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A Possible Larva of *Lepicerus inaequalis* Motschulsky (Coleoptera: Myxophaga: Lepiceridae) from Panama

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Abstract

A larva is described which is presumed to be that of *Lepicerus inaequalis* Motschulsky based on several probable first instars and one later instar collected a few miles from and in a similar habitat to adult specimens of this species. The association is additionally based on several features also occurring in other known myxophagan larvae. A key is provided comparing these larvae with those of the other three families of Myxophaga.

Key words: Coleoptera, Myxophaga, Lepiceridae

Introduction

“How often have I said to you that when you have eliminated the impossible, whatever remains, however improbable, must be the truth?” Sherlock Holmes to Dr. Watson (Doyle 1890).

Thirty-seven years ago, one of us (AFN) discovered a short series of minute larvae extracted with a Tullgren funnel from wet leaves and flood debris along the banks of a stream near Gamboa, Canal Zone, Panama. Two adults of *Lepicerus inaequalis* Motschulsky were collected on the same date in a similar habitat along a nearby stream (see below). A permanent slide was made of one larva and several others were cleared, dissected and placed in ethanol or glycerine. These unusual larvae (Fig. 1) were compared with those myxophagan taxa with known immature stages, but a possible association with *Lepicerus* was rejected due to the complete lack of spiracular gills. These unusual breathing organs are present in Torridincolidae, Hydroscaphidae and Sphaeriusidae and were considered as a potential synapomorphy of the suborder (e.g., Beutel & Haas 1998). When various staphylinoid taxa were excluded as possible candidates by AFN, the assumption was that these specimens probably represented a species of Cucujoidea whose immature stages were as yet unknown. Given the diversity of the Panamanian beetle fauna, this possibility was pursued no further. In the intervening years, one of us (JFL) reexamined these larvae on several occasions, in connection with various projects, including keys to beetle larvae (Lawrence 1991; Lawrence *et al.* 1999), but it was only in the past few years that the myxophagan alternative was reconsidered. Although there is virtually no information on the life cycle of *Lepicerus* species, it has been assumed over the years by Hinton (1969) and others that the beetles are aquatic. This idea was supported by Reichardt (1976) who claimed that a ventral plastron occurs in *L. bufo* (Hinton). Navarrete-Heredia *et al.* (2005), who made a detailed study of this species and *L. inaequalis*, found that no plastron was present in either species. These authors also noted that adults of *L. inaequalis* were usually found near the edges of rivers in moist substrate just below the surface, but never below the water line or associated with algae or plants, while those of *L. bufo* were usually found in sandy areas further from the river's edge, often under stones. Shepard *et al.* (2005) collected *L. inaequalis* in numbers from various sites in Costa Rica; typical habitats were in sand relatively high up on stream banks, near where marginal vegetation meets bare sand, although many specimens were collected below the water line (A.E.Z. Short, personal