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S. B. ARTS AND K. C. P. SCIENCE COLLEGE, NEW CAMPUS,
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DEPARTMENT OF ZOOLOGY
B.SC., VI SEMESTER STUDENT PROJECT LIST AS PER GUIDE ALLOTMENT 2023-24

Sl. No.	STUDENTS NAME	UUCMS NO.	PROJECT GUIDE ALLOTTED	PROJECT ENTITLED
1	VIJAYALAXMI V	041	Dr. DHARMA GURU PRASAD M P	STUDY ON THE PHYSICO-CHEMICAL PROPERTIES IN RELATION TO ZOOPLANKTON IN BHUTNAL LAKE (SITE - I) OF VIJAYAPURA DISTRICT, KARNATAKA, INDIA
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VIJAYAPURA DISTRICT, KARNATAKA, INDIA”**

Submitted In Partial Fulfillment of B. Sc., Degree (Zoology Discipline)

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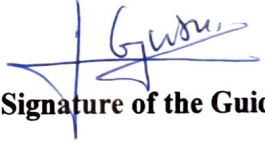
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2023-2024

CERTIFICATE

This is to certify that VIJAYALAXMI VASTRAD, SUDEEP BHANDARI, VISHAL MATH, PRATHAM MURAGE, VINAYAK SHESHADRI have submitted the Project dissertation entitled **Study On Physico-Chemical Properties In Relation To Zoo plankton In Bhutnal Lake Of Vijayapura District, Karnataka, India** in partial fulfillment of Sixth semester B. Sc., Degree (Zoology discipline), during 2024 under my guidance and supervision in the Department of Zoology, BLDEA'S SB Arts & KCP Science College, New campus, Vijaypur, Affiliated to Rani Chanamma University, Belgaum.

Date: 24/8/2024
Place: Vijayapura.


Signature of the Guide

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DECLARATION

We, VIJAYALAXMI VASTRAD, SUDEEP BHANDARI, VISHAL MATH, PRATHAM MURAGE, VINAYAK SHESHADRI here by declare that the dissertation entitled, Study On Physico-Chemical Properties In Relation To Zoo plankton In Bhutnal Lake Of Vijayapura District, Karnataka, India submitted to the Department of Zoology, BLDEA'S SB Arts & KCP Science College, New campus, Vijaypur, in partial fulfillment of B.Sc., Degree (Zoology Discipline) embodies the results of the project work carried out by us. We are solelys responsible for the contents of the dissertation.

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ACKNOWLEDGEMENT

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Thank you all

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Introduction

Water is the chemical matrix that allows life to exist, as well as the molecular chain that binds all living things on the earth. Water is the most plentiful, fascinating, and useful chemical substance in nature, endowed with a variety of physicochemical qualities and distinct features (Ansari and Khan, 2008). As addition to liquid and gaseous forms, water may be found in ice, steam, and water vapour on Earth.

Water covers 71% of the Earth's surface, giving it the moniker "Blue Planet," and it is required for all known forms of life. In the air, 0.001 percent of the water is in the form of vapour, clouds (made of solid and liquid water particles suspended in the air), and precipitation. Only 0.6 percent of Earth's freshwater is suitable for human use (Neill, 1990). Rivers, lakes, and the atmosphere contain less than 0.3 percent of all freshwater, while biological organisms have even less (0.003 percent). Agriculture consumes over 70% of the available fresh water consumed by people. Water is also crucial to the global economy since it is used to cooling and transportation in industries. Since water is a universal solvent, it is required for all living species and is essential for humans to live.

Water, the most prevalent component on the world, is physiologically essential for all living things. The process of hydrolysis is used in the digestive system to break down various polymers and dimmers into smaller molecules (e.g.: proteins into amino acids). Water is created during respiration, and this water may be very beneficial to creatures that live in arid environments. Photosynthesis needs the presence of water in order for autotrophs to create food. Water is required for plant survival. Plant cells take in water by osmosis, which generates an increase in pressure on the stiff cell-wall, allowing herbaceous plants to stay erect. Water is used by all species, from plants to animals to humans.

Sources of Water

Water that falls on the ground as rain or hail is known as surface water. This water is gathered from a catchment, which is a particular location. Rivers, streams, and creeks flow water into a holding area from the catchment. The water is subsequently kept in a dam or reservoir, which may be natural or artificial (man-made).

Parameters	Bhutanal lake						%CV
	Site-I	Site-II	Site-III	Site-IV	Total Mean	SD	
	Mean	Mean	Mean	Mean			
Air Temp.(°C)	22	22	22	22	22	0	0
Water Temp.(°C)	21	21	21	21	21	0	0
pH	7.8	7.9	7.8	7.8	7.825	0.0500	0.63
Conductivity(μS ^{cm})	478.5	476.2	476.5	478.6	477.45	1.27	0.26
Turbidity(NTU)	1.7	1.8	1.7	1.3	1.625	0.22	13.64
TSS(mg/L)	3.1	3.2	3.0	3.2	3.125	0.095	3.068
DO(mg/L)	7.3	7.1	7.1	7.6	7.275	0.23	3.24
Co ₂ (mg/L)	0	0	0	0	0	0	0
Hardness(mg/L)	95.89	95.59	95.39	95.99	95.715	0.27	0.28
Chloride(mg/L)	210	204	212	213	209.75	4.03	1.92
Alkalinity(mg/L)	134	133	138	132	134.25	2.62	1.95
Sulphate(mg/L)	808	802	809	803	805.5	3.51	0.43
Calcium(mg/L)	137.8	132.8	133.8	137.2	135.4	2.47	1.82

Table1:Season wise comparison of physico-chemical parameters in Marchalli lake from June 2024–July 2024.

Results of Zooplankton

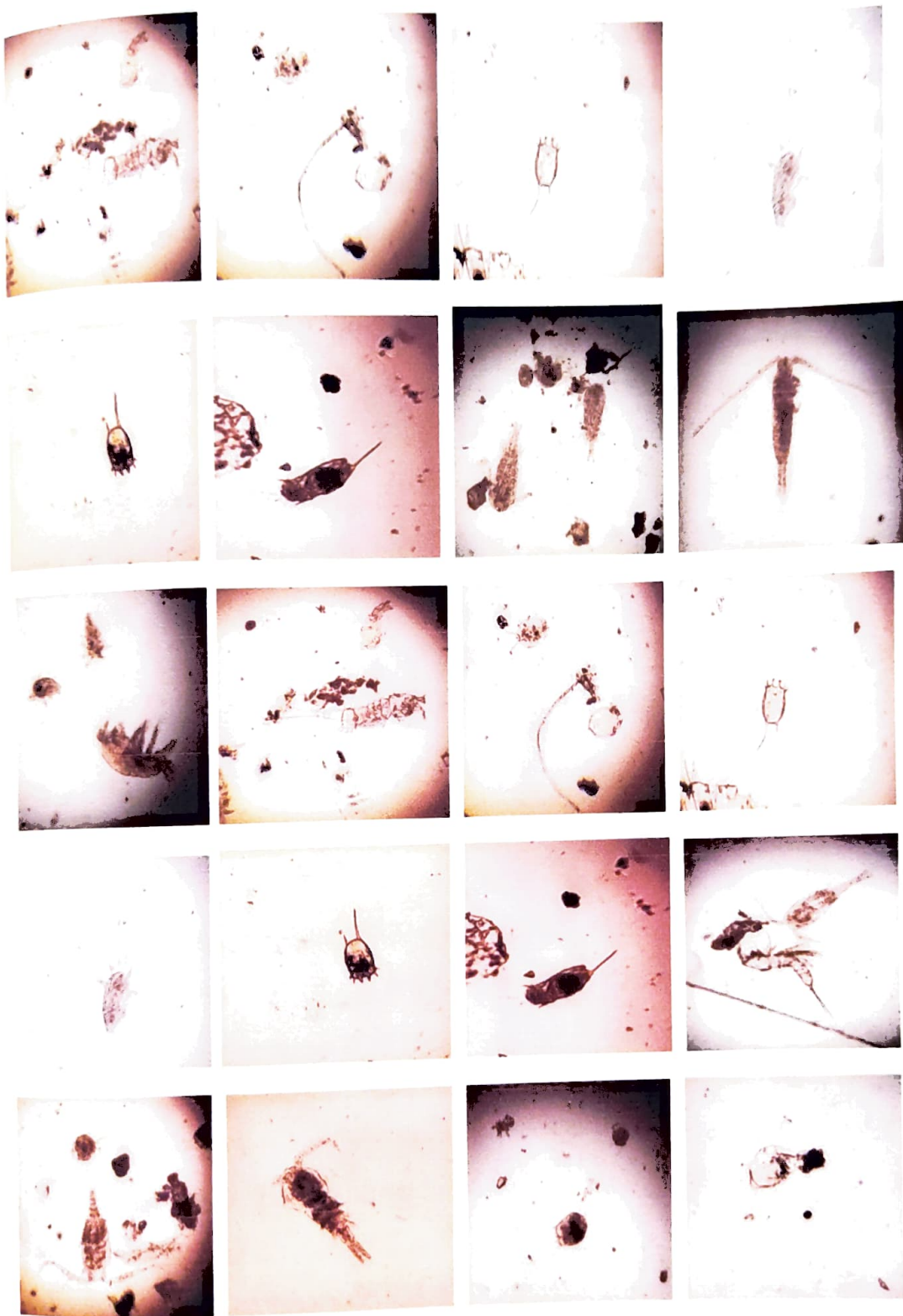


Plate : Microscopic image of zooplankton

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CERTIFICATE

This is to certify that SHOBHA KOKATNUR, ANKITA POL, SAHANA HONAKAMBLE, CHANNAREDDY, PRAJWAL BIRADAR have submitted the Project dissertation entitled **Study On Physico-Chemical Properties In Relation To Zoo plankton In Bhutnal Lake Of Vijayapura District, Karnataka, India** in partial fulfillment of Sixth semester B. Sc., Degree (Zoology discipline), during 2024 under my guidance and supervision in the Department of Zoology, BLDEA'S SB Arts & KCP Science College, New campus, Vijaypur, Affiliated to Rani Chanamma University, Belgaum.

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Place: Vijayapura


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DECLARATION

We, SHOBHA KOKATNUR, ANKITA POL, SAHANA HONAKAMBLE, CHANNAREDDY, PRAJWAL BIRADAR here by declare that the dissertation entitled, Study On Physico-Chemical Properties In Relation To Zoo plankton In Bhutnal Lake Of Vijayapura District, Karnataka, India submitted to the Department of Zoology, BLDEA'S SB Arts & KCP Science College, New campus, Vijaypur, in partial fulfillment of B.Sc., Degree (Zoology Discipline) embodies the results of the project work carried out by us. We are solelys responsible for the contents of the dissertation.

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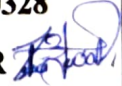
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ACKNOWLEDGEMENT

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Introduction

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Water covers 71% of the Earth's surface, giving it the moniker "Blue Planet," and it is required for all known forms of life. In the air, 0.001 percent of the water is in the form of vapour, clouds (made of solid and liquid water particles suspended in the air), and precipitation. Only 0.6 percent of Earth's freshwater is suitable for human use (Neill, 1990). Rivers, lakes, and the atmosphere contain less than 0.3 percent of all freshwater, while biological organisms have even less (0.003 percent). Agriculture consumes over 70% of the available fresh water consumed by people. Water is also crucial to the global economy since it is used to cooling and transportation in industries. Since water is a universal solvent, it is required for all living species and is essential for humans to live.

Water, the most prevalent component on the world, is physiologically essential for all living things. The process of hydrolysis is used in the digestive system to break down various polymers and dimmers into smaller molecules (e.g.: proteins into amino acids). Water is created during respiration, and this water may be very beneficial to creatures that live in arid environments. Photosynthesis needs the presence of water in order for autotrophs to create food. Water is required for plant survival. Plant cells take in water by osmosis, which generates an increase in pressure on the stiff cell-wall, allowing herbaceous plants to stay erect. Water is used by all species, from plants to animals to humans.

Sources of Water

Water that falls on the ground as rain or hail is known as surface water. This water is gathered from a catchment, which is a particular location. Rivers, streams, and creeks flow water into a holding area from the catchment. The water is subsequently kept in a dam or reservoir, which may be natural or artificial (man- made).

Parameters	Bhutanal lake						
	Site-I	Site-II	Site-III	Site-IV	Total Mean	SD	
	Mean	Mean	Mean	Mean			
Air Temp.(°C)	22	22	22	22	22	0	0
Water Temp.(°C)	21	21	21	21	21	0	0
pH	7.8	7.9	7.8	7.8	7.825	0.0500	0.63
Conductivity(μS ^{cm})	478.5	476.2	476.5	478.6	477.45	1.27	0.26
Turbidity(NTU)	1.7	1.8	1.7	1.3	1.625	0.22	13.64
TSS(mg/L)	3.1	3.2	3.0	3.2	3.125	0.095	3.068
DO(mg/L)	7.3	7.1	7.1	7.6	7.275	0.23	3.24
Co ₂ (mg/L)	0	0	0	0	0	0	0
Hardness(mg/L)	95.89	95.59	95.39	95.99	95.715	0.27	0.28
Chloride(mg/L)	210	204	212	213	209.75	4.03	1.92
Alkalinity(mg/L)	134	133	138	132	134.25	2.62	1.95
Sulphate(mg/L)	808	802	809	803	805.5	3.51	0.43
Calcium(mg/L)	137.8	132.8	133.8	137.2	135.4	2.47	1.82

Table1:Season wise comparison of physico-chemical parameters in Marehalli lake from June 2024–July 2024.

Results of Zooplankton

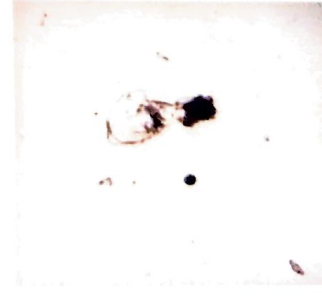
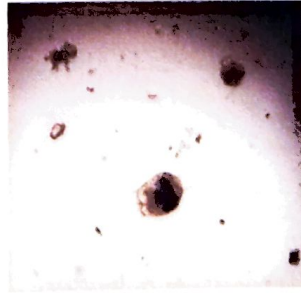
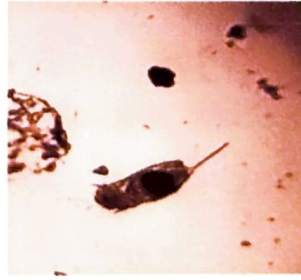
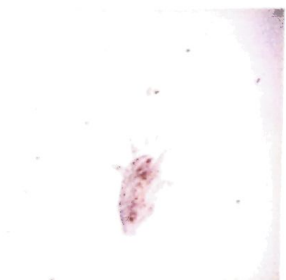
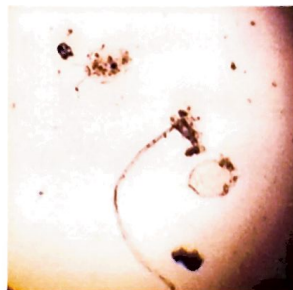
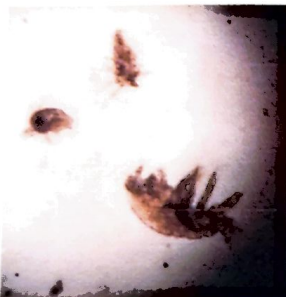
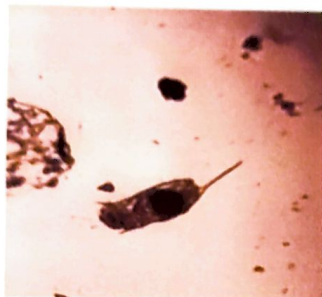
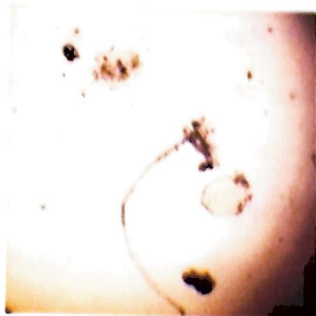


Plate : Microscopic image of zooplankton

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DEPARTMENT OF ZOOLOGY
Project Dissertation Entitled

**“STUDY ON PHYSICO-CHEMICAL PROPERTIES IN
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Submitted In Partial Fulfillment of B. Sc., Degree (Zoology Discipline)

Submitted By

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Gouri Jogannavar	U15KM21S0565
Akshata Kadi	U15KM21S0198
Aditya Wagamare	U15KM21S0435
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Assistant Professor

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August 2024

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BHAGESH D	U15KM21S0073
MANJUNATH U	U15KM21S0064
MAHANTESH Z	U15KM21S0087

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VIJAYAPURA - 586103

August 2024

DECLARATION

We, Vinayak K, Bhagesh D, Mahantesh Z, Manjunath, hereby declare that the dissertation entitled, —Study On Physico-Chemical Properties In Relation To Zooplankton In Bhutnal Lake Of Vijayapura District, Karnataka, India || submitted to the Department of Zoology, BLDEA'S SB Arts & KCP Science College, New campus, Vijaypur, in partial fulfilment of B. Sc., Degree (Zoology Discipline) embodies the results of the project work carried out by me. I am solely responsible for the contents of the dissertation.

Vinayak K , Bhagesh D , Manjunath U, Mahantesh Z
U15KM21S0217, U15KM21S0073, U15KM21S0064, U15KM21S0087

Place: Vijayapura

Date: 23/8/24.

CERTIFICATE

This is to certify that Bhagesh D. Mohantesh Z.,
have submitted the Project dissertation entitled —Study On Physico-Chemical Properties In
Relation To Zooplankton In Bhutnal Lake Of Vijayapura District, Karnataka, India in partial
fulfilment of Sixth semester B. Sc.,
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Signature of the Guide

Counter Signed By,


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H.O.D. of Zoology
BLDEA's S.B.Arts & K.C.P. Science College,
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Principal,
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ACKNOWLEDGEMENT

I express my sincere gratitude to my project supervisor, for their guidance, advice, suggestions and encouragement throughout this project work.

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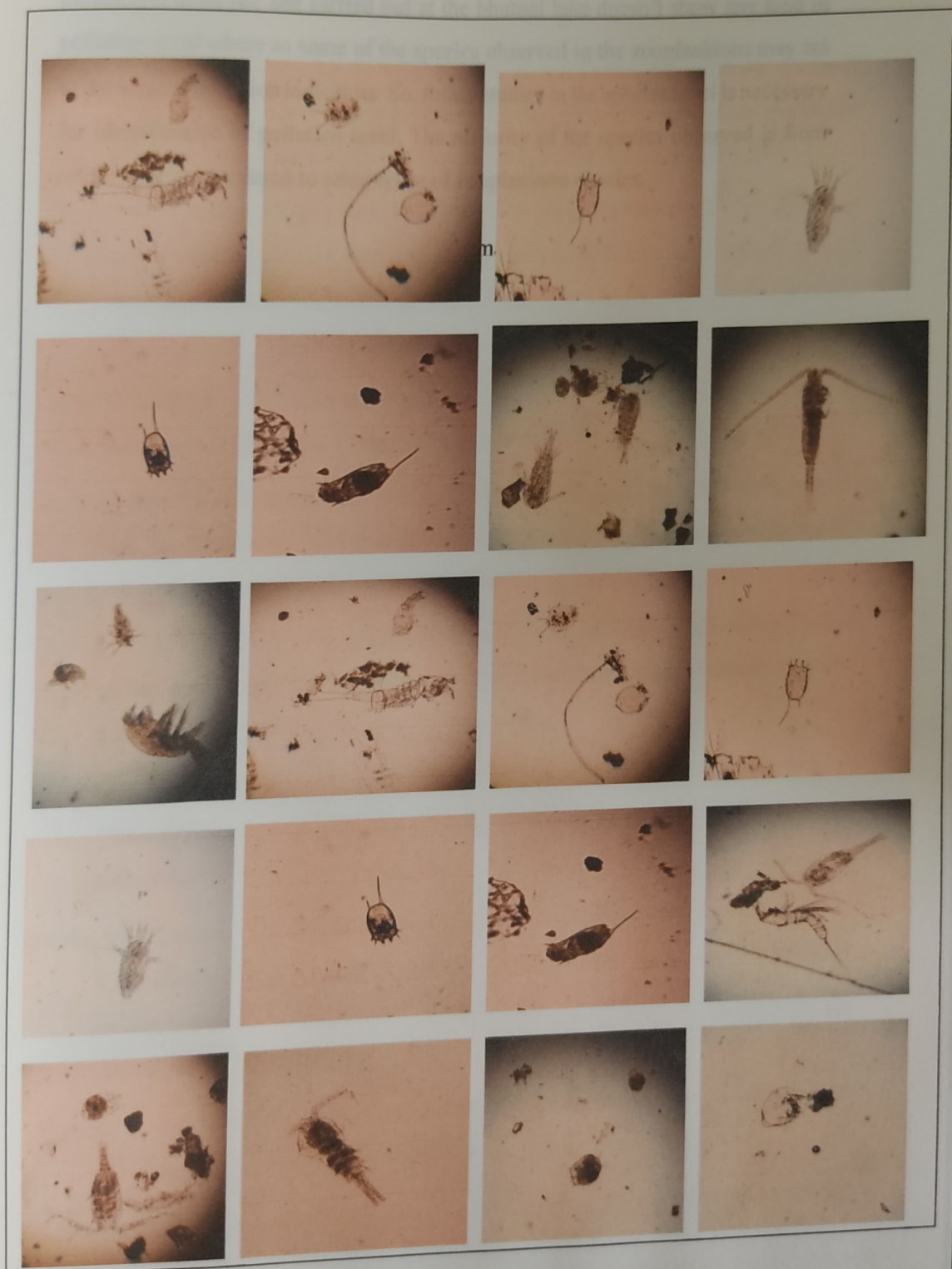


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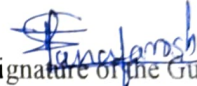
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Place: Vijaypur


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DO(mg/L)	7.3	7.1	7.1	7.6	7.275	0.23	3.24
Co ₂ (mg/L)	0	0	0	0	0	0	0
Hardness(mg/L)	95.89	95.59	95.39	95.99	95.715	0.27	0.28
Chloride(mg/L)	210	204	212	213	209.75	4.03	1.92
Alkalinity(mg/L)	134	133	138	132	134.25	2.62	1.95
Sulphate(mg/L)	808	802	809	803	805.5	3.51	0.43
Calcium(mg/L)	137.8	132.8	133.8	137.2	135.4	2.47	1.82

Table 1: Season wise comparison of physico-chemical parameters in Marchalli lake from June 2024 – July 2024.

Results of Zooplankton

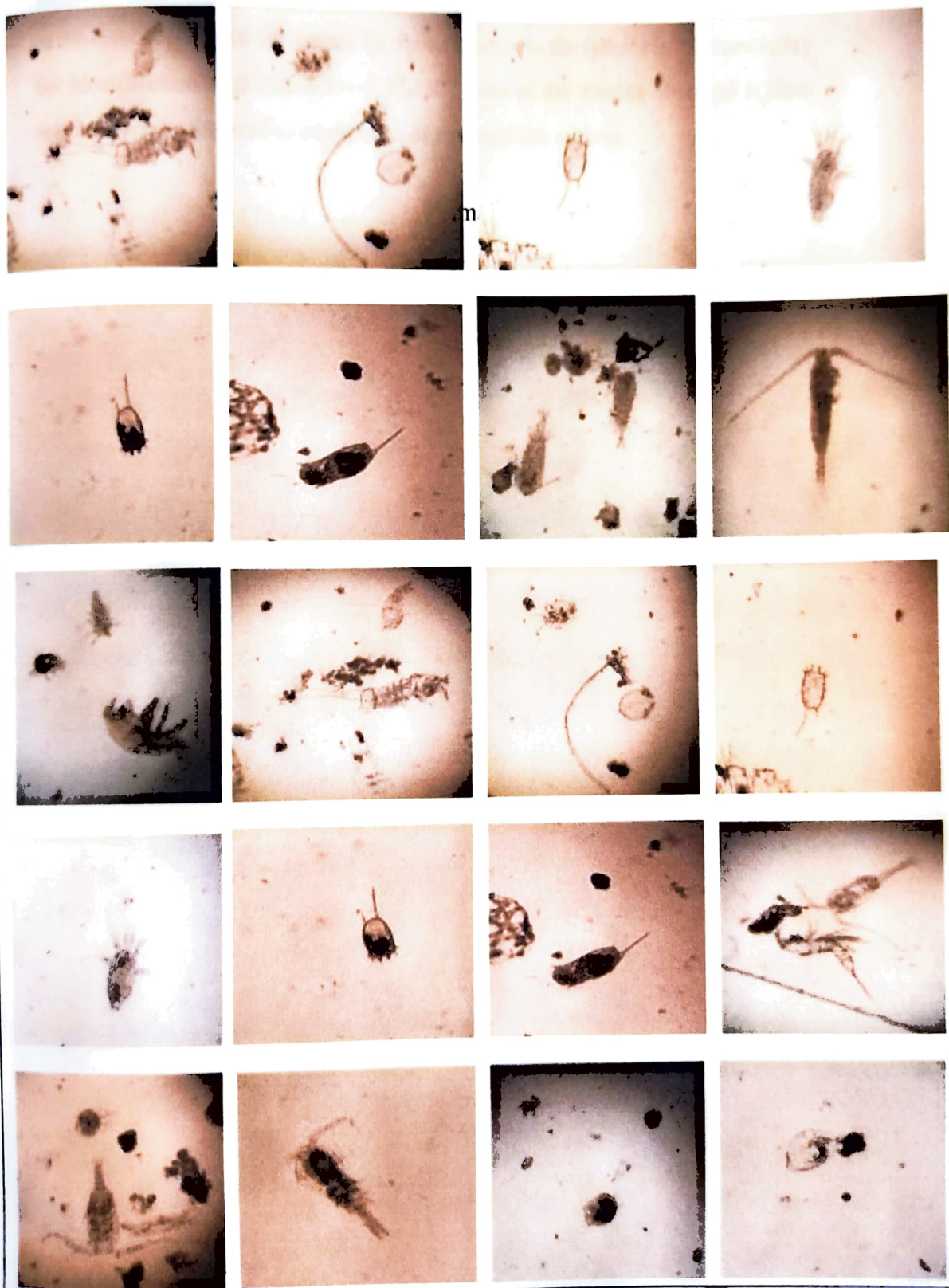


Plate: Microscopic imsgs of zooplankto

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DEPARTMENT OF ZOOLOGY

**Project Dissertation Entitled
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AT BHUTNAL LAKE OF
VIJAYAPURA DISTRICT, KARNATAKA, INDIA"
Submitted In Partial Fulfillment of B. Sc., Degree (Zoology Discipline)**

Submitted By

**SALEEM MUJAWAR
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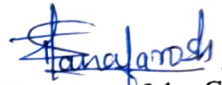
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ACKNOWLEDGEMENT

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Thank you all

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INTRODUCTION:

Aquatic insects, which make up the majority of insect species, inhabit freshwater environments like swamps, ponds, lakes, springs, streams, and rivers. Diverse freshwater ecosystems are home to approximately 8600 insect species, belonging to 12 orders and 150 families. Aquatic insect study involves insects that complete their life cycle in the aquatic environment or have life stages closely linked to aquatic environments. While insects make up over three-quarters of all described animal species, only 2–3% are associated with inland waters as truly aquatic or semiaquatic. Despite their relatively small presence in the worldwide fauna, aquatic insects are the dominant invertebrate group in freshwater systems, in terms of abundance, species richness, and production, and can be found in almost every type of aquatic habitat.

Aquatic insects are crucial for the functioning of inland water ecosystems, as they help process organic matter and cycle nutrients. They also play a vital role as food sources for various insect-eating animals and are commonly utilized in biomonitoring to evaluate water quality. In most freshwater environments, aquatic insects are plentiful and often display a wide variety. They have important roles in freshwater ecosystems, being consumed by a broad range of predators, both vertebrate and invertebrate, that inhabit aquatic systems. The study of aquatic insect ecology encompasses various aspects such as species diversity, life-history limitations, community structure, interactions between predators and prey, detritus consumption, grazing, and their implications for nutrient dynamics. There is a wealth of information available on how insects respond to different environmental conditions, including factors that affect large-scale landscapes. Consequently, they are frequently utilized as indicators of water-quality conditions in both standing and flowing water systems.

AQUATIC INSECTS FOUND AT THE LOCATION



1. Kingdom: Animalia

Phylum: Arthropoda

Class: Insecta

Order: Hemiptera

Family: Notonectidae

Scientific Name: *Notanecta nymph*

Common name: **Common backswimmer**



2. Kingdom: Animalia

Phylum: Arthropoda

Class: Insecta

Order: Odonata

Family:

Common name: **Dragonfly nymph**



3. Kingdom: Animalia

Phylum: Arthropoda

Class: Insecta

Order: Hemiptera

Family: Gerridae

Scientific Name: *Gerris lacustris*

Common name: **Water strider / Pond skater**



4. Kingdom: Animalia

Phylum: Arthropoda

Class: Insecta

Order: Diptera

Family: Culicidae

Scientific Name: *Culex larva*

Common name: **Culex larva**

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MORPHOMETRIC STUDY OF FRESHWATER FISH *CIRRHINUS MRIGALA* & *MUGIL CEPHALUS* IN BHUTNAL LAKE

Introduction :

CIRRHINUS MRIGALA

India is home to more than 10% of the global fish diversity along with the carps having a commercial culture status, thus revolutionizing the freshwater aquaculture section to the level of a fast-growing industry. Carp is a common name for various species of the Cyprinidae family, which represents a very large group of freshwater fishes native to Asia and Europe. An important cultivable species among the carps is *Cirrhinus mrigala* widely known as Mrigal, Nain, Mirgah, Mirki, Narain and Mori prominent in the South East Asian countries and it is reported to be well established in the rivers of Indo-Gangetic plains of India and Pakistan. This species is widely studied as it holds commercial importance and form a major part of the Indian reservoir fisheries. The easiest and authentic methods to identify specimens are morphometric measurements and meristic counts which are mostly termed as morphological systematic. These are two useful morphological aids mostly employed to delineate stocks of

fish. The morphometric relationships between various body parts of fish help to distinguish between separate unit stocks of the same species, assess their well-being and examine variations related to the habit and habitat among the variants of the species. Several researchers have concluded that information of the morphometric measurements of fishes and their statistical analysis is essential for determining their taxonomic status. Many pieces of researches have shown that the cause of variation in the biometric characters can be partly attributed to intraspecific variability, which is under the influence of environmental parameters hence applicable for examining short-term variations induced by the environment. A more thorough understanding of the morphometrics of the fishes would thus contribute to the management of their populations and would further throw some light on the factors controlling

The same (genetic, intermediate or environmental). On the basis of range difference, these morphometric characters may be categorized into environmentally (vast range), intermediate (moderate range) and genetically (narrow range) controlled characters. Although comparisons

Result and discussion

CIRRHINUS MRIGALA

- Phylum : chordata
- Subphylum : vertebrata
- Division : gnathostomata
- Superclass : pisces
- Class : Actinopterygii
- Order : cypriniformes
- Family : cyprinidae
- Genus : cirrhinus
- Species : cirrhinus mrigala (Hamilton 1822)



Fig:2 Cirrhinus mrigala

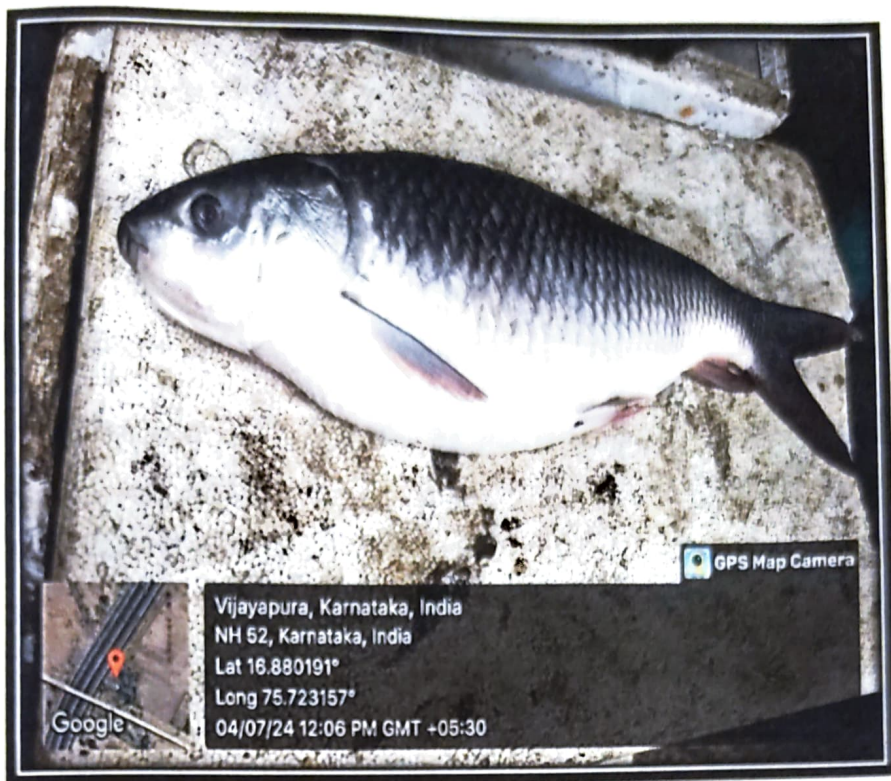


Fig : 3 : Mugil cephalus (lobed mullet)

Sl no:	Morphometric parameters	Large size Mugil cephalus	Small size Mugil cephalus
1	Total length	60cm	32cm
2	Standard length	53cm	23cm
3	Head length	14cm	8cm
4	Eye diameter	2.2cm	1.5cm
5	Pectoral fin	13cm	7cm
6	Dorsal fin length	17.9cm	13cm
7	Anal fin length	13cm	6cm
8	Caudal length	2cm	1cm
9	Body depth	19cm	9cm

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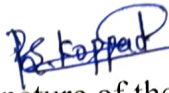
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MORPHOMETRIC STUDY OF FRESHWATER FISH *LABEO ROHITA* & *TILAPIA* *MOSSAMBICUS* IN BHUTNAL LAKE

Introduction

Labeo rohita:

Morphometric study is the basic fundamental tool to know the development of organisms, growth, variations and structure of population characteristics of a fish. Morphometry is the study of geometrical form of organisms which shows differences in growth and maturity patterns which are sensitive to environmental changes. In general body shape of an organism is determined by both genetic and ecological or environmental factors. The morphometric analyses of fishes are very important for the study of biology of fishes and it helps in determining the relationship between various parts of the body. A change in the relative growth of the various parts of body in fishes occurs at different stages of life cycle and notably at sexual maturity with the increase in total length, growth of other body parts shows proportionally positive increase. Therefore, morphometric measurements and the statistical relationship among them are necessarily for taxonomic study and growth variability in fishes. The study of the morphometric traits is one of the most commonly used and costeffective method and it is essential for the identification of fish species and their habitat.

The morphometric relationship between various body parts of fish can be used to show possible differences between separate unit stocks of the same species. To determine the length-weight relationship, length measurements are used in fishes because it can be obtained under a large range of circumstances than weight measurements. Fishes adapt themselves by making necessary morphometric changes as they are very sensitive to environmental changes. Fishes indicate greater variation in morphological characters both within and between populations as compared to other vertebrates. * Corresponding author: Newton Paul

Fishes are cold blooded, aquatic, marine or freshwater and jaw bearing vertebrates. They are characterized by the presence of streamlined bodies, covered with scales. In fish's gills are present for respiration and paired fins for swimming. They belong to superclass Pisces.

Fishes are very important source of dietary animal protein.

Common name of *Labeo rohita* is rohu and it belongs to family Cyprinidae, order

Cypriniformes. It's a warm-water teleost and column feeder herbivore. It can be identified by depressed snout, thick lips. *Labeo rohita* are mainly found in the rivers of northern and central India

Result 4 Discussion

Labeo rohita:

- Phylum : chordata
- Subphylum : vertebrata
- Division : Gnathostomata
- Superclass : pisces
- Class : Actinopterygi
- Order : perciformes
- Family : cichlidae
- Genus : oreochromis
- Species : mossambicus

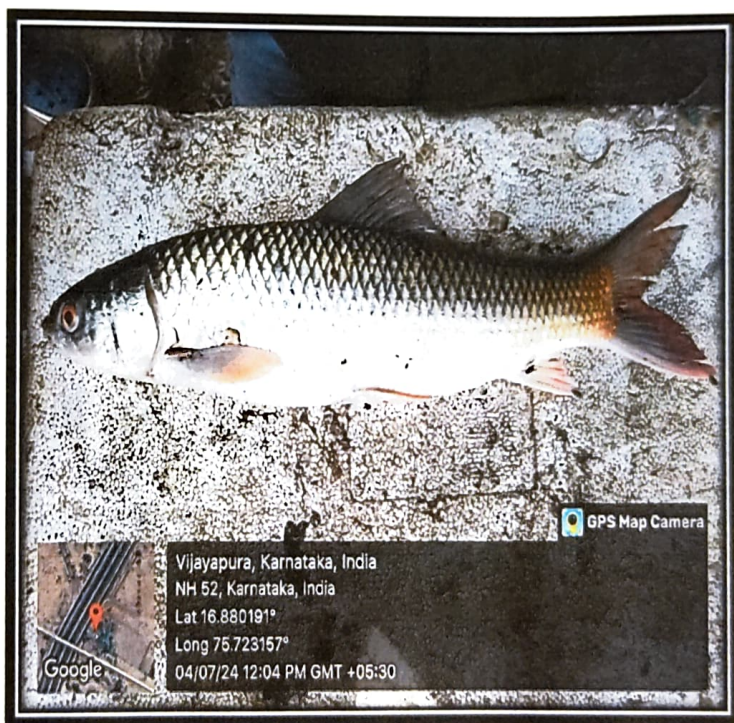


Fig: 2: *Labeo Rohita*

Sl no:	Morphometric parameters	Large size labeo rohita	Small size labeo rohita
1	Total length	45 cm	20 cm
2	Standard length	41 cm	18 cm
3	Head length	9 cm	3.5 cm
4	Eye diameter	1.8 cm	1 cm
5	Pectoral fin	5 cm	2 cm
6	Dorsal fin length	13.5 cm	9 cm
7	Anal fin length	7 cm	3 cm
8	Caudal length	0.8	0.4
9	Body depth	16 cm	7 cm



Fig: 3 : Image during taking morphometric measurements

Tilapia mosambicus:

- phylum : chordata
- Subphylum : vertebrata
- Division : gnathostomata
- Superclass: pisces
- Class: Actinopterygil
- Order: perciformes
- Family : cichildae
- Genus : oreochromis
- Species : *oreochromis mosambicus*



Fig: 4 *Tilapia mosambicus*

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