

RESEARCH ARTICLE

Systematic revision of the repository collection of Cantharoidea in the Department of National Museums, Colombo, Sri Lanka (Coleoptera: Cantharidae, Lampyridae, Lycidae, Rhagophthalmidae)

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Abstract: The collection of Sri Lankan Cantharoidea in the National Museums Colombo was initiated and identified by European and British collectors in the early 1800s. Their collection has been reserved as ‘Sri Lankan firefly collection’ in the National Museums, Colombo. Subsequently no systematic studies have been undertaken in an attempt to confirm the identifications and update the classification of these specimens using recent taxonomic information. During January to June in 2010, we examined 1,214 dry mounted specimens using a stereo microscope to determine external morphology in an attempt to reclassify specimens using up to date taxonomy. The collection originally was arranged into 4 families classified under 27 genera and 63 species. In our opinion, there are 4 families, containing 29 genera and 61 species including 27 Lampyridae species. The collection is clearly marked with labeled specimens indicating any authority for the suggested changes.

Keywords: Cantharoidea, Museum collection, Reclassification, Sri Lanka.

INTRODUCTION

The collection of specimens of Sri Lankan Cantharoidea was carried out by European and British naturalists in the 18th century. They built up the museum collection through expedition and contributed to our present knowledge of the Sri Lankan fireflies. Documentation of the Sri Lankan Cantharoidea was initiated with the establishment of the British rule. Findings of these surveys and studies were recorded in the ‘Fauna of British India’ Series (Arrow, 1910; 1917; 1931).

Tennent (1861) recorded 2,007 insect species in 9 orders in Sri Lanka. A list of Sri

Lankan beetles in the collection of the Colombo Museum in 1890 recorded 1,510 insect species (Haly, 1890). Tennent (1849) included 28 species of fireflies belonging to five genera from Sri Lanka (Appendix 1). Twenty nine species of Cantharoidea were recorded by Green (1912). Thirty species of Cantharoidea have been recorded as a dominant group of nocturnal insects in terrestrial and aquatic environments in Sri Lanka by Baker (1937) and Bertrand (1973). McDermott (1966) listed 31 species of Lampyrids from Sri Lanka (Appendix 2).

Among the originally recorded 24 Lampyrid species from Sri Lanka, *Luciola melaspis* and *L. cingulata* have been recorded from Southern Province (McDermott 1964, 1966), while the endemic species, *Harmataliua ototreinae* has been recorded from Central Province of Sri Lanka. Olivier (1885) reported *Luciola chinensis*, *L. cingulate* and *L. doriae* from Galle in Southern Province in Sri Lanka. The occurrence of aquatic Lampyrid larvae in Sri Lanka has been reported by Bertrand (1973).

In 2010, Ballantyne prepared the ‘Geographical list of Luciolinae fireflies in South-east Asia’, including 258 species using the information of McDermott (1966) list. Out of that, type specimens of 16 species of Lampyrids recorded from Sri Lanka were located in the Natural History Museums in London and Paris. A study was carried out in 2009 on Lampyrid distribution and species composition in agro ecosystems and other natural habitats in Southern Province of Sri Lanka (Wegiriya *et al.*, 2009; Bogahawatte *et al.*, 2009). They identified and

classified the collected Lampyrids to a certain extent (7 species) and their studies highlighted the importance and need for a taxonomic revision of Sri Lankan Lampyrids.

Studying the systematics of Cantharoidea in Sri Lanka is an important aspect of biodiversity and conservation of the country. Further, it will be helpful to discard the outdated taxonomy and incorrect identifications and to introduce correct identifications to the list of Sri Lankan insects.

The objective of the present study was to investigate the previous taxonomic information of Cantharoidea specimens deposited at the Department of National Museums, Colombo, Sri Lanka and to revise their systematics using currently valid taxonomic information.

MATERIALS AND METHODS

The collection of Cantharoidea specimens in the 'Sri Lankan firefly collection' at the Department of National Museums, Colombo were used for the study.

Specimen selection and data collection

Dry mounted adult firefly specimens of 1,214 categorized as 'Sri Lankan fireflies' were examined using a compound light microscope (maximum magnification 40×) from January to June in 2010. Each specimen was photographed using a Dino-Lite digital microscope (Dino Capture- version 2.5). List of the Cantharoidea species and information labels including collector's name, location, date, and their taxonomy available at the Department of National Museums, Colombo were recorded. Practical and handling limitations of reference specimens were also recorded.

Identification of species

The genus/ species level of repository specimens was confirmed using external morphological characters such as colour pattern of dorsal and ventral side of the body, light organ shape, number of light segments and type of antenna. Information available in taxonomic keys, photographs of type specimens deposited in London and Paris museums were used to confirm the identifications (Ballantyne and Lambkin, 2009; Jeng, 2008). The modern identification techniques such as genitalia dissection was not applied due to practical limitations and

regulations of the museums. Hence, taxonomic identification of many of the Luciolinae was difficult.

Systematic revision and classification

Identified specimens and their external morphological characters were compared with the updated taxonomic information up to 2013 in South-east Asia (Ballantyne and Lambkin, 2009; Ballantyne *et al.*, 2013; Jeng, 2000, 2001, 2003b, 2008 and 2010; Branham, 2001). The list of recorded Cantharoidea from the museum was updated including their revised classification (Table 1).

RESULTS

Observed species of Cantharoidea deposited at the Department of National Museums, Colombo

Specimens at the Department of National Museums, Colombo have been categorized into 63 species of 27 genera in 4 families (Table 1). However, all these specimens have been allocated as 'Sri Lankan firefly collection' in the National Museums, Colombo.

All specimens have been collected before early 18th century, e.g., *Lyropaeus fallex* (in 1419), *Hatiogewani dishaota* (in 1411), *Lycostomus similis* (in 1450). Hence, some of these specimens are already destroyed, lost or damaged due to handling and fungal attacks. Some specimens are not returned by researchers while others have been sent abroad for further identification. Specimens of the following species which have been recorded from Sri Lanka in publications were not found in this collection at present: *Lycostomu spraeustus*, *Taphes brevicollis*, *Xylobanus costifer*, *Xylobanus humerifer*, *Plateros testaceus*, *Plateros exsertus*, *Plateros limbatocollis*, *Luciola candezei*, *Luciola promelaena*, *Luciola antennalis*, *Luciola horni*, *Luciola nicollieri*, *Luciola perplexa*, *Luciola ochracea*, *Diaphanes bugnioni*, *Harmatelia discalis*, *Ditoneces scabripennis*, *Lucernut slateralis*, *Lucernuta oblonga*, *Micronychus terminates*, *Lamprophorus lutosipennis*, *Dilophotes bugnioni*, *Ectodaphus languidus*, *Lamprophoru slutescens*.

The list of Cantharoidea deposited at the Department of National Museums, Colombo is updated in the present study and their classification is revised according to the updated taxonomy in South-east Asia.

DISCUSSION

This study focused on the revision of the Cantharoidea deposited in the 'firefly collection' at the Department of National Museums, Colombo using the updated systematics of south-east Asian region. The repository collection of the Cantharoidea at the Department of National Museums, Colombo, could be categorized into nocturnal and diurnal firefly species based on external morphology of specimens such as the type of the antenna and presence of light organs in abdominal ventrites (diurnally active species have well-branched, unipectinate, antenna and no light organs). As such, repository specimens of Family Lampyridae consisted mainly of nocturnal species and diurnal species that belonged to genus *Harmatelia*. Repository specimens of Family Cantheridae, Lycidae and Rhagophthalmidae consisted of species identified as diurnal fireflies (Jeng, 2010).

According to the old taxonomic information the original repository collection at the Department of National Museums, Colombo represented 63 species belonging to 27 genera in 4 families. Present systematic revision reveals that the number of species of the repository specimens is reduced to 61 and the number of genera is increased to 29 in 4 families. The present systematic revision of these recorded species was conducted based on newly introduced two new genera of Luciolinae namely genus *Abscondita* and *Asymmetricata* and the amendment of four species of the genus *Luciola* to two species of genus *Abscondita*. As such, species namely *Luciola melaspis* and *L. promelaena* are revised to *Abscondita promelaena*, while *Luciola chinensis* and *L. vespertina* are revised to *Abscondita chinensis*.

Among the specimens, 19 species belonged to the Subfamily Luciolinae which has its highest diversity in South-east Asia (Ballantyne *et al.*, 2005). In 2013, Ballantyne *et al.* described a new genus *Abscondita* based on the shapes of male light organs and features of the genitalia. Consequently, specimens labeled

as *Luciola melaspis* and *Luciola promelaena* were placed under *Abscondita promelaena* (Walker). Specimens standing originally under *Luciola chinensis* and *Luciola vespertina* were placed under *Abscondita chinensis*, and those standing under *Luciola perplexa* were placed under *Abscondita perplexa*.

In 2009, Ballantyne *et al.* suggested that the new genus *Asymmetricata* based on the asymmetric nature of the 8th abdominal tergite. Specimens identified in the collection as *Luciola humeralis* and *Luciola impressa* were moved under the genus *Asymmetricata*. This does not constitute any formal reassignment of these species at this stage, but we recognized that males of both these species possessed an asymmetrical abdominal tergite 8 characteristic of the genus *Asymmetricata*.

Ballantyne *et al.*, (2009) proposed another subdivision, *Luciola substriata* complex based on the similarity of the shape of male's light organ in 7th abdominal ventrite and the presence of sclerites surrounding the aedeagal sheath. Species including *L. substriata*, *L. aquatilis*, *L. cingulata*, *L. seriata* and *L. brahmina* were assigned to that complex. According to this taxonomic revision, *L. cingulata* should be grouped under the subdivision of *L. substriata* complex.

Available literature records in south-east Asia were not sufficient to revise the systematics of other Luciolinae species at the Department of National Museums, Colombo. Hence, their systematics were not revised. In addition systematics of *Luciola candezei*, *L. antennalis*, *L. horni*, *L. nicollieri*, and *L. ochracea* were not done due to unavailability of specimens at the Department of National Museums, Colombo.

Out of the Luciolinae in the south-east Asia, *Luciola antennalis*, *L. horni*, *L. cingulata*, *L. doriae*, *L. humeralis* and *L. auritula* were originally recorded from Sri Lanka (McDermott, 1966). However, the species of *L. auritula* has not been included in the list of fireflies at the Department of National Museums, Colombo.

Table 1: Annotated list of Canthoroidea deposited at the Department of National Museums, Colombo and their revised classification according to the updated systematics in South-east Asia

		Family	Subfamily	Genus	Species	Assigned Group/complex
1	<i>Atelius expansicornis</i>	Lycidae	-----	<i>Atelius</i>	<i>expansicornis</i>	Diurnal
2	<i>Calochromus m. simulans</i>	Lycidae	Calochrominae	<i>Calochromus</i>	<i>micronychus</i>	Diurnal
3	<i>Cantharis dimidiata</i>	Cantheridae	-----	<i>Cantharis</i>	<i>dimidiata</i>	Diurnal
4	<i>Cautires dignus</i>	Lycidae	-----	<i>Cautires</i>	<i>dignus</i>	Diurnal
5	<i>Diaphanes lutescens</i>	Lampyridae	Lampyrinae	<i>Diaphanes</i>	<i>lutescens</i>	Nocturnal
6	<i>Diaphanes olivieri</i>	Lampyridae	Lampyrinae	<i>Diaphanes</i>	<i>olivieri</i>	Nocturnal
7	<i>Diaphanes taprobanus</i>	Lampyridae	Lampyrinae	<i>Diaphanes</i>	<i>taprobanus</i>	Nocturnal
8	<i>Diaphanes vitrifera</i>	Lampyridae	Lampyrinae	<i>Diaphanes</i>	<i>vitrifera</i>	Nocturnal
9	<i>Diaptoma greeni</i>	Rhagophthalmidae	Rhagophthalminae	<i>Diaptoma</i>	<i>greeni</i>	Nocturnal
10	<i>Diaptoma adamsi</i>	Rhagophthalmidae	Rhagophthalminae	<i>Diaptoma</i>	<i>adamsi</i>	Nocturnal
11	<i>Dictoneces aculeatus</i>	Lycidae	-----	<i>Dictoneces</i>	<i>aculeatus</i>	Diurnal
12	<i>Dictoneces pubicornis</i>	Lycidae	-----	<i>Dictoneces</i>	<i>pubicornis</i>	Diurnal
13	<i>Dictoneces pubipennis</i>	Lycidae	-----	<i>Dictoneces</i>	<i>pubipennis</i>	Diurnal
14	<i>Dilaphotes bugnioni</i>	Lycidae	-----	<i>Dilaphotes</i>	<i>bugnioni</i>	Diurnal
15	<i>Ditoneces soabripennis</i>	Lycidae	-----	<i>Ditoneces</i>	<i>soabripennis</i>	Diurnal
16	<i>Ditoneces terminalis</i>	Lycidae	-----	<i>Ditoneces</i>	<i>terminalis</i>	Diurnal
17	<i>Ectodaphus languidus</i>	Lycidae	-----	<i>Ectodaphus</i>	<i>languidus</i>	Diurnal
18	<i>Harmatelia bilinia</i>	Lampyridae	Ototretadrilinae- Ototretinae complex	<i>Harmatelia</i>	<i>bilinia</i>	Pan- ototretines (Diurnal)
19	<i>Harmatelia discalis</i>	Lampyridae	Ototretadrilinae- Ototretinae complex	<i>Harmatelia</i>	<i>discalis</i>	Pan- ototretines (Diurnal)
20	<i>Ichthyuris bicaudata</i>	Lycidae	-----	<i>Ichthyuris</i>	<i>bicaudata</i>	Diurnal
21	<i>Lamprophorus diffinis</i>	Lampyridae	Lampyrinae	<i>Lamprigera</i>	<i>diffinis</i>	Nocturnal
22	<i>Lamprophorus lutescens</i>	Lampyridae	Lampyrinae	<i>Lamprigera</i>	<i>lutescens</i>	Nocturnal
23	<i>Lamprophorus lutosipennis</i>	Lampyridae	Lampyrinae	<i>Lamprigera</i>	<i>lutosipennis</i>	Nocturnal
24	<i>Lamprophorus tenebrosus</i>	Lampyridae	Lampyrinae	<i>Lamprigera</i>	<i>tenebrosus</i>	Nocturnal
25	<i>Lucernuta ablonga</i>	Uncertain	----	----	----	Nocturnal
26	<i>Lucernuta lateralis</i>	Uncertain	----	----	----	Nocturnal
27	<i>Luciola antennalis</i>	Lampyridae	Luciolinae	<i>Luciola</i>	<i>antennalis</i>	Nocturnal
28	<i>Luciola candezei</i>	Lampyridae	Luciolinae	<i>Luciola</i>	<i>candezei</i>	Nocturnal
29	<i>Luciola chinensis</i>	Lampyridae	Luciolinae	<i>Abscondita</i>	<i>chinensis</i>	Nocturnal
30	<i>Luciola cingulata</i>	Lampyridae	Luciolinae	<i>Luciola</i>	<i>cingulata</i>	Nocturnal
31	<i>Luciola doriae</i>	Lampyridae	Luciolinae	<i>Luciola</i>	<i>doriae</i>	Nocturnal
32	<i>Luciola extricans</i>	Lampyridae	Luciolinae	<i>Luciola</i>	<i>extricans</i>	Nocturnal
33	<i>Luciola horni</i>	Lampyridae	Luciolinae	<i>Luciola</i>	<i>horni</i>	Nocturnal
34	<i>Luciola humeralis</i>	Lampyridae	Luciolinae	<i>Asymmetricata</i>	<i>humeralis</i>	Nocturnal
35	<i>Luciola impressa</i>	Lampyridae	Luciolinae	<i>Asymmetricata</i>	<i>impressa</i>	Nocturnal
36	<i>Luciola intricata</i>	Lampyridae	Luciolinae	<i>Luciola</i>	<i>intricata</i>	Nocturnal
37	<i>Luciola melaspis</i>	Lampyridae	Luciolinae	<i>Abscondita</i>	<i>promelaena</i>	Nocturnal
38	<i>Luciola nicollieri</i>	Lampyridae	Luciolinae	<i>Luciola</i>	<i>nicollieri</i>	Nocturnal
39	<i>Luciola nigripes</i>	Lampyridae	Luciolinae	<i>Luciola</i>	<i>nigripes</i>	Nocturnal
40	<i>Luciola ochracea</i>	Lampyridae	Luciolinae	<i>Luciola</i>	<i>ochracea</i>	Nocturnal
41	<i>Luciola perplexa</i>	Lampyridae	Luciolinae	<i>Abscondita</i>	<i>perplexa</i>	Nocturnal
42	<i>Luciola promelaena</i>	Lampyridae	Luciolinae	<i>Abscondita</i>	<i>promelaena</i>	Nocturnal
43	<i>Luciola vespertina</i>	Lampyridae	Luciolinae	<i>Abscondita</i>	<i>chinensis</i>	Nocturnal
44	<i>Lycostomus analis</i>	Lycidae	----	<i>Lycostomus</i>	<i>analis</i>	Diurnal
45	<i>Lycostomus internexus</i>	Lycidae	----	<i>Lycostomus</i>	<i>internexus</i>	Diurnal
46	<i>Lycostomus praeustus</i>	Lycidae	----	<i>Lycostomus</i>	<i>praeustus</i>	Diurnal
47	<i>Lycostomus similis</i>	Lycidae	----	<i>Lycostomus</i>	<i>similis</i>	Diurnal
48	<i>Lyropaeus fallex</i>	Lycidae	----	<i>Lyropaeus</i>	<i>fallex</i>	Diurnal
49	<i>Metriorrhynchus astutus</i>	Lycidae	----	<i>Metriorrhynchus</i>	<i>astutus</i>	Diurnal

50	<i>Micronychus bimaculatus</i>	Lycidae	----	<i>Micronychus bimaculatus</i>	Diurnal
51	<i>Micronychus terminatus</i>	Lycidae	----	<i>Micronychus terminatus</i>	Diurnal
52	<i>Ochotyra semiusta</i>	Rhagophthalmidae	Rhagophthalminae	<i>Ochotyra semiusta</i>	Nocturnal
53	<i>Plateros ceylonicus</i>	Lycidae	Platerodinae	<i>Plateros ceylonicus</i>	Diurnal
54	<i>Plateros dispellenes</i>	Lycidae	Platerodinae	<i>Plateros dispellenes</i>	Diurnal
55	<i>Platero sexsertus</i>	Lycidae	Platerodinae	<i>Plateros exsertus</i>	Diurnal
56	<i>Plateros limbatocollis</i>	Lycidae	Platerodinae	<i>Plateros limbatocollis</i>	Diurnal
57	<i>Plateros testaceus</i>	Lycidae	Platerodinae	<i>Plateros testaceus</i>	Diurnal
58	<i>Sphaerarthrum</i>	Lycidae	----	<i>Sphaerarthrum</i>	Diurnal
59	<i>Tapes brevicollis</i>	Lycidae	----	<i>Tapes brevicollis</i>	Diurnal
60	<i>Themus metallescens</i>	Lycidae	----	<i>Themus metallescens</i>	Diurnal
61	<i>Vespertina apicalis</i>	Lycidae	----	<i>Vespertina apicalis</i>	Diurnal
62	<i>Xylobanus costifer</i>	Lycidae	----	<i>Xylobanus costifer</i>	Diurnal
63	<i>Xylobanus humerifer</i>	Lycidae	----	<i>Xylobanus humerifer</i>	Diurnal

Source: Compiled using multiple sources; Ballantyne and Lambkin (2009), Ballantyne *et al.* (2013), Jeng (2000, 2001, 2003b, 2008, 2010), Branham (2001).

Repository specimens of eight firefly species at the Department of National Museums, Colombo have been classified under two genera namely *Lamprophorus* and *Diaphanes* belonged to Subfamily Lampyrinae. In 2000, Jeng *et al.* re-described the genus *Lamprophorus* as *Lamprigera*. According to that, the recorded repository specimens of *Lamprophorus diffinis*, *L. lutescens*, *L. lutosipennis* and *L. tenebrosus* should be revised as *Lamprigera diffinis*, *L. lutescens*, *L. lutosipennis* and *L. tenebrosus*.

In 2001, Jenget *al.* described the systematics of genus *Diaphanes* in detail. The repository specimens of *Diaphanes lutescens*, *D. olivieri*, *D. taprobanus* and *D. vitrifer* were identified using Jeng's paper. Among them, two species namely *D. lutescens* and *D. olivieri* were originally recorded from Sri Lanka (McDermott, 1966). Firefly species of genus *Harmatelia* are presently considered as one of the diurnal firefly groups (Jeng, 2008). According to the old systematics, *Harmatelia bilinia* and *H. discarlis* have been classified into Subfamily Pterotinae and Family Prilidae.

In 2008, Jeng suggested the new paraphyletic group, Ototretadrilinae-Ototretinae complex to Family Lampyridae and it contained diurnally active firefly species which were earlier belonged to Family Drilidae and Prilidae. According to that, the systematics of genus *Harmatelia* should be revised to Group Pan ototretines, Subfamily Ototretadrilinae-Ototretinae complex and Family Lampyridae. The confirmation of the taxon and the revision of systematics of species such as *Diaptoma greeni* and *D. adamsi*, and *Rhagophthalmus* species (*R. confuses*) are complicated due to lack of

literature records and valid systematic information.

Repository species belonged to Family Cantharidae (*Cantharis dimidiata*) and Family Lycidae (Genera *Lycostomus*, *Tapes*, *Metriorrhynchus*, *Cautires*, *Xylobanus*, *Atelius*, *Plateros*, *Dictoneces*, *Ectodaphus*, *Micronychus*, *Calochromus*, *Dilophotes*, *Lyropaeus*) are presently considered as diurnally active species (Jeng, 2008). Further classification and identification of these species cannot be completed due to lack of valid taxonomic information of these families.

Systematics of Cantharoidea specimens deposited in the 'firefly collection' at the Department of National Museums, Colombo has not been updated since their original work began in early eighteenth century by Europeans. In this study, some of the repository firefly specimens were revised using currently valid taxonomic information of south-east Asia and it will be useful for future researchers, taxonomists and scientist for their studies on Sri Lankan insect fauna.

CONCLUSION

Of the 63 species in four genera listed in table 1, due to lack of updated taxonomic information and access to specimens, we were unable to further address thirty Lycidae, one Cantharidae, two of uncertain position (*Lucernuta*), and eight species of *Luciola*. Of the *Luciola* many were not present in this collection although having been recorded from Sri Lanka. We have been able to confirm identity of four species of *Diaphanes*, and moved four species of *Lamprophorus* to *Lamprigera* while not confirming their identity.

Similarly, two species of *Rhagophthalmus* and two of *Harmatelia* were reclassified to different subfamilies. We have had most success with certain *Luciolinae* where there is an updated recent taxonomy, and here we were able to transfer five *Luciola* species to *Abscondita*, two to *Asymmetricata*, and another to a new genus which is in review.

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Appendix 1: The list of Canthoroidea recorded from Sri Lanka (extracted from “The list of Animals in Ceylon” by Sr. J.E. Tenant, 1849).

	Genus	Species
1	<i>Colophotia</i>	<i>humeralis</i> (Walker)
2	<i>Colophotia</i>	<i>vespertina</i> (Walker)
3	<i>Colophotia</i>	<i>perplexa</i> (Walker)
4	<i>Colophotia</i>	<i>intricata</i> (Walker)
5	<i>Colophotia</i>	<i>extricans</i> (Walker)
6	<i>Colophotia</i>	<i>promelas</i> (Walker)
7	<i>Dictyopterus</i>	<i>internexus</i> (Walker)
8	<i>Harmatelia</i>	<i>discalis</i> (Walker)
9	<i>Harmatelia</i>	<i>bilinear</i> (Walker)
10	<i>Lampyris</i>	<i>tenebrosa</i> (Walker)
11	<i>Lampyris</i>	<i>diffinis</i> (Walker)
12	<i>Lampyris</i>	<i>lutescens</i> (Walker)
13	<i>Lampyris</i>	<i>vitrifera</i> (Walker)
14	<i>Lycus</i>	<i>triangularis</i> (Hope)
15	<i>Lycus</i>	<i>geminus</i> (Walker)
16	<i>Lycus</i>	<i>astutus</i> (Walker)
17	<i>Lycus</i>	<i>fallax</i> (Walker)
18	<i>Lycus</i>	<i>planicornis</i> (Walker)
19	<i>Lycus</i>	<i>melanopterus</i> (Walker)
20	<i>Lycus</i>	<i>pubicornis</i> (Walker)
21	<i>Lycus</i>	<i>duplex</i> (Walker)
22	<i>Lycus</i>	<i>costifer</i> (Walker)
23	<i>Lycus</i>	<i>revocans</i> (Walker)
24	<i>Lycus</i>	<i>dispellens</i> (Walker)
25	<i>Lycus</i>	<i>pubipennis</i> (Walker)
26	<i>Lycus</i>	<i>humifer</i> (Walker)
27	<i>Lycus</i>	<i>expansicornis</i> (Walker)
28	<i>Lycus</i>	<i>divisus</i> (Walker)

Appendix 2: List of Canthoroidea originally recorded from Sri Lanka based on McDermott, 1966

Firefly species			
1	<i>Diaphanes brunioni</i> (Bourg, 1909)	17	<i>Luciola humeralis</i> (Walker, 1858)
2	<i>Diaphanes lutescens</i> (Walker, 1858)	18	<i>Luciola impressa</i> (Walker, 1858)
3	<i>Diaphanes olivieri</i> (Gorham, 1895)	19	<i>Luciola intricate</i> (Walker, 1858)
4	<i>Harmatelia bilinea</i> (Walker, 1858)	20	<i>Luciola melaspis</i> (Walker, 1858)
5	<i>Harmatelia discalis</i> (Walker, 1858)	21	<i>Luciola nicollieri</i> (Walker, 1858)
6	<i>Harmatelia distincta</i> (Bourg, 1909)	22	<i>Luciola ochracea</i> (Walker, 1858)
7	<i>Lamprophorus lutosipennis</i> (Walker, 1974)	23	<i>Luciola promelaena</i> (Walker, 1858)
8	<i>Lamprophorus tenebrosus</i> (Motsch, 1861)	24	<i>Luciola perplexa</i> (Walker, 1858)
9	<i>Lampyris vitrifera</i> (Walker, 1858)	25	<i>Lychnuris lateralis</i> (Gorham, 1880)
10	<i>Luciola antennalis</i> (Bourg, 1905)	26	<i>Lychnuris oblonga</i> (Motsch, 1861)
11	<i>Luciola auritula</i> (E. Olivier, 1910)	27	<i>Ochotyra obscura</i> (P. Melong, 1921)
12	<i>Luciola candezei</i> (E. Olivier, 1885)	28	<i>Ochotyra semiusta</i> (Pascoe, J, 1862)
13	<i>Luciola chinensis</i> (Linnaeus, 1767)	29	<i>Rhagophthalmus confuses</i> (E. Olivier, 1911)
14	<i>Luciola cingulata</i> (E. Olivier, 1885)	30	<i>Rhagophthalmus filiformis</i> (E. Olivier, 1911)
15	<i>Luciola doriae</i> (E. Olivier, 1885)	31	<i>Rhagophthalmus notaticolis</i> (P. Melong, 1916)
16	<i>Luciola horni</i> (Bourg, 1905)		