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Arachnologische Mitteilungen 44: 10-13 Nürnberg, Dezember 2012

Withius hispanus new to the fauna of Slovakia (Pseudoscorpiones: Withiidae)

Jana Christophoryová, Giulio Gardini & Edina Énekesová

doi: 10.5431/aramit4403

Abstract: An illustrated description of *Withius hispanus* (L. Koch, 1873) is provided based on its morphological and morphometric characters. This finding of *W. hispanus* is the first record of the family Withiidae in Slovakia. The present re-description of this species allows an assessment of the variability of its morphological and morphometric characters.

Key words: Central Europe, floodplain forest, morphology, morphometric analysis, first record, taxonomy

The pseudoscorpion family Withiidae Chamberlin, 1931 is recorded here for the first time in Slovakia. This family is distributed in most parts of the world, chiefly in Africa and South America. Withiids occur in leaf litter, under tree bark and under stones (BEIER 1963, HARVEY 2011). The family contains 31 genera, of which *Withius* Kew, 1911 contains 42 species (HARVEY 2011). The species *Withius hispanus* (L. Koch, 1873) is known from several countries – Austria, Azerbaijan, Bosnia-Herzegovina, Bulgaria, France, Georgia, Italy, Montenegro, Morocco, Portugal, Russia, Spain (loc. typ.), Switzerland and Turkey (HARVEY 2011). *Withius lohmanderi* Kobakhidze, 1965 (loc. typ.: Sochi, Krasnodarskiy Kray, Russia; KOBAKHIDZE 1965) is considered as junior synonym of *Withius hispanus* (synonymized by DASHDAMIROV & SCHAWALLER 1992). The aim of the present study is to describe a new specimen of *Withius hispanus* from Slovakia in detail.

Material and methods

One female of *Withius hispanus* was examined (leg. E. Énekesová): SW Slovakia, region Galanta, study site situated in a floodplain forest by the Čierna voda brook near the village of Vozokany in the Podunajská rovina lowland (grid reference number from the Databank of Slovak Fauna 7872, 48°06'02.46"N, 17°41'09.67"E, 117 m a.s.l.) (Fig. 1). The soil profile was composed mostly of sandy gravel from the Danube River resulting from the former activity of the river, alluvial sediments and loess loam. The floodplain forest was composed of white willow (*Salix alba*) along with white poplar (*Populus alba*). The vegetation comprising the undergrowth was formed mainly by wild garlic (*Allium ursinum*) and yellow wood anemones (*Anemone ranunculoides*). The female was collected using a pitfall trap (4% formaldehyde solution) which was exposed from 4th July to 1st August 2009. The trap comprised a plastic cup with an upper diameter of 7 cm and with a wooden cover to protect traps from rainfall and litter. The specimen was determined by J. Christophoryová and G. Gardini. The specimen was studied as a temporary slide mount, and photographed using a Leica DM1000 compound microscope with ICC50 Camera Module (LAS EZ application, 1.8.0). Measurements were taken from the photographs using the AxioVision 40LE application (v. 4.5). Figures were drawn using a Leica drawing tube. The material is deposited in the collection of the first author in the Comenius University, Bratislava.

Results

Description of the female of *Withius hispanus* (Fig. 2): Carapace, tergites, sternites and palps reddish-brown; vestitural setae on carapace, tergites and palps dentate (except the two lateral acuminate setae on tergite XI), all setae on coxae and sternites acuminate; surface of carapace granulated. Carapace (Fig. 2A) about as long as broad, broadest posteriorly, anterior margin straight; one pair of well developed eyes with lenses and two transverse furrows, the anterior one distinct, the subbasal indistinct, flat and situated close to posterior margin of carapace; 53 setae, 6 of which are along the anterior margin, 26 in front of the first transverse furrow and 7 along the posterior margin (insertion of

Jana CHRISTOPHORYOVÁ, Edina ÉNEKESOVÁ, Department of Zoology, Faculty of Natural Sciences, Comenius University, Mlynská dolina B-1, SK–84215 Bratislava, Slovak Republic.
E-Mails: christophoryova@gmail.com, edinaenekesova@gmail.com

Giulio GARDINI, Dipartimento per lo Studio del Territorio e delle sue Risorse, Università degli Studi di Genova, Corso Europa 26, I–16132 Genova, Italy. E-Mail: giuliogardini@libero.it

eingereicht: 6.2.2012, akzeptiert: 16.5.2012; online verfügbar: 25.7.2012

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posterior setae markedly bulged); 19 slitlike lyrifissures present on carapace, 6 of them on the posterior carapace margin (Fig. 2A).

Chelicerae (Fig. 2B) small, slightly sclerotized, with small, largely unsclerotized teeth on both fixed and movable fingers; hand with 5 setae, movable finger with one seta; subapical lobe slightly prominent; galea with 5 terminal rami; rallum of 4 blades, serrula exterior with 18 blades.

Palps thick, hand of chela subcylindrical, movable finger slightly longer than width of hand; trichobothria as in Fig. 2C; fixed finger with 19, movable finger with 21 contiguous teeth; terminal tooth of fixed finger broken; no venom ducts discernible.

Pedal tarsus IV with long tactile seta (Fig. 2D), distinctly longer than width of tarsus (length of seta 0.24 mm, width of tarsus 0.08 mm) and inserted distally of the middle (TS = 0.65).

Abdominal tergite I partly divided, tergites II–X divided, tergite XI undivided; chaetotaxy of tergites I–X (right+left hemitergite): 3+3: 3+4: 4+4: 5+5: 8+8: 7+8: 7+8: 9+7: 8+8: 8+6, tergite XI with 8 setae and 2 long tactile

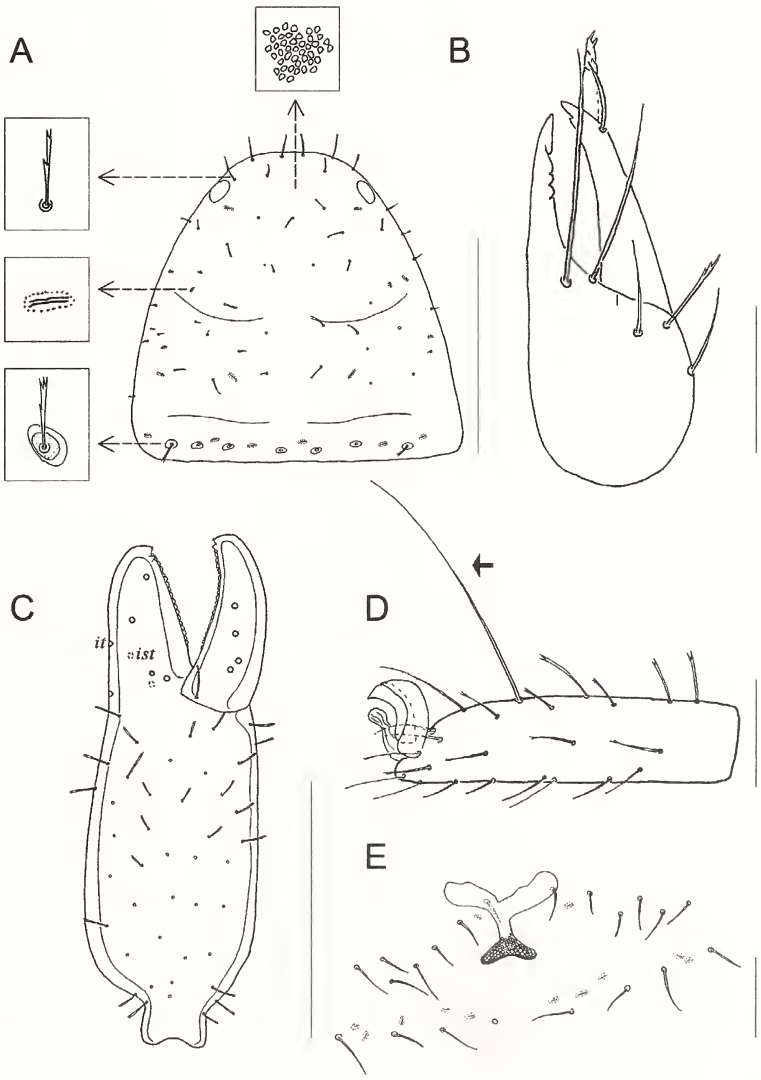

Fig. 1: Map showing the locality of *Withius hispanus* in Slovakia. Arrow points to the study site.

Fig. 2: Female of *Withius hispanus* from Slovakia. A. Carapace with transverse furrows (dorsal view). Arrows point to the details of granulation, setae and lyrifissure. B. Right chelicera with galea (dorsal view). C. Left palpal chela with the trichobothrial pattern (lateral view; *it* – interior terminal trichobothrium, *ist* – interior subterminal trichobothrium). D. Tarsus IV (dorsal view). Arrow points to the tactile seta. E. Spermatheca (ventral view). Scales: 0.1 mm (B, D, E), 0.5 mm (A, C).

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setae; lyrifissures on tergites I–X (right+left hemitergite): 3+3: 3+3: 3+3: 2+3: 4+4: 3+3: 3+3: 2+3: 3+3: 2+2, tergite XI with 2 lyrifissures. Abdominal sternite II partly divided, sternites III–X divided, sternite XI undivided; sternite II with 13 setae; chaetotaxy sternites III–IX (right+left hemisternite): 4+4: 5+5: 7+7: 8+7: 8+8: 8+8: 8+8; sternite X with 6+5 and 2 long tactile setae; sternite XI with 6 setae and 4 tactile setae; stigmatic plates with 1 small seta; sternites VII–VIII with 2 small sensory setae. Internal genitalia with median circumflex-shape cribriform plate and sclerotised lateral parts with small oval cribrate areas; a pair of sac-shaped spermathecae (Fig. 2E).

Measurements (length/width in mm) and ratios: Body length 2.00. Carapace: 0.75/0.74 (anterior width 0.40) (ratio x1.0); eyes 0.07 from anterior margin of carapace. Chelicerae: 0.25/0.12 (x2.1); movable finger length 0.18; galea length 0.06. Pedipalps: trochanter 0.33/0.19 (x1.7); femur 0.61/0.21 (x2.9); patella 0.58/0.26 (x2.2); chela 0.98/0.33 (x3.0); hand 0.65/0.33 (x2.0), hand without pedicel length 0.56; movable finger length 0.35. Leg I: femur I 0.12/0.13 (x0.9); femur II 0.24/0.135 (x1.8); tibia 0.25/0.09 (x2.8); tarsus 0.28/0.06 (x4.7). Leg IV: femur 0.56/0.23 (x2.4); tibia 0.45/0.13 (x3.5); tarsus 0.32/0.08 (x4.0).

Discussion

Until recently, 54 pseudoscorpion species from seven families were known from Slovakia, including the previous first regional records of *Allochernes powelli* (Kew, 1916), *Chthonius carinthiacus* Beier, 1951 and *Chthonius tuberculatus* Hadži, 1937 (CHRISTOPHORYOVÁ et al. 2011b, 2011c, 2012). In the present paper the family Withiidae is reported as the first regional record, represented by the species *Withius hispanus*. This species was originally briefly described by KOCH (1873) from Spain from the collection of E. Simon. More taxonomic characters were given by BEIER (1932, 1963), but he considered *Withius faunus* (Simon, 1879) as a synonym of *Withius hispanus*. HEURTAULT (1971a) elaborated a key of the European and North African species with the differentiation of the species *W. hispanus* and *W. faunus*. Later she described their genitalia in detail (HEURTAULT 1971b). According to the key by HEURTAULT (1971a), the palpal femur of *W. hispanus* is less than 2.5 times and the palpal patella less than 2.3 times longer than broad. The palpal femur of the Slovakian specimen is 2.9 times longer than broad. HADŽI (1939) mentioned a length/width ratio of the palpal femur of 2.6 times, DUCHÁČ (1999) 2.9 times and MAHNERT (2004) from 2.3 to 2.8 times. The main taxonomic characters of the Slovak female correspond with those given by other authors for this species. A greater variability was registered in the chaetotaxy of the carapace, sternites and tergites, measurements of the carapace, galea, pedipalps and leg IV and the number of teeth on the chelal fingers. HADŽI (1939) mentioned that tergites I and X were not divided, in our female tergite I was partly divided and tergite X divided. The presence of six setae on the cheliceral hand mentioned by HADŽI (1939) seems to be incorrect; the hand of the Slovak female and specimens from the collection of second author from Sardinia bears only five setae.

DASHDAMIROV & SCHAWALLER (1992) and MAHNERT (2004) differentiated *W. hispanus* from *W. piger* (Simon, 1878) by the position of trichobothria *it* and *ist* on the fixed chelal finger (Fig. 2C) – in *W. hispanus* the trichobothrium *it* is dorsal and *ist* internal (e contra converso in *W. piger*) and *it* is situated in the level of the *ist* position (in *W. piger* more distally than *ist*). The spermatheca of both species is different as well (HEURTAULT 1971b, LEGG & JONES 1988).

Withius hispanus lives mainly under the bark of trees and stumps such as plane trees (LESSERT 1911, KÄSTNER 1928), oak and elm trees (BEIER 1963), an almond tree and pine stumps (BEIER 1967) or dead trees (DUCHÁČ 1999). DASHDAMIROV (1999) collected specimens under the bark of trees, stumps and occasionally under stones. ZARAGOZA (2007) found specimens under the bark of domestic apple and a locust tree. In Slovakia, the female was found in the pitfall trap situated in the floodplain forest composed of white willow and white poplar.

This new record of the family Withiidae – and also several other previous first species and family records in Slovakia (CHRISTOPHORYOVÁ et al. 2011a, 2011b, 2011c, 2011d, 2012) – indicates that the total diversity of pseudoscorpions is still not completely known in this country.

Acknowledgements

The first author would like to thank Alica Christophoryová for technical assistance with the figures. The project was financially supported by UK/227/2012 and VEGA 1/0176/09.

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Zeitschrift/Journal: Arachnologische Mitteilungen

Jahr/Year: 2012

Band/Volume: 44

Autor(en)/Author(s): Christophoryova Jana, Gardini Giulio, Enekesová Edina

Artikel/Article: Withius hispanus new to the fauna of Slovakia (Pseudoscorpiones: Withiidae) 10-13