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A new cavernicolous species of the millipede genus *Typhloglomeris* Verhoeff, 1898 from western Georgia, Caucasus (Diplopoda: Glomerida: Glomeridellidae)

Новый пещерный вид многоножек рода *Typhloglomeris* Verhoeff, 1898 из Западной Грузии, Кавказ (Diplopoda: Glomerida: Glomeridellidae)

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КЛЮЧЕВЫЕ СЛОВА**:** таксономия, *Typhloglomeris*, новый вид, пещера, Грузия, Закавказье.

ABSTRACT. A new diplopod species is described from a cave in western Georgia, Transcaucasia: *Typhloglomeris palatovi* **sp.n.** The new species seems to be a troglobite and joins the *caucasica*-group, but differs clearly from *T. caucasica* Golovatch, 1975, the sole other component species, a troglophile from near Sochi, Krasnodar Territory, Russian Caucasus, primarily by the shape of the telopod syncoxite which in *T. palatovi* **sp.n.** shows particularly thick lateral horns and a simple, rounded, central lobe devoid of parabasal "shoulders".

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РЕЗЮМЕ. Из пещеры в Западной Грузии (Закавказье) описан новый вид диплопод: *Typhloglomeris palatovi* **sp.n.** Новый вид, кажется, является троглобионтом и входит в группу видов *caucasica*, но хорошо отличается от *T. caucasica* Golovatch, 1975, единственного другого вида-компонента группы, троглофила близ Сочи (Краснодарский край, российский Кавказ), прежде всего, формой синкоксита телоподов, который у *T. palatovi* **sp.n.** имеет особенно сильно утолщённые боковые рога и простую, округлую, центральную пластинку, у основания лишённую «плеч».

Introduction

The millipede genus *Typhloglomeris* Verhoeff, 1898 has hitherto been known to comprise 13 accepted species (not ca 15, as erroneously stated in Minelli [2015]), arranged in alphabetic order as follows: *T. alba* (Golovatch, 1989), from Yalova, western Turkey [Golovatch, 1989]; *T. asiaeminoris* (Strasser, 1975), from western Turkey (including its European part) and central and southern mainland Greece [Strasser, 1975, 1976; Golovatch, 1989; Thaler, 1999; Kime, Enghoff, 2013]; *T. caucasica* Golovatch, 1975, from near Sochi, Krasnodar Territory, Russian Caucasus [Golovatch, 1975, 1989; Golovatch, Chumachenko, 2013]; *T. coeca* Verhoeff, 1898, the type species, possibly a troglobiont widespead in Bosnia and Hercegovina, as well as northern Montenegro and southern Croatia, including some subalpine caves [Verhoeff, 1898, 1899; Attems, 1929, 1959; Mršić, 1994; Makarov et al., 2003, 2004; Kime, Enghoff, 2013], and a senior synonym of *T. serrata* Attems, 1951 [Attems, 1951, 1959; Strasser, 1971; Kime, Enghoff, 2013]; *T. contrasta* Golovatch, 2003, from northwestern Syria [Golovatch, 2003]; *T. fiumarana* Verhoeff, 1899, from a limestone outcrop in Croatia [Verhoeff, 1899; Attems, 1929; Mršić, 1994; Kime, Enghoff, 2013]; *T. ljubetensis* (Attems, 1929), from Serbia (including Kosovo) and the Republic of Macedonia [Attems, 1929; Mršić, 1993; Makarov et al., 2003, 2004; Kime, Enghoff, 2013]; *T. lohmanderi* (Golovatch, 1989), from the central Caucasus within Armenia, Georgia and Russia [Golovatch, 1989]; *T. kosswigi* (Golovatch, 1989), from near Antakya (= Antiochia), Hatay, central Turkey; *T. martensi* (Golovatch, 1981), from the Hyrcanian Province of the Caucasus within both the Republic of Azerbaijan and northwestern Iran, as well as from Cyprus and Rhodes, Greece [Golovatch, 1981, 1989; Thaler, 1987, 1999; Kime, Enghoff, 2013; Vagalinski et al., 2014]; *T. semitica* Golo-

vatch, 2003, from Israel [Golovatch, 2003]; *T. seuti* Makarov, Lučić, Tomić et Karaman, 2003, from a cave in southern Montenegro [Makarov et al., 2003, 2004; Kime, Enghoff, 2013]; and *T. varunae* Makarov, Lučić, Tomić et Karaman, 2003, from a cave in the Republic of Macedonia [Makarov et al., 2003, 2004; Kime, Enghoff, 2013].

Most species are well-pigmented and clearly epigean. Formerly all such forms were assigned to the genus *Albanoglomus* Attems, 1929. But several which are typically pallid and troglo- or geomorphic represent presumed troglophiles or troglobites. Originally those were placed in the genus *Typhloglomeris*. It was Golovatch [2003] who formally synonymized *Albanoglomus* with *Typhloglomeris*. Thus, at present the family Glomeridellidae contains only two genera: *Glomeridella* Brölemann, 1913 with 7–8 species from Spain, France, eastern Alps and the Balkans [Kime, Enghoff, 2013; Minelli, 2015], and the eastern Mediterranean *Typhloglomeris*. The ranges of both genera slightly overlap only in the western Balkans.

The Balkan *T. coeca*, *T. seuti* and *T. varunae* are quite troglomorphic and have only been recorded in caves, thus representing presumed troglobites [Makarov et al., 2003]. However, keeping in mind the similarly unpigmented, but likely geobiotic or MSS-dwelling *T. fiumarana* and even the mostly pallid, but epigean *T. alba*, in which only the ocelli are dark, the ecological status of cavernicoles requires confirmation. This is proven by the evidence derived from the sole cavernicolous Caucasian congener, *T. caucasica*. Originally described and later recorded from a few caves near Sochi, Krasnodar Territory [Golovatch, 1975, 1989], this entirely unpigmented and superficially troglomorphic species has since been found epigeically in forest litter in the same area [Golovatch, Chumachenko, 2013]. As a result, it appears to be a trioglophile [Turbanov et al., 2016].

The present paper puts on record a new, presumably troglobitic *Typhloglomeris* taken from a cave in western Georgia, Caucasus, the first cavernicolous congener to be found in that country.

Taxonomy

Typhloglomeris palatovi Golovatch et Turbanov, **sp.n.**
Figs 1–7.

HOLOTYPE ♂ (ZMUM), Caucasus, Georgia, Samegrelo-Zemo Svaneti, Martvili Municipality, Chortskhu (= Jortsku) Cave near Martvili Canyon, 42°30.62'N, 42°25.17'E, 2.II.2017, leg. D. Palatov.
NON-TYPE: 1 juv. ♀ (ZMUM), same data, together with holotype.

Figs 1–2. *Typhloglomeris palatovi* **sp.n.**, ♂ holotype, habitus, ventral and lateral views, respectively. Pictures by K. Makarov, taken not to scale.
Рис. 1–2. *Typhloglomeris palatovi* **sp.n.**, голотип ♂, общий вид, соответственно снизу и сбоку. Фотографии К. Макарова, сняты без масштаба.

NAME. Honours Dmitry M. Palatov, the collector.

DIAGNOSIS. Differs from other species of the genus primarily by the clearly troglomorphic facies (entirely unpigmented body, elongated and unpigmented extremities and antennae), coupled with the especially numerous (18) striae on the thoracic shield and several structural details of ♂ legs 17 (outer coxal lobes low and telopodites 4-segmented), 18 (femora subcylindrical, not swollen ventrally) and 19 (syncoxite with a simple, rounded, central, bare lobe and particularly thick lateral horns, each latter supplied with an apical spine). See also Discussion below.

DESCRIPTION. Length of holotype ca 7 mm, width (maximum on tergum 2) 4.0 mm, non-type ca 5 mm long and 2.8 mm wide. Body and extremities entirely unpigmented, pallid (Figs 1–2).

Tergal tegument smooth and shining, densely punctured, only limbus of terga of posterior body half very delicately microcrenulate. Ocelli poorly discernible, 2+2 on each side of head, completely unpigmented, translucent, convex and setigerous.

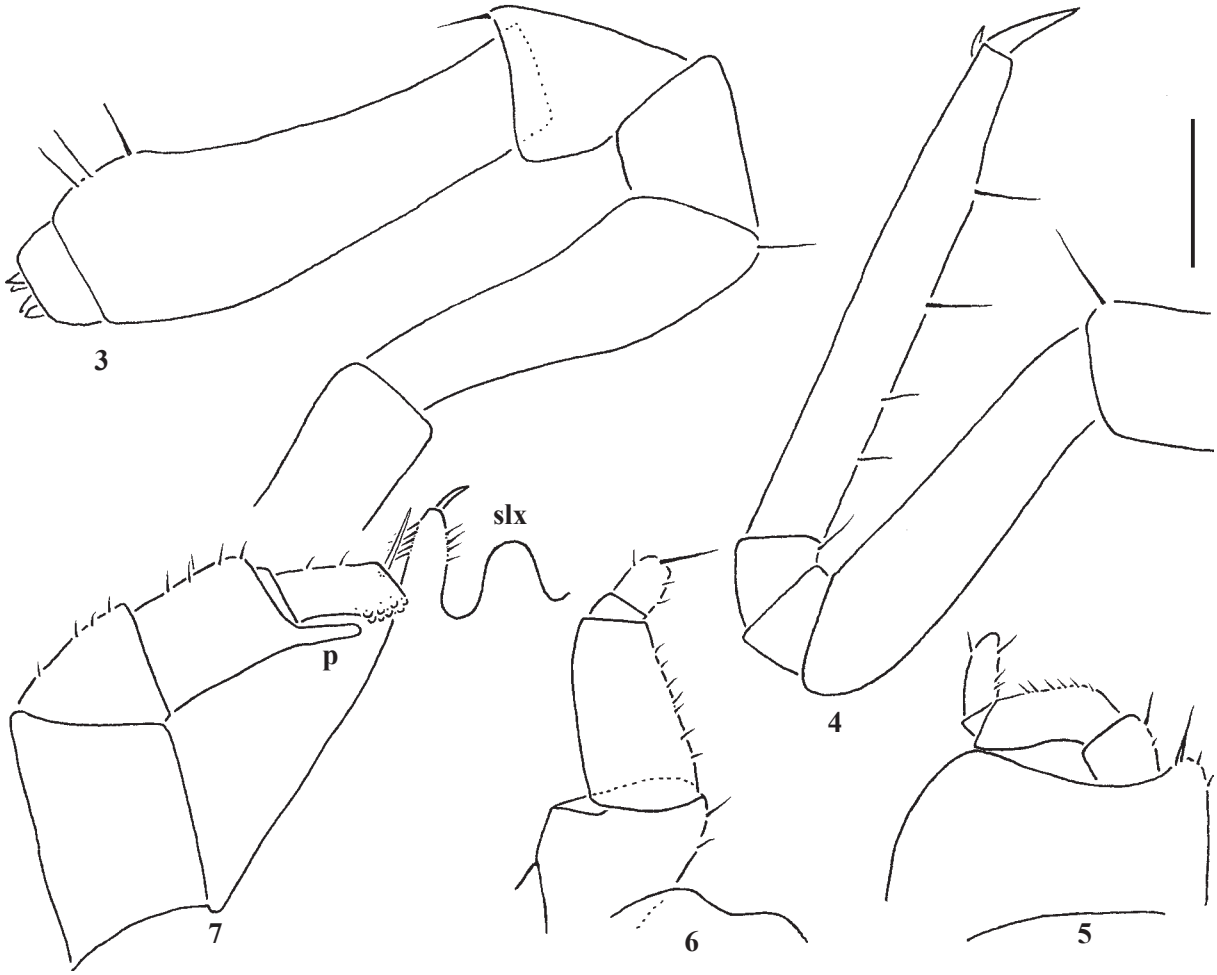
Tömösváry's organ transverse-oval, ca 1.2 times wider than long (Fig. 1). Antennomere 6 unusually long, ca 2.8 times as long as high, dorsal margin nearly straight (Figs 1–3). Antennomere 8 with four small, apical, sensory cones.

Collum with two transverse striae, but a 3rd, rudimentary stria traceable laterally behind 2nd.

Tergum 2 (= thoracic shield) with a very small and narrow hyposchism far from reaching behind caudal tergal margin; about 18 superficial, sometimes confusedly arranged and incomplete, rather regular, transverse striae laterally and dorsolaterally: one starting below, one in front of schism, all others above schism, with eight crossing the dorsum; mid-dorsal region with a number (3–4) of additional, incomplete, broken, confused, mostly short striolae behind last regular stria (Fig. 2).

♂ anal shield slightly flattened centrocaudally, clearly emarginate medially at caudal margin, emargination being flanked by short, but evident, flattened and rounded projections (Figs 1–2).

Legs long and slender (Fig. 4), moderately setose, with a short, but evident apicodorsal, sharp peg before a long, regularly curved, similarly sharp claw. ♂ legs 17 (Fig. 5) particularly strongly reduced, with a rather low, regularly rounded, outer coxal lobe; telopodite 4-segmented. ♂ legs 18 (Fig. 6) less strongly reduced, incrassate, placed on a membranous, slightly undulate sternum; coxa subcylindrical, strong and stout, about as high as broad; telopodite 3-segmented;



Figs 3–7. *Typhloglomeris palatovi* **sp.n.**, ♂ holotype: 3 — antenna, lateral view; 4 — leg 13, lateral view; 5 — leg 17, caudal view; 6 — leg 18, caudal view; 7 — leg 19 (telopod), caudal view. Scale bar 0.2 mm.

Рис. 3–7. *Typhloglomeris palatovi* **sp.n.**, голотип ♂: 3 — антенна, сбоку; 4 — нога 13, сбоку; 5 — нога 17, сзади; 6 — нога 18, сзади; 7 — нога 19 (телопод), сзади. Масштаб 0,2 мм.

femur subcylindrical, not swollen ventrally; tibia rudimentary, very short; tarsus finger-shaped, with a strong apical seta. ♂ legs 19, or telopods (Fig. 7), particularly strongly incrassate, with a rather high, rounded, simple, central, bare, syncoxital lobe (**sxl**) flanked by two setose horns, each latter slightly higher than **sxl**, prominent, thick, crowned by an acuminate spine. Postfemur with a rather slender, short, dorso-apical process (**p**) opposed to and forming a pincer with both a rudimentary, extremely short tibia and a prominent, distodorsally papillate tarsus bearing a particularly strong, spiniform, subapical, ventral seta.

Discussion

Makarov et al. [2003] split *Typhloglomeris* into five species groups. The new species definitely joins the *caucasica*-group that encompasses *T. caucasica* alone. It shows 4-segmented telopodites of male legs 17, 3-segmented telopodites of male legs 18, in which the femur remains cylindrical and non-crassate mesally, and the telopods that have an apicomesal finger on the femur and forms a distinct pincer with the acropodite, the tarsus also being papillate apically. We can add the especially abundantly striate thoracic shield as possibly another trait to distinguish this species group. In addition, the group's distribution pattern is coherent, as both *T. caucasica* and *T. palatovi* **sp.n.** are confined to the western Caucasus.

These two species differ clearly from each other primarily by the shape of the telopod syncoxite which in *T. palatovi* **sp.n.** shows particularly thick lateral horns (much like in *T. alba*, but each supplied with an apical spine) and a simple rounded lobe devoid of parabasal "shoulders". Besides this, the telopod tarsus is not only papillate distally, but also characteristically and obliquely truncated apically (Fig. 7).

Certain traits of troglomorphism seem to be more clearly expressed in *T. palatovi* **sp.n.** compared to those of *T. caucasica*. In particular, the especially long antennomere 6 (Fig. 3) and less numerous discernible ocelli (2+2 *vs*. 4+4) allow us to provisionally consider *T. palatovi* **sp.n.** as representing a troglobite, but this statement requires verification.

Interestingly, there are two caves near Martvili bearing the same name Jortsku (= Chortskhu). Both have been listed in the recent catalogue of cavernicolous invertebrates of Georgia, but neither contains a millipede record [Barjadze et al., 2015].

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