



## A new species of *Desmopachria* Babington (Coleoptera: Dytiscidae) from Cuba with a prediction of its geographic distribution and notes on other Cuban species of the genus

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### Abstract

A new species, *Desmopachria andreae* sp. n. is described from Cuba. Diagnostic characters including illustrations of male genitalia are provided and illustrated for the five species of the genus occurring on the island. For these five species both a simple key to adults and maps of their known distribution in Cuba are also provided. Using a Maximum Entropy method (MaxEnt), a distribution model was developed for *D. andreae* sp.n. Based on the model's predictions, this species has a higher probability of occurring in high altitude forests (above 1000 m a.s.l.), characterised by relatively low temperatures especially during the hottest and wettest seasons, specifically, the mountainous areas of the Macizo de Guamuha (Central Cuba), Sierra Maestra (S Cuba) and Nipe-Sagua-Baracoa (NE Cuba). In some of these areas the species has not yet been recorded, and should be searched for in future field surveys.

**Key words:** Hydroporinae, Neotropical, diving beetle, morphology, MaxEnt, species distribution models

### Introduction

The predaceous water beetles of the genus *Desmopachria* Babington, 1841 are small dytiscids ranging from 1.1 to 3.0 mm in length (Young 1981, 1989; Miller 2001, 2005). The genus comprises 99 species widely distributed in the New World (see Nilsson 2001; Miller 2001, 2005; Braga & Ferreira-JR 2010), although it is most speciose in Neotropical lowlands (Miller 1999).

*Desmopachria* is postulated to represent a monophyletic group based on both adult (Biström *et al.* 1997; Miller 2001) and larval characters (Michat & Archangelsky 2007). The adults are characterized by antennomeres 1–2 wider than the following ones, antennomeres 5–10 short and slightly expanded in the apical half, the labial palpus with an apical pair of sensilla that are widely separated, the maxillary palpus with an apical sensillum and the pronotum with posterolateral angles produced (Miller 2001). The species of this genus are easily distinguished by the shape of the male genitalia (Epler 2010) and, based on this new species have been recently described (Miller 2001, 2005; Braga & Ferreira-JR 2010). Miller (2001) rejected the use of subgenera within *Desmopachria* based on an analysis of male genitalia and external features and reorganized the species into eight informal groups, with several species ungrouped.

Four species of *Desmopachria* have been reported in Cuba to date (*Desmopachria aspera* Young, 1981, *D. darlingtoni* Young, 1989, *D. glabella* Young, 1981 and *D. tarda* Spangler, 1973), two of which are endemic to the island (*D. glabella* and *D. tarda*) (Spangler 1973, 1981; Young 1981, 1989; Peck 2005). However, little is known on the biogeography of *Desmopachria* species in Cuba. In this study, a new species of *Desmopachria* is described and illustrated. In addition, we develop a maximum entropy (Phillips *et al.* 2006) presence-only distribution model to determine i) the potential distribution of *D. andreae* in Cuba and ii) the ecological variables that may determine its distribution. In this sense, predicting the species distribution using ecological niche modelling offers a powerful approach to identify unsampled areas that are potentially inhabited (Elith *et al.* 2006; Phillips *et al.* 2006).

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