजूद सामान्य किसान पुष्तैनी खेती परंपरागत तरीके से करने पर मजबूर है। षहरों तथा गाँवों की नज़दिकी जमीनों पर फैक्ट्रीयाँ बन रही है। साथ ही इन जमीनोंपर बिना खेती के ठप्पे लगवाकर इमारें तथा मकान बनाये जा रहे है। नकली खाद, मौसम की मार के कारण खेतों की फसल गायब हो जाता है। इस प्रकार अपनी ही किस्मत को कोसनेवाले भारतीय किसान का जीवन मानाक बनकर रह जाता है।

हिन्दी साहित्य में भारतीय किसानों की दयनिय हालत को प्रेमचंद ने अपने कथा साहित्य में पूरजोर तरीके से उठाया है। उन्होंने एक साधारण किसान को नायक बनायत डॉ. अर्जुन चव्हाण लिखते है -''प्रेमचंद जानते थे कि जब तक किसानों में चेतना जागृति नहीं होगी तब तक गुलामी और षोशण से उनकी मुक्ति संभव नहीं।''१ होरी भलेही अकेला, दूर्बल दिखाई देता हो किन्तु षोशण के प्रति विद्रोह के बीज उन्हीं दिनों बोये गये थे। 'गोदान' में रुपा का पति रामसेवक किसानों में चेतना जगाने का काम करता है। वह दातादीन से कहता है : ''मुकदमा तो एक न एक लगा ही रहता है महाराज! संसार में गऊ बनने से काम नहीं चलता। जितना दबो, उतना ही लोग दबाते हैं। थाना-पुलिस, कचहरी-अदालत सब हैं हमारी इच्छा के लिए, लेकिन इच्छा कोई नहीं करता। चारों तरफ लूट हैं। जो गरीब है, बेकस है, उसकी गर्दन काटने के लिए सभी तैयार रहते है। भगवान न करे, कोई बेईमानी करे। यह बड़ा पाप है, लेकिन अपने हक और न्याय के लिए न लड़ना उससे भी बड़ा पाप है। तुम्ही सोचो, आदमी कहाँ तक दबे?''२ आज किसान अपनी मांगो के लिए आंदोलन करता है। वह सरकार से लड़ने की ताकत रखता है। इस दृश्टि से प्रेमचंद का 'गोदान' आज भी प्रासंगिक है।

प्रेमचंद की कहानी 'पूस की रात' का नायक हल्कू की पत्नी मुन्नी कड़ाके की ठंड से बचने के लिए कम्मल खरीदना चाहती है, किन्तु सहना जैसे साहुकार से अपमानित होने के डर से वह अपनी मजूरी से एक-एक पैसा काटकर जो तीन रुपये कम्मल के लिए जमा करके रखता है वे सहना को दे देता है। भारतीय किसान की त्रासदी यह है कि साहुकारों के चंगुल से उसका पीछा छूटता ही नहीं। हल्कू की पत्नी मुन्नी कहती है - ''जरा सुनूँ तो कौन-सा उपाय करोगे? कोई खैरात दे देगा कम्मल? न जाने कितनी बाकी है, जो किसी तरह चुकने ही नहीं आती। मैं कहती हूँ, तुम क्यों नहीं खेती छोड़ देते? मर-मर का करो, उपज हो तो बाकी दे दो, चलो छुट्टी हुई। बाकी चुकाने के लिए ही तो हमारा जनम हुआ है। पेट के लिए मजूरी करो। ऐसी खेती से बाज आये।''

आज की जमीनी हकिकत यह है कि किसानों से ज्यादा मजूरी करनेवाला सुखी रहता है। मुन्नी हल्कू को यही सलाह देती है कि खेती छोड़कर मजूरी करो। हल्कू ठंड से बचने के लिए आठ चिलम पी जाता है किन्तु कम्मल के अभाव में ठंड का सामना नहीं कर पाता। उस समय उसे सामाजिक विशमता याद आती है। वह जबरा कुत्ते से कहता है - ''कलसे मत आना मेरे साथ, नहीं तो ठंडे हो जाओगे। यहा राँड पछुआ न जाने कहाँ से बरफ लिए आ रही है। उठूँ, फिर एक चिलम भरूँ। किसी तरह रात तो कटे ! आठ चिलम तो पी चुका। यह खेती का मजा है। और एक-एक भगवान ऐसे पड़े हैं, जिनके पास जाड़ा जाय तो गरमी से घबड़ाकर भागे। मोटे-मोटे गद्दे, लिहाफ-कम्मल। मजाल है, जोड़े का गुजर हो जाय। तकदीर की खुबी! मजुरी हम करें, मजा दुसरे लूटे।'' किसानों का अपने पालतू जानवरों के प्रति प्रेम प्रस्तुत कहानी में व्यक्त हुआ है। यह तो प्रेमचंद की कलम का जादू है कि वे भारतीय किसान और खेती का ऐसा चित्रण करते है कि कहानी पढते समय पाठक को उसमें स्वानुभूति होने लगती है। नीलगायों द्वारा खेत का सफाया हो जाने पर भी हल्कू सुबह मुन्नीको प्रसन्न दिखाई देता है। क्योंकि खेती करके भी किसानों की हालत जैसे के तैसे रहती है। मजूरी करके मालगुजारी भरना वह पसंद करता है।

कैलास बनवासी की कहानी 'बाजार में रामधन' किसान विमर्ष की एक सषक्त कहानी है। न चाहते हुए भी रामधन को अपने बैल बालोद के बाज़ार में लेकर जाना पड़ता है। कहानी के रामधन का व्यक्तित्व आम भारतीय किसान की तस्वीर प्रस्तुत करता है। नई पीढी के युवा वही परंपरागत खेती से छुटकारा पाना चाहते है। रामधन का भाई मुन्ना कोई छोटा-मोटा धंदा करना चाहता है। धंधा करने के लिए पैसा नहीं है। सालों से घर की वहीं खस्ता हालत है। रामधन और उसकी पत्नी जैसे तैसे मेहनत-मजूरी करने अपना पेट पालते है। मुन्ना इसमें परिवर्तन चाहता है। वह हल-बैल की जगह किराए के ट्रैक्टर से खेती करने की सलाह देता है। वह रामधन को बैल बेचने की बात करता है। आखिर पिता के खरीदे हुए बैलों पर वह अपना भी अधिकार दिखाता है। रामधन ने बचपन से जिन्हें पाला था उन्हें बेचने की बात सुनकर रामधन को धक्का लगता है। रामधन के हर काम में साथ देने वाले बैलों की उसने खूब सेवा की थी। किसानों का अपने पालतू जानवरों से परिवार का नाता रहता है। वे उसके सुख-दुःख के साथी रहते है। उन्हें बेचने की बात प्राण निकालकर देने जैसी होती है। किसान को हर जगह ठगने का प्रयास किया जाता है। बचपन से पाले हुए बैलों को बाजार में ज्यादा दाम मिलनेपर भी बेचने का मन नहीं करता। रामधन भुलऊ महाराज, सहदेव दलाल, भुनेष्वर दाऊ, चईता दलाल सबको चकमा देकर बैल बेचता नहीं। बाज़ार में किसान अपनी अनात हो या जानवर जब ले जाता है लेनेवाले सभी उसको ठगना चाहते है। किसी को किसान की मेहनत नहीं दिखाई देती। सबकुछ जानते-समझते हुए किसान को मजबूरी की वजह से खामोष रहना पड़ता है। रामधन का अन्तर्मन बैलों की मन की थाह ने का प्रयास करता है। कैलास बनवासी की इस कहानी पर प्रेमचंद का पूरा प्रभाव दिखाई देता है।

निश्कर्शत: कहा जा सकता है कि, किसान का अपनी जमीन से अटूट रिश्ता है। वह सबसे अधिक लगाव उसीसे रखता है। लाख प्रलोभन भी उसे

हिला नहीं सकते। वह अपनी जमीन के लिए उग्र रूप धारण करके रास्ते पर उतरकर आंदोलन भी कर सकता है। हिन्दी साहित्य की विभिन्न विधाओं में किसान जीवन का समय-समय पर प्रामाणिक अंकन हुआ है। प्रेमचंद ने किसान को साहित्य में मुकम्मल जगह प्रदान की। उनके बाद उपन्यासों, कहानियों, कविताओं में भी किसान जीवन अभिव्यक्त हुआ है। कुछ सालों में परिस्थितियाँ बदल गई है। अब किसानों के सामने कई प्रश्न तथा चुनौतियाँ खड़ी है। वैश्विकरण तथा भू-मण्डलीकरण के प्रभाव के कारण भारत के इस 'पोथिदे' को आत्महत्या करनी पड़ रही है। विमर्षों के इस दौर में किसान धीरे-धीरे लेखक की कलम से छूटता जा रहा है। वैसे संजीव के उपन्यास 'फांस' में महाराष्ट्र के विदर्भ के किसानों की आत्महत्या के विशय को उठाया गया है। शिवमूर्ति की लंबी कहानी 'अंधी छलांग' में एक संपन्न किसान को अहसास होता है कि पूंजीवाद के दौर में खेती-बाड़ी का कोई मतलब नहीं। तात्पर्य यह है कि भारतीय किसान और गाँव भी अब शहरीकरण के प्रभाव में आने लगे है। कुछ किसान गाँव न छोड़ते हुए भी अपने खेती तथा अपना जीवन बदलने में लगे हुए है। किसानों की बात करने वाले लेखक जब तक किसान-मजदूरों के जीवन को नजदिक से समझने की कोशिश नहीं करेंगे तब तक साहित्य में किसानों के जीवन की वास्तविक स्थिति उभरकर नहीं आ सकेगी।

संदर्भ सूची

१) अनभै - त्रैमासिक पत्रिका, अंक ३८, अप्रैल-जून २०१३, पृ. २२
२) गोदान - प्रेमचंद२, संस्करण २००९, पृ. २८२

खिलाफ नारी संगठनोंका उदय हुआ है। राजनीतिक स्तर पर भी महिला संगठन बने हैं। जो महिलाओं को न्याय प्राप्त करवा रहे हैं।

साहित्य में भी महिला लेखिकाओं ने नारी मनकी भावनाओं को संवेदनात्मक स्तर पर परखते हुए पारिवारिक तथा सामाजिक जीवन में व्याप्त समस्याओं को चित्रित किया है। संबंधों का बदलाव इन लेखिकाओं ने बखुबी चित्रित किया है। मन्नु भंडारी, उषा प्रियंवदा, दीप्ति खंडेलवाल, कृष्णा सोबती, मेहरून्निसा परवेज, मृदुला गर्ग, शशीप्रभा शास्त्री, ममता कालिया, शिवानी, सुधा अरोड़ा, मालती जोशी, सूर्यबाला, चित्र मुद्गल, राजी सेठ, तथा और भी लेखिकाओं ने हिन्दी कहानी साहित्य को समृद्ध किया है।

उषा प्रियंवदा की `जिन्दगी और गुलाब के फूल` कहानी में भाई (सुबोध) बेरोजगार होने के कारण बहन वृंदा कमाने लगती है। बेरोजगारी के कारण सुबोध का शोभा से विवाह नहीं हो पाता। परिवार में कमाई न करने के कारण बहन भाई की उपेक्षा करने लगती है। यहाँ अर्थ के कारण आया बदलाव दृष्टिगोचर होता है। महानगरीय जीवन में कामकाजी नारी नोकरी करते समय दो पाटों के बीच पिसी जाती है। सुधा अरोडा की कहानी `महानगर की मैथिली` में दिवाकर और चित्रा नामक दाम्पत्य कस्बे की भली जिंदगी छोड़कर महानगर में आकर नौकरी करते हैं। उन्हे अपनी नन्ही बच्चों को नौकरानी के भरोसे छोड़ना पड़ता है। मातृ-पितृ प्रेम के अभाव में नन्ही मैथिली मानसिक रूप से बिखर जाती है।

मन्नु भंडारी की `नई नौकरी` कहानी में ऐसे पुरूष का चित्रण हुआ है जो भौतिक समृद्धि प्राप्त करने के लिए अपने बॉस को खुश कर तरक्की पाना चाहता है। इसलिए वह अपनी पत्नीकी नोकरी छुड़वाकर उसे घर की सजावट में लगा देता है। इनकी खोटे सिक्के में अमानवीय अत्याचार तथा `सजा` कहानी में निरपराध व्यक्ति पर होने वाले अत्याचार तथा शासन और न्याय व्यवस्था की पोल खोल दी है। मन्नुजी की `अकेली`, मालती जोशी की `एक सार्थक अहसास` कहानियों में नियति का फेर तथा जीवनसाथी के चले जाने के कारण प्राप्त अकेलापन चित्रित हुआ है। मालती जोशी की `क्षरण` कहानी की विमलाजी तथा उषा प्रियंवदा की `वापसी` कहानी के गजाधर बाबू मोहभंग के शिकार है।

मृदुला गर्ग की `यह मैं हूँ` में व्यसनाधिन पति के कारण पत्नी तथा पूरा परिवार टूट जाता है। मेहरून्निसा परवेज की `सलाखों में फंसा आकाश`, `उसका घर`, `एक और सैलाब` कहानियों में बिमारी के कारण उध्वस्त दाम्पत्य की पीड़ा चित्रित हुई है। मालती जोशी की `एक सार्थक दिन`, चित्रा मुद्गल की `लिफाफा` जैसी कहानियों में बेरोजगारी की समस्या को उठाया है। कुसुम अंसल की `धुआँ` में अनमेल विवाह, कमला सिंघवी `देह से परे`, कृष्णा अग्निहोत्री की `दूसरी औरत` में पुनर्विवाह की समस्या को उठाया है। अलगाव, चिंता, कुंठा, दो के बीच तीसरे की उपस्थिति, आंतरजातिय विवाह, विधवा विवाह जैसे विषयोंपर भी इन लेखिकाओं ने प्रकाश डाला है। दीप्ति खंडेलवाल की `देहगंध` की मिसेज श्रीवास्तव एक बड़े अफ़सर की पत्नी होने के बावजूद अपने पूर्व प्रेमी मनोहर जोशी से शारीरिक संबंध रखना चाहती है। कृष्णा सोबती की `मित्रों मरजानी` की मित्रो तीव्र कामेच्छा के कारण विवाहपूर्व तथा बादमें भी कई पुरूषों से संबंध रखती है। यहाँ नारी का स्वच्छन्द रूप दिखाई देता है।

अक्सर देखने में आता है कि नारी विमर्श का संबंध लेखिकाओं के साथ जोड़ा जाता है। इसमें संकीर्णता दृष्टिगोचर होती है। विमर्श विचारोंका होना चाहिए। नारी पर आजकल पुरूष लेखक भी लिख रहे है और प्रामाणिक ढंग से लिख रहे है। नारी की समस्याओंका चित्रण नारी विमर्श के केन्द्र में रहा है। बाल विवाह, भ्रूण हत्या, बलात्कार, शिक्षा का अभाव, बालिका मज़दूरी, कुपोषण जैसी अनेक समस्याओं पर ज्यादातर लेखिकाओं का ध्यान नहीं गया है। मैत्रेयी पुष्पा के उपन्यासों, कहानियों में नारी, विशेषतः गाँव की अनपढ़ नारी, उसका शोषण, सामाजिक विषमता जैसी अन्य समस्याओंका बेबाक चित्रण हुआ है। प्रभा खेतान के उपन्यास `छिन्नमस्ता` तथा उनकी आत्मकथा `अन्या से अनन्या` में नारी विमर्श का विस्तृत चिंतन दिखाई देता है। यौन कुण्ठाओं के अलावा देश-विदेश की नारी संबंध में अनेक समस्याओं

का वर्णन इन्होंने किया है। अनेक प्रवासी भारतीय लेखिकाएँ भी हिन्दी साहित्य को समृद्ध कर रही है। इन प्रवासी लेखिकाओं में सुषमा बेदी, उषा प्रियम्वदा, सुधा ढींगरा, उषा राजे सक्सेना उल्लेखनीय रही है। वैसे तो हिन्दी साहित्य में नारी को लेकर आरंभ से लिखा जा रहा है। किन्तु नारी विमर्श बहुत बाद में बहस का मुद्दा बना। समय-समय पर नारी को लेकर लेखन हुआ है। हर विधा में हुआ है। हर काल में हुआ है। किन्तु आज का जो नारी विमर्श है उसमें आज की समस्याएँ मौजुद है। नारी विमर्श का पथ महादेवी वर्मा ने भी बहुत पहले प्रशस्त किया था। उनके `आधुनिक नारी` निबंध का उल्लेख किये बिना नारी विमर्श पर कुछ कहना उचित नहीं होगा। इसमें उन्होंने पश्चिमी और भारतीय नारी में साम्य दिखाया है। दोनों में असंतोष दिखाई देता है। प्रस्तुत निबंध में महादेवी वर्माने आधुनिक युग में नारी में चेतना जगाने का काम किया है।

निष्कर्षत:

कहा जा सकता है कि, महिला कहानीकारों ने पारिवारिक जीवन के बदलते आयामों के साथ-साथ यांत्रिक सभ्यता के युग में बदलती धारणाओं तथा जीवन मूल्यों में आये परिवर्तन का यथार्थ चित्रण किया है। नारी की मुक्ति में इनका विश्वास है। नारी की वैयक्तिक, पारिवारिक, सामाजिक समस्याओं को गहराई से संवेदनात्मक स्तरपर उकेरा है। इसमें स्त्री पुरूष संबंधो को अनेक स्तरोंपर सुक्ष्मता से अभिव्यक्ति मिली है।

अंतमे डॉ. पुष्पपालसिंह के शब्दों में कहा जा सकता है कि, ''अपनी उच्च शिक्षा, संस्कारों और आर्थिक स्वावलंबन के कारण यही नारी युग-युग से प्रताड़ित नारी व्यक्तित्व की स्थिति के प्रति विद्रोह कर स्वतंत्र जीवन-मूल्य स्थापित करने की क्षमता रखती है।''[२]

संदर्भ:

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18-19

लीळाचरित्र एकांकमधील समाज जीवन

– प्रा. संजय धर्मा पाटील
आर. एल. कॉलेज,
पारोळा, जि. जळगाव

'लीळाचरित्र' हा मराठी भाषेतला पहिला चरित्र ग्रंथ. शके १२०० च्या सुमारास म्हाइंभट यांनी तो लिहिला. महानुभाव पंथाचे संस्थापक श्रीचक्रधर स्वामी यांचे सविस्तर जीवन चरित्र या ग्रंथात वर्णन केले आहे. हा ग्रंथ गद्यात लिहिलेला आहे. लिळाचरित्र हा ग्रंथ अध्यात्मिक तर आहेच पण तो अलौकिकाप्रमाणेच लौकीक समाज जीवनाचे दर्शन घडवणारा आहे. भाषा, साहित्य, समाजदर्शन, तत्वज्ञान अशा अनेक विषयांच्या अभ्यासाच्या दृष्टीने लीळाचरित्राचे महत्व अनन्यसाधारण आहे.

लीळाचरित्र या ग्रंथात केवळ श्रीचक्रधर स्वामींचेच नव्हे तर तत्कालीन महाराष्ट्र समाज जीवनाचे चित्रण उमटले आहे. त्यावरून त्यावेळचा समाज त्यांच्या चालीरिती, रूढी परंपरा, व्रत वैकल्य, सणवार, खाणीपिणी, वस्त्रप्रावरणे, व्यवसाय, व्यापार अशा अनेक अंगांचे दर्शन घडुन त्या समाजाच्या परिस्थितीची चांगलीच कल्पना येऊ शकते. महाराष्ट्रीय समाज व त्याची संस्कृती यांच्या इतिहासाच्या अभ्यासात लीळा चरित्राचा फार उपयोग होण्यासारखा आहे.

'लीळाचरित्र' हा ग्रंथ एकांक, पुर्वार्ध व उत्तरार्ध याप्रमाणे तीन भागात विभागलेला आहे. प्रस्तूत निबंधात एकांकचा विचार केला आहे. एकाकांत श्रीचक्रधरांनी भडोच येथील प्रधान पुत्राच्या मृत देहात प्रवेश करून अवतार धारण केल्यापासुन तो त्यांच्या पैठण येथे आगमनापर्यंतचा भाग आला आहे. प्रस्तुत निबंधात लीळाचरित्र एकांकमधील समाज जीवनाचा उहापोह करावयाचा आहे.

यादवकालीन महाराष्ट्रातील सामाजिक जीवनाच्या अभ्यासाचे साधन या दृष्टीने लीळाचरित्र हा ग्रंथ केवळ अपुर्व आहे. चरित्रकाराने सांगितलेल्या लीळातून किंवा आठवणीतून त्यावेळच्या समाज जीवनाच्या विविध अंगांचे दर्शन सहजगत्या घडते.

१) चातुर्वर्ण्य समाज व्यवस्था :–

यादवकालीन समाज चातुर्वर्ण्याच्या कल्पनेवर उभा आहे. चक्रधरांच्या दर्शनाने समाधी किंवा विदेहस्थिती प्राप्त झालेल्या एका चांभाराची ईश्वर पुरूष म्हणुन पुजा होत असल्याचे पाहुन ६ एणे गाव विटाळला, असे त्यांच्याच गावचे इतर चांभार म्हणतात या कृत्याबद्दल त्याला सरकारी अधिकाऱ्यांकडून शिक्षाही होते. श्रीगोविंद प्रभू सारख्या अवतारी पुरूषाने एका मांगाकडील हुरडा व सोले खाणे इतरांना विपरीत वाटते. तसेच स्मशानातील वस्त्रावर तेथे राहणाऱ्या महाराचा हक्क असतो. हे सुचविणारी लीळाही सामाजिक दृष्ट्या महत्वाची वाटते.

२) समाजातील उद्योग व्यवसाय :–

त्याकाळात शेती हा प्रमुख व्यवसाय दिसून येतो. शेतीला जवळचा व्यवसाय गुरे राखण्याचा दिसून येतो. तसेच गुराख्याच्या गरीबीचे वर्णन दिसून येते. पिकांचे राखण करण्याचाही व्यवसाय दिसून येतो. गुराख्याची गरीबी ३३ व्या लिळेत दिसून येते. तेल्याचा व्यवसाय करणाऱ्यांचा उल्लेख दोन लिळात आढळतो. पैकी पहिलीतील तैल्यकार आंध्रदेशातील असून तो लिंगोपासना करणारा आहे. दूसरा तेली स्वत:ला तीळ मारा तेली म्हणवतो. रांधवणहाट व त्यातील रांधवणे म्हणजे खाद्य पदार्थ तयार करून विकणारे हलवाई यांचे वर्णन दोन लिळांत आढळते. दुसे किंवा दांडी उभारून वस्त्रांचा व्यापार करणाऱ्या दुकानदाराचे चित्र ५६ व्या लिळेत दिसते. हेडाऊ म्हणजे घोड्यांचे व्यापारी यांचा उल्लेख १६ व्या लिळेत दिसते. मजुरांना वेठीस धरून कामाला लावण्याची पध्दत तेव्हाही होती असे 'वेठी जाणे' या लिळेवरून कळते. शरीर विक्री करणे हा वेश्यांचा सामान्य स्त्रिया व त्यांच्या वस्तीस सामान्यखीहाट म्हटले आहे.

३) समाजातील धार्मिक जीवन व अंधश्रध्दा :–

सत्पुरूषाच्या भेटीने पिशाच्च योनीतुन मुक्त होता येते अशी एक कथा आहे. श्रीचक्रधरांच्या दर्शनाने स्थित्यानंद झालेली एक व्रतस्थ स्त्री देहभान विसरून १२ वर्षे अन्नपाण्यावाचुन राहते. हे पाहुन तिचा बाप, भाऊ तिच्यावर भुतबाधा झाली असेल या कल्पनेने तिच्यावर उपचार करतात. बारंगळचा एक धनाढ्य सावकार आपल्याला मुल व्हावे या अपेक्षेने चक्रधरांची पाचासहस्त्राची पुजा करतो. एक ठाकूर पुत्र प्राप्तीच्या इच्छेने स्वत:च्या बायका चक्रधरांकडे सेवा करण्यासाठी पाठवतो. एकदा श्रीचक्रधरांना उकिरड्यात पडून राहण्याची लहर येते व काही वेळाने त्यांना तेथून बाहेर पडतांना पाहुन 'अरे उकिरडा व्याला' माणूस जाले, हे गावी अरिष्ट आले. आता शांती करा असे गावचे लोक म्हणू लागले. एवढेच नव्हे तर त्या अरिष्टाच्या शमनार्थ खीच पुरीयाचा स्वयंपाक करून वैराग्यांना जेवण घालतात. या सर्व लीळातून तत्कालीन समाजाची धर्मश्रध्दा, अंधश्रध्दा समजून येतात. पुत्रजन्म झाल्यावर बारसे करणे, उष्टवण करणे ही रूढी दिसते. विवाह समारंभाचे वर्णन दिसते. वराला गोत्र कुटूबियांना दाखवणे गौरज मुहूर्तावर लग्न करणे ही रित दिसून येते . तसेच वऱ्हाड, वऱ्हाडी, पाहुणचार, मानपान, मांडव, जवसा, सीमान्तपुजन यांचाही तपशिल रेखाटला आहे. (लीळा क्र. ४६) मळवट भरणे काडीमोड होणे. सेसभरणे हे सौभाग्याचे चिन्ह दिसून येतात. पित्याच्या मृत्युनंतर त्यांच्या पुत्राचे क्षौर करणे व दैविक म्हणजे सुतक पाळून शिवाशिव न करणे या चालीरिती दिसून येतात. मृत देहाची विल्हेवाट त्याला पुरून किंवा पाण्यात टाकून केली जात असे. श्रीचक्रधरांचा ह्या अवतारी पुरूषाच्या भेटीस जातांना बरोबर काही नजराना भेट म्हणुन देण्याची रित होती.

४) समाजातील मनोरंजन क्रिडा प्रकार :–

चक्रधरांना म्हणजे पुर्वीचा हरिपाल देवांना जुगार खेळण्याचे व्यसन होते. सारीचे जु म्हणजे पैसे लावून सोंगट्या खेळणे, जुगार खेळणे, जुआठा म्हणजे जुगारांचा आ, जुगारी लोकांचे नितीनियम इत्यादी गोष्टी लिळा क्र. ६३ मध्ये कळून येतात. पारध्यांनी आपले

भारतातील जात व वर्णव्यवस्था : एक समस्या

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इतिहास विभाग
राणी लक्ष्मीबाई महाविदयालय, पारोळा, जि.जळगांव

प्रस्तावना :

भारतीय समाजव्यवस्थेला 'जातियता' हा एक मिळालेला शाप आहे. अखिल भारतात जातीयतेचे प्रखर स्वरुप जाणवते. प्राचीन काळात चातुर्वर्ण्य व्यवस्थेतून जातिव्यवस्था निर्माण झाल्याचे दिसते. भारतीय समाजव्यवस्था ही विविध जातीजमातींनी मिळून बनलेली आहे. 'पूर्वी चार वर्ण होते. त्यातून हळूहळू निरनिराळ्या जाती उत्पन्न झाल्या. सर्व जाती ईश्वराने निर्माण केल्या असून, त्या जन्मजात आहेत. अशी एक भ्रामक समजूत हिंदूंमध्ये रूढ झाली. प्रत्येक जात स्वतःला अन्य काही जातीपेक्षा उच्च समजते व हा उच्चनीचपणा ईश्वरनिर्मित आहे, असे मानले जाते. पण या दोन्ही कल्पना चुकीच्या आहेत. जाती केवळ जन्मावर आधारित नसून व्यवसाय, आचार, उपास्य देव, देशभेद, पंथ इ. अनेक कारणांमुळे उत्पन्न झाल्या आहेत. जातींमध्ये आणखी उपजातीही अशाच कारणांनी निर्माण झाल्या. आजचा हिंदू समाज वर्णबद्ध नसून जातीबद्ध आहे. ब्राम्हण वर्ण नसून एक जात बनली आहे. अन्यवर्णही लोप पावले आहेत. त्या वर्णातल्या जाती मात्र कायम राहिल्या आहेत'.[१] एकोणिसाव्या शतकात आणि विसाव्या शतकाच्या पूर्वार्धात समाज सुधारकांनी समाजातील उच्चनीच भेद नष्ट करण्यासाठी महत् प्रयास केले. डॉ. बाबासाहेब आंबेडकरांनी कायद्याच्या चौकटीत जातियता मोडून काढण्याचा प्रयत्न केला. परंतु पुरोगामी महाराष्ट्रात आजही समाज सुधारकांच्या कल्पनेतील यश प्राप्त झालेले नाही.

जातीयतेला धार्मिकतेचा मुलामा :

जातियतेची कडक बंधने आज पाळली जात नसली, समतेचा आभास निर्माण केलेला असला तरीही जातियतेची तेढ समाजात आजही रूढ असल्याचे दिसते. 'चातुर्वर्ण्य, जातीभेद आणि अस्पृश्यता ही या काळातल्या धर्मवेत्त्यांची त्रयी विद्या होती. आणि तिचा पुरस्कार करून हा हिंदू समाज जितका विभाजित होईल, तितका करण्याचा त्यांनी जणू निर्धारच केला. ब्राह्मण, क्षत्रिय, वैश्य, शूद्र व अस्पृश्य आणि त्यांच्या संकरातून निर्माण झालेल्या अनंत जाती यांनी परस्परांत विवाह करु नयेत आणि एकमेकांचे व्यवसाय करु नयेत, असे दंडक त्यांनी घातले. शिवाय भिन्न घटकांनी परस्परांचे अन्न घेऊ नये, त्यांनी परस्परांना स्पर्शही करु नये, अशी बंधने धर्म म्हणून त्यांनी लावून दिली. शूद्र व अस्पृश्य हा या मानवसमूहातील बहुसंख्य वर्ग. त्यांना वेदपठणाचा तर राहोच; पण श्रवणाचा सुद्धा अधिकार त्यांनी ठेवला नाही. म्हणजेच विद्या, पूज्य ग्रंथ यांच्याही बाबतीत हा समाज विघटीतच राहिला पाहिजे, असा या धर्मशास्त्रज्ञांचा कटाक्ष होता'.[२] धर्ममार्तंडांनी धर्मग्रंथातील विचारांचा चुकीचा अर्थ लावून जातियता, अस्पृश्यता या बाबीचे समर्थन केले होते. धर्मभोळ्या जनतेच्या अज्ञानाचा फायदा घेऊन सामाजिक अराजकता निर्माण झालेली होती. धर्माच्या आधारावर अस्पृश्यता पाळणे पाप आहे हा विचार समाजापर्यंत पोहचविण्याची गरज होती. हा विचार महाराष्ट्रातील आचार्य आनंद शंकर ध्रुव, डॉ. भगवानदास, स्वामी केवलानंद, तर्कतीर्थ लक्ष्मणशास्त्री जोशी, नारायण शास्त्री मराठे, इंदिरा रमण शास्त्री, पी.एच. परांजपे, पं. श्रीधरशास्त्री पाठक यासारख्या धर्मशास्त्रांच्या जाणकरांनी मांडलेला दिसतो. मानव हा समाजप्रिय प्राणी असल्याने त्याच्यात सामाजिक बांधीलकी असते. आपण समाजाचे काहीतरी देणे लागतो याची त्याला जाणीव होते. त्यातूनच समाजासाठी कार्य करण्याची भावना निर्माण होते. विसाव्या शतकाच्या पूर्वार्धात महाराष्ट्रात याच विचारधारेने प्रेरित होऊन सुधारणावाद्यांची एक शृंखलाच निर्माण झालेली दिसते. प्राचीन धर्मशास्त्रांचे सखोल अध्ययन केलेल्या सुधारणावाद्यांनी धर्ममार्तंडांवर कडाडून प्रखर शब्दात हल्ले केले. 'चातुर्वर्ण्यावर विज्ञानाचा प्रकाशझोत टाकल्यावर त्यांची अशास्त्रीयता, असमर्थनीयता स्पष्ट झाली असली, तरी अद्याप अनेकांच्या मनात त्या प्राचीन समाजव्यवस्थेसंबंधी आकर्षण आढळते. एवढेच नव्हे तर पोथी-पुराणांच्या आधारे त्या व्यवस्थेची सयुक्तिकता पटवून देण्याचा आग्रही धरला जातो. पण भारताच्या राज्यघटनेने वर्णव्यवस्था आणि जातिभेद कालबाह्य आणि अग्राह्य ठरविले आहेत. अर्थात तेवढ्यानेही उद्देश सफल होऊ शकत नाही. निरोगी समाजरचनेच्या संदर्भात शिक्षणाने, प्रत्यक्ष आचारविचाराने, अनुकूल आर्थिक परिस्थितीने आणि योग्य वयात योग्य संस्कार केल्याने जन्मावर आधारलेली श्रेणीबद्ध चौकट नाहीशी होऊ शकते. थोडक्यात, मनावरील योग्य संस्कार, शिक्षणाचा प्रसार आणि आर्थिक उन्नती यासारख्या उपायांनीही वर्णव्यवस्थेचे अवशेष नाहीसे होऊन निरोगी समाज बांधणी शक्य होईल'.[३] महाराष्ट्रातील जातियता नष्ट करण्यासाठी आजही सुदृढ विचारांची, आचाराची गरज आहे.

पं. श्रीधरशास्त्रींचा जातिव्यवस्थेविषयी वैचारिक दृष्टीकोन :

संस्कृतमधील जाती या शब्दाचे जात हे मराठी रूप आहे. जत् - जन्मणे, जन्म घेणे याचे भूतकाळी रूप जात म्हणजे जन्मलेले असे होते. त्यावरून जाती या शब्दाचा अर्थ एकाच गटात जन्मलेल्यांचा समूह असा होतो. परंतु पुढे या शब्दाला तेवढाच मर्यादीत अर्थ राहीला नाही. एखादी व्यक्ती कोणत्या गटात जन्माला आली यावरुन त्या व्यक्तीला जातीचा शिक्का मारला जाऊ लागाला. जन्माला येणाऱ्या बालकास जात, वर्ग, समाज, धर्म या बाबींचा थांगपत्ताही नसताना त्यास जातीचे बिरुद लावले जाते. ही जातिव्यवस्थाच मुळात चुकीच्या पद्धतीने निर्माण झालेली आहे. चुकीच्या निकषावर जातिव्यवस्था उभी असल्याचे दिसून येते.

प्राचीन काळी वैदिक धर्मानुसार समाजात कामांची चार गटात विभागणी झाली. या कामावरुन विभागणी झालेल्या या गटांना चार्तुवर्ण्य

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९. राजर्षी शाहू महाराजांचे सामाजिक, शैक्षणिक आणि शेती विषयक धोरण

डॉ. रावसाहेब भिमराव नेरकर
इतिहास विभाग, राणीलक्ष्मीबाई महाविद्यालय, पारोळा, जि. जळगांव.

प्रस्तावना

१९ व्या शतकातील समाज पुर्णपणे अनिष्ट रूढी - परंपराच्या विळख्यात जखडला गेला होता. समाज रचना प्राचीन काळापासुन चार्तुवर्ण्य पध्दतीवर आधारलेली आहे. आपल्या संस्कृतीच्या रूढीपरंपरा एका पिढीकडुन दुसऱ्या पिढीकडे संक्रमित करणे हे येथील जनता जीवनाचे ध्येय मानतात समाज जीवनावर चार्तुवर्ण्य व्यवस्थेचा जबरदस्त पगडा होता. महाराष्ट्राच्या सांस्कृतिक पटलावर ब्रिटीश काळात संघटनात्मक आणि संस्थात्मक कार्याने या काळात उत्साह निर्माण झाला. राजकारण, समाजकारण आणि शिक्षण या क्षेत्रात स्वत:ला पुर्णपणे झोकुन देऊन नि:स्वार्थपणे कार्य करणाऱ्या कार्यकर्त्यांची एक प्रभावी फळी निर्माण झाली. १९ व्या शतकाच्या उत्तरार्धात शिक्षण हे सामाजिक परिवर्तनाचे मुख्य साधन मानले गेले. महात्मा फुले, लोकमान्य टिळक, आगरकर, कर्वे, राजर्षी शाहु महाराज, कर्मवीर भाऊराव पाटील यांचे शिक्षण क्षेत्रातील कार्य उल्लेखनीय आहे.

सामाजिक धोरण आणि सुधारणा

राजर्षी शाहु महाराजांनी आपल्या सत्तेचा आणि राजपदाचा उपयोग समाजविकासासाठी केला. त्यांनी आपल्या संस्थानात महत्वपुर्ण बदल करून समाज विकासाला एक विधापक दिशा प्राप्त करून दिली. राजर्षी शाहु महाराजांनी कोल्हापुर संस्थानाची सुत्रे हाती घेण्या अगोदर राजकोट येथील राजकुमार महाविद्यालयातुन पदवीचे शिक्षण घेतले होते. त्यांनी मुळातचं पाश्चात्य धरतीचे शिक्षण घेतल्यामुळे त्यांच्या विचारांच्या कक्षा रूंदावल्या होत्या. समाजाविषयी व्यापक दृष्टीकोन निर्माण झालेला होता. इंग्रजी आमदानीत ख्रिस्ती धर्माच्या प्रसारासाठी आलेल्या मिशनरींचे, त्यांच्या कार्याचे महत्व तत्कालीन सुशिक्षितांना पटले. परोपकार, दयाशीलता, या गोष्टी आपल्याकडे जरी असल्या तरी संघटितपणे व शिस्तबध्द रितीने सेवाकार्य करण्याची प्रेरणा पाश्चात्य शिक्षणातुन मिळाली. पाश्चात्य शिक्षणामुळे आणि त्यांच्या सहवासामुळे आपल्याकडे असलेल्या श्रेष्ठ गुणांची सुशिक्षीत वर्गाला जाणीव झाली. बुध्दिवाद, ऐहिकता, स्वातंत्र्य, समता यावर आधारित अशा पाश्चात्य शिक्षण व्यवस्थेमुळे वैचारिक जागृतीस फार मोठी चालना मिळाली. त्याच बरोबर युरोपीयन समाजाने केलेल्या प्रगतीची माहिती झाली. त्यातुनचं राजर्षी शाहु महाराजासारखे समाज सुधारक पुढे आले.

आर्थिक क्षेत्रात वतनदारी, सामाजिक क्षेत्रात विषमतेवर आधारलेली जातिव्यवस्था आणि या दोन्हीवर धर्मसंस्थेचे नियंत्रण हे समाज व्यवस्थेचे चित्र होते. सामाजिक विषमता, शोषण करणारा उच्च वर्ग अशी समाजाची भिन्नण स्थिती निर्माण झ

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१७. १९ व्या शतकातील स्त्रीवर्गाचे स्थान आणि स्त्री शिक्षण

डॉ. रावसाहेब भिमराव नेरकर
इतिहास विभाग, राणी लक्ष्मीबाई महाविद्यालय, पारोळा, जि. जळगांव.

प्रस्तावना

कुटुंबसंस्था हे समाजाचे मुलभूत अंग आहे. समाजव्यवस्था सुसंघटीत आणि सुव्यवस्थित राहण्यासाठी कुटुंबसंस्था महत्वपूर्ण कार्य करते. मानवी समाजात मुलांचा जन्म, वृद्धी आणि संगोपन हे कुटुंबसंस्थेतच होत असते. १९व्या शतकात मातृसत्ताक कुटुंबसंस्थेकडून पितृसत्ताक अवस्थेत समाज आला आणि उत्पादन साधने, मालमत्ता, सत्ता यावर पुरुषवर्गाची मक्तेदारी निर्माण झाली. यातुनच स्त्रीवर्गाच्या शोषणाला सुरुवात झाली. कुटुंबव्यवस्थेतील कणा असलेल्या स्त्रीला दुय्यम लेखले गेल. स्त्रीचे जीवन अनेक रुढी परंपरा, बधनांनी जखडले गेल.

'विवाह हा आर्यसंस्कृतीत अतिशय पवित्र संस्कार मानला जातो. 'विवाह या संकल्पनेत 'वि+वाह' वि म्हणजे दुसरा, वाह म्हणजे वाहून नेणे, एकाने दुस-याला आयुष्यभर गुणदोषासह वाहून नेणे, स्वीकारणे ही उदात्त कल्पना या पाठीमागे आहे.' म्हणजेच स्त्री-पुरुष यांच्या सहजीवनातून एक निर्मळ पवित्र समाजजीवन निर्माण व्हावे अशी अपेक्षा आहे. परंतू प्रत्यक्षात १९व्या शतकात या विवाहसंस्थेचे उदात्त तत्व बाजूलाच राहीले होते. स्त्रीकडे एक उपभोग्य वस्तु म्हणुन बघितले जात होते. अतिशय वाईट अशा प्रथापरंपरेत तिला गुरफटुन तिचे जीवन बंदीस्त केले होते. या पार्श्वभूमीवर खानदेशात श्रीधरशास्त्री पाठकांसारख्या थोर विचारवंतांनी समाज उद्बोधनास सुरुवार केली. 'संस्कारयुक्त विवाहसंस्था ही मानवाच्या सुसंस्कृतपणाचे निरर्थक असून त्यामुळे शुद्ध व वात्सल्ययुक्त अंतःकरणाने व कर्तृत्वबुद्धीने बालक व स्त्री यांची भरण पोषण व्यवस्था आपोआप झाली व मानवी मनोविकासाचे पाऊल त्यायोगे पुढे सरकले'.[२] आपल्या संस्कृतीतील नीतिकता, सद्विचार आणि सुसंस्कार हे गुण विवाहसंस्थेच्या माध्यमातून निर्माण झालेले आहेत. तसेच विवाहसंस्थेतून स्त्रीच्या पालनपोषणाची जबाबदारी पुरुषसत्ताक कुटुंबपद्धतीची आहे. या तत्वांचा, विचारांचा १९व्या शतकाच्या उत्तरार्धात समाजाला विसर पडलेला दिसतो.

बालविवाह पद्धती

१९व्या शतकात आणि विसाव्या शतकाच्या पूर्वार्धात मुलीच्या लग्नाचे वय कव असावे याला बंधन नव्हते. अगदी बालवयातच मुलीला विवाह म्हणजे काय, संसार काय हे कळत नसताना अवघ्या ५ ते ६ वर्षे वयाची असतांना तिचा विवाह केला जात असे. या विवाहामध्ये वराच्या वयाची मर्यादा मात्र नसे. साठ ते पासष्ठ वयाच्या वराशीही या कोवळ्या मुलीचा विवाह केला जाई. लग्नानंतर काही दिवसातच मुली विधवा होत असत. 'हळदीच्या डागावर विधवा झालेया त्या मुलीला सारं आयुष्य परित्यक्ता म्हणून व्यतीत करावे लागे'.[३] अतिशय दयनीय स्थितीत विधवा स्त्रियांना आपलं जीवन कंठावे लागत असे. 'खानदेशात स्त्रियांची चळवळ ख-या अर्थाने धुळ्यात महिला सभेच्या स्थापनेनंतर सुरु झाली श्रीमती विजया चौक यांनी या

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३. शाहू महाराज ''आदर्श राजा व आदर्श व्यक्तिमत्व''

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प्रस्तावना

शाहू महाराजांना सामाजिक, ऐतिहासिक, राजकीय, आर्थिक व शैक्षणिक अशा अनेक अंगांनी संपूर्ण महाराष्ट्राने अभ्यासलेला आहे. फुले, शाहू, आंबेडकर या त्रयींनी महाराष्ट्रातील अतिशय कठीणातील कठीण परिस्थितीचा सामना करत सर्व सामान्यांना सर्वांगाने न्याय देण्याचा प्रयत्न केलेला आहे. एवढेच नाहीतर सर्वांना शिक्षण, उद्योग, व्यवसाय हे अधिकर व स्वातंत्र्य बहाल करण्यासाठी संपूर्ण आयुष्य वेचले. म्हणून आज छत्रपती राजर्षि शाहू महाराजांच्या सामाजिक आर्थिक, राजकीय विचार व व्यक्तिमत्वाचा अभ्यास करणे काळाची गरज होऊन बसली. सन १९११ पासून शाहू महाराजांनी सत्यशोधक चळवळीच्या आधारे समाजातील दीन, दुबळे, गरीब, दलित, अस्पृश्य अशा अनंत तळागाळातील जाती जमातीना नवचैतन्य प्राप्त करुन देण्याचे कार्य त्यांनी केले.

विषयाचे महत्व

छत्रपती शिवाजी महाराजांच्या कुळातील या राजर्षिंनी आपण राजघराण्यातील आहोत, याची तमा न बाळगता तळागाळातील लोकांसाठी आपले जीवन वेचले. त्यांनी **१) शैक्षणिक कार्य** - बहुजन समाजाला ज्या घटकाने शिक्षणापासून वंचित ठेवलेले होते, त्यांना विरोध करुन शिक्षणाचा प्रचार आणि प्रसार केला. बहुजन समाजाला शिक्षणाची आवश्यकता त्यांनी प्रतिपादीली. त्यासाठी **२) वस्तीगृहाची स्थापना** - शाहू महाराजांनी बहुजनांना शिक्षण मिळावे, तेही मोफत किंवा अल्पदरात. या हेतूने त्यांनी कोल्हापूर येथे विविध जाती धर्माच्या लोकांसाठी वस्तीगृहे सुरु केले. उदा. सन १९०१ ला मराठा विद्यार्थ्यांसाठी तसेच पांचाळ, जैन, मुसलमान, चांभार, नाभिक, शिंपी अशा अनेक जातीच्या विद्यार्थ्यांसाठी स्वतंत्र

वस्तीगृहे सुरु करुन शिक्षणाचा प्रचार आणि प्रसार केला. **३) अस्पृशांचा उध्दार** - शाहू महाराजांनी विद्यार्थ्यांसाठी शैक्षणिक कार्य तर केलेच, प्रौढांसाठी देखील कार्य केले. त्यात पददलित व मागास लोकांची उन्नती घडवून आणणे हे आपले जिवीतकार्य मानले. त्यासाठी त्यांना विविध सरकारी कार्यालयांमध्ये नोकरी मिळवून दिली. महार, मांग, चांभार या जातीतील सुशिक्षित तरुणांना वकिलीच्या सनदा मिळवून दिल्या. सर्वांना सर्व प्रकारचे व्यवसाय करण्याचे स्वातंत्र्य त्यांनी मिळवून दिले. त्यातून **४) समानतेला प्राधान्य** - शाहू महाराजांनी आपल्या जीवनकार्यातून समता प्रस्थापित करण्याचा प्रयत्न केलेला आहे. समाजातील उच्च निचतेचा भेद नष्ट करण्याचा प्रयत्न केलेला आहे आणि म्हणून स्वत: राजे असतांनाही अस्पृशांसाठी स्पृशांपेक्षा जास्त कार्य केले. त्यांच्यासाठी शाळा, दवाखाने, पाणवठे, सार्वजनिक विहीरी याच बरोबर या दलित व पददलितांशी समानतेने वागावे असा आदेश दिला. जो कुणी जातीभेद, वर्गभेद, स्पृश्यास्पृश्यता मानत असेल व शाहू महाराजांच्या आदेशाचे पालन करत नसेल, त्याच्या विरुध्द कडक कारवाई करण्याचा आदेश महाराजांनी केला.

मोडणे हे राष्ट्रकार्य होय. हिंदू जातींमधील विविध पोटजाती व जमातींमध्ये बेटी व्यवहार मोकळेपणाने, निसंकोचपणे व्हावा, म्हणून हिंदुस्थानच्या कायदे कौन्सिलमध्ये बिल मंजूर व्हावे यासाठी त्यांनी प्रयत्न केले आणि म्हणूनच सन १९१८ साली छत्रपती शाहू महाराजांनी राष्ट्र व लोकहित जाणून तसले बिल आपल्या करवीर राज्यात पास करण्याचे धाडस व पुरोगामित्व दाखविले. या कायद्यामुळे हिंदू आणि जैन यांच्यातील धर्मशास्त्रे व रुढी यामुळे ज्या अनुलंघ्य अडचणी येत होत्या त्या नष्ट झाल्या व आंतरजातीय विवाह कायदेशीर केलेत.

राजे अमर झाले. कारण संपूर्ण महाराष्ट्राच्या नव्हे तर देशाच्या गोरगरीब, दीनदलित जनतेचे ते कैवारी झाले. भारतीय राज्य घटनेच्या उद्दीष्टांमध्ये स्वातंत्र्य, समता, न्याय, बंधुता या तत्वांचा समावेश डॉ. बाबासाहेब आंबेडकरांनी केला असेल तर, ते त्यांनी आपल्या मनाने केलेले नाही. तर, महात्मा फुले व राजर्षि शाहू महाराज यांची समतेची व स्वातंत्र्याची शिकवण डॉ. बाबासाहेब आंबेडकरांनी घेतलेली होती. म्हणूनच भारतीय राज्यघटनेवर जगातील आदर्श व चांगल्या राज्यघटनांचा प्रभाव असेल परंतु महात्मा फुले, राजर्षि शाहू महाराज व डॉ. बाबासाहेब आंबेडकरांच्या आदर्श विचारांचाही प्रभाव आहे हे विसरुन चालणार नाही.

समारोप

राजर्षि शाहू महाराज यांनी आयुष्यभर भारतीयांसाठी पर्यायाने भारतातील बहुजन, गरीब, दीनदलित वर्गासाठी सामाजिक, आर्थिक व राजकियदृष्टया महान कार्य केलेले आहे. म्हणून आम्हां भारतीयांना शाहू महाराजांचे विचार व कार्य विसरुन चालणार नाही. कारण प्राथमिक शिक्षणाची खरी सुरुवात, विद्यार्थ्यांना वस्तीगृहे, शिष्यवृत्या त्यांच्यामुळेच आज मिळत आहेत. जातीयतेला विरोध करुन स्त्रियांना स्वातंत्र्य, मागासवर्गीयांना आरक्षण धोरण ही शाहू महाराजांची पुण्याई आहे हे मान्य करावेच लागेल.

संदर्भ सूची

लेखक -	पुस्तकाचे नाव	प्रकाशक
• सुर्यवंशी कृ. गो.	राजर्षि शाहू राजा व माणूस	ग. ल. ठोकळ प्रकाशन, पुणे
• डॉ. राठी शुभांगी दिनेश	महाराष्ट्रातील सामाजिक-राजकीय चळवळी व प्रशासन	अथर्व पब्लिकेशन, धुळे
• डॉ. दिलीपसिंह निकुंभ	महाराष्ट्रातील सामाजिक-राजकीय चळवळी	प्रशांत पब्लिकेशन, जळगाव

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SELF ATTESTED

२०. प्रवासी भारतीय साहित्यकार तेजेंद्र शर्मा की कहानियोंका कथ्य

प्रा. डॉ. विजय श्रावण घुगे
राणी लक्ष्मीबाई महाविद्यालय, ता. पारोळा, जि. जळगाव.

भारत के बाहर रहकर हिंदी में लेखन करनेवाले साहित्यकारों को प्रवासी भारतीय साहित्यकार कहा जाने लगा है। साहित्यकार प्रवासी होता है, साहित्य नहीं। फिर भी `प्रवासी साहित्य` शब्द रूढ़ हो गया है। विदेश में रहनेवाले साहित्यकार अपने देश के प्रति समर्पित हैं। इसलिए महत्त्वपूर्ण है कि विदेशी भाषा का आश्रय न लेकर वे अपनी भाषा में साहित्य सृजन कर रहे हैं। देश के प्रति व्याकुलता, बेचैनी, अस्तित्व की तलाश तथा आत्मबोध इनके साहित्य में दिखाई देता है। `प्रवासी भारतीय` शब्द नया नहीं है। विदेश में बसे हिन्दी लेखकों की रचनाओं और पत्रिकाओं के प्रकाशन के कारण `प्रवासी साहित्य` प्रचलित हो गया। देश के पाठकों की इसके प्रति जिज्ञासा बढ़ गई। अब प्रवासी साहित्य हिंदी की वास्तविकता बन गया है। मुख्यधारा से जुड़ गया है।

प्रवासी भारतीय साहित्यकारों में तेजेंद्र शर्मा एक चर्चित नाम है। लेखक, कवि, संपादक, तथा उत्कृष्ट अभिनेता के रूप में आप मशहुर है। लंदन के ओवल ग्राउंड रेलवे में आप कार्यरत है। आप के `काला सागर`, `ढ़िबरी टाईट`, `देह की कीमत`, `यह क्या हो गया`, `बेघर आँखे` नाम से पाँच कहानी संग्रह तथा `ये तुम्हारा घर है` शीर्षक से एक कविता संग्रह प्रकाशित हो चूके है। अंग्रेजी में तेजेंद्र शर्मा ने तीन पुस्तकें लिखी है। इंग्लैंड से प्रकाशित होने वाली `पुरवाई` पत्रिका का आप ने दो वर्ष तक संपादन किया है। पंजाबी नेपाली, उर्दू भाषाओं में आपकी कहानियों के अनुवाद हो चुके है। कई पुरस्कारों से आप को सम्मानित किया गया है।

समकालीन कथा साहित्य में तेजेंद्र शर्मा ऐसे कहानीकार है जिनके कहानी साहित्य में पात्र स्वदेश-परदेश के द्वन्द्व में जिते है, मरते है। आपकी कहानियाँ एक नया परिवेश, नई जीवन दृष्टि तथा यथार्थ से परिचित करवाती है। वर्तमान और ज्वलंत समस्याओं का चित्रण आपकी कहानियों में हुआ है। भारतीय और पाश्चात्य संस्कृति, परिजनोंकी स्वार्थ वृत्ति, विदेश की नागरिकता, दोहरी नागरिकता, पुनर्विवाह, अनमेल विवाह, अंधविश्वास, भ्रष्टाचार, आंतकवाद, भारत पाकिस्तान संबंध, कर्गिल युद्ध, कश्मिर समस्या, अयोध्या बाबरी मस्जिद विवाद, मुस्लिम राष्ट्रों के अजब कानून, भारतीयों के साथ बदलता पूर्ण व्यवहार, विदेश का मोह और मोहभंग, मातृत्व की अतृप्ति, डिप्रेशन, काउंसलिंग जैसे विषयों का यथार्थ रूप में चित्रण आप की कहानियों में हुआ है। तेजेंद्र शर्मा की कहानियों में अलग-अलग देशों की विभिन्न सामाजिक, सांस्कृतिक परिस्थितियों का चित्रण हुआ है। वहाँ के इतिहास और भूगोल का भी लेखकने अवलोकन किया है। साथ ही सत्ता और राजनीति तथा कानून प्रक्रिया में होनेवाले विलंब की सच्चाई को लेखक ने चित्रित किया है।

`सपने मरते नहीं` कहानी में मातृत्व को लेकर अनगिनत सपनें सजाने के बाद जब इला स्टिल बॉर्न यानि मृत पुत्र को जन्म देती है तब वह मानसिक रूप से टूट जाती है और डिप्रेशन का शिकार बन जाती है। अजन्मे शिशु का नामकरण, उसकी चीजे, जन्म के बाद उसका खुबसुरत मृत शरीर सारी बातें इला को मानसिक रूप से तोड़ देती है। परिणाम यह होता है कि उसके

मन में यह डर घर कर लेता है कि उसका पति नीलेश उसे छोड़ न दे। लंदन में एक भारतीय गुजराती डॉक्टर से उसको काउंसिलिंग करवानी पड़ती है। निलेश जब एक अंग्रेज काउंसलर हिंदुस्थानी औरत के दिल के दर्द को कैसे समझ सकती है यह कहता है तब डॉ. पटेल कहती है - ''वैसे तो भावनाएं सांझी होती है मि. नीलेश, जब चोट लगती है तो आह चाहे अंग्रेजी में निकले या फिर किसी और जबान में, दर्द दोनों में एकसा ही होता है।''[1] अंततः इला को भारत उसके माता-पिता के घर लाया जाता है। विवाह के समय और विवाहोपरांत की सभी बातें, बिताये लम्हे, स्थान याद दिलाये जाते है, दिखाये जाते है। वह पुनः गर्भवती रहती है। इस प्रकार उसे काउंसलिंग द्वारा यह एहसास दिलाया जाता है कि, 'सपने मरते नहीं'। लेखक यहाँ काउंसलिंग यानि समुपदेशन द्वारा समस्या का हल किस प्रकार निकल सकता है इस बात पर प्रकाश डालते है। पुनर्विवाह के बाद पति-पत्नि में समझौता नहीं रहा तो होनेवाले दुष्परिणामों का चित्रण 'ओवर फ्लो पार्किंग' कहानी में हुआ है। कहानी का नायक दिल्ली में हुई एक भयंकर स्कूटर दुर्घटना के कारण मरते-मरते बचा था। उसी डर के कारण वह लंदन में कार नहीं चलाता। कहीं भी जाना हो तो कार पत्नी को ही चलानी पड़ती है। वह अपने पति को ताने मारती है। बार-बार अपमानित करती है। कमलजी की दूसरी पत्नी के अंतिम संस्कार समय स्मशान में भी वे झगड़ते है। पति की अकर्मण्यता उसे पसंद नहीं आती। कहानी की विशेषता यह है कि लेखक भारतीय और ब्रिटेन की संस्कृति का फर्क स्पष्ट करते है। हैनवर्थ क्रेमेटोरियम को देखते हुए कथा नायक को भारत के स्मशान घाट याद आते है। वह देखता है-''यहां न कोई आचार्यजी है न रोते बिलखते रिश्तेदार और न ही स्मशान घाट की रहस्यमयी चुप्पी। यहाँ मृत्यु के सप्ताह भर बाद अंतिम संस्कार होता है। शायद रिश्तेदारों के आँसू यहाँ तक पहुँचते-पहुँचते सूख जाते है।''[2] लेखक कहते है वहाँ मौत भी एक धन्धा बन गया है। हर चीज का पैकेज होता है। लेखक व्यंग्यात्मक भाषा में कहते है, ''आपकी मर्जी आपको मरना है या नहीं मरना है।'' विदेश में रहनेवाले प्रवासी भारतीयों की विशेषता है कि भले ही भारत में उनके तार जुड़े या न जुड़े किंतु विदेश में सभी एक साथ रहते हैं। कमलजी की पत्नी के अंतिम संस्कार समय ब्राह्मण, मुस्लिम, पंजाबी, गुजराती, सभी एक साथ रहते है। भारत की एकात्मता वहाँ भी दिखाई देती है। ब्रिटेन के भारतीय वहाँ के स्थानिय लोगों से कुछ प्रथाएँ सीख लेते है। अंतिम संस्कार के बाद अंग्रेज किसी पब में इकट्ठे होते है और उन्हें शराब पिलाई जाती है। कमलजी के घर भी शराब एवं भोजन की व्यवस्था की जाती है। नायक को वहाँ भी हिंदू धर्म पर गर्व महसूस होता है। वहाँ शव को जलाया नहीं बल्कि मशीन में डाला जाता है। हड्डियों का चूर्ण (राख) दो मिनट में एक थैली में भरकर वापस दे दिया जाता है। नायक को श्मशान में महसूस होता है कि, ''दूसरी शादी एक निरंतर मौत है जिसमें वह रोजाना इंच दर इंच मर रहा है.. बचने की कोई संभावना नहीं है।''[3] वह स्मशान में नये जीवन की कामना करता है। तात्पर्य उसके जीवन की गाड़ी भी समस्याओं की ऐसी ओवर फ्लो पार्किंग में अटक जाती है, जहाँ से उसे बाहर निकलना संभव नहीं होता।

विदेश का लालच बहुत बार कितना महंगा पड़ता है इसका यथार्थ चित्रण तेजेंद्र शर्मा की 'ढ़िबरी टाईट' कहानी में हुआ है। गुरमीत अपना अच्छा खासा घर, खेती-बाडी छोड़कर विदेश जाना चाहता है। ट्रैवल एजेंट उसे विदेश के सपने दिखाते है। उनके बहकावे में आकर वह कुवैत चला जाता है। विदेशी भूल-भूलैया के चक्कर में वह बुरी तरह फंस जाता है। आहिस्ता-आहिस्ता उसे सौदी अरब की धार्मिक कट्टरता का अनुभव आने लगता है। विदेश में अकेले पड़ जाने का खौफ़ उसे सताता है। अच्छी तरह स्थिर होने के बाद वह अपनी बच्ची और पत्नी को भी वहाँ ले जाता है। एक दिन उसकी पत्नी को प्रसव पीड़ा शुरू

हो जाती है। बेटा होने की खुशी में घर लौटते समय गुरमीत पैर से कार का एक्सीलेटर बढ़ा देता है। गाड़ी तेज रफ्तार से जुलूस के बीच में वहाँ के ठुल्ले उसे पकड़कर कैद कर लेते है। गिड़गिड़ाने, मिन्नतें करने पर भी उसे नहीं छोड़ते। इधर प्रसूति के समय वेदनाओं से घायल उसकी पत्नी एक बच्चे को जन्म देने के बाद मृत हो जाती है। कुछ देर बाद रो-रोकर नन्हा शिशु भी मर जाता है। उसकी बेटी गुड्डी का भूख के कारण बुरा हाल हो जाता है। वह फ्रिज के पास ही सो जाती है। दरवाजे को खिटकनी तक उसके हाथ नहीं पहुँचते। खाने की खोज में और माँ की खामोशी के कारण फैले सन्नाटे में वह भी मर जाती है। चार दिन के बाद पुलिस उसे छोड़ती है। घर आनेपर वह देखता है सभी लाशें पड़ी है। बदबू उससे सही नहीं जाती। गुस्से के कारण हैरान वह पुलिस से बदला लेने की बात सोचता है। किन्तु उसके दोस्त कथावक्ता और दिनेश बतरा उसे हौसला दिलाते है। तात्पर्य गुरमित ज्यादा कमाने के लालच में अपना सब कुछ खो देता है। उसे राहत तब मिलती है जब इराक द्वारा कुवैत पर हमला किया जाता है। तब वह कहता है, ''कर दी सालों की ढिबरी टाइट।''

'पासपोर्ट के रंग' कहानी में बाऊजी की मातृभूमि के प्रति प्रेम और लंदन में बैठे इकलौते बेटे के पास रहने की चाह इन दो पाटों के बीच पीसे जाते है। बँटवारे के समय उन्हें लाहोर से दिल्ली आना पड़ता है। जन्मभूमि छोड़ने का पहला दुःख इंग्लैंड जानेपर दुबारा भुगतना पड़ता है। बेटा उन्हें जबरदस्ती इंग्लैंड ले जाता है। गोपालदासजी के मन में अंग्रेजों के प्रति नफरत है, क्योंकि एक अंग्रेज सिपाही ने लाहौर में उन्हें बाई बाजू में गोली मारी थी। पत्नी की मृत्यु के बाद वे अकेले पड़ गये है। बेटी अमेरिका और बेटा इग्लैंड में है। वे भारत और इंग्लैंड दोनों देशों में रहना चाहते है। इसलिए दोनों देशों की दोहरी नागरिकता उन्हें चाहिए। प्रवासी भारतीयों के लिए प्रवासी दिवस के दौरान प्रधानमंत्री के ऐलान से वे खुश हो जाते है। किन्तु फॉर्म पाने के लिए भारत भवन के चक्कर लगाकर वे त्रस्त हो जाते है। सरकारी आश्वासनों की अविश्वसनियता और उनकी पूर्ति होने में लगनेवाला विलंब बाऊजी से सहा नहीं जाता। वे मानसिक रूप से टूट जाते है। घर आने के बाद उनकी मृत्यु हो जाती है। मृत्यु समय उनके एक हाथ में लाल रंग का ब्रिटीश पासपोर्ट और दूसरे हाथ में नीले रंग का भारतीय पासपोर्ट रहता है। तात्पर्य नोकरीयों, व्यवसायों अथवा शिक्षा के कारण विदेश में बसे भारतीयों के परिवार वालों को किस प्रकार अपने अपनों से, अपनी जड़ों से कटनेपर मजबूर होना पड़ता है इस समस्या को लेकर लेखक ने पाठकों का ध्यान आकृष्ट करना चाहा है।

मुस्लिम राष्ट्रों में नोकरी करनेवाले भारतीय नागरिकों को किस प्रकार दहशत के माहौल में रहना पड़ता है इसका यथार्थ चित्रण 'चरमराहट' कहानी में हुआ है। साथ ही भारत में अयोध्या में बाबरी मस्जिद गिराने के बाद मुस्लिम राष्ट्रों में व्यक्त धार्मिक प्रतिक्रियाओं का चित्रण इस कहानी में हुआ है। धर्म की आवश्यकता का महत्व भी यहाँ स्पष्ट हुआ है। इंद्रमोहन तिवारी को जेद्दाह में मुस्लिम धर्म के नियमानुसार और हिंदू धर्म के विरूद्ध कार्य करने पड़ते है। वहाँ गैर-मुस्लिम औरतों को भी आबाया (बुर्का) पहनना पड़ता है। दिन में पाँच बार नमाज पढ़ना पड़ता है। धार्मिक पुलिस का आतंक बना रहता है। मुस्लिमों को हरे रंग का इकामा यानि वर्क परमिट तथा गैर मुस्लिमों को दूसरे रंग का। मुस्लिमों के लिए आरक्षित सड़क तथा अन्य लोगों के लिए चक्कर लगाकर ताएफ जाना पड़ता है। ऐसे देश में अप्रवासीयों को दहशत के माहौल में रहना पड़ता है। इराक-कुवैत लड़ाई समय का वातावरण यहाँ दिखाया गया है। वहाँ के कठमुल्लाओं को डिश एँटेना शैतान की कटोरी और एड्स की कुंजी लगती है। इसलिए उसपर पाबंदी लगाई गई। इंद्रमोहन को अपना नाम बदलकर हिंदुस्तानी रखना पड़ता है। लेखक यहाँ धर्म के नाम पर फैलाये जानेवाले आडंबर पर प्रकाश डालते है। हिंदुस्तानी को धार्मिक विवाह नहीं करना है और कोर्ट की शादी में भी धर्म पूछा

जाता है। जेद्दाह में बने मलिक इलाके में चलनेवाले दो नम्बर के कामों को देखकर वह हैरान रह जाता है। पैसे के लालच में वहाँ नौकरी करनेवाले हिंदुओं तथा अन्य धर्मों की औरतों को भी बुर्का करना पड़ता है। पुरूष और महिलाएँ एक साथ हुक्का पान करते है। मिडिया वाले भारत में बाबरी मस्जिद गिराये जाने की खबर पुरे विश्व में दिखाते है। परिणामतः मुस्लिम देशों में मंदिर गिराये जाने लगे। वहाँ के प्रवासी भारतीयोंपर कई प्रकार की पाबंदियाँ लगाई गई। वहाँ के भारतीयों को, उनके छोटे-छोटे बच्चों को भी स्कूलों में इस घटना के लिए कसुरवार ठहराया जाने लगा। संजय की बेटी उसे कहती है - ``पापा, आपने मस्जिद क्यों तोड़ी? क्लास में मेरे से कोई बात भी नहीं करता।''[4]

सारी बातें देखकर हिंदुस्तानी को विश्वास हो जाता है कि इसके लिए वह भी जिम्मेदार है। खरीददारी के समय जब यह पार्किंग में गाड़ी लगाता है उसे अजान सुनाई देती है। वहाँ उस दौरान दुकाने बंद रहती है। इसलिए वह सामान गाड़ी की डिकी में रखता है। बाकी खरीददारी नमाज के बाद करना चाहता है। तभी वहाँ की धार्मिक पुलिस का एक टुल्ला उसे इकामा मांगता है। वह गाड़ी की चाबी, ड्रायव्हींग लाइसेन्स दिखाता है किन्तु उसके पास हरे रंग का इकामा नहीं था। परिणामतः पुलिस द्वारा उसके पासपोर्ट पर एग्जिट की लाल मोहर लगा दी जाती है और वहाँ से भारत के विमान में बैठा दिया जाता है। भारत लौटने पर हिन्दुस्तानी अयोध्या की ओर चल दिया। कुछ राजनीतिक कार्यकर्ताओं से मुलाकात होने पर उसने नाम पुछा जाता है। हिन्दुस्तानी अयोध्या की ओर चल दिया। कुछ राजनीतिक कार्यकर्ताओं से मुलाकात होनेपर उसे नाम पुछा जाता है। हिन्दुस्तानी बताने पर वे लोग खौल उठते है। उसे सफाई देनी पड़ती है, हम हिंदु पहले है, हिंदुस्तानी बाद में। इस प्रकार कहानी में धार्मिक कट्टरता, सांप्रदायिकता जैसी बातोंपर कहानीकार ने गौर किया है। ``सिर्फ ढाँचा ही नहीं बल्कि लोगों का विश्वास, प्यार, भाईचारा, समाज की नींव सब चरमरा गया है।''[5] पैसे कमाने और ऐश की जिंदगी जीने के लिए देश के कुछ युवा विदेश जाने के लिए गलत तरीके अपनाते है। 'देह की कीमत' कहानी का हरदीप भी गलत तरीके से जापान पहुँचता है। एजेंट उसे दिल्ली से बैंकाक देसी एअरलाईन्स द्वारा भेजता है। वहाँ से सिडनी की टिकट बनवाता है बाया टोकियों। टोकियो में आठ घंटे का ट्रांजिट हॉल्ट होता है। उसी आठ घंटो में उनका एजंट उन्हे एअरपोर्ट से बाहर निकाल कर ले जाता है। इनमें पाकिस्तानी, बांग्लादेशी, पंजाबी और फिलीपीन, कोरिया वाले भी होते है। सब इल्लिगल। कुछ तो अवैध कामों के लिए जापानी कन्यासे विवाह करके वहाँ वैध तरीकेसे रहते थे। इधर उसकी पत्नी पम्मी और छोटा बच्चा अकेले थे। एक दिन बिमारी में कार दुर्घटना में हरदीप की मृत्यु हो जाती है। पुलिस के डर से डाक्टर का इलाज भी नहीं कर पाया। दोस्तों ने छुपकर दवाईयाँ लायी। वैध वीजा न होने के कारण लाश को भारत लाने में परेशानी हो रही थी। जिंदा व्यक्ति के किराये से भी लाश को भेजना बहुत महँगा पड़ता है। उसका दोस्त सतनाम दो दिन में तीन लाख भारतीय रूपये जुटाता है। नवज्योत कहता है तीन लाख खर्च करके उसकी पत्नी को सिर्फ लाश मिलेगी। इसलिए सभी दोस्त हरदीप का क्रिया-कर्म जापान में ही करते है। उसकी अस्थियाँ मुफ्त में भारत पहुँचाई जाती है। तीन लाख रू. का ड्राफ्ट हरदीप की पत्नी पम्मी के नाम भेज दिया जाता है। पैसे पहुँचने से पहले ही हरदीप की माँ और भाईयों में लालच बढ़ने लगता है। इस प्रकार प्रस्तुत कहानी में विदेशी आकर्षण और उसके लिए कुछ भी कर गुजरने का दुःस्साहस तथा उसके दुष्परिणाम और परिजनों की स्वार्थवृत्ति चित्रित हुई है।

'एक बार फिर होली' कहानीकी नज़मा को विवाह करके पाकिस्तान भेज दिया जाता है। उसका पति इमरान कट्टर पाकिस्तानी सेना का अफसर है। उसे हिंदुस्तान की तारीफ या कोई बात पसंद नहीं आती। वह हमेशा नज़मा को आतंक के साये में रखता है। वह वहाँ की कट्टर स्थितीयो मे पिसी जाती है। इंदिरा गांधी का नाम वहाँ एक बला की तरह लिया जाता है। बांग्लादेश विभाजन के कारण इमरान के मन में प्रतिशोध की भावना है। वह कश्मिर पर भी नजर बनाए है। कारगिल युद्ध शुरू हो जाता है। वह युद्ध में मारा जाता है। उसका अंतिम संस्कार हिंदुस्तान की धरती पर किया जाता है। पाकिस्तान में इमरान की मौत को कोई महत्त्व नहीं दिया जाता है। मरणोपरांत कोई पदक भी नहीं। जमीन भी नहीं। नज़मा अपने बेटे से मिलने लंदन जाती है। वहाँ से भारत पहुँचती है। वह छब्बीस साल के बाद अपने पूर्व प्रेमी चंदर के पास पहुंचती है। प्रस्तुत कहानी में भारत और पाकिस्तान के बीच परंपरागत पनपने वाली दुश्मनी की भावना, पाकिस्तान में होनेवाली राजनीतिक उथलपुथल, दोनों देशों के बीच बिगड़ते हालात का यथार्थ चित्रण प्रस्तुत हुआ है। इस प्रकार 'काला सागर' कहानी में आतंकवाद की समस्या का चित्रण प्रस्तुत हुआ है। कहानी के विमल महाजन को इस स्थिती से गुजरना पड़ता है। विमान हादसे में कई भारतीयों की मौत हो जाती है। जिनकी लाशों की पहचान की जाती है। लाशों को काले सागर से निकाला जाता है। किसी-किसी की तो शिनाख्त भी नहीं हो पाती। मरनेवालों के परिजनों का दुःख प्रस्तुत कहानी में चित्रित हुआ है।

इस प्रकार तेजेंद्र शर्मा की कहानियों में प्रवासी भारतीयों का दुःख चित्रित हुआ है। विदेश में ज्यादा सुखी हम अपने देश में होते है। सिर्फ पैसों का लालच सबकुछ नहीं होता है। लेखक को विदेश की परिस्थितियों का, वहाँ के स्थानों का गहरा अनुभव दिखाई देता है। वे एक सजग कहानीकार है। उनकी कहानियों के पात्र परिवेशगत होते है। लेखक चाहते तो लंदन में रहकर अंग्रेजी भाषा में साहित्य सृजन कर सकते थे। किन्तु इनका देशप्रेम इन्हें हिंदी भाषा में लिखने के लिए प्रेरित करता है। साहित्य लेखन के समय लेखक संवेदनात्मक अनुभूति करते है। इस प्रकार हिंदी साहित्य के आंतरराष्ट्रीय विकास में तेजेंद्र शर्मा एक सजग साहित्यकार सिद्ध होते है।

संदर्भ

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Effect of iron doping on structural, microstructural and gas sensing properties of nanocrystalline $ZnSnO_3$ thin films prepared by spray pyrolysis techniques

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Abstract

This work presents the effect of iron doping on the structural, microstructural and electrical properties of zinc stannate ($ZnCl_4 \cdot 5H_2O$, 99.9% pure, Merck made, Germany) thin films, prepared by spray pyrolysis method. The thin films were prepared by doping ferric chloride ($FeCl_3 \cdot 4H_2O$, 99.9% pure, Merck made, Germany) having three different small volume ratios: 1 ml, 2.5 ml and 5 ml, in order to study the iron doping dependence of the structural and microstructural properties of thin films. These properties were characterized with X-ray diffraction (XRD) and Transmission Electron Microscope (TEM). In our study, XRD pattern indicates that $ZnSnO_3$ has a perovskite phase with face exposed hexahedron structure. The 2.5 vol % iron doped $ZnSnO_3$ thin films exhibited better gas response and rapid response–recovery characteristics to hydrogen. Further, it has been shown the gas sensitivity of the iron doped $ZnSnO_3$ gas sensor depends upon its grain size.

Keywords: pervoskite oxide, effect of iron doping, electrical properties, spray pyrolysis process.

1. Introduction

Recently, some composite oxides such as spinel AB_2O_4 and perovskite ABO_3 were found to be more attractive than single-metal oxides for their better selectivity and/or sensitivity to certain gases. Zinc stannate or zinc tin oxide (ZTO) is a class of ternary oxides that are known for their stable properties under extreme conditions and are useful for electrical as well as optical properties [1-6]. Zinc oxide (ZnO) has attracted attention because of the wide range of applications [7-10]. ZnO has been extensively investigated as a gas sensing material for practical applications. Generally, ZnO sensors provide a wide variety of advantages, such as low cost, short response time, easy manufacturing, and small in size, compared with the traditional analytical instruments. However, the traditional ZnO gas sensors suffer from several problems such as high operating temperature, poor selectivity, and relatively low response, which limit their applications

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माझे गांव माझा इतिहास – पारोळा ऐतिहासिक, सांस्कृतिक व आध्यात्मिक नगरी

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इतिहास विभाग राणी लक्ष्मीबाई महाविद्यालय,पारोळा जि.जळगांव

प्रस्तावना

मानवी जीवनाच्या प्रत्येक घटकाला ऐतिहासिक पार्श्वभूमी असते. प्रत्येक देशाला, राज्याला आणि त्यातील छोट्या – मोठ्या प्रदेशाला इतिहास असतो. इतिहासकार केवळ विकसित समाजगटाचा किंवा महान व्यक्तींचाच अभ्यास करीत नाही. समाजाच्या , राष्ट्राच्या विकासाला लक्षावधी अनामिकांचे हात लागलेले असतात, ह्या दुर्लक्षित व वंचित गटाचा इतिहास लिहणे, त्यांच्या कार्याची , संस्कृतीची, मानसिकतेची दखल घेऊन इतिहास लेखन होऊ लागले. त्याच अनुषंगाने स्थानिक इतिहास हि संकल्पना पुढे आली. स्थानिक इतिहास अभ्यासाच्या संकल्पनेतूनच गढ्या, गडकोट, स्थानिक सांस्कृतिकतेच्या समाज व्यवस्थेचा अभ्यास होऊ लागला. काळाच्या पडद्याआड गडप झालेल्या इतिहासाला उजाळा स्थानिक इतिहासाच्या अभ्यासातून मिळाला. इंग्रज इतिहासकार आर.जी.कोलींगवूड यांनी म्हटल्याप्रमाणे,जिज्ञासा म्हणजे नवे ज्ञान प्राप्त करण्याची तीव्र इच्छा ही मानवाची उपजत प्रवृत्ती आहे. माझे पुर्वज कसे राहत होते. त्यांची जीवन पद्धती काय होती हे जाणून घेण्याची जिज्ञासा प्रत्येक व्यक्तिला समाजाला व राष्ट्राला असते. हा परिचय इतिहासाद्वारे होतो. इतिहास गतकालीन संस्कृतीचा वारसा जपतो ; त्याद्वारे प्राचीन संपन्न परंपरेची जाणीव करून देतो आणि अशा प्रकारे आत्मज्ञान देतो.

स्थानिक इतिहासाच्या अभ्यासातून आपल्या शहराच्या, गावाच्या सांस्कृतिक ऐतिहासिक ठेव्याची जाण निर्माण होते. आपल्या शहाराला असलेल्या श्रेष्ठ ऐतिहासिक वारसांच्या अध्ययनाने त्यातील आत्मभान जागृत होते. खानदेशातील जळगांव जिल्ह्यातील पारोळा शहराला अतिशय मोठी सांस्कृतिक ऐतिहासिक आणि अध्यात्मिक पार्श्वभूमी लाभलेली आहे.

खानदेशातील पारोळा वैविध्यपुर्ण शहर

खानदेशातील जळगांव आणि धुळे जिल्ह्याच्या मध्यवर्ती ठिकाणी पारोळा हे शहर वसलेले आहे. या शहराला ऐतिहासिक , सांस्कृतिक व अध्यात्मिक पार्श्वभूमी लाभलेली आहे. या शहराला असलेल्या पारोळाया नावाची उत्पत्ती पारोळी व नंतर अपभ्रंश होऊन पारोळा हे झाल्याचे स्पष्ट होते. या गावात पिंपळाचे व लहान लहान देवतांचे अनेक पार रांगेने म्हणजेच ओळीने बांधलेले आढळून येतात. यावरूनच या शहाराला पारोळा नाव प्रचलित झाल्याचे दिसते.

भौगोलिक स्थान – पारोळा शहर हे २०रू.५०रू अंश व ७५?.३ रेखांशावर आहे.या गावाचे क्षेत्रफळ १.४५ चौ.मैल आहे. काळाच्या ओघात नविन बिनशेती जागेत वसाहतींची उभारणी झालेली दिसते. त्यामुळे या शहराचे क्षेत्रफळ वाढतांना दिसते. हे गाव समुद्र सपाटी पासुन ६०८?आहे. या ठिकाणचे पावसाचे प्रमाण साधारणपणे २०रूअंश ते २५रू अंश आहे. परंतू असंतुलित वातावरणाचा परिणाम येथील पर्जन्यवृष्टीवर होतांना दिसतो. या भागाला बारंवार दुष्काळाला सामोरे जावे लागेते. हवामानाच्या दृष्टीने हा विभाग विषम हवामानात मोडतो. हिवाळ्यात खुप थंडी तर उन्हाळ्यात अतिशय उष्णता असते. आरोग्याच्या दृष्टीनेहवा कोरडी व चांगली मानवणारी आहे. या गावात नदी किंवा पाटाचे पाणी नसल्याने पावसाच्या पाण्यावरच मुख्य पिके घेतली जातात. ज्वारी,बाजरी,भुईमुंग,कापुस इत्यादी पिके घेतली जातात. गहू,हरभरा ही पिके ओलीताची व्यवस्था असलेल्या ठिकाणी थोड्या प्रमाणात घेतली जातात. पाण्याची मुबलकता नसल्यामुळे आधीपासून उद्योगधंदे,कारखानदारीचा अभाव परिणामी आढळून येतो.

शहाराचा पूर्वतिहास – पारोळा शहरात प्रवेश करण्याआधीच या शहराला ऐतिहासिक वारसा असल्याचे निदर्शनास येते. या शहराला चोहोबाजूंनी तटबंदी आहे. तटबंदी असलेले शहर नजरेस पडताच त्याचे ऐतिहासिक महत्व लक्षात येते. शहरात प्रवेश करण्यासाठी वेगवेगळ्या दिशांना सात दरवाजे आहेत.त्या दरवाज्यावरील उत्कृष्ट शिल्पकला या ठिकाणच्या लोकांच्या कला,गुणांची साक्ष देते. आजही हे दरवाजे दिमाखदारपणे आपल्या शहराचे वैभव सांगण्यासाठी उभे असलेले दिसून येतात. या गावाची सुरूवात नेमकी कधी झाली असावी, हे जरी सांगता येत नसले तरी या ठिकाणी २९० वर्षापूर्वी बांधलेला किल्ला अस्तित्वात आहे. या पुराव्याच्या आधारे साधारणपणे ३०० वर्षापुर्वी या शहराची उभारणी झाली असावी. या शहराला ऐतिहासिक वारसाही लाभलेला आहे.रणरागिनी राणी लक्ष्मीबाई चा सह संबंध असलेले हे ऐतिहासिक नगर आहे.नेवाळकर ही राणी लक्ष्मीबाईंची सासरची मंडळी होती.हे नेवाळकर पेशव्यांचे सरदार होते.पारोळा हे त्यांच्या अखत्यारीतले गावहोते.

या शहरात हरी सदाशिव दामोदर हा जहांगीरदार होता. त्याने या शहरात इ.स.१९२७ मध्ये म्हणजे सुमारे २९० वर्षापूर्वी भुईकोट किल्ला बांधला. हा किल्ला म्हणजे वास्तुकलेचा उत्कृष्ट नमुना समजला जातो. ५२५? लांब आणि ४३५? रुंद असलेला किल्ल्याच्या तटाभोवती चारही बाजूंना पाण्याचे खंदक आहेत. पूर्व दिशेस एक मोठा रूंद तलाव आहे. किल्ल्याच्या मध्यवर्ती ठिकाणी एक उंच बुरूज आहे. ज्याची आज भग्न स्थिती झालेली दिसून येते.किल्ल्यात जहागिरदाराचा महाल व इतर प्रशस्त खोल्यांचे अवशेष दिसून येतात.किल्ल्यात आजही अनेक जीवंत पाणी असलेल्या विहीरी आढळून येतात. किल्ल्यात एक भुयार असून त्याचे प्रवेशद्वार पारोळ्यापासून ३ कि.मी. वर असलेल्या नागेश्वर या प्राचीन महादेव मंदिराजवळ आहे.

इंग्रजांनी मराठ्यांचा इ.स. १८१८ मध्ये पराभव करून आपली सत्ता प्रस्थापित केली. इ.स.१८५७ च्या स्वातंत्र्य युध्दात राणी लक्ष्मीबाई पारोळ्याच्या जहांगीरदाराने मदत केल्याचा आरोप ठेवून इंग्रजांनी २२ जुन १८५८ रोजी हा किल्ला आपल्या ताब्यात घेतला. त्याच बरोबर पारोळा शहरही आपल्या ताब्यात घेतले.

पारोळा शहराचे आध्यात्मिक अधिष्ठान

पारोळा शहर मंदिरांचे गाव म्हणूनही ओळखले जाते.या ठिकाणी असंख्य पुरातन देव देवतांचे मंदिरे आहेत. प्राचीन देवालये आणि विविध धर्मपंथीयांचे श्रध्दास्थान असलेला हा परिसर महाराष्ट्राच्या भाविकांसाठी आकर्षणाचा विषय आहे. पारोळा शहराचे विशेष आकर्षण म्हणजे सुमारे ३०० वर्षापुर्वीचे श्री बालाजी चे जागृत देवस्थान होय. या मंदिराचा नुकताच म्हणजे २०१८ मध्ये लोक वर्गणीतून सुमारे ५ कोटी रुपये खर्च करून जीर्णोध्दार केला गेला. अतिशय भव्य,अप्रतिम शिल्पकलेचा उत्कृष्ट नमुना ठरावा असे या मंदिराचे रुप पारोळा शहराच्या वैभवातील मुकूटमणी ठरलेले आहे. राजस्थानातून आणलेल्या लाल संगमरवरी दगडात उभारलेले भव्य दिव्य मंदिर,मंदिरातील घुमट, मंदिरापुढील गरूड खांब,नगारखाना सारेच अप्रतिम आहे.

पारोळा शहराच्या आध्यात्मिक अधिष्ठानात श्री बालाजी देवस्थाना बरोबरच अनेक पुरातन मंदिरेही आहेत. पुरातन राममंदिर त्याला लागून धर्मशाळा आहे. चुनखडी दगडात बांधलेले सुमारे १७५ वर्षापुर्वीचे हे मंदिर आहे. मंदिरातील नक्षीकाम चित्रकला अप्रतिम आहे. पारोळा शहराचा जहांगीरदार हरी

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12. Improvement of H2S Sensing Performance of SnO2 Based Thick Film Gas Sensor Surface Activated by CuO

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Abstract

Bulk Tin Oxide (SnO_2) powder in the form of thick film was observed to be less sensitive to the polluting gases. So, nanostructured SnO_2 powder was synthesized by disc type ultrasonicated microwave assisted centrifuge technique. Thick films of as synthesized powder were fabricated by simple screen printing technique followed by the calcinations at 500°C for 1 hr. Thick films of pure nanostructured SnO_2 powder were surface activated by dipping them into 0.01 M aqueous solution of $CuCl_2$ for different intervals of time followed by calcinations at 500°C for 30 min. The films exhibit the semiconducting nature due to non-stoichiometry and respond to various gases. Optimizing the particular conditions, the thick films can be used for gas sensing. The SnO_2 film activated for 15 min. by CuO was found to give better response to H_2S gas at room temperature.

This paper deals with the synthesis of nanostructured SnO_2, characterization and its application as a Gas Sensor. The sensor was found to be highly sensitive and selective to 5 ppm H_2S gas among the mixture of various gases even at high concentrations. The surface morphology, chemical composition, crystal structure, electrical and thermal properties of the bulk and nanostructured SnO_2 have been investigated by Field Emission Scanning Electron Microscope (FE-SEM), Energy Dispersive Analysis by X-rays (E-DAX), X-Ray Diffraction (XRD), etc.

Key-words: Bulk and Nanostructured SnO2, CuO, Thick Films, H2S, etc.

1. Introduction

SnO_2 has been found to be the most promising material to detect the toxic and hazardous gases [1]. It has been studied that modified CuO was used as a gas-sensing element. CuO

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34. Hydrogen Gas Sensor Based On Nanocrystalline Titanium Dioxide Thin Film Prepared By Simple Spray Pyrolysis Technique

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Abstract

In the Present work the spray pyrolysis technique was employed to prepare nanocrystalline TiO_2 thin film. Their gas sensing properties are strongly dependent on deposition technique. To prepare nanocrystalline TiO_2 thin film by using solution of AR grade Titanium chloride ($TiCl_3$, 0.01 M). The solution was sprayed on quartz substrate heated at 350^0C temperature to obtain the film. This thin film was annealed for a one hours at 550^0C. As prepared thin film was characterized by X-ray diffraction, Microstructure study was conducted using Transmission Electron Microscopy and Optical properties was studied using U-V Spectroscopy. The sensing performance of this thin film was tested for various gases such as LPG, H_2, CO_2, Ethanol, NH_3 and Cl_2 (100 ppm). Gas response, selectivity, response and recovery time of the sensor were measured and presented.

Keywords: Spray pyrolysis techniques, TiO_2 thin films, Hydrogen gas sensor.

1. Introduction

Over the last few years a great attention has been focused on the titanium dioxide (TiO_2) thin films because its excellent materials in many applications such as in the field of sensors, antireflection coatings, gas sensors[1], solar cells[2] and photocatalysis [3,4]. There are many methods that can be used to prepare TiO_2 thin films with desired properties including sol-gel [4-

7], sputtering [8], anodic oxidation [9-14], pulsed laser deposition (PLD) [15] and spray pyrolysis [1-3, 16-17]. Of all the afore-mentioned thin film fabrication methods, spray pyrolysis is widely used because of its simplicity, cheap chemical deposition procedure, allowing the growth of rough-surface films at atmospheric pressure, on large area.

Hydrogen gas is tasteless, colorless and odorless so it cannot be detected by human beings. The low ignition energy and wide flammable range makes it easy inflammable and explosive. Therefore rapid and accurate hydrogen detection is necessary during the production, storage and use of hydrogen and it is also essential for monitoring/controlling the hydrogen concentration of nuclear reactors, coal mines and semiconductor manufacturing, etc [18].

2. Experimental

2.1 Preparation of pure TiO_2 thin film

The spray pyrolysis technique was employed to prepare TiO_2 thin film. Aqueous solution of Titanium chloride was used as precursor ($TiCl_3 \cdot 6H_2O$, 99.9% pure,Merck made, Germany) with concentrations of 0.01 M, were prepared in double distilled water.The solution was sprayed onto glass substrate heated at 350^0C to obtain the film. This thin film was fired for a one hour at 550^0C and termed as S.

3. Materials characterizations

The structural analysis of nanocrystalline TiO_2 thin films was carried out by XRD (Rigaku DMAX 2500) with CuKα radiation at a wavelength of 1.5418 Å. Electron diffraction patterns of nanocrystalline TiO_2 thin films were obtained using a Transmission Electron Microscopy [Philips, CM 200 (200 KV HT)]. A UV-Visible spectrophotometer (Shimadzu 2450 UV-VIS) was used to study the optical properties of nanocrystalline TiO_2 thin film. The thickness and roughness of thin film was measured by using Surface Profiler [AMBIOS Tech. (USA) XP-I].

3.1 Thickness and roughness determination of TiO_2 thin films

The thickness and roughness of thin film was measured by using Surface Profiler (AMBIOS Tech. (USA) XP-I) having vertical resolution of 1.5Å, Lateral resolution of 100 nm and lateral length of 200 nm. From this, thickness of nanocrystalline TiO_2 sample is 223.8nm and roughness of sample TiO_2 is 33.3nm.

3.2 Structural properties: X-ray diffraction studies

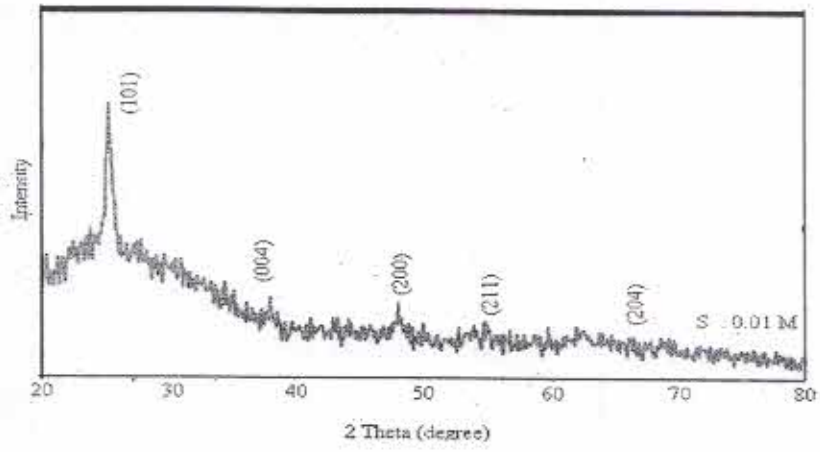


Figure 1: X-ray diffraction spectra of sample S

Figure 1 shows XRD spectra of sample S. The observed "d" values of TiO_2 films confirmed that the deposited films are of TiO_2 anatase phase with tetragonal structure matched well with the ASTM data book [19]. In the XRD pattern, the (101) peak has the most distinct reflection. So, the mean crystalline size is calculated with the line broadening of the (101) reflection using well known Scherrer Eq. (1)

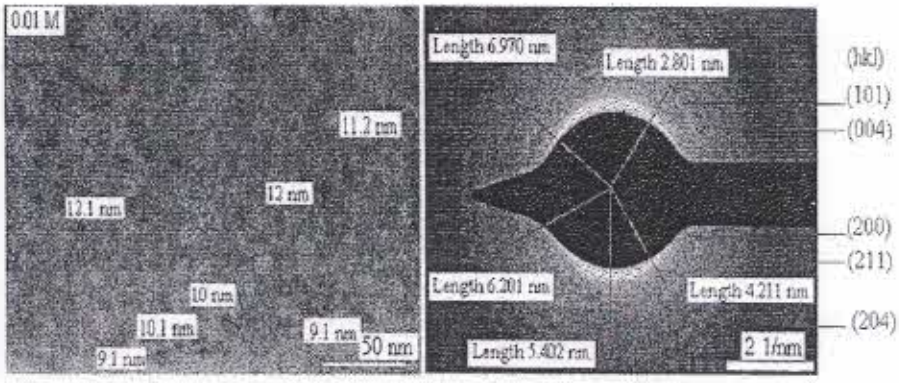
$$d = 0.9 \lambda / \beta \cos\theta \quad (1)$$

Where, d is crystallite size, β is the full width at half maxima in radians and λ the wavelength of X-ray (1.5418 Å). The crystallite size was observed to be 9.24 nm.

3.3 Microstructure and electron diffraction using TEM

Figure 2 (a) shows the Transmission Electron Micrograph [CM 200 Philips (200 kV HT)] of powders obtained by scratching the thin film sample S and powder was dispersed in ethanol. TEM uses copper grid to hold the powder. The sample particles on the grid were scanned in all the zones before the picture was taken. Figure 2 (a) shows that the grains are spherical or ellipsoidal in nature with an average grain size of 10.52 nm. Fig. 2 (b) shows the electron diffraction patterns of S. The electron diffraction patterns show clear and continuous ring patterns revealing their polycrystalline structure. Five fringe patterns corresponding to planes: (1 0 1), (0 0 4), (2 0 0), (2 1 1) and (2 0 4) are consistent with the peaks observed in XRD patterns. XRD and TEM studies confirmed pure tetragonal structure of TiO_2 as evidenced from figure 1

and figure 2 respectively. Table 2 show the comparison of grain size from Transmission Electron Micrograph and X-ray Diffraction.



(a) (b)

Figure (a): TEM image of sample S Figure (b): Electron diffraction image of sample S

Table 2: Grain size calculated from XRD and TEM.

Sample	Grain size calculated from XRD(nm)	Grain size calculated from TEM (nm)
S	9.24	10.52

3.4 Optical absorption

Figure 3 show the variation of absorbance with wavelength of nanocrystalline TiO_2 thin films in the range of 300-600 nm. The band gap energy of the samples was calculated from the absorption edges of the spectra [20]. The band gap was observed to be 3.28 ev.

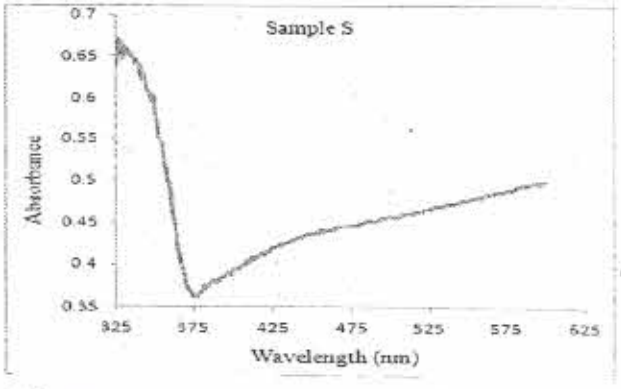


Figure 3: Absorption spectra of samples S

4. Sensing performance of pure TiO_2 thin films

4.1 Gas sensing performance of thin film resistors

The thin film sensors mounted in static gas sensing system were tested on exposure of ethanol, carbon dioxide, LPG, ammonia, chlorine and hydrogen. Values of currents before and after exposure of gas were measured and gas responses at various operating temperatures were determined.

4.2 Measurement of gas response and selectivity

Gas response (S) is defined as the ratio of the change in conductance of the sensor on exposure to the target gas to the original conductance in air. The relation for S is as:

$$S = (G_g - G_a) / G_a$$

where, G_a and G_g are the conductance of sensor in air and in a target gas medium, respectively.

Selectivity or specificity is defined as the ability of a sensor to respond to a certain gas in the presence of other gases.

4.3 Variation of gas response with operating temperature for different gases

Figure 4 shows the variation of gas responses with operating temperature. It is clear from the figure 4 that the gas response increases with operating temperature, reaches to maximum [for H_2 (S=22) at 250^0C for 100ppm] and falls with further increase in operating temperature. Sensor S is most sensitive to H_2 at 250^0C.

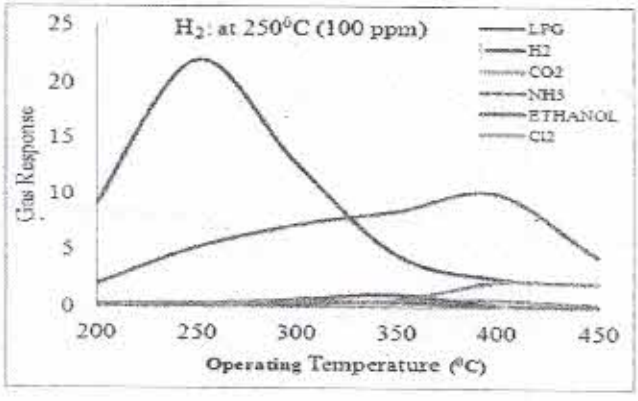


Figure 4: Variation of gas responses with operating temperature.

5. Discussion

It is well known that oxygen molecules are adsorbed on the surface of TiO_2 to form O_2, O, and O^2 ions by abstracting electrons from the conduction band of TiO_2 depending on

temperature. The oxygen species are O_2 molecules below 100^0C, O_2^- between 100 and 300^0C, and O^{2-} above 300^0C [21].

$$H_{2\,(ads)} + O^-_{\,(ads)} \rightarrow H_2O_{\,(gas)} + e^- \qquad (2)$$

When the TiO_2 thin films are exposed to H_2 gas, the H_2 gas reacts with the adsorbed O^- ions on the surface of TiO_2 thin films according to equation (4.6). Then, electrons are returned back to the films. Increase of electrons decreases the resistance of the TiO_2 thin films and conductivity increases upon exposure to H_2.

6. Conclusions

- The grain sizes of sample S is calculated from XRD match well with the grain sizes observed from TEM.
- Nanocrystalline TiO_2 thin films were observed to be sensitive to hydrogen at 250^0C.
- Nanocrystalline nature was observed to be useful in gas sensing.

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10. Preparation, Characterization of Nanostructured Zno Powder and Sensing Performance of its Thick Film Sensor

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Abstract

Nanostructured ZnO powder was prepared by ultrasonic atomization technique. As prepared powder was characterized by X-ray diffractogram, Scanning Electron Microscopy, Transmission Electron Microscopy and Energy Dispersive Analysis of X-rays. The powder was used to prepare thick films using screen printing technique. The sensing system was used to test the sensing performance of the nanostructured ZnO thick-film sensors on the exposure of conventional gas (Ammonia, LPG, Hydrogen, Ethanol, Carbon-Dioxide and Chlroine)) and simulants of chemical warfare agents (dimethyl methyl phosphonate, 2-chloroethyl ethyl sulfide and 2-chloroethyl phenyl sulphide). The nanostructured ZnO thick-film sensor was found to be most sensitive to Ammonia (conventional gas) and Dimethyl Methyl Phosphonate (simulant of chemical warfare agents) respectively.

Keywords: Ultrasonic Atomization, Zno, Thick Films, Sensor

1. Introduction

Metal oxide semiconductor is used to detect the hazardous and toxic gases [1]. ZnO thin films have been prepared by various technique such as metal organic chemical vapour deposition [2], dc magnetron sputtering [3], sol–gel [4] and spray pyrolysis [5] etc. Among these techniques, ultrasonic spray pyrolysis is convenient and simple technique. Now a days

Plant Invasion In India As Revealed From Tantrasarah

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Abstract: Exotic and adventive plant species form important component of native flora. Their occurrence in foreign lands is a result of human migration and daily necessities of life. They ultimately turn into an integral part of human culture prevalent in the area of invasion.Some such plant taxa have been gleaned the ancient Sanskrit script *viz.*,Tantrasarah. The text of Tantrasarah explains employment of various plant species or their products/parts in different rites and worships. The present authors could notice total 24 exotic species belonging to 24 genera and 17 angiospermic families. They belong to different continents, countries and geographical regions of the world including America.Majority of them (19 species) are cultigens exclusively. Only 03 species (*) run exclusively in wild and other two species are found as cultigen and wild ($) ones. These taxa are conceived as a reflection of Indian contacts in ancient times with other parts of the world directly or indirectly.

Key Words: Plant Invasion, Tantrasarah, India.

Introduction:

Biological diversity and cultural diversity is embodied in many of the ancient Indian epics, Vedas, SmrutiTexts, Puranas and special treatises like Kautilya'sArthashastra. They are versed in Sanskrit and entel myths, rituals, rites, worships daily life especially of our Indian ancients. If the 'Knowledge System' hidden in them is unlocked, they provide much information in our biological, geographical, ecological and cultural diversities in the then Indian subcontinent. The knowledge system prevalent even accords us linkages between the aforesaid fields and disciplines. One such Sanskrit script *viz.*,Tantrasar or Tantrasarah is a rich heritage which deals with the mantras (hymns) and methods of worship of various gods. It contains the essence of different sectarian tantras*viz.*,Saivc, Sakta, Vaisnava, Saura, and Ganapatya. It reveals instructions on different religious rites. It was developed in the 15th to 16th century AD (Banerjee, 1988). It is said to be compiled originally byKrishnandaAgamvgisha. Plants are held in high esteem in it. The biodiversity is obviously intertwined with cultural diversity. The present authors especially paid attention to the exotic floral elements then available in Indian territory. Taxonomic composition,nativity and broad categories of utilities are emphasized in this communication.

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DEPARTMENT OF BOTANY

Workshop on Restructuring of S.Y.B.Sc. Syllabus in Botany (CBCS Pattern)

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