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LEPTOIULUS (LAMELLOIULUS) IVANJICAE, A NEW ENDEMIC MILLIPEDE FROM THE BALKAN PENINSULA (DIPLOPODA, JULIDAE)

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Key words: Myriapoda, Julidae, *Leptoiulus (Lamelloiulus) ivanjicae*, biogeography, Yugoslavia.

ABSTRACT

A new species of the diplopod genus *Leptoiulus* Verhoeff, 1894: *Leptoiulus (Lamelloiulus) ivanjicae* nov. spec. is described from western Serbia, Yugoslavia. The diagnostic characters of this millipede are compared to those of its phylogenetically close congeners. Notes are given on the habitat and geographic distribution of this endemic species.

INTRODUCTION

The genus *Leptoiulus* Verhoeff, 1894, comprises as many as nine subgenera: *Leptoiulus* s. str. (about 30 species; central and south-eastern Europe), *Cannoniulus* Verhoeff, 1929 (one species; Croatia), *Lamelloiulus* Verhoeff, 1926 (4 species; central and eastern Europe), *Heloiulus* Verhoeff, 1932 (2 species; northern and eastern Europe), *Proleptoiulus* Verhoeff, 1929 (1 species; southern Europe), *Acrovelatus* Attems, 1927 (4 species; central and western Europe), *Kolpophylacum* Attems, 1927 (6 species; western Alps), *Iberogallus* Attems, 1927 (4 species; France, Spain, and Portugal), and *Parviulus* Jawlowski, 1929 (3 species; ex-USSR, and Iran) (Hoffman, 1979).

In Yugoslavia (Serbia and Montenegro), only representatives of the subgenus *Leptoiulus* s. str. have been found so far (Strasser, 1971; Mršić, 1987, 1988). Twenty-two species of this subgenus inhabit the Balkan Peninsula, of which only two are found in both Serbia and Montenegro: *Leptoiulus (Leptoiulus) trilineatus* (C. L. Koch, 1847), and *Leptoiulus (Leptoiulus) sarajevensis* Verhoeff, 1898.

Another subgenus, *Lamelloiulus*, included four species: *Leptoiulus (Lamelloiulus) proximus* Nemeč, 1896 (Germany, Austria, the Czech Republic, Hungary, Slovenia, and Croatia), *Leptoiulus (Lamelloiulus) trilobatus* Ver-

hoeff, 1894 (Germany, the Czech Republic, Poland, Hungary, and Romania), *Leptoiulus (Lamelloiulus) rubidicollis* Verhoeff, 1899 (Hungary, and Romania) and *Leptoiulus (Lamelloiulus) liptauensis* Verhoeff, 1899 (Poland and the Czech Republic) (Attems, 1927; Hoffman, 1979; Mršić, 1987, 1988). A fifth species of this subgenus, *Leptoiulus (Lamelloiulus) ivanjicae* is described in this paper as a new species to science from western Serbia, Yugoslavia.

MATERIAL

Two samples of diplopods, collected in 1994 and 1996, from oak and beech litter, near Ivanjica, western Serbia, Yugoslavia, have yielded one new species: *Leptoiulus (Lamelloiulus) ivanjicae* nov. spec. The specimens of this new taxon have been dissected, thoroughly examined, described, and illustrated.

The type specimens of *L. (L.) ivanjicae* nov. spec. are deposited in the collections of the Institute of Zoology, Faculty of Biology, University of Belgrade, Belgrade, Yugoslavia, and in the Zoological Museum Amsterdam (ZMA), The Netherlands (1 paratype male and 1 paratype female).

DESCRIPTION

Leptoiulus (Lamelloiulus) ivanjicae, nov. spec.
(Figs. 1-8)

Etymology

This species is named after its type-locality.

Specimens studied

Holotype male, allotype female, 2 paratype males and 3 paratype females, from oak and beech litter, humus and soil, Mt. Ravana, Ivanjica; October 16, 1994; collected by O. S. Karamata, R. N. Dimitrijević, L. R. Lučić and S. E. Makarov; 1 paratype male and 1 paratype female, from oak litter, humus and soil, village of Kumanica (at the Roman bridge), the slopes of Mt. Golija, near Ivanjica; August 13, 1996; collected by B. P. M. Ćurčić, O. S. Karamata, S. V. Djukić, and M. V. Ćurčić.

Males with 42 podous segments and 2 apodous segments, females with 37-47 podous segments and 2 apodous segments. Body length 10.6-11.8 mm (males), 8.2-13.6 mm (females). Maximal vertical body diameter (H) 0.7-0.8 mm (males), 0.6-1.0 mm (females). From last 6 segments body rapidly tapering towards telson.

Colour: body dorsally dark brown, ventrally light brown. Legs whitish.

Head: with frontal setae; with a single row of 15 marginal labral setae and with a single row of 4 supralabral setae. Eyes small, arranged in 6 or 7 rows; each eye composed of 25-31 ocelli. Antennae short: 0.7 mm in males, 0.8 mm in females; apical antennal sensilla long (of the same length as antennomere 7); antennomerae 2 and 5 longer than others; antennomere 1 with two long setae. Mandibles in males normal; without stipital lobes. Gnathochilarium (Fig. 7) with 3 apical setae on each stipes and with 1 seta on each lingual plate; stipites not apically swollen.

Collum: smooth, with 6 long setae on posterior margin; posterior part of collum light yellowish-brown, anterior one dark brown.

Body segments: prozonites and metazonites smooth (without striae), posterior edges of metazonites with a row of 12-15 long setae. Suture between pro- and metazonites indistinct, ozopores situated behind suture, in metazonites.

Telson (Fig. 8): preanal ring with a long apical dorsal spine, which carries long setae on lateral side. Anal valves semicircular, densely covered with setae. Subanal scale triangular, with 3 long setae on each lateral side (6 in total).

Legs: second pair of legs (Fig. 3) with coxal projection; other legs without modifications and adhesive pads.

Male sexual characters: first pair of legs hook-shaped as in most other julids (Figs. 1, 2). Gonopods: promerite (Figs. 4-6) slender, almost parallel-sided. Mesomerite (Figs. 4-6) rounded on the top, with numerous nipples. Opisthomerite (Figs. 4, 5) slender, higher than pro- and mesomerite, apically divided into a finger-shaped solenomerite and a complex laminate process. Soleno-

merite with two small apical denticles. Laminate process convoluted, free edges facing solenomerite. Mesal edge of process undulate. Lateral edge of process overreaching mesal edge. Most of lateral edge densely covered with long, slender denticles, anteriorly a larger triangular process. Lateral edge basally excavate, with two slender processes: a basalmost larger process (covered with very fine hair-like processes), and a more distal, smaller bifurcate process.

Distribution

Western Serbia (Yugoslavia), epigeal (in leaf litter, humus, and soil); endemic species.

COMPARISON AND DISCUSSION

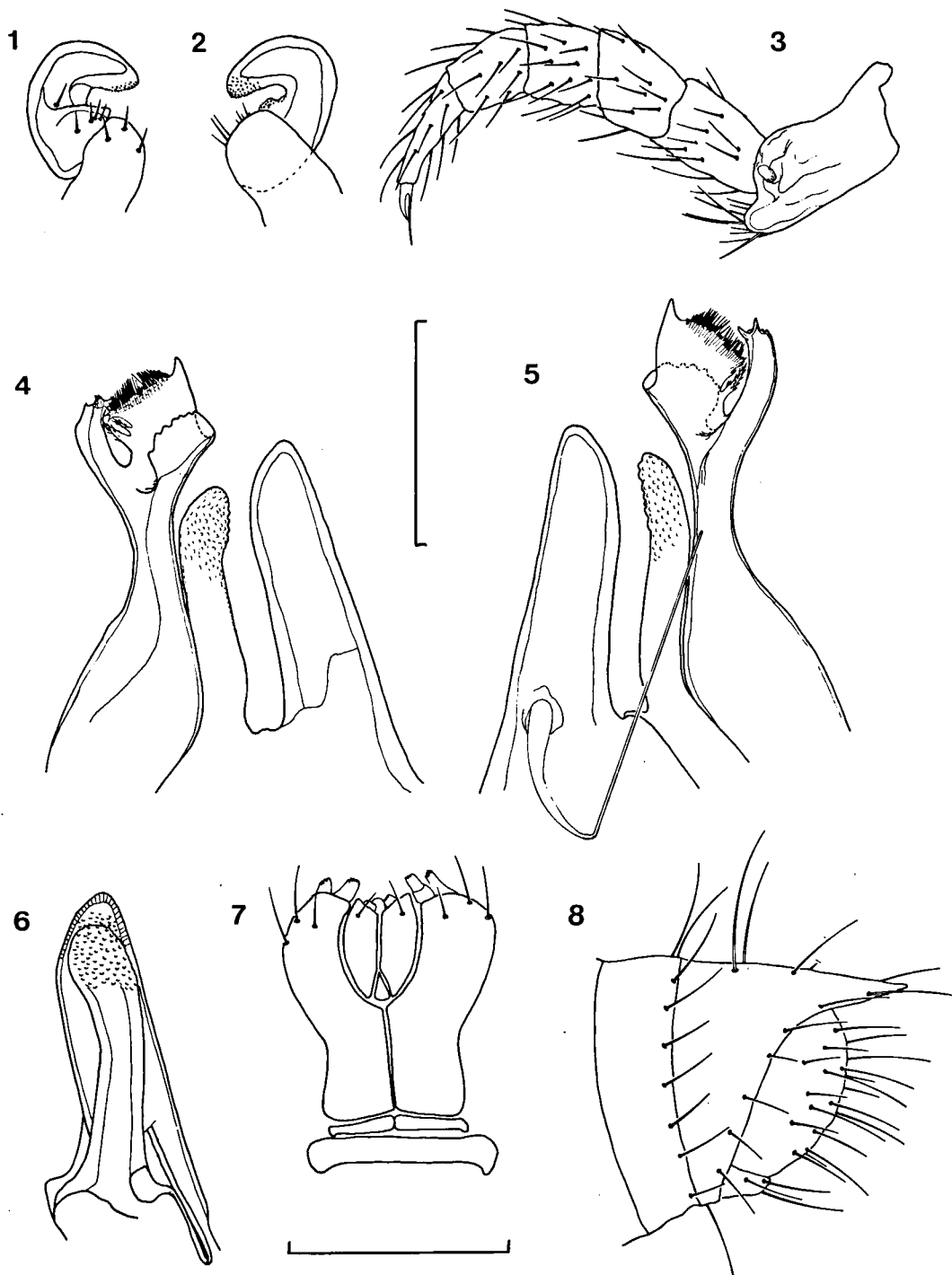
The new species differs in many important respects from all other *Leptoiulus (Lamelloiulus)* species, viz., *L. (L.) lip-tauensis*, *L. (L.) proximus*, *L. (L.) trilobatus*, and *L. (L.) rubidicollis*. From all these species, *L. ivanjicae* nov. spec. is easily distinguished by the combination of the following characters: smaller size of the body, the absence of metazonite striae, the absence of the promerite internal process, the absence of phylacum, the absence of the opisthomerite coxal process, and by the presence of denticles on the opisthomerite laminate process.

From the biogeographical point of view, the Balkan Peninsula belongs to the so-called "Adriatic angle" (Stanković, 1960), which is characterized by a high degree of endemic differentiation of species and by the presence of a rich relictual fauna of many arthropod groups, including millipedes (Vandel, 1964; Pretner, 1968; Strasser, 1971; Gueorguiev, 1977; Deeleman-Reinhold, 1978; Ćurčić, 1988; Beron, 1994). The reasons for such diversity of both species and genera have been outlined elsewhere (Ćurčić, 1988).

It is pertinent to note that many relict diplopods have a limited distribution in the Balkan Peninsula; some of these inhabit even only one or few caves (Ceuca, 1992), or they occur in rather restricted areas. Such forms, including *L. (L.) ivanjicae* nov. spec., probably represent the remnants of an older, humicolous and hygrophilous fauna; these forms colonized new niches (both in epigeal and/or subterranean habitats), which had been formed due both to the succession of the suitable climatic changes and the evolution of the karstification process in the area studied (Ćurčić, 1988).

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Figs. 1-8. *Leptoiulus (Lamelloiulus) ivanjicae* nov. spec., holotype male, from western Serbia, Yugoslavia. 1, first leg, internal view; 2, first leg, external view; 3, second leg, posterior view; 4, left gonopod, exterolateral view; 5, left gonopod, interolateral view; 6, promerite and mesomerite, posterior view; 7, gnathochilarium, ventral view; 8, preanal ring, lateral view. Scale lines: 0.2 mm (Figs. 1-7) and 0.4 mm (Fig. 8).

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