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## Two new species of *Euscorpium* (Scorpiones: Euscorpiidae) from Bulgaria, Serbia, and Greece

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### Abstract

Two new species of *Euscorpium* Thorell, 1876 (subgenus *Euscorpium* s.str.) (Scorpiones: Euscorpiidae) are described based on morphology and the COI DNA barcoding marker: *E. deltshevi* sp. n. from northern Bulgaria and neighbouring Serbia (formerly reported as *E. carpathicus*) and *E. solegladi* sp. n. from southwestern Bulgaria and neighbouring Greece (formerly reported as *E. hadzii*).

**Key words:** Scorpions, Balkans, DNA barcoding

### Introduction

A recent review of Bulgarian scorpions of the genus *Euscorpium* Thorell, 1876 (Fet & Soleglad 2007) outlined issues and problems involved with delineation and understanding of species in these enigmatic arachnids. In the first thorough molecular study of Greek *Euscorpium* taxa, Parmakelis *et al.* (2013a) demonstrated that cryptic speciation among these scorpions appears to be dramatically underestimated. Here, we apply DNA barcoding, or sequencing of the mitochondrial gene coding for cytochrome *c* oxidase subunit I (COI), to clarify the phylogenetic position and taxonomic identity of two new, but common, species of *Euscorpium* inhabiting Bulgaria, and provide descriptions of each.

### Material and Methods

**Material Studied.** Thanks to the courtesy of Dr. Petar Beron, who loaned the entire *Euscorpium* collection of the National Museum of Natural History, Sofia (NMNHS) to V.F., we studied as many as 190 specimens of *E. deltshevi* sp. n. and 62 specimens of *E. solegladi* sp. n., which allowed us to gain a better understanding of morphological variation as well as broaden our geographic perspective. A detailed list of material with label data is provided below.

**Specimens used for DNA barcoding.** Of 25 sequences of *Euscorpium* used for our phylogeny, 18 are reported here for the first time (listed below with GenBank accession numbers). *Euscorpium* (*E.*) *tergestinus* (C.L. Koch, 1837), SLOVENIA: under Nanos Mt., Vipava, 45°50'48"N, 13°57'47"E, 15.06.2001 (Univ. of Ljubljana), VF-0777 (AMSCO047-10, KM111249); CROATIA: Majorija, Senj, 44°59'25"N, 14°54'05"E, 550 m, 7.08.2000 (B. Sket), VF-0823 (AMSCO081-10, HM418305). *Euscorpium* (*E.*) *hadzii* Di Caporiacco, 1950, BOSNIA & HERZEGOVINA: Herzegovina, 15 km S Trebinje, 42°42'N, 18°20'E, 3.08.2000 (P. Trontelj), VF-0795 (AMSCO056-10, HM418290); Herzegovina, Čemerno, 43°14'14"N, 18°36'4"E, 8.09.2006 (D. Pavicevic), VF-0796 (AMSCO057-10, HM418291); Republika Srpska, Lukavac, 44°46'13"N, 18°53'31"E, 8.09.2006 (D.

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