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## Redescription of the first record of the species *Elmomorphus brevicornis* from the family Dryopidae (Coleoptera) in Manipur

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### Abstract

In this study, species of the family Dryopidae, *Elmomorphus brevicornis* were recorded for the first time from Manipur, North eastern part of India. The samples were collected from piles of submerged twigs and branches of a decayed tree from a mountain stream in Leimaram hill, Senapati district, Manipur. *E. brevicornis* Sharp was redescribed based on type material and new material. A lectotype is designated for this species. Redescription, SEM photographs, habitat, and taxonomic notes for *E. brevicornis* are provided.

**Keywords:** Coleoptera, Dryopidae, taxonomy, *Elmomorphus brevicornis*, Senapati district, Manipur, India.

### Introduction

Dryopidae is a common, widespread family of beetles and commonly known as long-toed water beetle, currently composed of approximately 300 described species worldwide that belong to 33 genera (Jäch and Balke, 2008) [4]. Dryopids are more abundant and diverse in the humid tropics of the Neotropical, Afrotropical and Oriental regions. The Palearctic and Nearctic regions are less diverse, and only a few species are known from the Australian region (Kodada & Jäch, 2005) [5]. This family, although relatively small in terms of the number of recognized species, is rather diverse ecologically, having humicolous, arboreal, semi-aquatic and aquatic members Perkins, 1999 [11]. The history of the family is intertwined with that of the Elmidae, since the two groups were placed for so long within a single family. In 1791, Olivier created the genus *Dryops* for *Dermestes auriculatus* Geoffroy 1785 and a new species from Guadeloupe (now *Pelonomus picipes*). In 1792, Fabricius described *Parnus prolifericornis* as a new genus and species. Unfortunately, it was not until many years later that *P. prolifericornis* was recognized as a junior synonym for *Dryops auriculatus*. For the next century the names of higher taxa were based on the invalid *Parnus*. To compound the confusion, Leach in 1817 assigned the European species of *Helichus* (though this name was not created until 30 years later) to Olivier's *Dryops*. Thus most species of *Dryops* were described as *Parnus*, whereas most species of *Helichus* were described as *Dryops*. Most Adults dryopid specimen are mainly found in aquatic and usually found in riparian habitats, of the streams in leaf packs, log jams or other stream substrates.

The larvae occur in moist soil along creek margins (Le Sage 1991a) [9]. While the larvae are usually terrestrial or semi aquatic and inhabit moist decaying wood, humid soil, and leaf litter (Ulrich, 1986; Hayashi and Kadowaki, 2008) [14].

The genus *Elmomorphus* was established by Sharp (1888) [13] on the basis of *Elmomorphus brevicornis* from Japan. This genus is widespread in the Oriental and Eastern Palearctic Regions (Kodada and Jäch, 2005, 2006; Kodada *et al.*, 2009) [5-7]. However, there have been no records of *Elmomorphus* and other dryopid beetles in India. The adults of *Elmomorphus* are found on piles of submerged twigs and branches of a decayed tree in the lentic areas of a mountain stream. They may be xylophagous. They use plastron respiration, which is well characterized in the elmid riffle beetles (Elmidae). The biology and taxonomy of dryopid larvae are poorly known. In this study, we report the family Dryopidae for the first time in India (Manipur) by the specimen of *E. brevicornis* Sharp collected from Leimaram, Senapati District, Manipur.

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## Materials and Methods

The specimen collected was studied in the Entomology Research Laboratory, P.G. Department of Zoology, Dhanamanjuri College of Science, Imphal from January to December 2015. Specimens were collected from freshwater habitats of Leimaram, Senapati District Manipur. The material examined for this study was collected by means of sieve, ladle, and net with 3.15x1-mm mesh size in different sites of Leimaram, Senapati District Manipur. The beetles were killed with ethyl alcohol (70%) and were stored in small bottles until identification. Specimens were cleaned with a brush before identification. Aedeagophores were dissected under a stereomicroscope and cleared in 10% KOH solution for 1-2 h. The photographs were taken using an Olympus type BX51 compound microscope and a Nikon type SMZ 1500 stereomicroscope. Three specimens are deposited in the Laboratory of Entomology, P.G. Department of Zoology, Dhanamanjuri College of Science, Imphal, and Manipur. The identified species have been converted into museum material and deposited in author's collections.

## Systematic Accounts

### Order- Coleoptera

Family Dryopidae Billberg, 1820 (Korean name: Yeo-ulbeol-Re-bu-chi-gwa)

Genus *Elmomorphus* Sharp, 1888 (Korean name: Yeo-ulbeol-Re-bu-chi-sok)

*Elmomorphus* Sharp, 1888: 242; Satô, 1985: 255; Kodada *et al.*, 2003: 455; Satô and Yoshitomi, 2005: 636.

*Dryopidius* Grouvelle, 1896: 33.

*Elmomorphellus* Chûjô and Satô, 1964: 193.

Type species: *Elmomorphus brevicornis* Sharp, 1888: 243.

### *Elmomorphus brevicornis* Sharp

*Elmomorphus brevicornis* Sharp, 1888: 243 [type (gender unknown)]

(Natural History Museum, London): "South Japan,

### Material examined

**Redescription: Male adult:** Body length (TL) 3.49-3.60mm; width (EW) 1.60-1.80 mm. Body elongate, oval, shining, convex dorsally, and black color. Lateral parts of pronotum, dorsal parts of elytra, medial part of prosternum along midline, narrow area anterior to abdominal intercoxal process, medial parts of metasternal intercoxal process, pro- and mesocoxa, inner surface of metacoxa, legs and abdominal ventrites dark brown. Labrum, antennae, maxillae, pro-, meso-trochanter and tarsi reddish brown.

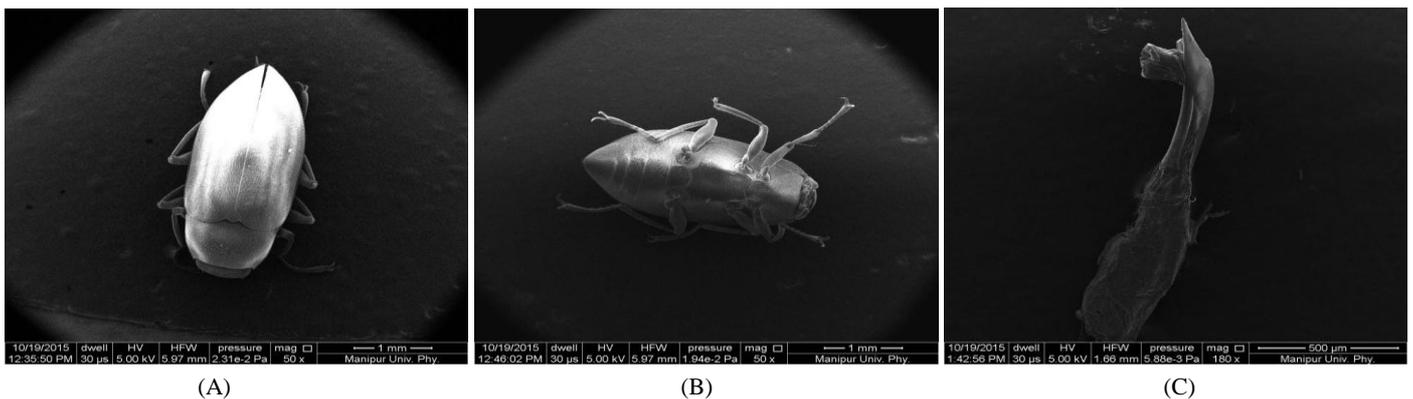
Head [Fig. 1 (a)] more or less concealed under pronotum, disc somewhat flattened, closely and distinctly punctate, finely pubescent; clypeus emarginate at the anterior margin and provided with close and long hairs; Labrum wider than long,

with dense setae anteriorly, round in frontal angles. Eyes large, distance between them separated by 3 X the diameter of each eye; Antennae 9-segmented short, closely pubescent, 1st and 2nd segments stout, 3rd to 9th forming a club; antennomere 1 slender posteriorly and stout anteriorly, antennomere 2 wider, than of antennomere 1; antennomere 3 short and small; antennomeres 4-9 wider than long, gradually reducing in length and width. Maxillary palp 4-segmented; longer than antenna, palpomere 1 short; palpomere 2 longer than 3; palpomere 3 longer than 1; terminal palpomere relatively long with lateral sensory field, elongate, more or less wide, about half length of terminal palpomere. Labial palp 3-segmented; palpomere 1 shortest; palpomeres 2 and 3 short.

Pronotum subquadrate about 1.5 X as broad as long, Pronotum strongly convex, shiny at middle part, carinae absent, wider than long, widest posteriorly; punctures similar to head punctures on dorsal surface; each angle acute; integument smooth. *Scutellum* heart-shaped, longer than wide, finely punctate. Prosternum punctate, with plastron; prosternal process wider than long, without plastron, widest at middle part, shiny, round at apex. Hypomeron broadest posteriorly, narrowed anteriorly with plastron. Mesoventrite with plastron and punctate, deeply grooved for reception of prosternal process. Metaventrite punctate, covered with plastron except narrow middle part, flat and shiny at middle part; median longitudinal suture posterior part with transverse suture. Legs long and slender; procoxae and mesocoxae globular; metacoxae transverse; trochanters of hind legs flat, largest and round; femora clavate, with small punctures; middle femora with row of long strong setae on inner surface; tibiae slender, tomented on inner surface; tarsi 5-segmented, light brown tarsomere 5 longest, as long as tarsomeres 1-4 combined; two claws with one basal tooth, slender, sharp, and shiny.

Elytra elongate oval, convex dorsally, widest near middle part, sparsely short setae laterally and posteriorly; lateral margin crenulate; pointed at apex. The sides slightly dilated posteriorly; surface shining at the central area, opaque at broad imbricate, marginal area, the punctures a little closer than those of pronotum; Each elytron with nine punctate striae; stria punctures moderately large and deep anteriorly, becoming gradually finer posteriorly; Hind wings fully developed. Abdomen with five ventrites, longer than wide, with plastron; ventrite 5 strongly granulate laterally, widely emarginate at apex; apical margin feebly crenulate.

Aedeagus [Fig 1 (c)] long and tubular. Penis elongate, slender apically (narrower towards apex), parameres longer than the length of median lobe; evidently narrowed terminally and its apex rounded. Ventrally curved in lateral view; anterolateral apophyses short and acute; membranous ventral sac with fine longitudinal furrows.



**Fig 1:** Habitats of *Elmomorphus brevicornis* (a) Dorsal (b) Ventral and (c) Aedeagus

**Habitat Notes:** The aquatic adults of this family are found in flowing water (e.g. *Elmomorphus*, Erichson) or stagnant water, such as abandoned paddy fields, swamps, etc. *Elmomorphus* is often collected in packs of leaves and twigs that have accumulated in riffle areas in forest streams. Many dryopid species are capable of flight. They are often attracted by light traps.

**Regional fauna:** Our knowledge of the Indian Dryopidae is still very poor. Only one aquatic genera, Dryops had been recorded. *Elmomorphus* had not been recorded earliest. A revision of Indian *dryopids* is in under preparation; this revision will include description of many new species. A few aquatic genera from Manipur are still undescribed. At least *Elmomorphus* is common in India.

**Taxonomic remarks:** According to Sharp (1888), G. Lewis found two specimens of this species from Kobe, South Japan. Jan Kodada (Comenius University, Slovakia) confirmed deposition of the type specimen (1 dry specimen) in the British Museum of Natural History (Fedor Ciampor, personal communication). This is the first record of the family Dryopidae in Manipur as well as in India. One subspecies belonging to the genus *Elmomorphus* were recorded for the first time in India.

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