



FIRST RECORD OF *ABSCONDITA CHINENSIS* (LINNAEUS) (LAMPYRIDAE, LUCIOLINAE) FROM UTTARAKHAND

NIDHI RANA^{1,2}, RAJESH RAYAL^{1*}, V P UNIYAL³ AND PANKAJ BAHUGUNA⁴

¹Department of Zoology, School of Basic and Applied Sciences,
Shri Guru Ram Rai University, Patel Nagar, Dehradun 248001, Uttarakhand

²Wildlife Institute of India, Chandrabani, Dehradun 248001, Uttarakhand

³Graphic Era (Deemed to be) University, Dehradun 248001, Uttarakhand

⁴Department of Zoology, Govt. Degree College Dehradun Shahar, Dehradun 248001, Uttarakhand

*Email: drrajeshrayal@gmail.com (corresponding author): ORCID ID 0000-0002-9106-0046

ABSTRACT

This study is on the first record of a lampyrid *Abscondita chinensis* (Linnaeus) from Doon Valley, Uttarakhand, India. Sample collection was done during May to September 2021 (7:30- 9:30 p.m.), through sweeping net and hand-picking methods. Morphology including genitalia are described with confirmation based on genitalia. *Abscondita chinensis* is differentiated from *Abscondita terminalis* with which it is frequently confused with.

Key words: Lampyridae, Western Himalaya, Doon Valley, fireflies, *Abscondita chinensis*, *Abscondita terminalis*, new record, morphology, genitalia

Bioluminescent fireflies have been well-studied in regions other than India (Viviani & Santos 2012). Nevertheless, the bioluminescent emission of fireflies *Abscondita chinensis* (Rabha et al., 2017; Barua et al., 2009) is well understood from the north-eastern region of India. However, there is no record from the Western Himalayan region of India. This study provides the first record of *Abscondita chinensis* from Doon Valley, Western Himalaya. Sample collection was done from May to September 2021, with sweeping net and hand-picking. Taxonomic key (Ballantyne et al. 2013; Ballantyne et al. 2019) was used for species identification. The reported species *Abscondita chinensis* belongs to the family Lampyridae, subfamily Luciolinae. Its dorsal appearance is identical to other fireflies, namely *Curtos costipennis* (Fu et al., 2012), *Pteroptyx maipo* (Ballantyne et al., 2011), and other *Abscondita* sp. (Ballantyne et al. 2013). *Abscondita chinensis* and *Abscondita terminalis* resemble each other except for the ventral abdominal colour; *A. chinensis* always has V5 (ventrite) completely dark coloured, while in *A. terminalis* V5 is pale in the middle (Ballantyne et al. 2013); interestingly *A. chinensis* can possess both the abdominal colour pattern on their 5th ventrite. This study clarifies the distinction of these species.

MATERIALS AND METHODS

The samples were randomly handpicked and net-

sweeped between 7:30-9:30 p.m. (within the plots of 100 x 100 m) from different habitat types (forest, urban, agriculture, and riverine) of Doon Valley, Uttarakhand, India in 2021. Collected samples were preserved in 70% ethanol (Ballantyne and Lambkin 2013). Moreover, for genital examination, the specimen was soaked in the soap water solution for 20-30 minutes, making the specimen soft so the abdomen could be pulled out easily leaving the other body parts intact. The extracted abdomen was then immersed into 10% KOH for 2-3 hours (Ballantyne et al., 2019), to confiscate sclerotization, and then cleaning was done under Carton DSZ-45T microscope. Morphometry and photography were done using a MICAPS camera attachment with the microscope, all the measurements were in mm. Confirmation was based on the shape of the aedeagal sheath and aedeagus (Ballantyne et al., 2013). Currently, the specimen is deposited in the depository of Shri Guru Ram Rai University, Dehradun, and Uttarakhand, India.

RESULTS AND DISCUSSION

Class Insecta (Linnaeus, 1758), Order Coleoptera (Linnaeus, 1758), Family Lampyridae (Rafinesque, 1815), Subfamily Luciolinae (Lacordaire, 1857), Genus *Abscondita* (Ballantyne, Lambkin & Fu, 2013)

Abscondita chinensis (Linnaeus, 1767) (Fig. 1-4).

Material examined: *Abscondita chinensis* (♂♂♂),

Doon Valley (N30.31415, E78.033395) Uttarakhand, Western Himalayas, Nidhi Rana (NR-SGRR03), 3♂ (NR-SGRR03a, NRSGR03b, NRSGR03c).

Distribution: Pakistan, Sri Lanka, China (Mainland), Myanmar, Taiwan, Philippines, India (Guwahati, Andhra Pradesh), and currently reported from Dehradun Uttarakhand (Western Himalaya).

Diagnosis: The specimen distinguished from *Abscondita cerata* (Olivier) by their dorsal coloration of pale elytra with black apices as *Abscondita cerata* possess black elytra. Moreover, specimen possess black terminal tergite (Fig. 3) whereas *Abscondita perplexa* possess pale terminal tergite (Ballantyne et al. 2013). According to Ballantyne *Abscondita terminalis* and *Abscondita chinensis* share resemblances through their yellow elytra having black apices and black terminal tergite though they can be distinguished by the characteristic feature of coloration in the 5th ventrite, which is usually black with pale the mid in *Abscondita terminalis* and complete black in *Abscondita chinensis*. However, the samples studied

possess both the coloration pattern in their 5th ventrite (Fig. 1), i.e. the whole black and black with paleness in the mid creating confusion which was ridden due to genital dissection. The aedeagal sheath sternite of the specimens (*Abscondita chinensis*) terminated at apically acute and divergent lobes whereas for those of *Abscondita terminalis* were rounded, elongated, and closer to each other (Fig. 3, 4).

Male measures 9-10 mm long and 3 mm wide; elytra orange, comprising black apices at the tip of it. A fully developed scutellum is divided into pro, meso, and metascutellum, having clear boundaries to each other can be seen from above at the mid junction of elytra (Fig. 2). Proscutellum is light yellow in color whereas the latter two are orange in color. The head is comprised of two large compound eyes, which are partially covered with the pronotum. Two filiform antennae having 11 segments are also present. The distance between the scapes of the antennae is approximately 0.14 mm and in between the eyes is 0.71 mm. Pronotum is also orange in color, measuring 1.69 mm in length and 3.00 mm wide; it has brownish-orange labrum and a pair of dark shiny brown mandibles. 4 segmented brown maxillary palps are also present. All legs are



Fig. 1. *Abscondita chinensis* male a-c ventral abdomen showing ventrite markings and light organ, d-f dorsal habitus

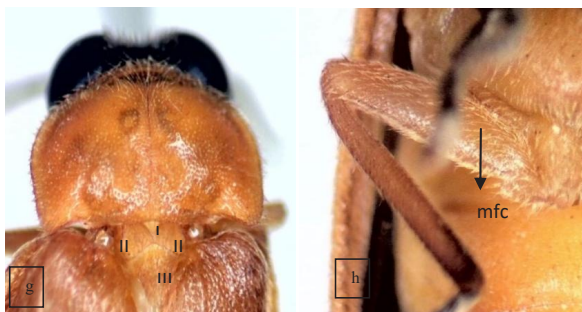


Fig. 2. *Abscondita chinensis* I, II, III shows pro, meso and metascutellum, respectively; mfc stands for meta femoral comb

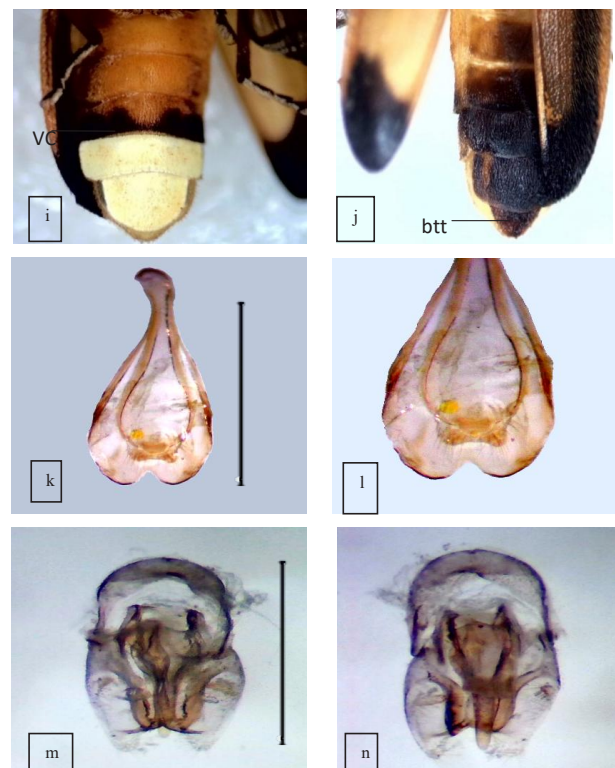


Fig. 3. *Abscondita chinensis* male genitalia i, j ventral and dorsal habitus of the specimen, respectively showing VC (ventrite colouration) and btt- black terminal tergite, k, l aedeagal sheath, m and n dorsal, ventral aedeagus, respectively, scale bar 1 mm

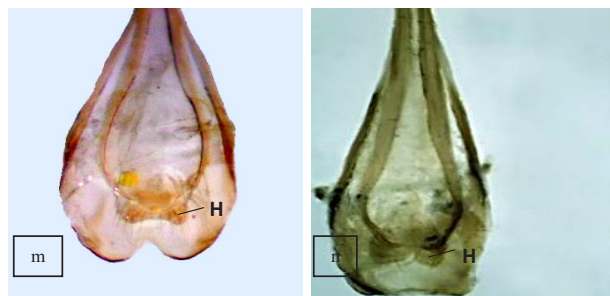


Fig. 4. Aedeagal sheath m and n showing hairy lobes (HL) of *A. chinensis* and *A. terminalis*

orange-yellow in color except for the black tips of the tibia, and tarsi. 4 segmented tarsi are extended to a pair of claws. Meta-femoral comb (mfc) is also present, which is a hairy structure on the meta-femora (Fig. 2). Abdomen is orange-yellow with a ventral brown marking pattern on the 5th ventrite (Fig. 1). The aedeagal sheath sternite (Fig.3) measures approx. 1.80 mm in length and terminated at apically rounded and posteriorly with divergent lobes; aedeagus comprises of median and lateral lobe and basal piece (Fig.3); lateral lobes slightly longer than the median lobe; aedeagus measure approximately 1mm (Fig. 3). Specimens vary possessing either black colour 5th ventrite with pale in the mid or whole black 5th ventrite (Fig. 1). Specimens are deposited in the depository of Shri Guru Ram Rai University, Dehradun, Uttarakhand. *Abscondita chinensis* shows earliest records from the Northeast (Guwahati) and southeast region (Andhra Pradesh) of India. This study documented the first record of *Abscondita chinensis* from Doon Valley, Western Himalaya. The specimens were collected with an intensive sampling effort at different habitat types from May to September 2021 and identified using (Ballantyne et al. 2013). Thus, in addition to the first report of the species, current study provided a significant conclusion by demonstrating that species differentiation can be reliably achieved through genital dissection, irrespective of ventrite color patterns.

ACKNOWLEDGMENTS

The authors like to show their gratitude to the Vice Chancellor, Dean, and Dean of Research of Shri Guru Ram Rai University for providing consistent support to the study. Director, Dean, Wildlife Institute of India for granting access to the laboratory facilities for identification. Uttarakhand Forest Department for

permission to conduct the study. Dr. Lesley Ballantyne for her reliable sustenance during the study.

FINANCIAL SUPPORT

Authors Thank the Rufford Foundation for providing the financial support.

AUTHOR CONTRIBUTION STATEMENT

NR, RR, and PB conducted the field sampling at night, whereas NR, and VP worked together for specimen dissection and identification.

CONFLICT OF INTEREST

No conflict of interest.

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(Manuscript Received: February, 2024; Revised: June, 2024;

Accepted: June, 2024; Online Published: July, 2024)

Online First in www.entosocindia.org and indianentomology.org Ref. No. e24983