

3.2.1 Number of papers published per teacher in the Journals notified on UGC website during the year.

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Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISBN/ISSN Number	Link to the recognition in UGC enlisted Journal/Digital Object Identifier (doi) Number
LRS Bianchi type I Cosmological Model With Quark and Strange Quark Matter in f Gravity	L. S. Ladke	Mathematics	International Research Journal of Modernization in Engineering Technology and Science	2021	2582-5208	
Molecular Interaction in aqueous solution of Doxycycline at Different Temperatures	A. B. Dhote, S. H. Shirame	Chemistry	International Journal of Science, Technology and Management	2022	2394-1537	
Ultrasonic Velocity and Jones-Dole Equation B Coefficients For Aqueous Solution of Piperacillin and Tazobactam at Different Temperatures	A. B. Dhote, G. R. Bedare, K. P. Jumde	Chemistry	International e-Conference on New Horizons and Multidisciplinary Applications in Science And Technology	2021	2395-602X	

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Ultrasonic Velocity and Jones-Dole Equation B Coefficients For Aqueous Solution of Piperacillin and Tazobactam at Different Temperatures	Dr. K. P. Jumde	Chemistry	Interanational e-Conferenc e on New Horizons and Multidisciplinary Applications in Science And Technology	2021	2395-602X	
Ultrasonic velocity and Jones-Dole Equation B Coefficients for Rabeprazole Sodium Different Temperatures	Dr. K. P. Jumde	Chemistry	GALAXY LINK volume X, Issue II Page No: 54-57	2022	2319-858	
Refractometric Studies fo 2,4,6-Triazinostubstuedthio Carbamides In Dioxane-Water Systems	Dr. K. P. Jumde	Chemistry	Interation al Journal of Scientific Research in Science and Technolog y	2022	2395-602X	
Molecular Interaction In Aqueous Solution of Ceftriaxone Sodium and Cefotaxime Sodium: An ultrasonic Study	Rajesh S. Hajare, Shashikan t R. Aswale, Sunanda S. Aswale	Chemistry	Interation al Journal of Scientific Research - in Science and Technolog y	2021	2395-602X	
Macrophytes Diversity of Mahadwadi Lake Near Chandrapur (M. S. ), India	Harney N. V.	Zoology	GALAXY LINK	2022	2319-8508	
Zooplankton biodiversity of Chalbardi lake near Bhadrawati, Chandrapur District Maharashtra, India	Harney N. V.	Zoology	Internatio nal Journal of Life Sciences	2021	2320-7817	


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Benthic Macroinvertebrate and Aquatic Insects of Chalbardi Lake, Tehsil Bhadrawati, District Chandrapur (M. S.), India	Harney N. V.	Zoology	Journal of Emerging Technologies and Innovative Research	2021	2349-5162	
Biodiversity of Rotifers in Ghotnibala lake of Bhadrawati, District Chandrapur, (M. S.) India	Harney N. V.	Zoology	Journal of Emerging Technologies and Innovative Research	2021	2349-5162	
Studies of Macro benthos in Ramsagar Lake Armori, Dist-Gadchiroli (M. S)	Harney N. V.	Zoology	International Journal of Researches in biosciences, Agriculture and Technology Journal of Life Sciences	2022	2347-517X	
Assessment of Automobile Service Stations for the Study of Wastewater Toxicity in Nagpur City, Maharashtra (India).	S. R. Sitre	Zoology	International Journal of Creative Research Thoughts (IJCRT)	2022	2320-2882	
Water Quality Assessment of Satara Tukum Lake of Pombhurna Tehsil in Chandrapur District of Maharashtra State with Respect to Physico-chemical Characteristics	S. R. Sitre	Zoology	International Journal of Researches in biosciences, Agriculture and Technology Journal of Life Sciences	2022	2347-517X	

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Seasonal variation and diversity of Chlorophycean Algae in paddy field area of Nagbhid Tehsil, Chandrapur district, Maharashtra. India	N. S. Wadhve	Botany	International Journal of Advances in Engineering and Management (UAEM)	2021	2395-5252	
Macrophytes Biodiversity Assessment of Various Lakes of Bhadrawati Tehsil, Dist - Chandrapur, Maharashtra, India	Praveen Kumar N. Nasare	Botany	Worldwide International Interdisciplinary Research Journal	2022	2454-7905	
Internet of Things An IOT and Cloud Based Real Time smart monitoring and Detection of Fire Through Bolt IOT Kit and LM35 Sensor	Mohiuddin N. Quadri	Computer Science	2nd International Conference on Modern Research in Agriculture, Biological, Medical and Environmental Sciences	2022		
Technical Review on Educational Data Mining	Mohiuddin N. Quadri	Computer Science	Aayushi International Interdisciplinary Research Journal	2022	2349-638X	
Internet of Things: A Comparative Research on Sensors to Detect Fire and Air Pollution	Mohiuddin N. Quadri	Computer Science	International Conference IRIMS and T, E&H 2022	2022		
Use of Learning Resources and Knowledge Based System in Educational Data Mining: A Survey	Mohiuddin N. Quadri	Computer Science	Galaxy Link	2022	2319-8508	

  
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**LRS BIANCHI TYPE-I COSMOLOGICAL MODEL WITH QUARK AND STRANGE QUARK MATTER IN f(R) GRAVITY**

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**ABSTRACT**

In this paper, we studied LRS Bianchi type-I Cosmological Model in the presence of quark and Strange quark matter in f(R) gravity. Energy density and pressure are evaluated for quark and strange quark matter. Some Physical parameters are also studied.

**Keywords:** - LRS Bianchi type -I, Quark and Strange quark matter, f(R) gravity.

**I. INTRODUCTION**

Modern cosmological observational data [1-6] confirms that our universe is currently, undergoing an accelerated expansion. These results when combined with observations of cosmic microwave background (CMB) and large scale structure (LSS) observations, strongly suggest that the universe is dominated by an exotic component with large negative pressure called as Dark energy. However accelerated expansion nature of the universe is still changing problem in modern cosmology. To explain such issues of current cosmic acceleration modification of Einstein Hilbert action is one of the alternatives the approach which leads to modified theories of gravitation. A few of modified theories of gravity such are f(T) theory of gravity, f(R,T) theory of gravity and f(R) theory of gravity. f (T) theory of gravity, where T is the scalar Torsion has been proposed to explain current acceleration of the universe without involving dark energy. M.Sharif et. al. [7] considered spatial homogeneous and anisotropic Bianchi type-I universe in f(T) gravity. T.P.Sotiriou[8] had been discussed large scale structure in f(T) gravity. Rathbay M [9] has shown that the accelerating expansion of the universe understood by the f(T) gravity models.

Herkoet. al. [10] proposed the modified theory which is the generalized version of f(R) theory of gravity known as f(R,T) theory of gravity, where the gravitational langrangian involves an arbitrary function of the scalar curvature R and the trace of energy momentum T. Adhav [11] studied the exact solutions of Locally Rotationally symmetric Bianchi type-I space time. D.R.K Reddy et. al. [12] studied Bianchi type-II model in f(R, T) theory. FarasatShamir et. al. [13] obtained exact solutions of Bianchi type-I and V model in f(R, T) gravity with assumption of constant deceleration parameters variation law of Hubble Parameters.

Among these theories f(R) theory of gravity is considered to be the most suitable due to its cosmological importance. f(R) actions first studied by Weyl[14] and Eddington[15]. Nojiri and Odintsov [16] have explored visible dark energy models of f(R)gravity which shown the unification of early inflation and late time acceleration. Lobo and Oliveira [17] constructed warm whole geometries in the context of f(R) theories of gravity. Sharif and Kausar [18] discussed various vacuum Bianchi typemodels in f(R) theory of gravity. Santhiet. al. [19] has studied Bianchi type-III bulk viscous string cosmological models in f(R) theory of gravity. Shamir [20] has investigated dynamics of LRS Bianchi type-I Power law f(R) cosmology. Yilmazet. al. [21] studied quark and strange quark matter inf(R) gravity for Bianchi type-I and V space-times

At an early stage when the temperature of the universe was  $T = 200\text{Mev}$ , the phase transition of the universe took place from quark gluon plasma to hadron gas, which is referred as 'quark hadron phase' There are two ways of formation of quark matter. One is the 'quark hadron phase' transition in the early universe and second is the conversion of neutron stars into strange ones at ultrahigh densities. In the bag model, it is assumed that

quarks are mass less and non interacting with quark pressure  $p_q = \frac{\rho_q}{3}$  where  $\rho_q$  is the quark energy. Quarks

## Molecular Interaction in aqueous solution of Doxycycline at Different Temperatures

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### ABSTRACT:

The ultrasonic velocity, density, viscosity have been measured for solution of antimalarial drug as doxycycline at different temperatures at 2MHz by ultrasonic interferometer. The acoustical parameters such as relaxation time, internal pressure, free volume have been computed. These acoustic parameters are useful to predict the nature and strength of molecular interaction in the binary mixture of doxycycline with water. Doxycycline at different temperatures and at different concentration.

**Key Words:** doxycycline, relaxation, internal pressure, ultrasonic

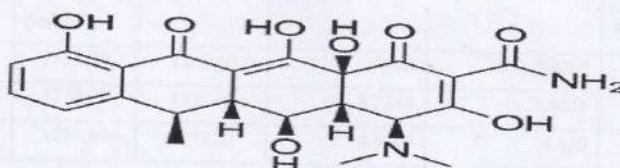
### INTRODUCTION:

In recent years, the study of acoustical properties of liquids has been useful to be helpful in understanding the molecular interactions in solution. Ultrasonic waves have obtained the test for the investigation of structure and properties of matter in the basic science. Ultrasonic examinations are utilized to evaluate the thermodynamic properties and to predict the intermolecular interaction in pure liquid. Though the molecular interactions. Now a day's Ultrasonic technology is employed in a wide range of applications in medicine, biology, industry, material science, agriculture, oceanography, sonochemistry research etc. due to its nondestructive nature<sup>1-5</sup>.

Ultrasonic is most exciting and fascinating field of scientific research among the researchers since the ultrasonic and other related thermo acoustic parameters provide useful information regarding the structure of molecules, molecular order, molecular packing, inter and intra-molecular interactions<sup>6-9</sup>.

The review of literature shows that a lot of work has been done to investigate ultrasonic measurement of pure liquid and liquid mixture at different concentrations and temperatures but less effort has been made to investigate ultrasonic studies in binary as in Doxycycline with water. Thus, in the present work, acoustical studies have been studied in water at different temperatures over a different range of Doxycycline concentrations.

The structure of Doxycycline is as





IJSRST

International e-Conference on New Horizons And Multidisciplinary Applications In Science And Technology  
In Association with International Journal of Scientific Research in Science and Technology  
Volume 9 | Issue 6 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

## Ultrasonic Velocity and Jones-Dole Equation B Coefficients for Aqueous Solution of Piperacillin and Tazobactam at Different Temperatures

A. B. Dhote, G. R. Bedare, K. P. Jumde

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### ABSTRACT

The acoustic and viscometric study of aqueous solution of Piperacillin and Tazobactam is carried out. This study was carried out at 298.15 K. The accurately measured viscosity values were used to calculate Jhon-Dole coefficient A and B. The viscometric and acoustic parameters are useful for understanding the different types of interactions of drugs in solution. The effect of solute on solvent is predicted from coefficient constant A and B.

Keywords : Acoustic, Jhon-Dole, Piperacillin, Tazobactam

### I. INTRODUCTION

To study the physical, chemical and thermodynamic properties of the polymeric solutions, liquids, liquid mixtures and electrolytic solutions Ultrasonic and viscometry study is useful<sup>1-2</sup>. Jones-Dole viscosity coefficients 'A' and 'B' are very useful in predicting the type and extent of molecular interactions present in the solution. The Jones-Dole B coefficient<sup>3</sup> is often used to classify ions as either structure-makers (kosmotropes) or structure-breakers (chaotropes) according to their supposed strengthening or weakening of the hydrogen-bond network of water<sup>4-5</sup>.

$$\eta / \eta_0 = 1 + Ac^{1/2} + Bc$$

The constant A is related to the long-range interionic<sup>6-8</sup> and the term  $Ac^{1/2}$  is predominant in very dilute solutions. The coefficient B is related to the interaction between the ions and the solvent and is interpreted as a measure of the structure forming and structure-breaking capacity of an electrolyte in solution<sup>9</sup>.

In the present study ultrasonic velocity and viscosity of aqueous solution of Piperacillin and Tazobactamin is measured at different temperatures. From the viscosity coefficient A and B molecular interaction is predicted.

### II. Experimental

The ultrasonic velocity (U) of Piperacillin and Tazobactam in aqueous solution which prepared by taking purified AR grade samples, have been measured using an ultrasonic interferometer (Mittal type, Model F-81) working at 2MHz frequency and at different. The accuracy of sound velocity was  $\pm 0.1$  ms<sup>-1</sup>. An electronically

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## Refractometric Studies of 2,4,6-Triazinostubstitutedthio- Carbamides In Dioxane-Water Systems

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### ABSTRACT

Recently in this laboratory, the refractometric study of 1-(4-hydroxy-6-methyl)- 2,4,6-triazino-3-p-tolythiocarbamide (M1), 1-(4-hydroxy-6-methyl)- 2,4,6-triazino-3-m-tolythiocarbamide (M2), 1-(4-hydroxy-6-methyl)- 2,4,6-triazino-3-o-tolythiocarbamide (M3) were carried out at various percentage compositions of solvent to investigate effects of various groups on 2,4,6-triazinothiocarbamides. The results obtained during this investigation gave detail information regarding drug pharmacokinetics and pharmacodynamic activities of these.

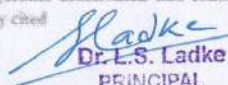
**Keywords:** 1-(4-hydroxy-6-methyl) - 2,4,6-triazino-3-p-tolythiocarbamide (M1), 1-(4-hydroxy-6-methyl)- 2,4,6-triazino-3-m-tolythiocarbamide (M2), 1-(4-hydroxy-6-methyl)- 2,4,6-triazino-3-o-tolythiocarbamide (M3), dioxane-water various percentage composition, refractometer.

### I. INTRODUCTION

When we go to literature survey it was observed that symmetrical triazine and thiocarbamide nucleus containing drugs have importance in drug chemistry. Many of them are used as muscle relaxant<sup>1</sup>, hypoglycemic agent<sup>2</sup>, blood pressure depressant<sup>3</sup>, anti-diabetic drug<sup>4</sup>. They also showed anti-tumour<sup>5,6</sup>, anti-bacterial<sup>7,8</sup>, anti-inflammation<sup>9</sup>, anti-cancer<sup>10</sup> hormone antagonists<sup>12</sup> and antipsychotic properties<sup>13</sup>. Some are used in industries such as finishing and brightening agents<sup>14</sup>. They are also been used as herbicides<sup>15,16</sup>, sea water algicides<sup>17</sup>, fungicides<sup>18</sup>, insecticides<sup>19</sup> and pesticides<sup>20</sup>. In our chemistry, concentration of unknown binary dilute solution was determined by the refractometric method<sup>21</sup>. Refractometric study of s-triazinothiocarbamides in 80% dioxane-water mixture at different temperature was carried out by Kshirsagar<sup>22</sup>. From this it can be concluded that the symmetrical triazino compounds initiated the new branches of development in the medicinal, pharmaceutical, agricultural and biochemical fields. The drug absorption,

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## Molecular Interaction In Aqueous Solution of Ceftriaxone Sodium and Cefotaxime Sodium : An Ultrasonic Study

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### ABSTRACT

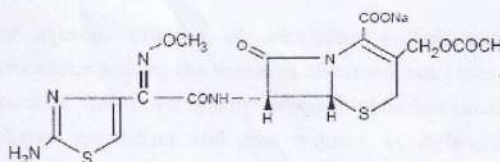
Ultrasonic velocity, viscosity and density have been measured for antibiotic Cefotaxime sodium and Ceftriaxone sodium in water at different concentrations, temperatures and frequency at 2MHz. As the acoustical parameters like relative association, specific acoustic relaxation time and free volume would be more useful to predict the molecular interaction. By using ultrasonic velocity, viscosity and density of the prepared solution of Cefotaxime sodium and Ceftriaxone sodium in water these acoustical parameter have been determined. It has been identified that the molecular interactions in aqueous solution of Cefotaxime sodium were stronger than that of in aqueous solution of Ceftriaxone sodium. And also there is a strong solute - solvent interaction occurring in aqueous solution of Cefotaxime sodium than that of aqueous solution of Ceftriaxone sodium.

**Keywords :** Viscosity, density, Ultrasonic velocity, Cefotaxime sodium, Ceftriaxone sodium

### I. INTRODUCTION

Ultrasound creates number of applications in medicine and research. After first antibiotic penicillin invention number of natural, semi synthetic and synthetic antimicrobials were discovered and applied in clinics, achieving great progress in bacterial infection therapy<sup>1</sup>. However, many decades later, Due to lack of new drug development and rapid emergence of resistant bacteria, bacterial infections have again become a serious threat<sup>2</sup>. To understand the physical and chemical properties of drug action, it is necessary to consider the bonds formed by drug molecules which are influenced by thermal agitation and chemical environment<sup>3</sup>. A

number of researchers<sup>4-15</sup> have investigated molecular interaction in aqueous solution of different antibiotics. In pharmaceuticals Cefotaxime sodium and Ceftriaxone sodium is used as an antibiotic. Cefotaxime sodium -



ISSN 2319 - 8508  
AN INTERNATIONAL MULTIDISCIPLINARY  
HALF YEARLY RESEARCH JOURNAL

# GALAXY LINK

Volume - X

Issue - II

May - October - 2022

ENGLISH / MARATHI

Peer Reviewed Refereed  
and UGC Listed Journal  
Journal No. 47023



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## **10. Macrophytes Diversity of Mahadwadi Lake Near Chandrapur (M.S.), India**

**Harney N. V.**

Department of Zoology and IHLRSS, Nilkanthrao Shinde Science & Arts College,  
Bhadrawati, Dist. Chandrapur.

### **Abstract**

Aquatic plants provide food, oxygen, shelter and breeding place for aquatic animals and maintain the integral balance of the ecosystem. Wetland is among the most productive ecosystems in the world. Several works have been done on the aquatic macrophytes and phytosociology in different freshwater bodies of India. Aquatic macrophytes play an important role in structuring communities in aquatic environments. These plants provide physical structure, increase habitat complexity and heterogeneity and affect various organisms like invertebrates, fishes and water birds. The present paper describes the diversity of macrophytes of Mahadwadi lake near Chandrapur of Maharashtra State from February 2020 to January 2021 in which 16 species belonging to 4 groups such as 6 Free floating suspended submerged, 3 Rooted floating leaves weeds, 2 Rooted submerged hydrophytes and 5 Submerged floating weeds.

**Key words-** Macrophytes, Mahadwadi Lake, Biodiversity.

### **Introduction**

Aquatic plants are plants that have adapted to living in aquatic environments (saltwater or freshwater). They are also referred to as hydrophytes or macrophytes. These plants require special adaptations for living submerged in water, or at the water's surface. The most common adaptation is aerenchyma, but floating leaves and finely dissected leaves are also common. Aquatic plants can only grow in water or in soil that is permanently saturated with water. They are therefore a common component of wetlands.

The Mahadwadi lake is located near the Chandrapur of Maharashtra State, India. It is 29 km away and situated on the north side of Chandrapur at about 636 m. above mean sea level and is at 20° 00' 57.30" N latitude and 79° 32' 52.61" E longitude. The depth of water 20 feet (monsoon) and 6 feet (summer). During the last few decades considerable studies on aquatic



## Zooplankton biodiversity of Chalbardi lake near Bhadrawati, Chandrapur District Maharashtra, India.

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### Manuscript details:

Received: 14.06.2020  
Accepted: 27.08.2021  
Published: 30.09.2021

### Cite this article as:

Bansod MA and Harney NV (2021) Zooplankton biodiversity of Chalbardi lake near Bhadrawati, Chandrapur District Maharashtra, India., *Int. J. of Life Sciences*, 9 (3): 342-345.

Available online on <http://www.ijlsci.in>  
ISSN: 2320-964X (Online)  
ISSN: 2320-7817 (Print)

### ABSTRACT

Chalbardi lake is the principal fresh water body of Bhadrawati tehsil, Chandrapur district of Maharashtra state. This lake spread over the area of 24.3 acre. Due to anthropogenic activities water quality of this lake is deteriorating with an enormous rate. The study of this lake takes for the year to assess the types of zooplankton present in this lake. The biodiversity of this lake was represented by 6 different groups of zooplankton like Protozoa, Rotifera, Cladocera, Copepoda and Ostracoda with 19 different types of species. The water of this lake is utilised for different activities like washing clothes, bathing and open defecation causing deterioration of water quality.

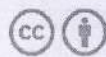
**Keywords:** Chalbardi lake, Bhaderawati, Zooplankton

### INTRODUCTION

Lakes are important resource of water for civilization to sustain life as well as to balance ecosystem. Living organisms needs good quality water for their daily activities if such water gets polluted due to pollutants may cause severe health problems as well as aquatic ecosystem also gets disturbed.

Zooplankton are microscopic organisms feeds on phytoplankton major groups of zooplankton includes Protozoa, Rotifera, Cladocera, Copepoda and Ostracoda. Study on zooplankton are made by researchers like Sharma (1980), Michael and Sharma (1988), Mishra and Saksena (1998), Dhanpathi and Rama Sarma (2000), Pandit *et al.* (2007), Paulose and Maheshwari (2008), Ahangar *et al.* (2012), Dagne *et al.* (2008), Ahemad *et al.* (2012), Sitre (2012), Symons *et al.* (2012), Smitha *et al.* (2012), Ezhili *et al.* (2013), Kadam *et al.* (2014), Kapoor (2015), Pawar (2016) and Kengar (2017).

Zooplankton act as food for higher consumer level. They respond quickly for increase in abundance of phytoplankton. Zooplanktons exist in wide variety of environmental conditions but still few physicochemical factors like light, temperature, salinity, pH influence



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## BENTHIC MACROINVERTEBRATE AND AQUATIC INSECTS OF CHALBARDI LAKE, TEHSIL BHADRAWATI, DISTRICT CHANDRAPUR (M.S), INDIA.

Bansod, M.A<sup>1</sup>. and Harney, N.V<sup>2</sup>.

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### Abstract

Benthic macroinvertebrates are bottom dwelling organisms without backbones, which are visible to the eye without use of a microscope they are living in all types of aquatic environment like rivers, streams, ponds, lakes etc. Most of the aquatic insects live in side water in their aquatic larval stages. They often found on, under or around rocks, vegetation, logs and sticks or burrowed into the bottom sand and sediments. In this regard's benthic macroinvertebrate and aquatic insects of Chalbardi lakes, Bhadrawati were studied.

Benthic macroinvertebrates are commonly used as indicators of the biological condition of waterbodies. Macroinvertebrates play crucial role in aquatic ecosystem as they are major food sources for higher trophic levels. Benthic Macroinvertebrates were studied by viewing their potential degree of pollution. In lake side areas the aquatic organisms like coleopteran, Dytiscidae (Predaceous diving beetle *Cybister* spp.), Gyrinidae (Whirling beetles) and aquatic hemipterans, Belostomidae (Giant Water bug), Nepidae (Water scorpion), hydrometra, Rantara and others were found. The occurrence of dipteran larvae like *Chironomus* larvae in the lake sediments point out towards the presence of organic pollution



## BIODIVERSITY OF ROTIFERS IN GHOTNIMBALA LAKE OF BHADRAWATI, DISTRICT CHANDRAPUR, ( M. S ) INDIA.

Bansod, M.A<sup>1</sup>. and Harney, N.V<sup>2</sup>.

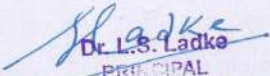
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### Abstract

Rotifers are microscopic, aquatic invertebrates common in freshwater others live in damp moss or lichens. Some are parasitic some are free-living, some are living individually where as some in community.

Ghotnimbala lake of Chandrapur spread over large area. Water of this lake utilised for different purposes including domestic, agricultural, washing cloths, bathing, washing animals etc causing degradation of water quality if such activities continuously going on causing lake water to unfit for household uses. During study period total 18 Rotifers species from 14 genera were found. According to seasonal changes, change in Rotifers diversity and density observed which is at high level in summer while in monsoon is at lowest level. 17 species observed in summer, 15 species in winter while lowest that is 8 species were recorded in monsoon season.

**KEYWORDS:** Ghotnimbala Lake, Rotifers, Biodiversity

  
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## STUDIES OF MACRO BENTHOS IN RAMSAGAR LAKE ARMORI, DIST- GADCHIROLI (M.S.)

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Communicated :08.03.2022

Revision : 11.03.2022  
Accepted : 28.03.2022

Published: 02.05.2022

**ABSTRACT:** Benthological variables are particularly useful in measuring the water quality and such biological monitoring can provide resolution in space and time. pollution is a major cause of environmental deterioration. The use of macro benthos as bio indicator. The distribution, density and biomass of benthic organisms depend upon physicochemical characteristics of water. the use of macrobenthos as biotic indicator in the assessment of water quality realized better understanding in the field of limnology as compared to biotopes characteristics. insects and molluscs are the tolerant species in the changing condition of water ecosystem. The present study is carried out to study macrobenthos in ramsagar lake in the year 2020-2021. In present investigation, total 18 species from four major group were observed viz. Gastropoda, nematoda, oligochaeta and insect. In gastropods 07 species were recorded, nematode 02 species recorded, oligochaeta 02 species and insect 07 species were recorded.

**Key words:** - Macro-benthos, limnology, Ramsagar lake, water quality, bio indicator

### INTRODUCTION :

Benthic organisms which inhabit on the bottom of water body. this group of organisms recognizing as very important group in detecting the water quality and these organism move away from pollution site. they have show sensitivity to pollution. they can be relatively easily collected handles and identified. they are important linked with food web of fishes and also play an important role in mud water exchange of biological nutrients. Many of benthic forms are detritivores and depend to a large extent on organic detritus as food. as the detritus reach the bottom, it enters a web of energy transfers that sustain the benthic community, thus the benthic macro invertebrates play a key role in the mineral recycle and, in turn serve as food of fish.

Benthological variables are particularly useful in measuring the water quality and such biological monitoring can provide resolution in space and time, Tittizer and Kothe (1978) and Price (1978).

better understanding in recent years about benthos and its environment results of their exploitations from water bodies. Water body leading to enrichment of the nutrient level beyond proper line. The present study was carried out to study macro benthos in Ramsagar lake during 2020-2021..

### MATERIALS AND METHODS:

During the period of investigation benthic samples were collected with the help of tray tyre sampler. samples transferred into laboratory in polythene bag and water benthic organisms floats on the surface and are pick up with the help of dropper and preserved in 4% formalin and identified as per Edmondson (1959), Tonapi (1980) and Pennak (1989).

### OBSERVATION AND RESULT:

In present investigations total 18 species from four groups were observed viz. Gastropoda, nematoda, oligochaeta and insect. In gastropods 07 species were recorded, nematode 02 species recorded, oligochaeta 02 species and insecta 07

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## INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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# Assessment of Automobile Service Stations for the Study of Wastewater Toxicity in Nagpur City, Maharashtra (India).

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**Abstract:** This study has been undertaken to investigate the toxicity of wastewater generated by automobile service stations in the Nagpur city. Exhausted engine oil wastewater was collected from one significant automobile service stations of Nagpur city during survey and combined homogenous wastewater was used for the toxicity testing experiments. Poly aromatic hydrocarbons (PAHs), Poly Chlorinated Biphenyls (PCBs), Heavy metals, detergents and other toxicants were tested. Poly aromatic hydrocarbons were detected in this wastewater such as Naphthalene 32µg/l, Fluorene 3.29µg/l, Phenanthrene 20.09µg/l, Anthracene 10.26µg/l, Fluoranthene 2.33µg/l, Pyrene 21.65µg/l, Benz(a) anthracene 1.69µg/l and Benzo(a)pyrene 2.05µg/l. Copper, Cobalt, Iron, Cadmium, Nickel, Zinc and Manganese were 0.279mg/l, 0.069mg/l, 26.047mg/l, 0.021mg/l, 0.04mg/l, 0.530mg/l and 1.344mg/l respectively detected. Wastewater pH was 7.45. Values of NO<sub>3</sub><sup>-</sup>, COD, Oil and Grease in this wastewater generated were reported more than permissible limit of effluent standard. Study also reveals that most of these service stations are lacking basic infrastructure facilities for vehicular washing and subsequent wastewater treatment. Only eleven service stations were found with systematic effluent treatment plants (ETPs). It is imperative to use effective technologies to reduce the water consumption, wastewater generation and to reuse the wastewater after vehicular servicing.

**Keywords:** Automobile service stations, Exhausted engine oil, Effluent treatment plants (ETPs).

### I. INTRODUCTION

Population growth, urbanization and subsequent industrialization is dramatically changing our environment which not only polluting air but water too. Nagpur city is one of the fastest growing metro city in Vidarbha region and sub-capital of Maharashtra state in India. It is one of the greenest city of India with around eight to ten lakes, many freshwater ponds and two rivers. The Nag river is a river flowing through the city known for providing etymology for the name Nagpur. The Nag river runs through the midway of the Nagpur from west to east nearly seventeen kilometers and collects untreated wastewater of different sources including authorized and unauthorized automobile service stations from drainage of Nagpur Municipal Corporation (NMC). The wastewater generated from automobile servicing stations is highly toxic, but its indiscriminate discharge in drainage still is not taken seriously by the authorities.

Population growth is adding vehicular traffic in the city continuously and automobile service stations are too mushrooming to cater to the servicing needs of vehicles. Vehicles are essential for transportation and to cover long distance in a short time. The Nagpur had a total of 12,54,595 two wheelers and 1,31,412 four wheelers, while in rural part of Nagpur registered a total of 3,51,874 two wheelers and 24,340 four wheelers in the year 2017. This total number of registered vehicles in Nagpur raised to over 17 lakhs in the year 2019.

The servicing of vehicles generates large volumes of wastewater laden with exhausted engine oil which contains PAH, PCB, heavy metals, detergents, other toxicants and solid waste. When this wastewater is disposed without treatment it not only causes surface water pollution but also contaminates groundwater too and tends to accumulate in flora and fauna thus leading to mass kills of aquatic biota. Majority of rural people living by the side of river and lake depend largely on the fish as a source of protein and





## WATER QUALITY ASSESSMENT OF SATARA TUKUM LAKE OF POMBHURNA TEHSIL IN CHANDRAPUR DISTRICT OF MAHARASHTRA STATE WITH RESPECT TO PHYSICO-CHEMICAL CHARACTERISTICS

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Communicated :05.03.2022

Revision : 09.03.2022  
Accepted :26.03.2022

Published: 02.05.2022

**ABSTRACT:** Satara tukum is a very small village in Pombhurna tehsil of Chandrapur district located in Maharashtra state. A freshwater perennial lake is present in this village. All village people depend on this lake water for cloth washing, irrigation, farming, and for all domestic activities. Due to continuous anthropogenic activities the lake water is getting polluted day by day.

In this context in present studies 17 different physico-chemical characteristics of this lake water were analyzed for 2 years span during 2018-2019 and 2019-2020. The analyzed physical and chemical parameters include atmospheric temperature, water temperature, turbidity, conductivity, total dissolved solids, free CO<sub>2</sub>, total alkalinity, pH, dissolved oxygen, total hardness, Calcium, chlorides, phosphate, nitrate, sulphate, Phosphate, COD and BOD were recorded. In all 17 different physico-chemical parameters were analyzed and recorded during the study on this freshwater ecosystem of perennial nature. The physico-chemical parameters show the prevailing water quality conditions of the lake water in a particular area which is presented in this research paper.


**Key words:** - Satara Tukum, Physico-chemical characteristics, Pombhurna tehsil, Chandrapur district, Maharashtra state.

### INTRODUCTION :

India is a agricultural country totally based on water resources. The quality of water plays a vital role for mankind because it is directly linked with human health. Lake waters are mainly used for domestic, farming and cloth washing purposes. Increasing various human activities and some natural processes, degrade the water quality and is posing a great threat to all forms of life including man. The reason of water pollution in rural areas is due to extensive use of fertilizers and pesticides for agriculture purposes. We need to conserve water for future purpose and designing an appropriate framework to safeguard our natural resources

for sustainable development and biodiversity conservation.

The Physico-chemical parameters of any lake show the exact water quality conditions of the lake water in a particular lake site and a real picture emerge from it. In India a number of ponds, lakes and reservoirs are naturally present which are not being utilized fully due to lack of insufficient knowledge about them. In this context present research work is an attempt towards finding out the water quality of a perennial rural lake. The physico-chemical conditions vary according to different climatic conditions and the surrounding factors play a important role in it.

  
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## Seasonal variation and diversity of Chlorophyceae Algae in paddy field area of Nagbhid Tehsil, Chandrapur district, Maharashtra. India

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Submitted: 25-06-2021

Revised: 07-07-2021

Accepted: 10-07-2021

**ABSTRACT:** The diversity of Chlorophyceae in relation to seasonal variation of paddy fields of Nagbhid Tehsil, District Chandrapur, Maharashtra has been undertaken for the first time in this area. The continuous seasonal collections have been made during regular field visits in the year 2017 to 2019. Total 22 Chlorophyceae taxa could be identified in the present investigation belonging to various orders i.e., Zygnematales, Chlorellales, Ulotrichales, Sphaeropleales, Oedogoniales, Chaetophorales, etc. Rice fields provide a very comfortable habitation to different kinds of algae occurring in the stagnant water, prevalent high temperature and high humidity in the rice fields. The present investigation reveals that the comparatively maximum number of Chlorophyceae members is growing in the rainy season in comparison to winter and summer seasons.

**KEYWORDS:** Paddy, Chlorophyceae, Nagbhid Tehsil, Diversity.

### I. INTRODUCTION

Chlorophyceae flora from a different region of India has been studied by various authors like Prescott 1931; Tipparan and Yuwadee 2012; Hosmani 2013, Satpati 2013; Das and Adhikary 2014; Patil and Deore 2017; Farishta Yasmin et.al 2015, and Rajeshwari and Krishnamurthy 2015.

The Chlorophyceae is a large and unique group of freshwater green algae which are important both economically and scientifically. The green algae play an important role acting as a primary producer and also increase the fertility of the soil in paddy fields. (Amit Kumar and Radha Sabu 2012). Algalization seems to have little effect on the physical properties of the soil, however, it may improve soil aggregation (Sankarama.1917). algae are also used as biological indicators of water pollution (Subramanian, 1996, Handa and Jadhav,2015). Chlorophyceae members form the base

of the food chain, are directly or indirectly a good source of food for various animal groups (Rao,1975). In recent years it is used as an alternative source for food, fodder medicine, and also an important tool for researchers in nanotechnology, space biology, Genetics, and other fields of applied sciences (Shrestha et.al. 2013).

Thus it is essential to study the diversity of green algae in fluctuating physico-chemical parameter of paddy fields area 06 Nagbhid Tehsil to conserve and to maintain the ecosystem

### II. MATERIAL AND METHODS

#### Area of Study:

In present investigation four study areas, of Nagbhid Tehsil namely Mohadi area, Talodhi area, Navegaon area and Nagbhid area were selected for the sampling of water, soil, and algal flora pertaining to the respective study area in different seasons. Mohadi Area which is located 10 km from Nagbhid towards north (Longitude 79°40'0" E and Latitude 20°35'0" N). Talodhi Area is located 15 km from Nagbhid Towards south (Longitude 79°40'0" E and Latitude 20°35'0" N). Navegaon Pandav area is located 0.9 km from Nagbhid Towards East (Longitude 79°40'0" E and Latitude 20°35'0" N). Nagbhid area is located 0.2 km from Nagbhid city Towards West (Longitude 79°40'0" E and Latitude 20°35'0" N) of Nagbhid Tehsil Dist. Chandrapur, Maharashtra.

#### Method of sampling and identification

Collections of samples were done during the morning period in clean sample bottles and polythene bags. A small amount of sample was used for the taxonomical identification and the remaining sampling were preserved in 4% formalin for a long time. The collected algal samples were observed

ISSN: 2454 – 7905

*SJIF Impact Factor 2022: 7 . 479*

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Vol. I      ISSUE - XLVI      Year · 7      Jan. 2022

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Vol. I - ISSUE · XLVI

SJIF Impact Factor : 7.479

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## MACROPHYTES BIODIVERSITY ASSESSMENT OF VARIOUS LAKES OF BHADRAWATI TEHSIL, DIST- CHANDRAPUR, MAHARASHTRA, INDIA

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### ABSTRACT:

This particular paper reports of comparative analysis of macrophytes biodiversity assessment between various lakes of Bhadrawati tehsil, Chandrapur, Maharashtra, India. Various lakes have different entity from each other with respect to inflow source, depth, vegetation and surroundings; The present work was carried out to study macrophytes biodiversity from the period December 2016 to January 2017. Result shows various lakes have floristic differences. Total 13 species of macrophytes as *Nehubolitea*, *Ottelialisimoides*, *Hydrillasps*, *Echinidoruscordifelius*, *Ludwigaperennis*, *Azollacarolimana*, *Salvinia rotundifolia*, *Sagitariasp.*, *Trapasps.*, *Lemna minor*, *Pisiastratiates*, *Cerdtophyllumechinatum* were recorded during study period in various lakes of Bhadrawati tehsil.

**KEYWORDS:** Macrophytes, Biodiversity, Lakes, Bhadrawati, Chandrapur, Maharashtra

### INTRODUCTION:

Macrophytes are the diverse naked aquatic photosynthetic plants which include algae, bryophytes, pteridophytes as well as spermatophytes and they grow seasonally and permanently grow in the vicinity of water. Macrophytes play a key role in the functioning of an aquatic ecosystem. Macrophytes are aquatic plants that play an important role in aquatic ecosystems functioning (Deshmukh, 2016). They serve as a source of oxygen, provide a substratum for algae as well as shelter for invertebrates. Macrophytes play an important role in aquatic ecosystem by providing food, nutrients and habitats to other aquatic organisms and thus they maintain the aquatic biodiversity (Agastinho 2007, Theel 2008).

Aquatic macrophytes also used as bio-indicators of water pollution as they respond to the changes in water quality and also play significant role in mineral cycling and organic components of aquatic ecosystem. Macrophytes having potential to accumulate the heavy metals in water bodies (Delvin, 1967). Aquatic macrophytes are also useful to evaluate and determine anthropogenic activities and their impact on aquatic ecosystem (Solak et. al., 2012).

Several workers have been studied on macrophytes from different freshwater bodies of India and abroad such as Shimoda et. al. (1984), Wadhavet. al. (2010), Tijareet. al. (2011), Harney (2015), Murkuteet. al. (2015), SAVA (2015), Deshmukhet. al. (2016), Reddy et. al. (2016), Chunne and Nasare (2018), Bhute and Harney (2017), Khaparde and Harney (2017), Pimpalshende and Sitre (2019), Harney (2020)

### Study Area

Chandrapur district is located between 19.57°N latitude and 79.18°E longitude occupies an area of 11,443 Km which constitutes 3.72 percent of the total area of the state. Bhadrawati tehsil is located in eastern edge of Maharashtra, sea level height is 549. Bhadrawati has tropical hot climate with high range of temperature throughout the year. Bhadrawati tehsil area is full of lakes and hence it is called as tehsil of lake. Macrophytes biodiversity assessment was done during the study period

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**INTERNET OF THINGS: AN IOT AND CLOUD BASED REAL TIME SMART MONITORING  
AND DETECTION OF FIRE THROUGH BOLT IOT KIT AND LM35 SENSOR**

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**ABSTRACT**

The Internet of Things, in short say IoT, is a new paradigm that has shifted people's lifestyles from traditional to high-tech. This technology has brought about changes such as smart cities, smart homes, pollution management, energy conservation, smart transportation, and smart industries. In order to improve technology through IoT numerous important research studies and investigations have been conducted. Research gap will be fulfilled by practical approach towards automated fire detection system. For that credit goes to Bolt IoT platform and sensor LM35. Data read by sensor and collected on Bolt IoT Bolt cloud, detect the fire or air pollution by comparing with threshold value of temperature and humidity, alert the same by alarm and also by displaying the alert message. This paper will assist readers and researchers in comprehending the IoT and its use in the real world in online mode. Entire things are automated and accessed from anywhere. Also it proves that an IoT is the game-changing approach to future innovations in science and technological advancement.

*Keywords: Bolt IoT kit, cloud, detection, ESP8266 WiFi, fire, IoT, LM35 sensor*

  
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## Technical Review on Educational Data Mining

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### Abstract-

Importance of education is to develop good society in terms of cultural, social and economic. Educational data mining (EDM) is a new area for knowledge discovering from large amount of educational data. Researchers from the globe are trying to search the outline and elements which give betterment of education. This paper shows the review of data present in the world and methodology used for collecting and clearing them before applying data mining techniques. It represents different techniques used by different research for educational data mining. It gives kind of result for selecting proper technique for proper data mining in educational data.

Keywords: Educational Data Mining, Dropout, Data Mining, Decision Trees

### 1. Introduction

Education has different meaning as per the situation. Education is very broad term for considering individual. Basically it is a character appearance of a single person known as education. The education reflected from the society of different persons who represent their culture. In education sector the schools, colleges and universities and so on represent education. The newly education system which will be implemented from 2022-2023 by the Indian government for focusing the aim regarding education system by 2040 with equitable access to the highest-quality education for all learners regardless of social or economic background [1]. The system divides the education parts such as Fundamental, Preparatory, Middle, Secondary and Higher education. Education gives the development of the persons or society. It gives good impact on the society and the nation. The development may be attitudes, modern values and economic growth of a person by education due to which equality and social justice is occurring.

Data is important for any sector. We are living around the data, now a days we are using World Wide Web (WWW), Whatsapp, Facebook etc. which having lot of important data around us. The person tries to find out the meaningful data from the huge data by applying knowledge discovery from data or KDD process. Data mining technique can be applied for meaningful data [2]. In educational field, Data Mining is used to understanding of learning process of students. Educational Data Mining (EDM) is growing area for data mining to better understand students [3].

### 2. Layout For Drop-Out Learner

Different scholars have used different model or layout for drop out learner. The architecture [4] used is based on ETL process. The abbreviation of ETL is Extract, Transform and Load.

It is business oriented system in which author study the operational system to support business. The model [5][6] which predicting students result at school level which are failure. It involved the stages Data collection, Preprocessing, Data mining and Interpretation. Early student success prediction is also layout by the authors by showing the model [7].

Layout of primary involvement of elements, database creation, processing and output of educational data using Data Mining is as follows in Fig. 1.

  
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## Internet of Things: A Comparative Research on Sensors to Detect Fire and Air Pollution

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### Abstract

The Internet of Things is the concept of a novel technology in the field of Science and Technology. Various things are connected through sensors and besides that cloud is used to store online data, through which data is to be analysed and it makes easy to take any concrete and appropriate decision. In this concept the net connection plays the major role, through which the concern object or thing is to be accessed from any platform, anytime and from anywhere in the world. So, it's called as Internet of Things. The acronym IoT is used for the Internet of Things. In this paper we focus on comparative research on sensors to detect fire and air pollution. Without sensor IoT is as dead. Unless and until we cannot uses the sensor technology in IoT concepts, the IoT is meaningless. This is the reason behind that we focus here on sensors. For narrowing the task comparing the few sensors, senses only for detecting the fire and air pollution. Such as LM35, IR sensor, DHT11, DHT22 and DS18B20.

**Keywords:** IoT, sensor, comparison, LM35, IR sensor, DHT11, DHT22 (AM2302)

### I. Introduction

IoT is totally based on Internet and sensors. In this paper we are focusing on a sensor which detects fire and air. We are doing its comparative study according to its various physical properties. Such as measures or detection, operating range, sensing range, communication protocol and accuracy. In this paper we focus on comparative research on sensors to detect fire and air pollution. Without sensor IoT is as dead. Unless and until we cannot uses the sensor technology in IoT concepts, the IoT is meaningless. This is the reason behind that we focus here on sensors. For narrowing the task comparing the few sensors, senses only for detecting the fire and air pollution.

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Volume - X, Issue - II  
May - October - 2022  
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## 10. Use of Learning Resources and Knowledge Based System in Educational Data Mining: A Survey

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### Abstract

As the start of 21<sup>st</sup> century year 2020 the educational sector is drastically change towards online mode due to COVID-19. From last two years whole world education spread through online with advance digital learning. The online an open world for education section in which any one any time learns it. Now a days the Learning Management System (LMS) which having no border for education and having large amount of data. The University Grand Commission (UGC) provides the online courses for each sector in the education through different channels. A Knowledge Based System (KBS) is gathering the meaningful data from the stored information. The knowledge base (KB) is one of the research area where researcher still performing their research. The aim of this paper is to study the various tools used in education sectors to provide online education and increasing the teaching and learning process easy and effectively as well as how knowledge bases system is developed in the educational sector which gives mining in education.

**Keywords:** Data Mining, Association Rule, Knowledge Based System, Educational Data Mining, Moodle, Decision Tree, Visualized Tools

### I. Introduction

Educational data mining comes in existence with the online learning databases which having large amount of data related to education. EDM is one of the glob areas in the current time [1]. The online education having multidimensional data in which meaningful data we have to extract and gives the birth of EDM process for teaching and learning. The information comes from this database becomes the knowledge and decision taking help in education sector [2][3][4].

The Knowledge based system is a special part of computer program which work on the data stored in the knowledge base. KB is introduced from 1960s in the DENDRAL project [5]. This project is first practical knowledge-driven program on medical and life science field. KBs