The Afrotropical millipede, *Xanthodesmus vagans* (Carl, 1909): the first meaningful iconography and a record new to the fauna of Ethiopia (Diplopoda: Polydesmida: Paradoxosomatidae)

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ABSTRACT. The Afrotropical diplopod, *Xanthodesmus vagans* (Carl, 1909) is redescribed and properly illustrated, based on samples from the population introduced to the Gulele Botanical Garden in Addis Ababa, Ethiopia. Its source area, however, remains obscure. How to cite this article: Golovatch S.I. 2025. The Afrotropical millipede, *Xanthodesmus vagans* (Carl, 1909): the first meaningful iconography and a record new to the fauna of Ethiopia (Diplopoda: Polydesmida: Paradoxosomatidae) // Invert. Zool. Vol.22. No.2. P.367–371. doi: 10.15298/invertzool.22.2.11

KEY WORDS: taxonomy, description, introduction.

Афротропичсеская многоножка-диплопода Xanthodesmus vagans (Carl, 1909): первая значимая иконография и находка, новая для фауны Эфиопии (Diplopoda: Polydesmida: Paradoxosomatidae)

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PE3ЮME. Афротропическая многоножка-диплопода *Xanthodesmus vagans* (Carl, 1909) переописана и должным образом проиллюстрирована по пробам из популяции, завезенной в ботанический сад Gulele Аддис-Абебы (Эфиопия). Исходная территория этой интродукции остается неясной.

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КЛЮЧЕВЫЕ СЛОВА: таксономия, описание, интродукция.

Introduction

The millipede family Paradoxosomatidae is perhaps the largest in the entire class Diplopoda, presently counting 1000+ species from 200+ genera, 22 tribes and three subfamilies (e.g., Golovatch, Korotaeva, 2024). The family's distribution is remarkable in having no indigenous representatives not only in Antarctica, which is self-evident, but conspicuously also in entire North America.

Native representatives of only four tribes of Paradoxosomatidae compose the fauna of Africa, in particular the Afrotropical realm (Jeekel, 1968): the Eviulisomatini (Jeekel, 2003; VandenSpiegel, Golovatch, 2014; Enghoff, 2018; Enghoff, Reboleira, 2019; VandenSpiegel, Ntashavu, 2022), the Xanthodesmini (Hoffman, 2004; Jeekel, 2004), the Cnemodesmini (Jeekel, 2006), and the Sulciferini. None is endemic to Africa, being shared also with the faunas of either Europe and/or Asia, and/or South America (Jeekel, 1968; Hoffman, 1980; Nguyen, Sierwald, 2013). Among the tribes, the Eviulisomatini is by far the largest.

The endemic Afrotropical genus Xanthodesmus Cook, 1896 (Xanthodesmini) has been thoroughly reviewed and catalogued (Jeekel, 2004), and all of its four accepted species (one with three formal subspecies) were supplied with descriptive notes, keyed and nicely illustrated. Species of Xanthodesmus range from Senegal in the west to Eritrea in the east, extending south down to Nigeria, the Democratic Republic of the Congo, Burundi, Uganda and Tanzania (Jeekel, 2004). Ethiopia has so far been known to host only one paradoxosomatid species: X. abyssinicus Cook, 1896, recorded from Keren and El Dire, also reported from several places in Eritrea (Jeekel, 2004). The present note not only puts on record a second congener recently found introduced to a botanical garden in Addis Ababa, but it also presents the first meaningful iconography for a species of Xanthodesmini.

Material and methods

The samples treated in this paper have been shared between the collections of the Zoological Museum of the Moscow State University (ZMUM) and the Zoological Institute of the Russian Academy of Sciences in St. Petersburg (ZISP), Russia. The samples are still preserved in 75% ethanol.

The pictures of fixed material were taken at the Paleontological Institute, Russian Academy of Sciences (PIN), Moscow, using a Flexacam C1 camera mounted on a Leica M165C stereo microscope with built-in LasX software. Final image processing was performed with Adobe Photoshop CC.

New faunistic record

Xanthodesmus vagans (Carl, 1909) Figs 1–13.

MATERIAL. 14 $\Im \Im$, 10 $\Im \Im$ (ZMUM), 2 $\Im \Im$ (ZISP), Ethiopia, Addis Ababa, Gulele Botanical Gar-

den, pitfall trapping, 12-20.XI.2024, A. Gromov leg.

REDESCRIPTION. Length *ca* 19–21 mm, width 2.6–2.8 mm and 2.8–3.0 mm on midbody pro- and metazona, respectively (\mathcal{S}, \mathcal{Q}). Coloration generally dark brown to grey brown, devoid of a distinct pattern, but with slightly lighter posterior halves of metazona and paraterga (Figs 1–5), gonopods yellow- to redbrown (Figs 7–13).

Body subcylindrical and robust, tegument basically smooth and shining, only below paraterga finely microgranulate, in places faintly striolate as well. In width, head < collum = ring 2 = 3 < 4 < 5–15, thereafter body gradually and gently tapering towards telson (Figs 1-5). Head densely setose in front of antennae, vertex with only 1+1 setae; interantennal isthmus ca 1.5x as broad as diameter of antennal socket (Fig. 3). Antennae rather short, but slender, in situ extending past ring 2 (\mathcal{J}) or collum (\mathcal{Q}) when stretched dorsally, only faintly clavate; in length, antennomere 2-5 > 6> 1 > 7 > 8 (Figs 1–3). Paraterga small (especially so in \mathcal{Q}), set low (at about half midbody height), thick (poreless rings) to very thick (pore-bearing rings) and mostly slightly arcuate bars broadly rounded anteriorly and either more narrowly rounded (poreless rings) or obliquely subtruncate (pore-bearing rings) caudally in lateral view, caudal corner being drawn past rear tergal margin only on rings 2 and 15–19 ($\stackrel{\frown}{\bigcirc}$) (Fig. 1) or only on ring 2 (\bigcirc); in dorsal view, caudal corners more or less narrowly rounded to nearly sharp teeth (Figs 1-4). Paraterga on collum broadly and regularly rounded, narrowly rimmed (Fig. 1). Following paraterga similarly rimmed, smooth, clearly demarcated by complete deep sulci dorsally and by less distinct and incomplete sulci ventrally in caudal halves (Fig. 1). Tergal setae fully absent, setation pattern being un traceable. Ozopores fully lateral, lying inside ovoid pits close to caudal corners of poriferous paraterga. Transverse metatergal sulci evident, close to reaching the bases of paraterga on rings 5-18. Strictures between pro- and metazona very delicately striolate, thin and deep (Figs 1-4). Pleurosternal carinae very evident, strongly arcuate, granulated ridges clearly visible on rings 2-18. Epiproct short, finger-shaped, flattened dorsoventrally, subtruncate, with very small, lateral, subapical, setigerous papillae (Figs 1, 5). Hypoproct roundly subtrapeziform, with 1+1 setae on minute knobs well removed from caudal margin (Fig. 5).

Sterna without evident modifications, densely setose; \eth legs with tarsal and tibial brushes except for two last pairs, clearly incrassate compared to \heartsuit (Figs 1, 3, 5, 6). Legs relatively long and slender, densely setose, devoid of adenostyles, 1.9–2.0x (\eth) (Fig. 1) or 1.2–1.3x (\heartsuit) as long as midbody height. In length, femur > coxa = prefemur = postfemur = tibia = tarsus > claw (Fig. 6).

Gonopods (Figs 7–13) rather complex, both independent at base, *in situ* very clearly curved mesad and crossing terminally (Figs 7, 8), each consisting



Figs 1–11. Xanthodesmus vagans (Carl, 1909), ♂ from Addis Ababa. 1 — habitus, lateral view; 2, 3 — anterior part of body, dorsal and ventral views, respectively; 4 — middle part of body, dorsal view; 5 — posterior part of body, ventral view; 6 — leg 9, lateral view; 7, 8 — both gonopods, ventral and subventral views, respectively; 9–11 — left gonopod, mesal, subventral and submesal views, respectively. Photographs courtesy R. Rakitov. Puc. 1–11. Xanthodesmus vagans (Carl, 1909), ♂ из Аддис-Абебы. 1 — общий вид, сбоку; 2, 3 — передняя часть тела, соответственно сверху и снизу; 4 — средняя часть тела, сверху; 5 — задняя часть тела, снизу; 6 — нога 9, сбоку; 7, 8 — оба гонопода, соответственно снизу и почти снизу; 9–11 — левый гонопод, соответственно изнутри, почти снизу и почти изнутри. Фотографии любезно сделаны Р. Ракитовым.



Figs 12, 13. Right gonopod of *Xanthodesmus vagans* (Carl, 1909), ♂ from Addis Ababa, mesal and lateral views, respectively. Photographs courtesy R. Rakitov.

Рис. 12, 13. Правый гонопод *Xanthodesmus vagans* (Carl, 1909), ♂ из Аддис-Абебы, соответственно изнутри и сбоку. Фотографии любезно сделаны Р. Ракитовым.

of a subcylindrical coxite (**cx**) with a small and setose bulge distoventrally and a typical, curved and simple cannula apicomesally, and a telopodite (**te**). Telopodite (**te**) about twice as long as coxite (**cx**), divided into an as usual densely setose prefemorite (**pfe**), a shorter, simple and somewhat flattened femorite (**fe**), clearly demarcated by a distofemoral cingulum from a short, subcylindrical and simple postfemoral portion (**pf**), and a mesally curved solenophore (**sph**). Solenomere (**sl**) flagelliform, long, arising distomesally from postfemorite (**pf**) to become quickly sheathed and fully concealed by a distally bifid solenophore (**sph**), both of its branches being simple and subequal in length and shape.

REMARKS. Among the varieties of Xanthodesmus vagans as outlined by Jeekel [2004], all formerly proposed as independent species or subspecies, all formally synonymized with X. vagans, all supplied with descriptive and comparative notes, one variety described in particular detail and one more also depicted, i.e. X. biseriatus (Attems, 1929), X. biseriatus pictus (Attems, 1938), cursor (Chamberlin, 1927), X. garambanus (Chamberlin, 1927), X. peculiarius (Attems, 1927) and X. vagans (Carl, 1909), the samples from Addis Ababa seem to come the closest to biseriatus. Perhaps this is because X. biseriatus has been redescribed much better than others. Yet the Ethiopian material shows only very slight traces of a colour pattern, transverse metatergal sulci start with ring 5, not 4, \mathcal{J} tibiae and tarsi are with evident brushes until the last two leg-pairs (vs until midbody legs), tergal setae are totally missing (vs present) etc. The most striking difference from all above varieties,

however, lies in the presence in the new samples of a distinct postfemoral cingulum and portion (pf) in the gonopods (Figs 7–13)! In addition, the solenomere (sl) seems to be shorter than usual, as its tip is exposed neither between nor among the distal branches of the solenophore (sph).

As a result, the source area of the population introduced to the botanical garden in Addis Ababa remains obscure. At present, *Xanthodesmus vagans* is known to occur in Tanzania, Uganda, Burundi, the Democratic Republic of the Congo (Jeekel, 2004), and Ethiopia.

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