

Luminous Organs in Males of *Diaphanes marginella*, Ho.
(Coleoptera: Lampyridae)

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(With 4 Text-figures)

Diaphanes marginella の雄の発光器

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Synopsis

An outline morphology, position of luminous organs and luminosity of male forms of *Diaphanes marginella* has been described.

Introduction

Luminescent beetles come under the families, Lampyridae, Phengodidae, Rhagophthalmidae, Drilidae, and Elateridae. Recently various aspects of bioluminescence have been reviewed and compiled. (JOHNSON, 1955, and JOHNSON & HANEDA 1966). HARVEY (1952) gave a detailed list of luminous lampyrids but did not include the genus *Diaphanes* in the luminous group. Amongst the Lampyridae from India, luminosity and location of light organs have been recorded in the adults and larvae of a few species of *Luciola* and *Lampyrophorus*. LEFROY (1909) listed *Diaphanes marginella* along with *Luciola* as luminescent but nothing is recorded about the location of light organs. RAJ (1943) while describing the external morphology of the larva of *Diaphanes* sp. stated 'the eighth pair of spiracular pleurites are eburated and photogenic.' But nothing is mentioned regarding the structure of luminous organs or luminosity of these larvae. The present work deals with the morphology, position of light organs and luminosity of male form of *Diaphanes marginella*.

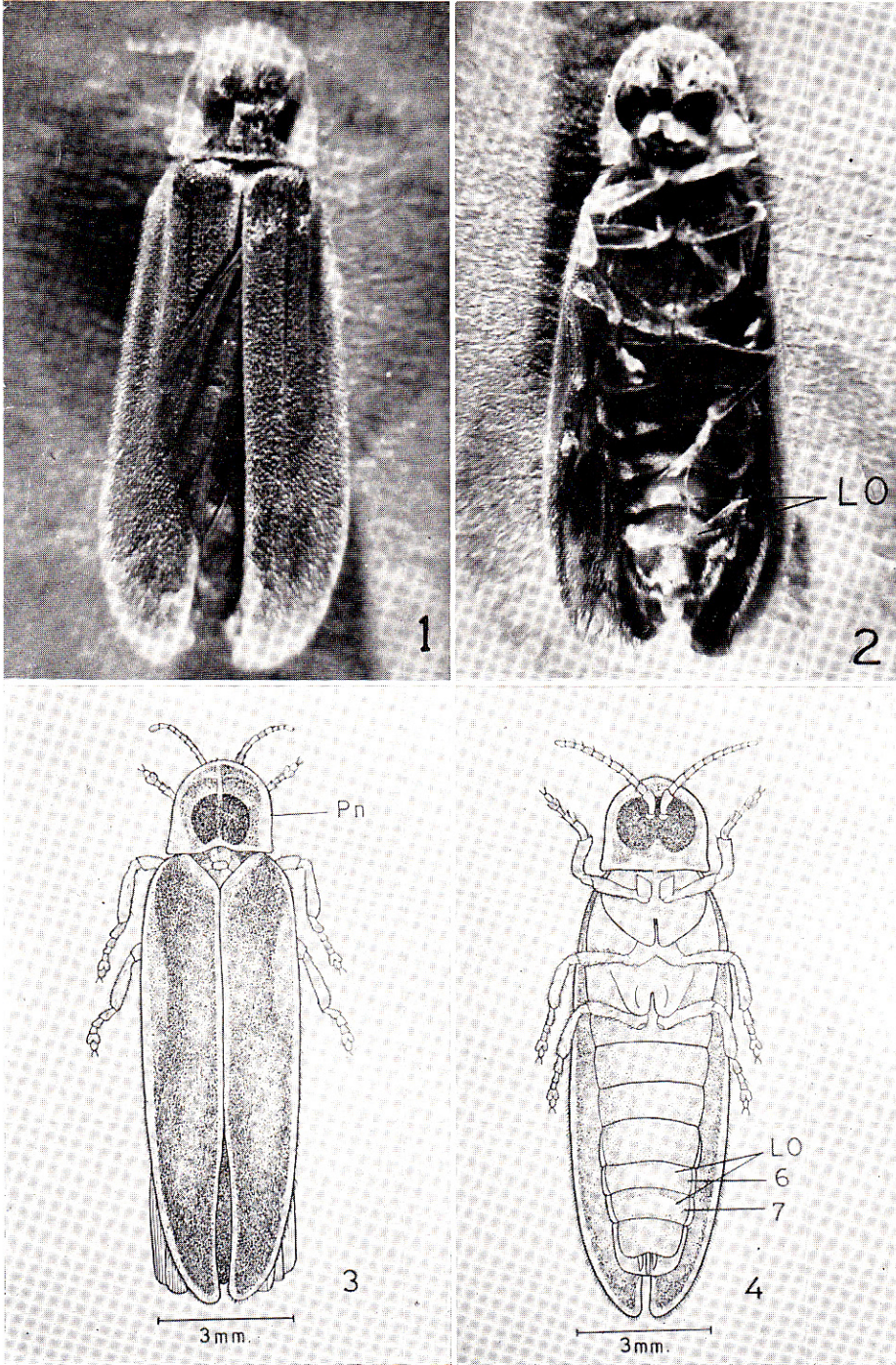
Observations

Adult male forms were collected from a forest area of Motihari, Dist. Champaran, Bihar, India. These were found on mainly on lower branches of trees just after dusk and flashing. Some were found flying quite low and could be collected easily. They exhibited the same gregarious habit as found in *Luciola gorhami* Rits. (GANGULY, 1963) It is strange that all the winged specimens collected were found to be males only. So far no female form of *D. marginella*, Ho. could be collected from that area. Probably unlike *Luciola gorhami* the female may be an apterous one. Further work is being continued for collection of female specimens also.

Living male specimens were kept in the laboratory under proper care to note their luminosity. Like *Luciola* these adult forms refused to take and food, earthworm, small molluscs etc. Most of the specimens died within two to three days but a few could be kept alive for six days with proper provision of moisture and air.

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Explanation of text figures

Figs. 1 & 3. Dorsal view of male form of *Diaphanes marginella*. Pn: Pronotum.
 Figs. 2 & 4. Ventral view LO. Light organ.

Morphology: The male of *Diaphanes marginella* like other male luminous lampyrids are winged and the elytra are longer than the abdomen, concealing the abdomen completely (Figs. 1 & 3). The elytra are uniformly pale brown & unlike *Luciola* do not have black apices. Body is more flattened than *Luciola gorhami*. Average length of the adult males is 12 to 14 mm where as average length of male *L. gorhami* is 8 to 9 mm (GANGULY 1963). Head is small with large contiguous compound eyes. While in rest, the head remains completely concealed under the shield shaped pronotum (Fig. 3 Pn). Antennae are small, 3 mm in length and moliniform with eleven segments. All the segments of the antenna are more or less uniform in size except the first and the second. The first is longest and the second smallest. Apical segment is oval and bead like.

Legs are well developed, coxa light brown and concolour with the sternite and not black like that of the larva as reported by RAJ (1943). Tibia and Tarsus are dark brown and densely setose. Tarsus five segmented, fourth segment bilobed.

Abdominal segments are much broader than long. Posterior margins of sternal plates are free and over lap the anterior margins of the succeeding segments. The posterior margin of the sternal plate is notched in the middle and is provided with a row of fine hairs.

Light organs: The light organs in the male *D. marginella* occupy the ventral surface of the sixth and seventh abdominal segments (Fig. 2 & 4, LO) The cuticle of the sternites over the light organ is thin and non-pigmented. In dead specimens, the light organs are visible as opaque white patches occupying the middle of the segments but in living forms the light organs appear as light yellow patches. Unlike *Luciola*, the light organ of *D. marginella* in each segment is not spread all over the segment. Light emitted is very bright but more greenish than yellow. Light is emitted simultaneously from both the organs. According to BUCK (1948) method of light emission in male of *D. marginella* may be termed as flash type and not intermittent type. The significance of light emission appears to be for mating.

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