A COMPARATIVE STUDY OF RIVER WATER AND NEARBY GROUND WATER

Dissertation submitted to Mahatma Gandhi University in partial fulfilment of the requirement for the ***Degree of bachelor of science***

By,

Aarya M S

Reg no. 200021039560

Under the supervision of

Ms. Teena James

DEPARTMENT OF ZOOLOGY ALPHONSA COLLEGE, PALA

2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA

ARUNAPURAM, PALA

CERTIFICATE

This is to certify that the dissertation title "A COMPARATIVE STUDY ON RIVER WATER AND NEARBY GROUND WATER" is a Bonafide work done by Aarya M S under my guidance in the department of Zoology, Alphonsa College, Pala during the course as partial fulfilment of the requirements for the award of BSc. Zoology degree in MG University During the period of 2020-2023

Ms Teena James

Supervising Teacher

Zoology department

Alphonsa college, Pala

Place: PALA

Date: 05-05-2022

Counter signed by, 05/05/23

Dr.Sr.Manju Elizabeth Kuruvilla

Head of the Department

Alphonsa College, Pala

ABSTRACT

Water is perhaps the most precious natural resource after the air. Though the surface of the earth mostly consists of water, only a small part of it is usable, which makes water a limited resource. This precious and limited resource, therefore, must be used with care. As water is required for different purposes the suitability of it must be checked before use. Also, sources of water must be monitored regularly to determine whether they are in sound health or not. The poor condition of water bodies is not only an indicator of environmental degradation but is also a threat to the ecosystem. Even in industries, improper quality of water may cause hazards and severe economic loss. Thus, the quality of water is very important in both environmental and economic aspects. Thus, water quality analysis is essential for using it for any purpose. The project was an analysis on how the quality of surface water affects the nearby ground water. A comparison between surface water and ground water was also done. Surface water and nearby groundwater were collected. Fifteen parameters were analyze in both water sample.The presence of bacteria also checked. The results indicate slight contamination of both surface and ground water. Fecal contamination was noted in both water samples by the presence of *Coliforms* and *E-coli*. Thus the surface water contamination affects the nearby ground water source.

EFFECT OF BIOLOGICAL AND CHEMICAL PARAMETERS ON QUALITY OF WATER IN EELAKKAYAM CHECK DAM

DISSERTATION SUBMITTED TO THE MAHATMA GANDHI UNIVERSITY KOTTAYAM

PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

BACHELOR OF SCIENCE IN ZOOLOGY

BY

AISHA T SABEER

Reg No: 200021039561

THE SUPERVISION OF

DR.SIMIMOLE SEBASTIAN

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE

PALA-686574

MARCH 2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA

Affiliated to Mahatma Gandhi University

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA

(Affliated to Mahatma Gandhi University)

CERTIFICATE

This is to certify that the project, titled "**EFFECT OF BIOLOGICAL AND CHEMICAL PARAMETERS ON QUALITY OF WATER IN EELAKKAYAM CECK DAM**" in partial fulfilment of the requirement for the bachelor's degree award, is a record of the original project done by Aisha T Sabeer (200021039561) during the period of study (2020-2023) in the department of Zoology, Alphonsa college, Pala, under our supervision and guidance. Thus work has not been presented earlier for the award of any other degree.

Dr. Simimole Sebastian

Assistant professor

Department of Zoology

Alphonsa College Pala

5/5/23

Countersigned by,

Dr. Sr. Elizabeth Kuruvila

Head of the Department

Alphonsa College Pala

DEPT. OF ZOOLOGY, PALAI ALPHONSA COLLEGE

CERTIFIED GENUINE

DECLARATION

I hereby declare that this project report, including project titled "**EFFECT OF BIOLOGICAL AND CHEMICAL PARAMETERS ON QUALITY OF WATER IN EELAKKAYAM CECK DAM**" is bonafide record of the work done by myself, during the VIth semester of our undergraduate degree in ZOOLOGY , for the partial fulfilment of the requirement of the degree award. I declare that this report has been composed entirely by me and it has not been accepted in any previous application for a degree. The work of which it is a record has been done by my self. Quotations have been distinguished by quotation marks, and sources of information have been specifically acknowledged.

Place: pala.

Date:.

Aisha T Sabeer

Reg No:200021039561

DIVERSITY OF ANT

submitted to Mahatma Gandhi University in partial

Fulfilment of the requirement for the ***Degree of bachelor science in zoology***

By

AISWARYA PS

Reg no. 200021039562

Under the supervisor

Ms.Teena james

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA

2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE, PALA

KOTTAYAM PALA

CERTIFICATE

This is to certify that the dissertation titled "DIVERSITY OF ANT" Is a bonafide work done by AISWARYA PS, under my guidance in the department of Zoology, Alphonsa college, pala during the course as partial fulfilment of the requirement for the award of Bsc. Zoology degree in MG University during the period of 2020-2023.

Ms.Teena James

Supervising Teacher

Zoology department

Alphonsa college pala

Place

Date

Counter signed by,

05/05/23

Dr.sr.manju Elizabeth kuruvilla

Head of the Department

Alphonsa college,pala

DEPT. OF ZOOLOGY
PALA.
ALPHONSA

CERTIFIED GENUINE

ABSTRACT

Ants are eusocial insects of the family Formicidae and, along with the related wasps and bees, belong to the order Hymenoptera. Ants evolved from vespoid wasp ancestors in the Cretaceous period. More than 13,800 of an estimated total of 22,000 species have been classified. Depending on the species, their size can range from 1.5 mm to 13 mm in length. Like all insects, the body of an ant is divided in three distinct parts: head, thorax and abdomen.They are easily identified by their geniculate antennae and the distinctive node-like structure that forms their slender waists. The present study ,7 species of ant belonging to Formicidae family were Recorded from the selected site. Most abundant species was observed In Nylanderia fulva species .

DIFFERENT BREEDS OF GOAT AND COMMON DISEASES

DISSERTATION SUBMITTED TO

THE MAHATMA GANDHI UNIVERSITY KOTTAYAM

IN PARTIAL FULLFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

BACHELOR OF SCIENCE IN ZOOLOGY

BY

ANGELINE LUKA

Reg No: 200021039563

UNDER THE SUPERVISION OF

DR. AMBILI T R

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE

PALA-686574

MARCH 2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA

Affiliated to Mahatma Gandhi University

CERTIFICATE

This is to certify that the dissertation entitle, "DIFFERENT BREEDS OF GOAT AND COMMON DISEASES" is a bonafide work carried out by Miss ANGELINE LUKA, of the Department of Zoology. Alphonsa College, Pala, in partial fulfilment of the requirement for the award of B.Sc. Programme in Zoology of M. G. University during the period 2020-2023 under my supervision and guidance. This work has not been presented earlier for the award of any other degree.

Place: Pala

Date: 5/5/2023

Dr Ambili T R

Assistant professor

Department of Zoology

Alphonsa college Pala

Countersigned by, 05/05/23

Dr. Sr.Manju Elizabeth Kuruvila

Head of the Department

Alphonsa college, Pala

PALA

ABSTRACT

Goat occupy unique role in human history. Goat are members of subfamily caprinae of the family Bovidae. Goat is raised of many reasons including families can enjoy drinking nutritious milk, making tasty cheese, and collecting crop-transforming goat manure to fertilize their gardens. And also for meat. Goat has important role in agriculture. This deals with the different goat breeds and there common disease were identified Tetanus, Johne's disease, Mastitis, foot rot , pneumonia, coccidiosis. The six different goat breed are taken for the study – beetle, sirohi, jamunapari,malabari, osmanabadi , Assamesedwarf.

PHYSICO-CHEMICAL AND BACTERIOLOGICAL ANALYSIS OF WATER IN KAVALIPUZHA MINI BEACH, KIDANGOOR, KOTTAYAM

DISSERTATION SUBMITTED TO

MAHATMA GANDHI UNIVERSITY KOTTAYAM

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

BACHELOR OF SCIENCE IN ZOOLOGY

BY

ANJALI PAULOSE

Reg no: 200021039564

UNDER THE SUPERVISION OF

Dr. SIMIMOL SEBASTIAN

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE

PALA -686574

MARCH – 2023

CERTIFICATE

This is to certify that the project, titled **"PHYSICO- CHEMICAL AND BACTERIOLOGICAL ANALYSIS OF WATER IN KAVALIPUZHA MINI BEACH, KIDANGOOR, KOTTAYAM"** submitted in partial fulfilment of the requirement for the bachelor's degree award, is a record of the original project done by **Anjali Paulose (200021039564)** during the period of study (2020-2023) in the department of Zoology, Alphonsa College, Pala, under our supervision and guidance.

Place :

Date :

Dr.Simimol Sebastian

Assistant Professor

Dept. Zoology,Alphonsa college, Pala

Counter signed by 05/05/23

Dr.SrManju Elizabeth Kuruvila

Head of the Department

Dept. Of zoology

DEPT. OF ZOOLOGY, PALAI. ALPHONSA COLLEGE

CERTIFIED

ABSTRACT

The environmental quality is greatly focused on water because of its importance in maintaining the human health and health of the ecosystem. Many parts of the world are facing water scarcity problem due to limitation of water resources coincided with increasing population. Rivers are vital freshwater systems that are critical for the sustenance of life.The present work '**Physico-chemical and bacteriological analysis of water in Kavalipuzha mini beach, Kidangoor,Kottayam'**was conducted to analyse the physiochemical and bacteriological parameters of Kavalipuzha mini beach.The water samples were taken from the mini beach.The water quality parameters namely alkalinity, acidity, pH, phosphate, magnesium, sulphate, nitrate, MPN count, FC count, E coli count were analysed.pH of the entire water sample,phosphate,MPN Count,FC count and,E.coli count is not within permissible limits as per IS:10500-2012. Bacteriological count are higher than permissible limits. Alkainity ,acidity ,sulphate ,nitrate, magnesium ions are within as per permissible limits as per IS:10500-2012. Beach shows primary indications of pollution.

DIFFERENT BREEDS OF CATTLES AND THEIR COMMON DISEASES

DISSERTATION SUBMITTED TO

THE MAHATMA GANDHI UNIVERSITY KOTTAYAM

IN PARTIAL FULLFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

BACHELOR OF SCIENCE IN ZOOLOGY

BY

ANU SEBASTIAN

Reg No: 200021039565

UNDER THE SUPERVISION OF

DR. AMBILI T.R.

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE

PALA-686574

MARCH 2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA

(*Affiliated to Mahatma Gandhi University*)

CERTIFICATE

This is to certify that the dissertation entitle,"**DIFFERENT BREEDS OF CATTLE AND THEIR COMMON DISEASES**" is a bonafide work carried out by Miss **Anu Sebastian,** of the Department of Zoology. Alphonsa College, Pala, in partial fulfilment of the requirement for the award of B.Sc. Programme in Zoology of M. G. University during the period 2020-2023 under my supervision and guidance. This work has not been presented earlier for the award of any other degree.

Place: Pala

Date: 05-05-2023

Dr Ambili T.R.

Assistant professor

Department of Zoology

Alphonsa college Pala

Countersigned by, 05/05/23

Dr. Sr. Manju Elizabeth Kuruvila

Head of the Department

Alphonsa college, Pala

DEPT. OF ZOOLOGY, PALAI. ALPHONSA COLLEGE

CERTIFIED GENUINE

ABSTRACT

Cows occupy unique role in human history. Cows are members of subfamily Bovinae of the family Bovidae. Cows are raised for many reasons including milk, cheese, other dairy products also for meat such as beef. Cattle has an important role in agriculture. This work deals with the different cattle breeds and their common diseases were identified Anthrax, grass tetany, lumpy skin disease, foot rot, mastitis, and brucellosis. The six different cattle breeds was taken for the study- Holstein Friesian, Swiss brown, kasargod dwarf, jersey, vechur and sunadhini hf cross.

STUDY ON MILK QUALITY OF DIFFERENT BREEDS OF COW

A project report submitted to the Mahatma Gandhi University, Kottayam in partial fulfilment of the requirements for the award of Bachelor Degree of Science

By

Athulya Andrews

Reg no:200021039566

Under the supervision of

Dr. Maya George

Department of Zoology

Alponsa college Pala

March2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE, PALA

Affiliated to Mahatma Gandhi University

CERTIFICATE

This is to certify that the dissertation entitled "**STUDY ON MILK QUALITY OF DIFFERENT BREEDS OF COW"** is a bonafide work carried out by Miss. **Athulya Andrews**, of the department of Zoology, Alphonsa College, Pala, in partial fulfilment of the requirement for the award of B.Sc. Programme in Zoology of M. G. University during the period 2020 - 2023 under my supervision and guidance. This work has not been presented earlier for the award of any other degree.

Place: Pala

Date:

for Dr. Maya George 05/05/23

Assistant Professor

Department of Zoology

Alphonsa College, Pala

Counter singed by,

05/05/23

Dr. Sr. Manju Elizabeth Kuruvila

Head of the Zoology department

Alphonsa College, Pala

DEPT. OF ZOOLOGY PALAI ALPHONSA COLLEGE

CERTIFIED GENU

ABSTRACT

Milk is very important due to its special nutritive value and its important for human and animal life. The composition of milk differs widely among species. Various factors affect the quality of milk such as the type of protein, the proportion of protein, fat, and sugar; the levels of various vitamins and minerals.The present study was carried out among different breeds of cow at Malanad development society. The main aim of the study was to analysis the quality of milk in different breeds of cow on the basis of their SNF, fat, density and specific gravity. Milk samples were collected from 6 different breeds-Jersey,sunidhini,Hf,Gir,Hf-sindhi cross and Hf-jersey cross. On the basis of different parameters Jersey breed has highest fat (5.4) density (30.7) ,SNF (8.9) and specific gravity (1.0307)followed by GIR which has fat (5.3) ,density (29.9), SNF (9.0) and specific gravity (1.0299)

Key words: Milk quality, breeds of cow, SNF

A COMPARISON OF DIFFERENT GRAINS ON SPAWN DEVELOPMENT OF OYSTER MUSHROOM

A project report submitted to the Mahatma Gandhi University, Kottayam in partial fulfilment of the requirements for the degree of

BACHELOR OF SCIENCE IN ZOOLOGY

By

Gayathri Prakash

Reg no:200021039567

Under the supervision of

Ms. Teena James

Department of Zoology

Alphonsa college Pala,

March2023

CERTIFICATE

This is to certify that the project, titled **"A COMPARISON OF DIFFERENT GRAINS ON SPAWN DEVELOPMENT OF OYSTER MUSHROOM"** submitted in partial fulfilment of the requirement for the bachelor's degree award, is a record of the original project done by **Gayathri Prakash (200021039567)** during the period of study (2020-2023) in the department of Zoology, Alphonsa college, Pala, under our supervision and guidance.

Place : Pala
Date : 5/5/23

MS. TEENA JAMES
Assistant professor
Dept. Zoology
Alphonsa College, Pala

Counter signed by,

05/05/23

Dr.Sr Manju Elizabeth Kuruvila
Head of the Dept. Of zoology

DEPT. OF ZOOLOGY
PALA
ALPHONSA COLLEGE

CERTIFIED GENUINE

ABSTRACT

A study was conducted to examine the effect of different types of spawns on oyster mushroom (*Pleurotus ostreatus*) production using sawdust. Locally available grains of paddy and corn were used for spawn production. Sawdust spawned with different types *P. ostreatus* spawns were examined for spawn running (mycelia development), pinhead formation and fruit body formation, mean yield, and biological efficiency. The experiment was setup as a complete randomized design with two replicates. The paddy spawn produced an acceleration of spawn running, pinhead formation, fruit body formation compared with corn whereas yield is greater in the corn spawn. The fastest spawn running of 18 days, pinhead formation of 35 days was realized for paddy spawn, maximum fresh mushroom was harvested from corn spawn.

Apis cerana indica - INTERACTIONS AND ADAPTATIONS

Dissertation submitted to Mahatma Gandhi University in partial fulfilment of the requirement for the ***Degree of bachelor science in zoology***

By

GAYATHRY RAJAN

Reg no. 200021039568

under the supervision of

Dr. MAYA GEORGE

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA

2023

DEPARTMENT OF ZOOLOGY
ALPHONSA COLLEGE, PALA
ARUNAPURAM, PALA

CERTIFICATE

This is to certify that the dissertation titled *"Apis cerana indica-* INTERACTIONS AND ADAPTATIONS" is a bonafide work done by Gayathry rajan , under my guidance in the department of Zoology, Alphonsa college, pala during the course as partial fulfilment of the requirement for the award of Bsc. Zoology degree in MG University during the period of 2020-2023.

Dr. Maya George
Supervising Teacher
Zoology Department
Alphonsa college, Pala.

05/05/23

Place:

Date:

Counter signed by,

05/05/23

Dr. Sr. Manju Elizabeth Kuruvilla
Head of the Department
Alphonsa college, Pala

DEPT. OF ZOOLOGY
PALAL
ALPHONSA COLLEGE

CERTIFIED GENUINE

ABSTRACT

Plant–animal interactions are ubiquitous and important. A common theme throughout the study of plant–animal interactions is the enormous effect that these interactions have on plant and animal evolution. There is strong evidence that the interaction between plants and insect pollinators is the primary driver of diversity in flowering plants and the groups of insects most involved in pollination.

Bees and angiosperms have shared a long and intertwined evolutionary history and their interactions have resulted in remarkable adaptations. The present study noticed and identified interactions and morphological adaptations of *Apis cerana indica* with different plant species. It is found that the interaction between bees and the observed plants are mutualistic. Of the observed plants *Cocos nucifera* have the highest number of bee visits. The highest number of bees were observed at morning time. Both the bee and the plant have adaptations for effective pollination.

key words: *Apis cerana indica* ,*Bee*,*Cocos nucifera*

SPIDER DIVERSITY OF SPIDERS FOUND IN ALPHONSA COLLEGE PALA CAMPUS

DISSERTATION SUBMITTED TO

THE MAHATMA GANDHI UNIVERSITY KOTTAYAM

IN PARTIAL FULLFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

BACHELOR OF SCIENCE IN ZOOLOGY

BY

MARIA VIANY JOHNSON

Reg No: 200021039570

UNDER THE SUPERVISION OF

Ms. POORNIMA BABY

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE

PALA – 686574

MARCH 2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA

(Affiliated to Mahatma Gandhi University)

CERTIFICATE

This is to certify that the dissertation **"SPIDER DIVERSITY OF SPIDERS FOUND IN ALPHONSA COLLEGE PALA CAMPUS"** submitted by **MARIA VIANY JOHNSON** of Alphonsa collage Pala,for the degree of Bachelor of Science in Zoology of Mahatma Gandhi University Kottayam is a bonafide record of project work done during 2020-2023 in this department under my supervision.

Ms. POORNIMA BABY

Assistant professor

Department of Zoology

Alphonsa college Pala

Place: Pala

Date: 05-05-2023

Countersigned by, 05/05/23

Dr. Sr.Manju Elizabeth Kuruvila

Head of the Department of Zoology

Alphonsa college, Pala

DEPT. OF ZOOLOGY, PALAI ALPHONSA COLLEGE

CERTIFIED GENUINE

ABSTRACT

The present study explored the diversity of spiders in the campus of Alphonsa college Pala, in Kottayam district. The investigation was carried out from January 2023 to April 2023. Spiders are mainly focused in green gardens, trees, college ground, and a small part of campus buildings. Observations were carried out once in a week, especially Saturday or Sunday in morning 7:00AM to 8:30AM. In the present study, 15 species of spiders belonging to 7 families were recorded from different places of campus. Araneidae was the dominant family, composed of 8 species of 6 genera. The study was focused in finding common spiders found in the campus.

PHYSIOCHEMICAL ANALYSIS OF MEENACHIL RIVER

DESSERTATION SUBMITTED TO

MAHATMA GANDHI UNIVERSITY KOTTAYAM

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

BACHELOR OF SCIENCE IN ZOOLOGY

BY

MERIN MARIYA BINOY

Reg no: 200021039571

UNDER THE SUPERVISION OF

Dr. SIMIMOL SEBASTINE

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE

PALA -686574

MARCH – 2023

PHYSIOCHEMICAL ANALYSIS OF MEENACHIL RIVER

(Affiliated to Mahatma Gandhi University)

CERTIFICATE

This is to certify that the dissertation entitled " **PHYSIOCHEMICAL ANALYSIS OF MEENACHIL RIVER** " is a bonafied work carried out by Miss Hafilacv , Department of Zoology , Alphonsa College,Pala in a partial fulfillment of the requirement for the award of Bsc program in Zoology of MG.university during the period 2020 – 2023 under my supervision.

Dr. SIMIMOL SEBASTINE

Assistant professor
Department of zoology

Alphonsa college pala

Pala :

Date:

Counter singed by 05/05/23

Dr.sr.Manju Elizabeth kuruvila

Head of the Department of zoology

Alphonsa college pala

DEPT. OF ZOOLOGY
PALAI

CERTIFIED GENUINE

ABSTRACT

The Meenachil River is one of the major rivers that flows through the Kottayam District of Kerala, India. The water quality of the Meenachil River was studied. The sample were collected from the kattachira check dam of Meenachil river basin from March 18,2023. pH, Alkalinity, Acidity, Nitrate, Phosphate, Sulphate, Mg+ ions ,MPN count, FC count, E.coli were the parameters measured. From the study, it was observed that diverse human activities have an impact on the water quality of the Meenachil River. The present study showed that the pH of the water sample is 5.98 having the lowest pH, indicating that the water sample is acidic in nature. Due to the discharge of industrial and household wastewater phosphate ,MPN count ,FC count and E.coli count was not ok in the sample collected from the river.

OSTEOARTHRITIS- A CASE STUDY

A project report submitted to the Mahatma Gandhi University, Kottayam in partial fulfilment of the requirements forthe degree of

BACHELOR SCIENCE IN ZOOLOGY

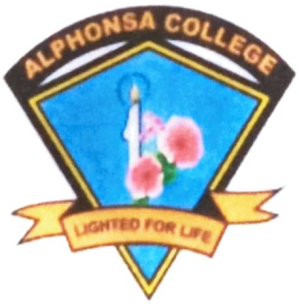
By

NOURIN THAHA

Reg no: 200021039572

Under the supervision of

Ms. Teena James



Department of Zoology

Alphonsa college Pala

March 2023

CERTIFICATE

This is to certify that the project, titled **"OSTEOARTHRITIS: A CASE STUDY"** submitted in partial fulfilment of the requirement for the bachelor's degree award, is a record of the original project done by **Nourin Thaha (200021039572)** during the period of study (2020-2023) in the department of Zoology, Alphonsa college, Pala, under our supervision and guidance.

Ms. Teena James
Assistant professor
Dept. Zoology
Alphonsa College, Pala

Counter signed by,

Dr.Sr Manju Elizabeth Kuruvila
Head of the Department
Dept. of zoology

DEPT. OF ZOOLOGY
PALAI
ALPHONSA COLLEGE

CERTIFIED GENUINE

POULTRY FARMING
&
ITS MANAGEMENT

Dissertation submitted to the MG University of Kottayam in partial fulfilment of the requirements for the award of the Degree of

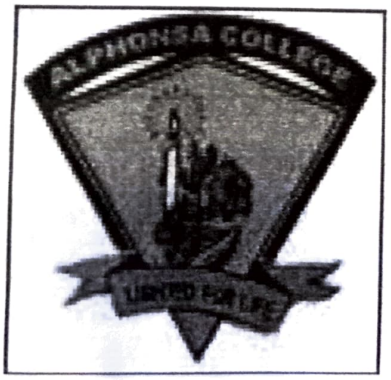
BACHELOR OF SCIENCE IN ZOOLOGY

By

RIYA TOM
(Reg.No : 200021039573)

Under the Guidance of

DR. SIMIMOL SEBASTIAN



DEPARTMENT OF ZOOLOGY, ALPHONSA COLLEGE
KOTTAYAM, PALA-686575

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA,KOTTAYAM-686575,
KERALA,INDIA
(Affiliated to MG University,Kottayam)

MAY-2023

CERTIFICATE

This is to certify that the dissertation, entitled **"POULTRY FARMING & ITS MANAGEMENT"** submitted to the MG University of Kottayam in partial fulfilment of the requirements for the award of the degree of **Bachelor of Science in zoology** is a record of original research work done by **Riya Tom** during the period of December 2022-March 2023 of her study in the Department of Zoology at Alphonsa College, Pala, Kottayam, under my supervision and guidance and the dissertation has not formed the basis for the award of any Degree/Diploma/Associateship/Fellowship or other similar title to any candidate in any university.

Place : Pala
Date: 05/05/23

Signature of the Guide
Dr. SIMIMOL SEBASTIAN
Asst. Prof., Department of Zoology,
Alphonsa College, Pala

Signature of the Examiners
1.

2.

DEPT. OF ZOOLOGY, PALAI. ALPHONSA COLLEGE

05/05/23

Signature of HOD

CERTIFIED GENUINE

ABSTRACT

Poultry farming production is in demand now a days because of the increasing population around the world. Monitoring of a poultry farm could be very helpful to produce a great number of chicken meat and to meet the demand of the people. However, there are different environmental factors that are affecting the growth of a chicken that also affects the production of chicken meat for food consumption. This study discusses the current knowledge on the impact of intensive poultry farming on environmental and human health, as well as taking a look at solutions for a sustainable future.

FISH DIVERSITY IN PADDY FIELDS

Dissertation submitted to the Mahatma Gandhi University in partial fulfilment of the requirements for the Degree of **Bachelor of Science in Zoology**

By

SNEHA SABU

REG. NO: 200021939574

Under the supervision of

Dr AMBILI T R

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLAGE, PALA

Affiliated to Mahatma Gandhi University.

CERTIFICATE

This is to certify that the dissertation entitled "FISH DIVERSITY IN PADDY FIELDS" is a bonafide work carried out by Miss Sneha sabu, of the Department of Zoology. Alphonsa College, Pala, in partial fulfilment of the requirement for the award of B.Sc. Programme in Zoology of M. G. University during the period 2020-2023 under my supervision and guidance. This work has not been presented earlier for the award of any other degree..

Place: Pala
Date :

05/05/23

Ms. Dr. Ambili T. R
Assistant Professor
Department of Zoology
Alphonsa college, Pala

Counter signed by,

05/05/23

Dr. Sr. Manju Elizabeth Kuruvila
Head of the Department
Alphonsa College, Pala

DEPT. OF ZOOLOGY
PALA
ALPHONSA COLLEGE

ABSTRACT

The area selected for study belong to kottayam district, in central Kerala. The study was conducted from Jan 1 to Jan 29 2023. The site selected in meechachil panchayath. Observation were caried out once in a week in the morning 9.00-10.00 am in the present study. In the present study, a total of 10 species of fishes belonging to 10 genera and 7 families were collected. Out of 89 genera of freshwater fishes from Indian region, 10 genera were collected from the study area. Cyprinidae is the most diverse family with 4 different species ie, Dawkinesia filamentosa, Halduraria fasciata, Puntius vittatus Rasbora daniconius .Themost abundant family in the study area is Cyprinidae and least abundant are Channidae and Heteropneustidae

SIGNIFICANCE OF DIETARY FIBRE IN DIABETES MANAGEMENT

Dissertation submitted to Mahatma Gandhi University in partial

Fulfilment of the requirement for the ***Degree of bachelor science in zoology***

BY

Vidya Vijayakumar

Reg no :200021039575

Under the supervisor

Dr.Sr.Manju Elizabeth Kuruvilla

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA

March 2023

CERTIFICATE

This is to certify that the work contained in the dissertation entitled-" SIGNIFICANCE OF DIETARY FIBRE IN DIABETES MANAGEMENT" submitted to Mahatma Gandhi university for partial fulfillment of the requirements for degree of Bachelor of science. is a record of bonafide research work carried by Miss. Vidya Vijayakumar under my direct supervision and guidance, in the Department of zoology, Alphonse College Pala.

05/05/23

Dr.sr.Manju Elizabeth Kuruvila

Department of Zoology

Place :

Date:.

DEPT. OF ZOOLOGY PALA ALPHONSE COLLEGE

Counter signed by,

05/05/23

Dr. Sr. Manju Elizabeth Kuruvila

Head of the Department

Alphonse College, Pala

Abstract

India is facing a triple burden of pre-diabetes, diabetes, and obesity. Unhealthy eating habits and physical inactivity have been linked to the onset and progression of type 2 diabetes mellitus .Higher intakes of dietary fibre are associated with a reduction in premature mortality and incidence of a wide range of noncommunicable diseases and their risk factors in the population at large. India contributes significantly to the global diabetes epidemic, with the second highest diabetes population in the world. The project" significance of dietary fibre in diabetes management" deals with some selected dietary sources which are easily available and fast growing in our surroundings, which are high in dietary fibre contents.

A BRIEF STUDY ON THE IDENTIFICATION OF FISHES IN MEENACHIL RIVER OF THIDANAD REGION

DISSERTATION SUBMITTED TO THE MAHATMA GANDHI UNIVERSITY KOTTAYAM

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ZOOLOGY

By

ALBY SIBY

REG.NO: 200021039576

UNDER THE SUPERVISION OF

DR.SR. MANJU ELIZABETH KURUVILA

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE

PALA 686574

MARCH 2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE

ARUNAPURAM, PALA

CERTIFICATE

This is to certify that the dissertation entitle "A BRIEF STUDY ON THE IDENTIFICATION OF FISHES IN MEENACHIL RIVER OF THIDANADU REGION" is a bonafide work carried out by Alby Siby, under my guidance, in the department of zoology, Alphonsa college pala during a course as partial fulfilment of the requirements for the award of B.SC programme in Zoology of M. G university during the period 2022-2023.

5/5/23

Dr. Sr. Manju Elizabeth Kuruvila
Supervising Teacher
Department of zoology
Alphonsa college pala

Place: Pala
Date:05-05-2023

DEPT. OF ZOOLOGY PALA ALPHONSA COLLEGE

Countersigned by 05/05/23
Dr. Sr. Manju Elizabeth kuruvila
Head of the Department

CERTIFIED

ABSTRACT

The present project entitled '**A brief study on the identification of fishes in Meenachil river of Thidanadu region'** was an attempt to identify the fishes with external characters.In this present work 11 species were identified with external characters and with the help of native people.The scientific names and common names were also found.The identified species are *Aplocheilus lineatus, Channa orientalis, Dawkinsia filamentosa, Etroplus maculatus, Garra mullya, Haludaria fasciata, Mastacembelus armatus, puntius dorsalis, puntius euspilrus, Rasbora daniconius, xenentodon cancila.* In this study the most abundant fish belonging to the family cyprinidae. *Garra mullya* is the most abundant fish with 65.3 abundance included in the cyprinidae family.The IUCN status shows that *Aplocheilus lineatus, Dawkinsia filamentosa, Etroplus maculatus, Garra mullya, Haludaria fasciata, Mastacembelus armatus, puntius dorsalis, Rasbora daniconius, xenentodon cancila* are in the least concern category.*Channa orientalis* is vulnerable. *Etroplus maculatus* is data deficit.The diversity can be calculated using Simpson' s diversity index it is 0.6.It shows that the study area has moderate degree of fish diversity.

A COMPARATIVE STUDY OF RIVER WATER AND NEAR BY GROUND WATER

Dissertation submitted to Mahatma Gandhi University in partial fulfilment of the requirement for the ***Degree of bachelor of science***

By, Amruta Suresh

Reg no. 200021039577

Under the supervision of

Ms. Teena James

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE, PALA

2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA

ARUNAPURAM, PALA

CERTIFICATE

This is to certify that the dissertation title "A COMPARATIVE STUDY ON RIVER WATER AND NEARBY GROUND WATER" is a Bonafide work done by Amruta Suresh under my guidance in the department of Zoology, Alphonsa College, Pala during the course as partial fulfilment of the requirements for the award of BSc. Zoology degree in MG University During the period of 2020-2023

Ms Teena James

Supervising Teacher

Zoology department

Alphonsa college, Pala

Place: PALA

Date: 5/5/23

Counter signed by, Manju 05/05/23

Dr.Sr.Manju Elizabeth Kuruvilla

Head of the Department

Alphonsa College, Pala

ABSTRACT

Water is perhaps the most precious natural resource after the air. Though the surface of the earth mostly consists of water, only a small part of it is usable, which makes water a limited resource. This precious and limited resource, therefore, must be used with care. As water is required for different purposes the suitability of it must be checked before use. Also, sources of water must be monitored regularly to determine whether they are in sound health or not. The poor condition of water bodies is not only an indicator of environmental degradation but is also a threat to the ecosystem. Even in industries, improper quality of water may cause hazards and severe economic loss. Thus, the quality of water is very important in both environmental and economic aspects. Thus, water quality analysis is essential for using it for any purpose. The project was an analysis on how the quality of surface water affects the nearby ground water. A comparison between surface water and ground water was also done. Surface water and nearby groundwater were collected. Fifteen parameters were analyze in both water sample.The presence of bacteria also checked. The results indicate slight contamination of both surface and ground water. Fecal contamination was noted in both water samples by the presence of *Coliforms* and *E-coli*. Thus the surface water contamination affects the nearby ground water source.

ASSESSMENT OF WATER QUALITY USING CHEMICAL AND BIOLOGICAL PARAMETERS IN KALARIYAMAKAL CHECK DAM , MEENACHIL RIVER

Dissertation submitted to the Mahatma Gandhi University in partial Fulfillment of the requirements for the award of the degree of

BACHELOR OF SCIENCE IN ZOOLOGY

By,

ANAKHA K B

REG. NO: 200021039578

Under the supervision of

SIMIMOL SEBASTIAN

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA

APRIL – 2023

CERTIFICATE

This is to certify that the dissertation entitled "ASSESSMENT OF WATER QUALITY USING CHEMICAL AND BIOLOGICAL PARAMETERS IN KALARIYAMAKAL CHECK DAM, MEENACHIL RIVER " is a bonafide work carried out Miss. ANAKHA K B of, the Department of Zoology, Alphonsa College, Pala, in a partial fulfillment of the requirements for the award of B.Sc Programme in Zoology of M.G University during the period 2020 - 2023 under my supervision and guidance. This work has not been presented earlier for the award of any other degree.

Assistant professor

Dr. Simimol Sebastian

Supervising Teacher

Department of Zoology

Alphonsa college , Pala

Place: Pala

Date: 5-5-2023

Counter signed by

05/05/23

Dr. Sr. Manju Elizabeth kuruvila

Head of the Department

Alphonsa college, Pala

DEPT. OF ZOOLOGY PALAI ALPHONSA COLLEGE

CERTIFIED GENUINE

ABSTRACT

People on the globe are under tremendous threat due to undesired changes in the physical, chemical and biological characteristics of air, water and soil. Due to increased human population, industrialization, uses of fertilizers and man made activity water is highly polluted with different harmful contaminants. The availability of good quality water is an indispensable feature for preventing diseases and improving quality of life . This study was designed to assess the chemical and biological parameters of kalariyamakal check Dam in Meenachil River. Water samples from the check dam were collected to examine certain chemical parameters such as pH, Alkalinity, Acidity, Nitrate, Phosphate, Sulphate and magnesium. The samples were also analysed for MPN count, FC count and E.coli. Analysis revealed that the biological properties such as MPN count , FC count and E.coli are very high than the standard value of WHO. The desirable limit of E.coli in drinking water is 0/100 ml. The phosphate content in the water sample is slightly higher than the standard value. According to WHO the standard value of pH is 6.5 - 8.5. In the present study water samples have pH lower than the prescribed level.

SPIDER DIVERSITY IN SELECTED AREAS OF AYYAPPANCOIL GRAMAPANCHAYAT, IDUKKI

Dissertation submitted to the MG University of Kottayam in partial fulfillment of the requirements for the award of the degree of

BACHELOR OF SCIENCE IN ZOOLOGY

ANINA BIJU

(Reg. No. 200021039579)

Under the Guidance of

Ms. POORNIMA BABY

DEPARMENT OF ZOOLOGY, ALPHONSA COLLEGE PALAI-686575, KOTTAYAM

MARCH-2023

DEPARMENT OF ZOOLOGY

ALPHONSA COLLEGE PALAI, KOTTAYAM -686575, KERALA

(Affiliated to MG University, Kottayam)

CERTIFICATE

This is to certify that the dissertation, entitled **"Spider Diversity in Selected Areas of Ayyappancoil Gramapanchayat, Idukki"** submitted to the MG University of Kottayam in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Science in Zoology** is a record of original research work done by **ANINA BIJU**. During the study period February 2023-March 2023 of her study in the Department of Zoology at Alphonsa College Palai, Kottayam, under my supervision and guidance and the dissertation has not formed the basis for the award of any Degree /Diploma/Associateship/Fellowship or other similar title to any candidate in any University.

Place : Palai

Date : 5/5/2023

Signature of the Guide

Ms. POORNIMA BABY

Department of Zoology,

Alphonsa College Palai

Signature of the Examiners

1.

2.

5/5/23

Signature of HOD

DEPT. OF ZOOLOGY
PALAI

CERTIFIED GENUINE

ABSTRACT

The present study was carried to study the spider fauna and to identify the most predominant family of spider species in farms and nearby areas in Ayyappancoil Gramapanchayat. The investigation revealed the presence of [illegible] species belonging to the [illegible] families and 24 genera. The family Salticidae was found to be predominant one and the Araneidae has second position. The most abundant spider is Plexippus petersi.

A COMPARATIVE STUDY OF BLOOD VALUES IN FIVE DISEASED AND RECOVERED DOGS

Dissertation submitted to the Mahatma Gandhi University In Partial Fulfillment of the requirements for the award of the degree

Of

BACHELOR OF SCIENCE IN ZOOLOGY

By,

ANJANA K.S.

REG. No.: 200021039580

Under the Supervision of

Dr. AMBILI T.R.

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE, PALA-686574

APRIL-2023

CERTIFICATE

This is to certify that the dissertation entitled **"A COMPARATIVE STUDY OF FIVE DISEASED AND RECOVERED DOGS"** is a bonafide work carried out by Miss. ANJANA K.S of the Department of Zoology, Alphonsa College, Pala, in a partial fulfillment of the requirements for the award of BSc Programme in Zoology of M.G University during the period of 2020-2023 under my supervision and guidance. This work has not been presented earlier for the award of any other degree.

Dr. Ambili T.R.
Assistant professor
Supervising Teacher
Department of Zoology
Alphonsa College , Pala

Place: Pala
Date : 5/05/2023

Counter signed by
Dr. Sr. Manju Elizabeth Kuruvila
Head of the Department
Alphonsa College, Pala

DEPT. OF ZOOLOGY
PALAI
ALPHONSA COLLEGE

CERTIFIED GENUINE

ABSTRACT

Early diagnosis of disease plays an important role in management of various diseases. Any diagnostic aid which help the clinician to arrive in an appropriate diagnosis in the field level is more acceptable than the sophisticated equipments. In this study we selected five animals infected with different etiological agents like bacteria, virus and parasite. Obtained complete blood count by CBC analyzer along with manual differential leukocyte count. Compare the results and the blood profile obtained by CBC analyzer was almost in conjunction with the result received by manual counting method.Changes in the count of different WBC's during various infections were analyzed and concluded that an increase in neutrophil were observed in bacterial infections like bacterial pneumonia and bacterialmyositis andlymphopenia were observed in viral infections like canine parvoviral enteritis and canine distemper. Parasitic infection were associated with an increase in eosinophils. In this study, mere blood smear examination helped us to arrive in a diagnosis. So it can also be concluded that blood smear examination can be used as a quick diagnostic aid in less equipped laboratories.

SPIDER DIVERSITY IN SELECTED AREAS OF AMARAPURAM, KOTTAYAM

Dissertation submitted to the MG University of Kottayam in partial fulfillment of the requirements for the award of the degree of

BACHELOR OF SCIENCE IN ZOOLOGY

ANJANADEVI T M

(Reg. No. 200021039581)

Under the Guidance of

Ms. POORNIMA BABY

DEPARMENT OF ZOOLOGY, ALPHONSA COLLEGE PALAI-686575, KOTTAYAM

MARCH-2023

DEPARMENT OF ZOOLOGY

ALPHONSA COLLEGE PALAI, KOTTAYAM -686575, KERALA

(Affiliated to MG University, Kottayam)

CERTIFICATE

This is to certify that the dissertation, entitled "Spider Diversity in Selected Areas of Amarapuram ,kottayam district submitted to the MG University of Kottayam in partial fulfillment of the requirements for the award of the Degree of Bachelor of Science in Zoology is a record of original research work done by ANJANADEVI T M. During the study period February 2023-March 2023 of her study in the Department of Zoology at Alphonsa College palai., Kottayam, under my supervision and guidance and the dissertation has not formed the basis for the award of any Degree /Diploma/Associateship /Fellowship or other similar title to any candidate in any University.

Place : palai

Date : 05/05/2023

Signature of the Guide

Ms. POORNIMA BABY

Department of Zoology,

Alphonsa College Palai

Signature of the Examiners

1.

2.

05/05/23

Signature of HOD

DEPT. OF ZOOLOGY PALAI ALPHONSA COLLEGE

CERTIFIED GENUINE

ABSTRACT

The present study was carried to study the spider

Fauna and to identify the most prominent family of spider in home nearest areas of Amarapuram. The investigation revealed the presence of 12 species belonging to 8 families of 12 genera .pholicidae was found to be the prominent one and saliticidae is in second position

.

"A STUDY ON SOIL QUALITY AND MACRO FAUNAL DIVERSITY OF TWO SELECTEDPLANTATIONS"

Dissertation submitted to the MG University of Kottayam in partial fulfillment of the requirements for the award of the degree of

BACHELOR OF SCIENCE IN ZOOLOGY

APARNA SANTHOSH

(Reg. No. 200021039582)

Under the Guidance of

Dr Cinnie Susan Antony

DEPARTMENT OF ZOOLOGY,

ALPHONSA COLLEGE

PALAI-686575, KOTTAYAM

MARCH-2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA, KOTTAYAM -686575, KERALA

(Affiliated to MG University, Kottayam)

CERTIFICATE

This is to certify that the dissertation entitled "A STUDY ON SOIL QUALITY AND MACRO FAUNAL DIVERSITY OF TWO DIFFERENT PLANTATIONS", submitted to Mahathma Gandhi University for partial fulfilment of the requirements for degree of Bachelor of Science, is a record of bonafide research work carried by Miss. Aparna Santhosh under my direct supervision and guidance, in the Department of Zoology, Alphonsa College Pala.

Place : Pala

Date : 05/05/2023

Signature of the Guide

Dr. Cinnie Susan Antony.
Department of Zoology,
Alphonsa College Palai

Signature of the Examiners

1.

2.

Signature of HOD 05/05/23

Dr. Sr. Manju Elizabeth Kuruvila

ABSTRACT

Soil is the most fundamental natural resources supporting a variety of ecosystem goods and services to benefit of mankind.Soil is a natural habitat for various micro and macroorganisms.Soil is a major source of nutrients needed by plants for growth. They vary based on the soil quality, fertilizers used, pH, etc. Soil quality will vary with the physical properties of soil, fertilizers, pollution, etc. Here a study ware conducted to analyse the soil quality.micro and macro nutrients availability, it's variation and the factors influencing soil quality, and also the macro faunal variation.Two plantations ware selected for the study one of which is cardamom and other is nutmeg plantation. cardamom plantation is situated in Idukki district and Nutmeg plantation is situated in Kottayam district. Two plantations are belongs to different regions and one of it is fertilized with chemical fertilizers (DAP-A to Z) and other is fertilized with organic fertilizers (cow dung and rice water). The soil samples of two plantation are collected from four corners of plantations, using a spade, V shape marked on the surface of the soil and dig up to 25 cm, the soil collected from that dig. the soil collected from all the four corners ware mixed, packed and sealed in a plastic cover. The samples brought into the laboratory for examination. We examined the physicochemical parameters, micro and macronutrients of these two plantations and also macro faunal diversity. The analysed physical character is pH, analysed macro nutrients include Nitrogen(N), Phosphorus(P), and Potassium(K) and the micro nutrients include sulphur, iron, zinc, copper, manganese, boron. The results shows a great variation in the amount of micro and macro nutrients of these two plantations from normal range. All the micro nutrients are extremely high from the normal range. The macro fauna of two plantations shows little variations in their number and diversity. The results suggests that the use of chemical fertilizers affect the soil quality and macro fauna diversity.

"SIGNIFICANCE OF DIETARY FIBERS IN DIABETES MANAGEMENT"

Dissertation submitted to the MG University of Kottayam in partial fulfillment of the requirements for the award of the degree of

BACHELOR OF SCIENCE IN ZOOLOGY

APARNA T

(Reg. No. 200021039583)

Under the Guidance of

Dr Sr. Manju Elizabeth Kuruvila

DEPARTMENT OF ZOOLOGY,

ALPHONSA COLLEGE

PALAI-686575, KOTTAYAM

MARCH-2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA, KOTTAYAM -686575, KERALA

(Affiliated to M.G University, Kottayam)

CERTIFICATE

This is to certify that the dissertation entitled "STUDY OF SIGNIFICANCE OF DIETARY FIBERS IN DIABETES MANAGEMENT", submitted to Mahathma Gandhi University for partial fulfilment of the requirements for degree of Bachelor of Science, is a record of bonafide research work carried by Miss. Aparna T under my direct supervision and guidance, in the Department of Zoology, Alphonsa College Pala.

Place : Pala

Date : 05/05/2023

Signature of the Guide Manju 05/05/23

Dr. Sr. Manju Elizabeth Kuruvila

Department of Zoology,

Alphonsa College Palai

Signature of the Examiners

1.

2.

Signature of HOD Manju 05/05/03

Dr. Sr. Manju Elizabeth Kuruvila

ABSTRACT

India is facing a triple burden of pre-diabetes, diabetes, and obesity. Unhealthy eating habits andphysical inactivityhave been linked to the onset and progression of type 2 diabetes mellitus .Higher intakes of dietary fibre are associated with a reduction in premature mortality and incidence of a wide range of non-communicable diseases and their risk factors in the population at large.. The project "significance of dietary fibre in diabetes management" deals with some selected dietary sources which are easily available and fast growing in our surroundings, which are high in dietary fibre contents, and it's about the benefits in terms with diabetes.

"WATER QUALITY ANALYSIS OF THAMARAKULAM POND VALLICHIRA, KOTTAYAM DISTRICT "

Dissertation submitted to the MG University of Kottayam in partial fulfillment of the requirements for the award of the degree of

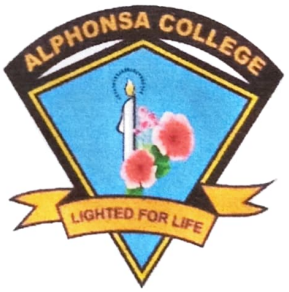
BACHELOR OF SCIENCE IN ZOOLOGY

ASWATHY V

(Reg. No. 200021039584)

Under the Guidance of

Dr Simimol Sebastian



DEPARTMENT OF ZOOLOGY,

ALPHONSA COLLEGE

PALAI-686575, KOTTAYAM

MARCH-2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA, KOTTAYAM -686575, KERALA

(Affiliated to M.G University, Kottayam)

CERTIFICATE

This is to certify that the dissertation entitled "WATER QUALITY ANALYSIS OF THAMARAKULAM POND VALLICHIRA, KOTTAYAM DISTRICT", submitted to Mahathma Gandhi University for partial fulfilment of the requirements for degree of Bachelor of Science, is a record of bonafide research work carried by Miss. Aswathy V under my direct supervision and guidance, in the Department of Zoology, Alphonsa College Pala.

Place : Pala

Date : 05/05/2023

Signature of the Guide

Dr. Simimol Sebastian

Department of Zoology,

Alphonsa College, Pala

Signature of the Examiners

1.

2.

Signature of HOD 05/05/23

Dr. Sr. Manju Elizabeth Kuruvila

ABSTRACT

Water is the main constituent of Earth's hydrosphere and the fluids of all known living organisms All the biochemical processes which occur in plants and animals, our surroundings, etc require water to function. It is required for the existence of life on earth as it is an essential component of all the biological processes. We cannot imagine our lives without the presence of water. The present study is conducted to analyse the water quality of a freshwater pond using selected physico chemical and biological prameters. The study was conducted on the surface water of the Thamarakulam pond situated in the Vallichira Gramapanjayath , Kottayam District, Kerala, India.The pond water was collected and tested on March 18 , 2023 at around 10.45 AM.The sample water was analysed and tested for pH, alkalinity, acidity, nitrate, phosphate, sulphate, Magnesium, MPN count, FC count and E.coli count using the methods mentioned by APHA(APHA).It was found that the acidity and phosphate content were slightly high in the water and the bacterial count was really high indicating human/animal waste contamination. The result indicated that the water is not drinkable and is contaminated due to the anthropogenic activities. The result suggests that the anthropogenic activities around the pond must be restricted and the pond must be protected to improve its water quality.

LEAF GALL INDUCING AGENTS AND THEIR HOST PLANTS

Project report submitted to Mahatma Gandhi University Kottayam, in partial fulfilment of the requirements for the award of Bachelor Degree of Science

SUBMITTED BY:

CHINCHU SABU

Reg No: 200021039585

UNDER THE SUPERVISION OF

Dr. Maya George

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA

2020-2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE, PALA

Affiliated to Mahatma Gandhi University

CERTIFICATE

This is to certify that the dissertation entitled **" Leaf Gall inducing Agents and their Host plants "** is a bonafide work carried out by Miss .Chinchu Sabu, of the department of Zoology, Alphonsa College, Pala, in partial fulfilment of the requirement for the award of B.Sc. Programme in Zoology of M. G. University during the period 2020 - 2023 under my supervision and guidance. This work has not been presented earlier for the award of any other degree.

Place: Pala

Date:

for Dr. Maya George 05/05/23

Assistant Professor

Department of Zoology

Alphonsa College, Pala

Counter singed by,

05/05/23

Dr. Sr. Manju Elizabeth Kuruvila

Head of the Zoology department

Alphonsa College, Pala

DEPT. OF ZOOLOGY PALA ALPHONSA COLLEGE

CERTIFIED GENUINE

ABSTRACT

A gall is a growth of plant tissue that starts with the chemical and/or mechanical stimulus of an organism, which increases the production of plant growth hormones. An insect gall forms due to the response of plant to the insect life cycle starting from egg laying up to adult emergence from the gall. The present study was conducted around Idukki and Kottayam districts. 14 leaf galls were identified from different parts of the study area. Insects and arachinids were observed to be the gall inducing agents. Gall characteristics and their host plants were also studied. Most galls were epiphyllous. The identified gall inducers are: *Pseudophacopteron tuberculatum, Trioza jambolana, Pauropsylla depressa, Apsylla, Asphondyla* and *Contarina*. Gall-inducing insects are restricted to specific plant taxa, some of them, are indicated to be capable of inducing galls on plant species closely related to their most preferred host.

Key words : leaf gall, gall inducer, Epiphyllous gall

STUDY OF OTOLITH IN DIFERENT SPECIES OF FISHES

Dissertation submitted to Mahatma Gandhi University in partial fulfilment of the requirement for the ***Degree of bachelor of science***

By,

GANGA NB

Reg no. 200021039587

Under the supervision of

Dr. Sr. Manju Elizabeth Kuruvila

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE, PALA

2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE PALA, KOTTAYAM -686575, KERALA

(Affiliated to M.G University, Kottayam)

CERTIFICATE

This is to certify that the dissertation entitled "STUDY OF OTOLITH IN DIFFERENT SPECIES OF FISHES", submitted to Mahathma Gandhi University for partial fulfilment of the requirements for degree of Bachelor of Science, is a record of bonafide research work carried by Miss. Ganga N. B under my direct supervision and guidance, in the Department of Zoology, Alphonsa College Pala.

Place : Pala
Date : 05/05/2023

Signature of the Guide Manju 05/05/23
Dr. Sr. Manju Elizabeth Kuruvila
Department of Zoology,
Alphonsa College Palai

Signature of the Examiners

1.

2.

Signature of HOD Manju 05/05/23
Dr. Sr. Manju Elizabeth Kuruvila

ABSTRACT

Otolith composition, shape analysis, age ditermination etc. are reasent developing reaserch field in fisheries and aquaculture. Otoliths or 'ear bones' are small calcified structures found in the head of fish which assist in detecting sound and are used for balance and orientation. The present study deals with comparison of otoliths shapes in different speacies of fishes, and find the corrilation between otolith length and fish length & between otolith width and fish length. Total 12 different fishes were collected 9 of them were marine and 3 of them were fresh water fishes. Length of the fishes were measurd and otolith were collected. Measure the length and width of otolits with vernear calipper. From the otolith picture the outline shapes were taken. The outline of collected otolith were analysed. The reasults revealed that there is a moderate positive corrilation between otolith length and fish length (0.514506). And low corrilation between otolith width and fish length(0.32094). Shape analysis of otolith shows that fresh water fishes tend to be oval and convex in shape and marine fishes did not shows any notable similarity exept they are tend to be flat and some shows prosseses in them. We can identify the fishes with the otoliths shape.

ANALYSIS OF SOIL QUALITY AND IDENTIFICATION OF MACROFAUNA IN TWO PLANTATIONS

Dissertation submitted to the Mahatma Gandhi University is partial fulfilment of the requirements for the award of the degree

Of

BACHELOR OF SCIENCE IN ZOOLOGY

By

NAMITHAKRISHNA RATHEESH

Reg No.200021039589

Under the Guidance of

Dr. Cinnie Susan Antony

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE, PALA

MARCH-2023

CERTIFICATE

This is to certify that the work contained in the dissertation entitled "**COMPARITIVE STUDY ON SOIL QUALITY AND MACRO FAUNA DIVERSITY OF TWO SELECTED PLANTATIONS IN IDUKKI DISTRICT**", submitted to Mahatma Gandhi university for partial fulfilment of the requirements for degree of Bachelor of Science, is a record of bonafide research work carried by Miss. Namithakrishna Ratheesh under my direct supervision and guidance, in the Department of Zoology, Alphonsa College Pala.

Dr. Cinnie Susan Antony
Department of zoology
Supervising Teacher
Department of Zoology
Alphonsa college , Pala

Place: Pala
Date: 5/5/23

Counter signed by

05/05/23

Dr. Sr. Manju Elizabeth kuruvila
Head of the Department
Alphonsa College, Pala

DEPT. OF ZOOLOGY
PALA
ALPHONSA COLLEGE

ABSTRACT

A soil quality analysis is important for several reasons: to optimize crop production, to protect the environment from contamination by runoff and leaching of excess fertilizers, to aid in the diagnosis of plant culture problems, to improve the nutritional balance of the growing media and to save money and conserve energy . This work deals with the study based on Comparative study of soil quality and macro faunal diversity of two selected plantations in idukki district . Two different plantations are selected; ward no.4 under idukki Kanjikuzhy gramapanchayat and ward no. 11, Ayyappankovil Idukki District. Field studies were conducted between February and march 2023.. Soil is collected by digging 15 cm depth. Parametres such as P^H, EC, macronutrirents and micronutrients are selected for observation. The Parametres range and number of macrofauna present in soil depends on the type of fertilizers used. The physico-chemical parametres, P^H and EC show Comparatively same range. The presence of macronutrients like N,K is comparatively higher than the normal range in site 1and site 2 have optimum level value. Micronutrients such us S,Fe,B present in site 1 is comparatively higher than in site 2.Macrofauna is collected by handpicking method and identified from standard books and journals.Total 8 types of macrofauna are present in two plantations .In Banana plantations there are 5 types of macrofauna are found from phylum Arthropoda and Annelida. Three types of macrofauna seen in Cardamom plantation. During the study period earthworms of different species are abundantly seen in site 1 this may be due to the application of natural fertilizers in site 1.The presence of minimum number of species in site 2 may be due to the long term usage of artificial fertilizers in site 2, the natural ability of soil to regulate nutrient level might have been reduced.

COMPARITIVE STUDY OF SOIL QUALITY AND MACROFAUNA OF TWO SELECTED PLANTATIONS

DESSERTATION SUBMITTED TO

MAHATMA GANDHI UNIVERSITY KOTTAYAM

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

BACHELOR OF SCIENCE IN ZOOLOGY

BY

NASRI .U

Reg. No.200021039591

UNDER THE SUPERVISION OF

Dr. CINNIE SUSAN ANTONY

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE

PALA -686574

MARCH – 2023

CERTIFICATE

This is to certify that the work contained in the dissertation entitled "**COMPARITIVE STUDY OF SOIL QUALITY AND MACROFAUNA OF TWO SELECTED PLANTATIONS**" submitted to Mahathma Gandhi University for partial fulfilment of the requirements for degree of Bachelor of Science, is a Record of bonafide research work carried by **Nasri U** under my direct Supervision and guidance, in the Department of zoology, Alphonsa College Pala.

Dr. Cinnie Susan Antony

Assistant professor

Department of zoology

Place:

Date:

Counter singed by 05/05/23

Dr.sr. Manju Elizabeth Kuruvila

Head of the department of Zoology

Alphonsa College Pala

PALAI

ALPHONSA COLLEGE

CERTIFIED GENUINE

ABSTRACT

Soil is the loose surface material that covers most land. It consists of inorganic particles and organic matter. Soil provides the structural support to plants used in agriculture and is also their source of water and nutrients. Soil is a major source of nutrients needed by plants for growth. They vary based on the soil quality, fertilizers used, Ph, etc Soil quality is how well soil does what we want it to do. Here the study where conducted to analysis the soil quality, parameters in soil like micro and macro nutrients availability and its variation, and the factors influencing the soil quality, and also the macro fauna present in the soil. The study location of soil is situated in Malappuram district Urangattiri panchayath which is considered as site 1 and Idukki district Ayyappancoil panchayath was taken as site 2. Two plantation where selected for the study and the selected plantations are tapioca cardamom. This two plantation belongs to two different regions, where one is fertilized with chemical fertilizer and the other is organic fertilizer. In this study we examined the physico-chemical Parameters of the soil, micro and macronutrients of these two plantations and also macro fauna Diversity. In order to collect the soil samples from tapioca plantation and cardamom plantation 500g of soil was taken from each places in 15 cm depth. First removed grasses , Litter and other plant residues from the soil surface and collect soil samples by using soil collection tools . In each case , a triangular block was marked and soil Samples were collected in a plastic bags , which were sealed , and labelled properly . soil samples were brought to the laboratory for analysis . Before analysis , the samples were hot air dried and homogenized , sieved through 2mm sieve to ensure homogeneity . The samples were preserved in clean sealed polythene bags for analysis . The samples brought into the laboratory for Examination. The results shows that soil in both site shows acidic Ph in nature and normal Ec conductivity. Organic carbon is medium in both sites. P&K is less in site 1 and high in site 2. Both sites shows high value of sulphur. Micronutrients like Fe, Zn, Cu, Mn, B are high in both sites. Addition to soil quality macrofauna assessment, macrofauna present in both soil are observe. Macrofauna are collected by handpick method and identified from standard books and journals. The macro fauna of two plantations shows little variations in their number and diversity. The results suggests that the use of chemical fertilzers will affect the soil quality and macro fauna diversity.

ABSTRACT

Soil is the loose surface material that covers most land. It consists of inorganic particles and organic matter. Soil provides the structural support to plants used in agriculture and is also their source of water and nutrients. Soil is a major source of nutrients needed by plants for growth. They vary based on the soil quality, fertilizers used, Ph, etc Soil quality is how well soil does what we want it to do. Here the study where conducted to analysis the soil quality, parameters in soil like micro and macro nutrients availability and its variation, and the factors influencing the soil quality, and also the macro fauna present in the soil. The study location of soil is situated in Malappuram district Urangattiri panchayath which is considered as site 1 and Idukki district Ayyappancoil panchayath was taken as site 2. Two plantation where selected for the study and the selected plantations are tapioca cardamom. This two plantation belongs to two different regions, where one is fertilized with chemical fertilizer and the other is organic fertilizer. In this study we examined the physico-chemical Parameters of the soil, micro and macronutrients of these two plantations and also macro fauna Diversity. In order to collect the soil samples from tapioca plantation and cardamom plantation 500g of soil was taken from each places in 15 cm depth. First removed grasses , Litter and other plant residues from the soil surface and collect soil samples by using soil collection tools . In each case , a triangular block was marked and soil Samples were collected in a plastic bags , which were sealed , and labelled properly . soil samples were brought to the laboratory for analysis . Before analysis , the samples were hot air dried and homogenized , sieved through 2mm sieve to ensure homogeneity . The samples were preserved in clean sealed polythene bags for analysis . The samples brought into the laboratory for Examination. The results shows that soil in both site shows acidic Ph in nature and normal Ec conductivity. Organic carbon is medium in both sites. P&K is less in site 1 and high in site 2. Both sites shows high value of sulphur. Micronutrients like Fe, Zn, Cu, Mn, B are high in both sites. Addition to soil quality macrofauna assessment, macrofauna present in both soil are observe. Macrofauna are collected by handpick method and identified from standard books and journals. The macro fauna of two plantations shows little variations in their number and diversity. The results suggests that the use of chemical fertilzers will affect the soil quality and macro fauna diversity.

COMPARITIVE STUDY OF SOIL QUALITY AND MACROFAUNA OF TWO SELECTED PLANTATIONS

DESSERTATION SUBMITTED TO

MAHATMA GANDHI UNIVERSITY KOTTAYAM

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

BACHELOR OF SCIENCE IN ZOOLOGY

BY

NASRI .U

Reg. No.200021039591

UNDER THE SUPERVISION OF

Dr. CINNIE SUSAN ANTONY

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE

PALA -686574

MARCH – 2023

A COMPARATIVE STUDY TO FIND OUT EFFICIENT MEDIA AND SOIL TYPE FOR VERMICOMPOSTING AND THE COMPETITION AMONG EARTHWORMS

DISSERTATION SUBMITTED TO

THE MAHATMA GANDHI UNIVERSITY KOTTAYAM

IN PARTIAL FULLFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

BACHELOR OF SCIENCE IN ZOOLOGY

BY

NIRANJANA ASHOK

Reg No: 200021039592

UNDER THE SUPERVISION OF

DR. AMBILI T.R.

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE

PALA-686574

MARCH 2023

CERTIFICATE

This is to certify that the dissertation entitled "**A COMPARATIVE STUDY TO FIND OUT EFFICIENT MEDIA AND SOIL TYPE FOR VERMICOMPOSTING AND THE COMPETITION AMONG EARTHWORMS** " is a bonafide work carried out by **NIRANJANA ASHOK** of, the Department of Zoology, Alphonsa College, Pala, in a partial fulfillment of the requirements for the award of B.Sc Programme in Zoology of M.G. University during the period 2020- 2023 under my supervision and guidance. This work has not been presented earlier for the award of any other degree.

Assistant Professor

Dr. Ambili T.R.
Supervising Teacher
Department of zoology
Alphonsa College, Pala

Place: Pala

Date: 5/05/2023

Counter signed by

05/05/23

Dr. Sr. Manju Elizabeth Kuruvila
Head of the Department
Alphonsa College, Pala

DEPT. OF ZOOLOGY
PALA.
ALPHONSA COLLEGE

CERTIFIED GENUINE

ABSTRACT

In this study three soil types (black soil, red soil and sandy soil) and the media (Kitchen waste, organic matter rich soil, newspaper) were selected. The initial number of earthworms in black soil, red soil and sandy soil is 30 and the final number of earthworms in black soil,red soil and sandy soil is 48,15 and 8. The initial weight of earthworms in black soil,red soil and sandy soil is 21g,18.5g,20.6g and the final weight of earthworms is 27g, 8.7g, 4.6g. Therefore in the present study black soil was observed as the most effective soil type for vermicomposting. The initial number of earthworms in the media (kitchen waste, organic matter rich soil and newspaper) are 30. And the final number of earthworms are 55, 49, 30. The initial weight of earthworms in each media (kitchen waste, organic matter rich soil, newspaper)was 20.25g, 20.7g, 19.2g. And the final weight of earthworms were 30g, 26.85g, 16.35g. Therefore in the present study the most effective media for vermicomposting is kitchen waste. For the study of competition among earthworms three pots are taken (P,Q,R). The initial number and weight of earthworms in P is 50 and 36g , in Q 75 and 41.5g and in R, 100 and 60g. In the end, the number and weight of earthworms in P is 77 and 42.5g ,in Q 86 and 47.46g and in R 78 and 43g. When the number of earthworms increases, competition increases. Therefore in pot R more competition occurs and in pot P less competition occurs.

SPIDER DIVERSITY IN ALPHONSA COLLEGE CAMPUS, PALA, KOTTAYAM

Dissertation Submitted to the Mahatma Gandhi University in Partial fulfillment of the requirements for the award of the Degree

of

BACHELOR OF SCIENCE IN ZOOLOGY

By

NIVEDITA HAREESH

REG. NO.: 200021039593

Under the Guidance of

Ms. POORNIMA BABY

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE, PALA

2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE, PALA

Affiliated to Mahatma Gandhi University

CERTIFICATE

This is to certify that the dissertation entitled "**SPIDER DIVERSITY IN ALPHONSA COLLEGE CAMPUS, PALA, KOTTAYAM"** is a bonafied work carried out by Miss. Nivedita Hareesh, of the Department of Zoology, Alphonsa College, Pala in partial fulfillment of the requirement for the award of B.Sc programme in Zoology of MG University during the period 2020-2023 under my supervision and guidance. This work has not been presented earlier for the award of any other degree.

Place: Pala

Date:

Ms. Poornima Baby

Assistant Professor

Department of Zoology

Alphonsa College, Pala.

Counter Signed by:-

05/05/23

Dr. Sr. Manju Elizabeth Kuruvila

Head of the Department

Alphonsa College, Pala

ABSTRACT

The area selected for study belongs to Kottayam district in Kerala. The study period was from January 2023 to March,2023. The selected habitat for the study was the area in the Alphonsa college Pala. Observations was carried out three times a week, especially Saturday and Sunday in morning 7.30 to 9.30 am and evening 4.30 to 5.30 pm. Photographs of spiders were taken using smartphone. In the present study, 11 species of spider belonging to 10 genera and 8 families were recorded from the site surrounding Alphonsa College Pala, Kottayam. The genus Plexippus showed high species diversity. Out of 438 genera reported from Indian Region, 10 genera were collected from Alphonsa College Pala. Maximum generic diversity was found in Lycosidae (3) and Salticidae(2). Lycosidae and Salticidae were the most common families with high number of individuals. Lycosidae was found to be the most diverse family with 3 different species viz, *Lycosa mackenziei*, *Hippasa agelenoides* and *Pardosa pseudoannulata.*

The most abundant families in the study area were found to be Lycosidae and Salticidae consisting of 23 individuals each. Sicariidae, Oxyopidae and Thomisidae were the least represented families with only 1 individual each.

ANALYSIS OF SOIL QUALITY AND IDENTIFICATION OF MACROFAUNA IN TWO PLANTATIONS

Dissertation submitted to the Mahatma Gandhi University in partial fulfilment of the requirements for the award of the degree

Of

BACHELOR OF SCIENCE IN ZOOLOGY

By

SHOMY JAYAN

Reg. No. 200021039594

Under the Guidance of

Dr. Cinnie Susen Antony

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE, PALA

APRIL-2023

CERTIFICATE

This is to certify that the work contained in the dissertation entitled "ANALYSIS OF SOIL QUALITY AND IDENTIFICATION OF MACROFAUNA IN TWO PLANTATIONS", submitted to Mahatma Gandhi university for partial fulfilment of the requirements for degree of Bachelor of Science, is a record of bonafide research work carried by Miss. Shomy Jayan under my direct supervision and guidance, in the Department of zoology, Alphonsa College Pala.

Dr. Cinnie Susan Antony

Department of Zoology

Place: Pala

Date:

Counter signed by, 03/05/23

Dr. Sr. Manju Elizabeth Kuruvila

Head of the Department

Alphonsa Collage, Pala

DEPT. OF ZOOLOGY
PALAI
ALPHONSA

CERTIFIED GENUINE

ABSTRACT

Soil is an independent body in nature with unique morphology from the surface down to the parent material. Different parameter of the soil determines its quality. The objective of this study is to analysis the quality of soil in two selected plantations. Rubber Plantation in Ramapuram Panchayat Kottayam district is considered as site 1 and Banana plantation in Kanjikuzhi Panchayat Idukki district was taken as site 2 .Soil is collected by standard methods. pH, Electric conductivity, Organic carbon, Phosphorous, Pottasium, Sulphur, Iron, Zinc, Copper, Manganese and Boron are the parameters measured. The result showed that, soils in both site shows Acidic pH and Normal electrical conductivity. Organic Carbon is medium in both sites. P&K is low in site 1 and is high in site 2. Both sites shows high value for sulphur. Selected micronutrients like Fe, Zn, Cu, Mn, B are high in both sites. Additional to the soil quality assessment, Macro fauna present in both soils are observed. Soil macro fauna plays an important role in soil fertility. Macrofauna is collected by hand picking method and identified from standard books and journals. Macrofauna present in both samples show similarity. Lasius niger, Spinotarsus colosseus, Lumbricus terrestris are found common in both. Another organism found in site one are Heteronychus , Tenebrio and coptotermes formosanus. In site 2 Orthomorpha coarctata and Eisenia andrei are found in addition. Site 1 shows lower values for almost all parameters when comparing with site 2. It is revealed that artificial fertilizer like Factamfose was used in site 1 and natural fertilizers like cowdung, vegetable wastes etc were used in site 2 by interacting with farmers of respective plantation. The low values in selected parameters shows in site 1 comparing with site 2 may be due to the application of artificial fertilizers in site 1. The nutritive level of site 1 may gradually decrease if such anthropological activities is continuing and it may also affect the soil macrofauna.

Apis mellifera - INTERACTIONS AND ADAPTATIONS

Dissertation submitted to Mahatma Gandhi University in partial fulfilment of the requirement for the
Degree of Bachelor of Science in Zoology.

By,

SONA MARIA CHANDY

Reg No. 200021039595

Under the supervision of

Dr. Maya George

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE, PALA

2023

DEPARTMENT OF ZOOLOGY

ALPHONSA COLLEGE, PALA

ARUNAPURAM, PALA

CERTIFICATE

This is to certify that the dissertation titled "*Apis mellifera*– INTERACTIONS AND ADAPTATIONS " is a bonafide work done by **Sona Maria Chandy**,under my guidance in the department of Zoology,Alphonsa college, pala during the course as partial fulfilment of the requirement for the award of Bsc. Zoology degree in MG University during the period of 2020-2023.

Manju 05/05/23

Dr. Maya George
Supervising Teacher
Zoology Department
Alphonsa college, Pala

Place: Pala

Date: 05/05/2023

Counter signed by,

Manju 05/05/23

Dr. Sr. Manju Elizabeth Kuruvilla

Headof the Department

Alphonsa College, Pala

DEPT. OF ZOOLOGY
PALAI
ALPHONSA COLLEGE

CERTIFIED GENUINE

ABSTRACT

Bees and angiosperms have shared a long and intertwined evolutionary history and their interactions have resulted in remarkable adaptations.

The present study was carried out to study the bee - plant interactions. The bee selected for study was *Apis mellifera*. Five plants were selected for study from different families. The study was carried out for one month from 16th February 2023 to 17th March 2023. The observations were made twice a day per week between two time intervals (7.30 am to 8.30 am and 5.00 to 6.00 pm). Interactions observed between bees and the selected plants are mutualistic interactions. Among the observed plants *Ixora coccinea* have the highest number of bee visits. The highest number of bees were observed at morning time (7.30am - 8.30am). Adaptations observed include specialised hairs and pollen baskets for pollen collection and buzzing sound of the bee. Both the bee and the plant have adaptations for effective pollination.

Keywords: *Apis mellifera*, *Ixora coccinea*, Bee plant interaction