

# SHADPADA

*ENTOMOLOGY  
RESEARCH  
LAB*



**CHRIST**  
COLLEGE (AUTONOMOUS)  
IRINJALAKUDA, KERALA

**Shadpada Entomology Research Lab (SERL)** is a lab established in 1st August 2019 under Department of Zoology, Christ College (Autonomous), Irinjalakuda, Thrissur, Kerala, India. The main focus of the lab is to conduct Research and provide MSc dissertations, summer trainings and PhD programmes on Taxonomy of Insects, its bio-ecology and diversity. The lab also conducts outreach programmes through identification services, short training programmes, Invited talk series, commemorative day celebrations and various competitions like quizzes and BioBlitz.

**Lab Supervisor: DR BIJOY C.**

Assistant Professor, Department of Zoology

**Area of Specialisation:** Taxonomy and diversity of Insects

**Thrust areas:** Hymenoptera Neuroptera and Orthoptera Taxonomy

- 14 Research Publications in International Peer reviewed and SCOPUS/WOS journals (UGC care list) and 2 proceedings.
- 11 new species, 3 Indian new reports, 3 Western Ghats new reports



- Four Research scholars
- Suryanarayanan T. B. (CSIR fellow), Aswathy P. G. (CSIR fellow), Anju Sara Prakash (CSIR fellow) and Thasnim E. S. (UGC fellow)





## DISCOVERIES & FINDINGS

**Article**

**A new species of *Joguina* Navás, 1912 from India (Neuroptera: Chrysopidae: Chrysopinae)**

SHAUN L. WINTERTON\*, SURYANARAYANAN THANGALAZHIL BALAKRISHNAN, SHYU CHENTHAMARAKSHIAN†

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**Abstract**

A new species of the delicate lacewing, *Joguina* Navás, 1912 (Chrysopidae: Apochrysoidea) is described from the Western Ghats, Kerala, India. A key to species of *Joguina* is presented as well as revised diagnoses of genus, *Joguina* Navás, 1912 *stat. rev.*

**Key words:** Neuroptera, Chrysopidae, Apochrysoidea


**Introduction**

Green lacewings (Neuroptera: Chrysopidae) are a species-rich family divided into three subfamilies: Apochrysoidea and Chrysopinae. Apochrysoidea are numerically the smallest of the three subfamilies (Winterton & Brooks, 2002). They are distinctive for their very broad wings and delicate bodies. Apochrysoidea are commonly called 'exquisite' or 'delicate' lacewings (Fig. 1) (Winterton & Brooks, 2002). Using a phylogenetic framework based on adult morphology, Winterton & Brooks (2002) determined that while *Laminia* and *Joguina* are indeed sister genera, species of *Laminia* in certain distinct generic status. Consequently, *Laminia* is resurrected herein and both genera of their revised status and constituent species. Moreover, a new species of *Joguina* is described from the Western Ghats, Kerala, India and a key to species of *Joguina* is presented.

**Materials and methods**

Wing venation follows Brookkroux *et al.* (2017) as described in Winterton & Gupta (2021) follows Brooks & Hamad (1990). Wing drawings were made from images of type spec. specimens was carried out with Canon T9i digital camera with 100mm F2.8L, as deposited in the Western Ghats Regional Research Centre Zoological Survey of India, Kerala.

Accepted by D. Brookes, 28 Apr. 2021; published: 17 May 2021



A new species of green delicate lacewing discovered from Pudunagaram, Kerala, India and named as *Joguina unimaculata*. The finding was published in *Zootaxa*

**First Record of *Croce filipennis* Westwood, 1841 (Neuroptera: Nemopteridae) from Kerala**


T. B. Suryanarayanan\* and C. Bijoy

Shadpada Entomology Research Lab (SERL), Department of Zoology, Christ College, Irinjalakuda, Thirissur - 680125, Kerala, India; Email: suryanant1995@gmail.com

**Abstract**

The family Nemopteridae with the species *Croce filipennis* Westwood is recorded for the first time from Kerala. Description of the species with the images and the distribution in India is mapped.

**Keywords:** *Croce*, Nemopteridae, Kerala



*Croce filipennis*, only Nemopteridae (Thread winged lacewing) reported from India was recorded for the first time from Kerala. The finding was published in *Records of Zoological Survey of India*

<https://doi.org/10.33307/entomon.v46i3.612>

ENTOMON 46(3): 255-258 (2021)

Short Communication No. ent. 46304


**Record of *Apochrysa evanida* Gerstaecker, 1893 (Neuroptera: Chrysopidae) from the Western Ghats, India**

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**ABSTRACT:** *Apochrysa evanida* Gerstaecker, 1893 belonging to the Chrysopidae family of Neuroptera is reported for the first time from the Western Ghats and Kerala state. The species is described with its distribution.

**KEYWORDS:** Report, *Apochrysa evanida*, Kerala, distribution



A rare vanishing delicate lacewing, *Apochrysa evanida* reported for the first time from Western Ghats. This species is rediscovered after 128 years. The finding was published in *Entomon*

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HALTERES, Volume 12, 22-24, 2021

DOI: 10.5281/zenodo.5528715

**First Record of *Italochrysa japonica* (McLachlan, 1875) (Neuroptera: Chrysopidae) from India**

\*Suryanarayanan T.B. and Bijoy C.

Shadpada Entomology Research Lab, Department of Zoology, Christ College, Irinjalakuda, Thirissur, Kerala- 680125, India.

(Email: suryanant1995@gmail.com)

**Abstract**

The species, *Italochrysa japonica* (McLachlan, 1875) belonging to the Chrysopidae family is recorded for the first time from India.

**Keywords:** *Italochrysa*, Chrysopidae, India.



A rare green lacewing *Italochrysa japonica* (Neuroptera: Chrysopidae) reported for the first time from India. The finding was published in *International journal Halteres*.



## A checklist of bees (Insecta: Hymenoptera: Apoidea) of Kerala

Anju Sara Prakash<sup>1</sup>, T. Jobiraj<sup>2</sup> and C. Bijoy<sup>3</sup>

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**ABSTRACT:** A checklist of bee species from Kerala based on literature survey belonging to three families are listed. Accordingly 86 species of bees under 19 genera are enumerated.  
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**KEYWORDS:** Bee fauna, Apidae, Halictidae, Megachilidae

### INTRODUCTION

Bees are the group of beneficial insects belong to the order Hymenoptera. They are the members of the superfamily Apoidea and are further classified into seven families namely, Apidae, Halictidae, Megachilidae, Andrenidae, Colletidae, Melittidae and Stenotritidae (Michener, 2007). Bees are known for their important role as pollinators in nature since they provide valuable pollination services to many crops and natural vegetations (Free, 1993; Delaplane and Mayer 2000; Michener, 2007; Thakur, 2012). There are 20,473 described species of bees in the world (Ascher and Pickering, 2020). Bees exhibit a wide range of lifestyles from solitary to social (Benton, 2017). Honey bees, bumblebees and stingless bees are social bees. They live in colonies in which the members follow the division of labour.

In India, important works on the taxonomy of the bees were done by Bingham (1897), Jobiraj (2002) conducted studies on the systematics of the bee family Apidae of Kerala. Gupta in 2003 published

an annotated catalogue of bees of Indian region. Saini and Rathor (2012) published an Indian checklist of Halictidae family bees and reported 194 species under 27 genera. In 2017, Pannure and Belavadi published a distributional checklist of subfamily Nominae of South India and recorded 48 species under 13 genera. Sheeja and Jobiraj (2017) conducted studies on the bee fauna of the Vanaparvam biodiversity park, Kozhikode, Kerala and identified 18 species belong to 9 genera. In 2018, Manjusha and Jobiraj published a checklist of Nominae subfamily of Kerala which contains 25 species under 12 genera. Bijoy *et al.* (2019) recorded 19 species of bees belonging to 7 genera from rice ecosystems of Palakkad. In India there are 796 species of bees under 71 genera (Pannure and Belavadi, 2019). The present checklist provides a list of the bee fauna of Kerala.

### MATERIALS AND METHODS

This checklist was prepared entirely based on a literature survey and no specimens are examined for this purpose. Details regarding the bee diversity

\* Author for correspondence



## Diversity of bee (Insecta: Hymenoptera: Apoidea) pollinators of Ash gourd (*Benicassa hispida* (Thunb.) Cogn.) in Malappuram district, Kerala

Anju Sara Prakash, Bijoy C

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### Abstract

A comparative study of radiation characteristics of a polarized switchable microstrip planar array of triangular patch antenna printed on synthesized LiTiO<sub>3</sub> ferrite substrate with a normal magnetic bias field has been done and reporting here. Radiation pattern and some important characteristics of proposed array antenna have been compared with the same geometry printed on RT duroid and silicon. 61% miniaturization and high quality factor are some advantages of using LiTiO<sub>3</sub> ferrite compare to RT duroid. With the biasing of external magnetic field perpendicular to the ferrite substrate arise some tunable behavior which has been elaborated by the generation quasi TEM, magnetostatic and spin waves. In this analysis spin wave exchange term ( $\omega_r$ ) which depends upon the static internal field ( $H_{ex}$ ), has also included in the dispersion formula because the wavelength of microwave approach the inter-atomic distance of ferrite material which is the main cause of generation of spin waves in such types of layered structures.

**Keywords:** ash gourd, bee pollinators, diversity

### Introduction

Ash gourd (*Benicassa hispida* (Thunb.) Cogn.) is a vegetable from the family Cucurbitaceae which have many medicinal properties as well as economic values [1]. This vegetable is grown in tropical and subtropical regions and it contains water, carbohydrate, minerals and vitamins [2]. It has a long storage life and also known by the names wax gourd, white gourd, winter melon, white pumpkin and so on [3]. Ash gourd is monococious and hence it depends on insects for pollination [4]. Bees which belong to the order Hymenoptera of class Insecta are the important group of insect pollinators. They are efficient pollinators of many crops including Cucurbit [5]. To increase crop yield and to ensure propagation of plants, optimum pollination is required [6]. Many studies have been conducted so far regarding the insect pollinators of cucurbits and their effects in pollination and fruit setting. These studies revealed the importance of insect pollinators in these cross-pollinated crops [7, 8]. The flowers of ash gourd attract many insect pollinators. Hence conservation and management of these pollinators are very crucial. Here we conducted a short-term study to know exclusively about the bee pollinators of ash gourd and their diversity in Malappuram district of Kerala.

### Materials and methods

#### Study area

Study was conducted in Pottarakka (11.26755°N, 76.24775°E), a place in Malappuram district of Kerala, India in the months of October and November 2019 and 2020.

#### Collection of bees

Bees were collected between 08.00 am and 03.00 pm, in the 5-5m transect. Observations were made once in each month of study. Bees were collected using sweep nets (10 sweep/5m). Collected specimens were killed using ethyl

acetate and stored in 70% alcohol. Later the specimens were pinned and dried. Identification up to morpho species level was done using published keys.

#### Statistical analysis

Diversity indices were calculated using PAST (Paleontological Statistics Software Package) software version 4.03 [9]. Relative abundance of the species was also determined using the formula,

$$\text{Relative abundance of species } A = \frac{\text{Number of individuals of species } A}{\text{Total number individuals collected}} \times 100$$

#### Results and Discussion

A total of 142 specimens were collected during the study. The collected specimens belong to eleven species under 8 genera. Out of the 8 genera present, 7 belong to family Apidae and only one genus belongs to family Halictidae (genus *Halicta* Latreille). Table 1 provides the month wise data of bees collected from the study area. Highest number of individuals collected from ash gourd flowers belong to genus *Tetragona* Moore (25 individuals). Diversity indices were calculated for species level. The number of species was higher in the month of November 2019 (9 species) and lower in other months (8 species). Total number of individuals collected was also higher in November 2019 (27 individuals) and lower in the month of October 2020 (33 individuals). The Shannon-Wiener index and Simpson's index were also higher in the month of November 2019 (1.997 and 0.8459 respectively) and lower in the month of November 2020 (1.916 and 0.8318 respectively). Evenness was higher in October 2019 and lower in November 2019 (0.8927 and 0.8185 respectively). The diversity indices used in this study are given in table 2. Even though the diversity indices show only slight differences across the study period, it indicates that diversity of bee pollinators of ash gourd is in good state in the study area. Relative abundance of bees collected from ash gourd were

A checklist of bees of Kerala, reported 86 species from 19 genera. The checklist was published in Entomon

A study on grasshopper diversity in the Kole wetland and mangrove ecosystem of Thrissur district. The finding was published in IJER



## Macrohymenopteran diversity in Thommana Kole wetland, Thrissur, India

P.P. Mohammed Anas<sup>1</sup>, Anju Sara Prakash<sup>2</sup>, C. Bijoy<sup>3</sup> and H.E. Syed Mohamed<sup>4</sup>

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**ABSTRACT:** The study conducted on the diversity of macrohymenoptera at the Thommana Kole wetland, Thrissur, Kerala revealed 36 species from 24 genera and 9 families.

**KEYWORDS:** Abundance, Hymenoptera, wetlands.

Wetlands supports rich biodiversity by providing many unique habitats for organisms and hence known as biological supermarkets (Mitsch and Gosselink, 2000). Wetlands in Kerala are very important ecosystems. In 2002, Kole wetlands were declared as Ramsar sites which increased the importance (Jayson, 2018). Kole wetlands are the water-logged, paddy cultivating areas and cover an area of 13,632 ha and spread over the Thrissur and Malappuram districts of Kerala (Jolankutty and Veengopal, 1993).

A study was conducted from October to December 2019 to analyze the relative abundance of macrohymenopteran insects at the Thommana Kole wetland of Thrissur, Kerala. The term macrohymenoptera is followed in this work, which normally includes larger species and with numerous veins in their forewing (Mason and Hober, 1993). Thommana (10° 34'63" N 76° 2'44" E) is a village in Irinjalkuda block in the Thrissur district of Kerala state, India. It is a highly diverse and productive ecosystem. The study site is a part of Marayad Kole, which is a freshwater wetland (Thomas *et al.*, 2003). Line transect method was used to survey

the study site. The macrohymenoptera were collected by using a sweep net and by handpicking. Periodic collection of macrohymenoptera was done twice a month, taken in the morning from 8.00 am to 11.00 am. Ethyl acetate was used for killing the collected specimens. The killed specimens were dried and preserved for further study. Liquid preservation is used for the temporary storage of ant specimens until the specimens were card mounted for species identification. 70% ethanol is used as preservation fluid. The specimens were kept in small vials filled with alcohol, labelled and checked periodically. The specimen as such and its photographs were taken for identification. Identification was done up to the maximum possible level with the help of hymenoptera experts.

Altogether 36 species belonging to 24 genera and 9 families of macrohymenoptera were recorded during the period of study. Fig. 1 represent number of individuals collected from each genus. Families include Halictidae, Apidae and Megachilidae of bees; Vespidae, Scolidae, Ichneumonidae, Mutillidae and Sphecidae of wasps and Formicidae of ants. Specimens were identified to

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A study on the macrohymenopteran diversity of Thommana Kole wetland, Thrissur. The finding was published in Entomon



## First report of the cuckoo wasp *Chrysidea falsa* (Hymenoptera) from India

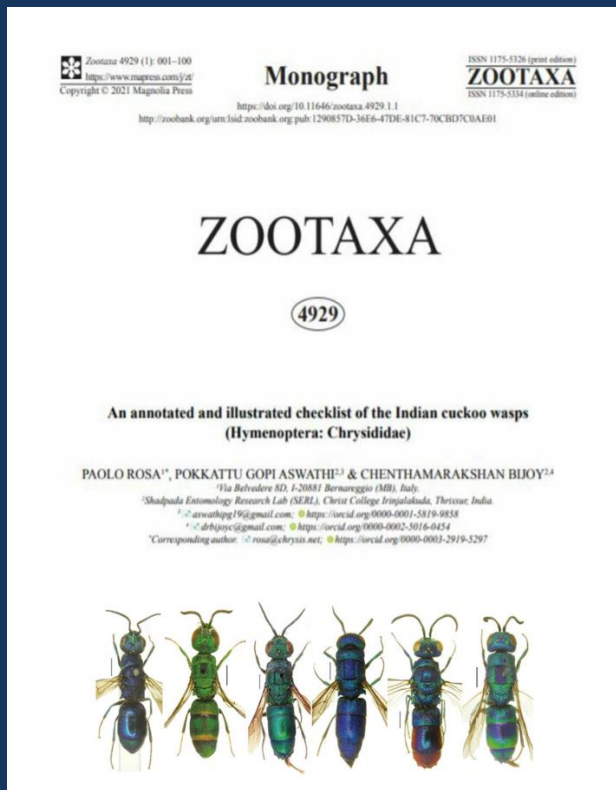
According to Kimsey & Bohart (1991), Rosa & Xu (2015), and Rosa *et al.* (2021), only two species of *Chrysidea* Bischoff, 1913 have been reported from India: *C. furiosa* (Cameron, 1897) from West Bengal and *C. pumila* (Klug, 1845) from Maharashtra (Bingham 1903). Here, we

Photomicrographs were taken with a Leica DMC4500 digital camera mounted on a Leica DM205 C stereo microscope. The image of the entire body was taken using a Canon 7D Mark II digital camera with 100mm F/2.8L macro lens. Specimens were identified using the original description by Rosa & Xu (2015). The specimens are deposited in the entomological collection of Shadpada Entomology Research Lab (CCSERLC), Christ College, Irinjalkuda,



A rare cuckoo wasp, *Chrysidea falsa* reported for the first time from India. The findings were published in the International Journal Taprobanica.

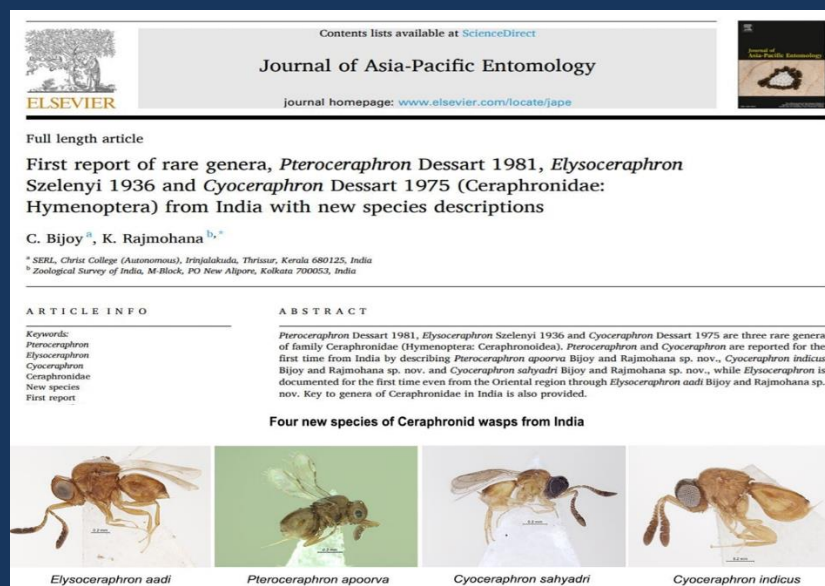




A monograph of Indian cuckoo wasps was published in Zootaxa. 105 species of cuckoo wasps were included in this annotated and illustrated checklist. Six species new to science were discovered



A rare mantid lacewing *Mantispa indica* reported for the first time from Western Ghats. The finding was published in International Journal of Threatened Taxa



Description of four new species of poorly known family Ceraphronidae collected from different localities of Southern Western Ghats of India published in JAPE. Species are *Pteroceraphron apoorva* sp. nov., *Elysoceraphron aadi* sp. nov., *Cyoceraphron indicus* sp. nov. and *Cyoceraphron sahyadri* sp. nov. This work forms the first report of Palearctic genus *Elysoceraphron* from the Oriental region; Nearctic genus *Pteroceraphron* from India; Oriental and Afrotropical genus *Cyoceraphron* from India.



**Diversity of bee (Insecta: Hymenoptera: Apoidea) pollinators of Ash gourd [*Benincasa hispida* (Thunb.) Cogn.] in Malappuram district, Kerala**

Anju Sara Prakash, Bijoy C

Shadpada Entomology Research Lab (SERL), Department of Zoology, Christ College (Autonomous), Irinjalakuda, Kerala, India

**Abstract**

Eleven species of bees under 8 genera were collected from flowers of ash gourd [*Benincasa hispida* (Thunb.) Cogn.] from Malappuram district of Kerala, India. Out of the 8 genera present, 7 belong to family Apidae and the highest number of individuals belong to genus *Tetragonula* Moure. Diversity of bee pollinators of ash gourd in the study area is in a good state.

**Keywords:** ash gourd, bee pollinators, diversity

**Introduction**

Ash gourd [*Benincasa hispida* (Thunb.) Cogn.] is a vegetable from the family Cucurbitaceae which have many medicinal properties as well as economic values [1]. This vegetable is grown in tropical and subtropical regions and it contains water, carbohydrate, minerals and vitamins [2]. It has a long storage life and also known by the names wax gourd, white gourd, winter melon, white pumpkin and so on [3]. Ash gourd is monoecious and hence it depends on insects for pollination [4]. Bees which belong to the order Hymenoptera of class Insecta are the important group of insect pollinators. They are efficient pollinators of many crops including Cucurbits [5]. To increase crop yield and to

(Paleontological Statistics Software Package) software version 4.03 [10]. Relative abundance of the species was also determined using the formula,

$$\text{Relative abundance of species A} = \frac{\text{Number of individuals of species A}}{\text{Total number individuals collected}} \times 100$$

**Results and Discussion**

A total of 142 specimens were collected during the study. The collected specimens belong to eleven species under 8 genera. Out of the 8 genera present, 7 belong to family Apidae and only one genus belongs to family Halictidae (genus *Halictus* Latreille). Table 1 provides the month wise data of bees collected from the study area. Highest number

Study on the diversity of bee pollinators of Ash gourd in Malappuram district, Kerala published in the international journal of Entomology Research



**Far Eastern Entomologist**

Number 433: 13-17

ISSN 1026-051X (print edition)  
ISSN 2713-2196 (online edition)

June 2021

<https://doi.org/10.25221/fee.433.2>

<http://zoobank.org/References/228A210B-4FDE-41FA-AAB5-ADBD0ABE1BE1>

**FIRST RECORD OF THE FAMILY LIOPTERIDAE (HYMENOPTERA: CYNIPOIDEA) FROM INDIA**

**K. Rajmohana<sup>1,\*</sup>, C. Bijoy<sup>2</sup>, S. Patra<sup>1</sup>**

1) Zoological Survey of India, PO New Alipore, Kolkata-700053, India. \*Corresponding author, E-mail: mohana.skumar@gmail.com

2) SERL, Christ College (Autonomous), Irinjalakuda, Thrissur, Kerala-680125, India.

**Summary.** Family Liopteridae (Hymenoptera: Cynipoidea), an archaic group of parasitoid wasp, is reported from India for the first time. *Paramblynotus annulicornis* Cameron, 1908 is found in the Great Nicobar Island. The specimen from India is re-described and illustrated.

**Key words:** parasitoid wasps, Liopteridae, fauna, new record, Great Nicobar Island, Oriental region.


Recorded *Paramblynotus annulicornis* for the first time from India. This is the first record of the family from the country. Work published in Far Eastern Entomologist




## EXTENSION ACTIVITIES

**CHRIST COLLEGE (AUTONOMOUS)**  
IRINJALAKUDA


**SHADPADA ENTOMOLOGY RESEARCH LAB (SERL),  
DEPARTMENT OF ZOOLOGY**  
is organizing an  
**INTERNATIONAL WEBINAR**




**RESOURCE PERSON**  
  
**Dr. K. B. Rebijith**  
Senior Scientist  
Ministry of Primary  
Industries (MPI)  
Auckland

**Topic:**  
**'Perspective of Molecular  
approaches in Entomology'**

**17 September 2020**      **Time: 11 am IST**

**CONVENER**  
  
**Dr. C. O. Joshi**  
Vice Principal  
Associate Professor & Head  
Department of Zoology  
Ph: 9847908357

**ORGANIZING SECRETARY**  
  
**Dr. Bijoy C.**  
Assistant Professor  
Department of Zoology  
Ph: 9895551003

**Shadpada Entomology Research Lab (SERL),  
Department of Zoology**  
invites you to

**Meet the  
Taxonomist**

**Dr. Sajad Hussain Pary**  
Expert on Indian Trichoptera (Caddisflies)

**22 FEBRUARY 2021- 11 AM  
ZOOLOGY LAB**

For more details contact:  
Programme Coordinator Dr. Bijoy C

Convener: Dr. C. O. Joshi, HoD, Department of Zoology




**CHRIST COLLEGE (AUTONOMOUS),  
IRINJALAKUDA**

**BIODIVERSITY CLUB  
and  
SERL, DEPARTMENT OF ZOOLOGY**

is organising a talk on  
**THE BUZZ ABOUT BEES**  
in connection with  
**WORLD BEE DAY 2021**

  
**RESOURCE PERSON**  
**Ms. ANJU SARA PRAKASH**  
PHD. SCHOLAR, SERL  
DEPARTMENT OF ZOOLOGY  
CHRIST COLLEGE, IRINJALAKUDA

**on May 20  
3 pm - 4 pm**

Register through the link given below  
<https://forms.gle/hz7uDupEfiWPNud26>

FOR MORE DETAILS CONTACT  
DR BIJOY C - 9895551003  
BIODIVERSITY CLUB COORDINATOR




YOUNG NATURALISTS KERALA

YNK presents

**ഇമ്മിണി ചെറിയൊരു ആന:-  
കുഴിയാനയും  
കുഴിയാനതുമ്പികളും**

7:30 pm Google Meet

**2021  
08 JUNE**

  
**Suryanarayanan**  
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**DEPARTMENT OF ZOOLOGY**  
**ST.ALOYSIUS COLLEGE,ELTHURUTH**

**ALUMNI ONLINE LECTURE SERIES - 3**

**OUTLOOK ON TAXONOMIC  
COLLECTION AND VALUES**



**Speaker**

SURYANARAYANAN T. B  
Research scholar, Shadpada,  
Entomology Research lab  
Department of Zoology,  
Christ college, Irinjalakuda



SEPTEMBER 24/2021  
10 AM

Head of the Department  
Dr.Jeeja Tharakan

Programme Coordinator  
Ms . Thulasi Venugopalan  
Dept.of zoology

**ഷഡ്‌പദങ്ങളുടെ  
അത്ഭുത ലോകം**



**Sri.BIJOY**  
(CHRIST COLLEGE IRINJALAKUDA)

സാന്നിദ്ധ്യം



Coordinator :  
**Sri Sudeesh P N**

Sri. Suresh N D  
DEO Irinjalakuda



Nov. 28, 2021  
4 PM  
Sunday

**Gifted Children Programme  
Irinjalakuda**



**Christ College (Autonomous), Irinjalakuda**  
Biodiversity Club and SERL, Department of Zoology



WORLD BEE DAY 2021

**BEE  
MONITORING  
PROGRAMME**

ON  
**MAY 21**  
Observe bees of your backyard  
and take photos of different  
bees along with flowers.

Those who send more  
diverse bee photos  
will be the winner

For more details contact:  
Dr Bijoy C. (Coordinator, Biodiversity Club):  
985551003

Send your entries along with your name, class and contact number to  
[biodiversityclubchristijk@gmail.com](mailto:biodiversityclubchristijk@gmail.com) on or before 21 May 2021, 6 pm



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