

FIRST RECORD OF *Cylindroiulus horvathi* (DIPLOPODA, JULIDA, JULIDAE) IN SERBIA

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ABSTRACT. *Cylindroiulus horvathi* (Verhoeff, 1897), found at a single locality in Vojvodina, north Serbia, is the third representative of the genus *Cylindroiulus* Verhoeff, 1894 in Serbian millipede fauna. Brief description and ecological aspects are given. Key to the *Cylindroiulus* species in Serbia and distribution map with incorporated new data are also provided.

Key words: Serbia, Diplopoda, Julida, *Cylindroiulus*.

INTRODUCTION

Currently, the Serbian millipede fauna includes 101 species, belonging to 44 genera and 16 families of which Julidae, with 16 genera and 41 species, is the largest (ANTIĆ *et al.*, 2013, 2014). Although the genus *Cylindroiulus* Verhoeff, 1894 includes about 100 species in Europe (Enghoff and Kime, 2013), only two of them were registered in Serbia up to now: *Cylindroiulus boleti* (C. L. Koch, 1847) and *C. luridus* (C. L. Koch, 1847) (ANTIĆ *et al.*, 2013). *C. horvathi* (Verhoeff, 1897) is the third species of this genus and the 102. species of millipedes in Serbia. It belongs to the *horvathi* group of species, alongside *Cylindroiulus abaligetanus* Verhoeff, 1901 and *C. cambio* Korsós & Read, 1994. Similarities in external characteristics and in gonopod structure have been recognized (ATTEMS, 1903; VERHOEFF, 1905), which led to the establishment of the group. They are small animals, with a crenulated limb and an indented apex of the gonopodal opisthomerite, separating the brachite from the solenomerite. Their distribution area extends from the middle Europe, Balkan Peninsula, Crimea, to northwest Russia (KORSÓS and READ, 1994). This paper represents the first report of *C. horvathi* in Serbia.

MATERIAL AND METHODS

Specimens were preserved in 70% ethanol and analyzed at the laboratories of the Institute of Zoology, University of Belgrade - Faculty of Biology. Examination of the whole specimens was done using a Carl Zeiss Stemi 2000-c binocular stereomicroscope with an AxioCamMRC camera and AxioVision Rel. 4.2 program. For adult specimens, dimensions

and numbers of body rings were determined. Photographs of the gonopods were prepared on Carl Zeiss Axioscope 40 microscope with Canon PowerShot A80 digital camera connected and processed through Zerene Stacker program.

To illustrate the distribution of the genus *Cylindroiulus* in Serbia we used the UTM notation system. The map records the presence of the species in 10 km squares of the UTM grid. The map (Fig. 4) records the presence of the species in 10 km squares of the UTM grid.

RESULTS AND DISCUSSION

Cylindroiulus horvathi (Verhoeff, 1897) (Figs. 1 and 3)

Syns.: *Cylindroiulus vitosae* Strasser, 1962

Cylindroiulus dietli Verhoeff, 1989

Cylindroiulus ponticus Golovatch, 1978



Fig. 1. *Cylindroiulus horvathi* (Verhoeff, 1897), a female from the shores of Lake Rusanda, Vojvodina, Serbia.

Material examined: 1 female, 1 male and a juvenile specimen from the shores of Lake Rusanda (Fig. 2), near Melenci, Vojvodina, north Serbia, collected on 3/18/2014, by M. Šćiban. Specimens are kept at the Institute of Zoology, University of Belgrade - Faculty of Biology.

Short description: Female with 43 body rings + telson, length 11.5 mm, maximum height 1.10 mm. Male with 40 body rings + telson, length 9.3 mm, maximum height 0.8 mm. Coloration light yellowish brown with distinctive ozadenes and lighter legs. Darker mid-dorsal stripe present. Head with antennae reaching first trunk body ring. Telson with an epiproctal projection directed downward. Gonopods: promerite and mesomerite of equal length. Projecting rim of promerite enwrapping mesomerite laterally. Oral margin of

mesomerite indented. Paracoxal rim prominent, embowed. Paracoxal process wide, blunt, with notches on posterior margin. Solenomerite projecting beyond tip of brachite (Fig. 3).



Fig. 2. Shore of Lake Rusanda, habitat of *Cylindroiulus horvathi* (Verhoeff, 1897) in Serbia (photo M. Šćiban).

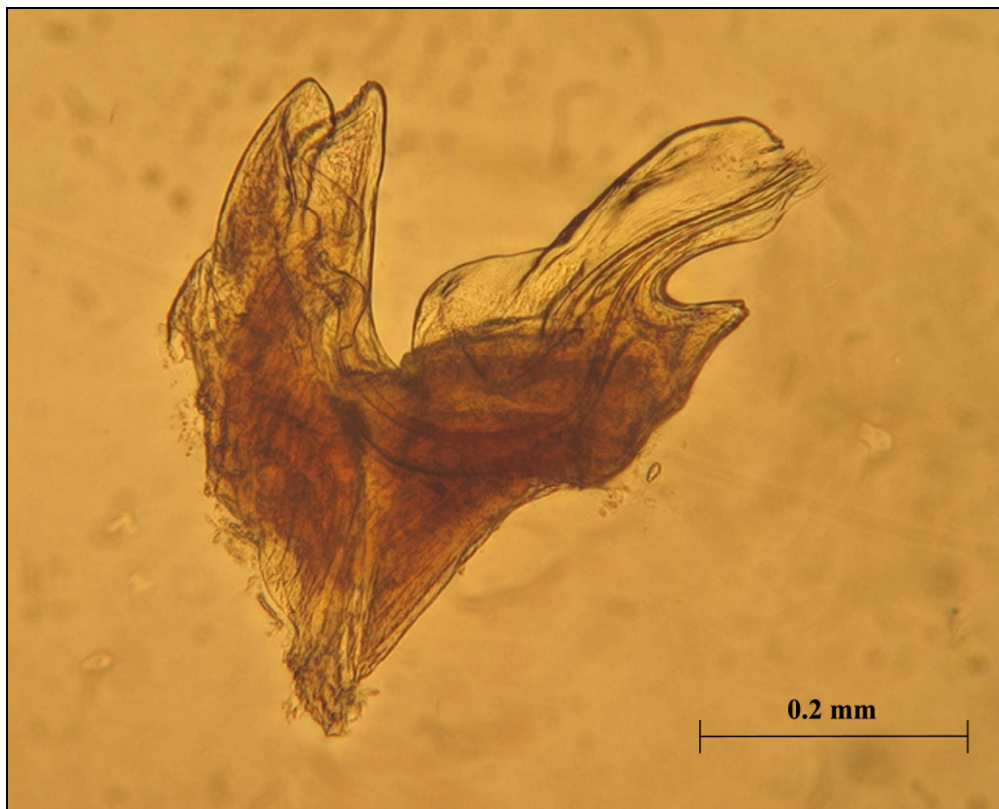


Fig. 3. – *Cylindroiulus horvathi* (Verhoeff, 1897), gonopods, mesal view, male from the shores of Lake Rusanda, Vojvodina, Serbia.

Distribution of *Cylindroiulus* species in Serbia (Fig. 4):

***Cylindroiulus boleti* (C. L. Koch, 1847):** Deliblatska pešćara (VUČKOVIĆ, 1956); v. Gledjica, near Ivanjica (ĆURČIĆ and MAKAROV, 1998); Ljuboten, Mt. Šar planina (ATEMS, 1929); Kačanik (VUČKOVIĆ, 1956); Mt. Fruška Gora (VUČKOVIĆ, 1956); Mt. Kosmaj (VUČKOVIĆ, 1956); north and central Serbia (ĆURČIĆ and MAKAROV, 1997); Obedska Bara, v. Obrež, nr. Belgrade (MAKAROV *et al.*, 2004); Ripanj, nr. Belgrade (MAKAROV *et al.*, 2004); without precise locality (STRASSER, 1971, 1971a; MRŠIĆ, 1985) east Serbia (ANTIĆ *et al.*, 2013); **new data:** 3 males, 1 female, 1 juvenile, v. Temska, Piroć, 6/1/2011, 6/2/2011, leg. D. Antić; 3 females, v. Izbice, Novi Pazar, 2012. leg., D. Stojanović; 1 male and 1 female, v. Viče, Mt. Šar planina, 5/11/2012, leg. N. Živić; 1 male, Leposavić, Zrnosek, 10/17/2012, leg. N. Živić; 1 female, vrelo Grze, Paraćin, 7/9/2009, leg. D. Antić and D. Stojanović; 2 juveniles, r. Ivanštica, Grza, Paraćin, 7/12/2009, leg. J. Đuknić; 1 female, klisura Ivanštice, Grza, Paraćin, 4/19/2010, leg. J. Đuknić; 1 juvenile, planinarski dom, Grza, Paraćin, 4/19/2010, leg. D. Antić; 6 females and 3 males, planinarski dom, Grza, Paraćin, 4/22/2010, leg. BID “Josif Pančić”; 1 female, planinarski dom, Grza, Paraćin, 7/8/2010, leg. D. Antić; 3 females and 1 juvenile, Donje jezero, Grza, Paraćin, 7/10/2010, leg. BID “Josif Pančić”; 1 female, Ravlje, Staniševac, Zasavica, Sremska Mitrovica, 8/5/2009, leg. M. Stanković; 1 female, Turske livade, Zasavica, Sremska Mitrovica, 11/18/2011, leg. M. Stanković; 1 female, Trebljevine, Banovo Polje, Zasavica, Sremska Mitrovica, 8/5/2012, leg. M. Stanković; 1 male and 1 female, Šumareva Čuprija, Zasavica, Sremska Mitrovica, 4/23/2013, leg. M. Šćiban.

Cylindroiulus horvathi (Verhoeff, 1897): Rusanda Lake, nr. Melenci (present study).

Cylindroiulus luridus (C. L. Koch, 1847): Central Serbia (ĆURČIĆ and MAKAROV, 1997); Donji Jasmići, Mt. Goč (MRŠIĆ, 1985).

Key to the identification of *Cylindroiulus* species in Serbia:

Description of the genus *Cylindroiulus*: Without frontal setae and setae on the metazonites. Flagellum always present. Brachite narrow. Coxite rising laterally as a high, semi-circular hump. Promerite and mesomerite short. Opisthomerite inclined backward (SCHUBART, 1934; READ, 2007).

1. Telson with downward directed epiproctal projection 2
Without projection of telson beyond anal valves*Cylindroiulus boleti*
2. Promerite and mesomerite subequal in length. Brachit well developed and wide, separated by a small indentation from solenomerite.*Cylindroiulus horvathi*
Promerite and mesomerite short and broad, with mesomerite somewhat shorter than promerite. Opisthomerite with narrow, curved hook-shaped brachite. *Cylindroiulus luridus*

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