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A new hypogean *Trechus* Clairville (Coleoptera, Carabidae, Trechini) discovered in a non-calcareous Superficial Subterranean Habitat of the Iberian System (Central Spain)

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Abstract

A new hypogean species of *Trechus* Clairville, *Trechus arrecheai* **sp. nov.**, is described from the Iberian Peninsula. It was captured by subterranean pitfall traps in a non-calcareous Superficial Subterranean Habitat from the Moncayo Massif (Zaragoza, Spain). Data on the accompanying fauna are provided and the biogeographical implications of this discovery are discussed. A synthesis of the data about the known distribution of the *Trechus angusticollis* species group is provided.

Key words: *Trechus arrecheai* **n. sp.**, *Trechus angusticollis*-group, taxonomy, systematics, biology, Moncayo Massif, Iberian Peninsula

Introduction

The subfamily Trechini, within the Carabidae, is the most diversified in hypogean habitats (Casale *et al*. 1998; Faille *et al*. 2011), with a high number of species showing remarkable morphological and physiological adaptations to this environment (Casale *et al*. 1998). These are convergent in different clades, in aspects such as the depigmentation, anophthalmy, apterism, appendage elongation, slender body form and an increment in the number of sensorial receptors (Racovitza 1907; Jeannel 1943; Barr & Holsinger 1985; Culver *et al*. 1990). Included in this subfamily is the Holarctic genus *Trechus* Clairville 1806, of which more than 600 species (Moravec *et al*. 2003) have been described, many of them inhabiting hypogean habitats (Jeannel 1941; 1942).

Of the 58 species endemic to the Iberian Peninsula, 18 are exclusively subterranean species (Ortuño & Arribas 2010; Serrano 2013; Ortuño & Barranco 2013). Until now, only four of those species (*Trechus beltrani* Toribio 1990, *Trechus carrilloi* Toribio & Rodríguez 1997, *Trechus triamicorum* Ortuño & Jiménez-Valverde 2011, *Trechus bouilloni* Faille, Bourdeau & Fresneda 2012) have been described from specimens captured in the Superficial Subterranean Habitat (MSS) (Ortuño 1996; Toribio & Rodríguez 1997; Carabajal *et al*. 1999; Faille *et al*. 2012). Other species show wider ecological valence, inhabiting both epigean cool and moist habitats, as well as hypogean habitats (Ortuño 2004), as it is the case for *Trechus barratxinai* Español.

The Superficial Subterranean Habitat was originally described as the *Milieu Souterrain Superficiel* (Juberthie *et al*. 1980), and although it has been translated in several ways, the original acronym MSS is well established in the literature. For this reason we maintain that criterion henceforth (see a more detailed explanation in Ortuño *et al. in press*). The MSS is a habitat consisting of a network of subterranean interstices that may or may not be covered by a layer of soil. Various types of MSS have been described according to the origin of the rock debris: bedrock, colluvial, volcanic or alluvial (Juberthie *et al*. 1980; Oromí *et al*. 1986; Gers 1992; Ortuño *et al.* 2013). This kind of environment constitutes a shelter for stenoic hygrophilous species, since it softens the fluctuations of humidity and temperature in relation to the surface (Pipan *et al*. 2011). In addition, edaphic and epiedaphic species may also inhabit this network of interstices. The most notable studies on the MSS have been carried out in Europe (Juberthie

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