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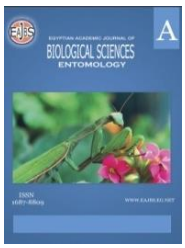

Systematics of *Lamprigera tenebrosa* (Walker, 1858) (Coleoptera: Lampyridae: Lampyrinae) in Sri Lanka

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ABSTRACT

The Subfamily Lampyrinae fireflies are distributed over the Oriental realm. *Lamprigera tenebrosa* (Walker, 1858) is one of the Lampyrinae which were originally described from Sri Lanka (as Ceylon). However, their systematics and biology have not been explored to any extent after they were first described in early eighteenth. *Lamprigera tenebrosa* was collected from grasslands, paddy fields, and freshwater associated lands from all nine Provinces of Sri Lanka in the study. The present paper describes the systematics and biology of the found male, female, larvae, and eggs of *L. tenebrosa* in Sri Lanka. The apterous female and larvae were identified when they were associating with males in the same habitats. Descriptions of their areas of incidence in Sri Lanka with indications of habitat types are included. The flashing differences and other behavioral aspects observed during the study are addressed here. The information of the study will be helpful for taxonomists, researchers who are interested in further studies on this group.

INTRODUCTION

Sri Lanka is a tropical country with rich biodiversity. The country enormously supports to have rich insect diversity including the number of rare insect groups. Fireflies or Lampyrids are one of the rare insects in Sri Lanka with an existing high conservation value. However, there is a dearth of past records and taxonomic studies on this important insect group in past several decades in Sri Lanka. There had not been explored to any extent of taxonomy or biology of Sri Lankan fireflies after they were originally described by European scientists in the early eighteenth century.

Lamprigera tenebrosa belongs to the subfamily: Lampyrinae. This species has been originally described by Walker, 1858 using the collected specimens from Sri Lanka.
There are numerous pioneering documented records (Tennent, 1861; Olivier, 1885; Green, 1912; Baker 1937; McDermott, 1964, 1966; Bertrand, 1973) and few recent studies (Wegiriya *et al*, 2009; Bogahawatte *et al*, 2009 & Wijekoon *et al*, 2012, 2013 & 2021) on Sri Lankan fireflies and which are contributed to the present knowledge of the fauna in the country. These all recent studies had emphasized the need for a long-term study on the taxonomy and ecology of fireflies in Sri Lanka. As such a long-term study was initiated on the taxonomy and ecology of Sri Lankan fireflies and *Lamprigera tenebrosa* was one of the firefly species recorded during the study.

Genus *Lamprigera*; *Lamprigera* Motschulsky, 1853 show great changes with different studies as Olivier (1907& 1910), McDermott (1964), Crowson (1972), Nakane (1991), Newton (1995), Jeng, *et al.* (1999) & (2000) and a recent study by Zhiwei Dong1, *et al.*, (2021). Both males and females of *Lamprigera* species are nocturnal. *Lamprigera* species are distributed in all the East and South-East Asian countries and Russia (Pacific side) (Jeng, 2008).

Adult male; They are flying form. Aedeagal sheath (abdominal sternite 9 + tergite 9-10) is bilaterally symmetrical, the apex of sternite 9 is broadly emarginated. Male genitalia typically trilobed, the median piece of male genitalia very slender dorsally but broad laterally; parameres sub-parallel sided, thick and evenly broad; basal piece symmetric and horseshoe-like (Jeng, *et al.*, 2000).

Adult female; Females of *Lamprigera* species are known only from three species (*Lamprigera tarda, L. tenebrosa* and *L. yunnana*) in which they are all true larviforms: not only being apterous but also possessing many larval morphological characters (Gahan, 1908; Paiva, 1918; Bess, 1956; Imms, 1964; Ho, 1997; Ho, *et al.*, 1998; Chen, 1999). The term "larviform" has been somewhat ambiguously used by McDermott (1964) in which it represented not only true larviform but also brachypterous as well as apterous females like those of *Lampyris, Diaphanes, Pyrocoelia* and others. *Lamprigera* female is either always larger than the male. Usually, they are apterous form. Elytra are either totally absent or present as small bud-like rudiments. Body colour is brownish yellow or milky white. It differs from the larvae morphologically by their body colour because larvae usually have dark brown or black body. Body size is either large or similar to their mature larvae (Jeng, *et al.*, 2000).

The present paper describes the taxonomy and biology of *Lamprigera tenebrosa* in detail using the collected specimens of their male, female, larvae and eggs during the survey in Sri Lanka. The study results would be crucial to fill the void to some extent of the taxonomy and biodiversity gap of Sri Lankan fireflies.

MATERIALS AND METHODS

Field Sites:

The survey was carried out from January 2010 to January in 2012. All nine Provinces of Sri Lanka, Uva, Sabaragamuwa, Southern, Western, Central, Eastern, Northern, North-Western, North- Central was selected for the study. Three sub-sampling sites indicating three types of habitats (terrestrial grassland, cultivated and fresh water associated) in each Province were selected for collecting the fireflies (Table 1). Locations of sub-sampling sites are indicated in the map (Fig. 1).

Collection of Specimens:

Data collection was carried out from 5.30 p.m. to 10.00 p.m. on each sampling day. The 100 m^2 area was selected in each habitat and adult fireflies (males) were collected using the standard size (30.5 cm/ 12 inch) insect hand net. Females and larvae were collected using fine forceps when they were associating with males in the same habitat. Two sampling occasions were carried out within each six-month period and a total of eight samplings were done during the study. Total individual number of males, females & larvae in each sampling visit at each habitat was recorded.

Table 1: Description of the selected sampling locations and habitats in nine Provinces of Sri Lanka

Province	Sub-sampling sites/ Locality	Latitude & Longitude	Habitat/ Vegetation type
Uva	Welimada	6° 54′ 04″ N,80° 55′ 22″ E	Fresh water associated
	Bandarawela	6° 50′ 0″ N, 80° 59′ 0″ E	Paddy cultivation
	Wellawaya	6° 44' 0" N, 81° 6' 0"E	Terrestrial grassland
Sabaragamuwa	Balangoda	6° 39′ 0″ N, 80° 41′ 0″ E	Fresh water associated
	Ratnapura	6° 40′ 0″ N, 80° 24′ 0″ E	Paddy cultivation
	Embilipitiya	6° 20′ 38″ N,80° 50′ 56″ E	Terrestrial grassland
Southern	Matara	5° 57′ 0″ N, 80° 33′ 0″ E	Terrestrial grassland
	Galle	6° 3′ 0″ N, 80° 13′ 0″ E	Fresh water associated
	Hambanthota	6° 7′ 28″ N, 81° 7′ 21″ E	Paddy cultivation
Central	Peradeniya	7° 16′ 0″ N, 80° 36′ 0″ E	Terrestrial grassland
	Kandy	7° 17′ 47″ N, 80° 38′ 6″ E	Paddy cultivation
	Nuwaraeliya	6° 58′ 0″ N, 80° 46′ 0″ E	Fresh water associated
Western	Maharagama	6° 51′ 0″ N, 79° 59′ 0″ E	Fresh water associated
	Panadura	6° 42′ 48″ N,79° 54′ 15″ E	Paddy cultivation
	Gampaha	7° 5′ 30″ N, 79° 59′ 59″ E	Terrestrial grassland
North Western	Kurunegala	7° 29′ 0″ N, 80° 22′ 0″ E	Terrestrial grassland
	Kuliyapitiya	7° 28′ 14″ N, 80° 2′ 44″ E	Paddy cultivation
	Narammala	7° 26′ 4″ N, 80° 13′ 17″ E	Fresh water associated
Northern	Point Pedro	9° 49′ 0″ N, 80° 14′ 0″ E	Terrestrial grassland
	Jaffna	9° 40′ 0″ N, 80° 0′ 0″ E	Paddy cultivation
	Kilinochchi	9° 23′ 0″ N, 80° 24′ 0″ E	Fresh water associated
Eastern	Arugam bay	6° 51′ 0″ N, 81° 50′ 0″ E	Terrestrial grassland
	Ampara	7° 5′ 0″ N, 81° 45′ 0″ E	Paddy cultivation
	Trincomalee	8° 34′ 0″ N, 81° 14′ 0″ E	Fresh water associated
North Central	Anuradhapura	8° 21′ 0″ N, 80° 23′ 0″ E	Paddy cultivation
	Kekirawa	8° 2' 0" N, 80° 36' 0"E	Fresh water associated
	Polonnaruwa	7° 56′ 0″ N, 81° 0′ 0″ E	Terrestrial grassland

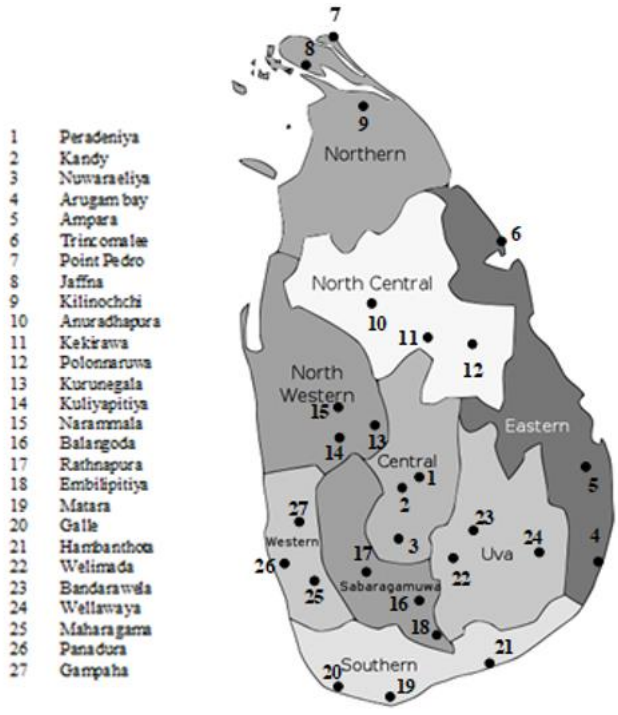

Fig. 1: Sub-sampling sites of nine Provinces of Sri Lanka

Identification of Specimens:

All adults (flying males & apterous females) and larvae observed in the selected area were collected. Collected individuals were temporarily put into transparent polythene bags in the field. Captured individuals were generally identified in the field using morphological characters such as dorsal and ventral colour, light organ shape, number of light segments. The limited number of samples of both sexes and larval stages were preserved in plastic containers with 70% ethanol medium for further identification and confirmation. Sexes were determined using the number of light segments at the ventral abdomen. Preserved specimens and also individuals that could not be identified in the field were brought to the laboratory to confirm their identity later. Collected males, females and larvae were taxonomically identified in the laboratory using available keys and published information of Lampyrids in South East Asia (Walker, 1858, Motschulsky, 1845: 36; 1853: 51. Olivier, 1907: 55; 1910a: 47. McDermott, 1964: 47; 1966: 118; Paiva, 1918; Bess, 1956; Imms, 1964; Ho, 1997; Ho, *et al.*, 1998; Chen, 1999; Jeng *et al*., 1999, 2000, 2010). In addition, the repository specimens stored in National Museum, Colombo, Sri Lanka were examined to confirm the species. Furthermore, male specimens were confirmed using genitalia characters (Ballantyne & McLean 1970; Ballantyne & Lambkin 2009; Ballantyne *et al*. 2019). Genitalia of five males were dissected and both male genitalia and aedeagal sheaths were examined. Females and larvae were confirmed after investigating their taxonomic characters.

The Light microscope (Nikon-ECLIPSE-E100) (10×4) (with a ruler- micrometer calibration) was used to observe several special body features (pronotal areolet, elytra, legs, antennae, pronotum, light organ) of recorded fireflies. The Dino-lite camera (AM7515MT4A - Digital Microscope, 2592 x 1944/5 MPixel, 415 -470x, USB 2.0) was used to take photographs of firefly specimens.

Taxonomic Measurements:

20 male, 10 female & 10 larvae were measured. Specimens were air-dried for 5-10 minutes. Then, each specimen was placed on the stage of Light microscope (Nikon-ECLIPSE-E100) (10×4) (with a ruler- micrometer calibration). Measurements of total body length, total body width, pronotal length, pronotal width, elytral length, elytral width, male light organ length, male light organ width and antennal length were taken for males. All measurements were converted to millimetre units. In addition, shapes of the antenna and colour patterns of the body were observed and compared. Similarly, two morphometric measurements such as total body length and total body width were measured in each female and larvae because firefly modern taxonomy is based on their male characters.

Ecological Studies:

The abundance of *L. tenebrosa* among three habitats (terrestrial grassland, cultivated and fresh-water associated) in each Province was compared throughout the study. In addition, the flashing differences among the sexes were observed.

Abbreviations for Taxonomic Characters:

TBL: Total Body Length
TBW: Total Body Width
PL: Pronotum Length
PW: Pronotum Width
EL: Elytral Length
EW: Elytral Width
MLOL: Male Light Organ Length
MLOW: Male Light Organ Width
AL: Antenna Length

RESULTS

Description of *Lamprigera tenebrosa* (Walker, 1858) **(Male)**

Lamprigera tenebrosa Walker, 1858, (original species description). Motschulsky, 1853: 36; 1853: 51 (by general description). Olivier, 1907: 55; 1910a: 47 (classification & distribution). McDermott, 1964: 47; 1966: 118 (checklist). Crowson, 1972 (classification), Nakane, 1991 (classification), Lawrence and Newton 1995(classification). Ho, 1997(biology). Chen, 1999 (biology). Jeng *et al*. 1999 (biology), 2000, (revision of the genus *Lamprophorus*), 2008 (distribution). Wijekoon *et al*. 2021 (distribution) Zhiwei D., *et al.,* 2021(check list).

Synonymes of *Lamprigera tenebrosa* **:**

Lampyris (Motschulsky 1853)
Lamprophorus (Motsch, 1861)
Lamprigera (Jeng *et al*. 2000)
Lampyris tenebrosa (Walker, 1858) by "The list of Animals in Ceylon" (Tennent, 1861)
Lamprophorus tenebrosa (Walker, 1858) by "Coleopterorum Catalogus". 9.77 (McDermott, 1966)
Lamprigera tenebrosa (Walker, 1858) by (Jeng *et al*. 2000)

Specimens Examined: SRI LANKA. Collector is WIJEKOON,(2010- 2012) Uva Province, Welimada 6° 54′ 04″ N, 80° 55′ 22″ E, Elevation-3720 ft, (07 ♂♂, 05 ♀♀ & 02 larvae); Bandarawela, 6° 50′ 0″ N, 80° 59′ 0″ E, Elevation-4000 ft, (10 ♂♂, 03 ♀♀ & 02 larvae); Sabaragamuwa Province, Rathnapura 6° 40′ 0″ N, 80° 24′ 0″ E, Elevation-430 ft, (12 ♂♂, 05 ♀♀ & 02 larvae), Balangoda 6° 39′ 0″ N, 80° 41′ 0″ E, Elevation-2467 ft (06 ♂♂, 04 ♀♀ & 03 larvae); North Western Province, Kuliyapitiya, 7° 28′ 14″ N, 80° 2′ 44″ E, Elevation-33 m, (08 ♂♂,04 ♀♀ & 02 larvae), Kurunegala, 7° 29′ 0″ N, 80° 22′ 0″ E, Elevation-116 m, (12 ♂♂,04 ♀♀ & 02 larvae),; Central Province, Peradeniya, 7° 16′ 0″ N, 80° 36′ 0″ E, Elevation-1630 ft, (02 ♂♂, 01 ♀, no larvae), Kandy, 7° 17′ 47″ N, 80° 38′ 6″ E, Elevation-1526 ft, (05 ♂♂, 03 ♀♀, 02 larvae); North central Province, Anuradhapura, 8° 21′ 0″ N, 80° 23′ 0″ E, Elevation-269 ft, (04 ♂♂, 03 ♀♀, 02 larvae) Polonnaruwa ,7° 56′ 0″ N, 81° 0′ 0″ E, Elevation-27 m, (07 ♂♂, 04 ♀♀, 03 larvae); Western Province, Panadura, 6° 42′ 48″ N, 79° 54′ 15″ E, Elevation-01 m, (02 ♂♂, 01 ♀, no larvae), Maharagama, 6° 51′ 0″ N, 79° 59′ 0″ E, Elevation-49 m, (06 ♂♂, 02 ♀♀,04 larvae); Southern Province, Matara, 5° 57′ 0″ N, 80° 33′ 0″ E, Elevation-7 ft, (08♂♂, 05 ♀♀,08 larvae), Hambanthota, 6° 7′ 28″ N, 81° 7′ 21″ E, Elevation-33 m(02 ♂♂, 01 ♀,06 larvae).

All examined specimens are stored at the Department of Zoology, University of Ruhuna, Sri Lanka.

Specimens examined in National Museum, Colombo, Sri Lanka; 05 ♂♂; collector unknown, (1941), location: Sabaragamuwa Province (Rathnapura), Southern Province (Galle).

Measurements- 20 males (10- terrestrial grasslands and 05- paddy cultivated land),10 females (05- terrestrial grasslands and 05- paddy cultivated land) and 10 larvae (05- terrestrial grasslands and 05- paddy cultivated land) (Table 2, 3 & 4).

Table 2: Measurements of male *Lamprigera tenebrosa* (in mm).

Species	Number measured	TBL	TBW	PL	PW	EL	EW	MLOL	MLOW	AL
Lamprigera tenebrosa	20	17-24	7-9	5-6	8-9	12-14	7-9	1-1.5	1-1.5	2-5

Table 3: Measurements of female *Lamprigera tenebrosa* (in mm)

Species	Number measured	TBL	TBW
Lamprigera tenebrosa	10	50-60	14-18

Table 04: Measurements of *Lamprigera tenebrosa* Larva (in mm)

Species	Number measured	TBL	TBW
Lamprigera tenebrosa	10	14-40	6-10

Diagnosis:

Pronotum is laterally expanded and median black with the semi-circular shape transparent area in the apex. Abdominal spiracles are on the dorsal side of the abdomen, Light organ is well developed and occupy in 7th abdominal sternite as two spots in both sides. An emarginated posterior margin is present. Females emit bright green light and males emit weak green light.

All morphological characters described by Walker, 1858, McDermott, Jeng *et al*., 1999, 2000 and 2008 on the genus and species are matched with our identifications of *L. tenebrosus*. In addition, the morphology of the identified specimens of *L. tenebrosus* in the study is compatible with the repository specimens stored in the National Museum, Colombo, Sri Lanka.

Taxonomic Description of Male (**Figs. 2 & 3**):

Colour: - light brown dorsally, TBL- "17-24" mm, TBW- "7-9" mm

Elytra: - entire elytra are light brown with gold shining; it has not either intestinal lines or punctuates, EL- "12-14" mm, EW- "7-9" mm

Head: - head totally concealed by pronotum dorsally, mouthparts well developed, Antenna with 11- segments, nearly filiform, relatively short, AL- "2-5" mm

Legs: - Femur, tibia, tarsus and claws black, each leg has pair of apical spurs

Thorax: - thorax dark orange ventrally

Pronotum: - pronotum with lateral expansions; black coloured with translucent or transparent area in sub apically (transparent area has spread continuously around the apex of pronotum), mesocutellum is black, no punctures, PL- "5-6" mm, PW- "8-9" mm.

Abdomen: - eight visible abdominal sternites, abdominal sternite 1-4 brownish orange with posterior margin black, sternite 5 pale yellow, sternite 6 and 7 transparent, sternites 7 has spot like light organs in both sides, tergite 8 curls around the apex of sternite 7 and which is medially pointed to the posterior side. MLOL (one spot) – "1-1.5" mm, MLOW (one spot)- "1- 1.5" mm.

Male Genitalia: 05 males dissected; morphologically similar genitalia observed (Fig. 4).

Aedeagus: - trilobed structure, single median narrowed lobe and two wider lateral lobes present, lateral lobes consist with fine hairs, lateral lobes fused dorsally, length- 0.3 mm, width-0.2 mm

Aedeagal Sheath: The shape of the aedeagal sheath is of taxonomic significance, it enfolds the aedeagus, anterior part of sheath wide and covered with hairs, sternite paired in anterior side and narrowed to posterior side, length- 0.3 mm, width-0.1mm.

Female (Fig. 5): Flightless, truly larviform, larger than male

Colour: Entire body brown, body surface smooth, TBL: "50-60" mm, TBW: '14-18" mm,

Elytra: No even rudimentary elytra

Head: Head completely covered with pronotum dorsally

Pronotum: Semi-elliptic shape, no areolet area

Legs: Three pairs of thoracic legs, brown,robust, femora and tibia flat

Abdomen: Nine abdominal segments present and entire dorsal surface smooth without projections, two spot-shaped light organs in abdominal segment 8, the abdomen terminated by series of filaments or holdfast organ and which function in locomotion and cleaning.

Larvae (**Fig. 6**)**:**

Colour: Dorsal body colour vary from dark brown to black with a pale yellow margin around the body, TBL- "14- 40" mm, TBW- "6-10" mm

Head & Thorax: - Dorsally 12 segments distinct as 3 thoracic and 9 abdominal segments, prothorax wider than long; anterior margin bluntly rounded, narrowed at anterior and containing retracted head beneath, retractable mouth parts distinct, meso and meta-thorax covering plates are larger and distinct from rests.

Legs: - base of legs dark brown and rest light brown.

Abdomen: Abdominal segments slightly narrowed posterior and sub-equal, dorsal surface of body smoothed without projections, one to eight of abdominal segments have single laterotergites at each side with sclerotised plates bearing the posterior hairs, two spot-shaped light organ present at abdominal segment 8, final plate divided making fishes' tail fin structure and abdomen terminated by series of filaments or holdfast organ and which function in locomotion and cleaning.

Eggs (**Fig. 5**)**:**

Size "4 – 5" mm, light yellow, not luminous at night, lay as single and 6-8 eggs per once, within 2 or 3 days start to hatch and larvae release to the soil, immediately hatched larvae are "3-4" mm long and "1-2" mm wide.

Ecological Remarks: This species is nocturnal. Adult males are always active in the uppermost layers of vegetation and suddenly come to the ground. They emit green colour light when they fly. Female emit bright green light.

Distribution: Globally distributed (Jeng, 2010). During the present study, this species was recorded from Uva, Sabaragamuwa, Southern, North Western, Central, North Central and Western Provinces. They were prominently found in terrestrial grasslands and paddy fields in Sri Lanka.

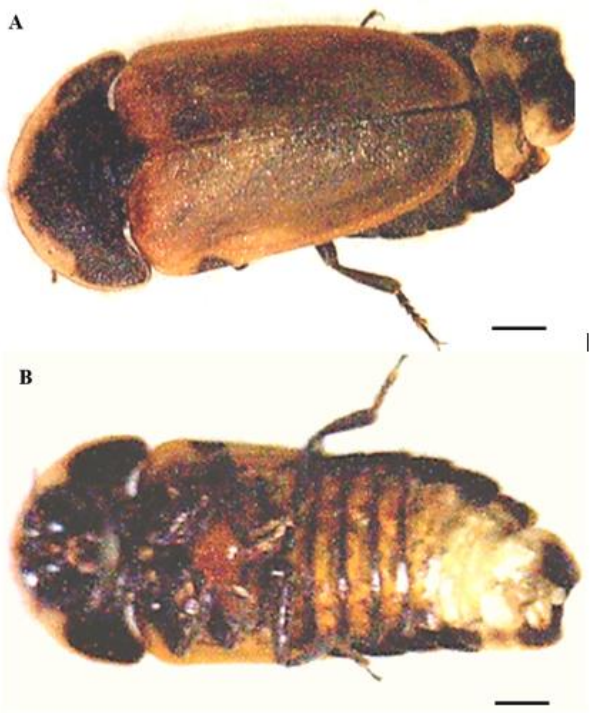

Fig. 2: *L. tenebrosa* (Male); (A) dorsal view, (B) ventral view (Scale bar = 1mm).

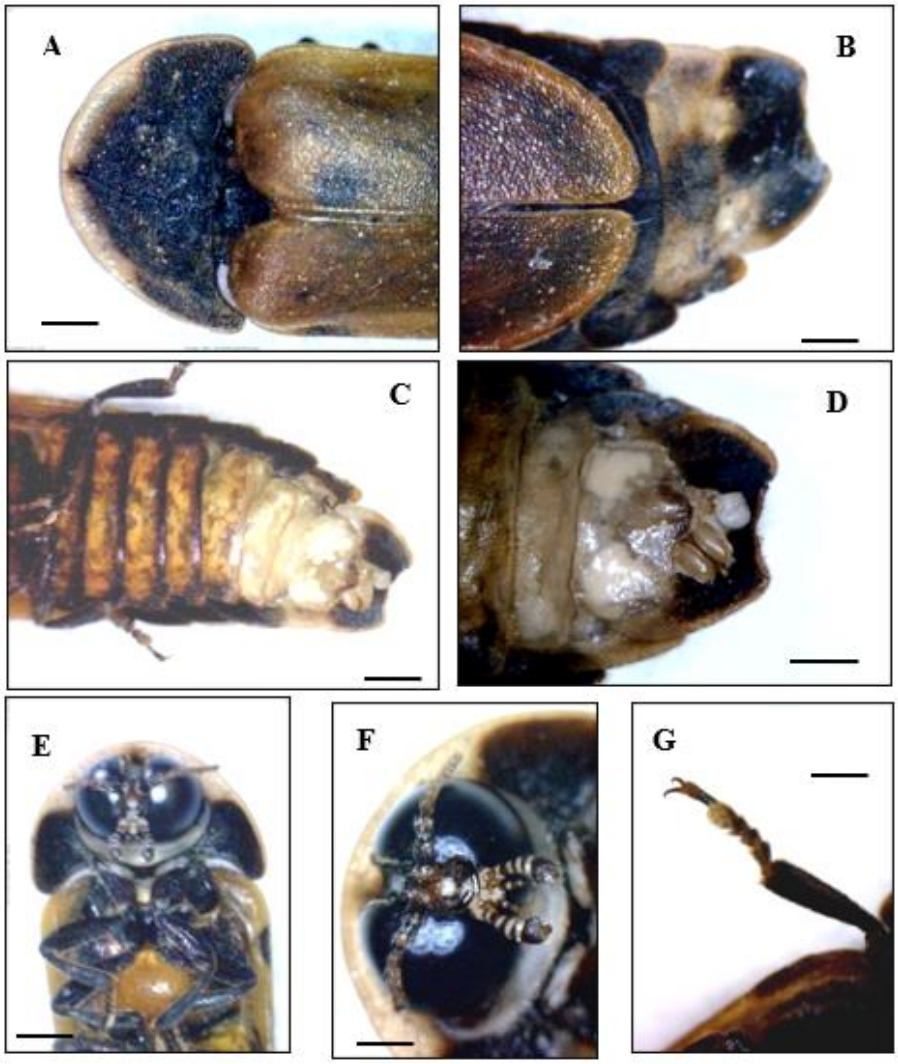

Fig. 3: Taxonomic characters of *L. tenebrosa* (Male); (A) pronotum and mesocutelum,(B) emarginated posterior part of the abdomen (C) eight abdominal sternites (D) sternite 7; two spot like light organs, (E) thorax and legs, (F) head and antennae, (G) two apical spurs of legs (Scale bar = 1mm).

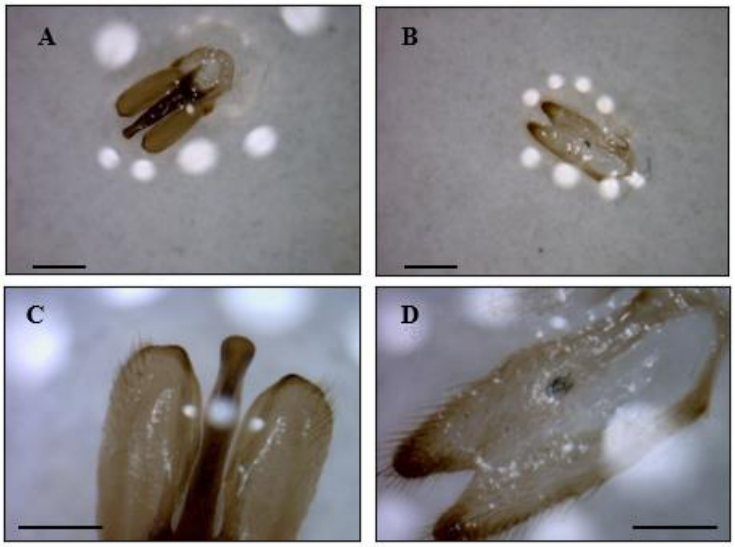

Fig. 4: Taxonomic characters of *L. tenebrosa* (Male); (A) aedeagus, (B) aedeagal sheath (C) magnified aedeagus, (D) magnified aedeagal sheath (Scale bar = 0.1mm)

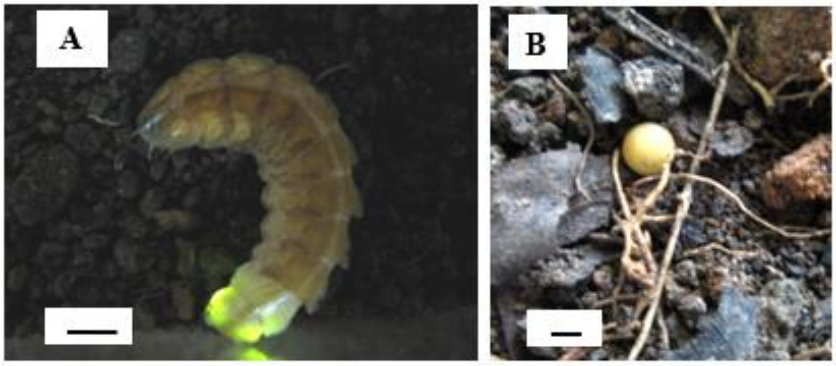

Fig. 5: Female and the egg of *L. tenebrosa*; (A) female dorsal morphology (B) the egg in natural environment (Scale bar = 1mm).

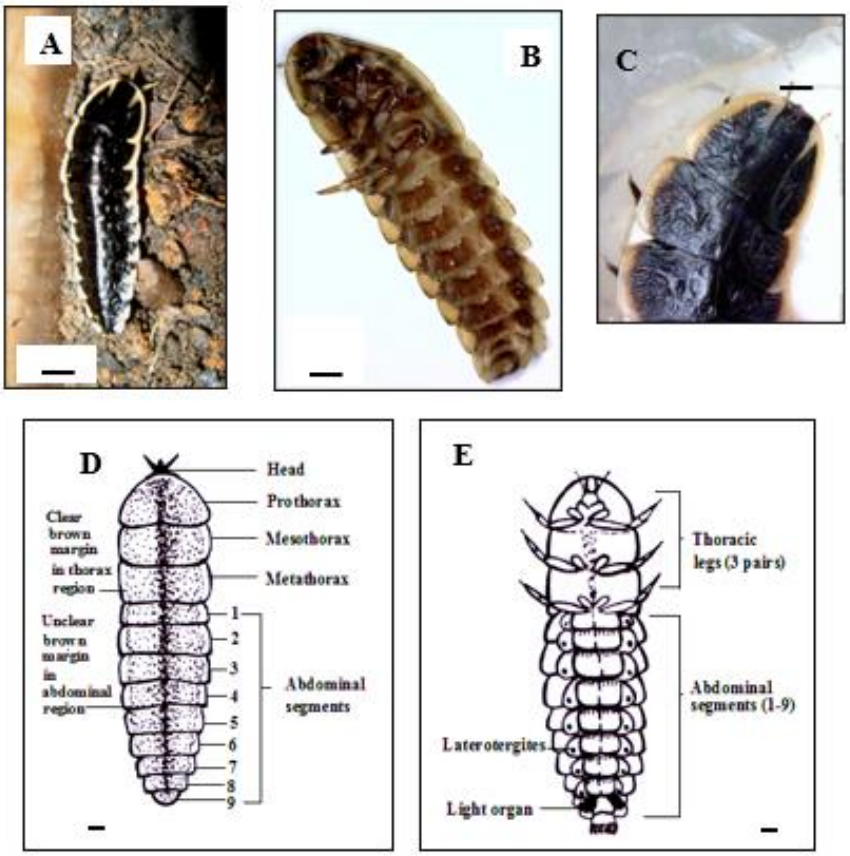

Fig 6: Larvae of *L. tenebrosa*; (A) dorsal morphology, (B) ventral morphology (C) morphology of thorax, (D) line diagram-dorsal, (E) line diagram- ventral (Scale bar = 1mm).

DISCUSSION

The paper provides the detailed taxonomic and biological description of male, female, larvae and eggs of *Lamprigera tenebrosa* recorded from Sri Lanka. *Lamprigera tenebrosa* is one of the commonly distributed species of subfamily Lampyrinae in Sri Lanka and there are 220 species of Lampyrinae are listed in the world (Jeng, 2010).

There are records of four *Lamprigera* species (*Lamprigera diffinis, L. lutescens, L. lutosipennis* and *L. tenebrosa*) from Sri Lanka at the National Museum, Colombo (Wijekoon *et al*, 2016). Among them, *L. tenebrosa* is widely distributed species throughout

the Oriental realm (Jeng *et al*. 2000). This species has been originally described using the specimens collected from Sri Lanka (as Ceylon) (McDermott, 1966). The genus *Lamprigera* was re-described by Jeng *et al*. (2000). *Lamprigera tenebrosa* could be identified using several morphological features such as pronotal areolet more or less obscure, semi-circular transparent area in the apex of the pronotum, abdominal spiracles on dorsal side of the abdomen, well developed light organ and two sided light spots of 7th abdominal sternite. These identification features are similar to the characters of Lampyrine described by Jeng *et al*. (2000). Morphology of *L. tenebrosa* is similar to some extent with *L. lutosipennis* which also was originally described by specimens collected from Sri Lanka (as Ceylon) (McDermott, 1966). *Lamprigera tenebrosa* could be distinguished from *L. lutosipennis* by the distinct transparent area of their pronotum.

The identifications of *L. tenebrosa* specimens found during the survey was based on the original morphological description by Walker, (1858), genitalia description by Jeng *et al*. (1999) and the genus re-description by Jeng *et al*. (2000). The identified specimens were completely compatible with the morphological features described by above authors.

Female *L. tenebrosa* recorded during the study and their main identification features such as true larviform, apterous and pale colour body are coincided with the description of Jeng *et al*. (2000). The female and larvae were collected when they were associating in the same habitat with males. We identified their females when they were showing the mating behaviour with males.

The recorded larvae and females were identified based on the biological descriptions reported by Ho, (19970; Chen, (1999) & Jeng *et al*. (1999).

Larvae of these species are common in the environment at the dark. Sri Lankans well know the larvae of *L. tenebrosa* as "Rebadulla". Bess, (1956) realized that the female and larvae of the firefly, *L. tenebrosa* was a voracious feeder on the giant African snail, *A. fulica* (Bowdich) and that during 1954 &1955 several hundred larvae were collected from Sri Lanka, and shipped to Hawaii, Indonesia & Guam and Philippines for control of the *A. fulica*. Interestingly, the larvae and female of *L. tenebrosa* has a potential ecological role as a biological control agent for most of molluscan pests in agriculture.

The study revealed that *L. tenebrosa* was commonly recorded from both grassland habitats and paddy cultivation lands in Sri Lanka than that of freshwater-associated habitats. Jeng *et al*. (2000) mentioned that *L. tenebrosa* has terrestrially adapted larvae with the terrestrial life cycle. The study reports the occurrence of *L. tenebrosa* from seven Provinces (Uva, Sabaragamuwa, Southern, Central, Western, North-Western and Northcentral) out of the nine provinces of Sri Lanka.

The description of systematics and biology of the male, female, larvae and egg of *L. tenebrosa* is crucial to fill the void of the present taxonomic dearth of the Sri Lankan fireflies in to some extent.

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Data Availability:

The study included in the manuscript was based on the work carried out for a postgraduate degree. The results are included in the thesis and have been submitted to the Faculty of Graduate Study, University of Ruhuna, Sri Lanka.

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The authors would like to declare that there are no conflicts of interest.

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Author`s contributions

W. M. C. D. Wijekoon conducted field surveys, data collection, data entering, data analysis and writing the manuscript, H. C. E. Wegiriya did the supervision the research and reviewing the manuscript.

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