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**KRUMITHURU**  
INSECTS OF SRI LANKA

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A meeting with a Butterfly : Common Jezebel



Moths of Sri Lanka : An introduction



Natural Super String : A tale of a Spider



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## What is BCSSL

Butterfly Conservation Society of Sri

Lanka is a non-government,

non-profit organization that was

established to create awareness and

connection between insect fauna

and humans, mainly specializing

about the Lepidoptera species of the

island. The society consists of

scientists, as well as enthusiasts who

are spread around the country and

throughout the world, spreading

knowledge and awareness in

conservation of Lepidoptera, other

insect fauna and the flora groups

related with their ecosystems.

Reverberating it was in my ears, the buzz, buzzz, buzzzz of the bees over the hedges, hoarding the gold from one flower after the other, adorned with a jacket of gold carefully bejeweled with blobs of pollen. Mornings are indeed busy with the bees, the butterflies, the beetles and the kind, all headed their merry way helping the plants grow in their wake. It's the new buzz I say, pollinators are on their way.

“Pollination”, and “pollinators” are two words that has not been given due recognition or importance in the human psyche, as much as the word “photosynthesis”, which could be the only word that may be more important than the first two. What is it that makes these three words so important that not only the survival of the humankind but most of the life on planet earth as we know it today, dramatically hinges on them, but we as the most consciously destructive beings, are blissfully ignorant of them?

Let's just first take the word “Photosynthesis”, this is the single most important word that defines or describes the single most unique activity that happens on planet earth that provides most of the carbon based life forms their most basic need, “Oxygen”, to breath and then the food in various forms, so the man as well as all other life forms will go on to live by using the energy by burning the food that we consume that's been supplied by the plants. Those are the true elixirs of life that through millions of years have provided and sustained life on earth that we've come to take for granted.

The single most important entity that facilitates this photosynthesizing activity on planet earth is the plants with chlorophyll. Now..., without plant life in its all glory, in the forms of lichens to giant Sequoia Redwood trees and every imaginable way to make a living, are the only viable beings, to date that has been able to give a viable supply of Oxygen to the atmosphere of planet earth.

Actually, for plants, the Oxygen generation is the waste of their self-sustaining lifestyle that they have evolved into but how do the plants manage to reproduce and ensure their line of generations and ensure the survival of their species is another story. In order for them to maintain a diverse gene pool along with a mix of hereditary traits as well as survival mechanisms,

most of plants that thrive today has invested themselves highly on inventing a special apparatus called a flower which poses either as the male and female components necessary for germination in a single unit or as male and female separately on separate plants of the same species. But the biggest problem of the plants is that they are pretty much immobile compared to the other life forms that have found much interesting ways to get their genes mixed up and ensure the creation of the next generation. Now, this is where the beautiful Butterflies and busy Bees come in to the story and fit into the words, Pollination and Pollinators. Butterflies, Bees and few other insects as well as some others are being lured into the flowers by the plants by way of true offerings or by deception. Whichever way, pollinators had for few million years had ensured the pollination of the flowers so the plants can produce their seeds full of nutrients, some coated with various sugars that have become the staple diet of many including humans.

Among all the beasts, insects have become the hardest hit in a “war” unleashed by man thorough their chemical weapons, because a handful have come into conflict with human welfare. A conflict that was created by man itself with the monocultures, urbanization and reintroduction to name a few. If this is to continue forever not many beasts are going to linger on for the future to continue a cycle created meticulously over many billion years.

The mornings have come to be insipid, now more than ever, fading into the oblivion little by little. Bees that frolic around buzzing in delight over the flowers to beetles that hover sprinkling a trail of pollen around the forests, will soon not be there anymore to greet us on our walks that led to great adventure. Soon it will be still forever with no bird to chirp, frog to wribbit and fish to flop through the rivers. So, there it is, plants produce oxygen we breath, and food we eat and produce our energy and the butterflies and bees are the vital link that keep this amazing relationship alive and well. So, if by any chance, someone is to take the Butterflies and the Bees out of this equation, which slowly but surely is happening right now, by the very beings that their lives depends on them, by an ungrateful and ignorant species called human's moribund is not going to be pleasant. It's about time we bring our prudence back.

# President's message

Dear Valuable Members,

In the year of 2013, a group of dedicated people dreamed about a coalition of scientist, conservationist and thousands of inspired people for a journey towards the conservation of butterflies. Today, this dream is becoming a reality and a fruitful product of this attempt is on your hands right now, in front of your eyes. I would unpretentiously say that we, together, were lucky enough to be a part of this mission. And this is a beginning of another hopeful year...!

**The Butterfly Conservation Society of Sri Lanka** is a growing tree where its base is standing on the hearts of young spirits. We, as pioneers of conserving Lepidopteron and other insects in Sri Lanka, play an immense role through multiple strategies to raise the interest, enthusiasm and finally towards action for protecting the insect fauna in the natural environment. Frequent request for creating butterfly friendly gardens and demand for conducting public and institutional environmental awareness activities are showing us how these efforts have succeeded.

We all know that the insects, which are essential parts of the ecosystem, are acting as vital pollinators and as a major food source for insectivores birds, bats and amphibians while some insects prey upon pest species. Today, they are declining due to habitat destruction, intense use of pesticides and environmental pollution, which have driven to loss of all kinds of insects including elegant butterflies, dragonflies and wild bees. This may cause a catastrophic collapse of nature in the near future. Even with recent outbreaks of invasive insects in Sri Lanka, unintentional controlling methods have caused unfortunate consequences to our non-target organisms.

Securing the value of insects requires immediate action in several areas, including agriculture, biodiversity conservation, land use planning, pesticide regulation and climate change.

However, promoting conservation activities is a challenge, in a country like Sri Lanka, where the majority is focusing on conventional education rather than gaining knowledge on natural environment. On the other hand, a trending force for protecting environment is emerging with the involvement of various organizations and volunteers. Under this platform, BCSSL gather people through monthly lectures, public awareness programs, student workshops, school programs and field visits to share our knowledge and to lead the membership to understand the importance of protecting these small creatures for the wellbeing of the entire ecosystem. **"Krumithuru"** is a precious chapter within all these efforts.

I take this opportunity to thank all our amazing founder members, general members and supporters those who gave hands during our activities and events. And we are grateful to you for being with us throughout these years and hoping to strengthen the bond in the future as well. We invite awaiting enthusiasts to join with us in knowledge sharing and for exciting field expeditions to learn and to pass this message now and for generations to come.

***"The nature decides everything, whether to wipe off or take care of mankind. Be a part of the survivals."***

*Happy Butterflying...!!!  
Narmadha Dangampola*

*Dear Members,*

Environmental conservation is a sensitive subject in this day and age. We hear of deforestation, oil spills and elephant deaths every single day, but a lot of people out there are talking about putting an end to it as well. May it be about saving the forests, about animal rights or about plastic in the oceans. But conserving something just for the sake of it will not end up well. You can't conserve something if you don't have a clear idea of why it needs to be conserved and how it should be done. The conservation efforts taken at one country wouldn't suit another. A threatened species of flora planted in the wrong habitat could destroy ten other species in its wake. You cannot ask fishermen to not go fishing just because an endangered species of fish happen to be their frequent by catch. And you cannot just go on and abolish tourism to save the pristine beaches.

Conservation is about coexisting as much as it is about protecting. The world population is increasing as we watch, and our needs are only going to escalate over time. This is why awareness is vital. BCSSL is set out on a mission to educate people on the importance of the smaller living beings around us - the insects - the ones that are often put aside as "bugs". The newsletter "Krumithuru" was initiated on the same purpose - to give our message to the society in a different manner and to provide our members with an opportunity to share their knowledge while making use of their creative skills. I wish the best of luck to the editorial team, and hope that "Krumithuru" will take us one step ahead in our mission.

*Thank You...!!!  
Ruwangika Gunawardana*

**The Annual General Meeting** of the Butterfly Conservation Society of Sri Lanka was successfully held on 09th of February 2019 at Meteorology Department auditorium. The invited guest speaker was the eminent botanist and researcher, Prof. Siril Wijesundara, from National Institute of Fundamental Studies. In the lecture titled "Plant distribution in Sri Lanka", he explained about the major floristic zones, the positive forces that influence the distribution of plants and the conservation status of the Sri Lankan flora.

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Ms. Upekshika Jalathge  
Mr. Tilan Hasaranga

# Meet the locals

## Common Jezebel (*Delias eucharis*)

*Delias eucharis* (Drury, 1773), “Common Jezebel” is one of the most abundantly available, astonishingly beautiful species of butterflies in the island. They flutter their wings all year-round through sea level to mid mountains, urbanized and agricultural areas but occasionally in denser forests. Since cultivated soft wooded and rough barked trees like Mango and Cashew supplies the best spots for mistletoe species to grow and as it is the feeding plant of the larvae of the Common Jezebel, they have widely distributed in anthropogenic landscapes. According to the National Red List 2012 of Sri Lanka (Moe, 2012), the species conservation status has been described as the “least concern”.

Adult hindwing underside is characterized by bright yellow color with a series of teardrop shaped vermilion red spots along the outer margin. This aposematic coloration warns predator about the poisonous substance in their bodies. Typically, the upper side is white color with defined black veins. Both male and female look similar except that the forewing apex of the female is more rounded and the veins are heavily lined with black. The wingspan of this delicate beauty is about 65-75 mm. Painted Sawtooth - *Prioneris sita* (C. & R. Felder, 1865) is the only similar species to Common Jezebel in the island who is very similar in color pattern except for the orange, columnar marginal spots on hind wing underside instead of vermilion teardrop pattern. Further, males of Painted Sawtooth are often seen mud puddling by the sides of wet mud patches, while Common Jezebel never does. It adorns many gardens by visiting plants with shorter corolla tubes like; *Duranta erecta*, *Stachytrapheta* sp., and *Lantana camera*. Having a shorter proboscis limits their nectaring and that is greatly overcome by flying early and late to access the nectar of flowers which bloom first and very late in the day. Females lay their eggs in clusters which is an uncommon habit for a butterfly species. They lay eggs on mature leaves of mistletoe species like; *Dendrophthoe*

*ligulatus*, *Dendrophthoe falcata* and *Taxillus cuneatus*. Recently laid eggs look two toned, with yellow lower half and a translucent white color at the top. However, after the completion of day one, they completely turn yellow. Emerging larvae feed gregariously on mature leaves in



a well synchronized manner until the larvae are ready to pupate. The larvae are avoided by birds, while most of the laid egg batches and larvae are tremendously /frequently destroyed by parasitic wasps. Other than that, the heavy wind can also be a threat by dislodging the larvae from tree canopies. To overcome this phenomena, the larva has adopted a clever mechanism which is putting out a sticky silk thread from its spinnerets while it falls and the thread helps the larva to get back to where it was. In the final larval stage, they start to roam around finding a suitable surface for pupation. Their chrysalis is brightly yellow in color with black defining areas of spots on tubercles.



(a). Jezebel Eggs (b). Jezebel Larvea (c). Jezebel Pupa

### References:

- Environment, M. o., 2012. The National Red List 2012 of Sri Lanka; Conservation Status of the Fauna. Colombo: Biodiversity Secretariat of the Ministry of Environment and National Herbarium.
- Jayasinghe, H. D., 2015. Common Butterflies of Sri Lanka. Colombo: Ceylon Tea Services PLC.
- Van Der Poorten, G. M. & Van Der Poorten, N. E., 2016. The Butterfly Fauna of Sri Lanka. Canada: Lepdon Books.

# Meet the locals

## Larval Food Plants of Jezebel (*Delias eucharis*)

Jezebel is one of the most common butterflies found in South Asian region such as Sri Lanka and India. The larval food plants of Jezebel mainly belong to Family Loranthaceae known as “Mistletoes” (in Sinhala commonly known as “පිලිලා” -Pilila) and Family Santalaceae (Sandalwoods). However in Sri Lanka, the early stages of Jezebel were only found on members belong to Family Loranthaceae, while in India they have been recorded on partially parasitic plants belong to Family Santalaceae.

**Family Loranthaceae :** The widespread distribution and abundance of Jezebel in the country is closely related to abundance of its larval food plant. Plants of family Loranthaceae spread across the lowland wet zone, Intermediate zone, dry zone and the montane region including the urban areas of the country even at the sea level. This family comprises mostly aerial hemiparasitic plants, the plants that photosynthesize up to some degree and partially obtain water and minerals from the host plant.

Loranthaceae, like nearly all mistletoes, are highly dependent on a biotic agent for pollination (Eg: in Sri Lanka, especially by Sunbirds). Bird-pollinated flowers in Loranthaceae display contrasting colors, such as red, orange, yellow, green and even black. All aerial Loranthaceae have sticky seeds, an essential adaptation that allows reaching a suitable substrate through dispersal vectors such as birds (Eg: Flowerpeckers) and attachment to the host branch. Later, the germination begins and an internal root-like structure that penetrates and establishes a connection to the host xylem to obtain food from the host system. In Sri Lanka, these mistletoes grow well on rough barked trees and are commonly found on a range of host plants such as *Mangifera indica* (Mango), *Albizia sp.*, *Persea americana* (Avocado), *Punica granatum* (Pomegranate) and on a variety of Citrus sp.

Total of 21 species of plants belong to family Loranthaceae have been recorded from Sri Lanka including 11 endemics. Out of those, followings are the mistletoes species which have been recorded as the food plants for Jezebel larval so far. However, they probably use other members of Loranthaceae as well.

<i>Dendrophthoe falcate</i>	<i>Scurrula parasitica</i>
<i>Dendrophthoe ligulatus*</i>	<i>Taxillus cuneatus</i>
<i>Dendrophthoe neelgherrensis</i>	<i>Taxillus tomentosus</i>
<i>Scurrula cordifolia*</i>	

\*Endemic



(a) *D. falcate* (b) Flowers of *D. neelgherrensis* (c) Flowers of *D. ligulatus*  
(d) Fruits of *D. falcate*

Photographs by Himesh Dilruwan Jayasinghe

Interestingly, the Gaudy Baron (*Euthalia lubentina psittacus*) and Peacock Royal (*Tajuria cippus longinus*) are also using some of these Loranthaceae species as their larval food plants. However, they occupy different ecological niches to reduce the competition and to share the resources, which the Gaudy Baron larvae are adapted to feed on well-matured leaves and Peacock Royals on leaf buds while the Jezebels feed on partially mature leaves.

References:

- [http://www.slbutterflies.lk/explore/butterfly/Delias\\_eucharis](http://www.slbutterflies.lk/explore/butterfly/Delias_eucharis)
- Nitin, R., Balakrishnan, V.C., Churi, P.V., Kalesh, S., Prakash, S., Kunte, K. (2018). Larval host plants of the butterflies of the Western Ghats, India. *Journal of Threatened Taxa*. 10(4). pp 11495-11550.
- Russel, R.V., & Nickrent, D. L. (2008) Evolutionary Relationships in the Showy Mistletoe Family (Loranthaceae). *American Journal of Botany*. 95(8). pp 1015-1029.
- Van der Pooten, G.M. & van der Pooten, N. E. (2016) The Butterfly Fauna of Sri Lanka. Lepodon Books. pp 243-244, 332.
- Yapa, S.S., Mohotti, A.J., Seneviratne, M.A.P.K., Peiris, B.L., Tennakoon K.U. (2018) Prevalence of Mistletoes in Fruit and Timber Trees in the Wet and Intermediate Zone of Sri Lanka. *Short Communication. Tropical Agricultural Research*. 29 (4). pp 330 - 340.

# Moths of Sri Lanka - an Introduction

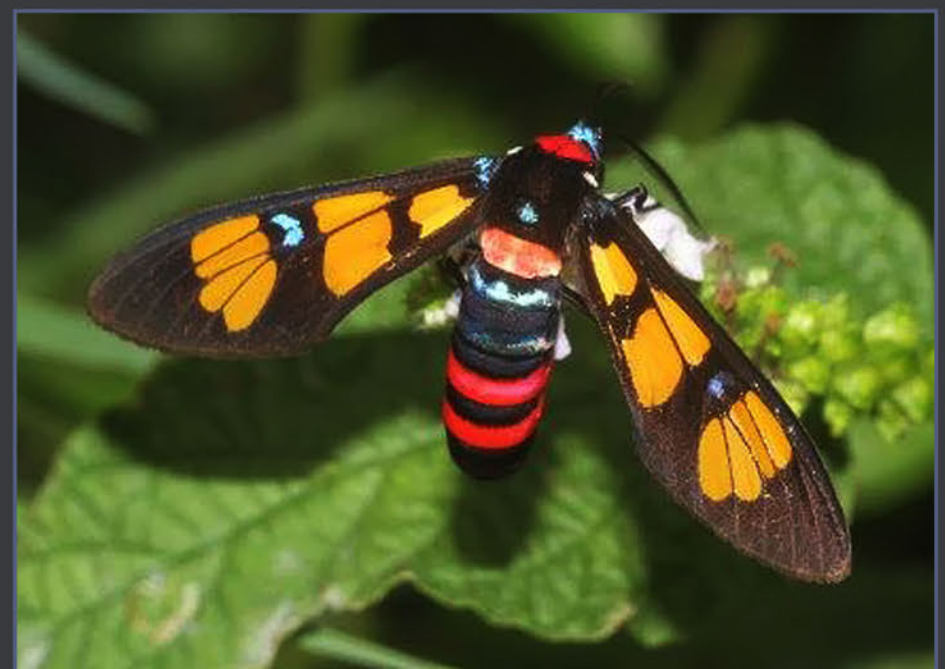
Butterflies and Moths belong to the order Lepidoptera due to the fact that their wings are covered with thousands of tiny overlapping scales. These scales are often quite brilliantly colored and distinctive patterns can be found on both butterflies and moths. There are approximately 174,250 known species of Lepidoptera, while about 90% of them being moths. However, they are less studied than butterflies, probably because of their nocturnal behavior.

Moths had made their appearance on the evolutionary scene around 160 million ago, following the evolution of flowering plants. The earliest moth fossils are estimated to be between 100 to 140 million years old. Compared to moths, butterflies didn't appear on the scene until fairly recently. The earliest butterfly fossils date to the early Tertiary Period, or about 60 million years ago.

## Moth Characteristics

Moths are so diverse that it is difficult to give a general description as there are even many of the day-flying species. Moths can be distinguished by their antennae, which lack clubbed tips and are filamentous or feathered. Following chart shows some differences between Butterflies and Moths, but there are exceptions to all those facts. For example the Painted Handmaiden Moth, *Euchromia polymena* (Linnaeus, 1758) is so colorful and not dull as suggested in the chart.

Attribute	Butterfly	Moth
Antennae	Rounded clubs on the ends	Thin or often feathery
Body	Thin and smooth	Thick and Fuzzy
Active	During the day	During the night
Color	Colorful	Dull
Pupal Stage	No cocoon covering the pupa	Make cocoons
Wings	Held Vertically when resting	Held flat against body when resting



Painted Handmaiden Moth (*Euchromia polymena*)

## Moth Anatomy

### Wings

- Moths have one pair of fore wings and a smaller pair of hind wings. How the wings are displayed when in a natural resting position varies between species.
- Many moths conceal their hind wings by folding back their fore wings and only reveal them when either disturbed or preparing to fly.
- There is also a small number of moths where the females are either completely wingless or have under-developed wings, known as vestigial wings, and are flightless.



# Moths of Sri Lanka - an Introduction



Female wingless moth (*Lymantria sp.*)



Fruit Piercing Moth, *Eudocima hypermnestra* (Cramer, 1780) showing hindwings

## Antennae

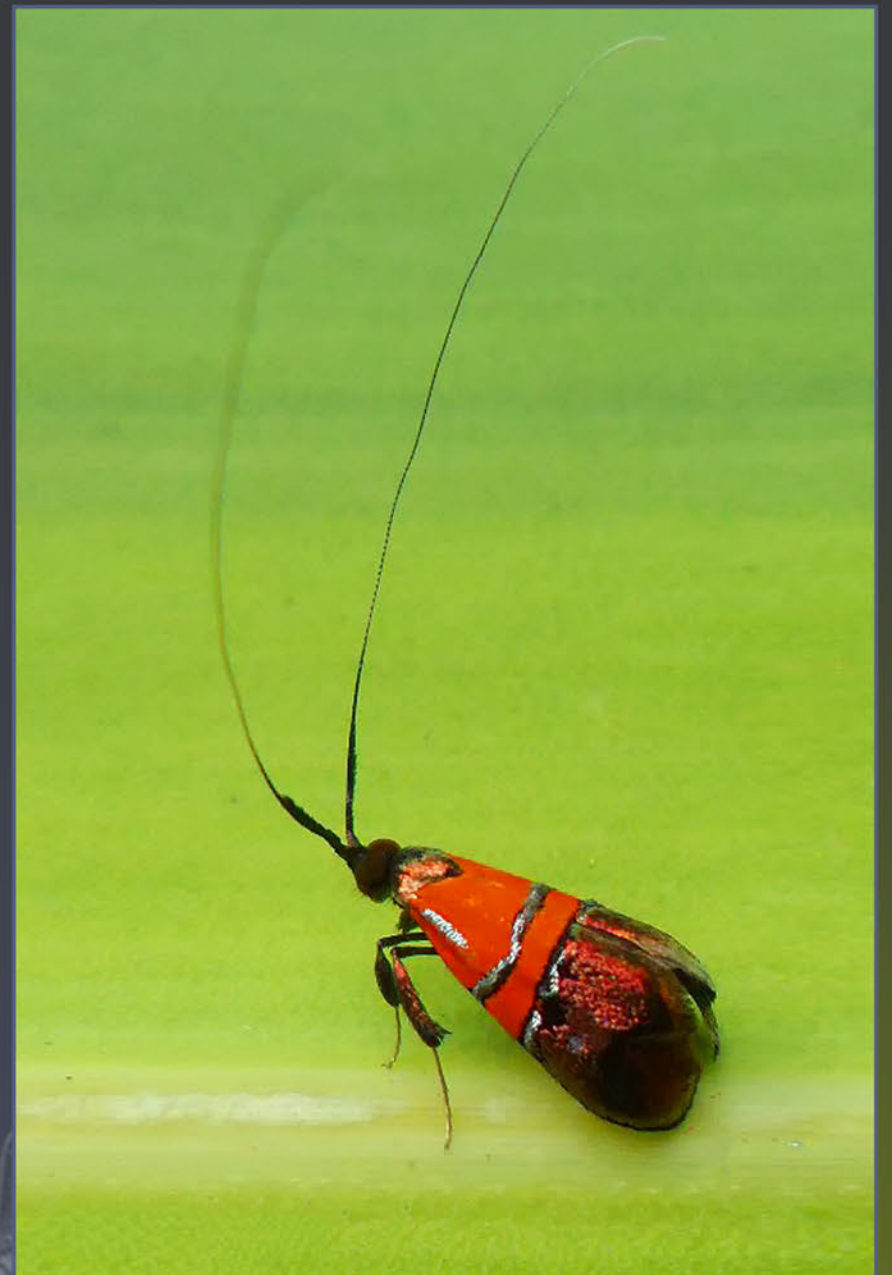
Moths have a pair of antennae which vary in size and complexity according to species. They are extremely sensitive to smell and are used to detect both food sources and mating partners. Some tiny species of moths such as Adelidae family of micro moths often referred to as “Longhorns”, have antennae considerably longer than their body.



Emerald Moth *Protulioctenemis biplagiata* (Moore, [1887])



Sri Lankan Moon Moth, *Actias selene taprobanis* (Paukstadt and Paukstadt, 1999)



Longhorn Moth (Adelidae)

# Moths of Sri Lanka - an Introduction

## Labial palps

Two labial palps extending from the mouth are considered to be modified mouth parts and are again more pronounced in some species. There is some debate as to the purpose of palpi with some suggesting they provide a protective cover for the proboscis while others believe that they are covered in scent detecting glands and are used for detecting food.



Emerald Moth *Protuliocnemis biplagiata* (Moore, 1887)

## Proboscis

- Many moths have a single tongue-like projection known as a *proboscis* located at the front of their faces which they use to feed.
- Some species such as the Hawk-moths have an elongated proboscis which it projects deep into flowers to sip nectar.
- When not feeding the proboscis is retracted either into the mouth or curled up like a spring.
- However, some moth species in adult stage do not feed and so do not have a proboscis.



*Loboschiza koenigiana*, (Fabricus, 1775) – Tortricidae



*Chalciopie mygdon*, Cramer, 1777)–Erebidae



*Thysanoplusia orichalcea* (Fabricus, 1775)–Noctuidae



*Scopula opicata* (Fabricus, 1798)–Geometridae



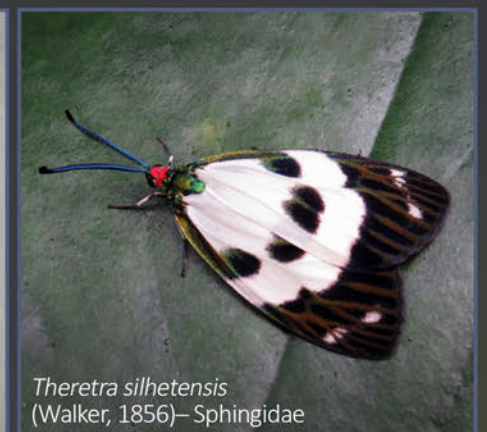
*Dysaethria lilacina*, (Moore, 1887) – Uraniidae



*Chalcosia venosa* (Walker, 1854)–Zygaenidae



*Ischnurges gratiosalis*, (Walker, 1859)–Crambidae



*Theretra silhetensis* (Walker, 1856)–Sphingidae

Being an integral part of the mainly nocturnal insect fauna, moths play a vital part in the balance of the natural world around them that it warrants more studies to be carried out by scientists as well as enthusiasts.

## References

- Aluthwattha R.G.S.T., (2013) Family Saturniidae (Insecta: Lepidoptera) of Sri Lanka: An overview. Lepcey–TheJournal of Tropical Asian Entomology 02(1): 01– 11
- Carter, D. (1992) Butterflies & Moths. Dorling Kindersley Hand books. Hampson, G.F. (1892-1896) The Fauna of British India, Including Ceylon and Burma. Moths (4 vols).
- Kehimkar, I. (2002) Moths of India. National Council for Science and Technology Communication, NCSTC-HORNBILL Natural History Series.
- Moore, F. (1883) Lepidoptera of Ceylon. Vol 2&3. London: Reeve & Co.
- Tennent, E. J., (1859). Ceylon: An Account of the Island Physical, Historical and Topographical with Notices to its Natural History, Antiquities and Productions, London, vols I and II.

# The Natural Super String

It is pretty sure that you have watched the film Spider Man and seen him stopping a high speed train with the help of spider silk he produces. Well, though it is a fantasy movie, the fact that spider silk is so strong remains a reality. Elaborating the point, if we replace 'Spider Man' with a human size real spider, it could have even stopped a Boeing 747 airplane.

Mastering the art of producing silk for about 380 million years (backed by the fossil presence) with the help of genetic diversity (having about 40 000 recorded species), spiders are able to make strands of silk which are stronger than any human made material while maintaining properties of elasticity, stickiness (occasionally) and biodegradability (always). Spiders make different types of silk with different mechanical and chemical properties depending on their lifestyle; method of capturing the prey, habitat, reproductive behaviors, ballooning, sheltering etc. But generally, the orb web weaving spiders secrete the most number of silk types.

They use seven types such as,

- Major Ampullate silk: To make the frame of the web and as a dragline.
- Minor Ampullate silk: To make temporary lines when creating the web.
- Pyriform: As the attachment cement.
- Flagelliforms: As fibres of sticky lines.
- Aggregate: As sticky droplets.
- Achniform: To wrap the prey and as the inner lining of the egg sack.
- Cylindriform: Outer lining of egg sack.

Out of these various types of silk available, major ampullate silk (dragline silk) is the type in which the scientists are mostly interested due to its very high modulus of elasticity and torsion resistance even though it has a very low density. (Hence less weight) As well, the flagelliform is interested in due to its high extensibility as much as twice the original length and pyriform and aggregates due to their high cohesive properties. Moreover, the property of biodegradability is a huge value addition. If ever scientists are able to mimic spider silk and synthesise a material with above mentioned properties, it would have a spectrum of uses,

- Military applications such as super light high strength body armour.
- Wear-resist super light, yet strong vehicle (land, water and air) parts.
- Wear-resistant day-to-day things such as clothes and ropes to alternatives for plastics which are biodegradable.
- Surgical instruments and medical applications ranging from bandages to targeted drug delivery.

Even though the mechanical properties, the types of silk proteins and their arrangement (genetic sequence) is discovered, scientists are still inferior to mimicking the original properties of strength, elasticity, lightness etc. of spider silk due to one specific reason, inability to mimic the precision of arranging the proteins to the level which the spiders do. In other words, the proteins which are secreted by 'protein glands', are stored in the 'protein storage' and are directed to the 'funnel' when needed. The funnel directs the proteins into the 'duct' in which the proteins become silk. So, processes and properties before and after the duct are discovered, but what happens inside the duct is yet to be discovered. Hence synthesizing spider silk completely artificially is not yet within the list of possible option.

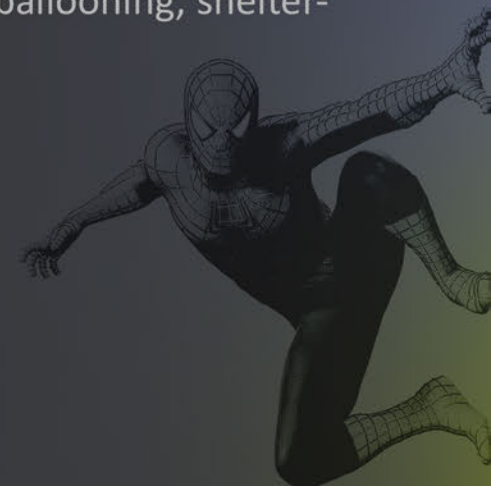
So maybe spider farming is an option..? As spiders are of cannibalistic nature and concern very much about the personal space, cultivating them in a collective pool is not an option. Even farming them with separate spaces given is also not viable due to un-economical nature since it needs thousands of spiders to produce a considerable amount of silk which can be used for human size applications.

As an alternative, scientists have tried to introduce the coding of the protein (genetic) sequence into other silk secreting organisms such as the silkworm which can be easily farmed. But the attempts have failed due to the fact that, even though these other organisms were able to mimic the protein sequence, they were not able to mimic the arrangement of the proteins as the spiders do in their duct. So still, the superior properties of spider silk is unparalleled. A recent study has shown that they can synthesis silk using bacteria, with properties a little different than that of spider silk.

However, modern science is just several decades into harnessing the properties of spider silk; the natural super string, which the spiders mastered over 380 million years...

## References:

1. Inspired by :
  - a) YouTube. (2018). Cheryl Hayashi: The magnificence of spider silk. [online] Available at: <https://www.youtube.com/watch?v=xossR6eHv3I> [Accessed 11 Nov. 2018].
  - b) YouTube. (2018). "Engineering Spider Silk and Spinning Science Fiction into Reality" | Amanda Brooks | TEDxNDSU. [online] Available at: <https://www.youtube.com/watch?v=2nya8sPWKOA> [Accessed 11 Nov. 2018].
2. Bashqawi, O. (2018). Biotechnological Uses of Spider Silk. [online] DigitalCommons@COD. Available at: <https://dc.cod.edu/essai/vol13/iss1/9/> [Accessed 11 Nov. 2018].
3. Uwyo.edu. (2018). Randy Lewis | Department of Molecular Biology | College of Agriculture and Natural Resources | University of Wyoming. [online] Available at: <https://www.uwyo.edu/molecbio/faculty-and-staff/randy-lewis.html> [Accessed 11 Nov. 2018].
4. Chm.bris.ac.uk. (2018). Spider Silk. [online] Available at: <http://www.chm.bris.ac.uk/motm/spider/page4.htm> [Accessed 11 Nov. 2018].



### රෝමාන්තික පරිසරවේදය !

ලෝකේ කියන්නේ විවිධාකාර ජීවීන් ඉන්න තැනක්. එහෙම නොවෙන්න ලෝකේ මෙව්වර ලස්සන නොවෙන්න තිබුනා. හරිම ඒකාකාරී වෙන්නත් තිබුනා. ඒත් ලෝකේ එහෙම වුනේ නෑ. ඒක විවිධාකාර වුනා.

මේ විවිධාකාර ලෝකේ ඉන්න අමුතූම ජීවී කොට්ඨාසයක් තමයි, **\*රෝමාන්තික පරිසරවේදියෝ\***!

සාමාන්‍යයෙන් අපි දන්න, දකින පරිසරවේදියෝ කියන්නේ, පාරිසරික සංරක්ෂණය ගැන යමක් ඉගෙනගෙන, ඒ දැනුම පාවිච්චි කරලා, පරිසරය වෙනුවෙන් වැඩ කරන උදවිය. ලෝකේ හෙට දවස වෙනුවෙන් වැඩ කරන උදවිය. එයාලා වැඩිපුර තීරණ ගන්නේ මොළෙන්!

හැබැයි මේ රෝමාන්තික පරිසරවේදියෝ කියන්නේ මොළයට වඩා හදවතට වැඩි බරක් තියන අය. සමාජ මාධ්‍ය ජාල වල නැගිටීමත් එක්ක හඩක් ලැබුන මේ අය, සමහර වෙලාවට කරන දේවල් වලින් වෙන්නෙ හොඳකට වඩා නරක !

සරල උදාහරණයක් ගමු. අපි දන්නවා ශ්‍රී ලංකාවේ මිනිස්සු සහ පරිසරය අතර තියෙන ලොකු ම ගැටීමක් තමයි, වන අලි ප්‍රශ්නය. සාමාන්‍ය පරිසරවේදියෙක් මේ ප්‍රශ්නය දැක්කම කරන්නේ, අලි මිනිස් ගැටුම ගැන විද්‍යාත්මක අධ්‍යයනයක් කරලා, "අලි ගම් වදින්න හේතු මොනවද" කියලා හොයලා, "අලි මැරෙන එක **\*අඩු කරන්න\*** අපිට ගන්න පුළුවන් විසඳුම් මොනවද", "ඒ ගැටලුවට මුහුණ පාන මිනිස්සුන්ට අපි දෙන විසඳුම් මොනවද" කියලා හරි හමන් තක්සේරුවකට ඇවිත්, ඒ සඳහා ක්‍රමෝපායන් යෝජනා කරන එක.

හැබැයි අර ජාතියේ රෝමාන්තික පරිසරවේදියෝ කරන්නේ මොකද්ද ? "අනේ බලන්න අලි මරලා", "මේ මිනිස්සුන්ට මොකද මේ වෙලා තියෙන්නේ", "අලි ගමට එන්නේ උඹලාගේ වරදින් නිසා උඹලා මැරුනට කමක් නෑ", "අලි මරන්න එපා, උඹලා මැරියල්ලා" වගේ කතන්දර කියාගෙන කවියක් දෙකක් ලියාගෙන, තමන්ගේ **\*මනුස්සකම\*** පෙන්වන එක!

මේක බැලූ බැල්මට එව්වර ම අවුල් වැඩක් නෙවෙයි. ඕනෙම කෙනෙක්ට, ඕනෙම විදිහක මතයක් දරන්න අයිතියක් තියෙනවනේ. ඉතිං ඒක එයාලගේ මතය. ප්‍රශ්නයක් නෑ, නේ?

ප්‍රශ්නය එන්නේ ඔය රෝමාන්තිකභාවය අදාල සීමාවන් අතික්‍රමණය කරද්දී. ඒකටත් උදාහරණ වලින් ම යමු. අපි දන්නවා විල්පත්තු රක්ෂිතය සහ, ඒ ආශ්‍රිත කලාපය තුල විශාල පාරිසරික ගැටලු රැසක් මතු වෙලා තියෙනවා. මේ සම්බන්ධයෙන් ඒ ඒ විෂයයන් ට සම්බන්ධ පරිසරවේදීන් එක එක ආකාරයේ විසඳුම් යෝජනා කරමින් සහ, ඒවා ක්‍රියාත්මක කරමින් ඉන්නවා.

ඒ අතරේ අපි දකිනවා, අර රෝමාන්තික පරිසරවේදීන් ගන්න ක්‍රියාමාර්ග. "අපි අරුන්ට රිදෙන්න විල්පත්තුවේ කුඹුක් ගස් පන්දාහක් හිටවමු" ජාතියේ යෝජනා තමා එයාලා ඉදිරිපත් කරන්නේ. (මේ සත්‍ය සිදුවීමක්).

විල්පත්තුවේ පරිසරය කොහොම එකක්ද, ඒ ආශ්‍රිතව ගස් හිටවනවා නම්, හිටවන්න ඕන මොන ගස් ද, ගස් කියක් හිටවිය යුතුද, ඒ ගස් හිටවන්න ඕන මොන තැන් වලද, වගේ ප්‍රශ්න එයාලට අදාල ම නෑ. නිකං හිතෙනවා, සමාජ මාධ්‍ය ජාලයක පල කරනවා, කට්ටියක් එකතු කරගෙන යනවා, ගිහින් හිටවනවා.

එතනින් එහාට ඒ ගස් වලට මොකද වෙන්නේ, එහෙම නැත්තං ඒ හිටවන ගස් නිසා ඒ පරිසරයට මොකද වෙන්නේ, ඒ අවට ජීවත් වෙන සත්තුන්ට මොකද වෙන්නේ කියලා එයාලා දන්නේ නෑ. හදවත ඉස්සර වෙලා !

මේ අයගේ තියෙන අනිත් ප්‍රශ්නය තමයි, මේ වැඩ වල අඩුපාඩු පෙන්වන විට, ඒ ගැන ඇහුන්කන් නොදීම. ඒ අය හිතනවා, පරිසරය ගැන **\*සැබෑ හැඟීමක්\*** තියෙන්නේ තමන්ට විතරයි, තමන් **\*පරිසරය රැකීම උදෙසා\*** කරන මේ **\*මහත් කර්තව්‍යය\*** ට අනික් අය අකල් හෙලන්නේ ඉරිසියාව නිසා ය කියලා. ඉතිං මේ ජීවී කොට්ඨාසය එක්ක වැඩ කරන එක හරිම අමාරු වැඩක්!

ඉතිං, මේ වෙනකොට පරිසරය ගැන කිසි ඇල්මක් නැති, පාරිසරික හානි නිසා වෙන බලපෑම් ගැන දැනුමක් නැති, ඒ නිසා ම පරිසරයට හානි කරන මිනිස්සුන් ගෙන් පරිසරය ආරක්ෂා කරන ගමන් ම, අපිට සිද්ධ වෙලා තියෙනවා, පෙර කී රෝමාන්තික පරිසරවේදීන්ගෙන් පරිසරය රැකගන්න.

දැන් කෙනෙකුට හිතෙන්න පුළුවන් අව්වර පරිසරය විනාශ කරන මිනිස්සු ඉන්න අතරේ, ඇයි මේ පරිසරයට ආදරේ කරන මිනිස්සුන්ගේ වැරද්දක් අල්ලන් දහලන්නේ කියලා.

හේතුව වෙන මොකුත් නෙවෙයි, පරිසරයට උඹලා ආදරේ බව දන්නා නිසා ම, උඹලා ගැන තියෙන ආදරේ ට! රෝමාන්තිකයි නේ ?



# BCSSL past events

## Field Visit to Meethirigala

It was a morning filled with heavy skies from the downpour the night before. Nonetheless everyone was with high hopes and gleaming eyes in witnessing the pot of gold at the end of the rainbow.

There it began a 2 hour journey to the middle kingdom of Meethirigala. Unlike all human beings, we as usual were bound to an extra set of meals and it was not soon before a pit stop was made to fill our tummies. After eating to more than our stomachs could hold and several wrong turns we reached our destination, the 'Meethirigala Nissarana Aranya Senasanaya'. It was around 9.00 am when we got out armed with our weapons of choice.

Lay in front were two paths of which we chose to go straight, the path towards the village that we later found out was a great choice despite the fact that the villagers used it as their mini highway. On either side of the road was the forest with trees reaching up to the skies and vines trying to reach above one another to get to the sun that lay beyond. Through this ran a stream of which the trickling sound we could hear faintly. I was lost in the thoughts and sights and not to mention the anticipation of a leech attack when the reverie was suddenly broken by the appearance of a Brown-breasted Flycatcher, a winter migrant. Shown with sunlight were its light yellowish beak and a white eye rim that gave us hope and a good start to the day that lay ahead.

The damp and humid weather kept the birds active while it left the butterflies at bay till the golden beams hit the forest floor. The birds though did not disappoint us at all as it was not long before we encountered a mixed feeding flock consisting of Scarlet (Flame) Minivets, Tickel's blue Flycatchers, Dark-fronted Babblers, Black-napped Monarchs and a pair of Golden-fronted Leafbirds. The sounds they gave away filled the air and echoed away into the deep forest. Brief visit by a Bar-winged Flycatcher-shrike and a shy Slaty-legged Crake was cherry on top. The great Houdini was the Three-toed Kingfisher that eluded us all except one who was lucky enough to catch him in the vanishing act.

The Clipper was the first of the few butterflies that were brave enough to straighten up the wings that morning and a few more appeared soon after joined by a Common Bluebottle. Several Blue Mormans and a Tailed Jay along with some Lycaenids gave us hope on the open patch that lay ahead. Skies were cloudy and heavy and we all knew it was not long before the heavens would open up on us. Thus a quick change in the plans meant we would have to skip the open paddy fields that lay beyond. But the sun was kind on us and we were lucky to feast our eyes on several butterflies of family Hesperidae along with a Sailor, Sri Lankan Cingalese Bushbrown, Blue Admiral and a Psyche.

Fresh from a workshop on Spider identification, the troop was very quick to put their skills to test by spotting and identifying the ample spider and arachnid fauna that lay hidden as well as right in front of our eyes. The highlight on the way back was the sighting of an "Ahetulla" by a lucky few who went ahead.

Soon there it came, the high heavens with all its might to which we all had nothing to do but surrender. There we said our good byes to the few village dogs that hung around with some tasty morsels in the form of biscuits before beginning our homeward journey that brought us back to the university premises by around 6 o'clock wet and smelly but with a wealth of knowledge and memories that would last.

# BCSSL past events - 2019

## January

- **Proposed Butterfly Garden at Lyceum International, Nugegoda** - BCSSL gave the guidance for the students of Lyceum International School, Nugegoda to form a Butterfly Garden inside the school premises. The students participated for lectures to gain the basic knowledge on butterflies, their behaviors and butterfly gardening.

## February

- **BCSSL Stall at World Wetland's day** - "Living in a Wetland City" – at Diyasaru Park Thalawathugoda BCSSL Exhibition Stall –BCSSL had our stall at World Wetland's day on 2nd of February 2019 which allowed the public to meet our experts, gather knowledge on butterflies and buy exciting merchandise

- **AGM and Guest Lecture** - The Annual General Meeting of the Butterfly Conservation Society of Sri Lanka was held on 9th February 2019 at Meteorology Department Auditorium. The invited guest speaker was the eminent botanist and researcher, Prof. Siril Wijesundara, from National Institute of Fundamental Studies on " Plant distribution in Sri Lanka ", followed by the election of the new office bearers for the year of 2019. Ms. Narmadha Dangampola as the new president while Ms. Ruwangika Gunawardane as the secretary and the treasurer was Mr.Rukmal Rathnayake. The founder members, former committee members, general members and university students were participated in this occasion.



- **Exhibition stall at "Wake up for nature"** art exhibition - All-island School Children's Art Exhibition organized by FOGSL (Field Ornithology Group of Sri Lanka), SPEARS Foundation and Youth Wing of the Rotary Club of Colombo West, in preparation for the 18th CITES CoP18, which was held at the J. D. A. Perera Gallery from 26th February to 2nd March 2019.

# BCSSL PAST EVENTS - 2019

## March

• Monthly lecture - "**Protective Mechanisms of Moths**" was conducted by Mr. Nuwan Chathuranga, an Expert on Moths, Former Curator of the Natural History Museum, Girithale and Wildlife Guard of the Department of Wildlife Conservation, on Saturday, 2nd of March 2019 at Colombo Public Library Lobby.



• Lecture and field session on "**Wetlands and Butterflies**" – Diyasaru Park, Thalawathugoda – BCSSL had their contribution for a lecture and a field session on "Wetlands and Butterflies" on 9th March for Emotional Intelligence and Life Skills Training Team (Gte) Ltd, at Diyasaru Park, Thalawathugoda providing them the basic knowledge regarding butterflies and butterfly gardening.

## • 14th -17th March - Nilgala Field Visit



# An invite to contribute ...

Dear readers,

We would like to see more contributions of yours to be published in our news letter, **Krumithuru**.

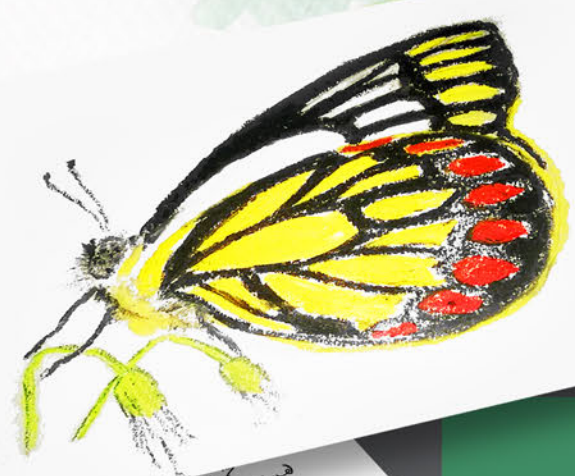
Please send your ...

articles,  
photographs,  
sketches,  
paintings,

or even reports, scientific papers or any other material or a creation that you would see fit to be published in our news letter.



Dharmika Priyadarshanie



Narmadha Dangampola



You can show case your **talent** and share your **knowledge** while **motivating** others to **improve** themselves,

gather more knowledge and involve in the conservation of our **mother nature** in many ways.

We at **Krumithuru**, will be looking forward to see you sending your suggestions, or contributions and let you enjoy the due recognition as well.

emails us to **krumithuru@bcssl.lk**

or contact the Chief editor

**0777 255 793**

(Imaduwa)

*the be to keep the  
with me a president left; and  
can be vice-president; and  
I hope that I will also  
co-operate with you counsel; and  
never said I would not be at  
president! If I can't be the  
right to vote whenever I  
please to take the chair.  
to grieve the inconceivable  
haltedness of spirit that sa  
to have slain its head for the  
1st time in our American  
Chological world! You  
only!*



## Events to come...

### 06<sup>th</sup> April 2019

- Butterfly and Dragonfly Race at **Seethawaka Botanical Gardens**

This event aims to popularize wetlands around Colombo by promoting butterfly and dragonfly watching in them. This time it'll be a novel experience for the participants as it is conducted inside a wet zone botanical garden. As a part of the program, a brief field session after the race will focus on identifying butterfly and dragonfly species in the field. The Field sessions will be conducted by Dr. Michael van der Poorten, Mr. Himesh Jayasinghe and Mr. Amila Sumanapala. These field sessions are open for public.



**Observe, Identify & WIN Prizes**

## BUTTERFLY DRAGONFLY RACE 2019

Date - 06<sup>th</sup> April 2019  
Venue - **Seethawaka Wetzone Botanic Gardens, Awissawella**  
(Transport will be provided)

Form a team of five and compete with fellow teams by recording the highest number of butterfly and dragonfly species within the given time to emerge as the winners and win valuable prizes.

Join with the public field sessions conducted by Dr. Michael van der Poorten, Himesh Jayasinghe and Amila Sumanapala on field identification of butterflies and dragonflies after the race.

**Register Before 29<sup>th</sup> March**

For more INFO:  
**Narmada**  
+94-718097339  
**Dushan**  
+94-715439739

Butterfly Conservation Society of Sri Lanka  
Email: butterflycssl@gmail.com | VISIT: www.bcssl.lk | www.facebook.com/ButterflyConservationSociety  
Butterfly Conservation Society of Sri Lanka, 262A, Yathorns, Mahwasa, Sri Lanka

### Next field visit

- One day Field trip - to Bathalegala.....  
Date to be notified

## How to join BCSSL

Butterfly Conservation Society of Sri Lanka is open to anyone interested in butterflies and other insect fauna. BCSSL members can actively participate and share their abilities and knowledge during activities organized by the society such as monthly lectures, field visits, workshops and annual events. Join hands with us to help aware and create a world rich in butterflies and other fauna and flora for future generations to enjoy.

**You could become a member of the BCSSL in several categories.**

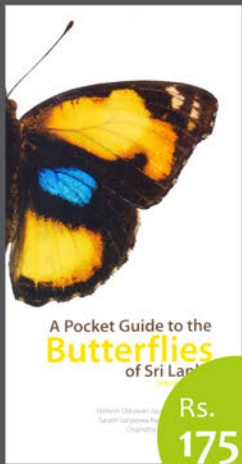
- \* General membership (anyone interested in joining BCSSL)
  - \* School membership (school children from age (15 – 19)
  - \* Overseas membership (non-Sri Lankan natives and foreigners)
- Both General and Overseas categories have long term membership facility (membership extends up to 5 years)

**BCSSL membership and details can be obtained**

- Directly at the monthly lecture sessions
- Via social media (Facebook, Twitter, Instagram)
- By sending an email request to butterflycssl@gmail.com
- By visiting BCSSL website <http://www.bcssl.lk/>

# Shop around the Block

## BOOKS & PUBLICATIONS

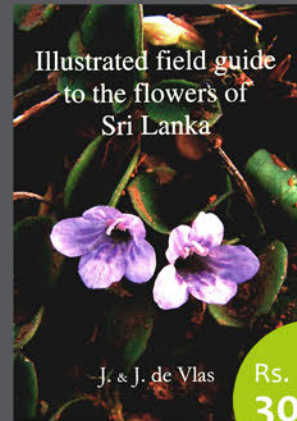


### A Pocket Guide to the Butterflies of Sri Lanka

Second Edition

By : Himesh Dilruwan Jayasinghe  
Sarath Sanjeewa Rajapakshe  
Chamitha De Alwis

Rs. 1750/=



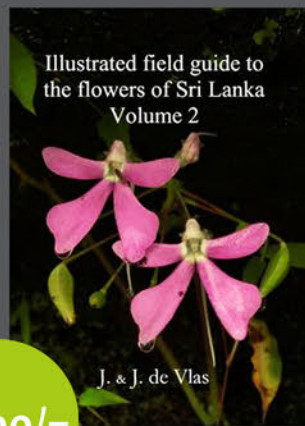
### Illustrated Field Guide to the Flowers of Sri Lanka (Vol I)

By : J. & J. de Vlas

Rs. 3000/=

### Illustrated Field Guide to the Flowers of Sri Lanka (Vol II)

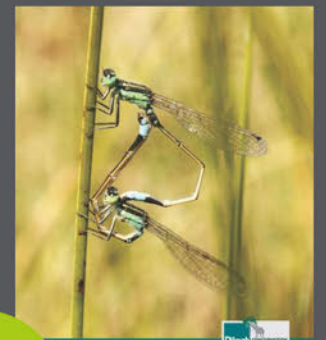
By : J. & J. de Vlas



Rs. 3500/=

### A Field Guide to the Dragonflies and Damselflies of Sri Lanka

By : Amila Prasanna Sumanapala



Rs. 400/=

## Butterfly and Dragonfly T-SHIRTS



Rs. 900/=



Rs. 900/=

## BCSSL BAGS



Rs. 350/=

# KRUMITHURU

INSECTS OF SRI LANKA



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