

FIRST RECORD OF *BOTHRIONEURUM VEJDovskyANUM* ŠTOLC, 1886 (OLIGOCHAETA, TUBIFICIDAE) IN SERBIA

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Abstract - We report the discovery of *Bothrioneurum vejdoskyanum* Štolc, 1886 (Annelida: Oligochaeta: Tubificidae: Rhyacodrilinae) in Serbian freshwaters. Fifteen specimens were found in the middle course of the River Ibar (southern Serbia), at a locality where the macrolithal type of substrate and strong currents prevail. These organisms were found together with *Stylodrilus heringianus* (Claparede, 1862). They were among the most abundant Oligochaeta species. The species are described and its biology and distribution are discussed. The present record contributes to the knowledge on the general distribution of this rare species, particularly in the Balkans (southeastern Europe).

Key words: *Bothrioneurum vejdoskyanum*, Tubificidae, rare species, Ibar River, Serbia

INTRODUCTION

Information on the distribution of *Bothrioneurum vejdoskyanum* Štolc, 1886 (Annelida: Oligochaeta) is scarce. *B. vejdoskyanum* belongs to a rare species of the family Tubificidae, subfamily Rhyacodrilinae, as its representatives have diffuse prostate tissue on the atria and abundant and large coelomocytes. Within the genus *Bothrioneurum* which includes 6 species distributed in the tropic region of South America (except *B. iris* Beddard, 1901 which is found in S. America, Asia and tropical Africa), only *B. vejdoskyanum* is widely distributed in the Holarctis (Timm, 1997).

The occurrence of this species in Serbia has not been reported until now. Illies (1978) has reported this species for the Mediterranean (ecoregion 3),

the Central Uplands in Germany (ecoregion 9), the Carpathian Mountains (ecoregion 10), the North European Plain (ecoregions 14 and 15) and England (ecoregion 18). In accordance with Fauna Europea (2011), the hitherto known distribution includes almost all of Europe, except the southeastern region (the Balkans). Bulgaria is the only country on the Balkan Peninsula where *B. vejdoskyanum* was recorded prior to the recent report of Šundić et al. (2011) who identified the species in Montenegro. This species probably exists in other countries of the region; however, it is rare. Further, as it has only bifid setae, it can be easily mistaken for juvenile specimens of other species, such as *Limnodrilus* spp., *Potamothrix moldaviensis* (Vejdovsky and Mrázek, 1902) and *Rhyacodrilus falciformis* (Bretschger, 1901) (Dumnicka and Poznańska, 2006). The new record of *B. vejdoskyanum* in Serbia presented

herein extends its distribution from central Europe to the southeast.

MATERIALS AND METHODS

Fifteen undamaged specimens of *B. vej dovsky an um* were collected from the Ibar River (Serbia) in April 2011 at Kaznovičko hill near Raška (N 43° 16' 33", E 20° 38' 24"; altitude of 426 m) (Fig. 1.). Samples were collected with a benthological hand net (mesh size 500 µm; Kick and Sweep technique – EN 27828:1994) from an area of 0.0625 m² and from all the available habitats represented with more than 5% of the total habitat area on the sampling stretch, according to the multi-habitat sampling procedure.

The worms are preserved in 4% formaldehyde and stored in the collection of biological materials of the Benthological Section of the Institute for Biological Research “Siniša Stanković” in Belgrade. For a detailed examination of the identifying characters, three specimens were mounted on slides in Canada balsam and photographed using a Carl Zeiss invert AXIOVERT 200M microscope, with digital microscopic camera software AxioVision 4.5.

RESULTS AND DISCUSSION

All of the morphological characters of the examined individuals corresponded to Timm's (2009) guide for species identification (Fig. 2a). The prostomium possesses a distinct sensory pit (Fig. 2b). In the dorsal and ventral bundles, only bifid setae are noted. The upper tooth is longer than the lower tooth anteriorly; posteriorly, the teeth were of equal length. Hair setae in dorsal bundles are absent.

The investigated sector of the Ibar River has a large hilly-mountainous watercourse character. Certain features of the macrozoobenthos community point to the presence of moderate amounts of organic pollutants (domination of indicators of beta-mesosaprobity). The macroinvertebrate community at the same sampling site was diverse. It was comprised of nematodes, Hydrachnidia, bivalves and a variety of insects, such as Chironomidae and other

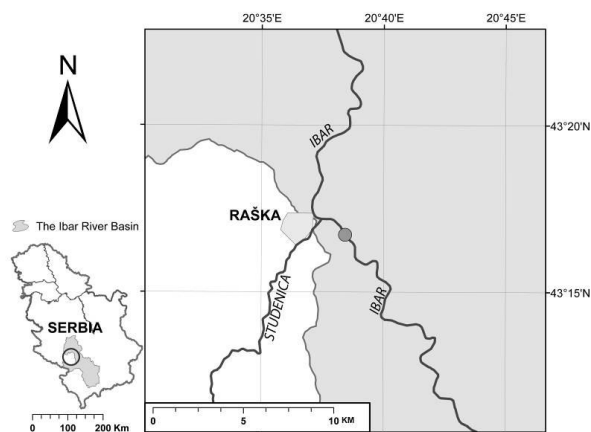


Fig. 1. The position of the Ibar River Basin and sample site where *Bothrioneurum vej dovsky an um* was found.

Diptera larvae, Ephemeroptera, Trichoptera, Plecoptera and Coleoptera. *B. vej dovsky an um* was recorded in a habitat that mainly contained large (macrolithal 50%, grain size 20-40 cm) and medium sized stones (mesolithal 40%, grain size 6-20 cm). The bottom substrate in about 5% of the investigated stretch has size fractions smaller than 2 cm (alcal and psammal substrates).

All of the observed individuals were juvenile or immature. This is not surprising since asexual reproduction is typical for *B. vej dovsky an um*. As Timm (1997) has observed, maturation of this species is very rare and hard to observe. Accompanying Oligochaeta species were *Sty lodrilus heringianus* (Claparede, 1862), (the dominant species in the oligochaete assemblage; 52% of the total population); *Henlea ventriculosa* (d'Udekem, 1854), (8%); *Limnodrilus hoffmeisteri* (Claparede, 1862), (4%); *Psammoryctides albicola* (Michaelsen, 1901), (4%); *Potamothrrix vej dovsky i* (Hrabe, 1941), (2%). *B. vej dovsky an um* was the subdominant species in the oligochaete assemblage (30%).

According to Uzunov et al. (1988), *B. vej dovsky an um* belongs to beta-mesosaprobic species with a saprobic valence (Si)=1.7. However, it is tolerant to eutrophication and organic pollution (Timm, 2009; Sporka and Mlák a, 2008; Dumnicka,

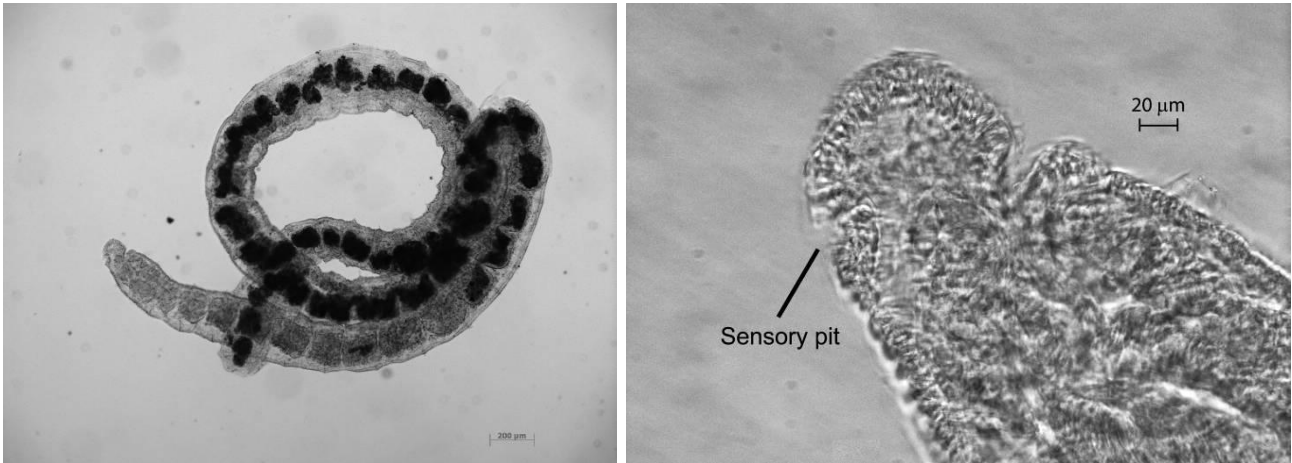


Fig. 2. *Bothrioneurum vejdoskyanum*. (a) Whole specimen and (b) anterior end of body (prostomium) with sensory pit.

2007), the same as *S. heringianus* (SI=1.7 according to Uzunov et al. (1988) and SI=1.9 according to Hörner et al. (2002)) which is a common species in pollution-free areas (Hiltunen, 1969). However according to this author it has also been reported in polluted waters. *S. heringianus* is the dominant species in habitats with stony substrates (Nijboer et al., 2004). *B. vejdoskyanum* prefers a relatively straight and shallow stretch of river with water levels that do not fluctuate too much and in which the substratum does not shift (Sporka and Mláka, 2008). In view of the above, co-occurrence of these two species in the Oligochaeta assemblage is not unexpected. The distribution of the substrates decreased the competition between *B. vejdoskyanum* and *S. heringianus* that were the dominant species at this site.

According to the available literature records, the species can be expected to be found in lowland streams or lower highland streams, at elevations between 103 and 260 m a.s.l. (Sporka and Mláka, 2008; Schenková et al., 2006). The species was found in the River Danube in the Iron Gate II stretch at an altitude of 42 m (Graf et al., 2008). *B. vejdoskyanum* was discovered in the Zeta River in Montenegro at the same altitude (Šundić et al., 2011). Our finding of the species at 426 m a.s.l indicates that it can also be present at medium elevations.

The species was mostly observed in sand- and gravel-dominated habitats (Timm, 1987). Further, it was recorded in the River Danube at stretch where the bottom substrate consists mostly of sand and mud (Graf et al., 2008). The records of Šundić et al. (2011) correspond to our findings in regard to the dominant riverbed substrate, suggesting that the substrate is not a limiting factor for *B. vejdoskyanum*.

According to Timm (1987), a high level of organic pollution is a limiting factor for the distribution of this species, since it is absent from the habitats assessed as alpha-mesosaprobic.

Judging by the available literature data, and the results of our previous investigations of Serbian freshwaters, we can conclude that *B. vejdoskyanum* is a rare species, especially in southeastern Europe (the Balkans). The present finding extends the limits of distribution of this rare species.

Further studies are necessary to investigate the presence of this species in other Serbian watercourses, and to establish which environmental parameters influence its distribution and reproduction.

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