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# (V)
# First record of *Lamprigera tenebrosa* (Walker, 1858) subfamily Lampyrinae from Doon Valley, Uttarakhand, Western Himalaya, India

Fireflies are dominant group of nocturnal insects in the family Lampyridae, order Coleoptera. There are nearly 2,200 fireflies species known worldwide (Martin *et al*., 2019) inhabiting mainly in tropical and temperate regions (Rooney and Lewis, 2000). However, their population is declining (Lewis, 2016). Therefore, a citizen science approach was adopted (Rana *et al*., 2022) to record the occurrence of fireflies throughout India. Moreover, their larvae are carnivorous, that feeds on arthropods, snails, slugs and other invertebrates (Lloyd, 1973), and *Lamprigera tenebrosa* (Walker, 1858) was one of the major feeder of the group (Wijekoon *et al*., 2016). The genera was proposed by Motschulsky with *Lamprigera boyei* (Motschulsky, 1852) from Sumatra, Indonesia designated as type species. *Lamprigera tenebrosa* (Walker, 1858) is widely distributed throughout the Oriental realm. Their female is true larviform and apterous (Jeng *et al*., 2000). Larvae of these species are common in the environment at dark. There are total of 20 species known from genus *Lamprigera*, out of which maximum number (11) was from China (Dong *et al*., 2021). The morphological traits, especially the male genitalia and pronotum of different species were described and it is find out that both the characters- male genitalia and pronotum were the most important diagnostic traits for distinguishing species of *Lamprigera* and this is confirmed by *COI* data (Dong *et al*., 2021). However, 5 species of *Lamprigera* were earlier recorded from different regions of India (Table 1) (Dong *et al*., 2021), but there was no earlier record of genus *Lamprigera* from the Western Himalayas. Therefore, the current paper provides the first record of the specie *Lamprigera tenebrosa* (Walker, 1858) from Doon valley, Uttarakhand, Western Himalayas, India. Sampling was done from May to September, 2021 (7:30 to 9:30 pm), and sweeping net and hand picking methods were used. Identification was done through different keys mainly- (Dong *et al*., 2021; Wijekoon and Wigeriya, 2021). The main distinguishing features of the samples were their pronotum and body colouration, and genitalia configuration that are provided in the paper.

Fireflies were sampled in the urban, agriculture, riverine and forest areas of four forest ranges (Thano, Badkot, Malhan and Asharodi) of Doon valley from May to September 2021, but was only reported from Thano and Asharodi range (Fig. 1). Random sampling was done within the plots of 100 m x 100 m between 7:30 to 9:30pm. Sweeping net and hand picking methods were used to capture fireflies after which they were immediately transferred into a plastic jar containing 70% ethanol. They were then pinned in the wooden insect boxes and shifted to the laboratory for further identification process. For genital dissection, the dried specimen was soaked in the soap water solution for 15-20 minutes, which make the specimen soft so the genitalia could be pulled out easily without damaging other parts. Extracted genitalia was then immersed into 10% KOH for 2 hours (Ballantyne *et al*., 2019), to confiscate sclerotization. Firefly habitus, genitalia was photographed using stereo zoom microscope Carton DSZ-45T, having MICAPS attachment for measuring body dimensions (length and width).

**Abbreviations:** Tbl- Total body length, Tbw- total body width

**Diagnosis**

Body oblong, head totally concealed in pronotum dorsally, big kidney shaped eyes, short antennae. Morphological diagnosis of *Lamprigera* species are primarily based on pronotum coloration pattern and genital configuration.

**Specimen examined**

*Lamprigera tenebrosa* 2 male (♂♂) (Fig. 2), NR-Lampten1. Doon valley: Thano (N30.22034°, E78.19461°), Asharodi (N30.2830°, E077.9738°). *collector* Nidhi Rana.

**Distribution:**

Globally distributed. China, Sri Lanka, India (Pondicherry), and currently reported from Dehradun, Uttarakhand.

**Taxonomic description**

Species has oblong body, light brown in color. Habitus: Tbl 19 mm and Tbw 9 mm. Pronotum possess dark black coloration except the transparent lateral and apex areas (Fig. 2.c). Pronotum totally conceals the head, and measures 4.38 mm in length and 7.83 mm in width. Scutellum is present in the junction of the elytra's emerging base, which is well differentiated into pro, meso and metasctulleum, earlier two are light brown in

**Table 1:** Five recorded species of *Lamprigera* from different regions of India.

| S.No. | Species | Location |
|---|---|---|
| 1 | *Lamprigera crassus* | India (Pondicherry) |
| 2 | *Lamprigera tarda* | India |
| 3 | *Lamprigera tenebrosa* | India (Pondicherry) |
| 4 | *Lamprigera nitidicollis* | India (Kashmir) |
| 5 | *Lamprigera nepalensis* | India (Assam plain) |

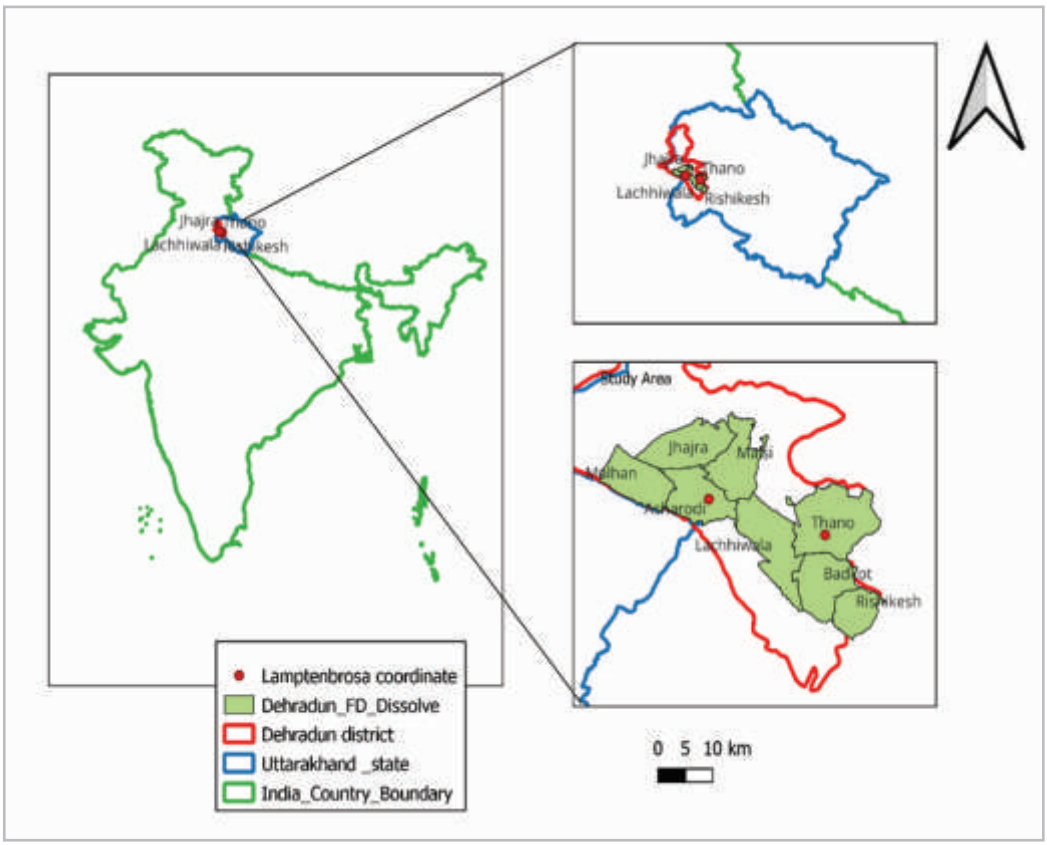


**Fig. 1:** Map of India showing Uttarakhand state with Dehradun district and Dehradun Forest Division.

color whereas the later one is dark balck in colour (Fig. 2.d). Elytra measure's 13.72 mm in length and 4.50 mm in width. The head comprises of two large compound eyes, two small serrate antennaes having 10 segments and mouth parts (Fig. 2.e). Distance between the eyes is 1.11 mm, whereas the distance between the scapes of the antennaes is 0.28 mm. Mouth parts comprises of a pair of dark brown pointed mandible, pair of maxillary and labial palps. Light brown labrum is present. Abdomen is segmented having 8 sternites. Femur, tibia and tarsi all are black in color (Fig. 2.f). Metafemoral comb is present. Tibia comprised of a pair oftibial spur(Fig.5.p). Tarsi have five segments and two claws (Fig. 4). The adeagus possess a trilobite structure having two lateral and one median lobe (Fig. 3). Lateral lobes are shorter than the median lobe. The whole adeagus measures 2.10 mm in length, and 0.81mm in width which is much greater in comparison to other fireflies genera's. Specimen has been deposited to the repository of SBAS, Shri Guru Ram Rai University, Dehradun.

*Lamprigera tenebrossa* previously recorded from Pondicherry state in India. Whereas, the current paper documented its presence in Doon valley, Western Himalaya, for the first time. It was collected mainly by hand picking method as the specie was not a swift flyer. During the study, it was noticed that other genera's than *Lamprigera* were emerged early around May, whereas it emerged late in post July and August 2021, which could be because of fluctuations in environmental variables mainly in temperature and precipitation as monsoon arrive around mid-June. Furthermore, the specimen was only found from disturbed areas near agriculture and forest areas. The specie was identified using mainly

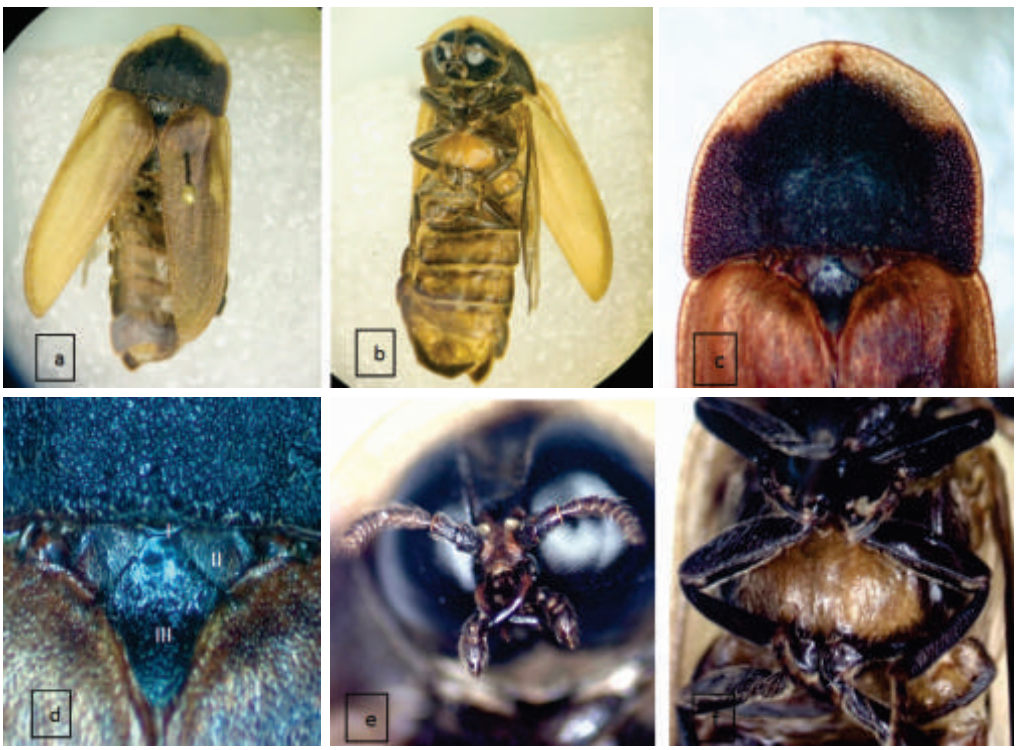


**Fig. 2:** *Lamprigera tenebrosa* male (**a-b)** dorsal & ventral habitus respectively, (**c)** pronotum colouration, (**d)** marking shows pro, meso & metascutellum respectively, (**e)** antennae & mouthparts, (**f)** legs.

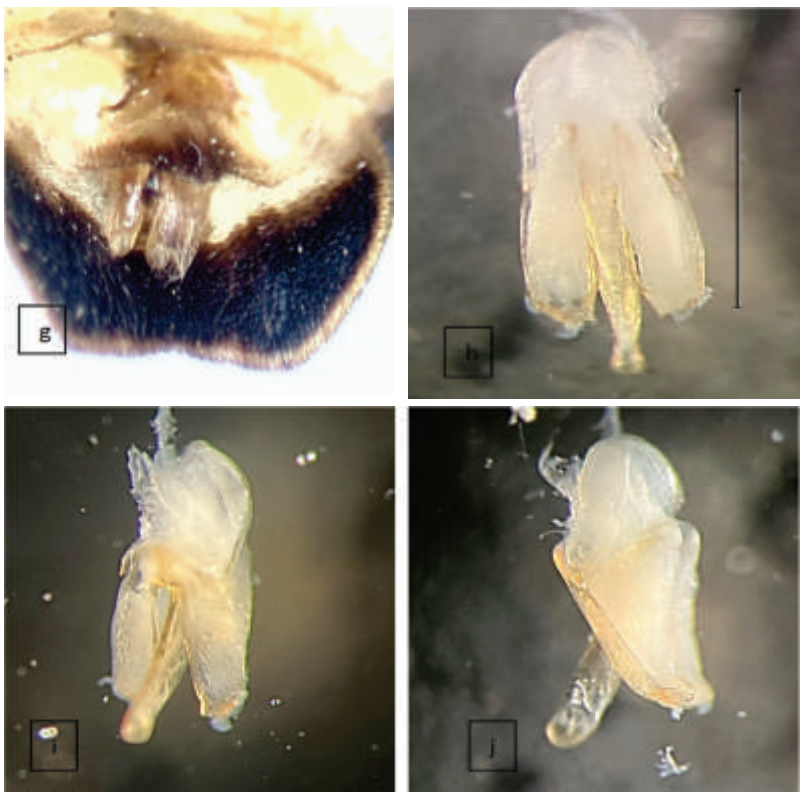


**Fig. 3:** *Lamprigera tenebrossa* **(g)** male genitalia, **(h**) ventral adeagus, **(i)** dorsal adeagus, **(j)** lateral adeagus, scale bar 2 mm.

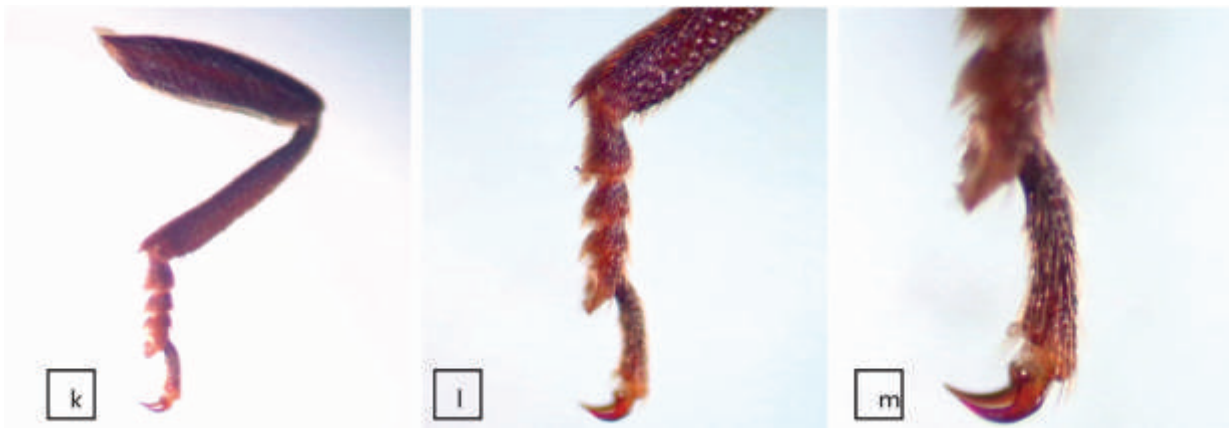


**Fig. 4 : (k-m)** showing legs of *Lamprigera tenebrosa* male.

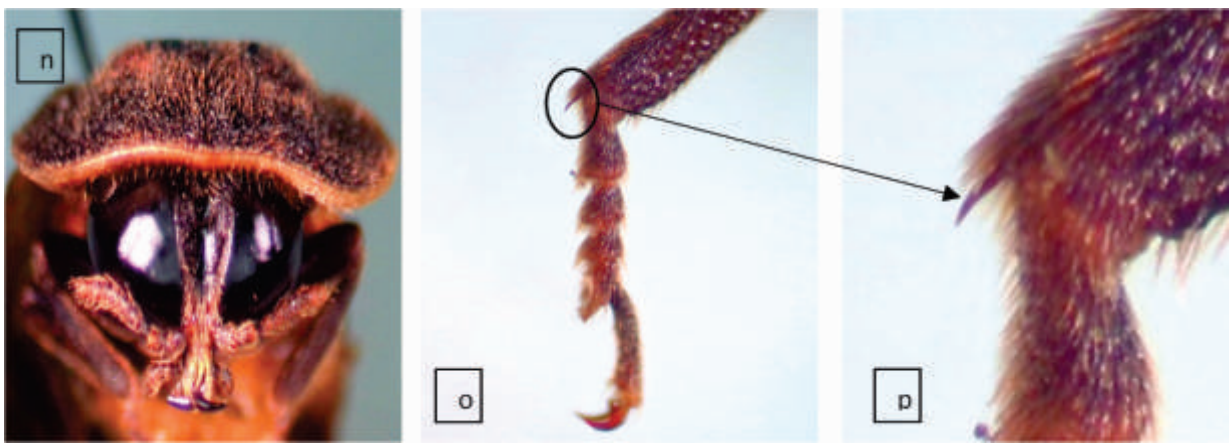


**Fig. 5:** *Lamprigera tenebrosa* **(n)** showing hat like structure of pronotum, **(o & n)** tibial spur.

Wijekoon and Wigeriya, 2021 and also confirmed over emailfrom Dr. Wijekoon. While identifying the specimen it was realized that the specimen can be identified over these main characterstics *i.e.*, pronotum and body coloration, and genitalial structure. However, we provided the specimen's whole body configuration. The Tbl:Tbw had a ratio of approximate 2:1 (*i.e.,* total body length is double the total body width). Pronotum possess dark black colouration in more than half part of it in a dome shaped pattern, which isvery important distinguishable character among *Lamprigera* species, as different specie possess different pronotum coloration pattern. On seeing anteriorly (Fig. 5.n) the pronotum looks like a hat placed above the eyes. Elytra colouration is light brown in color. Cerinae are present and the anterior side of the elytra possess slightly bulged out compression (Fig. 2.c).

Genus *Lamprigera* is reported for the first time from Doon Valley, Uttarakhand, India. It possess large body size than other fireflies species. The genus can be found only in two ranges out of four, thus, further studies could be conducted concerning their habitat and dietary preferences.

### *References*

Dong Z., Yiu V., Liu G., He J., Zhao R., Peng Y. and Li X. (2021). Three new species of Lamprigera Motschulsky (Coleoptera, Lampyridae) from China, with notes on known species. *Zootaxa*, **4950**(3): 441-468.

Jeng M.L., Lai J., Yang P.S. and Mastaka Sato (2000). Notes on taxonomy of Lamprigera yunna (FAIRMAIRE) and the Genus–Lamprigera (MOTSCHULSKY) (Coleoptera, Lampyridae) **6**, No 2, PP; 314

Lewis S.M. (2016). Silent sparks: The Wondrous World of Fire flies. Princeton University Press.

Lloyd J. E. (1973). Firefly parasites and Predators. *Coleopt. Bull.*, **27**: 91-106.

Martin G.J., Stanger-Hall K.F., Branham M.A., da Silveira L.F.L., Lower S.E., Hall D.W. and Bybee S.M. (2019). Higher-level phylogeny and reclassification of Lampyridae (Coleoptera: Elateroidea). Insect Systematics and Diversity, 3, https://doi.org/10.1093/isd/ixz024.

Rana N., Rayal R. and Uniyal V.P. (2022). Firefly survey: adopting citizen science approach to record the status of flashing beetles. *Journal of Threatened Taxa*, **14**(10): 22016-22020.

Rooney J.A. and Lewis S.M. (2000). Notes on the life history and mating behavior of Ellychnia corrusca (Coloeoptera: Lampyridae).*Florida entomologist*, **83**(3).

Walker F. (1858). XXX. Characters of some apparently undescribed Ceylon Insects. *Annals and Magazine of natural history*, Series 3, 2 (No. 10), 280–286.

Wijekoon D., Wegiriya H. and Bogahawatha C.N.L. (2016). Predatory role of Lampyrid larvae (Lamprigera tenebrosa); laboratory experiments to control agricultural molluscan pests, Achatina fulica & Laevicaulis altae. *International Journal of Science and Technology*, **5**(1): 1-6.

Wijekoon D. and Wegiriya H. (2021). Systematics of Lamprigera tenebrosa (Coleoptera: Lampyridae: Lampyrinae) in Sri Lanka. *Egypt. Acad. J. Biolog. Sci*., (A. Entomology) **14**(4): 201-213. DOI: 10.21608/EAJBSA.2021.211415

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