

Socio-economic Status of Bee-keeping Industry in Baripada Region of Dhule District of Maharashtra, (India)



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ABSTRACT-

The socioeconomic study of honey production from Baripada tribal region of Dhule district has done during the year 2017-2018. It is observed that the total honey production from 18 live boxes in one year from dominant honey bee species *Apis cerana indica* was 450-500 kg. The approximate cost of that honey was INR-90000-100000.- and net profit was 70000-80000. This business helped the weaker section of tribal society and had positive effect on the socio-economic development of Baripada region.

Keywords- Socio-economic study, Baripada, tribal region, *Apis cerana indica*, honey collection.

INTRODUCTION-

Assortment of honey from the forests for human welfare has been in existence since a long time. Several species of honey bees convert nectar of flowers into honey and store them in the combs of the hive.

Apiculture (Bee keeping) in India has great historical heritage. The knowledge of bees, honey and beekeeping has been mentioned in various Hindu Vedic scriptures like *Rig Veda, Atharva, Vedas, Upanishadas, Bhagavad Gita, Markandeya Purana, Raj Nighantu,*

Brihat Samhita, Arthashastra, Amar Kosha as well as Buddhist scriptures like Vinaya Pitaka, Abhidhamma Pitaka and Jataka tales. The popular epic *Ramayana* describes a "Madhuban" that was cultivated by *Sugriva* and in *Mahabharata* Madhuban is mentioned in the epic *Mahabharata near Mathura* where

Krishna and Radha used to meet.

Various rock paintings dating to Mesolithic and post-Mesolithic era are found in the Pachmarhi regions of Madhya Pradesh mainly depict honey collection activities from honey combs of *Apis dorsata* and *Apis mellifera* bees.

When British attacked (1842-49) the eastern coast of Odisha state in the Kondha tribe used tamed bees against them. But little is known about the techniques used by them for taming (Crane 2013). Various tribes in the hilly regions of Manipur and Nagaland used wooden logs

or earthen wares for beekeeping.

Before the discovery of bee keeping honey was extracted by squeezing out honey from honeycombs. But this was crude methods which had possibility of adulterating honey with the beeswax and also killing many bees in the process. Manipuri tribes have been used a hollow bamboo with a nail attached to pierce the comb has been used by. The hollow bamboo would allow flowing of honey to another container (Ghosh 1994).

Scientific beekeeping in India was started during 1880-1883 in West Bengal, Punjab and Kullu regions to keep *Apis cerana*. The first successful attempt was made by Reverend Newton during 1911-17 in Kerala. He developed a specifically designed hive and started training rural and tribal people to harvest honey from beehive. The design became popularly known as "Newton hive".

In India beekeeping activities were popularised in Travancore (1917), in Mysore (1925), Madras (1931), Punjab (1933) and Uttar Pradesh (1938). All India Beekeepers Association (1939) and the first

Beekeeping Research Station (1945) in Punjab Indian Council of Agricultural Research (Rakesh Kumar Gupta et al., 2014). Beekeeping was included in curriculum by the Agriculture College, Coimbatore (now Tamil Nadu Agricultural University) in 193 (Ghosh 1994).

After the Independence, the importance of beekeeping was hassled by Mahatma Gandhi comprising it in his rural development programmes. The beekeeping industry is working under Khadi and Village Industries Commission (KVIC) which in turn is under Ministry of Industry. In 1962, Central Bee Research and Training Institute was founded by KVIC at Pune (Rakesh Kumar Gupta et al., 2014). Beekeeping was encouraged in Kerala, Tamil Nadu, Coorg region of Karnataka, Mahabaleshwar in

Maharashtra, Northeastern states and West Bengal.

The production of honey in India is increasing significantly during the late 1990s. Being the major exporter of honey, India falls behind China, Argentina, Germany, Hungary, Mexico and Spain. In 2005, India's honey export reached a value of US\$ 26.4 million. 66% per cent of



Behavioral Responses Induced By Lead (Pb) and Arsenic (As) in Freshwater Fishes

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ABSTRACT-

In the present study, behavioral alterations induced by exposure of the freshwater fishes *Mystus bleekeri*, *Rasboradaniconious* and *Puntius sophoreto* different concentrations of lead (Pb) and arsenic (As) were reported. Their behavioral responses including erratic pattern of swimming, surfacing activity, opercular movements and mucous covering on body were observed in the fishes.

Key Words- Lead, Arsenic, behavioral responses, freshwater fishes.

INTRODUCTION-

Aquatic environment is the ultimate sink for all pollutants. Generally, the potential impact of pollutants is more on the aquatic organism than in terrestrial environment (Ilavazhahan *et al.*, 2010). Aquatic pollution is significant in fisheries and aquaculture industries. Discharge of industrial wastewater produce serious consequences in fish which results in impairment of important functions such as respiration and osmoregulation (Kumaraguru, 1995). The changes in physical, chemical and biological parameters of water may even alter the behaviour of fish besides causing mortality (Yadav *et al.*, 2007). The ethological changes in fish have been considered to be sensitive indicator of toxicity and the fish, as vertebrates are closely related to mammals (and humans) and tend to be similar in sensitivity (Tiwari *et al.*, 2011).

Freshwater gets contaminated with a wide range of pollutants and it has become a matter of major concern around the globe (Voegborlo *et al.*, 1999; Vutukuru *et al.*, 2005). Among pollutants, metals are of special concern because of their diversified effects and the range of concentrations that could cause toxic effects to fish (Rauf *et al.*, 2009). Heavy metals reach to the aquatic environment from natural and anthropogenic sources and distributed in the water bodies, suspended solids and sediments during the course of their transportation (Adeniya *et al.*, 2005; Aderinola *et al.*, 2009).

Fish has been the main supply of cheap and healthy protein to a large percentage of the world's population. The nutritional requirement of human population is met

mostly through aquaculture. However, in the recent times, aquaculture sector is contributing to a great extent towards the protein requirement of man. As fish is considered the most important and vital link in the food chain of the aquatic ecosystem and the inland fisheries are an important source of protein in a nation's diet, a thorough understanding of the toxicant's effect on fishes would be really vital for fish conservation and fisheries development (Agnihotri and Chattopadhyay, 1992).

Fish have been used in scientific research for a long time. From the surrounding water, fish may absorb dissolved heavy metals that may accumulate in various tissues and organs and even be biomagnified in the food-chain/web. In the absorption process there are four possible routes for metals to enter a fish: the food ingested; simple diffusion of the metallic ions through gill pores; through

drinking water; and by skin adsorption (Sindayigaya *et al.*, 1994). However which route is more important depends on environmental circumstances and has not always been properly documented (Depledge *et al.*, 1994). Amongst fish species, considerable differences in sensitivity to metals have been reported.

The poisoning by pesticides from agricultural fields is a serious water pollution problem and its environmental long-term effect may result in the incidence of poisoning of fish and other aquatic life forms (Jothi and Narayan, 1999). Toxic effects of pollutants are due to disturbance of the normal physiological functions of the organisms. Changes in biochemical constituents in the tissues due to pathogen, pesticide and heavy metal stress have definite pattern. Metabolic activity of an organism reflects utilization of biochemical energy to counteract the toxic stress (Ilavazhahan *et al.*, 2010).

In the study area paddy cultivation is the major agricultural activities. Water bodies adjoining paddy cultivation practically serve as sink for pesticides, fertilizers and some domestic discharges affecting biota in general and fishes in particular. Owing to the excessive use of pesticides, the environment and water resources are being polluted, thus, endangering aquatic biota directly and human indirectly. Heavy concentration of pesticides in water, in

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Business Opportunities by using Mahua Product among the Tribals

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ABSTRACT

West tribal zone of Pimpalner is rich in ethnic as well as floristic diversity. The tribal group of this region mostly depends on the natural resources. They prefer to stay in and around forests. They used several plants to fulfill their basic needs like food, medicine and shelter etc. in which Mahua plants play an important role in socio-economic life of tribal peoples. The Mahua tree is a nature gift to tribal's area Mahua (*Madhuca longifolia*) belongs to Sapotaceae family. Mahua flower are used as a food as well as used as an exchanger in tribal and rural areas. Mahua seeds are rich in edible fats so they have economic importance. Traditionally mahua flowers are collected by the tribals, these flowers are rich in sugars and hence harbours native yeast flora or Ranu goti (Ranu tablet) capable of carrying out natural fermentation. The dried flowers are also consumed as food by mixing it with flour and baking bread. The flowers are sweet and have glucose and sucrose. *Madhuca longifolia* has found many important properties every part of Mahua yields an economic product of great potential value. Further studies are needed to produce various edible product and will be the great business opportunities to the tribal area.

Key words: *Madhuca longifolia*, Fermentation, Mahua edible product etc.

INTRODUCTION

Madhuca longifolia is an important tree having vital socio-economic value and growing throughout the tropical and subtropical region of the Indian subcontinent, and also found in abundance in the tropical rain forests of Asian and Australian continents [1]. It is commonly known as 'mahua', 'mahwa' or butter nut tree, It is a fast-growing tree that grows to nearly 20 meters in height, possesses evergreen or semi-evergreen foliage, and it belongs to the family Sapotaceae. Mahua is a tree valued for its fruit, seeds, which are the largest source of natural hard fat commercially known as mahua butter or mowrah butter. Fruits are eaten as raw or cooked. The fruit pulp may be utilized as source of sugar, whereas seeds are good source of oil [2].

Mahua flowers are very rich in fermentable sugars

(glucose, fructose and maltose) The flowers of these trees are traditionally used in preparation of portable spirits, vinegar and feed for livestock by tribals. The leaves are used for making plates for various purposes. Mahua seeds can also be used for preparation of defatted flour, which has great potentiality in bakery products [3]. The flowering seasons begins from January and lasts until April. Mahua flowers falls to the ground in showers during March and April and the highest pollens were recorded in April. The color of the corolla is cream and collected flowers were dried in the open air on a clean surface. During this process, they shrink in size and turn reddish brown in color, the characteristic odour increase as a result of drying. The flowers are collected by the locals and are dried to prepare other edible products. It is one of the universal plants having medicinal activities also [4]. The mahua flower is edible and a food item for tribals [5]. They are used to make syrup for medicinal purposes [6]. Mahua flowers were used widespread as a source of energy for *Azotobacter*. Molasses was advocated as a soil fertilizer. Flowers are utilized as cattle feed which helps in improvement of health of cattle and increase in milk production [7].

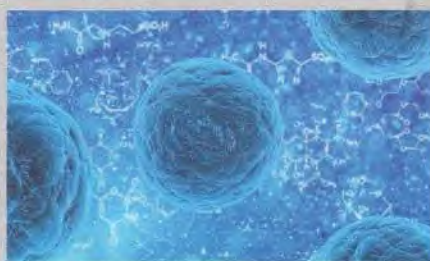
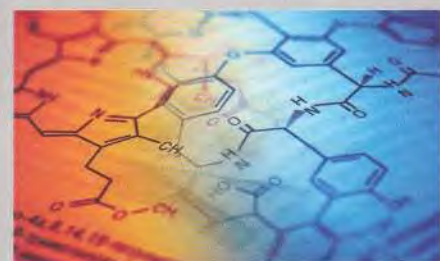
In India, large numbers of mahua trees are found in the states of Uttar Pradesh, Madhya Pradesh, Orissa, Jharkhand, Chhattisgarh, Andhra Pradesh, Maharashtra, Bihar, West Bengal, Karnataka and the estimated production of mahua flowers were more than one million tons in the country. Due to lack of post harvest processing technologies, most of the flowers get decomposed and waste. Various products like, acetone, ethanol, lactic acid and other fermented product have been prepared from the dry mahua flowers [8]. The dried flowers are also consumed as food by mixing it with flour and baking bread. The flowers are sweet and have glucose and sucrose. The flowers are also good cattle feed when mixed with other feed. The seeds give oil which has excellent saponification quality and is used by soap manufacturer. It is also used as a cooking media by the local people. The flowers are seed collections gives lot of employment to the people [9]. The corollas contains total sugars of 72.9 %, moisture content of 18.6 %, proteins of 4.4 mg, fats of

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CONTENTS

Research Papers :	
Synthesis, characterization and biological properties of metal complexes of novel crotonates Rajesh Kumar Dhurve, Arun Singh and Diwa Mishra	1 - 5
Evaluation of novel fused heterocyclic ligands and their chelating properties. Yogendra, Arun Singh and Diwa Mishra	6 - 10
Metal complexation studies of novel co-ordination compounds derived from 1,3,4-oxadiazole-2-thione Suresh Dawar, Arun Singh and Diwa Mishra	11 - 15
Solar energy conversion and storage in fuchsin basic-mannitol dye sensitized solar cell A.S. Meena, Sonika, M. Akram, Jayshree, H. Poswal, M.I. Meena and J. Meena	16 - 21
Studies on the status of the birds inhabiting sanjay pond pithampur, Dist Dhar, MP, with reference to the changing environment Brijendra Rawat, Dr.rajendra Chouhan and Nirmala Mourya	22 - 27
Electrochemical quantification of piperidine at square wave voltammetry Ayushi Srivastava, Sadhna Shrivastava and P.D.shakya	28 - 36
Electro-analytical study of formation constants of mixed-ligands complexes of cadmium(ii) with some amino acids (dl-isoleucine, L-glutamic acid) and 4,4,4-trifluoro-1 (2-naphthyl)butane-1,3-dione at dme in 60% acetonitrile medium Laksh Choudhary and C.P.S. Chandel	37 - 45
Exploring thermal gravimetric analysis data towards the determination of non-isothermal kinetics of oxalic acid G. R. Gupta, Y. V. Marathe, Dinesh Kanade and V. S. Shrivastava	46 - 50
Electro-analytical studies of formation constants of mixed-ligands complexes of cadmium(ii) with some bio-potentially important amino acids (l-valine, L-aspartic acid) and 4,4,4-trifluoro-1(2-naphthyl) Butane-1,3-dione at dme in 60% acetonitrile medium Laksh Choudhary and C.P.S. Chandel	51 - 59
The assessment of industrial effluents collected from the Vapi industrial area of Gujrat (India) Rajendra N. Marathe and V. S. Shrivastava	60 - 63
Studies of electrical conductance and antibacterial activity of synthetic membrane Anuradha Singh and M.A. Ansari	64 - 76
Antimicrobial and socio-historical studies of some newly synthesized and analyzed hydrazone complexes of Pr (iii). Jitendra Ambwani and Sushma Ambwani	77 - 79
Cancer nanotherapeutics : an innovative drug delivery system A. A. Shaikh, V. S. Shrivastava, M. G. Raghuvanshi, Aejaz Ahmed, G. J. Khan and Wajahat Syed	80 - 94
Detection of heavy metals and their accumulation in water and soil through electro plating industries by icp-aes technique. Dr. Pradeep and P. Talware	95 - 98
Synthesis and biochemical studies of some new Gd(III) hydrazone complexes Jitendra Ambwani and Mamta Kaushik	99 - 100
Review Papers :	
Organic compounds in the environment B. H. Patil	101 - 106

**DETECTION OF HEAVY METALS AND THEIR ACCUMULATION
IN WATER AND SOIL THROUGH ELECTRO PLATING INDUSTRIES
BY ICP-AES TECHNIQUE**

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Research**PRADEEP P. TALWARE**K.A.M.Patil Arts, Comm. and Kai. Annasaheb N.K.Patil Science Senior College,
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Abstract : The detection of heavy metals (Viz. Pb, As, Cd, Ni, Cu, Fe, Zn, Cr) and their accumulation have been studied in electroplating industrial waste water. This work describes the detection of concentration of these metals in industrial waste water by ICP-AES (Inductively Coupled Plasma Atomic Emission Spectroscopy) technique. In electroplating industrial waste water samples Pb, As, Ni, Cu, Fe, Cr are detected while Cd, Zn, As, Cu are detected in trace amount in some samples. For the accumulation of metals by the waste water samples were collected and analysed. This concentration of metals is due to various electro plating industries. The waste water samples were collected from MIDC, Ambad, Nashik. Maharashtra. At this point the soil is getting polluted by the disposal of different electro plating industrial waste water. Detected some of the metals are toxic.

Keywords : Accumulation, Heavy Metals, ICP-AES, waste water, detection

Introduction :

Industrial growth is an essential feature of the developing country. Without industrial growth a nation can not stand amongst the global scenario. Due to this rapid industrialization environmental pollution is becoming the most challenging threat to human beings (1,2). Pollutants in various forms are thrown into the nearby areas by industries. These pollutants pollute the air, soil, surface water as well as ground water (3). The industrial activities have contributes quantitatively as well as qualitatively to the large increase in the discharge of metallic pollutants into environmental sink. The heavy metals present in industrial effluents interact with organic and inorganic species and form complexes. Insoluble complexes are deposited on the surface of the soil but soluble complexes formed have a tendency to percolate through the soil (4) which affects the quality of the ground water and soil.

For this study the samples were collected from MIDC, Ambad, Nashik located in Maharashtra. In this industrial area most of the industries are electroplating industries

which are being discharged the effluent into open places. Most of the industrial waste water are containing organic, inorganic matter and hazardous metals (5). These heavy metals and organic compounds affect the quality of soil and ground water of the area. The heavy metals like Pb, As, Cd, Ni, Cu, Fe, An and Cr and some water soluble pollutants percolate into the ground water (6). Due to industrialization and urbanization pollution growth all the sources of water are either polluted or contaminated (7). Release of treated and untreated industrial effluents in unplanned manner is one of the major causes of water pollution. The effluents which are released into various surfaces water bodies not only affect the water quality and soil but also pollute the ground water due to percolation of some water soluble pollutants (8).

The main objectives are to understand and evaluate water quality to control and minimize the incidence of pollutant oriented problems and to provide water of appropriate quality of various water users ass urban water supply, irrigation water, municipal water supply etc. In order to keep the quality of water at an optimal level, continuous periodical

**INDEX**

No.	Title of the Paper	Authors' Name	Page No.
1	शिवाजी—इस्लाम संबंध	प्रा. मंगेश वाहाणे	1
2	गोपीनाथराव मुंढे यांचे सामाजिक कार्य	प्रा.झरेकर रमेश सोनू	5
3	साने गुरूजींचे अनुवादित साहित्य	डॉ. जयश्री शास्त्री	9
4	भटक्या विमुक्तांच्या साहित्याची भाषा : विशेष संदर्भ 'पालावरचं जग'	प्रा. गणेश दिगंबर सावजी	14
5	धरण प्रभावित क्षेत्रातील विस्थापित कुटूंबाच्या समस्या संजय नामदेवराव तोरवणे / प्राचार्य.डॉ.डी.एस.पाटील		18
6	स्त्री भुणहत्या कारणे व उपाययोजना	सौ. किर्ती नितीन सांगळे	22
7	मानवाधिकार आणि आदिवासी समाज	प्रा.डॉ.उल्हास एन राठोड	25
8	राजे लखुजी जाधवराव कार्य व कर्तुत्व— एक समालोचन	रविंद्र शंकरराव फटींग	30
9	इक्कीसवीं सदी के महिला उपन्यासकारों के उपन्यासोंमें चित्रित नारी	डॉ.प्रमोद परदेशी	36
10	भारतातील बौद्धिक संपदा अधिकाराचे महत्व व फायदे : एक दृष्टीक्षेप संशोधक	प्रा. सचिन ग. कर्णेवार / डॉ. प्रशांत म. पुराणिक	42
11	युवावगांतील फास्ट फुडचे वाढते आकर्षण : आरोग्याची एक भीषण समस्या	प्रा. डॉ. सोनाली राजेश बन्सोड	46
12	जागतिकीकरण आणि शिक्षण यांच्यातील तुलनात्मक अभ्यास	प्रा. डॉ. मंजुषा समर्थ	50
13	बहामनी सुलतान व नरसिंगदेव राय संघर्षातून हिंदू राज्य स्थापनेचे प्रयत्न	डॉ. गजेन्द्र बी. ढवळे	54
14	भारतीय राजनीति में भ्रष्टाचार: एक वास्तव	डॉ. आर. जी. बांबोळे	58
15	मंदोदरीबाई पाटीलयांचे जागृति वृत्तपत्रातील स्त्री सुधारणेविषयक विचार	प्रा. सचिन ज्ञानेश्वर मोरे	63
16	महाराष्ट्र आणि तेलंगणा राज्यातील अनुसूचित जमाती मधील 'आंध' समुदायाची बोलीभाषा	प्रा. गणेश बंडूजी माघाडे	66
17	कोव्हिड - १९ मधील प्लाझ्मा दान आणि लोकभ्रम	प्रा. कमलेश मानकर	74
18	राष्ट्रसंत तुकडोजी महाराजांचे आरोग्यासंबंधी विचारांची कोरोना काळामध्ये गरज	प्रा. डॉ. अनुराधा रा. मुळे	79

धरणप्रभावित क्षेत्रातील विस्थापित कुटूंबाच्या समस्या**संशोधक**

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नंदुरबार ता. जि. नंदुरबार

प्रस्तावना :

भारतातील विविध विकास प्रकल्पांमुळे तसेच धरणांच्या निर्मितीमुळे जंगले, सुपीक जमीन, नैसर्गिक पर्यावरण संतुलन यांचा नाश होऊन जीवन असुरक्षित बनले. विविध विकास प्रकल्पांना निर्माण धरणप्रभावित क्षेत्रातील पुर्नवसित कुटूंबाच्या सामाजिक, आर्थिक, सांस्कृतिक, पर्यावरणीय च्हास, जगण्याचा प्रश्न अशा अनेक समस्या पुढे येतांना दिसून येत आहे. त्याचप्रमाणे नैसर्गिक साधनसंपत्तीवर होणारा विपरीत परिणाम, चांगले जीवन जगण्याच्या मुलभूत हक्कांवर येणारे संकट, सामाजिक व पर्यावरणीय तोटा इत्यादी कारणांमुळे धरणांच्या निर्मितीला विस्थापितांचा विरोध होत असल्याचे दिसून आले. आदिवासी संस्कृतीचे मूल्य, जीवन जगण्याची पारंपारिक पध्दती, स्थावर संपत्ती नष्टहोणे यामुळे मोठ्या धरणाला विरोध होत आहे. विस्थापितांच्या मानवी हक्कांचे जसे संपत्ती, जीवन, संस्कृती व समूहाची विभागणी इत्यादी मानवी हक्कांचे पतन होत असल्यामुळेच धरणप्रभावित क्षेत्रातील कुटूंबाच्या समस्येत वाढ होत आहे. "भारतामध्ये मोठ्या धरणांची संख्या एकूण ४२९१ आहे. त्यापैकी १५२९ धरणे महाराष्ट्रातील ४५० नद्यांवर आहेत. यासर्व धरणांमुळे एकूण २.१३ करोड लोक विस्थापित झाले आहेत. त्यापैकी २५ टक्के लोकांचे पुर्नवसन पूर्ण झाले आहे. बाकीचे विस्थापित आहेत. १९५४ च्या कोयना हायड्रोलिक प्रकल्पाच्या राज्य सरकारच्या महाराष्ट्रातील सिंचन प्रकल्प प्रस्तांचे पुर्नवसनाबाबत तिरस्कारणीय कामगिरीचा सविस्तर आढावा घेतला. त्यामध्ये सचिव पातळीवरील अधिकाऱ्यांपासून शेवटपर्यंतच्या अधिकाऱ्यांच्या चूका व अनेक त्रुटी दाखविण्यात आल्या होत्या. जिवनावश्यक वस्तुंचे उत्पन्न मिळविल्यामुळे प्रकल्पप्रस्तांना ताकद मिळते या मुद्द्यावर भर देण्यात आला." धरण प्रभावित क्षेत्रातील पुर्नवसित कुटूंबाच्या विविध घटक व समस्यांचा ऊहापोह करण्यासाठी हा लेखप्रपंच.

विषयाचे महत्त्व :

विकास ही संकल्पना जागतिक स्तरावर मोठी चिंता बनून आहे. समाजासाठी मोठ्या प्रमाणात फायदे निर्माण व्हावेत यासाठी विकास हाती घेतला जातो. तसेच देशातील नैसर्गिक साधने, संसाधनाचे व्यवस्थापन व विकासाचा महत्त्वाचा घटक आहे. मागील जवळ जवळ ५० वर्षांपूर्वी सुरु झालेले धरण बांधकाम व धरणाचे पुर्नवसनामध्ये जवळपास ७० टक्के लोकांचे पुर्नवसन पूर्ण स्वरूपात झालेले नाही. प्रत्येकाची ह्या बाबतीत काहीतरी समस्या आहे. ह्या समस्यांबाबत विविध लेखकांनी केलेले लिखाण संशोधकाने जाणून घेतले आहे. देशातील व महाराष्ट्रातील विविध धरणांचा मुख्य उद्देश सिंचन व पिण्याच्या पाण्याच्या वापरासाठी ठरविण्यात आला आहे. बांधलेल्या धरणामुळे लाभक्षेत्रातील लोकांना त्यांच्या शेतीसाठी मोठ्या प्रमाणावर सिंचनाच्या सुविधा उपलब्ध झाल्याचे दिसून येते परंतु त्याचबरोबर धरणामध्ये ज्यांचे सर्वस्व गेले त्या धरणप्रस्तांना लाभ क्षेत्रात त्या धरणाच्या पाण्यामुळे सिंचनाचा झालेला फायदा हा अतिशय कमी प्रमाणात दिसून येत आहे. यादृष्टीने संशोधनात्मक अभ्यास करणे महत्त्वाचे वाटते.



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1	राष्ट्रसंत तुकडोजी महाराज यांच्या साहित्यातील मानवतावाद	डॉ.मनोहर आंबटकर डॉ. मिलिंद कांबळे	1-5
2	विमुक्त भटक्यांच्या चळवळीला दिशा देणारे आत्मकथन: 'कत्ती'	डॉ.मारोती कसाब	6-9
3	कुसुमाग्रजांची राष्ट्रीय कविता: एक आस्वाद	प्रा.डॉ.विनोद उत्तमराव भालेराव	10-15
4	संत साहित्यातील संतकवियित्री	प्रा. डॉ. सुनंदा चरडे	16-21
5	राष्ट्रसंतांची 'ग्रामगीता'निर्मिती मागील भूमिका	डॉ. अविनाश श. धोबे	22-25
6	एकोणिसावे शतक : स्त्री व समाज	जागृती अरुण बधान	26-29
7	'होळी' बंजारा समाजाचा सांस्कृतिक उत्सव	प्रा.डॉ.विनोद दे. राठोड	30-33
8	दलित आत्मकथनातील प्र.ई.सोनकांबळे यांचे समाजव्यवस्थेतील स्थान	प्रा.नामदेव शिनगारे	34-37
9	महारा द्रातील दत्त संप्रदायकालीन सामाजिक स्थिती.गती : एक दृष्टीक्षेप	प्रा.डॉ.राजेंद्र सुखदेव चौधरी	38-41
10	आदिवासी नायकांचे स्वातंत्र्यासाठीचे योगदान	डॉ. विठ्ठल केदारी	42-48
11	भाषा आणि साहित्य : आंतरसंहितात्मक अभ्यास	डॉ.बालाजी धारुळे	49-52
12	गुलाममंडी उपन्यास में चित्रित पात्रों की समीक्षा	डॉ.बालकवि लक्ष्मण सुरंज	53-55
13	इक्कीसवी सदी का मीडिया	प्रा. डॉ. बायजा कोटुळे	56-60
14	निराला के काव्य में राष्ट्रीय चेतना	डॉ. संतोष रामचंद्र आडे	61-64
15	"अल्मा कबूतरी" उपन्यास में अभिव्यक्त भाषाशैली एवं उद्देश्य	प्रीती अहिर डॉ.बालकवि लक्ष्मण सुरंज	65-67
16	कोरोना संकट में वैश्विक अर्थव्यवस्था और खेल उद्योग पर असर	डॉ.हेमंत वर्मा	68-74
17	आधुनिक हिंदी कहानियों में चित्रित वैवाहिक परिदृश्य	डॉ.ज्ञानेश्वर महाजन	75-77
18	सिनेमा और साहित्य	प्रा. डॉ. उत्तम जाधव	78-80
19	ओमप्रकाश वाल्मीकि की कविताओ में अभिव्यक्त आंबेडकरवादी चिंतन	प्रा.डॉ.रविंद्र आर. खरे	81-86
20	समकालीन दौर में साहित्य और सिनेमा की भूमिका	प्रोफेसर डॉ.आबासाहेब राठोड	87-91
21	महाराष्ट्रातील जलसिंचनातील असमोल : एक दृष्टिक्षेप	प्रा.रासकर भीष्मा रंगनाथ	92-98
22	भारताच्या नियोजन कालखंडातील शेतीचा विकास	डॉ. मुळे पी.एम.	99-102
23	धुळे जिल्ह्यातील धरणप्रभावित क्षेत्रांचा सामाजिक व आर्थिक अभ्यास	संजय नामदेवराव तोरवणे प्राचार्य. डॉ. डी. एस. पाटील	103-106

धुळे जिल्ह्यातील धरणप्रभावित क्षेत्रांचा सामाजिक व आर्थिक अभ्यास

संशोधक

संजय नामदेवराव तोरवणे

कर्म. आ. मा. पाटील कला, वाणिज्य आणि
कै. एन. के. पाटील सायन्स वरिष्ठ महाविद्यालय,
पिंपळनेर, ता. साक्री, जि. धुळे ४२४३०६

मार्गदर्शक

प्राचार्य. डॉ. डी. एस. पाटील
टी.ई.एस. महिला महाविद्यालय,
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प्रस्तावना :

भारतात एकूण २९ घटक राज्ये व ०७ केंद्रशासित प्रदेश आहेत. त्यातील भारताच्या पश्चिमेकडील एक प्रमुख राज्य म्हणून महाराष्ट्र राज्य ओळखले जाते. जसे अनेक जिल्हे मिळून राज्य तयार होते तसे महाराष्ट्र राज्य सुद्धा अनेक जिल्हे मिळून तयार झालेले आहे. महाराष्ट्रात आज पूर्ण झालेली मोठी १७ प्रकल्प (धरणे), मध्यम १७३ तर लहान १६२३ प्रकल्प तर अपूर्ण प्रकल्पात मोठे ६५, मध्यम १२६ तर लहान १८३ काम सुरू आहेत. महाराष्ट्रातील धुळे जिल्हा हा खानदेशातील एक प्रमुख जिल्हा म्हणून धुळे जिल्ह्याची ओळख आहे व १९९८ पूर्वी धुळे ते नंदुरबार हे दोघे जिल्हे एकत्रित होते. १ जुलै १९९८ मध्ये धुळे जिल्ह्याचे विभाजन होऊन धुळे व नंदुरबार असे दोन स्वतंत्र जिल्हे अस्तित्वात आले. धुळे जिल्हा औद्योगिकदृष्ट्या मागासलेला असून अनियमित पर्जन्यमान व सतत दुष्काळसदृश परिस्थितीमुळे धुळे जिल्हा अवर्षग्रस्त आहे. धुळे जिल्ह्याचा समावेश तापी खोज्यामध्ये होतो. जिल्ह्याचे आठ लाख बावीस हजार हेक्टर भौगोलिक क्षेत्र तापी खोज्यामध्ये समाविष्ट असून त्यापैकी ४ लाख ३७ हजार ६०० हेक्टर क्षेत्र लागवडीलायक आहे. हे प्रमाण ५३.१८ टक्के आहे. खानदेशातील सिंचन प्रकल्पांना विनासायास निधी उपलब्ध व्हावा आणि रखडलेल्या प्रकल्पांची उभारणी जलद गतीने व्हावी. विद्यमान शासन व्यवस्थेने तापी पाटबंधारे विकास महामंडळाची स्थापना केली. महामंडळाच्या स्थापनेपूर्वी जिल्ह्यात पूर्ण झालेल्या प्रकल्पामुळे १५.१ टक्के सिंचन क्षमता निर्माण झाली होती. म्हणजेच लागवडीस योग्य क्षेत्रापैकी केवळ ६५ हजार ६७५ हेक्टर क्षेत्र सिंचनाखाली होते. महामंडळाच्या स्थापनेनंतर पूर्ण झालेल्या बांध वा बांधीव प्रकल्पामुळे ४.७६ टक्के सिंचन क्षमता निर्माण झाली आहे. जून २००८ अखेर जिल्ह्यात एकूण १९. ७७ टक्के सिंचन क्षमता निर्माण झाली आहे. सध्यास्थितीत आज जिल्ह्यात अनेक उपयुक्त प्रकल्प कार्यान्वित असून त्यांची व्याप्ती सातत्याने वाढत आहे. संशोधक विद्यार्थी हे अशा धरण प्रभावित परिसरातीलच असल्यामुळे विविध गावांचा, लोकांचा तसेच त्यांची आर्थिक व सामाजिक स्थिती जाणून घेण्यासाठी संशोधनात्मक अभ्यास करण्यात आला आहे.

विषयाचे महत्त्व :

धुळे जिल्हा हा तसा अवर्षन प्रवण भाग आहे. येथे अनियमित पाऊस पडतो तसेच बारमाही नद्या नसल्याने बराचसा भाग नापिक जमिनीखाली असून जंगलव्याप्तही आहे. त्यातून स्थंलातर, बेकारी, दारिद्र्य, औद्योगिककरणाची कमतरता, शेती उत्पादनाचे अल्प प्रमाण तसेच सततच दुष्काळ अशा समस्या जिल्ह्यात दिसून येतात यावर उपाय म्हणून जिल्ह्यात विविध धरण प्रकल्प बांधले गेले आहेत. आज त्यामध्ये मोठे,

UV, FTIR and DFT studies of Pyrazolines in polar protic and polar aprotic solvent mixtures

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Abstract

UV and FTIR spectroscopic studies containing 0.01 and 0.001m some Pyrazolines with electron donating and withdrawing groups were done in 10 - 90% (w/w) methanol (ME) in DMSO/DMF solvent mixtures at room temperature. The λ_{\max} of solutes vary with the % of ME. The decrease was more in ME + DMSO than in ME + DMF. The amount of blue shift (lower wave length) has been used as a measure to the strength of hydrogen bond. Absence of $n \rightarrow \pi^*$ excitation in solute + ME + DMSO/ DMF was ascribed due to hydrogen bond formation. An irregular trends in ν_{OH} , $\nu_{\text{C=O}}$, $\nu_{\text{S=O}}$, $\nu_{\text{C-Cl}}$, $\nu_{\text{C-H}}$, ν_{NH} etc. with increase of ME in solution at a particular concentration of solute indicated structure of the medium changed with ME content. In certain compositions of 0.01 and 0.01m, no changes in vibration frequencies were detected. $\nu_{\text{OH}}/\nu_{\text{NH}}$ for Pyrazolines in both concentrations (0.01 and 0.001m) in all ME + DMF are greater than those of ME + DMSO, thereby indicating possibility of intramolecular hydrogen within Pyrazolines and intermolecular hydrogen bond among solvent molecule Hydrogen bond formation of ME with C-Cl of Pyrazolines was well supported by shifting of normal $\nu_{\text{C=O}}$ to 1650 -1640 cm^{-1} . Geometry optimizations of heterocyclic compounds, pure solvents and their 1:1 and 1:1:1 complex were carried out using the DFT/B3LYP method with medium size 6-31G(d) basis set available in G03(W) series of programs All optimized geometries were viewed through Gauss View 4.1 software to know exact nature of intermolecular interaction.

Keywords: UV, FTIR, DFT and molecular interaction

INTRODUCTION

Pyrazolines have played a crucial part in the development of theory in heterocyclic chemistry. Pyrazolines are well known important nitrogen containing five member



Page no - 1312 - 1320
7

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INDEX

S.No	Title & Authors	Page No.
1	X-Ray Crystallographic Studies of 6-Oxa-B-homo-5 α -cholestan-7-one, A Modified Steroids <i>DR.SHEEBA SHAFI</i>	801
2	Comparative Study of the Amending Value of the Two Organic Residual Products (ORPS) Derived from Distillation Activities of Clove Leaf Species case of 4-month-old leaf compost and leaf soil aged about 40 years. <i>CHRISTIAN PIERRE RATSIMBAZAFY, IGNACE RAKOTOARIVONIZAKA, RIJALALAINA RAKOTOSAONA</i>	811
3	Study of the Agronomic and Ecological Potential of Leaf Compost Derived from Residues from Distillation of Essential Oils from Leaf Cloves Case of Leaf Compost Aged Between 20 and 40 Years Collected at the Ambodimanga II Distillation Site, Rural Municipality of Maromitety, Vavatenina District, Analanjirifo Region (Madagascar) <i>CHRISTIAN PIERRE RATSIMBAZAFY, IGNACE RAKOTOARIVONIZAKA RIJALALAINA RAKOTOSAONA</i>	819
4	Considerations Regarding to Supercharging Air Control on an Electronically Controlled Diesel Engine <i>CUCU LEONARD-JULIAN, COPAE ION</i>	826
5	Research of Quality Indicators and Raw Materials of Carpet Products <i>KHAYDAROV SANAT SUNNATOVICH, ISLAMBEKOVA NIGORA MURTOZAYVNA</i>	848
6	Removal of Phenol from Synthetic Wastewater Using Modified Bagasse Activated Carbon <i>MAHANTESH PARUTI, SUNIL UMACHAGI, G M HIREMATH</i>	851
7	An Interface for Farmers to Enhance their Knowledge towards Modern Tool Usage for Effective Farming <i>NAYANA B. P, SATYANARAYANA M. S, RAGHAVENDRA S. N</i>	858
8	Improving the IQ Level of Intelligent Systems by using Data Analytics and Patterns <i>ARUNA T. M, M. S SATYANARAYANA</i>	865
9	Building Smart Education in Pandemics <i>LAKSHMI NARAYANAN, JIMCYMOL JAMES</i>	870
10	Automatic Facial Emotion Recognition and Turing on the Relative Music <i>PANKAJA R, CHETHAN C, MARIA NAVIN J R, CHANDINI D</i>	876
11	A Smart Automated Meeting Room Solution Management System <i>SHAYAN PAUL, SHOBA M C, SURESHA TALANKI, MANISH BALI, POORNIMA N</i>	883
12	Enhancement of Multilingual Search Indexing using Web Page Ranking System <i>MANJU MORE E, G SUNILKUMAR, MANJUNATHSWAMY B E, THRIVENI J, VENUGOPAL K R</i>	891
13	Comparative Study on Seismic Analysis of R.C.C., Steel and Composite Frame Structures Using ETABS and SAP2000 <i>BAIAHUNLANGKIHAI SUJA, MEGHA GUPTA</i>	902
14	Ground Water (Well Water) Quality Studies with Special Reference to Physico-Chemical Characteristics of Water-Pimpalner Region, Tahasil- Sakri, Dist- Dhule (M.S.) <i>W. B. SHIRSATH</i>	1312



Ground Water (Well Water) Quality Studies with Special Reference to Physico-Chemical Characteristics of Water-Pimpalner Region, Tahasil- Sakri, Dist- Dhule (M.S.)

W. B. Shirsath

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ABSTRACT: The increased human activity changes the land occupancy and land use, intolerable burden on the natural resources leading to the ground water system. Therefore keeping in mind these problems associated with rural area due to human activities and their effects the present investigation were undertaken on the well water quality in a region of Pimpalner.

The drinking water quality was investigated in rural area to ensure the safe drinking water for the public health protection. In this regard, a detailed physical and chemical analysis of drinking water samples was carried out in different residential village areas nearest to Pimpalner. The drinking water samples were taken from the ground water (well water) sources where maximum peoples were using them for drinking purpose. The Physico-chemical parameters considered for drinking water like pH, turbidity, electrical conductivity, total dissolved solids, total hardness, chlorides etc. were analyzed for-monsoon and post-monsoon well water samples collected from different areas and obtained values of each parameter were compared with the standard values set by the World Health Organization (WHO) and local standards such as National Drinking Water Quality Standard (NDWQS). The values of each parameter were found to be within the safe limits set by the WHO. Overall, the water from all the locations was found to be safe as drinking water.

KEYWORDS: Drinking well water, water quality standard, Physico-chemical Parameter, monsoon Post monsoon.

I. INTRODUCTION

Water is one of the most important of all natural resources for all kinds of life on this planet. The main source of water on earth is rainfall. Portions which penetrate into the earth are called the ground water and that can be collected by digging well. It is essential and important to all living organisms, most ecological systems, food production and economic development and plays a significant role in maintaining the human health and welfare. [1] However it adversely affected both qualitatively and quantitatively by all kinds of human activities on land, in air or in water. Contaminants in the water can affect the water quality and consequently the human health. The potential sources of water contamination are geological conditions, industrial and agricultural activities, and water treatment plants. These contaminants are further categorized as microorganisms, inorganic, organics, radionuclides, and disinfectants [2]. The safety of drinking water is affected by various contaminants which included chemical and microbiological. Such contaminants in the water can affect the water quality and consequently the human health problems. Due to these contaminants quality of the drinking water becomes poor. Sometimes such poor quality water causes many diseases in the humans so that quality of the water must be tested for both the chemical as well as for the microbial contaminants. During the study it was found that maximum number of physical and chemical parameter were within the desirable limit, as suggested by [3].

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No. 1A

Effect of Pesticides on two spotted spider mite, <i>Tetranychus urticae</i> Koch. Sanjeet Kumar Singh, Ajit Pratap Singh and R N Singh	01
Economic analysis of growth and instability of Rice production in Telangana State I. Shakuntala Devi, G.P. Sunandini, B. Sowjanya and P. Shiva Kumar	03
Mineral composition of <i>Avicennia</i> and <i>Sonneratia</i> species from Coastal Maharashtra, and its interpretation through Box plot- Statistical Tool Ajit B. Telave, Avinash S. Jagtap and Sourabh R. Chandankar	08
<i>Dienia ophrydis</i> (J. König) Seidenf. (Orchidaceae) New record to the Flora of Maharashtra State, India. Jagannath V. Gadpayale, Smita Raskar and Subhash R. Somkuwar	13
Phytochemical analysis of <i>Solanum xanthocarpum</i> Schrad. and Wendl. using HR-LCMS Technique. Prajakta S. Patil and Anil S. Bhuktar	15
RABIN-KARP algorithm based microsatellite searching in whole-genome Pallavi Singh and Ravindra Nath	25
Effect of algal biomass on seed germination and seedling growth in <i>Cucumis sativus</i> L. A. A. Aher and A. S. Wabale	32
Toxicity of Neem (<i>Azadirachta indica</i> A. Juss) leaf extracts on freshwater snail, <i>Bellamya bengalensis</i> (Lamarck, 1882). Kishore Dhara and Himadri Guhathakurta	35
Variability, Correlation and Path Analysis in forage Sorghum [<i>Sorghum bicolor</i> (L.) Moench] N. M. Kolekar, S. L. Korekar and G. W. Narkhede	40
Effect of physical factors on the Bio-control potential of <i>Trichoderma pseudokoningii</i> against <i>Rhizoctonia bataticola</i> causing root rot of Deccan Hemp Bharati G. Sathe and Shivaji S. Kamble	47
Detection of Diabetic Retinopathy using Transfer learning approach Nidhi Kamothi and Rashmi Thakur	51
Isolation and Biochemical characterization of <i>Xanthomonas Axonopodis</i> pv. <i>Punicae</i> causing Bacterial Blight of Pomegranate P. B Pawar, S. M. Inchure and D. V. Vedpathak	55
Butterfly Fauna of Golaghat District, Assam, India Chayanika Chetia and Sajmir Azad	57

Antifungal activity and characterization of Ethanolic extracts of <i>Ricinus communis</i> (Castor)	
Pawan Deshmukh and Umesh P. Mogle	
Influence of <i>Celosia argentea</i> L. weed manure on the yield of Spinach	64
Pratap Vyankatrao Naikwade	
Nodal Vasculature in some Bignoniaceae.	69
Dilip Aswale and Sangeeta Sutar*	
Powdery Mildew Disease on some plants from Jalna District, Maharashtra State, India	73
Navalsingh J. Todawat	
Zooplankton Diversity of Palashi Reservoir in Ahmednagar District, Maharashtra	78
Lalita Kunjir and S. A. Kawade	
Nutraceutical and Medicinal Bio-Resources used by Tea-Tribe of Jorhat District of Assam	81
Babita Phukan Borkotoky, Pavitra Chutia and Satya Ranjan Sarmah	
Screening, Isolation and Identification of Distillery spent wash decolourizing Bacteria from soil	90
A.B. Shinde and D.B. Nakade	
Effect of Organic Manures and Earthworm on soil nutrient content	95
W. B. Shirsath	
Biological control of Charcoal Rot of Jowar with the use of <i>Trichoderma</i> species	96
M.T. Gavali, S.A. Bansode and U. N. Bhale	
Cultural, Morphological, Biochemical and Genomic identification of <i>Enterococcus canis</i> N12 isolated from fresh water fish <i>Cyprinus carpio</i>	100
N. D. Totewad and G. Gyananath	
Qualitative analysis and Antimicrobial Activities of Cow urine against human Pathogens.	103
Pradeep Devidas Devkate, Mahesh Panditrao Jadhav and Mamata K, Malviya	
Host Parasite Interaction and protein profile of <i>Dendrophthoe falcata</i> (L.F) Ettingsh var. <i>Pubescens</i> (Hook. F) Associated with different hosts	105
Laxmishree S. Chengala and Geetha S. Menon	
Degradation of Edible Fats and Oils by Lipolytic Consortium for bioremediation of restaurant waste water	111
V.P. Sutar and J.V. Kurhekar	

EFFECT OF ORGANIC MANURES AND EARTHWORM ON SOIL NUTRIENT CONTENT

W. B. Shirsath

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Key Words: Soil, cow dung, agriculture waste, earthworm, and biocatalyst, biomass, and macronutrient.

Present investigation was undertaken to explore the effect of earthworms and biocatalyst on macronutrient content of soil and reproduction of earthworm. For this purpose earthworms (*Eudrilus eugeniae*) were obtained from Government Agriculture Nursery, Sakri, Dist. Dhule (M.S.), natural soil and agricultural waste were collected from agricultural field, while one month old cow dung (CD) was obtained from cow shed. Biocatalyst in the form of plant growth-promoting microorganisms (PGPM) was brought from Shejain laboratory, Satana. All these materials were cut, crushed and sieved.

The experiment was performed in small (5 liter capacity) plastic trays. Natural soil was treated as control. The composition of treatment wise soil-fertilizer mixtures are given in Table 1. The mixtures were left aside for

three days.

Fully grown Clitellar worms were released in the mixtures, as per the treatment details, and these composting beds were incubated for 45 days at room temperature. At the end of the experimental period of 45 days, the compost samples were dried under shade. The adults and juveniles of the earthworms from composting bed were collected by using brush and hand sorting method and washed with distilled water, dried on filter paper and the weight was recorded.

Dried samples of all composting groups were processed for the analysis of macronutrients. Nitrogen (N) was estimated by Kjeldal method (Jackson, 1973), Phosphorous (P) and Potassium (K) were analyzed following Anderson and Ingram, (1993) and Simard (1993) respectively.

Table 1: Composting groups

Group	Content
Control A	100 % Natural soil.
B	70 % soil + 20 % CD + 10 % agricultural waste.
C	70 % soil + 20 % CD + 10 % agricultural waste + earthworms.
D	70 % soil + 20 % CD powder + 10 % agricultural waste + earthworms + 10 gm biocatalyst.

Result and Discussion:

Maximum number of adult and juveniles of earthworms, earthworm biomass as well as N, P, K contents were recorded due to the treatment D. The results are in agreement with those reported by More and Patole (2014). Combination of soil, cow dung, agricultural waste, earthworm and biocatalyst is excellent for composting and to improve micronutrient content of the soil.

Acknowledgments:

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Dr. S.T. Sonawane, for providing laboratory facilities. The author also thanks Prof. B.C. More of Zoology for providing earthworm species and for extended valuable guidance. Thanks are also due to Shejain laboratory, Satana, Dist- Nashik (M.S.) for providing biocatalyst containing PGPM's (microbes).

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More B.C. and Patole, S.S. (2014) *Nat. Jr. of life sci.*, **11(2)** 169.

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Study of Different Types of Salts (NaCl) and their Domestic Uses and Side Effects: A Case Study

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ABSTRACT :- Salt is a crystalline mineral made of two elements, Sodium (Na) and Chlorine (Cl). Sodium and chlorine are essential for our body as they help our brain and nerve sends electrical impulses. Salt has various purposes, the most common is to flavour food. Salt is also used as a food preservative and it is essential for human life, but too much salt can raise blood pressure but eating less salt can improve health.

KEYWORDS :- Salt, NaCl, Sea water, Blood pressure, rock salt, halite

I. INTRODUCTION

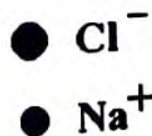
What is salt?

Salt is one of the world's most important cooking ingredients, without it many meals would taste bland and unappealing. Salt is a mineral composed of sodium chloride (NaCl), a chemical compound. Salt is in its natural form as a crystalline mineral known as rock salt or halite. Salt is present in vast quantities in seawater, where it is the main mineral constituent. The open ocean has about 35 grams (1.2 oz) solids per liter of seawater, a salinity of 3.5%. Nutrition facts in salt are zero calories.

How does the structure of NaCl look like?

Salt contains one Sodium (Na) atom and one chlorine (Cl) atom having electronic configuration as Na(11) — $1S^2, 2S^2, 2P^6, 3S^1$ and Cl (17) — $1S^2, 2S^2, 2P^6, 3S^2, 3P^5$ showing that Na donates one electron and chlorine accepts one electron.

NaCl is a face centered cubic (FCC) unit cell which has four cations and 4 anions. The cell looks the same whether we start with anions or cations on the corners. Each ion is 6 co-ordinate and has a local octahedral geometry.



NaCl

Seasonal Variations in Protein Content of Whole body Tissues of Three Freshwater Snails from Four Reservoirs of Dhule district of M. S. (India) in Relation to heavy Metal Pollution

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ABSTRACT: Protein metabolism in the body of organism is disturbed by various toxicants like heavy metals, pesticides etc. The total protein contents in soft body tissues of three freshwater snail *Bellamya bengalensis*, *Mellanoides tuberculata* and *Lymnaea acuminata* were estimated seasonally from four reservoirs of Dhule district. The observed results were compared in relation to the heavy metal pollution. The results showed lower protein contents in whole soft body tissues of snail species *Bellamya bengalensis* collected from Dedargaon reservoir followed by Latpada and Malangaon reservoirs and higher at Jamkhedi reservoir. For *Mellanoides tuberculata* lower protein contents were found in Dedargaon reservoir than Latpada reservoir while for *Lymnaea acuminata* lower protein contents were found in Dedargaon than Malangaon reservoir. This indicated that snail species inhabiting at Dedargaon reservoir are more under environmental stress than other three reservoirs, while snail species inhabiting at Jamkhedi reservoir are under less environmental stress. Thus, the order of metal pollution at four reservoirs was Dedargaon > Latpada > Malangaon > Jamkhedi. The results also indicated that protein contents were lowest in summer and highest in monsoon and intermediate in winter season in three snail species at four studied reservoirs.

KEYWORDS: Total protein, Freshwater snails, reservoirs of Dhule district, Seasonal variation, heavy metals

I. INTRODUCTION

The cumulative levels of heavy metal concentration in the environment are of great concern. When animals are exposed to polluted aquatic environment containing metals, these metals accumulate in various tissues significantly (Fernandes *et al.*, 2008). Accumulated heavy metals induce generation of reactive oxygen species (ROS). The ROS attack unsaturated fatty acids of the cell membrane which leads to formation of lipid peroxidation (Viarengo, 1989). Increased level of lipid peroxidation is responsible for decreased in the levels of GSH and antioxidant enzymes activities that results in oxidative stress (Regoli, 2000). The oxidative stress causes oxidative damage to biomolecules like proteins, lipids, nucleic acids and carbohydrates (Araujo *et al.*, 2006; Kaoud and El-Dahshan, 2010). Heavy metals mainly react with protein and interferes the physiological activities (Gulbhire and Zambare, 2013). Heavy metals are known to induce many changes in biochemical and physiological dysfunctions of the organisms.

The information obtained through conventional metal pollution monitoring system may be insufficient, which leads to inaccurate water quality assessment. To overcome this problem, most researchers use biochemical analysis of benthic organisms as monitors of both levels and long term influence of pollutant within an ecosystem.

It is assumed that, even at low concentrations, toxicant causes biochemical responses within individual organisms, before these effects are observed at higher levels of organization (Sarkar *et al.*, 2006). The responses are specific to particular toxicant. Biochemical responses in aquatic organisms have been used in several monitoring programs to study the anthropogenic pollution (Cajaraville *et al.*, 2000).

In past, monitoring programs were often carried out to investigate water quality. These include chemical and biological parameters. The use of biochemical markers was less frequent. But recently, more attention has been given to propose these biomarkers of exposure and effect, in toxicity testing among an application in pollution monitoring (Coulet *et al.*, 2005). Changes in biological structures and functions in response to heavy metal pollution helps to assess the health of aquatic animals as early warning signals (EWS) of various environmental risks (Venier and Zampieron, 2005).

Recently, the studies on the physiological and biochemical responses of the molluscs to environmental agents have been expanded significantly. Changes in biochemical components such as proteins, ascorbic acid, DNA and RNA



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26 & 27 March, 2021

Department of Zoology R.S.S.P. Mandal's Nanasaheb Y. N. Chavan Arts, Science and Commerce College Chalisgaon,
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**Studies On Effect Of Yoga Practices On Obesity and
Lipid Profile Of Rural People**

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Abstract:

Background: As an Americans in Indians obesity is the burning issue as health problems particularly in urban areas. About 30-70 % of urban people is either overweight or obese or has abdominal obesity. If BMI of the person is between 25 and 29.9 you are considered overweight and if BMI is 30 or over you are considered as obese. Generally body fat is accumulated on abdomen, thighs, buttocks and breasts may generate metabolic syndrome, diabetes, hypertension, arthritis and CVD.

Objectives: The main aim of this study was to observe the effect of yogic practices like yogic jogging, suryanamaskar, asanas and pranayama help to reduce BMI- obesity and correct the lipid profile with considerable health benefits.

Method: In this study 50 subjects between age of 20-60 years, of both sexes having overweight and obese were selected by Yoga Committee and Department of Zoology, Pimpalner. These were divided in to two group viz. yoga group and non-yoga group, 25 in each group.

Time Line- The yogic intervention consisted of 80-90 minutes daily, 3 months at Maratha Mangal Karyalaya, Pimpalner, Dhule (MH). BMI and lipid profile were observed prior to initiation yoga training and after 3 month of yoga training.

Result: It was found that there was significantly fall in BMI, total cholesterol (TC), low density lipoprotein (LDL), Very low density lipoprotein (VLDL), triglycerides (TG) and significant rise in high density lipoprotein (HDL) in both men and women.

Conclusion: Our finding indicates that yoga practices along with diet restriction is more beneficial in recovery of obesity/ BMI and lipid profile.

Keywords: Lipid profile, Obesity, Rural people, Asanas, Pranayama, Yoga Practices.

1. INTRODUCTION:

Presentday is age of competition and speed has increased the stresses and strains. It is resulting change in life style and health problems such as obesity, diabetes, hypertension and cardiovascular diseases.

Obesity is the burning issue as an important health problem particularly in urban areas. About 30-70 % of adult urban is either overweight or obese or has abdominal obesity. If the BMI is between 25 and 29.9 you are considered overweight and if BMI is 30 or over are considered obese. Generally body fat is accumulated on abdomen, thighs, buttocks and breasts it may generate metabolic syndrome, diabetes, hypertension, arthritis and CVD (Shukla Ravi, et al., 2016). Yoga is the best solution to solve the above problems by free of cost, without any side effects (Bhaskar and Srinivasan 2015). A recent survey has suggested that 15 million Americans have practiced yoga at least one in all life. Yoga is a way of life and an ancient discipline designed to bring parlance and health to the physical, mental, emotional and spiritual dimension of individual which corroborates well with the WHO definition of health. Yoga comprises eight aspects as *Yam, Niyama, Asana, Pranayama, Pratyhara, Dharma, Dyane and Samadhi* (Daljeet Singh, et al., 2014 and Meher Arati, et al., 2015). Hence yoga and pranayama has been incorporated in to modern medicine during recent decades. Yoga is the best life style modification which aims to attain the unity of body mind and spirit through the yoga practices and meditation (Ankad, et al., 2011).

The some studies stating that there have been improvements as a result of long term exercises (Archana Mandape, et al., 2015, Daljeet Singh & Monika Verma, 2014, Bhaskar and Srinivasan 2015, Maini S, et al., 2014, Seema Patel & Kamakhya Kumar, 2016, Abhishek Chaturvedi, et al., 2015).

Among the various approaches to prevent and manage the obesity and lipid profile level yoga as a physical and mental activity conveys multiple well established health benefits (Shete Sanjay Uddav, et al., 2012). The previous



Growth and Characterization of Cobalt Oxalate Crystal by Ager-Ager Gel Method

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Abstract

We have grown the cobalt oxalate crystals by adopting single diffusion technique via agar-agar gel. The tendency of cobalt oxalate crystals to form splices, twins, spherulites and dendrites was demonstrated. The growth dynamic of cobalt oxalate was studied by controlling the parameters like, concentration of gel, concentration of reactants, aging period and reversing of reactants. Physical properties of the grown crystals were analyzed by XRD, and FTIR techniques and the results are discussed.

KEYWORDS: Gel, Crystal, Gel Growth, Crystal Growth, XRD, and FTIR

Introduction

Crystals grown by the gel method has gained interest in the research community because it is cheap and easy to grow single crystals of alkaline-earth metal oxalates[1] and transition metal oxalates [2]. These materials have interesting properties like low solubility in water [3], decomposition before freezing point [4], interesting optoelectronic properties. Their role in analytical chemistry and subsequently in industries [5, 6] has created an opportunity for the researcher to investigate every scientific aspect of these materials. Therefore, efforts are being made to investigate and study the physical and chemical properties of these materials. Recently, there are reports on the growth of mixed-ligand complex formation using cadmium oxalate [7]. In the present study, we have presented the optimization of growth parameters to grow the cobalt oxalate single crystals using the agar gel method.

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INDEX

No.	Title of the Paper	Authors' Name	Page No.
1	महात्मा ज्योतिराव फुले : एक कृतिशील समाजवाचितक	प्रा. डॉ. ज्ञानदेव राऊत	1
2	महात्मा फुलेचे प्राथमिक शिक्षणाबद्दलचे विचार व आजची वस्तुस्थिती	डॉ. प्रज्ञा वागेश लाभतुरे	4
3	डॉ. बाबासाहेब आंबेडकर आणि पत्रकारिता: एक दृष्टिक्षेप	प्रा.डॉ.श्यामसुंदर पंढरीबाब वाघभारे	9
4	डॉ. बाबासाहेब आंबेडकरांचा उदारमतवाद	डॉ.दत्ता कुंचेलनाड	14
5	भारत में जातिव्यवस्था, वंचित वर्ग के संवैधानिक संरक्षण और विजोकरण का समाज पर प्रभाव	सुरेश प्रसाद अहिरवार	19
6	महात्मा फुले, डॉ.आंबेडकर,एक अनुबंध	प्रा.डॉ.सतीश मरवळे	24
7	परिवर्तनशील कवी महात्मा फुले	प्रा.डॉ. शंभरान नाईकनाडे	29
8	शेतकऱ्यांचा असुड' मधील म.फुले यांचे शेतीविषयक विचार	प्रा.डॉ.अशिषा विश्वा	31
9	डॉ.बाबासाहेब आंबेडकरांचा साहित्यविषयक दृष्टीकोन	प्रा.डॉ. संतोष हंकारे	36
10	डॉ.बाबासाहेब आंबेडकर आणि धम्मत्रांती	डॉ.सुधीर ब.गायकनाड	40
11	डॉ. बाबासाहेब आंबेडकर यांचे हिंदू कोड बिलाबाबत विचार	प्रा.डॉ.दिलीप जावकीराम भोंगडे	46
12	महात्मा ज्योतिबा फुले आणि त्यांचे शैक्षणिक विचार	डॉ. प्रविण भावसिंग कांबळे	51
13	महात्मा फुले आणि सत्यशोधक समाज	प्रा.डॉ.आचार्य आर.बी.	58
14	डॉ.बाबासाहेब आंबेडकरांचे सामाजिक विचार	डॉ. व्ही. बी. चांदजकर	60
15	'हिंदू कोड बिल आणि डॉ. बाबासाहेब आंबेडकर'	प्रा.डॉ. रमेश के. शेंडे	62
16	स्त्री मुक्तीचे जनक : भारतरत्न डॉ.बाबासाहेब आंबेडकर	प्रा.डॉ.सज्जराज राजाराम कहगळे	65
17	सामाजिक परिवर्तनाच्या संदर्भात डॉ.आंबेडकरांचा दृष्टीकोन	डॉ.गुरुभोक्तम भगवंता भगवडे	68
18	विश्वरत्न डॉ. बाबासाहेब आंबेडकर यांचे स्त्री-विषयक विचार	प्रा.डॉ. गिन्हे डी.पी.	74
19	महात्मा ज्योतिबा फुले आणि शेती विषयक विचार	महेश मुरलीधर भुंबे	77



महात्मा फुले, डॉ.आंबेडकर : एक अनुबंध

प्रा.डॉ.सतीश मस्के

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साक्री,जि.धुळे ४२४३०६ मो.९४२३३९७४८४

म.फुले आणि डॉ.बाबासाहेब आंबेडकर या दोघांच्या कार्यामध्ये एक अनुबंध आहे. अनुबंध म्हणजे परस्पर संबंध. एप्रिल महिन्यामध्ये म.फुले आणि डॉ.बाबासाहेब आंबेडकर यांच्या जयंतीचा कार्यक्रम येतो. डॉ.बाबासाहेब आंबेडकर महात्मा फुलेना आपल्या गुरुस्थानी मानत असत. दोघांचेही कार्य मानवतेसाठी म्हणजे मानवी कल्याणासाठी आहे. त्यांची जयंती म्हणजे अनंकांची उर्जा आणि प्रेरणा देणारी शक्ती असते. कोरोना प्रादुर्भावामुळे ती साजरा करता येणे शक्य नाही. परंतु त्यांनी केलेले कार्य, दिलेले विचार हे आजच्या परिस्थितीही फार उपयुक्त आहेत. आजही आम्ही जाती,धर्माच्या नावाखाली माणसांना तुच्छ लेखतो, अंधश्रद्धा, रूढी,परंपरा,कर्मकांड करतो, मात्र ते सारे कोरोनाने उजेडात आणल्याने वैज्ञानिक दृष्टीकोन किती महत्वाचा आहे, शिक्षण, शाळा, संशोधन किती महत्वाचे आहे हे फुले,शाहू, आंबेडकरांनी अगोदरच सांगितले होते. दोघांतील कार्याचा अनुबंध काही मुद्द्यांच्या आधारे स्पष्ट करता येईल.

शैक्षणिक घोरण

महात्मा फुले यांनी मानवाची मती,नीती,गती नष्ट होण्याचे कारण अविद्या हे सांगितले आहे. अविद्येने फार नुकसान होते. त्याचबरोबर मनुष्यातील पशुत्व जर हटवायचे असेल तर शिक्षण महत्वाचा मार्ग आहे. म्हणून म.ज्योतिबा फुले, सावित्रीबाई फुले यांनी शिक्षणाच्या कार्याला त्यांच्या प्रसाराला झोकून दिले होते. महात्मा ज्योतिबा फुले यांचे शिक्षण विषयक विचार सांगताना ते म्हणतात की, "यास्तव सरकारने शूद्रांना शैक्षणिक सवलती देऊन त्यांचे अज्ञान आणि पूर्वग्रह दूर करावे अशी सरकारला ज्योतिरावांनी विनंती केली. सरकारने कनिष्ठ वर्गातील लोकांच्या शिक्षणाची सोय करावी. असे करणे सरकारचे कर्तव्य आहे. कारण रयतेच्या घामाचा आणि कष्टाचा सरकारला महसूल मिळतो. सरकारी महसूल यापैकी मोठा भाग वरिष्ठ वर्गातील लोकांच्या शिक्षणावर खर्च करणे हे न्याय इष्ट नाही. कारण वरिष्ठ वर्गातील लोक आपल्या शिक्षणाची व्यवस्था स्वतः करू शकतील. शिक्षण खाली झिरपत जाईल हे करण्याची त्यांच्यामध्ये शिक्षणाचा प्रसार करणे हाच खरा मार्ग होईल असे ज्योतिराव पुन्हा पुन्हा आक्रोश करून सांगत होते." अगदी त्याचप्रमाणे डॉ. बाबासाहेब आंबेडकर म्हणतात. शिक्षण हे वाघिणीचे दूध आहे ते जो प्राशन करील तो गुरगुरत्याशिवाय राहणार नाही असेही ते म्हणत होते. म्हणत होते. म्हणून माणसाने शिक्षण घेणे गरजेचे आहे. शिक्षणाच्या अभावी माणूस गुलाम होतो असे डॉ.बाबासाहेब आंबेडकर म्हणत. आजही हे विचार शिक्षणाकडे दुर्लक्ष करणाऱ्या शासनाला जागे करणारे आहेत.

आदर्श संस्थाचालक

म.फुले आणि डॉ.बाबासाहेब आंबेडकर एक आदर्श संस्था चालक होते. संपूर्ण देशात मुलींची पहिली शाळा काढणारे म.ज्योतिबा फुले हे होते. स्वतः शाळा काढून समाजासमोर आदर्श निर्माण केला होता. काही शिक्षण संस्थ सुरू केल्या होत्या. त्याचप्रमाणे डॉ.बाबासाहेब आंबेडकर यांनी ८ जून १९४५ साली पीपल्स एज्युकेशन सोसायटीची स्थापना केली. मुंबई येथे सिध्दार्थ महाविद्यालय औरंगाबाद येथे मिलिंद महाविद्यालय महाड येथे डॉ.बाबासाहेब आंबेडकर महाविद्यालयाची स्थापना करून माणसाच्या जीवनामध्ये उन्नती होण्यासाठी शिक्षणाची गंगा



Physical and Optical Study of Cobalt Oxalate Single Crystals Grown by Agar-Agar Gel Method

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Abstract: The cobalt oxalate single crystals were grown in agar-agar using gel method. In the present investigation, the cobalt oxalate single crystals were grown by single diffusion technique, such grown crystals were found in different size and colour. The physical and optical properties of cobalt oxalate crystals were characterized by different techniques such as SEM and UV-Vis spectroscopy and results are discussed.

Index Terms: Cobalt oxalate, Crystal growth, Optical properties, SEM and Single diffusion.

I. INTRODUCTION

Single crystal growth is the rapid growing field in research because of increase in demand of single crystals for many applications there are various types of crystals which can be grown by gel method. It is simple and inexpensive technique. We have turned our attention towards the oxalates are having good application can be synthesized by gel method. Many research has grown the series of pure and mixed crystals to find out the new materials for various purpose (Bacchhav S. K. et al.,2014; Jhon M.V., et al.,2001; Gao P.,2008). There are various techniques for growing crystals like melt growth, Vapour growth, solution growth and etc. the gel technique attracted more attention towards it because of its simplicity and cost effectiveness. The crystals can be grown at ambient temperature.

Cobalt oxalate is quite interesting compound as they are having good application. The cobalt oxalate crystals have been grown by the single diffusion and double diffusion technique using silica gel and also studied as precursor of Co_3O_4 nano particles (Yuniar P.,2012). In the present work of investigation, the cobalt oxalate single crystals were synthesized using single diffusion technique at room temperature and their characterization by EDAX, Powder XR, FT-IR and TGA-DTA. The work has been already published

by the author (Pawar H.et al.,2021; Pawar H.et al.,2021).The crystals were analyzed by various characterization techniques. The physical and optical properties were studied by Scanning electron microscope (SEM) and UV-Vis Spectroscopy.

II. EXPERIMENTAL

A. Crystal Growth

The growth of cobalt oxalate crystals has been carried out by single diffusion technique using gel method. The glass test tube of 25 mm diameter and 250mm length were used as crystal growth apparatus. 1% of agar gel was prepared by adding 1gm of agar powder into hot water. The solution of cobalt chloride (first reactant) and oxalic acid (second reactant) of 0.5, 1.0, 1.5 and 2.0M concentration were prepared and store in clean glassware. Cobalt chloride solution and oxalic acid solution were used as first reactant and second reactant respectively. The solution of first reactant (oxalic acid) was taken in a test tube and 2% of hot agar gel was poured along the wall. Then test tubes were kept undisturbed for setting and aging gel, after setting and aging, 1M of second reactant (cobalt chloride) solution was gently poured over set gel. The open end of test tubes was closed with cotton plug to prevent evaporation and contamination of the exposed surface by dust particles and impurities of atmosphere and were kept undisturbed. After 28 to 42 days the good quality and different morphological crystals were grown and harvest them. The figures 1 (a) with working reaction during crystal growth in test tube and (b) shows that some good quality harvested cobalt oxalate crystals.

The reaction between cobalt chloride and oxalic acid in agar – agar gel medium resulted in the growth of cobalt oxalate crystals. As grown crystals were characterized for structural, morphological, physical and optical properties. Growth of cobalt

“The comparative study of removal of heavy metals Cr(VI), Sr(II) and Zn(II) from aqueous solutions by using Indian Natural Zeolite.”

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ABSTRACT

For this study industrial waste water samples from MIDC, Taluja near Navi Mumbai in Maharashtra were collected. At this point the soil is getting polluted by the disposal of different industrial waste water. The analysis of the present zeolite has carried using ICP-AES (Inductive Coupled Plasma – Atomic Emission Spectroscopy). The natural zeolite is then used to prepare adsorbed derivatives with Cr(VI), Sr(II) and Zn(II) metal ions. This work describes a green chemistry approach by the removal of heavy metals like Cr(VI), Sr(II) and Zn(II) and there comparative study by using the structural changes by IR spectroscopy.

In this study Scan Electron Microscopy (SEM) analysis for morphological structure and XRD technique is used to determine the unit cell structure of natural zeolite. Also thermal studies of natural zeolite is carried out using TGA (Thermal Gravimetric Analysis). For the same samples FESEM (Field Emission Scanning Electron Microscope) and EDAX analysis is also carried out.

KEYWORDS :- Natural zeolite, X-ray Diffraction, IR, TGA, SEM, FESEM, EDAX

INTRODUCTION

Natural zeolites are micro porous crystalline solids with well defined structures. Generally they contain Silicon, aluminium and oxygen in their pores. Many occurs naturally as minerals, others are synthetic and are made commercially for specific uses. Because of their unique porous properties, zeolites are used in a various of applications with a global market of several million is in petrochemical cracking, ion-exchange (water softening and purification) and in the separation and removal of gases and solvents. Multifunctional zeolites have attracted world wide attention, zeolites are aluminosilicate crystals with a three dimensional framework of SiO_4 and AlO_4 and are used as ion-exchange materials, shape selective catalyst, petrochemical catalysis and adsorbents (1-3). Many of the Natural Zeolites now serve as petroleum refining, petrochemical and chemical process industries as a selective adsorbent, ion-exchanger catalyst (4-5). These are also used for cleaning up of municipal, industrial and nuclear wastewater (6-7). The most fundamental consideration regarding the adsorption of chemical species by zeolites is molecular sieving. Zeolite pores are effectively sieved. This sieve effect can be utilised to produce sharp separations of molecules by size and shape (8).

The three dimensional crystalline framework of natural zeolite is formed by corner-sharing SiO_4 tetrahedral with the possibility to replace a few SiO_4 units by AlO_4 units and an equivalent amount of cations associated with the Natural Zeolite framework have played an important role in the field of catalysis. Natural zeolites are used widely for the adsorption of harmful gases (9). The catalytic importance of natural zeolite has prompted several investigations of its physical and chemical nature (10-11). Because cations are free to migrate in and out of zeolite structures, zeolites are often used to exchange their cations for those of surrounding fluids. The preference of a given zeolite among available cations can be due to ion sieving and aqueous phase for the cations that are present.

The dimension of the channels of natural zeolite and ability to adsorb gases adds a new approach to automobile emission control. Sr(II), Cr(VI) and Zn(II) ions natural zeolite have been found their application in preventing environmental pollution (12).

Most of the industries have discharged their effluents which are being added to aquatic system. The moieties present in industrial effluents accumulates in different region as soil, ground water and various parts of animals or plants (13). In the industrial area most of the industries are being discharged the effluent into the open places, rivers and sea. Most of the industrial waste water is containing organic and inorganic matter and hazardous metals (14). These heavy metals and organic compounds affect the quality of soil and ground water. Heavy metal enters in the human body by different pathways and causes harmful effects. The organics and heavy metals like Cu, Zn, Sr, Cd, Pb, Fe, Ni, Cr, Mn, Co etc. and some water soluble pollutants percolate into the ground water. The removal of these heavy metals from waste can be performed using physico chemical methods. Zeolites play an important role for the ion exchange property for the removal heavy metals (15).

The present work is carried out to find the stability and suitability of the natural zeolite for catalysis and pollution abatement. In addition the zeolite were also characterised by FESEM and EDAX by BET technique atomic force microscopy (16).



UV, FTIR and DFT Studies of Chlorochromones in Polar Protic and Polar Aprotic Solvent Mixtures

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Abstract: UV and FTIR spectroscopic studies containing 0.01 and 0.001m solute Chlorochromones with electron donating and withdrawing groups) were done in 10 - 90% (w/w) methanol (ME) in DMSO/DMF solvent mixtures at room temperature. The λ_{max} of solutes vary with the % of ME. The decrease in λ_{max} of all solutes was more in ME + DMSO than in ME + DMF. The amount of blue shift (lower wave length) has been used as a measure to the strength of hydrogen bond. Absence of $n \rightarrow \pi^*$ excitation in solute + ME + DMSO/ DMF was ascribed due to hydrogen bond formation. An irregular trends in ν_{OH} , $\nu_{C=O}$, $\nu_{S=O}$, ν_{C-Cl} , ν_{C-H} , ν_{NH} etc. with increase of ME in solution at a particular concentration of solute indicated structure of the medium changed with ME content. In certain compositions of 0.01 and 0.01m, no changes in vibration frequencies were detected. Hydrogen bond formation of ME with carbonyl of, CL₁ and CL₂ was well supported by shifting of normal $\nu_{C=O}$ to 1650 -1640 cm^{-1} . In the case of 0.01m CL₁, there was an initial increase in $\nu_{OH} \approx 50\%$ ME. Further addition of ME in the system dropped it. Dilute solute concentration (i.e. 0.001m) did not show much appreciable change for this frequency upto 40%ME, while further addition of ME decreased the same. The magnitude of $\nu_{S=O}$ remain unchanged after 10% ME for both 0.001 and 0.01m solute concentrations. The ν_{C-Cl} was around 700 cm^{-1} in 20 - 80%ME. These results demonstrate the presence of strong interactions among the molecules of the solvent as well as between solute and solvent. Geometry optimizations of heterocyclic compounds, pure solvents and their 1:1 and 1:1:1 complex were carried out using the DFT/B3LYP method with medium size 6-31G (d) basis set available in G03(W) series of programs. All optimized geometries were viewed through Gauss View 4.1 software to know exact nature of intermolecular interaction.

Keywords: Chalcones, Chlorochromones UV, FTIR, DFT and molecular interaction.

I. INTRODUCTION

Chlorochromones has played a crucial part in the development of theory in heterocyclic chemistry. Heterocyclic compounds of chlorochromones have played an important role in medicinal chemistry serving as key templates central to the development of numerous therapeutic agents. Natural chalcones and synthetic chalcones show various biological effects as anti-inflammatory, antitumour, antibacterial, anti-tubercular, antiviral anti protozoal antidepressant insecticidal, antidiabetic.[1-5] Chlorochromones are used extensively as synthons in organic synthesis reports [6] The synthesis [7] of α , β -unsaturated carbonyl compounds is one of main structural component in various naturally occurring and biologically essential substance. Several strategies for the synthesis of these system based on formation of carbon-carbon bond have been reported and among them the direct Aldol-condensation and Claisen-Schmidt condensation still occupy prominent position. It is well known that most natural or synthetic chalcones are highly active with extensive pharmaceutical and medicinal application. Chalcones are found to be effective as antiviral cardiovascular and anti-inflammatory agents. Reaction of 2'-hydroxy-5'-acetamido chalcones with catalytic amount of iodine in DMSO affords flavones molar amount of mercuric (II) acetate in pyridine gives aurones while with phenyl hydrazine and hydrazine hydrate gives Chlorochromones in triethanolamine medium [8].

Chlorochromones constitute a medicinal important class of heterocyclic small molecules that have shown potential bioactivity in numerous screening tests. Chlorochromones systems are known to be biologically active and are important constituents of many pharmaceutical and agrochemical products on the synthesis and pharmacology of chlorochromones revealed that some of these compounds exhibited a wide local anesthetic activity. Therefore, the synthesis of these compounds was of interest largely on account of their biological activity chlorochromones are possessing diverse biological activities such as anticarcinogenic, antidiabetic, anticonvulsant, anti-inflammatory, antifungal, antiviral, and analgesic and antioxidant activities and represent a very important class of biologically active agents and the focus of a significant amount of research interest. In particular, chlorochromones derivatives have found use as antitumor, antibacterial, antifungal, antiviral, antiparasitic, antitubercular and insecticidal agents



Physiochemical Properties of Binary Mixture of Methanol + Dimethylsulfoxide (DMSO) and Methanol + Dimethylformamide (DMF)

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Abstract: Physiochemical Properties of Densities and Viscosities of Pure Liquids Methanol (ME) and its binary mixtures with DMSO and DMF have been measured as a function of composition over the entire range at room temperature and atm. Pressure the excess volume V^E excess viscosity, viscosity deviation and interaction parameter have been calculated from experimental data as a function of composition. All the excess functions are found to be either positive or -ve over the entire range of composition depending upon the molecular interaction and nature of liquid mixture. The properties are discussed in terms of the molecular interaction between the component molecules. Neat FTIR spectra were recorded on a FTIR spectrometer (Model: SIMADZU 8400S PC) by using KBr pellet in the region $400-4000\text{ cm}^{-1}$ with 4.0 cm^{-1} resolution. An UV Spectra were recorded on a UV 2400 PC in the wavelength range $200-400\text{ nm}$ using air as a reference. The DFT (B3LYP) calculations were performed using Gaussian 03W program package. Geometry of the individual and two molecules together was optimized at 6-31G (d) basis set to know the exact nature of intermolecular interactions.

Index Terms: Density, DFT, FT-IR, Molecular-interaction, Viscosity

I. INTRODUCTION

Due to the recent developments made in the theories of liquid mixtures and experimental techniques, the study of binary liquid mixtures has attracted several researchers in the field (Nikam, P. S et al., 1988). The prediction of the viscosity of liquid mixture is a goal of long standing, with both theoretical and practical importance. A truly fundamental theory would predict the viscosity along with other thermodynamic and transport properties from the knowledge of the intermolecular forces and radial distribution function alone. Such a programme had appreciable success in application to pure simple liquids such as liquefied rare gases (Aminabhvi, T, M. et al.1998).

Binary liquid mixture formation is accompanied by increase, decrease or zero viscosity change. The non-ideal behaviors of binary associated solvents may be due to intermolecular interactions, which could be successfully interpreted with the help of excess thermodynamic functions.

Mixed solvents are often used in chemistry to modify molecular environment in order to modulate process. Physical properties of solvent mixture are often studied to get information about the mutual interaction between the solvent molecules. In the present study we have studied the excess volume V^E and deviation of viscosity ($\Delta\eta$).

Viscosity is an important property of liquid mixtures required for the design of flow system that are widely used in engineering application especially in heat exchanges as well as mass transfer equipment. The influence of H-bonding on solution properties is great interest to researchers.

In this study interaction of Methanol (ME) with DMSO and DMF has been investigated ME exist in associated form whereas DMSO exists in associated form whereas DMSO, DMF have associated / non-associated in the liquid state. When these liquids are mixed with each other mixing properties with varying intermolecular interaction may be generated.

To investigate this effect in the present investigation the density (δ) and η viscosity of binary mixtures of Methanol (ME) with DMSO and DMF have been studied over the entire range of composition at room temp.

DMSO was chosen because of wide range of applicability as a solvent in chemical and biological process involving in both plants and animals. It is highly polar aprotic solvent because of its S=O group and has a large dipole moment and relative permittivity ($\mu=3.9\text{ D}$ & $\epsilon = 46.6$ at 298.15 K) Similarly DMF which is an aprotic polar solvent with a large dipole moment and relatively high dielectric constant. In pure state itself association through dipole-dipole interaction. DMF is biologically important



Quantitatively Physico-Chemical Analysis of Some Soil Samples of Satana (Baglan)Tahsil, District Nashik, Maharashtra (India)

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Abstract: Soil is an important abiotic factor in the nature which provide natural habitat for plants and animals. Soil can hold water and acts as an important source of nutrients to the plants. It is formed by the combine action of climates factors like water, light, temperature and birth factors like microbes, plants and animals. Nutrient's content of the soil is affected by several factors. Keeping in mind the problems associated with rural area about soil testing for suitable crops. Investigations were undertaken on the soil quality in a region of Satana Tahasil in Nashik district. The soil testing was investigated in rural area to ensure the health of soil about crop productivity. In this regard, a detailed physical and chemical analysis of some soil samples was carried out in different village areas nearest to Satana. The soil samples were collected from some fields. The Physico-chemical parameters considered for analysis of soil samples were density, WHC, pH, Electrical Conductivity (E.C), organic carbon, calcium carbonate, nitrogen, Phosphorous Potassium, Sodium. Calcium, magnesium, iron sulphur Manganese, Zinc and Copper. Results showed that in all the selected sites of Satana region most of the parameter there is no considerable variations in concentration of nutrients. It is appropriate or adequate for crop yield. Analyses of soil samples are always beneficial to know the concentration of various parameters present in the soil. The values of each parameter were found to be within the normal and safe range overall, the soil quality from all the locations was found to be healthy for better crop. This study has provided baseline information about soil by using physico-chemical properties of soil

Index Terms: Satana (Baglan), Soil, Physico-chemical analysis, nutrients, pH

I. INTRODUCTION

The term solum is Latin word meaning and earthly materials which plant grow and develop. The study of soil or solum is known as pedology. Soils serve as natural habit for both plants and animals. It provides water and reservoir of various nutrients

to the plant body. Soil is defined as the weathered super facial layer of earth crust which is capable of supporting life. It is formed by combined action of climate factors such as water, light temperature and biotic factors such as plants, animals and microbes (Mishra, Bhushan and Sharma, Laboratory manual in Chemistry by Arya book Depot Delhi.). Soil consists of some of the components say as inorganic, organic materials living organism present in the soil. In addition to water and air which depend upon natural condition and type of soil. Physically soil is mixture of minerals particles with varying sizes. According to this course particles 2 to 0.2 mm which form coarse sand, smaller particles 0.2 to 0.02 mm form sand. Finer particles 0.02 to 0.002 mm form slit very fine particles less than 0.002 mm form clay. On the basis of properties of soil, soil is divided into various types say as sandy soil clay and loamy soil calcareous laterite and peat soil (Wikipedia free encyclopedia)

The physical properties of soil largely depend on the size of particles that soil is composed the properties are porosity, soil water, soil air and capillary. Acidity and alkalinity of the soil are more importance for growth and distribution of plants various kinds of bacteria and fungi are present in soil for maintaining fertility dark colour substance that is humus is present in the soil. This is formed by decomposition of dead animals' plants and microorganism. It is more importance to plant, crops both chemically and physically. It increases soil fertility and provide nutrients for growth of plants and other microorganisms including nitrogen fixing bacteria which also increase the availability of minerals in dissolved state to the plants. It can retain high amount of water and also increases the aeration and percolation of water (Gupta P.K.et al.,2007).

Bell and Dell in 2008 have showed that deficiency of nutrients has become measure restrictions to productivity and stability of soil. In the Satana (Baglan) Tahasil main crops are wheat, Bajara,