



Description of the larvae of three species of *Laccophilus* Leach and comments on the phylogenetic relationships of the Laccophilinae (Coleoptera: Dytiscidae)

MARIANO C. MICHAT

CONICET. Laboratorio de Entomología, Departamento de Biodiversidad y Biología Experimental, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires. Av. Int. Güiraldes s/n, Ciudad Universitaria, C1428EHA, Buenos Aires, Argentina. E-mail: marianoide@gmail.com.

Abstract

The larvae of three Neotropical species of the diving beetle genus *Laccophilus* Leach (*Laccophilus obliquatus* Régimbart, *L. paraguensis* Régimbart and *L. testudo* Régimbart) are described and illustrated for the first time, with an emphasis on morphometry and chaetotaxy of the cephalic capsule, head appendages, legs, last abdominal segment and urogomphi. Larvae of these species lack the primary setae LA10 and LA12, and have the primary seta CO7 articulated proximally on all coxae, two apomorphies that define the subfamily Laccophilinae. They are also characterized by a frontoclypeus truncate proximally in the first instar, the presence of pectens on legs, and the presence of secondary setae on first urogomphomere. These character states are apomorphies that define the genus *Laccophilus* Leach. The absence of pore PAc and the presence of a dense group of secondary spiniform setae dorsally at the base of the siphon in instar III may also characterize this genus, as similar states are not found in other dytiscids. On the other hand, *L. obliquatus*, *L. paraguensis* and *L. testudo* differ from the other species of *Laccophilus* known in detail in the presence of an additional seta on the stipes and in the absence of pore ABc. Brief comments on the putative phylogenetic relationships of Laccophilinae and *Laccophilus* inferred from larval morphology, as well as on the characters potentially useful in studying relationships within the group are presented.

Key words: Diving beetles, Laccophilinae, *Laccophilus*, larvae, chaetotaxy, phylogenetic relationships

Introduction

Laccophilus Leach is one of the most speciose and taxonomically difficult genera within Dytiscidae. The genus is cosmopolitan, and includes more than 250 species of small to moderate size diving beetles (Nilsson 2001). The adults of the North American species were revised by Zimmerman (1970), who emphasized the need of a similar revision for the Neotropical region. Almost 100 species of *Laccophilus* inhabit the Neotropics (Nilsson 2001), whose identification is a severe problem due to the absence of a revision of the species and of adequate keys. According to Trémouilles (1998) 13 species are present in Argentina, of which three are studied in the present contribution (*L. obliquatus* Régimbart, *L. paraguensis* Régimbart and *L. testudo* Régimbart).

Laccophilus is placed in the subfamily Laccophilinae, which includes two tribes, Laccophilini (with 12 genera) and Agabetini (with only the Holarctic genus *Agabetes* Crotch) (Nilsson 1989, 2001). Broad studies on the intergeneric relationships within Laccophilini have not been carried out so far, the most comprehensive is that of Ribera *et al.* (2008) which included seven genera. Preliminary analyses including few genera postulated that *Laccophilus* is the sister group of *Laccodytes* Régimbart (Miller 2001) or the sister group of a clade formed by *Australphilus* Watts + *Neptosternus* Sharp (Alarie *et al.* 2000) or of a clade including *Australphilus*,