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## On the enigmatic *Heterostomus curvipalpis* Bigot, 1857, with a description of the pupa (Diptera, Brachycera)

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### Abstract

The previously unknown pupa of *Heterostomus curvipalpis* Bigot is described. The morphology of the pupa of *Heterostomus* is compared with the pupae of Xylophagomorpha, Tabanomorpha and Stratiomyomorpha families, based on five characters, and its phylogenetic position is discussed. Currently placed in Xylophagidae, we conclude that the pupa of *Heterostomus* shares most characters with the pupae of Pelecorhynchidae.

**Key words:** Insecta, lower Brachycera, Systematics, Neotropical Region, Chile, Tabanomorpha, Xylophagomorpha, Stratiomyomorpha

### Introduction

*Heterostomus curvipalpis* Bigot, 1857 is a peculiar species from central Chile with an enigmatic systematic position. The placement of *Heterostomus* has been contentious among authors. Most included the genus in Xylophagomorpha (Mik 1890; Hunter 1900; James 1975; Nagatomi 1977, 1981, 1984, 1985, 1992; Woodley 1989; Sinclair *et al.* 1994; Mazzarolo & Amorim 2000; Jarzembowski & Mostovski 2000; Palmer & Yeates 2000; Stuckenberg 2001; Yeates 2002; Kerr 2010). Others included it in Tabanomorpha: Kröber (1930) placed it into Tabanidae; Malloch (1932) included it in Rhagionidae; and Hennig (1972) placed it close to Pelecorhynchidae. However, up to now only adults of *Heterostomus* were known, and to consider the systematic position of a brachyceran without knowing the immature stages is very difficult (Woodley 1989).

In this contribution we describe the pupa of *Heterostomus curvipalpis* for the first time, and its morphology is compared with the pupae of Xylophagomorpha, Tabanomorpha and Stratiomyomorpha.

### Material and methods

The materials examined belong to the Instituto de Entomología of Universidad Metropolitana de Ciencias de la Educación (UMCE), Santiago, Chile, and to the National Museum of Natural History (USNM), Washington DC, USA. External morphology and ornamentation were studied using a stereomicroscope. The terminalia were dissected, cleared using potassium hydroxide and phenol, and mounted using Canada balsam onto microslides; these were observed with a compound microscope. The morphological terminology is based on Coscarón and Coscarón (1995) and McAlpine (1981).

**Examined material:** From UMCE. CHILE, Valparaíso, Quilque, Los Penales; 20-X-68; Solervicens collector: 2 females, 1 pupa (collected in sawdust found in the soil of the forest, and maintained in the same substrate in the laboratory, where later a female emerged on 31-X-68). Limache, Piedras Blancas; 15-I-68; Solervicens collector: 1 male. Santiago, El Manzano; 11-XI-78; Rivas-Elgueta collector: 1 female. Maipu, Quebrada de la Plata; 4-XI-60; C. Vivas collector: 2 males. Talagante; 25-IX-58; G. Pino collector: 1 male. El