

**Identity of the millipede genus *Jaxartes* Verhoeff, 1930  
(Diplopoda: Polydesmida: Polydesmidae), with descriptions  
of two new species from Central Asia**

**Идентичность многоножек-диплопод рода *Jaxartes* Verhoeff, 1930  
(Diplopoda: Polydesmida: Polydesmidae) с описаниями  
двух новых видов из Центральной Азии**

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**KEY WORDS:** taxonomy, *Jaxartes*, *Turanodesmus*, new species, new synonymy, new combinations, lectotype, Uzbekistan, Tajikistan, Turkmenistan.

**КЛЮЧЕВЫЕ СЛОВА:** таксономия, *Jaxartes*, *Turanodesmus*, новый вид, новая синонимия, новые комбинации, лектотип, Узбекистан, Таджикистан, Туркменистан.

**ABSTRACT.** Based on new samples of *Jaxartes* Verhoeff, 1930 from Uzbekistan, Tajikistan and Turkmenistan, as well as the syntypes of *J. zachvatkini* Verhoeff, 1930, the identity of this heretofore monotypic genus is clarified and it is shown to be a senior synonym of the genus *Turanodesmus* Lohmander, 1933, syn.n. Two new species are described, i.e. *J. communicans* sp.n. from Turkmenistan and *J. reductus* sp.n. from Uzbekistan and Tajikistan. The following nine formal transfers are made: *J. almassyi* (Attems, 1904), *J. cornutus* (Spelda, Golovatch et Meidell, 1998), *J. cynodon* (Spelda, Golovatch et Meidell, 1998), *J. elevatus* (Lohmander, 1933), *J. expressus* (Golovatch, 1979), *J. inermis* (Lohmander, 1933), *J. stummeri* (Attems, 1904) and *J. tenuis* (Golovatch, 1979), all comb.n. ex *Turanodesmus* and all from Central Asia. A distribution map of all species of the genus *Jaxartes* is given.

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**РЕЗЮМЕ.** По новому материалу представителей рода *Jaxartes* Verhoeff, 1930 из Узбекистана, Таджикистана и Туркменистана, а также по синтипам *J. zachvatkini* Verhoeff, 1930, типового вида рода, прояснено положение этого до сих пор моно-

типического рода и показано, что он является старшим синонимом рода *Turanodesmus* Lohmander, 1933, syn.n. Описаны два новых вида: *J. communicans* sp.n. из Туркменистана и *J. reductus* sp.n. из Узбекистана и Таджикистана. Поэтому необходимо формально переместить следующие девять видов: *J. almassyi* (Attems, 1904), *J. cornutus* (Spelda, Golovatch et Meidell, 1998), *J. cynodon* (Spelda, Golovatch et Meidell, 1998), *J. elevatus* (Lohmander, 1933), *J. expressus* (Golovatch, 1979), *J. glaber* (Spelda, Golovatch et Meidell, 1998), *J. inermis* (Lohmander, 1933), *J. stummeri* (Attems, 1904) и *J. tenuis* (Golovatch, 1979), все comb.n. ex *Turanodesmus* и все из Средней Азии.

### Introduction

The millipede fauna of Central Asia is not especially diverse, but it is highly peculiar both at the species and generic levels [Read, Golovatch, 1994]. The family Polydesmidae is particularly species-rich, formally being represented there by five genera: *Brachydesmus* Heller, 1858, *Epanerchodus* Attems, 1901 (= *Usbekodesmus* Lohmander, 1933), *Jaxartes* Verhoeff, 1930, *Schizoturanius* Verhoeff, 1931, and *Turanodesmus* Lohmander, 1933 [Attems, 1904, 1940; Lignau, 1929; Verhoeff, 1930, 1931; Lohmander, 1933; Golovatch, 1979; Spelda et al., 1998; Golovatch et al., 2011]. One of the species of *Brachydesmus* recorded from Central Asia is the clearly introduced pan-Medi-

terranean *B. proximus* Latzel, 1889, found at Dushanbe, Tajikistan [Golovatch, 1979], whereas all other 18 polydesmid species, including two still undescribed *Schizoturanius* [Read, Golovatch, 1994], are endemic or subendemic to the region concerned. One of these, *Epanerchodus redikorzevi* (Lohmander, 1933), is also known from the adjacent parts of northern Afghanistan [Golovatch, 1991; Golovatch *et al.*, 2011], whereas *Brachydesmus pigmentatus* Attems, 1951 (= *B. pereliae* Golovatch, 1976) is confined to Hyrcania within the Caucasus, Iran and Turkmenistan [Golovatch *et al.*, 2016].

*Jaxartes* and its type species *J. zachvatkini* were established by Verhoeff [1930], based on a single ♂ and 4 ♀ syntypes taken from a garden in Tashkent, Uzbekistan. Neither the genus nor the species has ever been recorded since. Verhoeff distinguished *Jaxartes* from other genera of Polydesmidae, considering the following characters: (1) a particular, barrel-shaped antennomere 6; (2) presence on metaterga of three transverse rows of flat bosses, each supporting an evident knob with a sharp seta; (3) telson more strongly elongated than in *Polydesmus* spp.; and (4) gonopods highly peculiar. Character 4 was further detailed in the gonopods said to be relatively loosely attached to the sternum, leaving the coxae independent from each other, a situation which resembled Verhoeff the one observed in Paradoxosomatidae (his Strongylosomidea). In addition, the gonopodal telopodite was described and illustrated as being slender, suberect, unipartite and supplied with a usual, quite large accessory seminal chamber and an evident hairy pulvillus, both placed at about the distal third of the telopodite. Such an indeed striking gonopodal conformation as presented by Verhoeff, coupled with a barrel-shaped antennomere 6, were later repeated by Attems [1940] in the diagnosis of *Jaxartes* given in the last volume of his global treatise on the order Polydesmida.

We have been fortunate to receive for study a small material representing undoubtedly the same genus and two new species, both latter coming from three rather strongly separated parts of Central Asia, namely, eastern Turkmenistan, southern Uzbekistan and western Tajikistan. Already the first glance at these fresh samples and the sole syntype male of *J. zachvatkini* has demonstrated several lapses in Verhoeff's diagnosis of *Jaxartes* and his description of *J. zachvatkini*.

The present paper is devoted to the clarification of the identity of *Jaxartes*, with descriptions of two new species and a short note on the type material of *J. zachvatkini*.

## Material and methods

All newly described material presented in this paper belongs to the collection of the Zoological Museum of the Moscow State University (ZMUM), while the type material of *J. zachvatkini* belongs to the Bavarian State Collection of Zoology (ZSM). Pictures

were taken by using a Canon PowerShot A80 digital camera connected to an Axioscope 40 microscope, as well as a Nikon DS-Fi2 camera with a Nikon DS-L3 camera controller attached to a Nikon SMZ 1270 stereo microscope. Pictures were taken either with a Canon EOS 5D digital camera or a Nikon D3300 digital camera, or an ELP industrial camera with IMX-179 sensor chip, the latter two connected to a Leica Dialux microscope with 10x, 16x, 25x and 40x objectives. All colour images were stacked either with Zerene Stacker software or Helicon Focus 6 (<https://www.heliconsoft.com/heliconsoft-products/helicon-focus/>). Line drawings were executed with the help of a Zeiss or Leica stereo microscope and an attached camera lucida or using tracing paper placed on a computer monitor and pictures of relevant structures. The distribution map was generated using QGIS version 2.12.3 and Adobe Photoshop CS6. The final images were processed with Adobe Photoshop CS6. The terminology used to denominate certain parts of the gonopodal telopodite follows that of Spelda *et al.* [1998].

Abbreviations used to denote the country names on the map are as follows: KG — Kyrgyzstan, KZ — Kazakhstan, TJ — Tajikistan, TM — Turkmenistan, UZ — Uzbekistan.

## Taxonomy

### *Jaxartes communicans* sp.n.

Figs 1, 2, 8A, Map.

**MATERIAL.** Holotype ♂ (ZMUM Rd-4528 + slide), Turkmenistan, Kuhitang-Tau Mt. Range, Khodja-Pil-Ata, Lebap, 66.6029°E, 37.946°N, 1300 m a.s.l., 17.IV.1984, leg. V. Yanushev.

**DIAGNOSIS.** *Jaxartes communicans* sp.n. clearly differs from other congeners by a combination of characters, i.e. the presence of a fringed flagelloid process/blade on the gonopod telopodite (*vs.* a strongly developed distofemoral process in most congeners or a fully unipartite telopodite in *J. reductus* sp.n. and *J. zachvatkini*); antennomeres 4–6 with bacilliform sensilla (condition seen also in *J. reductus* sp.n. and *J. zachvatkini*); bacilliform, but sharp metatergal setae and 4–5 lateral paratergal teeth.

**DESCRIPTION.** Length ca. 7 mm, width of midbody segments 0.7 mm. Coloration light yellowish (Fig. 1).

Antennae slightly clavate, moderately long; in length, antennomere 6 > 3 > 2 = 4 = 5 = 7; antennomeres 4–6 each with at least a few small bacilliform sensilla distodorsally; antennomere 6 subcylindrical with both base and apex slightly narrowed; antennomere 7 with a small, distodorsal knob with a few acuminate sensilla (Figs 1A, 2C).

Body with 20 segments. In width, head < collum < segment 3 = 4 < 2 < 5–16, thereafter body gradually tapering. Metaterga with three transverse rows of flat bosses, each supporting an evident knob with a bacilliform, but sharp seta (Fig. 1C–F). Paraterga each with 4–5 lateral teeth (Fig. 1C, E, F). Epiproct elongated, conical, with acuminate setae (Fig. 1B, F).

♂ legs with sphaerotrichomes ventrally on femora, post-femora, tibiae and tarsi.

Gonopods (Figs 2A–B, 8A) simple. Coxae fused basally to sternum and each other, albeit coxal fusion weak; coxae roundish, devoid of projections, delicately papillate laterally, each with one strong seta; cannula slender, curved, as

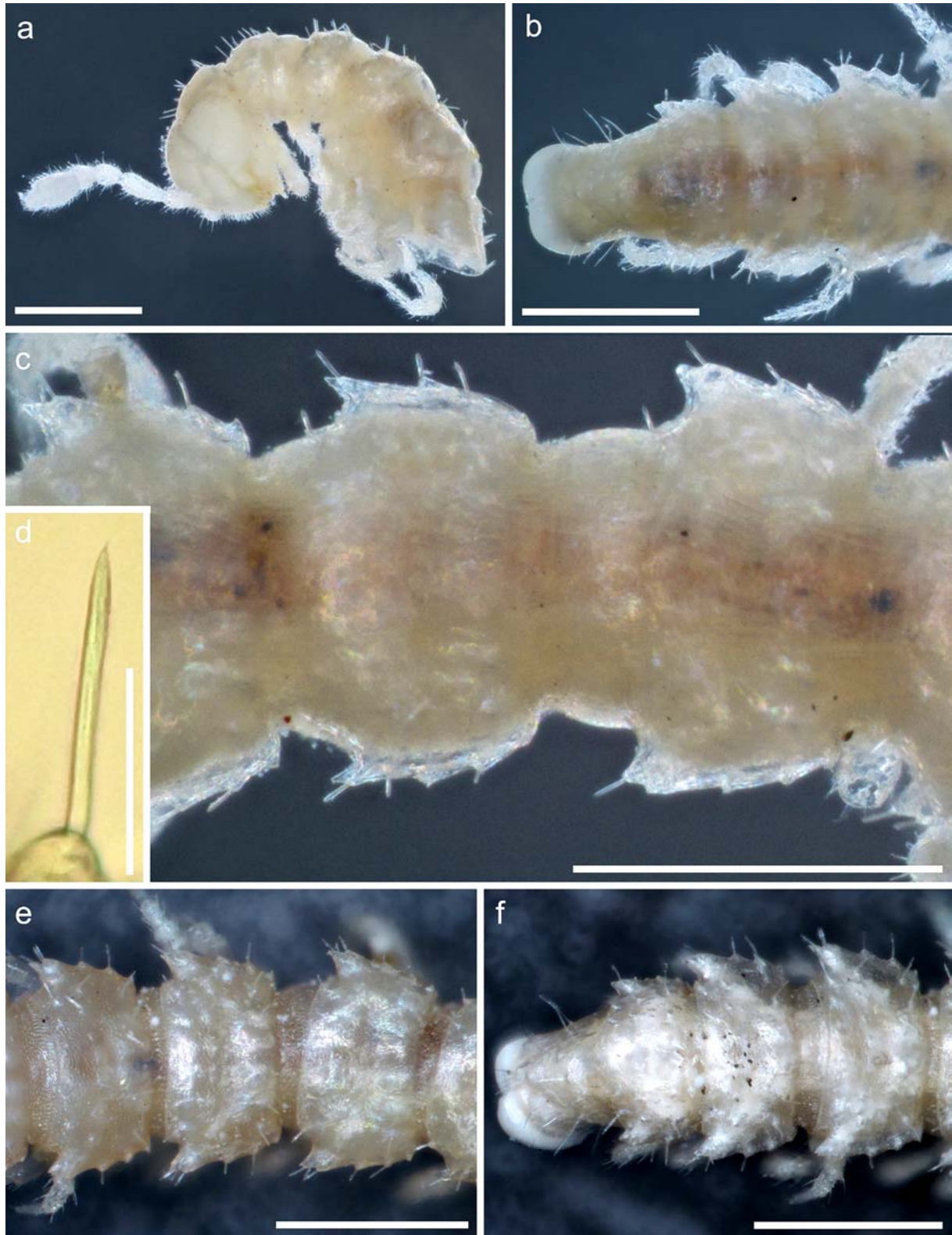


Fig. 1. *Jaxartes communicans* sp.n., ♂ holotype, habitus: a — anterior part of body, lateral view; b — posterior part of body, dorsal view; c — body rings 14–16, dorsal view; d — seta on body ring 11; e — body rings 15–17, dorsal view; f — posterior part of body, dorsal view. Scale bars: 0.5 mm (a, b, c, e, f) and 0.05 mm (d).

Рис. 1. *Jaxartes communicans* sp.n., голотип ♂, внешний вид: а — передняя часть тела, сбоку; б — задняя часть тела, сверху; с — туловищные сегменты 14–16, сверху; d — щетинка на туловищном сегменте 11; е — туловищные сегменты 15–17, сверху; f — задняя часть тела, сверху. Масштаб: 0,5 мм (а, б, с, е, f) и 0,05 мм (d).

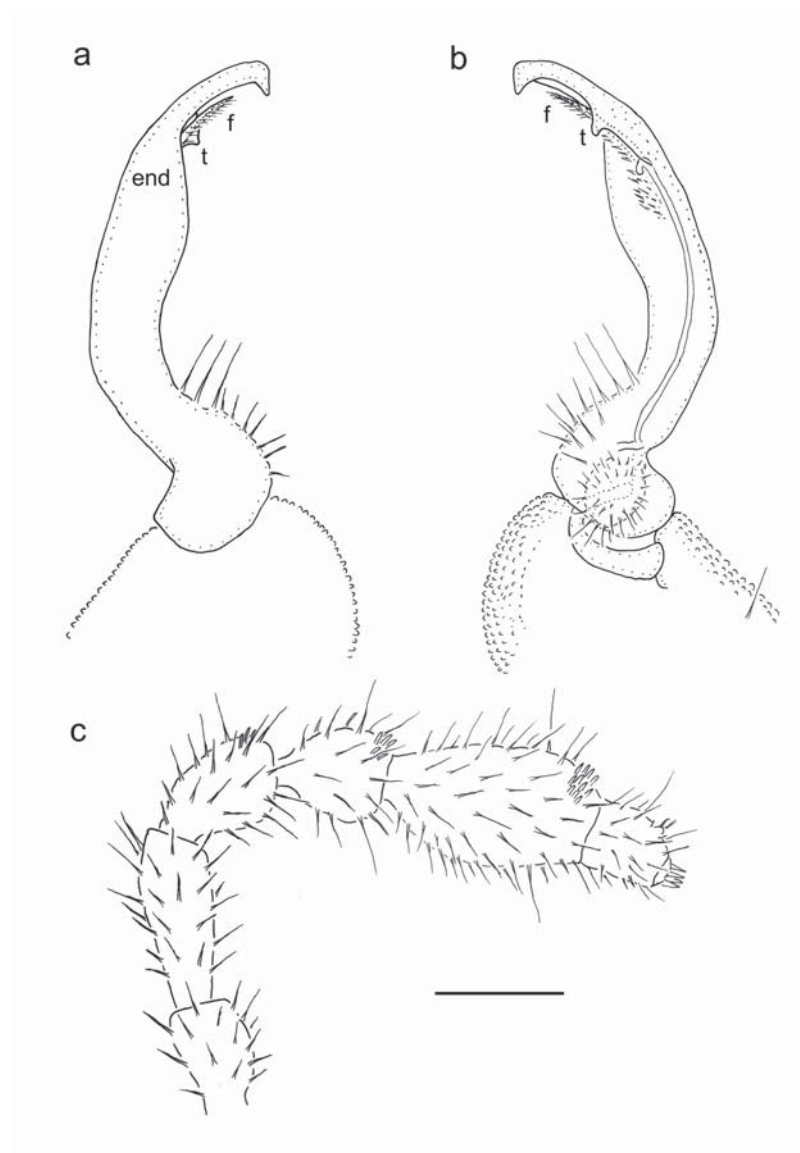


Fig. 2. *Jaxartes communicans* sp.n., holotype ♂: a — right gonopod, lateral view; b — right gonopod, mesal view; c — right antenna, lateral view. Scale bar: 0.2 mm.

Рис. 2. *Jaxartes communicans* sp.n., голотип ♂: а — правый гонопод, сбоку; б — правый гонопод, изнутри; в — правый усик, сбоку. Масштаб: 0,2 мм.

usual. Telopodite long, >2 times as long as coxa, slender, suberect, only slightly curved forward, bipartite/bifurcate in distal 1/4; prefemoral (= densely setose) part ca 1/3 as long as telopodite; the latter only slightly broadened in distal 1/3; seminal groove entirely mesal, very briefly recurved apically, forming no distinct accessory seminal chamber; apex of seminal groove marking both telopodite splitting into two branches and a distinct, ventral, hairy pulvillus, the latter extending onto a ventrally similarly fringed flagelloid process/blade (f); endomere (end) clearly longer than f, bearing a small, parbasal, ventral tooth (t) and ending up in a subtruncate, short and ventrally curved lobule.

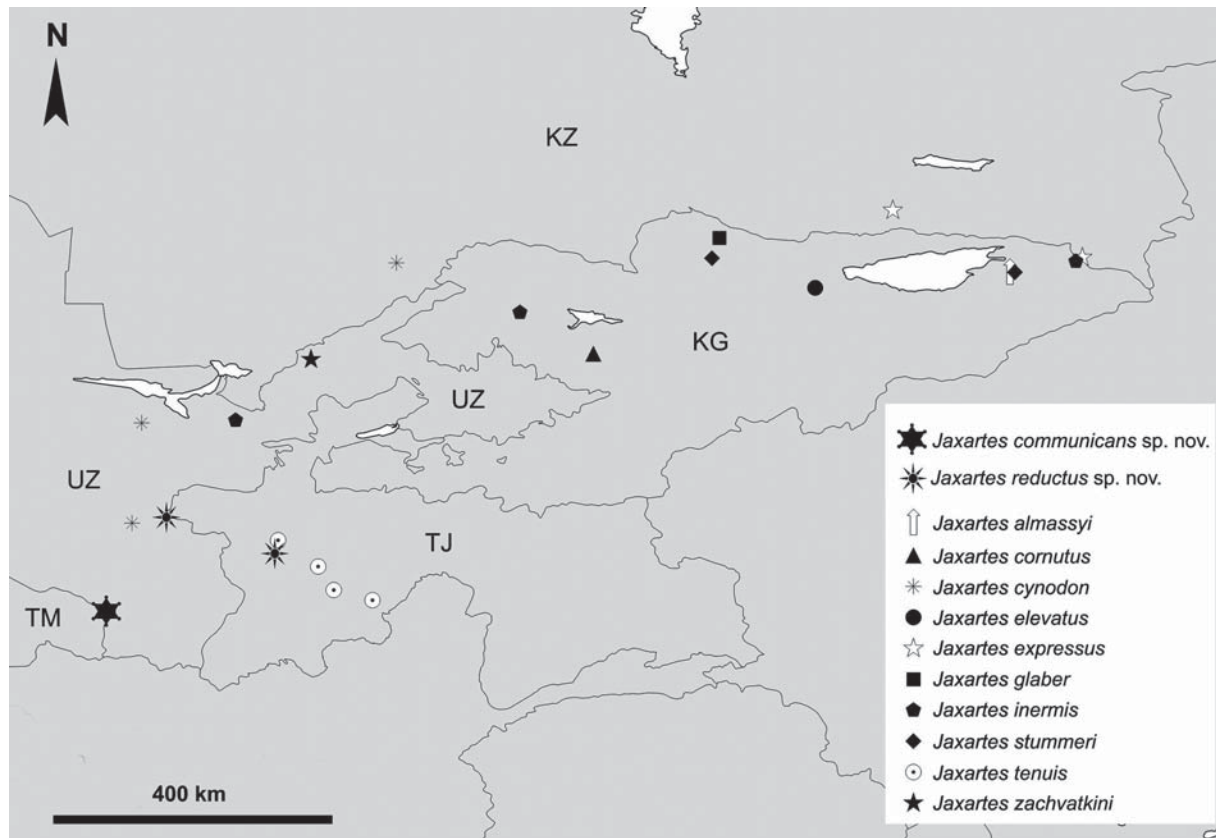
NAME. An adjective referring to a transitional state between congeners with a well-developed distofemoral process and those with fully unipartite gonotelopodites.

### *Jaxartes reductus* sp.n.

Figs 3–5, 8B, Map.

MATERIAL. Holotype ♂ (ZMUM Rd-4529), Tajikistan, Dushanbe, Varzob Pass, 68.8177°E, 38.774°N, 900–1400 m a.s.l., 22.IV.1990, leg. S. Dashdamirov. Paratypes: 2 ♂♂, 1 ♀ (ZMUM Rd-4530 + slide), Uzbekistan, Kitab Nature Reserve, Djaus, Djindi-darya and Khodja-kurgan river basin, 67.2669°E, 39.184°N, 13.IV.1990, leg. S. Dashdamirov.

DIAGNOSIS. *Jaxartes reductus* sp.n. clearly differs from all congeners except *J. zachvatkini* by a complete reduction of the distofemoral process of the gonopod, from *J. zachvatkini* by some gonopodal and habitual characteristics, i.e. the endomere has a distinct subapical lateral bulge (*vs.* absent from *J. zachvatkini*) and is strongly curved (*vs.* slightly curved in *J. zachvatkini*), as well as through bacilliform, blunt



Map. Distribution of *Jaxartes* species.

Карта. Распространение видов рода *Jaxartes*.

metatergal setae (vs. trichoid in *J. zachvatkini*) and 5–7 lateral paratergal teeth (vs. 4–5 in *J. zachvatkini*).

DESCRIPTION. Length 7–8 mm (♂♂) or ca 6 mm (♀), width of midbody segments 0.7–0.8 mm (♂♂) or 0.7 (♀). Coloration light yellow to brownish (Fig. 3).

Antennae slightly clavate, moderately long; in length, antennomere 6 > 3 > 2 = 4 = 5 = 7; antennomeres 4–6 each with a group of subbacilliform sensilla distodorsally; antennomere 7 with a small, distodorsal knob with a few acuminate sensilla (Figs 3A–B, 5E).

Body with 20 segments. In width, head < collum < segment 3 = 4 < 2 < 5–16, thereafter body gradually tapering. Metaterga with three transverse rows of flat bosses, each supporting an evident knob with a bacilliform, blunt seta (Figs 3B–D, 4). Paraterga with 5–7 lateral teeth (Figs. 3G, 4). Epiproct elongated, conical, with acuminate setae (Figs 3E, 4A).

♂ legs with sphaerotrichomes ventrally on femora, post-femora, tibiae and tarsi (Fig. 3H). ♀ coxa 2 a transverse squarish plate (Fig. 5F).

Gonopods (Figs 5A–D, 8B) simple, unipartite, C-shaped. Coxae fused basally to sternum and each other, albeit coxal fusion weak; coxae roundish, devoid of projections, delicately papillate laterally, each with one strong seta; cannula slender, curved, as usual. Telopodite long, >2 times as long as coxa, slender, distal end strongly curved posteroventrad; prefemoral (= densely setose) part ca 1/3 as long as telopodite; the latter only slightly broadened in distal 1/2; seminal groove entirely mesal, very briefly recurved apical-

ly, forming no distinct accessory seminal chamber; apex of seminal groove marking a distinct, ventral, hairy pulvillus. Endomere (end) bearing a small, parabasol, ventral tooth (t) mesally, as well as a subapical lateral bulge (b).

Vulva oblong-oval, serrate and setose, with a few ampullae inside gutter; operculum with two especially strong and long setae on top (Fig. 5G).

NAME. An adjective referring to the complete reduction of a distofemoral process.

#### *Jaxartes zachvatkini* Verhoeff, 1930

Figs 6, 7, 8C, Map.

MATERIAL. Lectotype ♂ (designated herewith): (ZMS-A-20033401) *Jaxartes zachvatkini* Verh.: a slide with male parts: 8–20. R., Taschkent; (ZMS-A-20033402) *Jaxartes zachvatkini* Verh.: a slide with male parts: Kopf. 1–7. R. Gp., Taschkent; Paralectotype ♀ (herein designated): (ZMS-A-20033400) *Jaxartes zachvatkini* Verh.: a slide with female parts, Taschkent (Fig. 6). Lectotype designation is warranted to ensure that the species is based on the single ♂ in the type series.

DIAGNOSIS. *Jaxartes zachvatkini* clearly differs from all congeners except *J. reductus* sp.n. by the complete reduction of a distofemoral process, from *J. reductus* sp.n. by some gonopodal and habitual characteristics, i.e. the endomere has no subapical lateral bulge (vs. present in *J. reductus* sp.n.), the endomere is slightly curved (vs. strongly curved in *J. reductus* sp.n.), trichoid metatergal setae (vs. bacilliform and blunt in *J. reductus* sp.n.), and 4–5 lateral paratergal teeth (vs. 5–7 in *J. reductus* sp.n.).

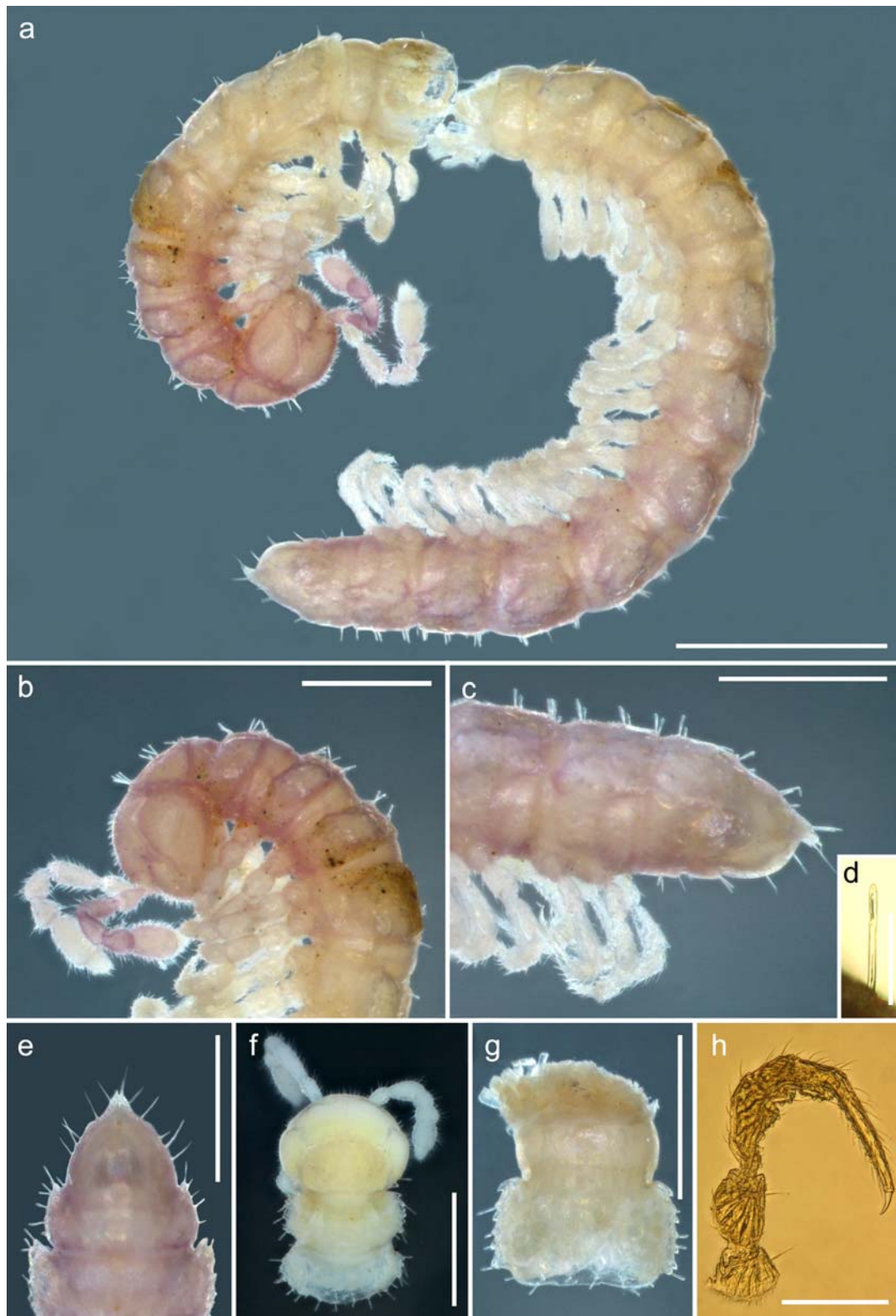


Fig. 3. *Jaxartes reductus* sp.n., a–e: ♂ holotype; f–h: ♂ paratype. a — habitus, lateral view; b — anterior part of body, lateral view; c — posterior part of body, lateral view; d — seta on body ring 11; e — posterior part of the body, dorsal view; f — anterior part of the body, dorsal view; g — body ring 11, dorsal view; h — walking leg, lateral view. Scale bars: 1 mm (a), 0.5 mm (b, c, e, f, g), 0.2 mm (h) and 0.05 mm (d).

Рис. 3. *Jaxartes reductus* sp.n., a–e: голотип ♂; f–h: паратип ♂. a — общий вид, сбоку; b — передняя часть тела, сбоку; c — задняя часть тела, сбоку; d — щетинка на туловищном сегменте 11; e — задняя часть тела, сверху; f — передняя часть тела, сверху; g — туловищный сегмент 11, сверху; h — ходильная нога, сбоку. Масштаб: 1 мм (a), 0,5 мм (b, c, e, f, g), 0,2 мм (h) и 0,05 мм (d).

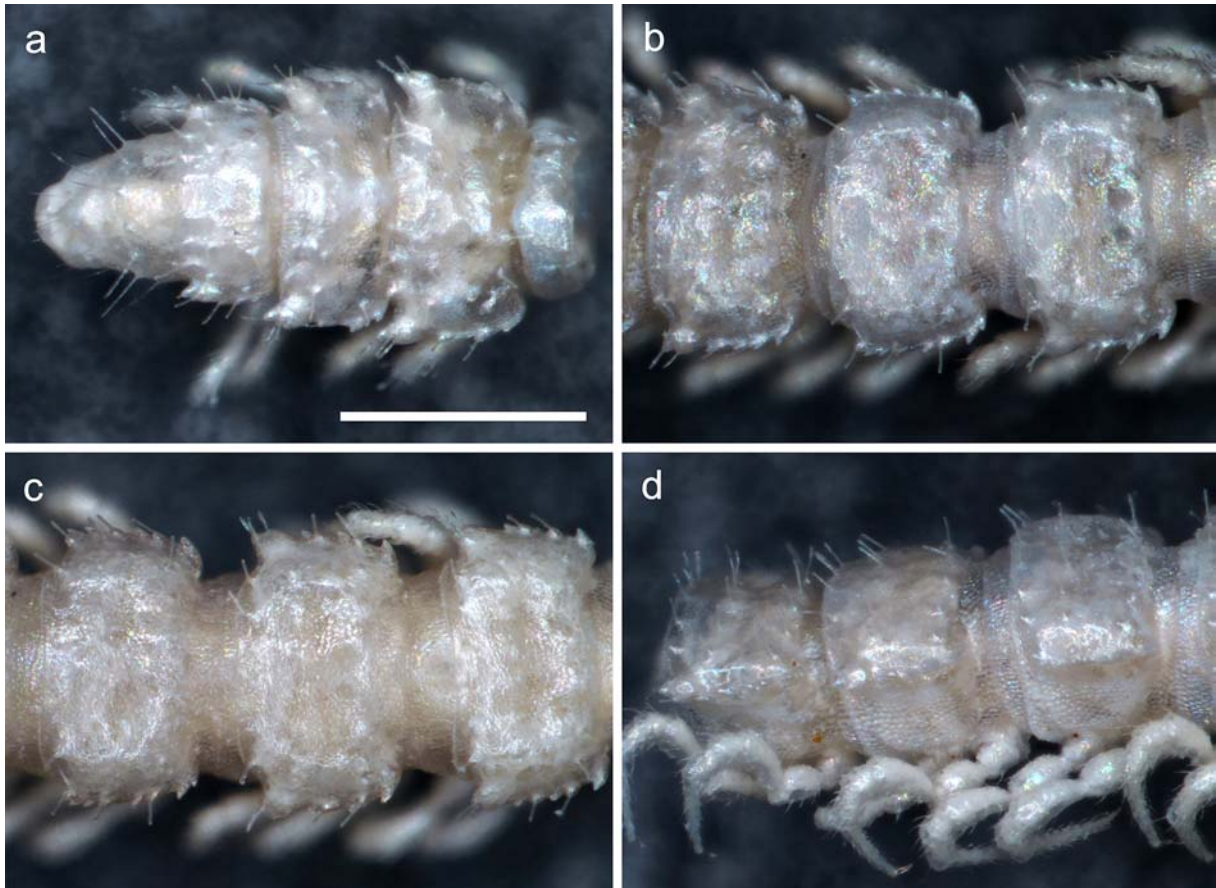


Fig. 4. *Jaxartes reductus* sp.n., ♂ paratype, habitus: a — posterior part of body, dorsal view; b — body rings 13–15, dorsal view; c — body rings 12–14, dorsal view; d — body rings 14–16, dorsolateral view. Scale bar: 0.5 mm.

Рис. 4. *Jaxartes reductus* sp.n., паратип ♂, общий вид: а — задняя часть тела, сверху; б — туловищные сегменты 13–15, сверху; с — туловищные сегменты 12–14, сверху; д — туловищные сегменты 14–16, одновременно сверху и сбоку. Масштаб: 0,5 мм.

NOTES. Although Verhoeff's [1930] description of *Jaxartes zachvatkini* is largely correct, there are several things that are misinterpreted or missed in the original description. These are discussed below.

## Discussion

As it can be seen from the above descriptions and based on our revision of the *Jaxartes zachvatkini* lectotype, several of Verhoeff's [1930] observations to make *Jaxartes* distinguished from the remaining genera of Polydesmidae are false. In contrast, some other important characters were omitted. Firstly, antennomere 6 is not truly barrel-shaped, but quite usual, subcylindrical, slightly narrowed both basad and apicad (Fig. 7E), as is typical of some Polydesmidae, including *Polydesmus*, e.g. *P. liber* Golovatch, 1991 from Hong Kong [Golovatch, 1991], and many other Polydesmida. In his original description, Verhoeff [1930] did not mention the presence of bacilliform sensilla on antennomeres 4–6, nor did he note the presence of a distodorsal knob with a few acuminate sensilla on antennomere 7. All these sensilla could be detected in the *J. zachvat-*

*kini* lectotype, at least one bacilliform sensillum on antennomeres 4 and 5, and a few on antennomere 6. It is the presence in *J. communicans* sp.n., *J. reductus* sp.n. and *J. zachvatkini* of a few (or at least one visible) apicodorsal sensilla on antennomere 4 that is really striking compared at least to some sympatric *Turanodesmus* spp. These latter show a likewise slender, subcylindrical antennomere 6, but distodorsal sensilla are visible only on antennomeres 5–7 [Spelda *et al.*, 1998]. Secondly, the presence of three transverse rows of polygonal setigerous bosses/tubercles on each post-collum metatergum is basically characteristic not only of Polydesmidae, but also of several other families of Polydesmida [e.g. Attems, 1940]. So *Jaxartes* is a typical polydesmid in this respect. Thirdly, although the telson/epiproct is indeed elongate caudad, its structure again shows no sufficiently striking traits to separate *Jaxartes* from other Polydesmidae or even Polydesmida. Fourthly, the gonopodal conformation actually reveals basally fused coxae, as well as a very slender and distally unipartite or bipartite telopodite which carries the seminal groove entirely on the mesal side and has a clear-cut hairy pulvillus, but no distinct accessory sem-

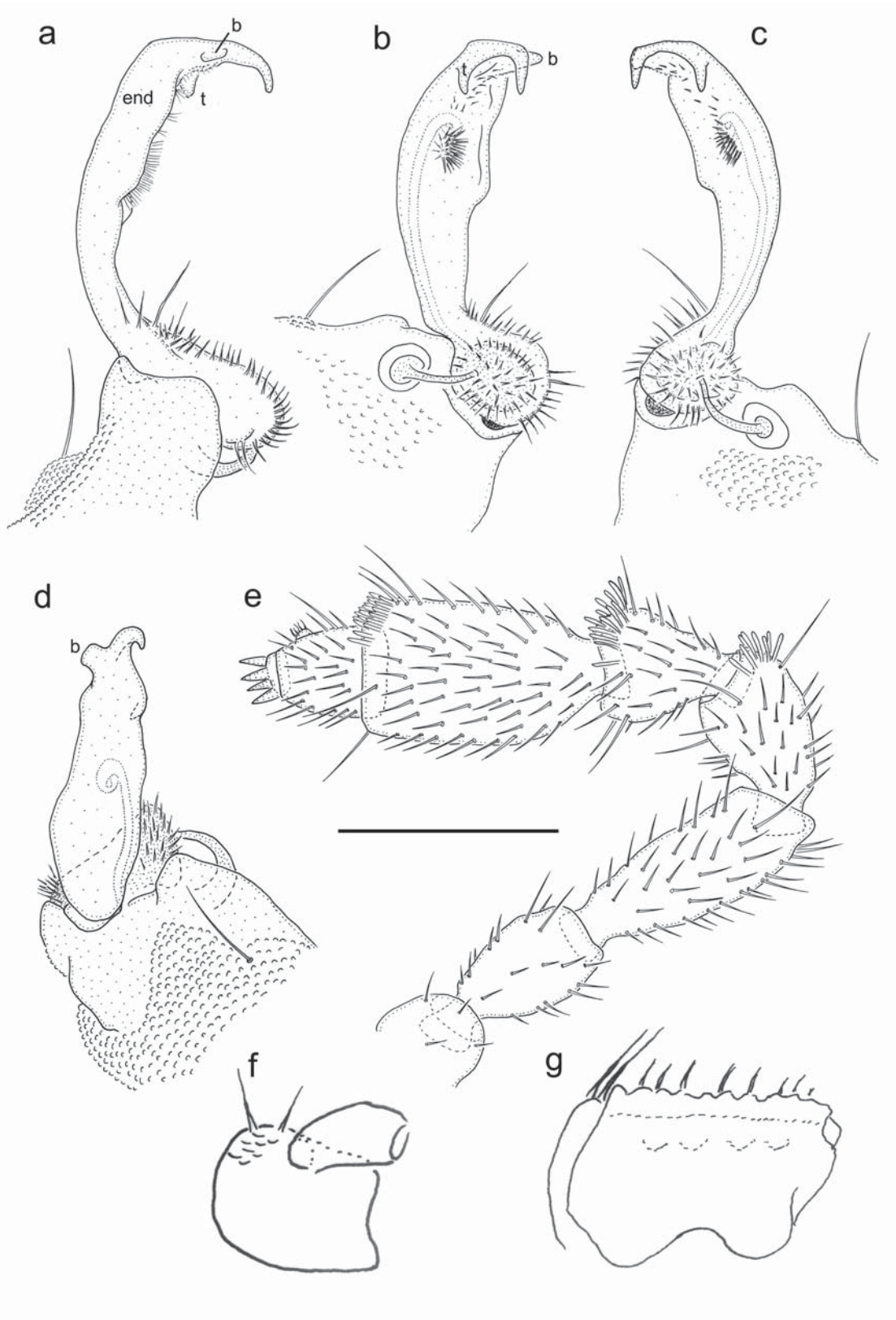


Fig. 5. *Jaxartes reductus* sp.n., a–e: ♂ holotype; f, g: ♀ paratype. a — right gonopod, lateral view; b — left gonopod, mesal view; c — right gonopod, mesal view; d — left gonopod, dorsal view; e — right antenna, lateral view; f — coxa 2; g — vulva. Scale bar: 0.2 mm.

Рис. 5. *Jaxartes reductus* sp.n., a–e: голотип ♂; f, g: паратип ♀. a — правый гонопод, сбоку; b — левый гонопод, изнутри; c — правый гонопод, изнутри; d — левый гонопод, сверху; e — правый усик, сбоку; f — тазик 2; g — вульва. Масштаб: 0,2 мм.





Fig. 6. *Jaxartes zachvatkini* Verhoeff, 1930, slides: a — ♂ lectotype (ZMS-A-20033402), head, body rings 1–7, gonopods; b — ♂ lectotype (ZMS-A-20033401), body rings 8–20; c — ♀ paralectotype (ZMS-A-20033400), body parts.

Рис. 6. *Jaxartes zachvatkini* Verhoeff, 1930, препараты: а — лектотип ♂ (ZMS-A-20033402), голова, туловищные сегменты 1–7, гоноподы; б — лектотип ♂ (ZMS-A-20033401), туловищные сегменты 8–20; с — паралектотип ♀ (ZMS-A-20033400), части тела.

inal chamber; all this (with the exception of a unipartite telopodite in *Jaxartes reductus* sp.n. and *J. zachvatkini*) makes *Jaxartes* in no way distinguished from the grossly sympatric genus *Turanodesmus* Lohmander, 1933. The latest revision of *Turanodesmus* lists as many as nine species, all keyed, mapped and confined to Central Asia [Spelda *et al.*, 1998]. Now that the synonymy *Jaxartes* = *Turanodesmus* has been revealed, all of the latter's species must be transferred to *Jaxartes*. As a result, the taxonomic outcome of our paper can be summarized as follows: *Jaxartes* Verhoeff, 1930 = *Turanodesmus* Lohmander, 1933, **syn.n.**, as the former generic name is older than the latter one, while *J. almassyi* (Attems, 1904), *J. cornutus* (Spelda, Golovatch et Meidell, 1998), *J. cynodon* (Spelda, Golovatch et Meidell, 1998), *J. elevatus* (Lohmander, 1933), *J. expressus* (Golovatch, 1979), *J. glaber* (Spelda, Golovatch et Meidell, 1998), *J. inermis* (Lohmander, 1933), *J. stummeri* (Attems, 1904) and *J. tenuis* (Golovatch, 1979) are all **comb.n.** ex *Turanodesmus*.

Among *Jaxartes* spp., *J. communicans* sp.n., *J. reductus* sp.n. and *J. zachvatkini* are distinct in showing an evident metatergal sculpture (bosses/tubercles with bacilliform or trichoid setae), combined with laterally clearly incised paraterga, ventral sphaerotrichomes present on four distal ♂ podomeres, a roundish gonopod coxa devoid of outgrowths, and the gonotelopodite which is particularly slender, suberect, with the endomere that is considerably longer than a ventrally fringed process (if present at all), also bearing a parbasal tooth and a subtruncate apex, basally with a very evident hairy pulvillus, but no distinct accessory seminal chamber [cf. Spelda *et al.*, 1998]. It seems that

during the evolution of this group the trend was the reduction of a distofemoral process, from a strongly developed structure in most of the species, through a barely visible and fringed process/blade very tightly appressed to the endomere in *J. communicans* sp.n., to a fully unipartite telopodite condition in both *J. reductus* sp.n. and *J. zachvatkini*. Map shows the known distributions of all 12 presently known *Jaxartes* species.

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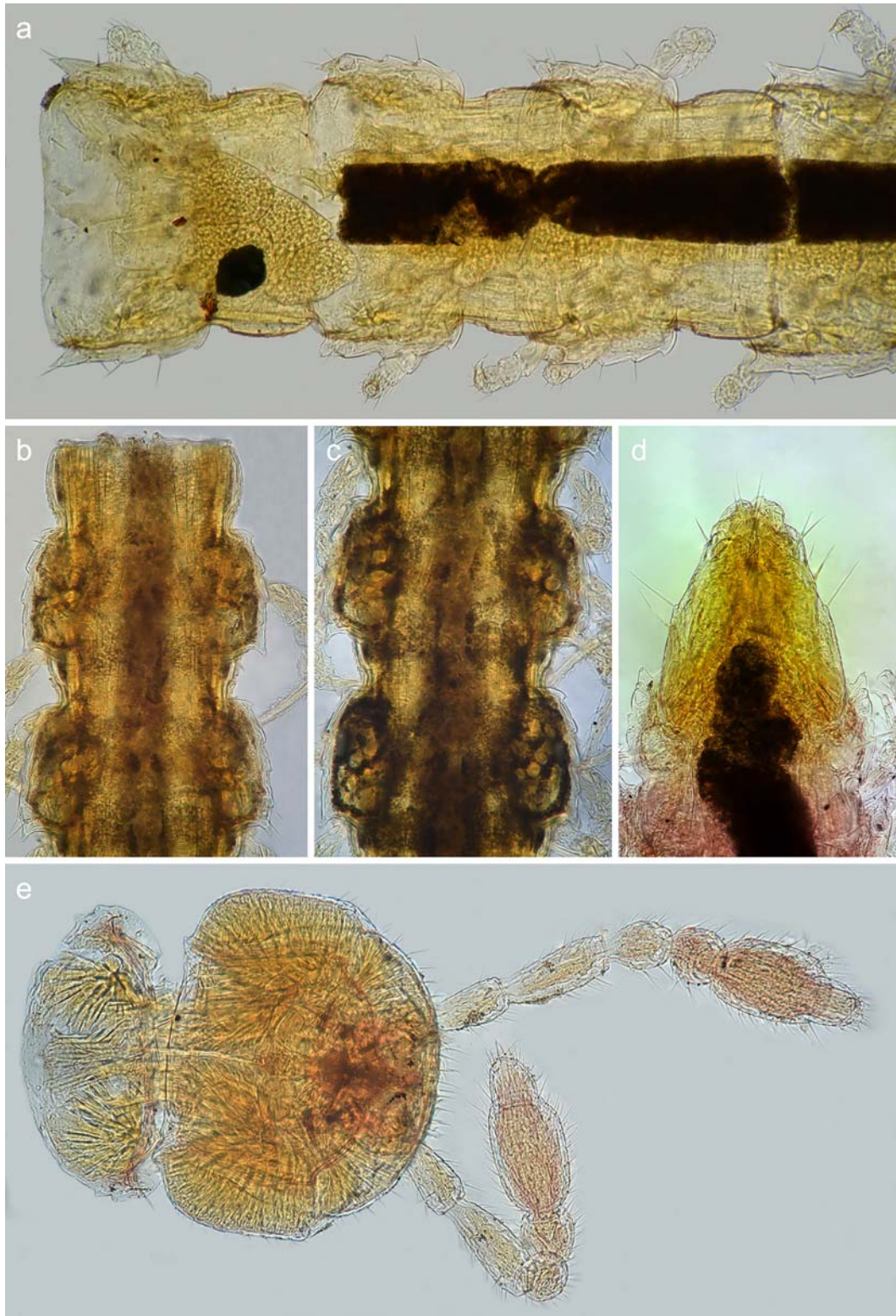


Fig. 7. *Jaxartes zachvatkini* Verhoeff, 1930, a: ♀ paralectotype (ZMS-A-20033400); b–d: ♂ lectotype (ZMS-A-20033401); e: ♂ lectotype (ZMS-A-20033402). a — body rings 11–14, dorsal view; b — body rings 8–9, dorsal view; c — body rings 10–11, dorsal view; d — posterior part of the body, dorsal view; e — head and collum, dorsal view.

Рис. 7. *Jaxartes zachvatkini* Verhoeff, 1930, a: паралекотип ♀ (ZMS-A-20033400); b–d: лекотип ♂ (ZMS-A-20033401); e: лекотип ♂ (ZMS-A-20033402). a — туловищные сегменты 11–14, сверху; b — туловищные сегменты 8–9, сверху; c — туловищные сегменты 10–11, сверху; d — задняя часть тела, сверху; e — голова и коллум, сверху.

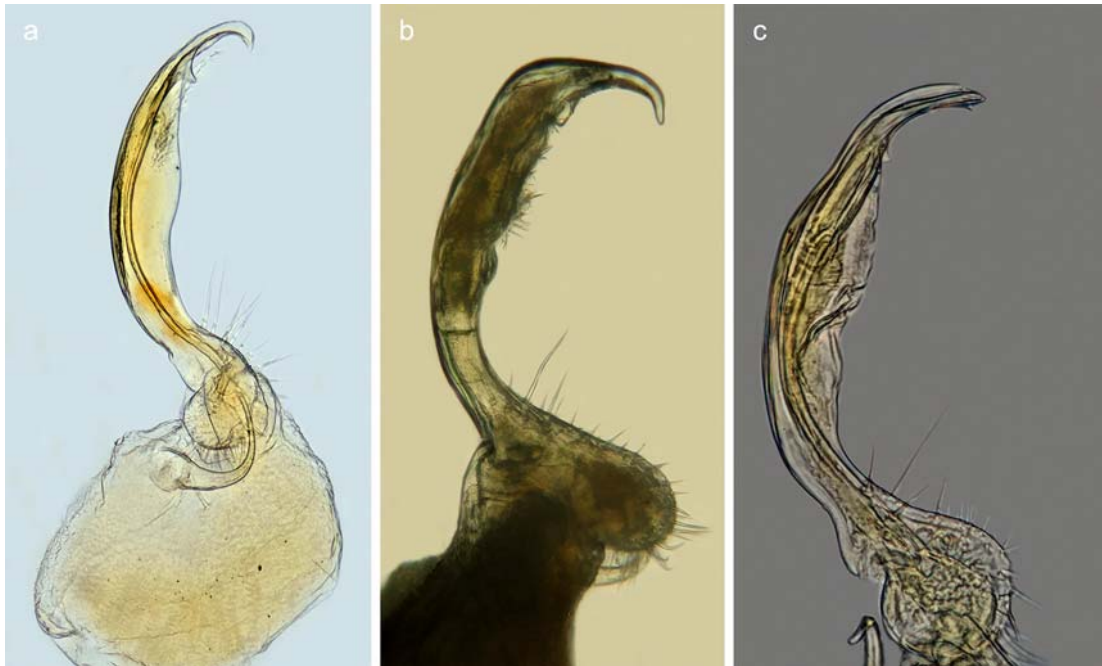


Fig. 8. Gonopods: a — *Jaxartes communicans* sp.n., ♂ holotype, left gonopod, mesal view; b — *Jaxartes reductus* sp.n., ♂ holotype, right gonopod, lateral view; *Jaxartes zachvatkini* Verhoeff, 1930, ♂ lectotype (ZMS-A-20033402), right gonopod, lateral view.

Рис. 8. Гonoпoды: a — *Jaxartes communicans* sp.n., гoлoтип ♂, левый гoнoпoд, изнутри; б — *Jaxartes reductus* sp.n., гoлoтип ♂, пpaвый гoнoпoд, cбoкy; *Jaxartes zachvatkini* Verhoeff, 1930, лeктoтип ♂ (ZMS-A-20033402), пpaвый гoнoпoд, cбoкy.

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