

Notes on Indian firefly *Luciola praeusta*
(Coleoptera: Lampyridae)

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(With 4 text-figures)

インド産ホタル *Luciola praeusta* について

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インド産ホタル *Luciola praeusta* の生活および同ホタルの雌雄の発光器と形態を記載した。同種は北部インドで普通にみられ、7月～9月の雨期に多数出現する。雄の体長は 8-9mm, 雌のそれは 10-12mm で両者ともに翅を有する。雄の複眼は雌のそれより大きい。幼虫は小さな貝, *Lymnaea acuminata* や *Acrostoma variabilis* などを食べる。雄の発光器は腹節末端部の 2 節であり, 雌では腹節第 6 節目にのみ存在している (Text-figs. 3, 4) このホタルは黄緑色のフラッシュ光を放つ。この発光は雌雄が出合い、交尾する上で大変重要と考えられる。

Introduction

Most of the luminescent beetles collected from India belongs to the families Lampyridae and Elateridae. Amongst the Lampyridae from India, luminosity and location of light organs have been described in the adults and larvae of a few species of *Luciola* and *Lamprophorous* (LEFROY, 1909). Luminous organs in males of *Diaphanes marginella* Ho has been described (GANGULY, 1973). Commonly known Indian fireflies are *Luciola praeusta* KIESENWETTER, *L. chinensis* LINN., *L. circumdata* MOTS., *L. ovalis* HOPE, *L. humeralis* WALK, *L. semilimbata* BON, *L. substriata* GORH., and *L. vespertina* FABR. Recently morphology and behaviour of many species of the Lampyridae from Japan have been described, revealing an important relationship between the size of the compound eyes, antennae and luminous organs (OHBA, 1978). The present paper deals with the natural history, position of light organs and difference in the size of compound eyes of male and female forms of *Luciola praeusta*.

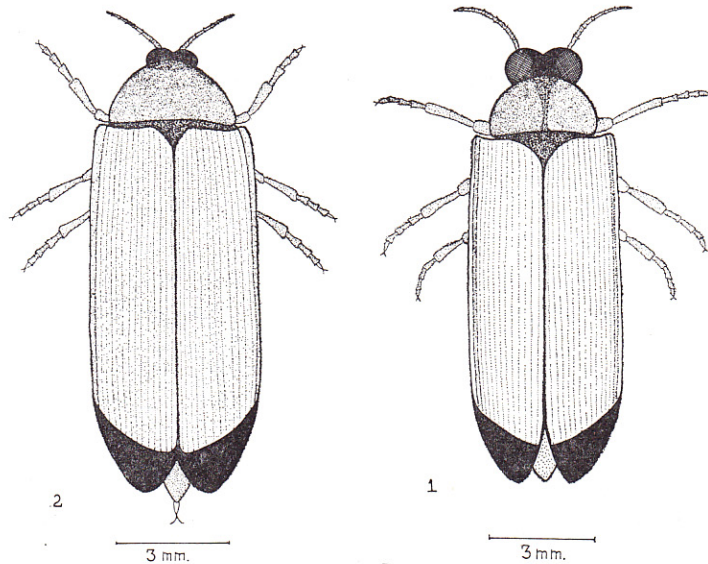
Observations

Natural history:

Luciola praeusta is one of the common fireflies found in northern India. Both

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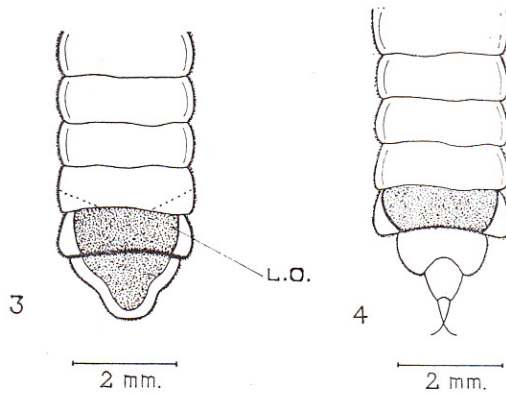
Text-figs. 1, 2. Dorsal view of male and female form of *Luciola praecusta*.

male and female forms exhibit a gregarious habit. The species hibernates as a larva during the winter months and the adults appear in great numbers during the rainy season from July to September. They inhabit marshy places and during the day remain concealed under grass or dead leaves and come out just after dusk, when they fly about and may assemble on a nearby tree. The adults are especially active if the day had been rainy. Both males and females are winged (Text-figs. 1 and 2). The females resemble the males except that they are slightly larger and the posterior end of the abdomen projects beyond the elytra. The average length of males is 8–9 mm and that of the females is 10–12 mm. Both sexes have pale brown elytra with black apices. The eyes of the males are larger than the females.

Light organs:

For the study of light organs, adult specimens, both males and females were collected from marshy places near Patna, India. These fireflies could not be reared in the laboratory, although larvae could be kept alive in the laboratory throughout the year after taking proper care for moisture, temperature and food. The larvae were fed on small snails, *Lymnaea acuminata* and *Acrostoma variabilis*. The larvae are voracious feeders.

The light organ in the male is much larger, occupying the ventral surface of the last three abdominal segments, whereas the light organ in the female is smaller, occupying the ventral surface of the sixth abdominal segment only (Text-figs. 3 and 4 L.O.) HASAMA (1942) has dealt with the tracheal end-cells and the distribution of tracheoles in the light organ. Detailed histological and cytological



Text-figs. 3, 4. Light organ (L.O.) of male and female form of *Luciola praeusta*.

structure of light organs have been worked out (GANGULY, 1963). Light organ of *L. praeusta* histologically is like the sixth type of BUCK (1948). In such species, where the female forms are apterous and males are winged, the males have smaller and less brilliant light organs than the females. For example in the common European glow-worms, *Lampyrus noctiluca* collected from Bristol in U.K. by the author.

The type of luminescence in the adult, male and female forms of *L. praeusta* is of flash type. There is a sudden burst of bright yellow-green light for a fraction of a second followed by few seconds of darkness. However at present the flashing patterns of *L. praeusta* could not be recorded either in the field with the help of cine-camera or in the laboratory by employing a photomultiplier tube, as has been done in case of five Japanese fireflies, *Hotaria parvula*, *Luciola cruciata*, *L. lateralis*, *Lychnuris artipennis* and *Cyphonocerus ruficollis* (OHBA, 1979a), also in case of three nocturnal species of Japanese fireflies *L. kuroiwae*, *L. filiformis yayeyamana* and *Hotaria parvula* (OHBA, 1979b).

The chief function of light emission in adult fireflies is to assist in attracting the sexes together for mating. However in the case of larva, no definite purpose is known regarding the emission of light, it may be used to warn any possible enemy as stated by HESS (1920). It is more probable that the light in larvae may be used to attract prey, as happens in the luminous Mycetophilid larvae, *Arachnocampa luminosa* (GANGULY, 1958).

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