

SCIENTIFIC NOTE

WHERE TO SPEND THE WINTER IN SERRA DA ESTRELA? THE FIRST RECORD OF *DIPHYUS QUADRIPUNCTORIUS* (MUELLER, 1776) OVERWINTERING IN A SUBTERRANEAN HABITAT IN PORTUGAL¹**Andreia Penado,^{2,3} Marta Sampaio,⁴ Madalena Madeira,⁵ Jesus Selfa,⁶ and Gonçalo M. Rosa^{4,7}**

The family Ichneumonidae is remarkably diverse with at least 100,000 species worldwide (Gauld et al., 2002). Of those, nearly 4,300 species constitute the large subfamily Ichneumoninae which comprises over 440 genera (Yu et al., 2005). Despite this diversity, the Portuguese fauna of this subfamily is still poorly known, with only 45 recorded species (Selfa and Anento, 1998a).

Ichneumonid wasps are important parasitoids, with females laying eggs on or in other insects such as the larvae and pupae of Coleoptera, Raphidioptera, Trichoptera, Hymenoptera and Lepidoptera, plus non-insect Chelicerata (Araneae) (Rasnitsyn and Siitan, 1981; Goulet and Huber, 1993).

Underground habitats can enclose a surprising biodiversity with diverse taxa represented and unique species inhabiting them (Romero, 2009). Although Hymenoptera are not common in underground environments (Moldovan, 2004), some species have been documented to occur in caves during the cooler months (Novak et al., 2010). However, no ichneumonid wasps are known to be cave-obligate (troglobiotic) (Decu et al., 1998; Romero, 2009).

One of the most frequent Ichneumonidae species found in European subterranean environments is *Diphyus quadripunctorius* (Müller, 1776), but its presence in these habitats has been reported only occasionally in France, Serbia, Switzerland, Spain, Germany, Romania, Belgium, Czech Republic, Austria and Slovenia (Jeannel, 1926; Remy, 1953; Jequier, 1961; Selfa and Escolà, 1991; Weber, 1995; Decu et al., 1998; Delhez et al., 1999; Kubátová and Devořák, 2005; Christian and Spötl, 2010; Novak et al., 2010). *Diphyus quadripunctorius*

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