

Moth diversity (Lepidoptera: Heterocera) of Shendurney and Ponnudi in Agasthyamalai Biosphere Reserve, Kerala, India, with notes on new records

Yash Sondhi¹, Sanjay Sondhi², Shashank Rajendra Pathour³,
and Krushnamegh Kunte⁴

¹Department of Biological Sciences, Florida International University, 11200 SW 8th St, Miami, FL 33199, USA.

^{1,2}Titli Trust, 49 Rajpur Road Enclave, Dhoran Khas, near IT Park, P.O. Gujrada, Dehradun 248001 Uttarakhand, India.

³Division of Entomology, Indian Agricultural Research Institute, New Delhi 110012, India.

⁴National Centre for Biological Sciences, Tata Institute of Fundamental Research (TIFR), GKVK Campus, Bellary Road, Bangalore 560065, Karnataka, India.

^{1,2,4}Indian Foundation for Butterflies, C-703, Alpine Pyramid, Rajiv Gandhi Nagar, Bengaluru 560097, Karnataka, India.

¹yash@ifoundbutterflies.org (corresponding author), ²sanjay.sondhi1@gmail.com, ³spathour@gmail.com, ⁴krushnamegh@ncbs.res.in

Date of issue online: 13 December 2018

Electronic copies (ISSN 2575-9256) in PDF format at: <http://journals.fcla.edu/troplep>; <https://zenodo.org>; archived by the Institutional Repository at the University of Florida (IR@UF), <http://ufdc.ufl.edu/ufir>; DOI: 10.5281/zenodo.2027709

© The author(s). This is an open access article distributed under the Creative Commons license CC BY-NC 4.0 (<https://creativecommons.org/licenses/by-nc/4.0/>).

Abstract: We present a list of 282 species of moths recorded during surveys conducted over 31 survey nights during a 3-year period in Shendurney Wildlife Sanctuary (WLS) and Ponnudi, Kerala, India. Shendurney WLS and Ponnudi are part of the Agasthyamalai Biosphere Reserve in the southern Western Ghats, which is one of India's three biodiversity hotspots. Shendurney is a diversity hotspot within the Western Ghats. It has a high degree of endemism and several new species have recently been described from the sanctuary. The moth diversity in Shendurney is poorly studied and only 128 moth species have been previously reported. This illustrated checklist of 282 species expands on previous reports and includes notes on flight periods and distribution. Fifteen range extensions were recorded, of which 14 were new records for Kerala, one a new record for India, and one a new species.

Keywords: biodiversity assessment, biodiversity hotspots, Asian moths, range extensions, Western Ghats.

INTRODUCTION

The moth diversity of the Western Ghats has been poorly studied in the past few decades. Pioneering work by Hampson (1891, 1892, 1894, 1895, 1896) and Bell and Scott (1937), although extensive, is in need of a systematic update and additional modern surveys. Species of agricultural importance have received some attention (Adiroubane & Kuppammal, 2010; Jha *et al.*, 2017; Nagaharish *et al.*, 2017). However, patterns of diversity and distribution for most non-pest moth species are not well documented. There are few studies that have examined regional moth diversity in southern India, and specific studies on the moth diversity of Kerala are summarized as follows. Mathew and Rahamathulla (1995) reported 318 species of moths from the Silent Valley National Park during five months of survey. Sudheendrakumar and Mathew (1999) reported 277 species of moth from Parambikulam Wildlife Sanctuary during three years of survey. Mathew *et al.* (2004a) reported 128 species of moths from Shendurney Wildlife Sanctuary during two weeks of survey. Mathew *et al.* (2004b) reported 87 species of moths from Peppara Wildlife Sanctuary during two months of survey. Mathew *et al.* (2005) reported 113 species of moths from Peechi-Vazhani Wildlife Sanctuary. Mathew *et al.* (2007) reported 90 species of moths from Neyyar Wildlife Sanctuary during two months of survey. Mathew *et al.*

(2018) reported 112 species of moths from the Vagamon Hills, Idduki during a year of survey. Mathew and Menon (1984) reported 155 species of Pyralid moths from Kerala.

Apart from Kerala, there have been a number of studies examining moth diversity in different states in peninsular India. Maharashtra has been surveyed the most comprehensively after Kerala. Shubhalaxmi *et al.* (2011) reported 418 species from northern Western Ghats. Gurule and Nikam (2013) reported 245 species from northern Maharashtra. Bharamal (2015) reported 56 species from Amboli reserve forest. Gadhikar *et al.* (2015) reported 41 species from Amravati city. The neighboring state to Kerala, Tamil Nadu, has fewer studies on moth diversity. Ramkumar *et al.* (2010) studied the seasonal abundance of five species of fruit piercing moth (Erebidae: Erebininae), Sivasankaran *et al.* (2011) reported 154 species of noctuid moths from the Tamil Nadu part of the Western Ghats. Sivasankaran and Ignacimuthu (2014) reported 67 species of Erebid moths from Tamil Nadu. Elanchezhian *et al.* (2014) reported 105 moth species from Maruthamalai hills. Karnataka, to the north of Kerala, has few recent studies on moth diversity outside of pest related species (Jha *et al.*, 2017; Nagaharish *et al.*, 2017). Ghorpade *et al.* (2013) reported 69 species of Sphingidae. Adiroubane and Kuppammal (2010) reported 95 moth species from Pudukcherry. Several authors have studied the moth diversity of families across the Western Ghats. Kirti *et*

al. (2012) reported 101 species of Geometridae moths from the Western Ghats. Sekhon and Singh (2015) reported 41 species of Erebidae moths from the Western Ghats. Singh and Singh (2012) have the first records of two species of Arctiidae (Erebidae: Arctiinae) from the Western Ghats. Outside of published literature, much of the seasonal abundance and distributional data of moths of the Western Ghats are scattered across various citizen science websites such as Moths of India (<http://www.mothsofindia.org/>; Sondhi *et al.*, 2018), iNaturalist (<https://www.inaturalist.org>), Project Noah (<https://www.projectnoah.org/>), and India Biodiversity Portal (<http://indiabiodiversity.org/>).

The present study was conducted in Shendurney Wildlife Sanctuary and Ponmudi (Fig. 1-3) in the Agasthyamalai Biosphere Reserve (ABR) (Fig. 4). Agasthyamalai Biosphere Reserve (ABR) is a UNESCO world biosphere reserve located in the Southern Western Ghats and extends across parts of two southern Indian states, Kerala and Tamil Nadu. ABR spans an area of 3500.36 km² and includes three Wildlife Sanctuaries, Neyyar, Peppara and Shendurney and one Tiger Reserve - Kallakad Mundanthurai (KMTR). The elevation level range in ABR is from 100 to 2000 m. The windward side of ABR receives 2000-5000 mm of precipitation, in contrast to the leeward side, which receives between 900-2000 mm of precipitation (Dutta *et al.* 2016). Shendurney WLS is located in Kollam District and is in the Kerala portion of ABR,

although the region is contiguous with the Tamil Nadu KMTR forests where the species assemblage are likely to be similar. Shendurney covers an area of 172 km² and primarily consists of tropical evergreen and semi-evergreen forests, but also has some moist deciduous and hilltop tropical evergreen forests. The sanctuary has a man-made lake of nearly 19 km² and is also surrounded by the reservoir of Thenmala Dam. Three sites were chosen at Shendurney with different altitudes and habitats in order to sample a greater portion of the species assembly (Table 1, Fig 1-3). The fourth site, Ponmudi, is a small hill-station that is also part of ABR. The habitat surrounding Ponmudi is a mix of valleys and hills with forests and plantations. Ponmudi was chosen for its accessibility and availability of electricity, which facilitated more frequent surveys. These four sites were surveyed over a three-year period in an effort to assess the moth species present in the region as well as to create a repository of voucher specimens with a tissue library. An illustrated checklist of the moths found during the study and the altitudes and months in which they were observed, along with notes on new records, are presented below.

MATERIALS AND METHODS

The partial checklist of moths presented in this paper is based on systematic surveys conducted primarily in Shendurney Wildlife Sanctuary and Ponmudi during 31 survey nights over a

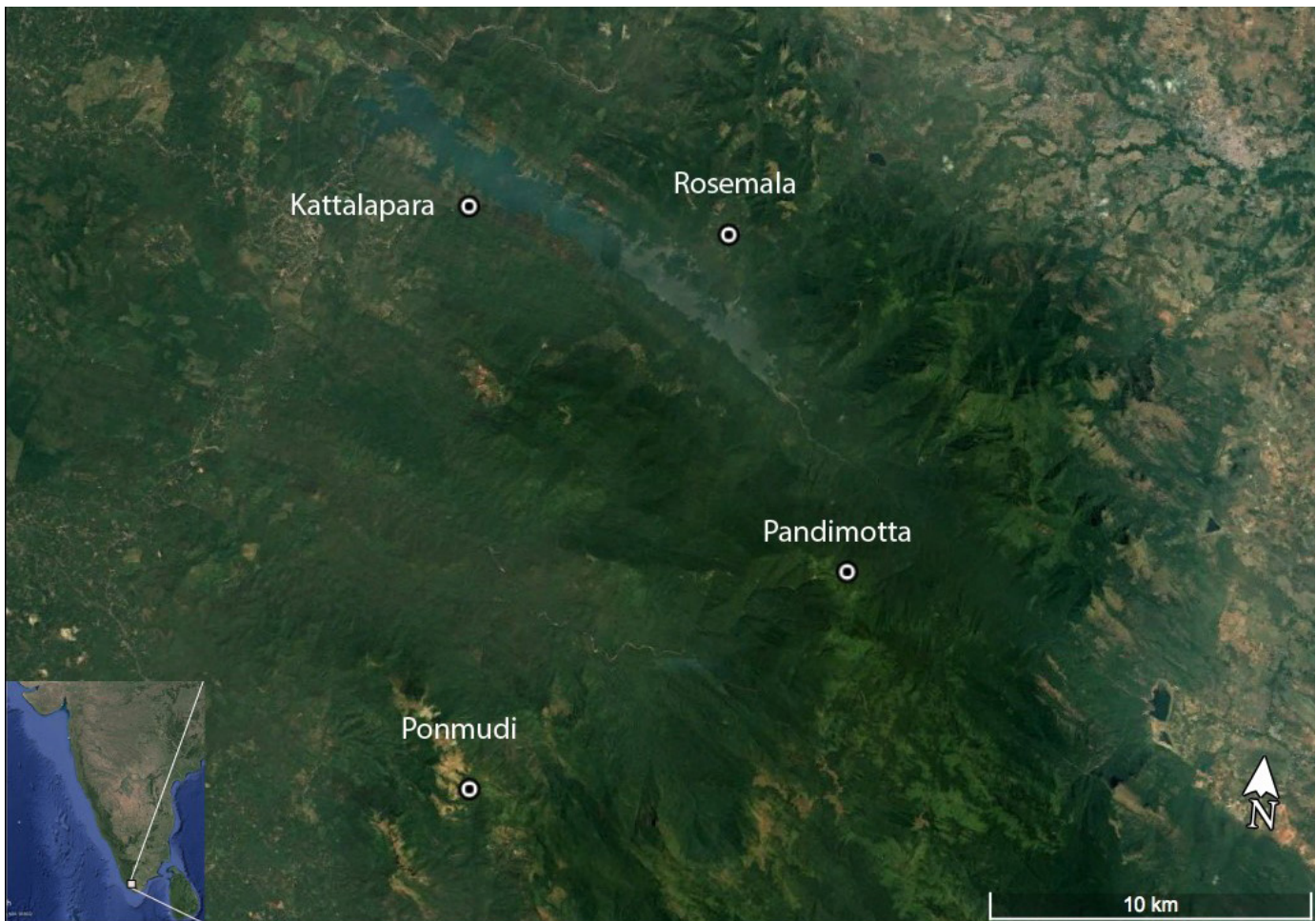


Figure 1. Location of study sites. Satellite imagery from Google Earth.



Figure 2. Habitat surrounding the various study sites where sampling was conducted during the surveys. (Top left: Pomudi, Top Right: Pandimotta, Bottom Left: Rosemala, Bottom Right: Kattalapara).

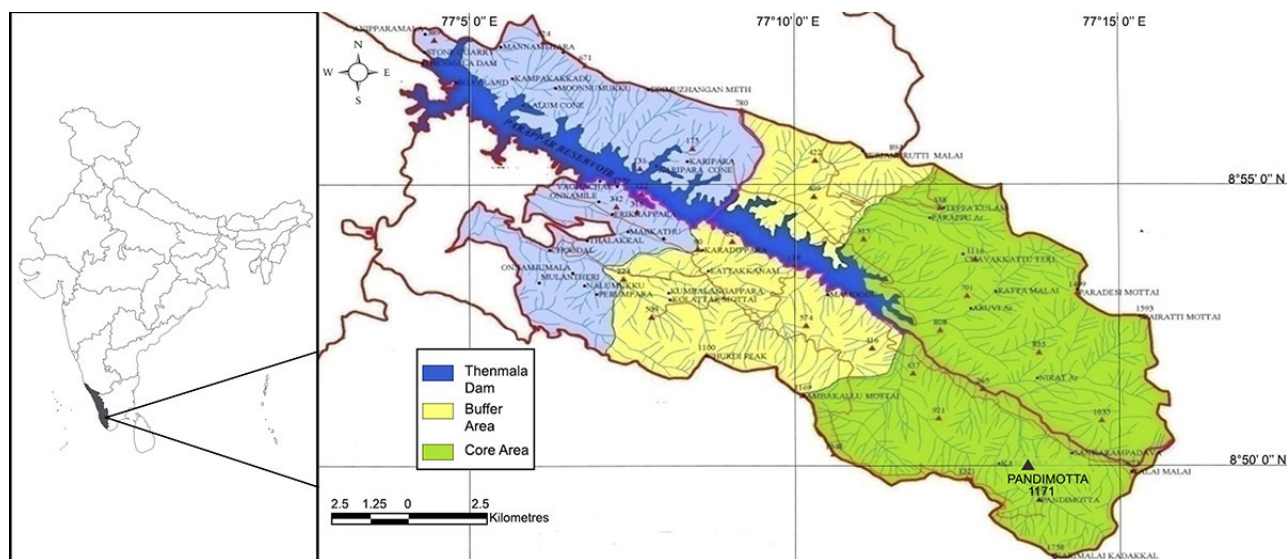


Figure 3. Map of Shendurney Wildlife Sanctuary in the southern Western Ghats of Kerala, India. Map of the area is adapted from a map provided by the Kerala Forest Department.

period of three years, 2014-2016, during the months of February, April, May, June, August, September, October and November (Table 1). The survey effort at all four sites was not the same, Pomudi was surveyed more frequently with shorter surveys, whereas the sites in Shendurney were surveyed for fewer but longer surveys, mostly due to logistical constraints (Table 1).

A light trap consisting of a 160W mercury vapor bulb was powered by a portable generator (Honda™ EP 1000) or electrical mains, if available, and placed in front of a 4 × 5 ft. white cotton screen. At Shendurney, the screen was illuminated using the portable generator after sundown and was run for a minimum of four hours, the trap was run from 19:30-22:00

and 24:00-01:30 since this included the activity peaks we observed at the sites. This ensured that species that fly later in the night were also recorded. At Ponmudi, the screen was run from sundown till early morning with electricity from the grid, barring poor weather conditions.

Moths were photographed in the field using a Nikon™ D300 with a 105 mm macro lens or a Nikon™ D60 and 18-55 mm lens. Collection permits were obtained from the Kerala Forest Department. Moths were collected in killing jars filled with ether, from which tissue (legs and thoracic muscle) was collected within 24 hours and stored in molecular-grade, 100% ethanol. Large specimens were pinned after tissue collection and small specimens were collected in duplicate, where possible. In the case of small specimens, one individual was pinned, and other specimens were stored with the body in 100% ethanol and wings in glassine envelopes with the same voucher codes. All specimens were deposited in the research collections of the Museum and Field Stations Facility of the National Centre for Biological Sciences (NCBS), Bengaluru (=Bangalore), Karnataka, India, unless mentioned otherwise.

The available literature was used to identify the moths, including Moore (1880-1840), Hampson (1891-1896), Bell and Scott (1937), Barlow (1982), Holloway (1983-2011), Pinratana and Lampe (1990), Robinson (1994), Inoue *et al.* (1997), Kendrick (2002), Pinratana and Lampe (1990) Kononenko and Pinratana (2005, 2013), Zolotuhin and Pinratana (2005), Schlintlmeister and Pinratana (2007), and Kirti and Singh (2015-2016). The classification system used by van Nieuwerkerken *et al.* (2011) was followed.

RESULTS AND DISCUSSION

During the study, 244 moth species were identified to species level and another 38 to generic level (Table 2, Plates 1-12). We provide images of voucher specimens collected or, if a specimen was not collected, photographs of live individuals. Whenever distinct sexual dimorphism was noted, and male and female specimens were collected, both sexes have been included in the plates. The families Geometridae, Erebidae and Crambidae were the most numerous (Table 3). Fifteen range extensions that were recorded are discussed below. One species was a new record for India and one new species of Sphingidae was described (Sondhi *et al.*, 2017).

Notes on range extensions and interesting records

Species checklists from the region were examined for previous records of these species (Mathew & Menon, 1984; Mathew and Rahamathulla, 1995; Sudheendrakumar & Mathew, 1999; Mathew *et al.*, 2004a, 2004b, 2005, 2007, 2018; Sivasankaran *et al.*, 2011; Kirti *et al.*, 2012; Singh & Singh, 2012; Elanchezian, 2014; Sivasankaran & Ignacimuthu, 2014). Notes on distribution only include the Indian subcontinent, unless otherwise mentioned. The identification was done based on external morphology which was sufficient to identify most of the species. However, some species required an examination of the genitalia or DNA barcodes to confirm the identity and those are mentioned in the notes.

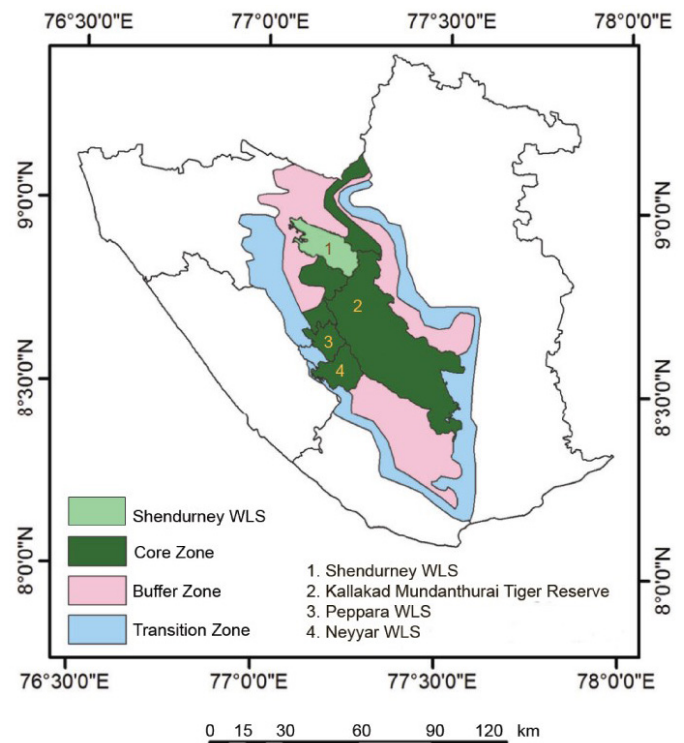


Figure 4. Map of Agasthyamalai Biosphere Reserve, including the location of Shendurney Wildlife Sanctuary. Map of the area is adapted from Jha *et al.* (2016).

Crambidae

Heortia vitessoides (Moore, [1885]) Pl 1:4

Material examined: 28.viii.2014 (NCBS-AG575), Ponmudi.

Photographic records: 19.x.2014, Ponmudi.

Distribution: Kerala (new record), North Eastern India (Arunachal Pradesh, Meghalaya, Assam, Tripura, Nagaland) and Sri Lanka. (Hampson, 1896; Sondhi *et al.*, 2018).

Remarks: This is the first record of this species from Kerala.

Polythlipta divaricata Moore, [1886] Pl 1:19

Material examined: 2.v.2014 (NCBS-PZ171), Pandimotta.

Photographic records: 5.vi.2014, Ponmudi 28.iv.2015, Ponmudi.

Distribution: Kerala, India (new record), Sri Lanka, Taiwan, China and Papua New Guinea (Hampson, 1896; Moore, 1884; Ratnasingham & Hebert, 2007; Sondhi *et al.*, 2018).

Remarks: The species is recorded in the list of Indian Pyralidae compiled by Mathew (2006), but the exact locality where it was found could not be traced. This current record confirms that the distribution of this species extends beyond Sri Lanka into India.

Drepanidae

Teldenia vestigiata (Butler 1880) Pl. 2:26

Material examined: 31.v.2014 (NCBS-QA591), Pandimotta; 3.vi.2014 (NCBS-AG249), Pandimotta.

Photographic records: 4.vi.2014, Ponmudi.

Distribution: Karnataka, Kerala, Garhwal and Kumaon Himalaya, Sikkim, Nagas and Sri Lanka (Hampson, 1892; Wilkinsons (1967); Smetacek, 2008; Sondhi & Sondhi, 2016).

Table 1. Location of study sites along with altitude, habitat, survey effort and number of species recorded.¹Survey effort includes number of days (X) and start date of each survey effort.

Site	Location Name	Latitude/Longitude	Altitude, m	Habitat	Survey effort ¹	Number of species
A	Ponnudi	8°45'26.18"N, 77° 7'0.67"E	865	Hilltop tropical evergreen forest and interspersed with plantation	3X(5-vi-2014) 1X(28-viii-2014) 1X(19-x-2014) 1X(21-ii-2015) 1X(28-iv-2015) 1X(7-xi-2015) 1X(19-xi-2016)	175
B	Pandimotta	8°49'39.18"N, 77°13'1.80"E	1,171	Stunted evergreen forest (shola) and hilltop tropical evergreen forest	5x(2-v-2014) 4x(31-v-2014) 2x(19-ix-2015) 1X(13-ii-2016) 1X(18-xi-2016)	136
C	Rosemala	8°55'6.44"N 77°10'27.82"E	356	Moist mixed deciduous and semi evergreen forest.	4X(27-v-2014)	75
D	Kattalpara		135	Tropical evergreen forest and semi evergreen forest.	3X(10-v-2014) 1X(13-ii-2016) 1X(19-xi-2016)	6

Remarks: An older revision of the genus *Teldenia* by Wilkinson (1967) reports specimens from both Kanara and Travancore. There is one unpublished record from Karnataka and second from Kerala where the moth was also reared (Balakrishnan Valappil, pers. comm.). This is only the second published record from Kerala.

Geometridae

Ornithospila submonstrans (Walker, 1861) Pl. 8:190

Material examined: 31.v.2014 (NCBS-QA589), Pandimotta.

Photographic records: 4.vi.2014, Ponnudi; 5.vi.2014, Ponnudi.

Distribution: Kerala (new record) Western Himalayas (Dehradun), Borneo (Sondhi & Sondhi, 2016; Holloway, 1996).

Remarks: This is the first record of this species from Kerala and only the second published record from India.

Ornithospila lineata (Moore, 1872) Pl. 8:189

Material examined: 6.vi.2014 (NCBS-QA669), Ponnudi.

Distribution: Kerala (new record), North Eastern Himalayas and Sri Lanka (Holloway, 1996).

Remarks: This is the first record of this species from Kerala.

Erebidae

Macrobrochis splendens (Butler, 1877) Pl. 2:52

Material examined: 3.v.2014 (NCBS-PX584), Pandimotta.

Photographic records: 3.vi.2014, Pandimotta; 28.viii.2014, Ponnudi.

Distribution: Kerala (new record), Maharashtra, Karnataka (Singh *et al.*, 2014)

Remarks: This is the first published record of this species from Kerala.

Noctuidae

Ramadasa pavo (Walker, 1856) Pl. 9:213

Material examined: 19.x.2014 (NCBS-AG546), Ponnudi; 28.viii.2014 (NCBS-AG528), Ponnudi.

Distribution: Kerala (new record), Sri Lanka and Andaman Islands, North East India (Hampson, 1894; Kendrick, 2002; Sondhi *et al.*, 2018).

Remarks: This is the first record of this species from Kerala.

Anoba pectinata (Hampson, 1896) Pl. 2:36

Material examined: 19.x.2014 (NCBS-AG584), Ponnudi.

Photographic records: 3.vi.2014, Pandimotta.

Distribution: Kerala (new record), Maharashtra, North Eastern Himalayas (Shubhalaxmi *et al.*, 2011; Sondhi *et al.*, 2018).

Remarks: Previously reported as a range extension from Mumbai. This is the first record of this species from Kerala.

Noctuidae

Plusiopalpa adrasta (Felder and Rogenhofer, 1874) Pl. 9:222

Material examined: Male, 18.xi.2016 (IRAI, Coll. by Shashank P.R.), Pandimotta.

Distribution: Kerala (new record), Meghalaya, Andaman and Nicobar Islands (Kendrick, 2002)

Remarks: Identification confirmed using genitalia. This is the first record of this species from Kerala.

Scriptoplusia nigriluna (Walker, 1858) Pl. 9:223

Material examined: Male, 18.xi.2016 (IRAI, Coll. by Shashank P.R.), Pandimotta.

Distribution: Kerala (new record), North Eastern Himalayas (Sekhon & Singh, 2015).

Remarks: Identification confirmed using genitalia. This is the first record of this species from Kerala.

Nolidae

Ariola ransonneti Felder & Rogenhofer, 1874 Pl. 9:224

Material examined: 3.v.2014 (NCBS-PZ189), Pandimotta.

Distribution: Kerala (new record), Sri Lanka (Holloway, 2003).

Remarks: Earlier this taxon was considered as *Ariola coelsigna* Walker, 1857, but Holloway considered them a series of syntypes and split them into separate species. The specimens

from Sri Lanka were allocated to an unused synonym *Ariola ransonneti* and the Himalayan and South East Asian ones were retained as *Ariola coelsigna* (Holloway, 2003). This is the first record of this species from Kerala.

Sphingidae

Acosmeryx anceus subdentata Rothschild & Jordan, 1903 Pl. 10:243

Material examined: 28.v.2014 (NCBS-PZ277), Rosemala.

Photographic records: 5.vi.2014, Ponmudi.

Distribution: Kerala (new record), Karnataka (Bell & Scott, 1937), Northern and North East India (Sondhi *et al.*, 2018).

Remarks: This is the first published record from Kerala.

Rhagastis acuta (Walker, 1856) Pl. 10:252

Material examined: Male, 31.v.2014 (NCBS-PW597), Pandimotta.

Distribution: Kerala (new record), Karnataka, Northern and North Eastern India (Kitching, 2018).

Remarks: The only other record of this genus from Kerala is a report of *Rhagastis castor* from Silent Valley, Kerala (Mathew & Rahamathulla, 1995). However, this record of *R. castor* is probably incorrectly identified and the species might actually be *R. acuta* given the difficulty distinguishing between these two species using external morphology alone. We used barcodes and genitalia to confirm the identity of the specimen. This is the first published record from Kerala.

Theretra shendurneensis Sondhi, Kitching, Basu & Kunte, 2017 Pl. 11:259

Material examined: Male 31.v.2014 (NCBS-QA070), Pandimotta; Female 1.vi.2014 (NCBS-QA587) Pandimotta; 2.vi. 2014 (NCBS-QA627), Pandimotta.

Distribution: Kerala (Sondhi *et al.*, 2017).

Remarks: We recorded a new species of Sphingidae during the study, which has been reported previously, see Sondhi *et al.* (2017).

Thyrididae

Herdonia cf. thaiensis Inoue, 1993 Pl. 11:274

Material examined: Female 27.v.2014 (NCBS-PZ292), Rosemala.

Distribution: Kerala (new record), Maharashtra, Karnataka.

Remarks: This species has only been recently reported from India and it is known to have a short flight period (Shashank, 2016; Valke, 2011). It is hard to confirm the identity of this species using external morphology alone, but given that the only other recorded *Herdonia* from South India is *Herdonia thaiensis*, which was reported from Kerala (Shashank 2016), it is likely to be the same species. This is the first record from Kerala and only the third published record from India.

Uraniidae

Rhombophylla edentata (Hampson 1895) Pl. 12:280

Material examined: 27.v.2014 (NCBS-PZ290), Rosemala.

Photographic records: 19.vi.2016. Thrissur (Moths of India image codes bk682; Sankaraman, 2018) .

Distribution: Kerala (new record), North Eastern India (Hampson, 1895).

Remarks: This species was transferred from *Epiplema* to *Rhombophylla* by Holloway (1998), who mentioned the distribution as India and also mentioned T. R. D. Bell as having reared it India, but did not mention the exact locality. Described from Sikkim by Hampson in 1895 with no published records from North East India after the original description. These are the first published records of this species from Kerala.

CONCLUSIONS

The present checklist is an accumulation of surveys in four locations in the Agasthyamalai Biosphere Reserve, primarily Shendurney and Ponmudi, over a three-year period. We recorded 282 species during the survey, however, this checklist represents only the moths that we were able to identify to a species or generic level and there are between 130-140 specimens that could not be identified. We recorded the most species from the families Erebiidae, Geometridae and Sphingidae. Ponmudi and Pandimatta, the higher elevation sites, were also the most species rich. We described a new hawkmoth species, fourteen new records for Kerala and one confirmed range extension for India. This study helped document the moth diversity in the region and establish baseline data, and it was also part of a larger effort to build a molecular reference collection of Indian Lepidoptera. Despite three years of survey, the sampling is still incomplete and more survey effort is required to assess the complete moth diversity of the region.

ACKNOWLEDGMENTS

We thank Dipendra Nath Basu for helping with genitalia dissections that assisted in species identification, Ian J. Kitching for assistance with species identification, and Anchal Sondhi, Kiran Marathe, Shantanu Joshi, Siddharth Pillai, Kushal Singh, Mallika Irene Suresh, Soham Mukherjee, Navya Nagananda and Parvathi P. Mohan for assistance with the fieldwork. In addition, we thank Dr. Freerk Molleman, Dr. Ullasa Kodandaramiah, Dr. Kalika Prasad as well as faculty and staff at IISER- Trivandrum for their help and support throughout the course of the project. We thank Geetha Iyer and George Mathew for their constructive feedback as reviewers. This work was facilitated by collection permit Ed.-WL10-5411/2014 issued to YS by the Kerala State Forest Department. Thanks are due to Kalesh S. and other members of the Travancore Natural History Society for logistical support. This project was funded by Titli Trust (www.titlitrust.org), a KVPY Fellowship (Kishore Vaigyanik Protsahan Yojana, Dept. of Science and Technology, Govt. of India) to YS, and a Ramanujan Fellowship and an NCBS research grant to KK.

Table 2. Partial checklist of moths recorded during the study.

¹Survey Sites A: Pomudi, B: Pandimotta C: Rosemala, D: Kattalapara. ²Months in which individuals were sighted or collected during the survey.

Sr. No.	Family	Subfamily	Species	Author, Year	Location ¹	Altitude range, m	Months recorded ²
1	Bombycidae	-	<i>Pencillifera apicalis</i>	(Walker, 1862)	AB	865-1171	v,viii
2	Bombycidae	-	<i>Trilocha varians</i>	Walker, 1855	A	865	vi,x,xi
3	Callidulidae	Callidulinae	<i>Tetragonus catamitus</i>	Geyer, 1832	C	356	v
4	Crambidae	Odontiinae	<i>Heortia vitessoides</i>	(Moore, [1885])	A	865	viii,x
5	Crambidae	Pyralinae	<i>Vitessa suradeva</i>	(Moore, [1885])	AB	865-1171	vi,viii,xi
6	Crambidae	Spilomelinae	<i>Agathodes ostentalis</i>	(Geyer, 1833)	AB	865-1171	v,viii,x
7	Crambidae	Spilomelinae	<i>Agrioglypta itysalis</i>	(Walker, 1859)	AC	356-865	iv-v,x-xi
8	Crambidae	Spilomelinae	<i>Botyodes asialis</i>	Guenée, 1854	AB	865-1171	vi,x
9	Crambidae	Spilomelinae	<i>Cadarena pudoraria</i>	Hübner, 1825	ABC	356-1171	v-vi
10	Crambidae	Spilomelinae	<i>Conogethes punctiferalis</i>	(Guenée, 1854)	A	865	vi,x-xi
11	Crambidae	Spilomelinae	<i>Diaphania indica</i>	(Saunders, 1851)	A	865	vi
12	Crambidae	Spilomelinae	<i>Dichochrosia nigrilinealis</i>	(Walker, 1866)	BC	356-1171	v
13	Crambidae	Spilomelinae	<i>Filodes fulvidorsalis</i>	(Hübner, 1832)	B	1171	v
14	Crambidae	Spilomelinae	<i>Glyphodes bivitrallis</i>	Guenée, 1854	A	865	vi
15	Crambidae	Spilomelinae	<i>Glyphodes stolalis</i>	Guenée, 1854	A	865	vi
16	Crambidae	Spilomelinae	<i>Isocentris filalis</i>	(Guenée, 1854)	AC	356-865	v-vi
17	Crambidae	Spilomelinae	<i>Nevrina procopia</i>	(Stoll, [1871])	AB	865-1171	v-vi
18	Crambidae	Spilomelinae	<i>Parotis cf. marginata</i>	(Hampson, 1893)	AC	356-865	v-vi,viii,x-xi
19	Crambidae	Spilomelinae	<i>Polythlipta divaricata</i>	Moore, [1886]	AB	865-1171	iv,vi
20	Crambidae	Spilomelinae	<i>Pygospila tyres</i>	(Cramer, 1779)	AB	865-1171	iv,viii,x-xi
21	Crambidae	Spilomelinae	<i>Syngamia falsidicalis</i>	(Walker, 1859)	A	865	vi
22	Crambidae	Spilomelinae	<i>Syngamia latimarginalis</i>	(Walker, 1859)	A	865	iv
23	Crambidae	Spilomelinae	<i>Syngamia violata</i>	(Fabricius, 1787)	A	865	vi
24	Drepanidae	Drepaninae	<i>Cyclura castanea</i>	(Hampson, 1891)	A	865	xi
25	Drepanidae	Drepaninae	<i>Oreta</i> sp.		AB	865-1171	vi,x
26	Drepanidae	Drepaninae	<i>Teldenia vestigiata</i>	Butler, 1880	AB	865-1171	v-vi
27	Drepanidae	Drepaninae	<i>Tridrepana cf. albonotata ochrea</i>	Moore, 1879	AC	356-865	vi,x
28	Erebidae	Aganainae	<i>Asota canaraica</i>	(Moore, 1878)	A	865	vi,viii,x
29	Erebidae	Aganainae	<i>Asota caricae</i>	(Fabricius, 1775)	ABC	356-1171	iv-vi, viii,x-xi
30	Erebidae	Aganainae	<i>Asota ficus</i>	(Fabricius, 1775)	AB	865-1171	vi,x
31	Erebidae	Aganainae	<i>Asota plana</i>	Walker, 1854	A	865	vi,viii
32	Erebidae	Aganainae	<i>Asota producta</i>	(Butler, 1875)	A	865	vi
33	Erebidae	Aganainae	<i>Asota sericea</i>	(Moore, 1878)	AB	865-1171	vi,viii
34	Erebidae	Aganainae	<i>Digama marchalii</i>	(Guérin-Méneville, 1843)	B	1171	v-vi
35	Erebidae	Aganainae	<i>Neochera dominia</i>	(Cramer, [1780])	AB	865-1171	v-vi,viii
36	Erebidae	Anobinae	<i>Anoba pectinata</i>	(Hampson, 1896)	AB	865-1171	vi,x
37	Erebidae	Arctiinae	<i>Amata cyseus</i>	(Stoll, 1782)	C	356	v
38	Erebidae	Arctiinae	<i>Amata georgina</i>	(Butler, 1876)	BC	356-1171	v
39	Erebidae	Arctiinae	<i>Amerila astreus</i>	(Drury, 1773)	AB	865-1171	v-vi,viii
40	Erebidae	Arctiinae	<i>Barsine cuneonotata</i>	(Walker, 1855)	ABC	356-1171	v-vi
41	Erebidae	Arctiinae	<i>Barsine cf. rufumdefecta</i>	Singh & Kirti, 2016	B	1171	v
42	Erebidae	Arctiinae	<i>Brunia antica</i>	(Walker, 1854)	C	356	v
43	Erebidae	Arctiinae	<i>Coleta (Nyctemera) coleta</i>	(Stoll, [1781])	B	1171	iv,viii
44	Erebidae	Arctiinae	<i>Cretonotus gangis</i>	(Linnaeus, 1763)	A	865	viii
45	Erebidae	Arctiinae	<i>Cretonotus transiens</i>	(Walker, 1855)	C	356	v
46	Erebidae	Arctiinae	<i>Cyana guttifera</i>	(Walker, 1856)	C	356	v
47	Erebidae	Arctiinae	<i>Cyana bhatejai</i>	Singh & Kirti, 2015	B	1171	v
48	Erebidae	Arctiinae	<i>Cyana</i> sp.		AC	356-865	v,x
49	Erebidae	Arctiinae	<i>Lyclene arcuata</i>	Moore, 1882	B	1171	vi
50	Erebidae	Arctiinae	<i>Lyclene</i> sp.		C	356	v
51	Erebidae	Arctiinae	<i>Macrobrochis gigas</i>	(Walker, 1854)	CD	135-356	v
52	Erebidae	Arctiinae	<i>Macrobrochis splendens</i>	(Butler, 1877)	AB	865-1171	v-vi,viii
53	Erebidae	Arctiinae	<i>Mangina argus</i>	(Kollar, [1844])	B	1171	vi
54	Erebidae	Arctiinae	<i>Mangina astreus</i>	(Drury, 1773)	A	865	vi
55	Erebidae	Arctiinae	<i>Nepita conferta</i>	(Walker, 1854)	C	356	v
56	Erebidae	Arctiinae	<i>Nyctemera lacticinia</i>	(Cramer, [1777])	A	865	vi
57	Erebidae	Arctiinae	<i>Oenistis entella</i>	(Cramer, [1779])	A	865	vi
58	Erebidae	Arctiinae	<i>Olepa clavatus</i>	(Swinhoe, 1885)	C	356	v
59	Erebidae	Arctiinae	<i>Pangora erosa</i>	(Walker, 1855)	D	135	v
60	Erebidae	Arctiinae	<i>Paraplastis hampsoni</i>	(Swinhoe, 1889)	B	1171	v
61	Erebidae	Arctiinae	<i>Pareuchaetes pseudoinsulata</i>	Rego Barros, 1956	A	865	ii

Table 2. Partial checklist of moths recorded during the study, continued.

Sr. No.	Family	Subfamily	Species	Author, Year	Location ¹	Altitude range, m	Months recorded ²
62	Erebidae	Arctiinae	<i>Rajendra biguttata</i>	(Walker, 1855)	C	356	v
63	Erebidae	Arctiinae	<i>Spilarctia cf. obliqua</i>	(Walker, 1855)	B	1171	v
64	Erebidae	Arctiinae	<i>Syntomis</i> sp.		A	865	xi
65	Erebidae	Arctiinae	<i>Syntomis</i> sp. 2		AC	356-865	v-vi,xi
66	Erebidae	Arctiinae	<i>Thysanoptyx</i> sp.			865	vi
67	Erebidae	Arctiinae	<i>Thysanoptyx tetragona</i>	(Walker, 1854)	BC	356-1171	v
68	Erebidae	Arctiinae	<i>Utetheisa lotrix</i>	(Cramer, [1777])	C	356	v
69	Erebidae	Aventiinae	<i>Zurobata</i> sp.		B	1171	vi
70	Erebidae	Boletobiinae	<i>Eublemma quadrapex</i>	(Hampson, 1891)	AB	865-1171	vi,x-xi
71	Erebidae	Boletobiinae	<i>Saroba cf. pustulifera</i>	Walker, 1856	A	865	vi
72	Erebidae	Calpinae	<i>Batracharta obliqua</i>	Walker, 1862	AB	865-1171	v,vi,viii
73	Erebidae	Calpinae	<i>Calesia dasypterus</i>	(Kollar, 1844)	A	865	vi
74	Erebidae	Calpinae	<i>Calesia fuscicarpus</i>	Hampson, 1891	C	356	v
75	Erebidae	Calpinae	<i>Calyptra parva</i>	Bänziger, 1979	B	1171	vi
76	Erebidae	Calpinae	<i>Cyclodes omma</i>	(Hoeven, 1834)	A	865	x
77	Erebidae	Calpinae	<i>Eudocima homaena</i>	(Hübner, 1816)	AB	865-1171	v-vi
78	Erebidae	Calpinae	<i>Eudocima hypermenestra</i>	(Stoll, 1780)	A	865	vi,x
79	Erebidae	Calpinae	<i>Eudocima materna</i>	(Linnaeus, 1767)	A	865	x
80	Erebidae	Calpinae	<i>Eudocima phalonia</i>	(Linnaeus, 1763)	AB	865-1171	v-vi,viii
81	Erebidae	Calpinae	<i>Eudocima salamina</i>	(Cramer [1777])	A	865	vi,viii
82	Erebidae	Calpinae	<i>Eudocima sikhimensis</i>	(Butler, 1895)	AB	865-1171	v,x
83	Erebidae	Calpinae	<i>Lopharthrum comprimens</i>	(Hampson, 1895)	ABC	356-1171	v-vi
84	Erebidae	Calpinae	<i>Oraesia provocans</i>	Walker, 1858	AB	865-1171	vi,xi
85	Erebidae	Erebinae	<i>Achaea janata</i>	(Linnaeus, 1758)	A	865	x
86	Erebidae	Erebinae	<i>Achaea mezentia</i>	(Stoll, 1780)	AB	865-1171	vi,viii
87	Erebidae	Erebinae	<i>Achaea serva</i>	(Fabricius, 1775)	AB	865-1171	v-vi
88	Erebidae	Erebinae	<i>Arcte modesta</i>	(Hoeven, 1840)	AB	865-1171	v,x
89	Erebidae	Erebinae	<i>Artena dotata</i>	(Fabricius, 1794)	AB	865-1171	iv-vi
90	Erebidae	Erebinae	<i>Asta quadrilinea</i>	Walker, [1863]	B	1171	v,viii,xi
91	Erebidae	Erebinae	<i>Avatha bubo</i>	(Geyer, 1832)	AB	865-1171	vi
92	Erebidae	Erebinae	<i>Avatha discolor</i>	(Fabricius, 1794)	A	865	x
93	Erebidae	Erebinae	<i>Bastilla crameri</i>	(Moore, 1885)	A	865	vi
94	Erebidae	Erebinae	<i>Bastilla joviana</i>	(Stoll, 1782)	A	865	v
95	Erebidae	Erebinae	<i>Buzara onelia</i>	(Guenée, 1852)	A	865	vi
96	Erebidae	Erebinae	<i>Catocala macula</i>	(Hampson, 1891)	AB	865-1171	v-vi
97	Erebidae	Erebinae	<i>Chalciope mygdon</i>	(Cramer, [1777])	A	865	vi
98	Erebidae	Erebinae	<i>Chilkasa falcata</i>	Swinhoe, 1885	AB	865-1171	vi
99	Erebidae	Erebinae	<i>Chrysopera combinans</i>	(Walker, 1857)	A	865	vi
100	Erebidae	Erebinae	<i>Diomea lignicolora</i>	(Walker, [1858])	BC	356-1171	v
101	Erebidae	Erebinae	<i>Dysgonia stuposa</i>	(Fabricius, 1794)	A	865	xi
102	Erebidae	Erebinae	<i>Ercheia cyllaria</i>	(Cramer, 1779)	AB	865-1171	v,vi,x
103	Erebidae	Erebinae	<i>Erebus ephesperis</i>	(Hübner, 1827)	A	865	vi
104	Erebidae	Erebinae	<i>Erebus macrops</i>	(Linnaeus, 1768)	A	865	vi,x
105	Erebidae	Erebinae	<i>Ericeia inangulata</i>	(Guenée, 1852)	B	1171	v,vi
106	Erebidae	Erebinae	<i>Grammodes geometrica</i>	(Fabricius, 1775)	A	865	x
107	Erebidae	Erebinae	<i>Homodes crocea</i>	Guenée, 1852	A	865	vi,viii,x
108	Erebidae	Erebinae	<i>Ischyja cf. manlia</i>	(Cramer, [1776])	B	1171	v
109	Erebidae	Erebinae	<i>Ischyja marapok</i>	Holloway, 2005	A	865	vi
110	Erebidae	Erebinae	<i>Ischyja</i> sp.		B	1171	vi
111	Erebidae	Erebinae	<i>Lygniodes vampyrus</i>	(Fabricius, 1794)	AC	356-865	v-vi,viii,x-xi
112	Erebidae	Erebinae	<i>Mocis frugalis</i>	(Fabricius, 1775)	A	865	viii
113	Erebidae	Erebinae	<i>Ophiusa coronata</i>	(Fabricius, 1775)	AB	865-1171	vi,viii
114	Erebidae	Erebinae	<i>Ophiusa disjungens</i>	(Walker, 1858)	AB	865-1171	v,viii
115	Erebidae	Erebinae	<i>Ophiusa honesta</i>	(Hübner, 1806)	A	865	vi,viii
116	Erebidae	Erebinae	<i>Ophiusa trapezium</i>	(Guenée, 1852)	AB	865-1171	v,viii
117	Erebidae	Erebinae	<i>Oxyodes scrobiculata</i>	(Fabricius, 1775)	AB	865-1171	iv-viii,x
118	Erebidae	Erebinae	<i>Pandesma</i> sp.		AB	865-1171	vi
119	Erebidae	Erebinae	<i>Pindara illibata</i>	(Fabricius, 1775)	A	865	vi
120	Erebidae	Erebinae	<i>Serrodos campana</i>	Guenée, 1852	A	865	vi,viii
121	Erebidae	Erebinae	<i>Speiredonia cf. itynx</i>	(Fabricius, 1787)	B	1171	v,viii
122	Erebidae	Erebinae	<i>Speiredonia mutabilllis</i>	(Fabricius, 1794)	AB	865-1171	vi
123	Erebidae	Erebinae	<i>Speiredonia obscura</i>	(Cramer, 1780)	A	865	viii
124	Erebidae	Erebinae	<i>Spirama cf. helicina</i>	(Hübner, 1831)	A	865	xi
125	Erebidae	Erebinae	<i>Spirama cf. retorta</i>	Clerck, 1764	A	865	vi
126	Erebidae	Erebinae	<i>Sympis rufibasis</i>	Guenée, 1854	ABC	356-1171	v,vi
127	Erebidae	Erebinae	<i>Tamba</i> sp.		A	865	x

Table 2. Partial checklist of moths recorded during the study, continued.

Sr. No.	Family	Subfamily	Species	Author, Year	Location ¹	Altitude range, m	Months recorded ²
128	Erebidae	Erebinae	<i>Trigonodes disjuncta</i>	(Moore, 1882)	A	865	vi
129	Erebidae	Herminiinae	<i>Simplicia cf. bimarginata</i>	Walker, 1864	C	356	v
130	Erebidae	Hypocalinae	<i>Hypocala deflorata</i>	Fabricius, 1794	A	865	vi
131	Erebidae	Hypocalinae	<i>Hypocala subsatura</i>	Guenée, 1852	A	865	viii
132	Erebidae	Hypocalinae	<i>Hypocala violacea</i>	Butler, 1879	A	865	vi
133	Erebidae	Incertae cedis	<i>Pseudosphetta moorei</i>	(Cotes & Swinhoe, 1887)	BC	356-1171	v,vi
134	Erebidae	Lymantriinae	<i>Arctornis marginata</i>	(Moore, 1883)	C	356	v
135	Erebidae	Lymantriinae	<i>Arctornis subvitrea</i>	(Walker, 1856)	B	1171	v
136	Erebidae	Lymantriinae	<i>Calliteara grotei</i>	(Moore, 1859)	BD	135-1171	vi
137	Erebidae	Lymantriinae	<i>Euproctis</i> sp.		C	356	v
138	Erebidae	Lymantriinae	<i>Laelia</i> sp.		C	356	v
139	Erebidae	Lymantriinae	<i>Lymantria</i> sp.		C	356	v
140	Erebidae	Lymantriinae	<i>Lymantria todara</i>	Moore, 1879	B	1171	v
141	Erebidae	Lymantriinae	<i>Orgyia</i> sp.		B	1171	v
142	Erebidae	Lymantriinae	<i>Pantana</i> sp.		C	356	v
143	Erebidae	Scoliopteryginae	<i>Anomis lineosa</i>	Walker, 1856	BC	356-1171	viii
144	Erebidae	Scoliopteryginae	<i>Anomis flava</i>	(Fabricius, 1775)	A	865	iv,x
145	Eupterotidae	Eupteroptinae	<i>Eupterote cf. fabia</i>	Cramer, 1779	BC	356-1171	v
146	Eupterotidae	Eupteroptinae	<i>Eupterote mollifera</i>	Walker, 1856	B	1171	v
147	Eupterotidae	Eupteroptinae	<i>Eupterote</i> sp.		B	1171	vi
148	Eupterotidae	Eupteroptinae	<i>Eupterote undata</i>	Blanchard, 1844	C	356	v
149	Euteliidae	Euteliinae	<i>Anuga constricta</i>	Guenée, 1852	BC	356-1171	v-vi
150	Euteliidae	Euteliinae	<i>Penicillaria</i> sp.		B	1171	v
151	Euteliidae	Euteliinae	<i>Penicillaria vitalba</i>	Semper, 1900	A	865	vi
152	Euteliidae	Stictopterinae	<i>Lophoptera squammigera</i>	Guenée, 1852	AB	865-1171	v-vi
153	Geometridae	Ennominae	<i>Achrosis incitata</i>	Walker, 1852	C	356	v
154	Geometridae	Ennominae	<i>Achrosis</i> sp.		B	1171	vi
155	Geometridae	Ennominae	<i>Amblychia cf. angeronaria</i>	(Guenée, 1857)	B	1171	v,xi
156	Geometridae	Ennominae	<i>Biston suppressaria</i>	(Guenée, 1858)	AC	356-865	v,viii
157	Geometridae	Ennominae	<i>Celenna festiviaria</i>	Fabricius, 1794	BC	356-1171	v,vi
158	Geometridae	Ennominae	<i>Chiasmia eleonora</i>	Hübner, 1818	ABD	135-1171	v-vi,viii,x-xi
159	Geometridae	Ennominae	<i>Cleora acaciaria</i>	(Boisduval, 1833)	A	865	viii
160	Geometridae	Ennominae	<i>Cleora</i> sp.		A	865	viii
161	Geometridae	Ennominae	<i>Cleora</i> sp.2		A	865	viii
162	Geometridae	Ennominae	<i>Corymica arnearia</i>	Walker, 1860	B	1171	vi
163	Geometridae	Ennominae	<i>Corymica deducta</i>	(Walker, 1866)	B	1171	v
164	Geometridae	Ennominae	<i>Corymica exiguinota</i>	(Hampson, 1891)	B	1171	v
165	Geometridae	Ennominae	<i>Fascellina chromataria</i>	Walker, 1860	ABC	356-1171	v,vi,xi
166	Geometridae	Ennominae	<i>Godonela ozararia</i>	(Walker, 1860)	ABD	135-1171	vi,viii
167	Geometridae	Ennominae	<i>Gonodontis clelia</i>	(Cramer, [1780])	A	865	vi
168	Geometridae	Ennominae	<i>Hypochrosis hyadaria</i>	Guenée, [1858]	AB	865-1171	v,vi
169	Geometridae	Ennominae	<i>Hypomecis infixaria</i>	(Walker, 1860)	A	865	xi
170	Geometridae	Ennominae	<i>Omiza pachiarra</i>	Walker, 1860	ABC	356-1171	v-vi,viii
171	Geometridae	Ennominae	<i>Ourapteryx marginata</i>	(Hampson, 1891)	ABC	356-1171	v-vi,viii,x-xi
172	Geometridae	Ennominae	<i>Ourapteryx</i> sp.		AB	865-1171	vi,ix
173	Geometridae	Ennominae	<i>Parasynegia (Borbacha) cf. pardaria</i>	(Guenée, [1858])	AB	865-1171	v,vi,viii
174	Geometridae	Ennominae	<i>Plutodes</i> sp.		A	865	vi,xi
175	Geometridae	Ennominae	<i>Plutodes transmutata</i>	Walker, 1861	A	865	ix
176	Geometridae	Ennominae	<i>Problepsis deliara</i>	(Guenée, [1858])	A	865	vi,xi
177	Geometridae	Ennominae	<i>Ruttellerona pallicostaria</i>	(Moore, [1868])	A	865	vi,x
178	Geometridae	Ennominae	<i>Thinopteryx nebulosa</i>	Butler, 1883	A	865	vi
179	Geometridae	Ennominae	<i>Timandra cf. responsaria</i>	Moore, 1888	AB	865-1171	v,x
180	Geometridae	Ennominae	<i>Zamarada</i> sp.		AC	356-865	v,x
181	Geometridae	Ennominae	<i>Zeheba marginata</i>	Walker, 1866 ^{SEP}	C	356	v
182	Geometridae	Geometrinae	<i>Argyrocosma</i> sp.		B	1171	vi
183	Geometridae	Geometrinae	<i>Comostola</i> sp.		AB	865-1171	v,xi
184	Geometridae	Geometrinae	<i>Eucyclodes picturata</i>	(Hampson, 1903)	A	865	xi
185	Geometridae	Geometrinae	<i>Hemithea tritonaria</i>	(Walker, 1863)	C	356	v
186	Geometridae	Geometrinae	<i>Lophophlema ruficosta</i>	Hampson, 1891	A	865	vi,x,xi
187	Geometridae	Geometrinae	<i>Maxates</i> sp.		C	356	v
188	Geometridae	Geometrinae	<i>Maxates</i> sp. 2		C	356	v
189	Geometridae	Geometrinae	<i>Ornithospila lineata</i>	(Moore, 1872)	A	865	vi
190	Geometridae	Geometrinae	<i>Ornithospila submonstrans</i>	(Walker, 1861)	B	1171	vi
191	Geometridae	Geometrinae	<i>Pelagodes cf. veraria</i>	(Guenée, [1858])	A	865	iv,xi
192	Geometridae	Geometrinae	<i>Pingasa chlora</i>	(Stoll, 1782)	A	865	vi

Table 2. Partial checklist of moths recorded during the study, continued.

Sr. No.	Family	Subfamily	Species	Author, Year	Location ¹	Altitude range, m	Months recorded ²
193	Geometridae	Geometrinae	<i>Pingasa cf. rubicunda</i>	Warren, 1894	A	865	vi
194	Geometridae	Geometrinae	<i>Spanniocentra pannosa</i>	(Moore, [1887])	C	356	v
195	Geometridae	Geometrinae	<i>Thalassodes</i> sp.		C	356	v
196	Geometridae	Larentiinae	<i>Abraxas sylvata</i>	(Scopoli, 1763)	A	865	vi
197	Geometridae	Oenochrominae	<i>Eumelia (Eumelea) ludovicata</i>	Guenée, [1858]	AB	865-1171	v-vi
198	Geometridae	Sterrhinae	<i>Lissoblemma lunuliferata</i>	(Walker, 1863)	AB	865-1171	v-vi
199	Geometridae	Sterrhinae	<i>Somatina rosacea</i>	Swinhoe, 1894	AB	865-1171	v-vi
200	Hyblaeidae	-	<i>Hyblaea puera</i>	(Cramer, 1777)	B	1171	v
201	Lasiocampidae	-	<i>Radhica rosea</i>	Hampson, 1891	B	1171	vi
202	Limacodidae	-	<i>Miresa albipuncta</i>	(Herrich-Schäffer, [1854])	B	1171	vi
203	Limacodidae	-	<i>Miresa inornata</i>	Walker, 1855	AC	356-865	v
204	Limacodidae	-	<i>Miresa nivaha</i>	Moore, 1858	C	356	v
205	Limacodidae	-	<i>Parasa fumosa</i>	Swinhoe, 1889	AC	356-865	v-vi
206	Limacodidae	-	<i>Scopelodes venosa</i>	Walker, 1855	BC	356-1171	v-vi
207	Noctuidae	-	<i>Zurobata</i> sp.		C	356	vi
208	Noctuidae	Amphipyridae	<i>Callopietria</i> sp. 1		AB	865-1171	v,viii
209	Noctuidae	Amphipyridae	<i>Callopietria</i> sp. 2		B	1171	viii
210	Noctuidae	Bagisarinae	<i>Chasmina candida</i>	(Walker, 1856)	A	865	x
211	Noctuidae	Bagisarinae	<i>Chasmina fasciculosa</i>	(Walker, 1858)	B	1171	v
212	Noctuidae	Bagisarinae	<i>Chasmina judicata</i>	Walker, 1858	A	865	iv
213	Noctuidae	Bagisarinae	<i>Ramadasa pavo</i>	Walker, 1856	AB	865-1171	viii-x
214	Noctuidae	Bagisarinae	<i>Xanthodes transversa</i>	Guenée, 1852	A	865	vi
215	Noctuidae	Hadeniinae	<i>Hadennia</i> sp.		B	1171	vi
216	Noctuidae	Hadeniinae	<i>Leucania cf. vittata</i>	Hampson, 1891	A	865	iv
217	Noctuidae	Hadeniinae	<i>Tiracola plagiata</i>	(Walker, 1857)	AB	865-1171	ix
218	Noctuidae	Hadeniinae	<i>Yepcalphis dilectissima</i>	(Walker, 1858)	A	865	x
219	Noctuidae	Hadeniinae	<i>Mudaria cf. leprosticta</i>	(Hampson 1907)	A	865	vi
220	Noctuidae	Noctuiinae	<i>Polytela gloriosae</i>	Fabricius, 1781	A	865	viii
221	Noctuidae	Plusiinae	<i>Erythrophusia propia</i>	(Butler, 1879)	B	1171	vi
222	Noctuidae	Plusiinae	<i>Plusiopalpa adrasta</i>	(Felder & Rogenhofer, 1874)	B	1171	xi
223	Noctuidae	Plusiinae	<i>Scriptoplusia nigriluna</i>	(Walker, 1858)	B	1171	xi
224	Nolidae	Chloephorinae	<i>Ariola cf. ransonneti</i>	Felder & Rogenhofer 1874	B	1171	v
225	Nolidae	Chloephorinae	<i>Carea angulata</i>	(Fabricius, 1793)	A	865	vi
226	Nolidae	Chloephorinae	<i>Pterogonia episcopalis</i>	Swinhoe, 1891	BC	356-1171	v
227	Nolidae	Eligminae	<i>Eligma narcissus</i>	(Cramer, 1775)	A	865	vi,viii
228	Nolidae	Westermanninae	<i>Westermannia argentea</i>	Hampson, 1891	AC	356-865	v-vi
229	Nolidae	Westermanninae	<i>Westermannia triangularis</i>	Moore, 1877	B	1171	v
230	Notodontidae	-	<i>Oxoia</i> sp.		A	865	vi
231	Notodontidae	-	<i>Pantanopsis</i> sp.		C	356	v
232	Notodontidae	Ceiridae	<i>Ambadra modesta</i>	Schintlmeister, 2007	C	356	v
233	Notodontidae	Ceiridae	<i>Bireta nana</i>	Swinhoe, 1889	B	1171	v
234	Notodontidae	Dudusinae	<i>Dudusa synopla</i>	Swinhoe, 1907	A	865	vi
235	Notodontidae	Dudusinae	<i>Tarsolepis sommeri</i>	Hübner, 1821	C	356	v
236	Notodontidae	Phalerinae	<i>Phalera</i> sp.		C	356	v
237	Notodontidae	Stauropinae	<i>Teleclita drynopa</i>	Dodd, 1902	A	865	vi
238	Saturniidae	Saturniinae	<i>Actias maenas</i>	Doubleday, 1847	A	865	viii
239	Saturniidae	Saturniinae	<i>Actias selene</i>	Hübner, 1807	A	865	viii
240	Saturniidae	Saturniinae	<i>Antheraea paphia</i>	Linnaeus, 1758	A	865	viii
241	Saturniidae	Saturniinae	<i>Loepa schintlmeisteri</i>	Brechlin, 2000	AC	356-865	v-vi,viii,x
242	Sphingidae	Macroglossinae	<i>Acosmeryx akanshi</i>	Melichar, Řezáč, Manjunatha & Horecký, 2014	AB	865-1171	v-vi,ix
243	Sphingidae	Macroglossinae	<i>Acomeryx anceus</i>	(Stoll, 1781)	BC	356-1171	v-vi
244	Sphingidae	Macroglossinae	<i>Daphnis hypothous</i>	(Cramer, 1780)	A	865	viii
245	Sphingidae	Macroglossinae	<i>Hippotion celerio</i>	(Linnaeus, 1758)	AB	865-1171	v-vi,x
246	Sphingidae	Macroglossinae	<i>Hippotion rosetta</i>	(Swinhoe, 1892)	AB	865-1171	v-vi,viii,x,xi
247	Sphingidae	Macroglossinae	<i>Hippotion velox</i>	(Fabricius, 1793)	B	1171	v
248	Sphingidae	Macroglossinae	<i>Macroglossum</i> sp.		A	865	x
249	Sphingidae	Macroglossinae	<i>Macroglossum cf. divergens heliophila</i>	Boisduval, [1875]	A	865	xi
250	Sphingidae	Macroglossinae	<i>Nephele hespera</i>	(Fabricius, 1775)	A	865	vi,viii,x
251	Sphingidae	Macroglossinae	<i>Pergesa acteus</i>	(Cramer, 1779)	A	865	viii
252	Sphingidae	Macroglossinae	<i>Rhagastis acuta</i>	(Walker, 1856)	B	1171	v
253	Sphingidae	Macroglossinae	<i>Theretra castanea</i>	Moore, 1872	AB	865-1171	iv-vi,x
254	Sphingidae	Macroglossinae	<i>Theretra clotho</i>	Drury, 1773	AB	865-1171	v,viii

Table 2. Partial checklist of moths recorded during the study, continued.

Sr. No.	Family	Subfamily	Species	Author, Year	Location ¹	Altitude range, m	Months recorded ²
255	Sphingidae	Macroglossinae	<i>Theretra gnoma</i>	Fabricius, 1775	B	1171	v
256	Sphingidae	Macroglossinae	<i>Theretra nessus</i>	Drury, 1773	AB	865-1171	v-vi,viii,x
257	Sphingidae	Macroglossinae	<i>Theretra oldenlandiae</i>	Fabricius, 1750	A	865	vi
258	Sphingidae	Macroglossinae	<i>Theretra pallicosta</i>	(Walker, 1856)	B	1171	v
259	Sphingidae	Macroglossinae	<i>Theretra shendurneensis</i>	Sondhi,Kitching, Basu & Kunte, 2017	B	1171	v-vi
260	Sphingidae	Smerinthiinae	<i>Amplypterus panopus</i>	(Cramer, 1779)	AB	865-1171	v,x
261	Sphingidae	Smerinthiinae	<i>Marumba dyras</i>	Walker, 1856	D	135	v
262	Sphingidae	Smerinthinae	<i>Ambulyx belli</i>	(Jordan, 1923)	BC	356-1171	v
263	Sphingidae	Smerinthinae	<i>Ambulyx moorei</i>	Moore, 1858	AB	865-1171	v,xi
264	Sphingidae	Smerinthinae	<i>Ambulyx substrigilis</i>	Westwood, 1847	B	1171	v
265	Sphingidae	Smerinthinae	<i>Clanis titan</i>	Rothschild & Jordan, 1903	C	356	v
266	Sphingidae	Smerinthinae	<i>Marumba nympa</i>	Rothschild & Jordan, 1903	ABC	356-1171	iv,v-vi
267	Sphingidae	Sphinginae	<i>Acherontia lachesis</i>	Fabricius, 1978	AB	865-1171	v-vi,ix
268	Sphingidae	Sphinginae	<i>Agrius convolvuli</i>	(Linnaeus, 1758)	AB	865-1171	v-vi,x
269	Sphingidae	Sphinginae	<i>Dolbina manjunatha</i>	Haxaire & Melichar, 2013	AB	865-1171	v-vi,xi
270	Sphingidae	Sphinginae	<i>Megacorma obliqua</i>	(Walker, 1856)	AB	865-1171	v,viii
271	Sphingidae	Sphinginae	<i>Meganoton nyctiphanes</i>	(Walker, 1856)	AB	865-1171	v,viii
272	Sphingidae	Sphinginae	<i>Psilogamma vates</i>	(Butler, 1875)	AB	865-1171	v,ix-x
273	Thyrididae	-	<i>Banisia cf. myrtaea</i>	(Drury, 1773)	AB	865-1171	v-vi
274	Thyrididae	-	<i>Herdonia cf. thaisensis</i>	Inoue, 1993	C	356	v
275	Thyrididae	-	<i>Rhodoneura sp.</i>		C	356	v
276	Uraniidae	-	<i>Epiplera indignaria</i>	Walker, 1866	B	1171	vi
277	Uraniidae	-	<i>Micronia aculeata</i>	Guenée, 1857	B	1171	vi
278	Uraniidae	-	<i>Phazaca sp.</i>		C	356	v
279	Uraniidae	Epipleminae	<i>Phazaca leucocera</i>	(Hampson, 1891)	C	356	v
280	Uraniidae	Epipleminae	<i>Rhombophylla edentata</i>	(Hampson, 1895)	C	356	v
281	Zygaenidae	-	<i>Cyclosia papilionaris australinda</i>	(Hampson, 1891)	C	356	v
282	Zygaenidae	Chalcosiinae	<i>Eterusia aeda virescens</i>	(Butler, 1881)	A	865	vi

Table 3. Family level breakdown for number of species recorded during the survey.

Family	Number of Species
Bombycidae	2
Callidulidae	1
Crambidae	20
Drepanidae	4
Erebidae	117
Eupterotidae	4
Euteliidae	4
Geometridae	47
Hyblaeidae	1
Lasiocampidae	1
Limacodidae	5
Noctuidae	17
Nolidae	6
Notodontidae	8
Saturniidae	4
Sphingidae	31
Thyrididae	3
Uraniidae	5
Zygaenidae	2
Total	282



1. *Pencillifera apicalis*

2. *Trilocha varians*

3. *Tetragonus catamitus*

4. *Heortia vitessoides*



5. *Vitessa suradeva*

6. *Agathodes ostentalis*

7. *Agrioglypta itysalis*

8. *Botyodes asialis*



9. *Cadarena pudoraria*

10. *Conogethes punctiferalis*

11. *Diaphania indica*

12. *Dichochrosis nigrilinealis*



13. *Filodes fulvidorsalis*

14. *Glyphodes bivitalis*

15. *Glyphodes stolalis*

16. *Isocentris filalis*



17. *Nevrina procopia*

18. *Parotis cf. marginata*

19. *Polythlipta divaricata*

20. *Pygospila tyres*



21. *Syngamia falsidicalis*

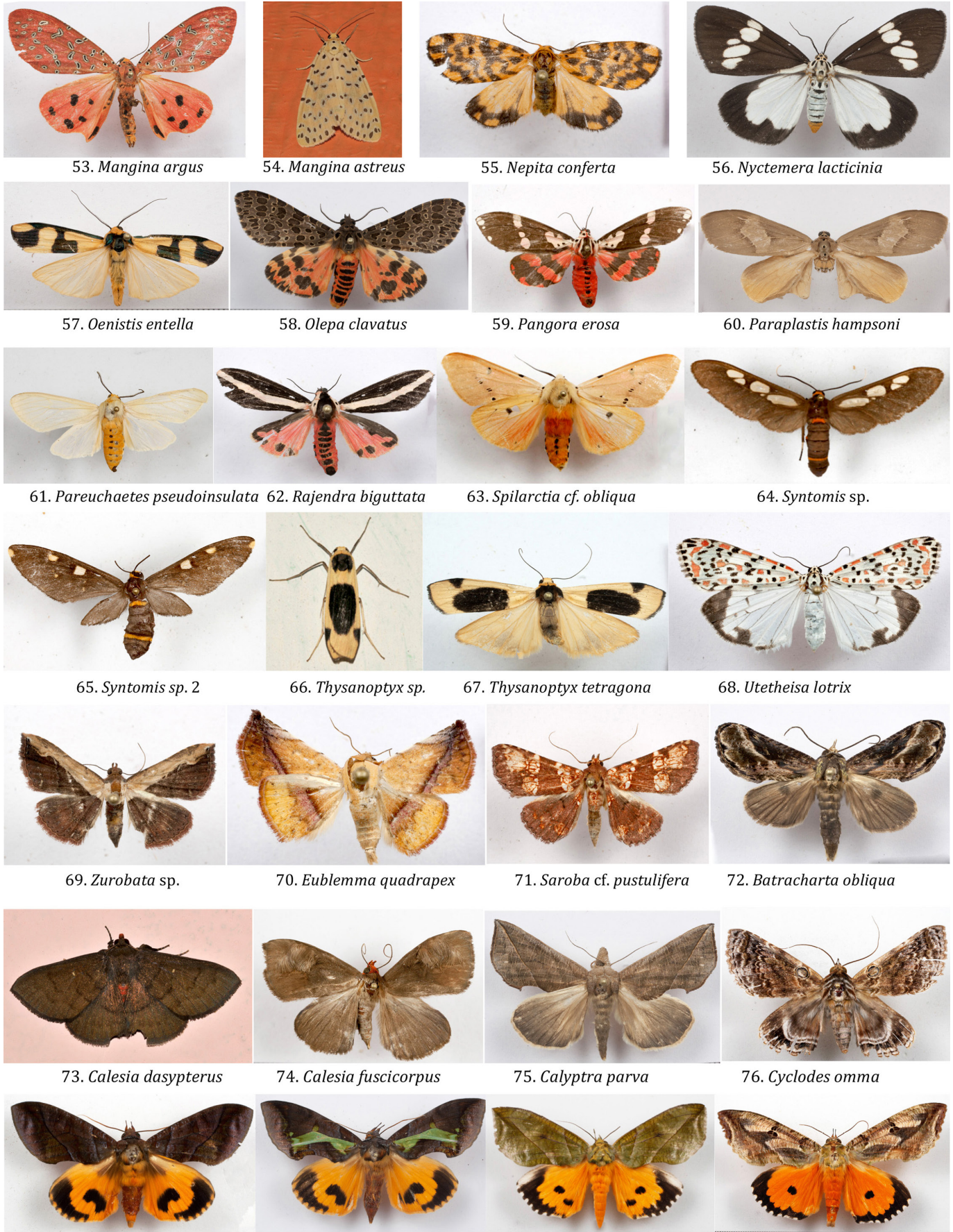
22. *Syngamia latimarginalis*

23. *Syngamia violata*

24. *Cyclura castanea*

Plate 1. Moths recorded from Shendurney WLS.

25. *Oreta* sp.26. *Teldenia vestigiata*27. *Tridrepana* cf. *albonotata ochrea*28. *Asota canaraica*29. *Asota caricae*30. *Asota ficus*31. *Asota plana*32. *Asota producta*33. *Asota sericea*34. *Digama marchalii*35. *Neochera dominia*36. *Anoba pectinata*37. *Amata cysseus*38. *Amata georgina*39. *Amerila astreus*40. *Barsine cuneonotata*41. *Barsine* cf. *rufumdefecta*42. *Brunia antica*43. *Coleta coleta*44. *Cretonotus gangis*45. *Cretonotus transiens*46. *Cyana guttifera*47. *Cyana bhatejai*48. *Cyana* sp.49. *Lyclene arcuata*50. *Lyclene* sp.51. *Macrobrochis gigas*52. *Macrobrochis splendens*



53. *Mangina argus*

54. *Mangina astreus*

55. *Nepita conferta*

56. *Nyctemera lacticina*

57. *Oenistis entella*

58. *Olepa clavatus*

59. *Pangora erosa*

60. *Paraplastis hamptoni*

61. *Pareuchaetes pseudoinsulata*

62. *Rajendra biguttata*

63. *Spilarctia cf. obliqua*

64. *Syntomis* sp.

65. *Syntomis* sp. 2

66. *Thysanoptyx* sp.

67. *Thysanoptyx tetragona*

68. *Utetheisa lotrix*

69. *Zurobata* sp.

70. *Eublemma quadrapex*

71. *Saroba cf. pustulifera*

72. *Batracharta obliqua*

73. *Calesia dasypterus*

74. *Calesia fuscicorpus*

75. *Calyptra parva*

76. *Cyclodes omma*

77a. *Eudocima homaena* male

77b. *Eudocima homaena* fem

78. *Eudocima hypermenestra*

79. *Eudocima materna*

Plate 3. Moths recorded from Shendurney WLS.



Plate 4. Moths recorded from Shendurney WLS.



106. *Grammodes geometrica*

107. *Homodes crocea*

108. *Ischyja* cf. *manlia* fem

109. *Ischyja marapok*



110. *Ischyja* sp.

111. *Lygniodes vampyrus*

112. *Mocis frugalis*

113. *Ophiusa coronata*



114. *Ophiusa disjungens*

115. *Ophiusa honesta*

116. *Ophiusa trapezium*

117. *Oxyodes scrobiculata*



118. *Pandesma* sp.

119. *Pindara illibata*

120. *Serrodes campana* fem.

121. *Speiredonia* cf. *itynx*



122. *Speiredonia mutabilis*

123. *Speiredonia obscura*

124a. *Spirama* cf. *helicina* male

124b. *Spirama* cf. *helicina* fem



125. *Spirama* cf. *retorta*

126. *Sympis rufibasis*

127. *Tamba* sp.

128. *Trigonodes disjuncta*

Plate 5. Moths recorded from Shendurney WLS.

129. *Simplicia bimarginata*130. *Hypocala deflorata*131. *Hypocala subsatura*132. *Hypocala violacea*133. *Pseudosphetta moorei*134. *Arctornis marginata*135. *Arctornis subvitrea*136. *Calliteara grotei*137. *Euproctis* sp.138. *Laelia* sp.139. *Lymantria* sp.140. *Lymantria todara*141. *Orgyia* sp.142. *Pantana* sp.143. *Anomis lineosa*144. *Anomis flava*145. *Eupterote* cf. *fabia*146. *Eupterote mollifera*147. *Eupterote* sp.148. *Eupterote undata*149. *Anuga constricta*150. *Penicillaria* sp.151. *Penicillaria vitalba*152. *Lophoptera squammigera*

153. *Achrosis incitata*154. *Achrosis* sp.155. *Amblychia* cf. *angeronaria*156. *Biston supressaria*157. *Celenna festiviaria*158. *Chiasmia eleonora*159. *Cleora acaciaria*160. *Cleora* sp.161. *Cleora* sp.2162. *Corymica arnearia*163. *Corymica deducta*164. *Corymica exiguinota*165. *Fascellina chromataria*166. *Godonela ozararia*167. *Gonodontis clelia* fem.168. *Hypochrosis hyadaria*169. *Hypomecis infixaria*170. *Omiza pachiarra*171. *Ourapteryx marginata*172. *Ourapteryx* sp.173. *Parasynegia* cf. *pardaria*174. *Plutodes* sp.175. *Plutodes transmutata*176. *Problepsis deliaria*

Plate 7. Moths recorded from Shendurney WLS.

177. *Ruttellerona pallicostaria*178. *Thinopteryx nebulosa*179. *Timandra* cf. *responsaria*180. *Zamarada* sp.181. *Zeheba marginata*182. *Argyrocosma* sp.183. *Comostola* sp.184. *Eucyclodes picturata*185. *Hemithea tritonaria*186. *Lophophlema ruficosta*187. *Maxates* sp.188. *Maxates* sp. 2189. *Ornithospila lineata*190. *Ornithospila submonstrans*191. *Pelagodes* cf. *veraria*192. *Pingasa chlora*193. *Pingasa* cf. *rubicunda*194. *Spanniocentra pannosa*195. *Thalassodes* sp.196. *Abraxas sylvata*197. *Eumelia ludovicata*198. *Lissoblemma lunuliferata*199. *Somatina rosacea*200. *Hyblaea puera*

Plate 8. Moths recorded from Shendurney WLS.



201. *Radhica rosea*

202. *Miresa albipuncta*

203. *Miresa inornata*

204. *Miresa nivaha*



205. *Parasa fumosa*

206. *Scopelodes venosa*

207. *Zurobata* sp.

208. *Callopostria* sp.



209. *Callopostria* sp. 2

210. *Chasmina candida*

211. *Chasmina fasciculosa*

212. *Chasmina judicata*



213. *Ramadasa pavo*

214. *Xanthodes transversa*

215. *Hadennia* sp.

216. *Leucania* cf. *vittata*



217. *Tiracola plagiata*

218. *Yepcalphis dilectissima*

219. *Mudaria* cf. *leprosticta*

220. *Polytela gloriosae*



221. *Erythroplusia propia*

222. *Plusiopalpa adrasta*

223. *Scriptoplusia nigriluna*

224. *Ariola coelissima*

Plate 9. Moths recorded from Shendurney WLS.

225. *Carea angulata*226. *Pterogonia episcopalis*227. *Eligma narcissus*228. *Westermannia argentea*229. *Westermannia triangularis*230. *Oxoia* sp.231. *Pantanopsis* sp.232. *Ambadra modesta*233. *Bireta nana*234. *Dudusa synopla*235. *Tarsolepis sommeri*236. *Phalera* sp.237. *Teleclita drynopa*238. *Actias maenas*239. *Actias selene*240. *Antheraea paphia*241. *Loepa schintlmeisteri*242. *Acosmeryx akanshi*243. *Acosmeryx anceus*244. *Daphnis hypothous*245. *Hippotion celerio*246. *Hippotion rosetta*247. *Hippotion velox*248. *Macroglossum* sp.249. *Macroglossum* cf. *divergens heliophila*250. *Nephela hespera*251. *Pergesa acteus*252. *Rhagastis acuta*

Plate 10. Moths recorded from Shendurney WLS.

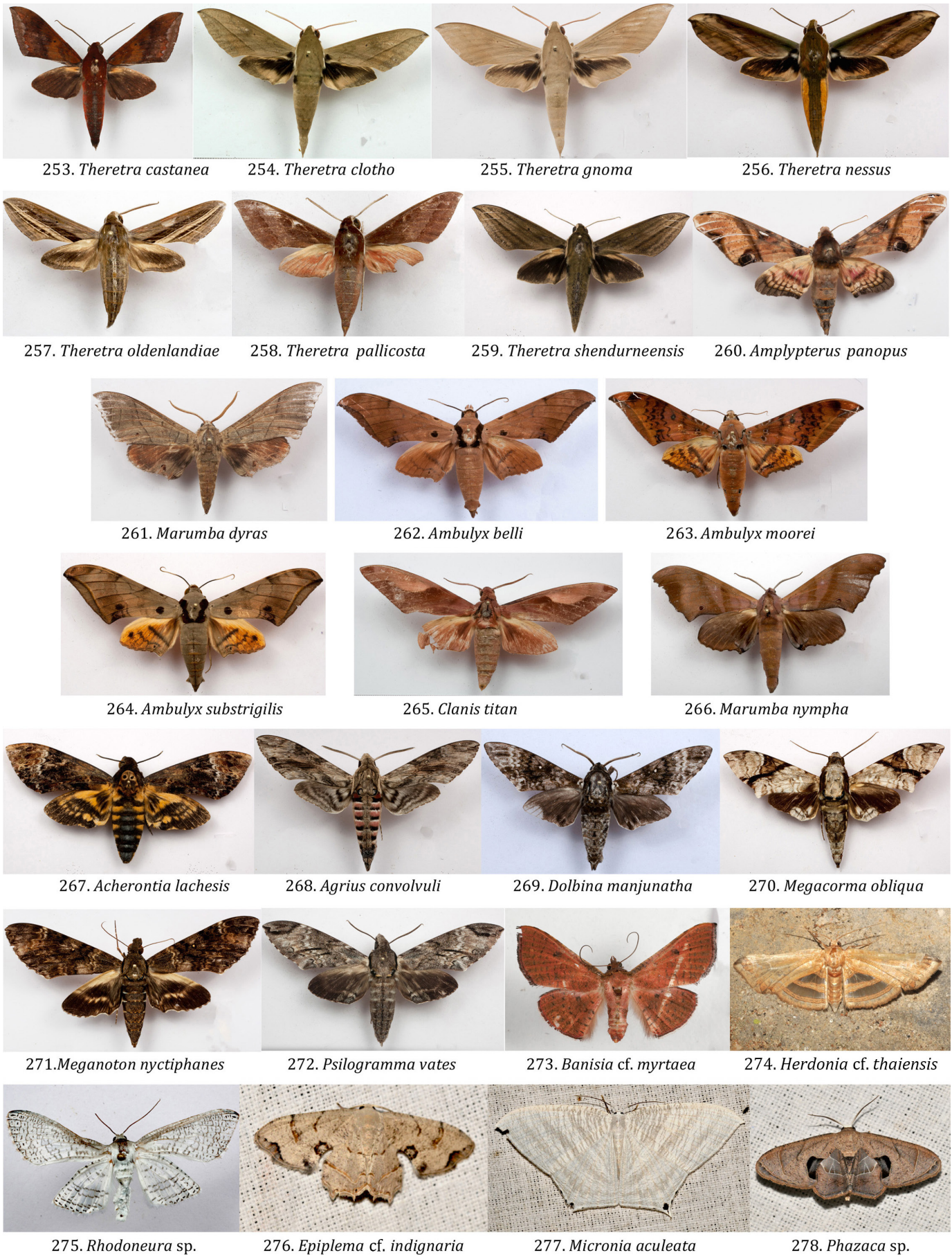


Plate 11. Moths recorded from Shendurney WLS.

279. *Phazaca leucocera*280. *Rhombophylla edentata*281. *Cyclosia papilionaris australinda* male282. *Eterusia aedeo virescens*

Plate 12. Moths recorded from Shendurney WLS.

LITERATURE CITED

- Adiroubane, D., Kuppammal, P.** 2010. Lepidopteran fauna of agri-horticultural ecosystem in Karaikal region. *Journal of Biopesticides* 3(1): 1–10.
- Barlow, H. S.** 1982. *An introduction to the moths of South East Asia*. Kuala Lumpur, Malayan Nature Society. 305 pp. + 50 pls.
- Bell, T. R. D., Scott, F. B.** 1937. *Fauna of British India, including Ceylon and Burma. Moths—Volume 5, Sphingidae*. London, Taylor and Francis. 537 pp. + 15 pls.
- Cerny, K., Pinratana, A.** 2009. *Moths of Thailand. Volume 6, Arctiidae*. Bangkok, Brothers of St Gabriel in Thailand. 283 pp. + 56 pls.
- Dutta, K., Reddy, C. S., Sharma, S., Jha, C. S.** 2016. Quantification and monitoring of forest cover changes in Agasthyamalai Biosphere Reserve, Western Ghats, India (1920–2012). *Current Science* 110(4): 508–20.
- Elanchezian, M., Gunasekaran, C., Deepa, A. A.** 2014. A study on moth diversity in three different habitats of Maruthamalai Hill, Western Ghats, South India. *Global Journal for Research Analysis* 3(12): 136–138.
- Ghodespade, K., Patil, R. R., Chandaragi, M.** 2013. Notes on Hawk Moths (Lepidoptera—Sphingidae) in the Karwar-Dharwar transect, peninsular India: a tribute to TRD Bell (1863–1948). *Colemania* 33: 1–16.
- Gurule, S. A., Nikam, S. M.** 2013. The moths (Lepidoptera: Heterocera) of northern Maharashtra: a preliminary checklist. *Journal of Threatened Taxa* 5(12): 4693–4713.
- Hampson, G. F.** 1891. *Illustrations of typical specimens of Lepidoptera Heterocera in the collection of the British Museum. Part VIII—The Lepidoptera Heterocera of the Nilgiri District*. London, Taylor & Francis, Order of Trustees. 144 pp. + 18 pls.
- Hampson, G. F.** 1892. *The Fauna of British India including Ceylon and Burma. Moths, Vol. 1, Saturniidae to Hypsiidae*. London, Taylor & Francis. 627 pp. + 333 figs.
- Hampson, G. F.** 1894. *The Fauna of British India including Ceylon and Burma. Moths, Vol. 2, Arctiidae, Agrostidae, Noctuidae*. London, Taylor & Francis. 609 pp. + 325 figs.
- Hampson, G. F.** 1895. *The Fauna of British India including Ceylon and Burma. Moths, Vol. 3, Noctuidae (cont.) to Geometridae*. London, Taylor & Francis. 546 pp. + 226 figs.
- Hampson, G. F.** 1896. *The Fauna of British India including Ceylon and Burma. Moths, Vol. 4, Pyralidae*. London, Taylor & Francis. 594 pp. + 287 figs.
- Holloway, J. D.** 1983. The moths of Borneo (part 4) Family Notodontidae. *Malayan Nature Journal* 37: 1–107.
- Holloway, J. D.** 1985. The moths of Borneo (part 14) Family Noctuidae: subfamilies Euteliinae, Stictopterinae, Plusiinae, Pantheinae. *Malayan Nature Journal* 38: 157–317.
- Holloway, J. D.** 1986. The moths of Borneo. (part 1). Key to families; Families Cossidae, Metarbelidae, Ratardidae, Dudgeoneidae, Epipyropidae, and Limacodidae. *Malayan Nature Journal* 40: 1–165.
- Holloway, J. D.** 1987. *The Moths of Borneo (part 3); Families Lasiocampidae, Eupterotidae, Bombycidae, Brahmaeidae, Saturniidae, Sphingidae*. Kuala Lumpur, Southdene Sdn. Bhd. 199 pp. + 163 figs., 20 pls.
- Holloway, J. D.** 1988. *The Moths of Borneo (part 6); Family Arctiidae: Subfamilies Arctiinae, Syntominae, Aganainae (to Noctuidae)*. Kuala Lumpur, Southdene Sdn. Bhd. 101 pp. + 168 figs., 6 pls.
- Holloway, J. D.** 1989. The moths of Borneo (part 12); Family Noctuidae: Subfamilies Noctuinae, Heliethinae, Hadeninae, Acronictinae, Amphipyriinae, Agaristinae. *Malayan Nature Journal* 43: 57–226.
- Holloway, J. D.** 1993. The moths of Borneo (part 11); Family Geometridae: Subfamilies Ennominae. *Malayan Nature Journal* 47: 1–309.
- Holloway, J. D.** 1996. The moths of Borneo (part 9); Family Geometridae: Subfamilies Oenochrominae, Desmobathrinae, Geometrinae. *Malayan Nature Journal* 49: 147–326.
- Holloway, J. D.** 1997. The moths of Borneo (part 10); Family Geometridae: Subfamilies Sterrhinae, Larentiinae, Addenda to other subfamilies. *Malayan Nature Journal* 51: 1–242.
- Holloway, J. D.** 1998. The moths of Borneo, part 8: Castniidae, Callidulidae, Drepanidae, Uraniidae. *Malayan Nature Journal* 52: 1–155.
- Holloway, J. D.** 1999. The moths of Borneo (part 5); Family Lymantriidae. *Malayan Nature Journal* 53: 1–188.
- Holloway, J. D.** 2003. *The Moths of Borneo (Part 18): Family Nolidae*. Kuala Lumpur, Southdene Sdn Bhd. 279 pp. + 611 figs., 10pls.
- Holloway, J. D.** 2011. The moths of Borneo (part 2); Families Phaudidae, Himantopteridae and Zygaenidae; revised and annotated checklist. *Malayan Nature Journal* 63: 1–548.
- Inoue, H., Kennett, R. D., Kitching, I. J.** [1996]. *Moths of Thailand. Volume 2, Sphingidae*. Bangkok, Brothers of St Gabriel in Thailand. 149 pp. + 6 figs., 44 pls.
- Jha, G. K., Singh, G., Vennila, S., Hegde, M., Rao, M. S., Panwar, H.** 2017. Multi-layer perceptron based neural network model predicting the maximum severity of *Spodoptera litura* (Fabricius) on groundnut in relation to the climate for Dharwad region of Karnataka (India). *Mausam* 68(3): 537–542.
- Kendrick, R. C.** 2002. *Moths (Insecta: Lepidoptera) of Hong Kong*. PhD Thesis. Hong Kong, University of Hong Kong.
- Kirti, J. S., Goyal, T., Kaur, M.** 2012. An inventory of family Geometridae (Lepidoptera) from Western Ghats of India. *Journal of Entomological Research* 36(1): 83–94.
- Kirti, J. S., Singh, N.** 2015. *Arctiid Moths of India, Volume 1*. New Delhi, Nature Books India. 205 pp.
- Kirti, J. S., Singh, N.** 2016. *Arctiid Moths of India, Volume 2*. New Delhi, Nature Books India. 214 pp.
- Kononenko, S. V., Pinratana, A.** 2005. *Moths of Thailand. Volume 3, Noctuidae*. Bangkok, Brothers of St Gabriel in Thailand. 231 pp. + 45 pls.
- Kononenko, S. V., Pinratana, A.** 2013. *Moths of Thailand Vol. 3, Part 2. Noctuoidea. An Illustrated Catalogue of Erebiidae, Nolidae, Euteliidae, and Noctuidae (Insecta: Lepidoptera) in Thailand*. Bangkok, Brothers of St Gabriel in Thailand. 524 pp. + 55 pls.
- Mathew, G.** 2006. An inventory of Indian pyralids (Lepidoptera: Pyralidae). *Zoo's Print Journal* 21(5): 2245–2258.
- Mathew, G., Menon, M. G. R.** 1984. The pyralid fauna (Lepidoptera: Pyraloidea: Pyralidina) of Kerala (India). *Journal of Entomological*

Research 8(1): 5–13.

- Mathew, G., Rahamathulla, V. K.** 1995. Biodiversity in the Western Ghats – A study with reference to moths (Lepidoptera:Heterocera) in the Silent Valley National Park, India. *Entomon* 20(2): 25–33.
- Mathew, G., Chandran, G. R., Brijesh, C. M., Shamsudeen, R. S. M.** 2004a. Insect fauna of Shendurney Wildlife Sanctuary, Kerala. *Zoo's Print Journal* 19(1): 1321–1327.
- Mathew, G., Shamsudeen, R. S. M., Chandran, R., Brijesh, C. M.** 2004b. Insect fauna of Peppara Wildlife Sanctuary, Kerala, India. *Zoos' Print Journal* 19(11): 1680–168.
- Mathew, G., Shamsudeen, R. S. M., Chandran, R.** 2005. Insect fauna of Peechi-Vazhani Wildlife Sanctuary, Kerala, India. *Zoo's Print Journal* 20(8): 1955–1960.
- Mathew, G., Shamsudeen, R. S. M., Brijesh, C. M.** 2007. Insect fauna of Neyyar Wildlife Sanctuary, Kerala, India. *Zoo's Print Journal* 22(12): 2930–2933.
- Mathew, P., Anand, S., Sivasankaran, K., Ignacimuthu, S.** 2018. The moths (Lepidoptera: Heterocera) of Vagamon hills (Western Ghats), Idukki district, Kerala, India. *International Journal of Entomology Research* 3(2): 114–120.
- Moore, F.** 1880. *The Lepidoptera of Ceylon, Vol 1.* London, L. Reeve & Co.
- Moore, F.** 1882. *The Lepidoptera of Ceylon, Vol. 2.* London, L. Reeve & Co.
- Moore, F.** 1884. *The Lepidoptera of Ceylon, Vol 3.* London, L. Reeve & Co.
- Nagaharish, G., Prabhuraj, M. S. M., Someshkar, A., Patil, S. G. S.** 2017. Faunistic studies on Crambidae: Pyraloidea (Lepidoptera) associated with fruit and flower crops of zone-1 and 2 of Karnataka, India. *Journal of Entomology and Zoology Studies* 5(1): 875–880.
- Pinratana, A., Lampe, R. E. J.** 1990. *Moths of Thailand. Volume 1, Saturniidae* (Vol. 1). Bangkok, Brothers of St Gabriel in Thailand. 47 pp. + 44 pls.
- Ramkumar, J., Swamiappan, M., Raguraman S., Sadasakthi A.** 2010. Species diversity and seasonal abundance of fruit piercing moth complex in Tamil Nadu. *Journal of Biopesticides* 3(1): 11–15.
- Ratnasingham, S., Hebert, P. D. N.** 2007. BOLD: The Barcode of Life Data System: Barcoding. *Molecular Ecology Notes* 7(3): 355–364.
- Robinson G. S., Tuck, K. R., Schaffer, M., Cook, K.** 1994. *The Smaller Moths of South-East Asia.* Kuala Lumpur, Malaysian Nature Society. 308 pp. + 51 figs., 32 pls.
- Schintlmeister, A., Pinratana, A.** 2007. *Moths of Thailand. Volume 5, Notodontidae.* Bangkok, Brothers of St Gabriel in Thailand.
- Sekhon, C. K., Singh, J.** 2015. Inventory of owlet moths from Western Ghats of India (Noctuidae: Lepidoptera). *International Journal of Applied Research* 1(5): 175–181.
- Shamsudeen, R. S. M., Mathew, G.** 2010. Taxonomy studies on the subfamily Psychinae (Lepidoptera: Psychidae) of Kerala, India. *World Journal of Zoology* 5(4): 330–331.
- Shashank, P. R.** 2016. Report on the genus *Herdonia* Walker (Lepidoptera: Tyrididae) in Karnataka Western Ghats, India. *Journal of Threatened Taxa* 8(2): 8531–8532.
- Shubhalaxmi, V., Kendrick, R. C., Vaidya, A., Kalagi, N., Bhagwat, A.** 2011. Inventory of moth fauna (lepidoptera: Heterocera) of the northern Western Ghats, Maharashtra, India. *Journal of the Bombay Natural History Society* 108(3): 183–205.
- Singh, N., Singh, J.** 2012. New records of two species of family Arctiidae (Lepidoptera) from Western Ghats of India. *Records of Zoological Survey of India* 112(1): 25–26.
- Singh, J., Singh, N., Joshi, R.** 2014. A checklist of subfamily Arctiinae (Erebidae: Noctuidae: Lepidoptera) from India. *Records Zoological Survey of India, Occasional Paper* 367: 1–76.
- Singh, N., Joshi, R., Kirti, J. S., Volynkin, A. V.** 2017. A new species of *Thysanoptyx* Hampson, 1894 from India (Lepidoptera: Erebidae: Arctiinae). *Zootaxa* 4319(2): 375–378.
- Sivasankaran, K., Gnanasekaran, S., Parandhaman, D., Ignacimuthu, S.** 2011. Diversity of Noctuid moths (Lepidoptera: Noctuidae) in Tamil Nadu part of Western Ghats (Nilgiris biosphere and Kodaikanal hills), India. *Bio-Diversity* 38: 4131–4134.
- Sivasankaran, K., Ignacimuthu, S.** 2014. A report of Erebidae (Lepidoptera: Noctuoidea) from the Tamil Nadu Part of the Western Ghats, India. *Journal of Bombay Natural History Society* 111(3): 193–209.
- Smetacek, P.** 1994. Hawkmoths (Lepidoptera, Sphingidae) of Kumaon, N. India: A probable case of faunal drift. *Records of the Zoological Survey of India, Occasional Paper* 156: 1–55.
- Smetacek, P.** 2008. Moths recorded from different elevations in Nainital District, Kumaon Himalaya, India. *Bionotes* 11(4): 5–15.
- Sondhi, Y., Kitching, I. J., Basu, D. N., Kunte, K.** (2017). A new species of *Theretra* Hübner (Lepidoptera: Sphingidae) from the southern Western Ghats, India. *Zootaxa* 4323(2): 185–196.
- Sondhi, Y., Sondhi, S.** 2016. A partial checklist of moths (Lepidoptera) of Dehradun, Mussoorie and Devalsari in Garhwal, Uttarakhand, India. *Journal of Threatened Taxa*, 8(5): 8756–8776
- Sondhi, S., Sondhi, Y., Roy, P. Kunte, K.** 2018. *Moths of India*, v. 1.81. Indian Foundation for Butterflies. <http://www.mothsofindia.org/> [6-VI-2018]
- Sudheendrakumar, V., Mathew, G.** (1999). *Studies on the diversity of selected groups of insects in the Parambikulam Wildlife Sanctuary.* KFRI Research Report.
- Valke, D. V.** (2011). Extension of the known distribution of the genus *Herdonia* Walker (Lepidoptera: Thyrididae) to the Yeoor. *Journal of Threatened Taxa* 3(9): 2108.
- van Nieuwerkerken E. J., Kaila, L., Kitching, I. J., Kristensen, N. P., Lees, D. C., Minet, J., Mitter, C., Mutanen, M., Regier, J. C., Simonsen, T. J., Wahlberg, N., Yen, S.-H., Zahiri, R., Adamski, D., Baixeras, J., Bartsch, D., Bengtsson, B. A., Brown, J. W., Bucheli, S. R., Davis, D. R., Prins, J. D., Prins, W.D., Epstein, M.E., Gentili-Poole, P., Gielis, C., Hättenschwiler, P., Hausmann, A. Holloway, J.D., Kallies, A., Karsholt, O., Kawahara, A. Y., Koster, S., Kozlov, M.V., Lafontaine, J. D., Lamas, G., Landry, J. F., Lee, S., Nuss, M., Park, K.-T., Penz, C., Rota, J., Schintlmeister, A., Schmidt, B. C., Sohn, J. -C., Solis, M. A., Tarmann, G. M., Warren, A. D., Weller, S., Yakovlev, R.V., Zolotuhin, V. V. & A. Zwick.** 2011. Order Lepidoptera, pp. 212–221. In: Zhang, Z.-Q. (Ed.), Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness. *Zootaxa* 3148: 212–221.
- Wilkinson, C.** 1967. A taxonomic revision of the genus *Teldenia* Moore (Lepidoptera: Drepanidae, Drepaninae). *Transactions of the Royal Entomological Society of London* 119(11): 303–362.
- Zolotuhin, V. V., Pinratana, A.** 2005. *Moths of Thailand. Volume 4, Lasiocampidae.* Bangkok, Brothers of St Gabriel in Thailand. 205 pp. + 2 figs., 28 pls.