

**A STUDY ON BEE DIVERSITY IN CHRIST
COLLEGE (AUTONOMOUS), IRINJALAKUDA**



**DEPARTMENT OF ZOOLOGY,
CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA
THRISSUR, KERALA – 680 125
APRIL 2023**

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*Project report submitted to the University of Calicut in partial fulfilment of
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BACHELOR OF SCIENCE

IN ZOOLOGY



Sl. No	Group members	Register No.
1	ANNMIYA ANTONY	CCAUSZO002
2	ATHULYA MANIKANDAN P	CCAUSZO003
3	BEEBI HALEEMA P A	CCAUSZO004
4	KRISHNA P S	CCAUSZO025
5	MARIA DAVY	CCAUSZO011
6	MOHAMMED SHAHSAD	CCAUSZO027
7	RAHUL BABU	CCAUSZO031
8	SRUDHI EBY	CCAUSZO033
9	TESSA MATHEW	CCAUSZO034

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DECLARATION

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Date: 24-04-2023

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CONTENTS

Topic	Page numbers
Abstract	1
Introduction	2
Objectives of the study	4
Review of Literature	5
Materials and Methods	7
Observations and Results	9
Discussion	14
Conclusion	15
References	16



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Topic	Page numbers
Abstract	1
Introduction	2
Objectives of the study	4
Review of Literature	5
Materials and Methods	7
Observations and Results	9
Discussion	14
Conclusion	15
References	16



**A STUDY ON BEE DIVERSITY IN CHRIST
COLLEGE (AUTONOMOUS), IRINJALAKUDA**



**DEPARTMENT OF ZOOLOGY,
CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA
THRISSUR, KERALA – 680 125
APRIL 2023**

A STUDY ON BEE DIVERSITY IN CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA

*Project report submitted to the University of Calicut in partial fulfilment of
the requirement for the award of the Degree,*

BACHELOR OF SCIENCE

IN ZOOLOGY



Sl. No	Group members	Register No.
1	ANNMIYA ANTONY	CCAUSZO002
2	ATHULYA MANIKANDAN P	CCAUSZO003
3	BEEBI HALEEMA P A	CCAUSZO004
4	KRISHNA P S	CCAUSZO025
5	MARIA DAVY	CCAUSZO011
6	MOHAMMED SHAHSAD	CCAUSZO027
7	RAHUL BABU	CCAUSZO031
8	SRUDHI EBY	CCAUSZO033
9	TESSA MATHEW	CCAUSZO034

**DEPARTMENT OF ZOOLOGY,
CHRIST COLLEGE (AUTONOMOUS),
IRINJALAKUDA,
THRISSUR, KERALA-680125**

DECLARATION

We, **AnnMiya Antony, Athulya Manikandan P, Beebi Haleema. P. A, Krishna. P. S, Maria Davy, Mohammed Shahsad, Rahul Babu, Srudhi Eby and Tessa Mathew**, do hereby declare that this project report entitled “**Study on Bee Diversity in Christ College (Autonomous), Irinjalakuda**” is a genuine record of project work done by us under the guidance of **Dr. Bijoy C.**, Assistant Professor, Department of Zoology, Christ College (Autonomous), Irinjalakuda, and has not been submitted to any University or Institution for the Award of any Degree or Diploma.

We further declare that results presented in this work and considerations made therein, contribute in general to the advancement of knowledge in science.

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8	CCAUSZO033	SRUDHI EBY	
9	CCAUSZO034	TESSA MATHEW	

Place: Irinjalakuda

Date: 24-04-2023

CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA
DEPARTMENT OF ZOOLOGY



CERTIFICATE

This is to certify that the project work entitled ‘**A Study on bee diversity in Christ college (Autonomous), Irinjalakuda**’ is an authentic record of research work carried out by **AnnMiya Antony, Athulya Manikandan P, Beebi Haleema P A, Krishna P S, Maria Davy, Mohammed Shahsad, Rahul Babu, Srudhi Eby and Tessa Mathew** as the part of B.Sc. practical during the year 2022-2023 and the results of this work has not been presented for the award of any other degree/diploma in any university.

Place: Irinjalakuda

Date: 24-04-2023

Dr. Sudhikumar A. V.

**Head, Department of Zoology,
Christ College, Irinjalakuda**

ACKNOWLEDGEMENTS

Following the successful completion of this project, we would like to express my heartfelt appreciation to the following individuals, without whom the work would not have been possible.

First and foremost, we would like to thank God Almighty for allowing us to complete this project on time and for the favourable circumstances that have resulted.

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CONTENTS

Topic	Page numbers
Abstract	1
Introduction	2
Objectives of the study	4
Review of Literature	5
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9	TESSA MATHEW	CCAUSZO034

**DEPARTMENT OF ZOOLOGY,
CHRIST COLLEGE (AUTONOMOUS),
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THRISSUR, KERALA-680125**

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Abstract	1
Introduction	2
Objectives of the study	4
Review of Literature	5
Materials and Methods	7
Observations and Results	9
Discussion	14
Conclusion	15
References	16



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CONTENTS

Topic	Page numbers
Abstract	1
Introduction	2
Objectives of the study	4
Review of Literature	5
Materials and Methods	7
Observations and Results	9
Discussion	14
Conclusion	15
References	16



**DIVERSITY AND ABUNDANCE OF SPIDERS IN
PERUVANMALA-THRISSUR, KERALA**

*A Project report submitted to the University of Calicut in partial
fulfilment of the requirement for the award of the Degree.*

BACHELOR OF SCIENCE IN ZOOLOGY



SL.No	GROUP MEMBERS	REGISTER NO
1	ALEENA VINCENT	CCAUSZO018
2	APARNA T S	CCAUSZO036
3	HRIDYA DINESH	CCAUSZO008
4	JITHIN K JAYAN	CCAUSZO024
5	MEENAKSHI V KUMAR	CCAUSZO038
6	NEHLA V A	CCAUSZO013
7	NIMISHA P S	CCAUSZO029
8	SONA SHAJI	CCAUSZO014

DEPARTMENT OF ZOOLOGY

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA
THRISSUR-KERALA-680125**

APRIL-2023

CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA
DEPARTMENT OF ZOOLOGY



CERTIFICATE

This is to certify that the project work entitled “**DIVERSITY AND ABUNDANCE OF SPIDERS IN PERUVANMALA-THRISSUR, KERALA**” is an authentic research work carried out by ALEENA VINCENT, APARNA T S, HRIDYA DINESH, JITHIN K JAYAN, MEENAKSHI V KUMAR, NEHLA V A, NIMISHA P S and SONA SHAJI as the part of B. Sc. Syllabus during the year 2022-2023 and the results of this work has not been presented for the award of any other degree/diploma in any University.

Place: Irinjalakuda

DR. SUDHIKUMAR A V

Date:

Head, Department of Zoology
Christ College, Irinjalakud

CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA

DEPARTMENT OF ZOOLOGY



Dr. Sumesh N. V

<http://www.christcollegeijk.edu.in>

Assistant professor (ADHOC)

Email: sumeshvasu14@gmail.com

Mob no: +91 9895280788

CERTIFICATE

This is to certify that the contents of this project work entitled “**DIVERSITY AND ABUNDANCE OF SPIDERS IN PERUVANMALA-THRISSUR, KERALA**” is the original research work done by ALEENA VINCENT, APARNA T S, HRIDYA DINESH, JITHIN K JAYAN, MEENAKSHI V KUMAR, NEHLA V A, NIMISHA P S and SONA SHAJI under my supervision and guidance at the Department of Zoology, Christ College (Autonomous), Irinjalakuda.

I further certify that no part of it has been presented for the award of any other Degree or Diploma.

Place: Irinjalakuda

Date:

Dr. Sumesh N.V

Project Supervisor,



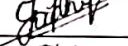





Department of Zoology

Christ College, Irinjalakuda.

DECLARATION

We, ALEENA VINCENT, APARNA T S, HRIDYA DINESH, JITHIN K JAYAN, MEENAKSHI V KUMAR, NEHLA V A, NIMISHA P S and SONA SHAJI do hereby declare that this project report entitled “**DIVERSITY AND ABUNDANCE OF SPIDERS IN PERUVANMALA-THRISSUR, KERALA**” is a genuine record of project work done by us under the guidance of Dr. Sumesh N V., Assistant Professor, Department of Zoology, Christ College (Autonomus), Irinjalakuda, and has not been submitted to any University or Institution for the award of any Degree or Diploma.

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Place: Irinjalakuda

Date:

ACKNOWLEDGEMENT

In the accomplishment of this project successfully, many people have best owned upon us their blessing and heart pledged support, this time we utilized to thank all the people who have been concerned with this project.

There are number of people we would acknowledge whose talents, time and support made this project work possible. We wish to express our deepest gratitude to **Dr. Sumesh N.V**, Assistant professor, Department of Zoology, Christ College (Autonomous), Irinjalakuda for his guidance, advice, criticism, encouragements, and insight throughout the project work. Without his enormous support and guidance this study will not be possible.

We are extending our heartfelt thanks in a special manner to **Rev. Fr. Dr. Jolly Andrews C.M.I.**, Principal, Chrsit college (Autonomous), Irinjalakuda, providing all available facilities for this work. We extend our thanks to **Dr. Sudhikumar A.V.**, Head of the Department of Zoology, Christ college (Autonomous), Irinjalakuda and all other teaching and non-teaching staff of the Department for their suggestions, comments and encouragement during this work. We take this opportunity to thank other teachers, Dr. Leyon Varghese, Dr. Abhilash Peter, Dr. Bijoy C and Dr. Sr. Dilla Jose and lab assistants Mr. Sabu and Mr. Biju of the Department for their assistance and valuable suggestions that helped us to complete this on time.

We convey our heartfelt gratitude towards Cochin Devaswom Board, Thrissur and local people from the premises for collecting specimens from the study area. Last but not least we would like to thank all our sixth semester B.Sc. Zoology classmates. We also extend our heartfelt gratitude to several others who provided encouragement to us but have not been mentioned by their name.

CONTENTS

ABSTRACT	1
INTRODUCTION	2
OBJECTIVES	4
RELEVANCE OF THE STUDY	5
REVIEW OF LITERATURE	6
MATERIALS & METHODS	9
RESULTS	13
DISCUSSION	20
CONCLUSION	23
REFERENCES	24
PLATES	29

**DIVERSITY AND ABUNDANCE OF SPIDERS IN
PERUVANMALA-THRISSUR, KERALA**

ABSTRACT

Spiders are one of the most fascinating and diverse invertebrate animals in the world. They have specific responses to environmental change, and are relatively easy to sample and identify. We studied the spider fauna in Peruvanmala Thrissur District and analyzed the influence of habitat structure on community composition of spiders. The sampling methods such as ground hand picking, aerial hand picking and vegetation beating were used to collect specimens. The collected specimens were preserved in ethyl alcohol and identified. The aim of project is to reveal the diversity and species richness of the area. This study was the first attempt to report the spider assemblage from these ecosystems. The diversity, richness and evenness were calculated using R programme. The study was conducted for a period of 6 months from October 2022 to March 2023. From laterite hills of Peruvanmala a total of 57 species of spiders belonging to 39 genera of 12 families were collected. Among the families collected, *Salticidae* was found to be the most dominant family. This study reveals that species diversity and species richness were found to be high in laterite hill of peruvanmala.

Keywords: Abundance, Diversity, Llaterite hill of Peruvanmala, Spider inventory,

TAXONOMIC STUDIES ON EREBID MOTHS (EREBIDAE: LEPIDOPTERA) FROM THRISSUR DISTRICT

*Project report submitted to the University of Calicut in partial fulfilment of
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BACHELOR OF SCIENCE IN ZOOLOGY



Sl No	Group members	Register No.
1	ANITTA VARGHESE	CCAUSZO001
2	BINDHYA A B	CCAUSZO005
3	DARSANA GOPINATHAN	CCAUSZO006
4	MALAVIKA K V	CCAUSZO010
5	SUMIN SURESH	CCAUSZO016
6	MYDHILY M K	CCAUSZO028
7	SAMEERA JOY	CCAUSZO032
8	YOGA PRATHAP	CCAUSZO039

**DEPARTMENT OF ZOOLOGY
CHRIST COLLEGE, IRINJALAKUDA
THRISSUR, KERALA-680125**

MARCH 2023

CHRIST COLLEGE, IRINJALAKUDA

DEPARTMENT OF ZOOLOGY



CERTIFICATE

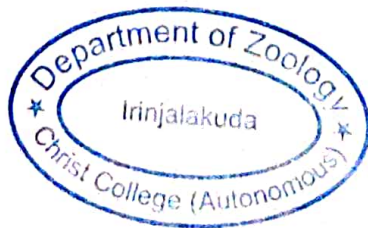
This is to certify that the project work entitled 'Taxonomic Studies on Erebid moths (Erebidae: Lepidoptera) from Thrissur District' is an authentic record of research work carried out by Anitta Varghese., Bindhya A. B., Darsana Gopinathan, Malavika K. V., Sumin Suresh, Mydhily M. K., Sameera Joy and Yoga Prathap as the part of B. Sc. practical during the year 2022-2023 and the results of this work has not been presented for the award of any other degree/diploma in any university.

Place: Irinjalakuda

Date: 17-04-2023

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**Head, Department of Zoology,
Christ College, Irinjalakuda**



CHRIST COLLEGE (AUTONOMOUS)



DEPARTMENT OF ZOOLOGY (DST-FIST)
CHRIST COLLEGE (AUTONOMOUS)
Irinjalakuda
Kerala-680125
India

Dr. Abhilash Peter
Assistant Professor
& Research Supervisor

<http://www.christcollegeijk.edu.in>
E-mail: abhilashpeter@gmail.com
Mob: 09747018791

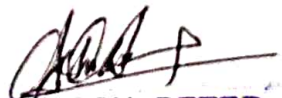
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
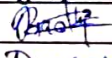
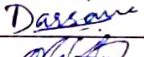



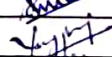
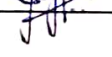

Dr. ABHILASH PETER
Assistant Professor & Research Supervisor
Entomo Lab
Zoology Department (DST-FIST)
Christ College (Autonomous)
Irinjalakuda - 680 125, Kerala



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Sl No	Group members	Signature
1	ANITTA VARGHESE	
2	BINDHYA A B	
3	DARSANA GOPINATHAN	
4	MALAVIKA K V	
5	SUMIN SURESH	
6	MYDHILY M K	
7	SAMEERA JOY	
8	YOGA PRATHAP	

Place: Irinjalakuda

Date: 17-04-2023

CONTENTS

Chapter	Title	Page No.
1	INTRODUCTION	1-3
2	OBJECTIVES	4
3	REVIEW OF LITERATURE	4-6
4	MATERIALS AND METHODS	7-8
5	OBSERVATIONS AND RESULTS	9-17
FAMILY: EREBIDAE		
1.	Genus <i>Anomis</i> Hubner	
	<i>Anomis sabulifera</i> Guenee	
2.	Genus <i>Asota</i> Hubner	
	<i>Asota producta</i> Butler	
3.	Genus <i>Avatha</i> Walker	
	<i>Avatha bubo</i> (Geyer)	
4.	Genus <i>Bastilla</i> Cramer	
	<i>Bastilla arcuata</i> (Moore)	
	<i>Bastilla crameri</i> (Moore)	
5.	Genus <i>Cretonotos</i> Hubner	
	<i>Cretonotos gangis</i> (Linnaeus)	
6.	Genus <i>Euchromia</i> Hubner	
	<i>Euchromia polymena</i> (Linnaeus)	
7.	Genus <i>Olepa</i> Watson	
	<i>Olepa ricini</i> (Fabricius)	
8.	Genus <i>Pangora</i> Moore	
	<i>Pangora matherana</i> Moore	
9.	Genus <i>Syntomoides</i> Hampson	
	<i>Syntomoides imaon</i> (Cramer)	
10.	Genus <i>Ercheia</i> Walker	
	<i>Ercheia cyllaria</i> (Cramer)	
11.	Genus <i>Erebus</i> Latreille	
	<i>Erebus macrops</i> (Linnaeus)	
12.	Genus <i>Sphingomorpha</i> Guenee	

Sphingomorpha chlorea (Cramer)

13. Genus *Spirama* Guenee

Spirama retorta (Clerck)

14. Genus *Eudocima* Billberg

Eudocima hypermnestra (Cramer)

Eudocima phallonia (Linnaeus)

6 **DISCUSSION & CONCLUSION**

18-19

REFERENCES

20-24

**A STUDY ON BEE DIVERSITY IN CHRIST
COLLEGE (AUTONOMOUS), IRINJALAKUDA**



**DEPARTMENT OF ZOOLOGY,
CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA
THRISSUR, KERALA – 680 125**

APRIL 2023

A STUDY ON BEE DIVERSITY IN CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA

*Project report submitted to the University of Calicut in partial fulfilment of
the requirement for the award of the Degree,*

**BACHELOR OF SCIENCE
IN ZOOLOGY**



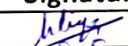
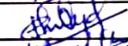
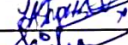


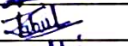
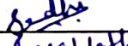

Sl. No	Group members	Register No.
1	ANNMIYA ANTONY	CCAUSZO002
2	ATHULYA MANIKANDAN P	CCAUSZO003
3	BEEBI HALEEMA P A	CCAUSZO004
4	KRISHNA P S	CCAUSZO025
5	MARIA DAVY	CCAUSZO011
6	MOHAMMED SHAHSAD	CCAUSZO027
7	RAHUL BABU	CCAUSZO031
8	SRUDHI EBY	CCAUSZO033
9	TESSA MATHEW	CCAUSZO034

**DEPARTMENT OF ZOOLOGY,
CHRIST COLLEGE (AUTONOMOUS),
IRINJALAKUDA,
THRISSUR, KERALA-680125**

DECLARATION

We, AnnMiya Antony, Athulya Manikandan P, Beebi Haleema. P. A, Krishna. P. S, Maria Davy, Mohammed Shahsad, Rahul Babu, Srudhi Eby and Tessa Mathew, do hereby declare that this project report entitled "Study on Bee Diversity in Christ College (Autonomous), Irinjalakuda" is a genuine record of project work done by us under the guidance of Dr. Bijoy C., Assistant Professor, Department of Zoology, Christ College (Autonomous), Irinjalakuda, and has not been submitted to any University or Institution for the Award of any Degree or Diploma.

We further declare that results presented in this work and considerations made therein, contribute in general to the advancement of knowledge in science.

Sl. No	Register Number	Name	Signature
1	CCAUSZO002	ANNMIYA ANTONY	
2	CCAUSZO003	ATHULYA MANIKANDAN P	
3	CCAUSZO004	BEEBI HALEEMA P A	
4	CCAUSZO025	KRISHNA P S	
5	CCAUSZO011	MARIA DAVY	
6	CCAUSZO027	MOHAMMED SHAHSAD	
7	CCAUSZO031	RAHUL BABU	
8	CCAUSZO033	SRUDHI EBY	
9	CCAUSZO034	TESSA MATHEW	

Place: Irinjalakuda

Date: 24-04-2023

CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA
DEPARTMENT OF ZOOLOGY



CERTIFICATE

This is to certify that the project work entitled 'A Study on bee diversity in Christ college (Autonomous), Irinjalakuda' is an authentic record of research work carried out by **AnnMiya Antony, Athulya Manikandan P, Beebi Haleema P A, Krishna P S, Maria Davy, Mohammed Shahsad, Rahul Babu, Srudhi Eby and Tessa Mathew** as the part of B.Sc. practical during the year 2022-2023 and the results of this work has not been presented for the award of any other degree/diploma in any university.

Place: Irinjalakuda

Date: 24-04-2023

Dr. Sudhikumar A. V.

**Head, Department of Zoology,
Christ College, Irinjalakuda**



**Christ College (Autonomous),
Irinjalakuda, Thrissur- 680 125**

Dr Bijoy C.
Assistant Professor,
Research Department of Zoology,
drbijoyc@gmail.com
Mob: 9895551003

CERTIFICATE

This is to certify that the content of this project work entitled “A STUDY ON BEE DIVERSITY IN CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA” is an authentic record of research work carried out by AnnMiya Antony, Athulya Manikandan P., Beebi Haleema P. A., Krishna P. S., Maria Davy, Mohammed Shahsad, Rahul Babu, Srudhi Eby and Tessa Mathew as a part of the BSc. Project work during the year 2020-2023 under my supervision and guidance at the Department of Zoology, Christ College (Autonomous), Irinjalakuda. I further certify that no part of the work has been presented for the award of any other Degree or Diploma.

Place: Irinjalakuda

Date: 24.04.2023

Dr. Bijoy C.

DR. BIJOY C.
ASSISTANT PROFESSOR & RESEARCH SUPERVISOR
SHADPADA ENTOMOLOGY RESEARCH LAB (SERL)
DEPARTMENT OF ZOOLOGY
CHRIST COLLEGE (AUTONOMOUS),
IRINJALAKUDA, KERALA - 680 125

ACKNOWLEDGEMENTS

Following the successful completion of this project, we would like to express my heartfelt appreciation to the following individuals, without whom the work would not have been possible.

First and foremost, we would like to thank 'God Almighty for allowing us to complete this project on time and for the favourable circumstances that have resulted.

We would like to express our heartfelt gratitude to Dr Bijoy C., Assistant Professor, Department of Zoology, Christ College, Irinjalakuda, for his guidance and for providing necessary advice, for his patience in bearing our ideas, and for all the efforts he made to see this project through to completion. This study would not be possible without his tremendous help and guidance.

We would like to express our gratitude to Dr A.V. Sudhikumar, Head of the Department of Zoology, Christ College Irinjalakuda, as well as all other teaching and non-teaching department personnel, for the suggestions.

We are also grateful to Rev. Dr Jolly Andrews CMI, Principal of Christ College Irinjalakuda, for providing all available resources for this project and his comments and encouragement throughout this work.

We would like to express our heartfelt appreciation to Ms. Anju Sara Prakash, Research Scholar at Shadpada Entomology Research Lab (SERL), Christ College, Irinjalakuda, for the identification of specimens, providing necessary ideas from the start of this project and also in order to complete this project on time. Thank you for all of your assistance.

Finally, we would like to express our gratitude to our family members for their assistance and support during the field trips.

CONTENTS

Topic	Page numbers
Abstract	1
Introduction	2
Objectives of the study	4
Review of Literature	5
Materials and Methods	7
Observations and Results	9
Discussion	14
Conclusion	15
References	16

ABSTRACT

The present study entitled "Bee diversity on Christ College (Autonomous), Irinjalakuda" is an attempt to find the diversity of bees in Christ College campus, to calculate the relative abundance of collected bees and to study the floral interaction of bees. The study was carried out in four sites of Christ College campus, Irinjalakuda, Thrissur district, Kerala. Collection was done on five months from October to February with two collections per month. January has the highest number of bees and October shows the lowest number. According to our study, we observed 12 bee species, Genus *Tetragonula* is the most abundant and Genus *Lasioglossum* is least among them.

COMPARATIVE STUDY OF SPIDER FAUNA FROM TWO SELECTED HABITATS OF THRISSUR DISTRICT, KERALA

*A Project report submitted to the University of Calicut in partial
fulfilment of the requirement for the award of the Degree*

BACHELOR OF SCIENCE IN ZOOLOGY



SL. NO.	GROUP MEMBERS	REGISTER NO.
1	ABHIRAMI E.J.	CCATSZO014
2	ACHUDAS K.D.	CCATSZO002
3	AMAL MICHEL	CCATSZO017
4	ANAGHA K.B.	CCATSZO019
5	ANLITTA JACKSON	CCATSZO003
6	ATHULA T.V.	CCATSZO025
7	KRISHNAPRIYA G.S.	CCATSZO037
8	RIDHIKA PAUL	CCATSZO032
9	SHAHEL A.Z.	CCATSZO033

DEPARTMENT OF ZOOLOGY
CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA
THRISSUR – KERALA – 680125
MARCH – 2022

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA
DEPARTMENT OF ZOOLOGY**



CERTIFICATE

This is to certify that the project work entitled “ **COMPARITIVE STUDY OF SPIDER FAUNA FROM TWO SELECTED HABITATS OF THRISSUR DISTRICT, KERALA**” is an authentic research work carried out by ABHIRAMI E.J., ACHUDAS K.D., AMAL MICHEL, ANAGHA K.B., ANLITTA JACKSON , ATHULA T.V., KRISHNAPRIYA G.S., RIDHIKA PAUL and SHAHEL A.Z. as the part of B.Sc. syllabus during the year 2021-2022 and the results of this work has not been presented for the award of any other degree/diploma in any University.

Place : Irinjalakuda
Date :

Dr. Sudhikumar A. V.
Head, Department of zoology
Christ College, Irinjalakuda

CHRIST COLLEGE (AUTONOMOUS)

DEPARTMENT OF ZOOLOGY
CHRIST COLLEGE (AUTONOMOUS)
Irinjalakuda
Kerala – 680703
India



Dr. Sudhikumar A. V
Assistant professor
Email: avsudhi@rediffmail.com
Mob no : +91 8547553174

<http://www.christcollegeijk.edu.in>

Dr. Sumesh N V
Assis Pr (ADHOC)
sumeshvasu14@gmail.com
+91 9845280788

CERTIFICATE

This is to certify that the contents of this project work entitled “ **COMPARITIVE STUDY OF SPIDER FAUNA FROM TWO SELECTED HABITATS OF THRISSUR DISTRICT, KERALA** ” is the original research work done by ABHIRAMI E.J., ACHUDAS K.D., AMAL MICHEL, ANAGHA K.B., ANLITTA JACKSON , ATHULA T.V., KRISHNAPRIYA G.S., RIDHIKA PAUL and SHAHEL A.Z. Under my supervision and guidance at the Department of Zoology, Christ College (Autonomous), Irinjalakuda.

I further certify that no part of it has been presented for the award of any other degree or diploma.

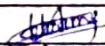
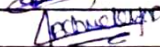

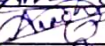
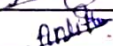
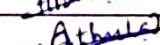


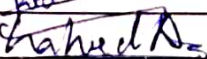
Place : Irinjalakuda
Date :

Dr. Sudhikumar A. V.
Project Supervisor,
Department of Zoology
Christ College, Irinjalakuda

DECLARATION

We, ABHIRAMI E.J., ACHUDAS K.D., AMAL MICHEL, ANAGHA K.B., ANLITTA JACKSON, ATHULA T.V., KRISHNAPRIYA G.S., RIDHIKA PAUL and SHAHEL A.Z. do hereby declare that this project report entitled “COMPARITIVE STUDY OF SPIDER FAUNA FROM TWO SELECTED HABITATS OF THRISSUR DISTRICT, KERALA” is genuine record of project work done by us under the guidance of Dr. Sudhikumar A. V., Assistant professor, Department of Zoology, Christ College (Autonomous), Irinjalakuda, and has not been submitted to any University or Institution for the Award of any Degree or Diploma.

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8	RIDHIKA PAUL	CCATSZO032	
9	SHAHEL A.Z.	CCATSZO033	

Place : Irinjalakuda

Date :

advice

ACKNOWLEDGEMENTS

In the accomplishment of this project successfully, many people have best owned upon me their blessing and heart pledged support, this time ^{we} I am utilizing to thank all the people who have been concerned with this project.

At first, I would like to show my deepest gratitude to the Almighty God whose unbounded rays of blessings enriched my thoughts and deeds and also gave me good health, strength and self-confidence.

There are a number of people I would like to acknowledge whose talents, time and support made this project work possible. I wish to express my deepest gratitude to **Dr. Sudhikumar A. V**, Assistant Professor, Department of Zoology, Christ College (Autonomous), Irinjalakuda for his guidance, advise, criticism, encouragements, and insight throughout the project work. Without his enormous support and guidance this study will not be possible.

We are extending our heartfelt thanks in a special manner to **Rev. Fr. Dr. Jolly Andrews C.M.I.**, Principal, Christ College (Autonomous), Irinjalakuda, providing all available facilities for this work. I extend my thanks to **Dr. Sudhikumar A. V.**, Head of the Department of Zoology, Christ College (Autonomous), Irinjalakuda and all other teaching and non-teaching staff of the Department for their suggestions, comments and encouragement during this work. We take this opportunity to thank other lecturers, **Dr. Leyon Varghese**, **Dr. Abhilash Peter**, **Dr. Sumesh V.** and **Dr. Bijoy C.** and the lab assistants **Mr. Sabu** and **Mr. Biju** of the department for their assistance and valuable suggestions that helped me to complete this on time.

We convey our heartfelt gratitude towards our Research Scholar **Mr. Vishnu Das E. H.** for guiding us throughout our work.

To my parents, I owe a huge debt for their generous financial and emotional support.

Cochin Dewaswam Board ^{local people from} Thirissur for collecting specimens from the study area -

Last but not the least I would like to thank my all classmates of sixth semester B.Sc. Zoology for providing encouragement right up to the end.

There are also several others who provided continuous encouragement to us but have not been mentioned by their name. I extent my heartfelt gratitude to all of them.

CONTENTS

Sl. No.	Chapter	Page number
1	Introduction	2
2	Objective of the study	5
3	Relevance of the study	5
4	Review of literature	6
5	Materials and methods	12
6	Results	16
7	Discussion	22
8	Conclusion	23
9	References	24
10	Plates	

ABSTRACT ✓

Spiders are one of the significant macro invertebrate predators of the ecosystem. They can be found every continent every ecosystem like the darkest caves to the most modern architecture except Antarctica. Wetlands are the pristine ecosystem. The present study deals with the comparison of the spider fauna between a mangrove ecosystem and a paddy field. A total of 57 species belonging to 44 genus and 16 families were collected and identified during the study period. 43 species belongs to 28 genera and 7 families were identified from Pullu kole area. The survey of spiders in Chettuva mangrove ecosystem resulted 57 species from 45 genera in 16 families. In both ecosystems Salticidae found to be the dominant family followed by Araneidae. According to the study mangrove (Chettuva) supports more spiders than the Pullu kole wetlands. Mangroves have more complex floral architecture to support more diverse fauna of spiders whereas, the paddy field is less complex and found to support a less diverse fauna.

Keywords: diversity, arachnid, flora, mangroves, wetland