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## A new species of the genus *Hessebius* Verhoeff, 1941 from the Lower Volga

(Myriapoda, Chilopoda, Lithobiomorpha, Lithobiidae)

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A new species of lithobiid, *Hessebius scythodes* spec. nov. (TL: Russia, Astrakhan Region, Bogdo-Baskunchak Nature Reserve, Gorkaya river, 48°13' N, 046°58'E), is described from the deserts of the Lower Volga. This species is the second one of the genus *Hessebius* Verhoeff, 1941 inhabiting the European part of Russia.

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### Introduction

Centipedes in the Russian Federation are still a very poorly investigated group. The first data on them were given by A. V. Sselivanoff (1878, 1884) who tried to make a list of Russian centipedes and who described several new species from there. Later centipede study has been performed mostly regionally; very few articles on this topic have been published. An example of such an article is a review of Tatarstan lithobiids (Alejnikova & Isotova 1956, Alejnikova 1965). A bit later, in 1978, a key to lithobiomorph centipedes of the USSR (Zalesskaja 1978) was compiled and it remains the only work on this group written in Russian until recently; it contains a list of 126 species. In 1982, a fauna of Lithobiomorpha of the Moscow region was performed, and only 8 species were found (Zalesskaja et al. 1982). However, the information is outdated and needs to be rechecked in most aspects, especially taxonomically.

Among modern investigations it is necessary to note the works of G. Farzalieva (Farzalieva & Zalesskaja 2002, Farzalieva & Esysunin 2008, 2010) containing results of the centipede study of the Ural region and descriptions of several species new to science.

Altogether 45 species of lithobiids are known from the European part of Russia (Zalesskaja 1978,

Farzalieva & Zalesskaja 2002, Farzalieva & Esysunin 2008); however, a number of specimens collected in the north of the Kalmyk Republic and from the calcareous soils of the southern part of the Ural region are still unidentified and are likely to belong to undescribed species (Gilyarov & Folkmanova 1957, Farzalieva & Esysunin 2008).

In the present article the description of a new species found in the Bogdo-Baskunchak Nature Reserve (Astrakhan region) is provided.

### Methods

Major structural features of the body and all external characters recognized under light microscopy are described in this paper. Binocular Micromed-MC-2-Zoom and Microscope Digital Camera C 510 NG were used to take photos. Later, all details necessary for determination were re-drawn from these photos. Generic placement of this species was confirmed using the key for lithobiomorph centipedes of the USSR by Zalesskaja (1978). Material is preserved in 80 % alcohol in glass vials. Totally 10 specimens were examined, among them 6 males and 4 females. The female was chosen as the holotype because it is more important for species identification (in the genus, the presence of dorsodistal projection of female gonopod is diagnostic). The material is temporarily preserved at the Zoology department of UISPU and will be later transferred to ZSM.

Terminology in the article follows Bonato et al. (2010). The following abbreviations are used in the text:  
 UISPU Ulyanovsk State Pedagogical University  
 ZSM Zoologische Staatssammlung München

## Taxonomy

### *Hessebius scythodes* spec. nov.

**Holotype:** ♀, Russia, Astrakhan Region, Bogdo-Baskunchak Nature Reserve, Gorkaya river, 48°13'N 46°58'E, 19.IV.2014, under a stone on sandy soil, leg. V. V. Zolotuhin.

**Paratypes:** 2♂, 1♀, Russia, Astrakhan Region, Bogdo-Baskunchak Nature Reserve, Gorkaya river, in soil traps, 20.IV.2014, leg. E. A. Kuzmin; 2♂, Russia, Astrakhan Region, Bogdo-Baskunchak Nature Reserve, Bolshoe Bogdo Mt., 48°08'56.4"N 46°50'30.6"E, 32 m, 21.IV.2014, leg. V. V. Anikin; 2♂, 2♀, Russia, Astrakhan Region, Bogdo-Baskunchak Nature Reserve, Gorkaya river, in soil traps, 1–10.VI.2014, leg. E. A. Kuzmin.

**Diagnosis of genus *Hessebius*.** Includes centipedes with body length 17–30 mm. Antennae with 19–23 (often more than 20) segments. Tömösváry's organ as large as the adjoining ocellus. Prosternum with 2+2 fine teeth; shoulders of forcipular coxosternite are expanded. Tergites without posterior triangular projections. Legs 12<sup>th</sup>–15<sup>th</sup> are short and broadened in males. Often the 12<sup>th</sup>–15<sup>th</sup> pair of legs and posterior sternites of male covered with a large number of short setae. Coxal pores are small and round. Male gonopod is small and unisegmented. Female gonopod with 2+2–5+5 spurs and often with simple

claws. The second article of gonopod has distinct dorsodistal projection.

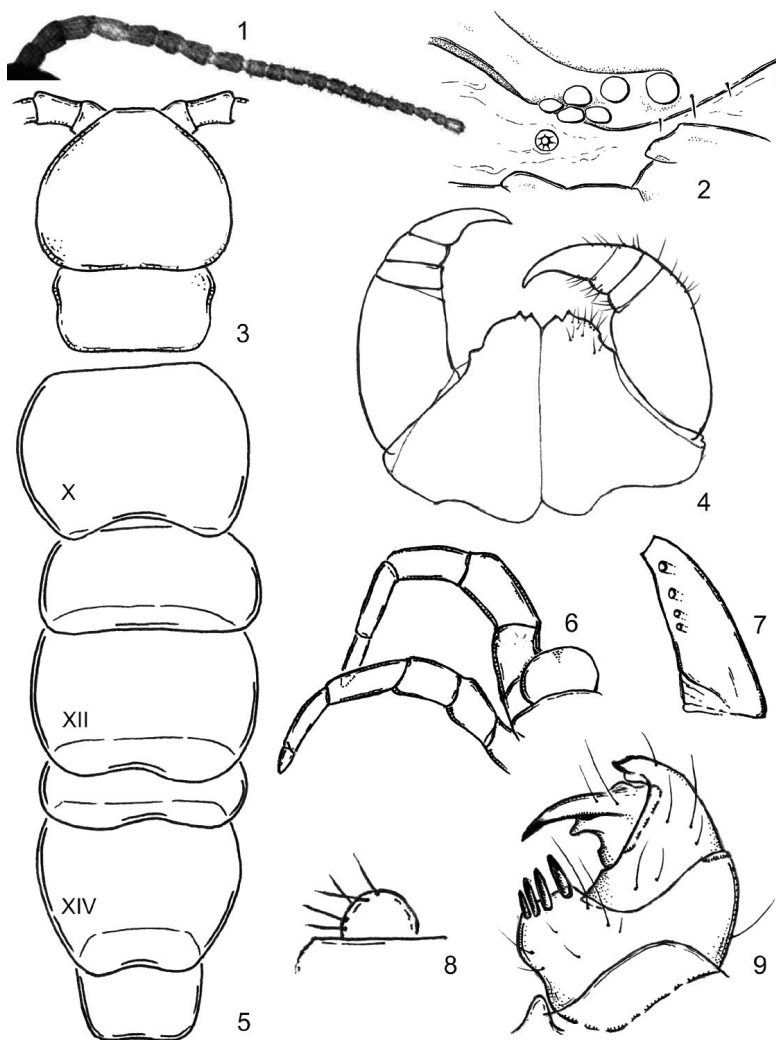
**Diagnosis of new species.** All tergites without posterior triangular projections, prosternum with 2+2 fine teeth and thin small porodontes; shoulders of forcipular coxosternite are expanded. Female gonopod with 4+4 pointed spurs closely arranged, the outer three almost equal in size, the second article of gonopod has distinct dorsodistal projection (reaching half of the third article); terminal claw of the third article with a much shorter accessory claw; male 15<sup>th</sup> leg strongly broadened.

## Description

Body pale brown, length 14–16 mm. Tergites without posterior triangular projections (Fig. 5). Head slightly expanded (Fig. 3). Prosternum with 2+2 fine teeth and thin small porodontes; shoulders of forcipular coxosternite are expanded; medial diastema is deep (Fig. 4). Antennae with 20 segments, covered with short pale setae (Fig. 1). Head sides with two large and four smaller ocelli, arranged in two rows. Tömösváry's organ as large as the adjoining ocellus (Fig. 2). Tarsi of all legs with simple claws; distinctly bisegmented. Coxal pores are small, round, pore formula (legs 12–15): 3443, present on 12<sup>th</sup>–15<sup>th</sup> pair of legs (Fig. 7). The distance between adjacent pores is equal to the diameter of the neighbour pores or slightly larger. Leg plectrotaxy as in Table 1. Female gonopod with 4+4 pointed spurs closely arranged, the outer three almost equal in size; the inner one, the fourth, is distinctly shorter; the second article of

**Table 1.** Plectrotaxy of *Hessebius scythodes* spec. nov. (Holotype). a, anterior; m, medium; p, posterior.

Legs	Ventral				Dorsal			
	trochanter	praefemur	femur	tibia	coxa	praefemur	femur	tibia
I	–	–	amp	m	–	p	ap	a
II	–	(p)	amp	am	–	p	ap	a
III	–	(p)	(a)mp	am	–	p	ap	ap
IV	–	(p)	(a)mp	am(p)	–	p	ap	ap
V	–	(p)	mp	am(p)	–	mp	ap	ap
VI	–	(p)	mp	am(p)	–	mp	ap	ap
VII	–	(p)	mp	am(p)	–	mp	ap	ap
VIII	–	mp	amp	am(p)	–	mp	ap	ap
IX	–	mp	amp	amp	–	mp	p	p
X	–	mp	amp	amp	–	mp	p	p
XI	–	mp	amp	amp	–	mp	p	p
XII	–	mp	mp	amp	–	amp	p	–
XIII	–	mp	mp	am	–	amp	p	–
XIV	m	(p)	–	am	–	amp	–	–
XV	m	(p)	–	–	(a)	amp	–	–



**Figs 1–9.** *Hessebius scythodes* spec. nov. 1. Right antenna; 2. ocellar field, depressed, lateral view; 3. head, dorsal view; 4. prosternum, ventral view; 5. posterior tergites, dorsal view; 6. broadened posterior legs of a male, dorsal view; 7. coxal pores, ventral view; 8. male gonopod, ventral view; 9. female gonopod, ventral view (orig.).

gonopod has distinct dorsodistal projection reaching half of the third article (Fig. 9); terminal claw of the third article with a much shorter accessory claw. Distal margin of first genital sternite with triangular medial protuberance. Male gonopod with five setae of equal size (Fig. 8). Praefemur, femur and tibia of 14<sup>th</sup>–15<sup>th</sup> pair of legs strongly broadened only in males (Fig. 6).

This species resembles *Hessebius multicalcaratus* Folkmanova, 1958 and *H. perelae* Zalesskaja, 1978. However, *H. perelae* has the formula of coxal pores 5545, and female gonopods bear 5 + 5 skittle-shaped spurs. Besides, this species was discovered in the

mountains of Khazakhstan at an altitude of 1400–1800 m and is endemic there. *H. multicalcaratus* has a darker colour, a smaller size and 2–3 coxal pores.

**Taxonomic comments.** It is also necessary to note that a species, very similar with our specimens, was considered in the work of G. Farzalieva and S. Esyunin (2008) from Sol'-Iletsk district of the Orenburg region. Its identity wasn't established originally because the single female lacked the majority of legs. The presence of lateral denticle in the gonopod claw and a very characteristic coxal pore (formula 344(5)3, with the distance between adjacent



Fig. 10. Known distribution of *Hessebius scythodes* spec. nov.

pores being equal to the diameter of the neighbour pores or slightly larger) prove that the species is conspecific to that described as *H. scythodes*. Also in the north of the Kalmyk Republic, on the saltmarsh Arshan-Zel'men, an undescribed lithobiid species was discovered about 60 years ago (Gilyarov & Folkmanova 1957: 216). It is assumed that these specimens are also identical with *Hessebius scythodes*.

**Distribution** (Fig. 10). Therefore *Hessebius scythodes* may be widely distributed on the calciphyte soils and saltmarshes in southern regions of the Lower Volga. Most likely, the distribution of this species ranges from Astrakhan region and the Kalmyk Republic to the Southern Ural. Of the 13 species of *Hessebius* previously known worldwide, altogether 8 species are known from the fauna of the ex-U.S.S.R., however, only one species – *Hessebius multicalcaratus* Folkmanova, 1958, was listed for Russia previously (Zalesskaja 1978). Thus, the new species is the second member of this genus native to Russia.

**Bionomics.** Initially *H. scythodes* was found on sandy soils with a significant level of salinity under shelters (basically flat slabs of limestone) on the Mount Bolshoe Bogdo in late April (Fig. 11). This period was cold and rainy, which contributed to moistening the soil. In the month of May, upon the occurrence of high daily temperatures reaching +28 °C and a strong warming of the soil, these centipedes were no longer observed in the same places. Later the species was also found in June in soil traps. The biotope of the new species is thus a clay semidesert with high level of salinity and extremely sparse vegetation (in the habitat lignified *Artemisia* bushes, *Tulipa biebertsteiniana* and *Tulipa gesneriana*, different species of *Gagea*, ephemeroïd Cruciferae, *Lepidium*, *Rheum* and arid Poaceae have been found) (Fig. 2). Seemingly, the species prefers loose sandy soils and is confined to the south facing ravine slopes and banks of small local rivers. It should be noted that *H. scythodes* was found together with small woodlice of the genus *Armadillidium* or closely related, which are probably their prey. However, in the investigated habitat





Fig. 11. Type locality (Gorkaya river in the Astrakhan Distr., arrowed, left) and a biotope of the new species in the Bogdo-Baskunchak Nature Reserve (right).

no scorpions were found where centipedes lived and no centipedes were found under stones where scorpions lived. In the Orenburg region the species was collected in the Sol'-Ilets'k district in soil traps on saltmarsh (Farzalieva & Esyunin 2008).

**Etymology.** The name of the species is originated from the epithet "Scythian", reflecting the peculiarities of its distribution dwelling mainly in sandy soils of the Scythian semideserts of the southern Russia. Further study of the fauna of centipedes in salt and calciphyte biotopes may reveal a few more taxa new to science because of the scarce knowledge on centipedes of these territories. Thus, the genus *Hessebius* now includes 14 species most of which are confined to South-East and Central Asia. Only 5 species are known from Europe.

Here, a key to the identification of the European species is given after Zaleskaja (1978) with additions and correction:

- 1(2) 2-3 coxal pores, female gonopod with 5+5 spurs. South of the European part of Russia.  
..... *multicalcaratus* Folkmanova, 1958
- 2(1) Four or more coxal pores.
- 3(4) Female gonopod with 4+4 spurs. Terminal claw of the third article of female gonopod bidentate. Lower Volga Region of Russia. ....  
..... *scythodes* spec. nov.
- 4(3) Female gonopod with 2+2 spurs.
- 5(6) At least one coxa with 3 pores. ....  
..... *barpipes* (Porat, 1893)
- 6(5) All coxae with 4 pores.
- 7(8) Terminal claw of the third article of female gonopod with simple claws. Eastern Ukraine. ....  
..... *megapus* Muralevitch, 1907

- 8(7) Terminal claw of the third article of female gonopod bidentate. Turkey, Armenia. ....  
..... *kosswigii* Verhoeff, 1941

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