The Journal of Threatened Taxa (JoTT) is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at www.threatenedtaxa.org. All articles published in JoTT are registered under Creative Commons Attribution 4.0 International License unless otherwise mentioned. JoTT allows unrestricted use, reproduction, and distribution of articles in any medium by providing adequate credit to the author(s) and the source of publication.

Journal of Threatened Taxa
Building evidence for conservation globally
www.threatenedtaxa.org
ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

COMMUNICATION

NEW ADDITIONS TO THE LARVAL FOOD PLANTS OF SRI LANKAN BUTTERFLIES (INSECTA: LEPIDOPTERA: PAPILIONOIDEA)

Himesh Dilruwan Jayasinghe, Sarath Sanjeewa Rajapakshe & Tharindu Ranasinghe

26 February 2021 | Vol. 13 | No. 2 | Pages: 17731-17740
DOI: 10.11609/jott.6875.13.2.17731-17740

For Focus, Scope, Aims, Policies, and Guidelines visit https://threatenedtaxa.org/index.php/JoTT/about/editorialPolicies#custom-0
For Article Submission Guidelines, visit https://threatenedtaxa.org/index.php/JoTT/about/submissions#onlineSubmissions
For Policies against Scientific Misconduct, visit https://threatenedtaxa.org/index.php/JoTT/about/editorialPolicies#custom-2
For reprints, contact <ravi@threatenedtaxa.org>

The opinions expressed by the authors do not reflect the views of the Journal of Threatened Taxa, Wildlife Information Liaison Development Society, Zoo Outreach Organization, or any of the partners. The journal, the publisher, the host, and the partners are not responsible for the accuracy of the political boundaries shown in the maps by the authors.
New additions to the larval food plants of Sri Lankan butterflies
(Insecta: Lepidoptera: Papilionoidea)

Himesh Dilruwan Jayasinghe1, Sarath Sanjeewa Rajapakshe2 & Tharindu Ranasinghe3

1,2,3 Butterfly Conservation Society of Sri Lanka, 762/A, Yatihena, Malwana, Sri Lanka.
1 himesh.jayasinghe@gmail.com, 2 sarathsanjeewa@gmail.com, 3 tharindu2010ac@gmail.com (corresponding author)

Abstract: Larval food plants (LFPs) of Sri Lankan butterflies have been well documented recently with the aid of studies done by numerous researchers. In this paper, we present further records, 118 LFPs used by 83 butterflies and 145 plant-butterfly combinations. LFPs of Lethe dynsate and Potanthus pseudomaesa pseudomaesa are reported for the first time in Sri Lanka. Important observations, possible LFPs and LFP preferences of rare and threatened butterfly species, are discussed. This information on plant-butterfly interactions will play an important role in conservation management of both plant and butterfly species.

Keywords: Caprona alida lanka, plant-butterfly interactions, Potanthus pseudomaesa pseudomaesa, Rinorea decora, threatened species.
INTRODUCTION

The knowledge on the natural history of Sri Lankan butterflies has been increasing rapidly over the past two decades, mainly due to the increase in the numerous field studies carried out by various researchers on butterflies, including their early stages, that had been published as research papers, detailed books, field guide books, leaflets and as other social media material (Gamage 2007; Jayasinghe 2014; Jayasinghe et al. 2015, 2020; van der Poorten & van der Poorten 2016, 2018). The availability of information has led many amateur naturalists to get interested and actively involved in the study of butterflies and now even contribute to the development of knowledge database on butterflies of Sri Lanka.

Early stages of Sri Lankan butterflies have been described in detail in several recently published research papers (van der Poorten & van der Poorten 2011a, b, 2012a, b, c, 2013a, b, 2014; Gunawardana et al. 2015; Priyadarshana et al. 2015; Herath et al. 2020), which provide information on their larval food plants (LFPs) as well. A research article focused on LFPs on Sri Lankan butterflies (Jayasinghe et al. 2014) provided 480 species of LFPs for 207 species of butterflies out of the 245 species known in the country during that time. Further, it documented 785 plant – butterfly combinations. Since then three more butterfly species have been added to the Sri Lankan inventory (van der Poorten & van der Poorten 2016, 2018), and a few more LFPs had been recorded.

Further studies carried out during the last few years revealed some more undocumented LFPs of Sri Lankan butterflies, which are presented in this paper. Some plant species which were not identified up to the species level in previous publication (Jayasinghe et al. 2014) are identified here as well. Recent nomenclatural and systematic changes in LFPs which were already documented in aforementioned publications are also addressed.

MATERIALS AND METHODS

The data presented in this paper is primarily based on studies carried out during 2014–2019 by the authors. Field studies were conducted throughout the country in various habitats, including the northern and eastern regions of the country, which were not studied for decades due to their inaccessibility. Materials and methods adopted for field observations, field notes, data collection, photography, lab works, and identification of butterfly species and plant species follow Jayasinghe et al. (2014). The lab rearing studies were carried out in Soragune (6.747N & 80.893E) Badulla District, Malwana (6.968N & 80.006E) Gampaha District and Kandumulla (7.075N & 80.071E) Gampaha District. Rearing of hill country species was restricted to Soragune, since the temperature and other climatic conditions are suited best out of all the three locations and due to relatively easy accessibility to collect fresh food material regularly from the field. Low country species, both from the wet zone and dry zone were reared at all the three locations, but rearing of northern species were mainly restricted to Malwana. Apart from identification from guide books, some plant species had to be confirmed by studying herbarium sheets at the National Herbarium at Peradeniya and online available herbarium sheets at K, BM, E, and L (Thiers 2020).

All the species of plants presented in this paper are confirmed LFPs in Sri Lanka. Here we consider a species as a confirmed LFP, when the butterfly larvae reared on it until maturity, or the early stages and egg laying behaviors observed regularly in the field on a given plant species. Even the larvae found on certain plants, if they were unable to complete the larval stage on those plants are not considered as confirmed LFPs. We observed that certain butterfly species (i.e., Acraea terpsicore) are trying to test new species of LFPs, but are not always successful. Certain butterfly larvae were found on non LFPs in the field, probably while they are moving from one plant to another or accidentally fell off. Species such as Delias eucharis and Papilio clytia lankeswara were observed shifting their LFPs for pupation. The data presented here, other than the studies carried out by the authors were included only if they were verified by detailed photographs and the plant species especially were identified by the authors based on information provided by those individuals.

Nomenclature of the butterflies follows van der Poorten & van der Poorten (2016). Classification and nomenclature of angiosperms, which had been subjected to dramatic changes due to recent molecular phylogenetic studies are based on (POWO 2019), and (WCSP 2020)

RESULTS & DISCUSSION

A total of 118 species of angiosperms, belongs to 44 families are newly added to the Sri Lankan butterfly LFPs check list. These plants include 23 endemic, 67
indigenous, and 27 exotic species. These plant species are used by 63 species of butterflies. LFPs for *Letha dysnate* (Hewitson, 1863) & *Potanthus pseudomaesa pseudomaesa* (Moore, [1881]) are reported for the first time in Sri Lanka. This represents 145 plant-butterfly interactions and the detailed list is given in Annexure 1.

Names of plants mentioned in previous publications (Jayasinghe et al. 2014; van der Poorten & van der Poorten 2016, 2018) should read as follows.

**Acanthaceae**: *Dipteracanthus prostratus* - *Ruellia prostrata* Poir., *Dyschoriste erecta* - *D. marudesensis* (Brum.f.) Kuntze, *Dyschoriste litoralis* - *D. nagchana* (Nees) Bennet, *Justicia procumbens* - *Rastellaria procumbens* (L) Nees, *Phaulopsis imbricata* - *P. dorsiflora* (Retz.) Staptau, *Stenosiphonium cordifolium* - *Strobilanthes cordifolia* (Vahl) J.R.I.Wood, *Strobilanthes diandra* - *S. diandra* var. *diandra* (Nees) Alston

**Annonaceae**: *Polyalthia ceroideae* - *Huberantha ceroideae* (Roxb.) Chaoawasku, *Polyalthia korinti* - *Huberantha korinti* (Dunal) Chaoawasku, *Polyalthia longifolia* - *Monoon longifolium* (Sonn.) B.Xue & R.M.K.Saunders

**Apocynaceae**: *Anodendron paniculatum* - *A. parviflorum* (Roxb.) I.M.Turner, *Ceropegia candelabrum* - *C. candelabrum* var. *candelabrum* L., *Dregea polychroma* - *Wattakaka polychroma* (L.f.) Stapf, *Gymnema laticerium* - *Marsdenia lactferra* (L.) I.M.Turner, *Holosteuma ada-kodien* - *Cynanchum annularium* (Roxb.) Liede & Khanum, *Pergularia daemia* - *P. daemia* subsp. *daemia* (Forssk.) Chiov, *Tylophora candelabrum* - *Vincetoxicum candelabrum* (Thwaites) Kuntze, *Tylophora flexuosa* - *Vincetoxicum flexuosa* var. *tenuis* (Blume) Neelam, *Meve & Liede, Tylophora indica* - *Vincetoxicum indicum* (Burm.f.) Mabb., *Tylophora multiflora* - *Vincetoxicum phisias* Meve & Liede, *Tylophora pauciflora* - *Vincetoxicum bracteatum* (Thunb.) Meve & Liede

**Cleomaceae**: *Cleome rutidosperma* - *C. rutidosperma* var. *burmanni* (Wight & Arn.) Siddiqui & S.N.Dixit, *Crataeva adansonii* - *C. adansonii* subsp. *odora* (Buch.-Ham.) Jacobs.

**Costaceae**: *Costus speciosus* - *Hellenia speciosa* (J.Koenig) S.R.Dutta

**Euphorbiaceae**: *Dimorphocalyx glabellus* - *D. glabellus* var. *glabellus* Thwaites

**Fabaceae**: *Abrus pulchellus* - *A. melanopsermus* Hassk., *Acacia caesa* - *Senegalia caesa* (L.) Maslin, *Seigler & Ebing, Acacia eburnea* - *Vachellia eburnea* (L.f.) P.J.H.Hurter & Mabb., *Acacia leucophloea* - *Vachellia leucophloea* (Roxb.) Maslin, *Seigler & Ebing, Acacia nilotica* - *Vachellia nilotica* (L.) P.J.H.Hurter & Mabb., *Acacia pennata* - *Senegalia pennata* (L.) Maslin, *Acacia planifrons* - *Vachellia planifrons* (Wight & Arn.) Ragup., *Seigler, Ebinger & Maslin, Bauhinia racemosa* - *Piliostigma racemosum* (Lam.) Benth., *Calliandra calothyrsus* - *C. houstoniana* (Mill.) Standl., *Caesalpinia bonduc* - *Guilandina bonduc* L., *Caesalpinia hymenocarpa* - *Mezoneuron hymenocarpum* Wight & Arn. ex Prain, *Caesalpinia sappan* - *Biancaea sappan* (L) Tod., *Chamaecrista auricoma* - *C. ischneanultiana* (DC.) O.Deug., *Chamaecrista nictitans* - *C. nictitans* var. *glabrata* (Vogel) H.S.Irwin & Barney, *Dalbergia pseudo-sissoo* - *D. rostrata* Hassk., *Desmodium heterocarpon* - *Grona heterocarpon* var. *heterocarpon* (L.) H.Ohashi & K.Ohashi, *Desmodium heterophyllum* - *Grona heterophylla* (Willd.) H.Ohashi & K.Ohashi, *Desmodium triflorum* - *Grona triflora* (L.) H.Ohashi & K.Ohashi, *Falcata marocana* - *F. falcata* (L.) Greuter & R.Rankin, *Pueraria phaseoloides* - *Neustanthus phaseoloides* (Roxb.) Benth., *Sesbania bispinosa* - *S. aculeata* (Schreb.) Pers.

**Icacinaceae**: *Notopodytes nimmoniana* - *Mappia nimonianna* (J.Graham) Byng & Stull

**Lauraceae**: *Neolitsea cassia* - *N. cassia* var. *cassia* (L.) Kosterm.

**Linderniaceae**: *Lindernia anagallis* - *Vandellia anagallis* (Burm.f.) T.Yamaz., *Lindernia antipoda* - *Bonna ya antipoda* (L) Druce, *Lindernia crustacea* - *Torenia crustacea* (L.) Cham. & Schltld., *Lindernia pusilla* - *Vandellia diffusa* L.

**Malvaceae**: *Grewia daminae* - *G. tiliifolia* Vahl

**Molluginaceae**: *Molluga cerviana* - *Hypertelis cerviana* (L.) Thulin

**Moraceae**: *Ficus nervosa* - *F. nervosa* subsp. *minor* (King) C.C.Berg, *Ochrasia oppositifolia* - *Artocarpus gomezianus* Wall. ex Trécul

**Ochnaceae**: *Gomphia serrata* - *Campylospermum serratum* (Gaertn.) Bittrich & M.C.E.Amaral

**Orchidaceae**: *Malaxis versicolor* - *Crepidium versicolor* (Lindl.) Sushil K.Singh, Agrawala & Jalal

**Phyllanthaceae**: *Saururus bacciformis* - *Systemon bacciformis* (L) G.L.Webster

**Poaceae**: *Eragrostis amabilis* - *E. viscosa* (Retz.) Trin., * Panicum maximum* - *Urochloa maxima* (Jacq.) R.D.Webster, *Sinarundinaria debilis* - *Kuruna debilis* (Thwaites) Attigala, Kaththr. & L.G.Clark

**Primulaceae**: *Embelia ribes* - *E. ribes* var. *ribes* Burm.f.

**Rhamnaceae**: *Ziziphus napecoa* - *Z. linnaei* M.A.Lawson

**Rutaceae**: *Euodia suaveolens* - *E. hortensis* J.R.Forst. & G. Forst., *Micromelum minutum* - *M. minutum* var. *ceylanicum* B.C.Stone, *Paramignya monophylla* - *P. monophylla* var. *monophylla* Wight
**Larval food plants of Sri Lankan butterflies**

**Jayasinghe et al.**

**Sabiaceae:** Meliosma pinnata – *M. arnottiana* (Wight) Walp., *Meliosma simplicifolia* – *M. simplicifolia* subsp. *simplicifolia* (Roxb.) Walp.

**Salvadoraceae:** Salvadoria persica - *Salvadora persica* var. *wightiana* (Planch. ex Thwaites) Verd.

**Sapindaceae:** *Dodonaea viscosa* – *D. viscosa* subsp. *viscosa* Jacq., *Lepisanthes tetraphylla* – *L. tetraphylla* var. *tetraphylla* (Vahl) Radlk.

**Symplocaceae:** *Symplocos cochinchinensis* – *S. acuminata* (Blume) Miq.

**Thymelaceae:** *Gnidia glauca* - *Lasiosiphon glaucus* Fresen.

**Violaceae:** *Hybanthus enneaspermus* - *Afrohybanthus enneaspermus* (L.) Flicker, *Viola betonicifolia* – *V. betonicifolia* subsp. *betonicifolia* Sm.

**Zingiberaceae:** *Amomum fulviceps* - *Meistera fulviceps* (Thwaites) Skornick. & M.F.Newman, *Amomum trichostachyum* - *Meistera trichostachya* (Alston) Skornick. & M.F.Newman

*Grewia carpinifolia* Juss. is considered as an African species in (POWO 2019) and the valid identity of the plant described under this name in (Dassanayake & Fosberg 1991) is doubtful. *Pericopsis mooniana* Thwaites for *Curetis thetis* (Drury, 1773) in Jayasinghe et al. (2014) was a mis-identification of recently discovered *Curetis siva* Evans, 1954. *Entada rheedei* Spreng. for *Nacaduba pactolus ceylonica* Fruhstorfer, 1910 was a very rare butterfly species which was originally described from Nakiyadeniya in southern wet zone (Woodhouse 1949) and not known for decades until its appearance in a disjunct population at the eastern intermediate zone (van der Poorten & van der Poorten 2016). One of its closely allied species *Arhopala arnottiana* (Evans, 1957) is using a Dipterocarpaceae species as its sole LFP, initially, which was described as early stages of *A. ormistoni* by an mis-identification (van der Poorten & van der Poorten 2013a). An unusual population of more than 50 individuals of *A. ormistoni* was found recently in the catchment area of Namal Oya reservoir (7.321N & 81.521E). The only plant species belonging to the family Dipterocarpaceae in this micro-habitat is confirmed during this study as *Vatica obscura*, the species that was tentatively identified previously as an egg-laying plant of this butterfly (van der Poorten & van der Poorten 2016). Though the adult individuals of endemic *Udara singalensis* (R. Felder, 1868) and *Thoressa decorata* (Moore, 1881) are quite regularly seen, there are no any clues about their LFPs. Mostly, males of these species are seen in the field, but we never had a chance to follow females who are searching for LFPs. The remaining endemic species *Tajuria arida* Riley, 1923, *Nacaduba olivettei* Corbet, 1947, and *Spindasis nubilus* (Moore, 1887) are very rare and only a few adult individuals have been observed in the recent past (Jayasinghe et al. 2015; van der Poorten & van der Poorten 2016).

Together with the new information provided in this paper, a total of 582 plants identified up to the species level, belonging to 75 families has been confirmed as LFPs of Sri Lankan butterflies. This list comprises 70 endemic, 351 indigenous and 161 exotic species. There are further 15 confirmed LFPs, which are, however, not identified up to the species level. Most of these...
unidentified plants belong to the family Poaceae. The total butterfly-plant interactions are summed up to 1091, with the details given in this paper.

According to the documented information available up to now, there are only two endemic species of butterflies that use a single endemic plant as their sole LFP. That is the interactions between Halpe egena (R. Felder, 1868) - Davidsonia attenuata (van der Poorten & van der Poorten 2016) and Lethe dynsate (Hewitson, 1863) - Ochlandra striulda. It is, however, possible that these butterflies are using other bamboo species as well since many of the related butterfly species feed on several Poaceae species. The only LFP identified of the endemic Lethe daretis (Hewitson, 1863) is the endemic Kuruna debilis (van der Poorten & van der Poorten 2012b), but this butterfly was observed by us laying eggs on an unidentified grass species at the lawn of Hakgala botanic garden (6.923N & 80.821E) and successfully reared them on the same grass until the emergence of the adult butterflies. Appias galene (C. & R. Felder, 1865) has been reported to feed on endemic Drypetes gardneri (Jayasinghe et al. 2014) at Pitawala (7.542N & 80.750E), but its preferred LFP is Drypetes sepioria. Endemic Baoris penicillata Moore, [1881] prefers to feed on the endemic Ochlandra striulda (Jayasinghe et al. 2014; van der Poorten & van der Poorten 2016), but it can adapt to other exotic bamboo species as well. Coladenia tissa Moore, [1881] is reported here, to feed on endemic Pitranthe verrucosa, but it has many other non-endemic LFPs (Jayasinghe et al. 2014). Elymnias singhala Moore, [1875] has been reported to feed on two endemic species, namely Calamus ovoideus (Jayasinghe et al. 2014) and Loxococcus rupicola (van der Poorten & van der Poorten 2016), but also feed on other palm species as well. The two distantly related endemics, namely Kallima philarchus (Westwood, 1848) and Celaenorrhinus spliothyrus (R. Felder, 1868) depend on various endemic Strobilanthes species as their LFPs (Jayasinghe et al. 2014; van der Poorten & van der Poorten 2016).

Ca. 20% of the indigenous and endemic LFP species are categorized under threatened categories in the National Red Data List (MOE 2012). Some of the LFPs considered as ‘extinct’ and ‘possibly extinct’ were recently rediscovered during this LFP identification research (Jayasinghe 2015; de Vlas & de Vlas 2014; de Vlas 2019). The rediscovered, endemic species Rinorea decora is found in three locations, including a recent new locality at Sulugune (7.469N & 80.900E) in the Dumbara mountain range. This is the sole LFP of the Critically Endangered butterfly Phalanta alcippe ceylonica (Manders, 1903), which is also restricted to the same area. We were able to find this very rare, micro-habitat specific plant by tracing the butterflies who are looking for suitable plants for egg laying and we observed early stages at all the three locations. This incident reveals the importance of conserving the LFPs for the conservation of butterflies. The preferred LFP of the Critically Endangered butterfly Catochrysops panormus panormus (C. Felder, 1860), Flemingia macrophylla, was considered to be possibly extinct until it was rediscovered during this research. Fortunately, this species is now being introduced as a hedge plant for low country tea estates by the Tea Research Institute (Rajika Gamage pers. comm. 17.iv.2018), but whether these plants are exactly from the native population or a cultivar and whether the butterfly larvae are feeding on them, is yet to be discovered.

Out of the known details of 223 butterfly species, 47 of them are reported having a single LFP each. This includes nine endemic species and 20 endemic subspecies. Most of them appear to have a sole LFP, but there is a possibility to find more LFPs for some of these species. At the other extreme, Neptis hylas varmona Moore, 1872 is the most polygamous species in Sri Lanka. It uses 46 species of LFPs belongs to six families. Euploea core asela Moore, 1877 ranked for the second place by using 30 LFPs, but those plants belong only to two families. Zesius chrysomallus Hübner, 1821 seems to feed on any plant, where the Red Weaver Ants Oecophylla smaragdina Fabricius, 1775 are colonized. Butterflies that use the highest number of LFPs are listed in table 1. The exotic plant Axonopus compressus (Sw.) P. Beauv. has been reported to be used by 14 species of butterflies. It is interesting that many Poaceae species are shared by a high number of butterfly species (Table 2). Three-hundred-and-forty-four plant species from the whole LFPs list are not shared by two or more butterfly species. Most of the reported LFPs belong to the family Fabaceae (Table 3).

This information on LFPs of Sri Lankan butterflies can be used for habitat conservation-oriented management strategies, which will enhance the conservation of other flora and fauna as well. Further studies on the life history of targeted species are required for the unknown 23 species of butterflies which consist of very rare and / or endemic species. These studies should be aimed at revealing the reasons for their scarcity, which are required to ensure their future survival.
Table 1. Butterfly species that are using highest number of LFP species.

| Butterfly species | No. of LFPs | No. of plant families |
|-------------------|-------------|----------------------|
| Neptis hyla varmona Moore, 1872 | 46 | 6 |
| Euploea core asela Moore, 1877 | 30 | 2 |
| Jamides bocchus bocchus (Stoll, 1782) | 23 | 1 |
| Eurema hecabe hecabe (Linnaeus, 1758) | 22 | 1 |
| Graphium agamemnon mendis (Fruhstorfer, 1904) | 22 | 3 |
| Presotata nora ardatea (Moore, 1875) | 17 | 5 |
| Lampides boeticus (Linnaeus, 1767) | 16 | 1 |
| Eurema blanda citrina (Moore, 1881) | 15 | 1 |
| Zesius chrysomalus Hübner, 1821 | 15 | 8 |
| Papilio polytes romulus Cramer, 1775 | 14 | 1 |
| Jamides alecto melichius (Fruhstorfer, 1916) | 14 | 1 |

Table 2. LFPs used by highest number of butterfly species.

| LFP | Family | No. of butterflies using the plant |
|-----|--------|-----------------------------------|
| Acanthus spinosus (L.) | Poaceae | 14 |
| Urochloa maxima (Jacq.) | Poaceae | 10 |
| Ischaemum timorense Kunth | Poaceae | 10 |
| Oryza sativa | Poaceae | 9 |
| Dendrophthoe falcata (L.f.) | Loranthaceae | 8 |
| Dalbergia rostrata Hassk. | Fabaceae | 7 |
| Lepisanthes tetraphylla var. | Sapindaceae | 7 |
| Ochlandra striidula Thwaites | Poaceae | 7 |

Table 3. Number of LFP species in highest ranked families.

| Family | No. of LFPs |
|--------|-------------|
| Fabaceae | 135 |
| Apocynaceae | 40 |
| Poaceae | 38 |
| Acanthaceae | 36 |
| Rutaceae | 26 |
| Annonaceae | 20 |
| Arecaeae | 20 |
| Malvaceae | 20 |
| Zingiberaceae | 20 |

REFERENCES

Dassanayake, M.D. & F.R. Fosberg (1991). A Revised Handbook to the Flora of Ceylon. Vol. 7. Amerind Publishing Co. Pvt. Ltd., New Delhi, 433pp.

de Vlas, J. (2019). Illustrated Field Guide to the Flowers of Sri Lanka - Volume 3. J. de Vlas, Netherlands, 320pp.
de Vlas, J. & J. de Vlas (2014). Illustrated Field Guide to the Flowers of Sri Lanka - Volume 2. J & J de Vlas, Netherlands, 320pp.

Gamage, R. (2007). An Illustrated Guide to the Butterflies of Sri Lanka. Rajika Gamage, 254pp.

Gunawardana, B.R., G.V.I.H. Wijewardhana, H.M.B.E. Herath & T.M.T.S. Priyadarshana (2015). Erionota torus Evans, 1941: A new record for Sri Lanka with notes on its biology (Lepidoptera: Hesperiidae). WildLanka 3(3): 163–68.

Herath, C.U., P.B. Gamage, I. Rupasinghe & M.H.K. Arachchi (2020). A first record of oviposition of Common Orxy Horaga onyx Moore, 1857 (Insecta: Lepidoptera: Lycaenidae) in Sri Lanka and its importance in conserving a highly threatened butterfly. Journal of Threatened Taxa 12(1): 15201–15204. https://doi.org/10.11609/jott.5443.12.1.15201-15204

Jayasinghe, H.D. (2014). Common Butterflies of Sri Lanka. Ceylon Tea Services PLC, Colombo, 176pp.

Jayasinghe, H.D. (2015). Notes on observations of some threatened flowering plants of Sri Lanka including two “Extinct” species. NeBio 6(2): 1–8.

Jayasinghe, H.D., S.S. Rajapaksha & C. de Alwis (2014). A compilation and analysis of food plants utilization of Sri Lankan butterfly larvae (Papilionoidea). Taphrobanica 6(2): 110–131. https://doi.org/10.4038/taphrobanica.v6i2.7193

Jayasinghe, H.D., S.S. Rajapaksha & C. de Alwis (2015). A Pocket Guide to the Butterflies of Sri Lanka, Second Edition. Butterfly Conservation Society of Sri Lanka, Malwana, 185pp.

Jayasinghe, H.D., S.S. Rajapaksha & C. de Alwis (2020). The story of Sri Lankan Butterflies, v. 2.0. Butterfly Conservation Society of Sri Lanka. http://www.slbutterflies.lk/ accessed 06 April 2020.

Kostermans, A.J.G.H. (1980). Notes on Ceylonese Plants I. Miscellaneous Papers Landbouwhogeschool (Wageningen) 19: 205–230.

MOE (2012). The National Red List 2012 of Sri Lanka; Conservation Status of the Fauna and Flora. Biodiversity Secretariat/Ministry of Environment, Colombo, Sri Lanka, viii+476pp.

Nitin, R., V.C. Balakrishnan, P.V. Churi, S. Kalesh, S. Prakash & K. Kunte (2020). A Revised Handbook to the Butterflies of Sri Lanka, Second Edition. Butterfly Conservation Society of Sri Lanka, Malwana, 185pp.

POWO (2019). Plants of the World Online. http://www.plantsoftheworldonline.org/ accessed 30 December 2019.

Priyadarshana, T.S., I.H. Wijewardhanne, S. Sarang & N. Wijayathilaka (2015). Immature stages and the larval food plant of Nacaduba pactolus ceylonica Fruhstorfer, 1916 (Lepidoptera: Lycaenidae) in Sri Lanka. Journal of Threatened Taxa 7(12): 7945–7949. https://doi.org/10.11609/jott.o4359.7945-9

Rao, K.S., R.K. Swamy, D. Kumar, R.A. Singh & K.G. Bhat (2019). Flora of peninsular India. http://peninsula.ces.iisc.ac.in/plants.php?name=Sesbania%20procumbens/. Accessed on 30 December 2019.

Thiers, B. (2020). Index Herbariorum. http://sweetgum.nybg.org/science/. Accessed on 30 January 2020.

van der Poorten, G. & N. van der Poorten (2011a). New and revised descriptions of the immature stages of some butterflies in Sri Lanka and their larval food plants (Lepidoptera: Nymphalidae). Part 1: Sub-Family Danainae. The Journal of Research on the Lepidoptera 44: 1–16.

van der Poorten, G. & N. van der Poorten (2011b). New and revised descriptions of the immature stages of some butterflies in Sri Lanka and their larval food plants (Lepidoptera: Papilionidae). Journal of Research on the Lepidoptera 44: 111–127.
Annexure 1. Newly recorded LFPs of Sri Lankan butterflies.

| Butterfly species | Plant species | DS | Plant Family / consumed parts of the plant | Remarks |
|--------------------|---------------|----|-------------------------------------------|---------|
| Papilio demoleus demoleus Linnaeus, 1758 | Ruta chalepensis L. | Ex | Rutaceae / l | PC: LA |
| Graphium soropedon teredon (C. & R. Felder, 1865) | Actinodaphne glauca var. glauca Nees | En | Lauraceae / l | |
| | Persia americana Mill. | Ex | | |
| Graphium agamemnon menides (Fruhstorfer, 1904) | Goniathalamus gardneri Hook.f. & Thomson | En | Annonaceae / l | |
| | Uvaria zeylanica L. | l | | |
| Leptasia nina nina Fabricius, 1793 | Brassica juncea (L.) Czern. | Ex | Brassicaceae / l | PC: SG |
| | Brassica oleracea L. | Ex | | PC: ND |
| Belenois aurora taprobana (Moore, 1872) | Capparis brevispina DC. | In | Capparaceae / l | |
| Cepora nerissa phynae (Fabricius, 1775) | Capparis tenera Dalzell | In | Capparaceae / l | |
| Appias libythea libythea (Fabricius, 1775) | Cleome aspera (L.) Koenig ex DC. | In | Cleomaceae / l | |
| Catopsilia pyranthe pyranthe (Linnaeus, 1758) | Senna sophera (L.) Roxb. | In | Fabaceae / l | |
| Catopsilia scylla (Linnaeus, 1763) | Senna sophera (L.) Roxb. | In | Fabaceae / l | |
| Eurema hecabe hecabe (Linnaeus, 1758) | Chamaecrista absus (L.) H.S.Irwin & Barneby | In | Fabaceae / l | |
| | Mimosa diplotricha C.Wright | Ex | | |
| Eurema blanda citrina (Moore, 1881) | Archidendron clypeanum subsp. subcoriaceum (Thwaites) I.C.Nielsen | In | Fabaceae / il | |
| | Entada zeylanica Kosterm. | l | | |
| Ideopsis similis exprompta Butler, 1874 | Vincetoxicum flexuosum var. tenuis (Blume) Schnieder, Moeve & Lieide | In | Apocynaceae / l | |
| Paramatica aglae aglae (Stoll, 1872) | Ceropogia candelablrum var. biflora (L.) Ancari | In | Apocynaceae / l | |
| Euploea core asela Moore, 1877 | Secamone emetica (Retz.) R.Br. ex Sm. | In | Apocynaceae / l | |
| Euploea klugii sinhala Moore, 1877 | Streblus zeylanicus (Thwaites) Kurz | In | Moraceae / l | |
| Cupha erymanthis placida Moore, [1881] | Flacourtia iermis Roxb. | Ex | Salicaceae / l | PC: CU |
| Vindula erota asela (Moore, 1872) | Passiflora subepeta Ortega | Ex | Passifloraceae / l | PC: NC |
| Cicroscra thais ionka Moore, 1872 | Hydrococcus octandrus Thwaites | En | Achariaceae / l | |
| Vanessa cardui (Linnaeus, 1758) | Anaphalis sulphurea (Trimen) Grierson | En | Asteraceae / l, st | |
| | Artemisia indica Willd. | In | Asteraceae / l | |
| Junonia ariatha patenas (Fruhstorfer, 1912) | Rungia repens (L.) Nees | In | Acanthaceae / l | |
| Junonia hierta (Linnaeus, 1798) | Ruella prostrata Poir. | In | Acanthaceae / l | only in the lab |
| Junonia atalites atalites (Linnaeus, 1763) | Vandellia pusilla (Willd.) Merr. | In | Linderniaceae / l | |
| | Limnophila repens (Benth.) Benth. | In | Plantaginaceae / l | |
| Junonia almana almana (Linnaeus, 1758) | Vandellia pusilla (Willd.) Merr. | In | Linderniaceae / l | |
| Doleschallia bisaltide ceylonica Fruhstorfer, 1903 | Pseuderanthemum carruthersii (Seem.) Guillaumin | Ex | Acanthaceae / l | only in the lab |
| Callima philarchus (Westwood, 1848) | Strabilonthes exserta C.B.Clarke | En | Acanthaceae / l | |
| Pantoporia hordonia sinuata (Moore, 1879) | Albizia chinensis (Osbeck) Merr. | In | Fabaceae / l | |
| Butterfly species | Plant species | DS | Plant Family / consumed parts of the plant | Remarks |
|-------------------|--------------|----|------------------------------------------|---------|
| Neptis hyales varmona Moore, 1872 | Calopogonium mucunoides Desv. | Ex | Fabaceae / I | |
| | Grona heterocarpa var. heterocarpa (L.) H.Ohashi & K.Ohashi In | | | |
| | Grona heterophylla (Willd.) H.Ohashi & K.Ohashi In | | | |
| | Desmodium tortuosum (Sw.) DC. | Ex | | |
| | Glycine max (L.) Merr. | Ex | | |
| | Phyllodium pulchellum (L.) Desv. | In | | |
| | Todehagi triquetrum (L.) H.Ohashi In | In | | |
| | Vigna radiata (L.) R.Wilczek | Ex | | |
| | Pityranthe verrucosa Thwaites En | | | |
| | Helicteres isora L. | In | Malvaceae / I | |
| | Sterculia zeylanica Kosterms. | En | | |
| Neptis jumbah nalanda Fruhstorfer, 1908 | Mitragyna parvifolia (Roeb.) Korth. | In | Rubiaceae / I | PC: KW |
| | Ihe sa nitithissina Kosterms. | En | Centropetalaceae / I | |
| | Petrospermum suberifolium (L.) Willd. | In | Malvaceae / I | |
| | Campylasperrum serratum (Gaertn.) Bittrich & M.C.E.Amaral | In | Ochnaceae / I | |
| Moduza procris calidasa (Moore, 1858) | Prunus walkerii (Wight) Kalkman | En | Rosaceae / I | |
| | Mitragyna tubulosa (Arn.) Kuntze | In | Rubiaceae / I | |
| | Mussaenda samana Jayew. | En | | |
| Charaxes athamas athamas (Drury, [1773]) | Alizia chinensis (Osbeck) Merr. | In | Fabaceae / I | |
| | Calliandra surinamensis Benth. | Ex | | |
| Charaxes psaphon psaphon Westwood, 1847 | Entada zeylanica Kosterms. | En | Fabaceae / I | |
| Melanitis leda leda (Linnaeus, 1758) | Arundo donax L. | Ex | Poaceae / I | |
| | Elaeusine indica (L.) Gaertn. | In | | |
| Melanitis phedima tambra Moore, 1880 | Arundo donax L. | Ex | Poaceae / I | PC:KW |
| | Cyrtococcum trigonum (Retz.) A.Camus | In | | |
| Lethe daretis (Hewitson, 1863) | Unidentified 5 (Galways) | | Poaceae / I | |
| | Ochlandra striudula Thwaites | En | Poaceae / I | |
| | Mycalesis patnia patnia Moore, 1857 | Isochamis timorense Kunth | In | Poaceae / I | |
| | Curetis thetis (Drury, 1773) | Derri parviflora Benth. | En | Fabaceae / II | |
| | Arhopala amantes amantes (Hewitson, 1862) | Syzygium carphophilatum (L.) Alston | In | Myrtaceae / I | |
| Zesius chrysomallus Hübner, 1821 | Terminalia bellirica (Gaertn.) Roxb. | In | Combretaceae / I | PC: CU |
| | Bridelia retusa (L.) A.Juss. | In | Phyllanthaceae / I | |
| | Canthium coromandelicum (Burm.f.) Alston | In | Rubiaceae / I | |
| | Symplax acuminata (Blume) Miq. | In | Symplocaceae / I | |
| Amblypodia anita naradoaides Moore, 1879 | Oxa imbricata Roxb. | In | Glacaceae / I | |
| Cataparcalima major myosotina Fruhstorfer, 1912 | Lannea coromandelica (Houttt.) Merr. | In | Anacardiaceae / I | |
| | Albizia lebbeck (L.) Benth. | In | Fabaceae / I | |
| | Vitex altissima L.f. | In | Lamiaceae / I | |
| | Dendrophthoe falcata (L.f) Ethingsh. | In | Loranthaceae / I | |
| Rathinda amor (Fabricius, 1775) | Mongifera indica L. | Ex | Anacardiaceae / II | PC: NC |
| | Scutia myrtina (Burm.f.) Kurz | In | Rhamnaceae / II | |
| Dimocarpus longan Loui. | In | Sapindaceae / II | | |
| Butterfly species                  | Plant species                          | DS | Plant Family / consumed parts of the plant | Remarks |
|-----------------------------------|----------------------------------------|----|-------------------------------------------|---------|
| Cheritra freja pseudojaffra Moore, [1881] | Entada zeylanica Kosterm.               | En | Fabaceae / il                             |         |
|                                   | Melosoma simplicifolia subsp. simplicifolia (Roxb.) Walp. | In | Sabiaceae / ii                            |         |
| Spindasis lohita lazularia (Moore, 1881) | Albizia lebbeck (L.) Benth.              | In | Fabaceae / l                              |         |
|                                   | Senna auriculata (L.) Roxb.             | In | PC: NC                                    |         |
| Prattapa deva deva (Moore, [1858]) | Dendrophthoe falcata (L.f.) Ethingsh.    | In | Loranthaceae / ii                         |         |
|                                   | Dendrophthoe neelgherrensis (Wight & Arn.) Tiegh. | In |                                         |         |
|                                   | Scirpus parasitica L.                   | In |                                         |         |
|                                   | Taxillus incanus (Trimen) Wiens         | En |                                         |         |
| Hypolycaena niliginica Moore, [1884] | Thrixspermum pulchellum (Thwaites) Schltr. | In | Orchidaceae / fl                          | PC: GR  |
| Bindahara phocides moorei Fruhstorfer, 1904 | Euonymus walkeri Wight                | En | Celastraceae / fr                         |         |
| Rapala manea schistacea (Moore, 1879) | Aliophyllum càble (L.) Forsyth f.        | In | Sapindaceae / fl                          |         |
| Anthene lycaenina lycaenina (R. Felder, 1868) | Senegaia caesia (L.) Maslin, Seigler & Ebinger | In | Fabaceae / fl, flb                        |         |
| Nacaduba herms sidoma Fruhstorfer, 1916 | Connarus moncarpus L.                  | In | Connaraceae / ii                          |         |
| Nacaduba berenic armstoni Toxopeus, 1927 | Celtis philippensis Blanco             | In | Cannabaceae / fl, flb                     |         |
| Prosotas nora ardates (Moore, [1875]) | Archidendron clypearia subsp. subcoriareum (Thwaites) I.C.Nielsen | In | Fabaceae / fl, flb                        |         |
|                                  | Dalbergia rostrate Hassk.               | In |                                         |         |
| Prosotas dubiossa indica (Evans, [1925]) | Senegaia caesia (L.) Maslin, Seigler & Ebinger | In | Fabaceae / fl, flb                        | PC: KW  |
|                                  | Dalbergia rostrate Hassk.               | In |                                         |         |
|                                  | Mimosa diplotricha C.Wright             | Ex |                                         | PC: CU  |
|                                  | Mimosa pudica L.                        | Ex |                                         |         |
| Jamides bochus bochus (Stoll, [1782]) | Centroarea plumieri (Turpin ex Pers.) Benth. | Ex | Fabaceae / fl, flb                        |         |
|                                  | Senna occidentalis (L.) Link            | Ex |                                         |         |
| Jamides alecto melichius (Fruhstorfer, 1916) | Meistera benthamiana [Trim.] Skornick. & M.F.Newman | En | Zingiberaceae / fl, se                   | PC: KW  |
|                                  | Zingiber officinale Roscoe              | Ex |                                         |         |
| Jamides celena tissoma (Fruhstorfer, 1916) | Centroarea plumieri (Turpin ex Pers.) Benth. | Ex | Fabaceae / fl, flb                        |         |
|                                  | Entada zeylanica Kosterm.               | En | Fabaceae / il                             |         |
| Catochrysops strabo strabo (Fabricius, 1793) | Cajanus cajan (L.) Huth                | Ex | Fabaceae / flb                            |         |
|                                  | Flemingia lineata (L.) Roxb. ex W.T.Aiton | In |                                         |         |
| Lamprotes boeticus (Linnaeus, 1767) | Crotalaria albida B.Heyne ex Roth       | In | Fabaceae / fl, flb                        |         |
|                                  | Crotalaria beddomeana Thoth. & A.A.Ansari | Ex |                                         |         |
| Leptotes plinius plinius (Fabricius, 1793) | Ormocarpum senneoides subsp. hispidum (Willd.) Brench & Leonard. | In | Fabaceae / flb                            |         |
| Zizeeria karsanda (Moore, 1865) | Amaranthus blitum L.                   | Ex | Amaranthaceae / il                        |         |
| Zizina otis indica (Murray, 1874) | Alysicarpus scoroius (Rottler ex Spreng.) Graham | In | Fabaceae / flb                            |         |
|                                  | Aphyllodium biarticulatum (L.) Gagnep.  | In |                                         |         |
| Zizula hylax hylax (Fabricius, 1775) | Hygrophila heinii Sreem                 | In | Acanthaceae / flb                         |         |
|                                  | Phaulopsis dorsiflora (Retz.) Santapau  | In | Acanthaceae / flb, br                    |         |
| Everses lacturnus lacturnus (Godart, 1824) | Gromina heterophylla (Willd.) H.Ohashi & K.Ohashi | In | Fabaceae / se                             | PC: CU  |
| Azanus ubaldiis (Stoll, [1782]) | Aphyllodium amar (Roxb.) Boivin         | In | Fabaceae / flb                            |         |
| Megisba malaya thwaitesi Moore, 1881 | Mallotus rhamnifolius (Willd.) Müll.Arg. | In | Euphorbiaceae / flb                       |         |
| Abisara echerius prunosa Moore, 1879 | Ardisia gardneri C.B.Clarke             | En | Primulaceae / il                          |         |
| Chaespes benjamini benjamini (Guerin-Méneville, 1843) | Melosoma simipilicate subsp. simplicifolia (Roxb.) Walp. | In | Sabiaceae / il                            |         |
van der Poorten, G. & N. van der Poorten (2012a). Catopsilia Scylla (Linnaeus, 1763): a new record for Sri Lanka with notes on its biology, life history and distribution (Lepidoptera: Pieridae). The Journal of Research on the Lepidoptera 45: 17–23.

van der Poorten, G. & N. van der Poorten (2012b). New and revised descriptions of the immature stages of some butterflies in Sri Lanka and their larval food plants (Lepidoptera: Pieridae). Part 2: Subfamilies Satyrinae. Tropical Lepidoptera Research 22(2): 80–92.

van der Poorten, G. & N. van der Poorten (2012c). The bionomics of Spindasis greeni Heron, 1896 and a review of the early stages of the genus Spindasis in Sri Lanka (Lepidoptera: Lycaenidae). The Journal of Research on the Lepidoptera 45: 119–33.

van der Poorten, G. & N. van der Poorten (2013a). New and revised descriptions of the immature stages of some butterflies in Sri Lanka and their larval food plants (Lepidoptera: Lycaenidae). Part 1: Polyommatinae and Theclinae, in Part. The Journal of Research on the Lepidoptera 46: 25–49.

van der Poorten, G. & N. van der Poorten (2013b). New and revised descriptions of the immature stages of some butterflies in Sri Lanka and their larval food plants (Lepidoptera: Pieridae). Part 1: Subfamilies Pierini (in Part) and Coliadinae. Tropical Lepidoptera Research 23(1): 22–31.

van der Poorten, G. & N. van der Poorten (2014). New and revised descriptions of the immature stages of some butterflies in Sri Lanka and their larval food plants (Lepidoptera: Pieridae). Part 2: Subfamily Pierinae (in Part). Tijdschrift Voor Entomologie 157: 1–25. https://doi.org/10.1163/22119434-00002036

van der Poorten, G.M. & N.E. van der Poorten (2016). The Butterfly Fauna of Sri Lanka. Lepodon Books, Toronto, 418pp.

van der Poorten, G.M. & N.E. van der Poorten (2018). Field Guide to the Butterflies of Sri Lanka. Lepodon Books, Toronto, 250pp.

WCSP (2020). World Checklist of Selected Plant Families. https://wcsp.science.kew.org accessed 30 January 2020.

Woodhouse, L.G.O. (1949). The Butterfly Fauna of Ceylon, second complete edition. The Colombo Apothecaries’ Co. Ltd., Colombo, 121pp.
First record of Wroughton’s Small Spiny Mouse *Mus phillipsi* Wroughton, 1912 (Rodentia: Muridae) from Odisha, India with notes on diversity and distribution of other rodents  
– Pratyush P. Mohapatra, S.S. Talmale, V. Sarkar & S.K. Dutta, Pp. 17611–17618

Small mammals in the human-dominated landscape in the northern Western Ghats of India  
– Sameer Bajaru, Amol R. Kulavmode & Ranjit Manakadan, Pp. 17619–17629

Faunal diversity of an insular crepuscular cave of Goa, India  
– Pratiksha Sail, Manoj Ramakant Borkar, Ismat Shaikh & Archana Pal, Pp. 17630–17638

Potential remote drug delivery failures due to temperature-dependent viscosity and drug-loss of aqueous and emulsion-based fluids  
– Derek Andrew Rosenfield, Alfredo Acosta, Denise Trigilio Tavares & Cristianne Schilbach Pizzuto, Pp. 17639–17645

Foraging behavior and association with mixed flocks by the Critically Endangered Alagoas Tyrannulet *Phylloscartes ceciliae* (Aves: Passeriformes: Tyrannidae)  
– Carlos Otávio Araujo Gussoni & Tatiana Pongiluppi, Pp. 17646–17650

Ichthyofaunal diversity in the upper-catchment of Kabini River in Wayanad part of Western Ghats, India  
– Dencin Rons Thampy, M.R. Sethu, M. Bibin Paul & C.P. Shaji, Pp. 17651–17669

Herpetofaunal inventory of Van Province, eastern Anatolia, Turkey  
– Mehmet Zülfü Yildiz, Naşit İğci & Bahadır Akman, Pp. 17670–17683

Herpetofauna assemblage in two watershed areas of Kumoan Himalaya, Uttarakhand, India  
– Kaleem Ahmed & Jamal A. Khan, Pp. 17684–17692

A checklist of earthworms (Annelida: Oligochaeta) in southeastern Vietnam  
– Dang Hai Lam, Nam Quoc Nguyen, Anh Duc Nguyen & Tung Thanh Nguyen, Pp. 17693–17711

Some biological aspects of the central Indian endemic scorpion *Hottentotta jabelpurenisis* Kovářík, 2007 (Scorpiones: Buthidae)  
– Pragya Pandey, Pratyush P. Mohapatra & D.B. Bastawade, Pp. 17712–17721

First record of the early immature stages of the White Four-ring *Ypthima ceylonica* (Insecta: Lepidoptera: Nymphalidae), and a note on a new host plant from India  
– Hari Theivaprakasham, Hari Ramanasaran & Appavu Pavendhan, Pp. 17722–17730

A first record of *Lipotriches (Rhopalomelissa) parca* (Kohl, 1906) (Halictidae: Nomiinae) from India  
– Bhaswati Majumder, Anandhan Rameshkumar & Sarfrazul Islam Kazmi, Pp. 17841–17842

Addition of four species to the flora of Andaman Islands, India  
– Mudavath Chennakesavulu Naik, Lal Ji Singh, Gautam Anuj Ekka & C.P. Vivek, Pp. 17843–17846