

**A brief pictorial review of the Andean millipede genus
Ergethus Chamberlin, 1949, with a new record of *E. connectens*
(Kraus, 1960) from Peruvian Amazonia (Diplopoda:
Polydesmida: Paradoxosomatidae)**

**Краткий иллюстрированный обзор андских многоножек-
диплопод рода *Ergethus* Chamberlin, 1949, с новой находкой
E. connectens (Kraus, 1960) из перуанской Амазонии
(Diplopoda: Polydesmida: Paradoxosomatidae)**

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КЛЮЧЕВЫЕ СЛОВА: таксономия, ключ, иконография, Неотропики.

ABSTRACT. The genus *Ergethus* is briefly reviewed, with the gonopods of all of its seven presently known species illustrated, including a new record of *E. connectens* (Kraus, 1960) from near Iquitos, Loreto Region, Peruvian Amazonia.

РЕЗЮМЕ. Дан краткий обзор рода *Ergethus* с иллюстрированным гоноподом для всех семи известных пока его видов, включая новую находку *E. connectens* (Kraus, 1960) из окрестностей Икитоса (район Лорето, перуанская Амазония).

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. Only three native species of Paradoxosomatidae are known to occur in entire Central America, all in the largest Neotropical genus *Iulidesmus* Silvestri, 1895, which currently encompasses ca 100 species ranging from the island of Dominica, Lesser Antilles, in the north to Uruguay, southern and eastern Brazil, and northern Argentina in the south [Golovatch, Korotaeva, 2024].

The diversity of paradoxosomatids in South America is impressive (ca 170 species), being higher than that of the Euro-Mediterranean realm, but subordinate in relation to the Afrotropical (together with southern Africa) and, especially, Indo-Australian ones. The indigenous Neotropical fauna contains only members of the subfamily Paradoxosomatinae, being clearly dominated by species and genera of the tribe Catharosomatini (including *Iulidesmus*). The remaining two tribes are much smaller: Eviulisomatini Brölemann, 1916, with the sole Neotropical genus *Onciuerosoma* Silvestri, 1932, and Graphisternini Verhoeff, 1941, with two genera, *Ergethus* Chamberlin, 1949 and *Graphisternum* Verhoeff, 1941, altogether 11 species [Golovatch, Korotaeva, 2024].

Graphisternum differs from *Ergethus*, both the only component genera of the tribe which is endemic to the Neotropical realm, by the gonopodal solenophore usually being more compact (vs rather elongate, typically with a distinct lobe on the mesal side of the femorite), and with a shorter and fully concealed free solenomere (vs clearly longer, flagelliform and better exposed at least near the base and apically). ♂ sternal and leg modifications usually present and varied [Golovatch, Korotaeva, 2024].

Ergethus presently comprises seven species, all from Peru. The rather recent catalogue of the genus and its species is still fully relevant [Nguyen, Sierwald, 2013], but, because the genus is masculine in gender

[Jeekel, 1970], some species names must be corrected. All are listed below and arranged in alphabetic order, as follows:

Ergethus albipes (Kraus, 1959), from Peru, eastern versant of the Andes: Pan de Azucar, Rio Tarma, tributary of Rio Chanchamayo in Ucayali River basin, 1400 m [Kraus, 1959].

Ergethus castaneus (Kraus, 1954), from Peru, near Abra Porculla (60°10'S, 79°30'W), W versant of the Andes, montane tropical forest, 2000 m [Kraus, 1954].

Ergethus connectens (Kraus, 1960), from Peru, Amazonia, tropical forest in middle course of Rio Pastaza, tributary of Rio Marañon [Kraus, 1960].

Ergethus jaujensis (Kraus, 1955), from Peru, Andes,

W versant, Incatacuna between Jauja and Tarma, 3800 m [Kraus, 1955].

Ergethus mamillatus (Kraus, 1960), from Peru, near Laguna Aracocha, environs of Lake Junin, alpine meadows at 4300 m., from Peru, (1) near La Viuda on road between Matukana and Oroya, alpine meadows at 4500 m; (2) near Lake Torococha near La Viuda, alpine meadows at 4200 m [Kraus, 1960].

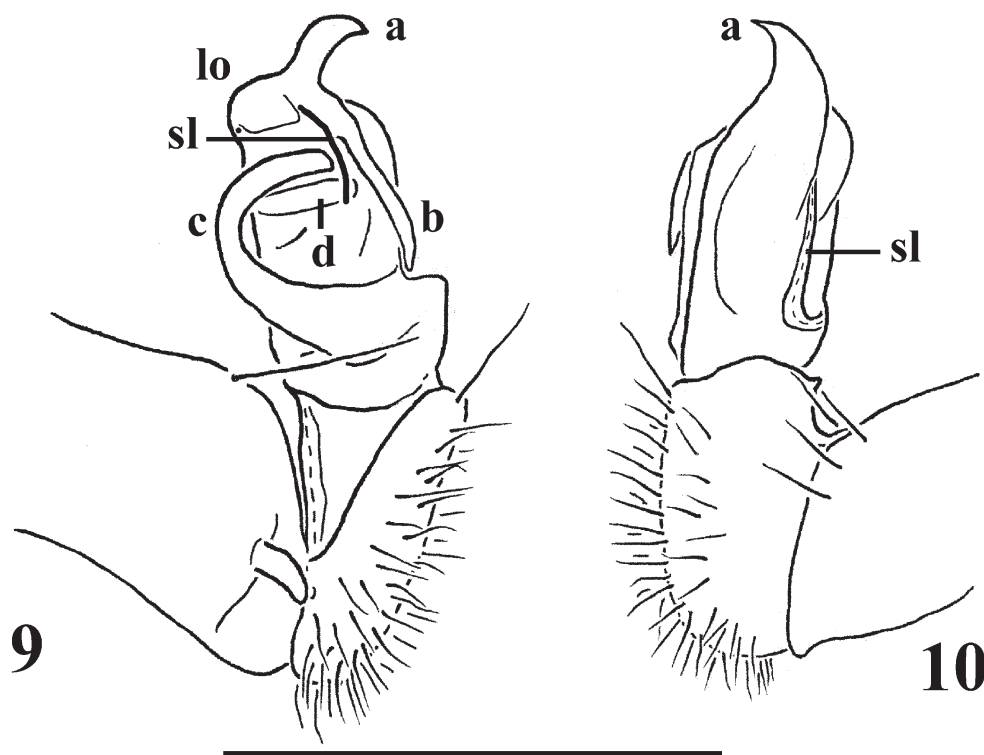
Ergethus muticus (Kraus, 1955), from Peru, near Laguna Aracocha, environs of Lake Junin, alpine meadows at 4300 m [Kraus, 1955].

Ergethus perditus Chamberlin, 1949, the type species, obviously from an unspecified locality in Peru [Chamberlin, 1949; Shear, 1971].



Figs 1–8. *Ergethus connectens* (Kraus, 1960), ♂ from Allpahuayo. 1 — habitus, lateral view; 2, 3 — anterior part of body, dorsal and ventral views, respectively; 4 — posterior part of body, ventral view; 5–8 — left gonopod, mesal, subventral, dorsal and lateral views, respectively. Photographs courtesy R. Rakitov.

Рис. 1–8. *Ergethus connectens* (Краус, 1960), ♂ из Allpahuayo. 1 — общий вид, сбоку; 2, 3 — передняя часть тела, соответственно сверху и снизу; 4 — задняя часть тела, снизу; 5–8 — левый гонопод, соответственно изнутри, почти снизу, сверху и сбоку. Фотографии любезно сделаны Р. Ракитовым.



Figs 9, 10. Left gonopod of *Ergethus connectens* (Kraus, 1960), ♂ from Allpahuayo, mesal and lateral views, respectively. Designations: **a**, **b**, **c** and **d** — outgrowths/processes of acropodite; **lo** — subapical lobule; **sl** — solenomere. Scale bar: 0.5 mm.

Рис. 9, 10. Левый гонопод *Ergethus connectens* (Kraus, 1960), ♂ из Allpahuayo, соответственно изнутри и сбоку. Обозначения: **a**, **b**, **c** и **d** — выросты или отростки акроподита; **lo** — субапикальная пластинка; **sl** — соленомер. Масштаб: 0,5 мм.

Material and methods

The specimen treated in this note is in the collection of the Zoological Museum of the Moscow State University (ZMUM). The sample is 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.

Abbreviations used to denote particular structures of the specimen are explained both in the text and in figure captions.

New faunistic record

Ergethus connectens (Kraus, 1960)

Figs 1–10.

MATERIAL. 1 ♂ (ZMUM), Peru, Loreto Region, Allpahuayo ca 30 km SW of Iquitos (presently Allpahuayo-Mishana National Reserve), terra firme, primary lowland tropical rainforest, litter, 26.III.1998, S.I. Golovatch leg.

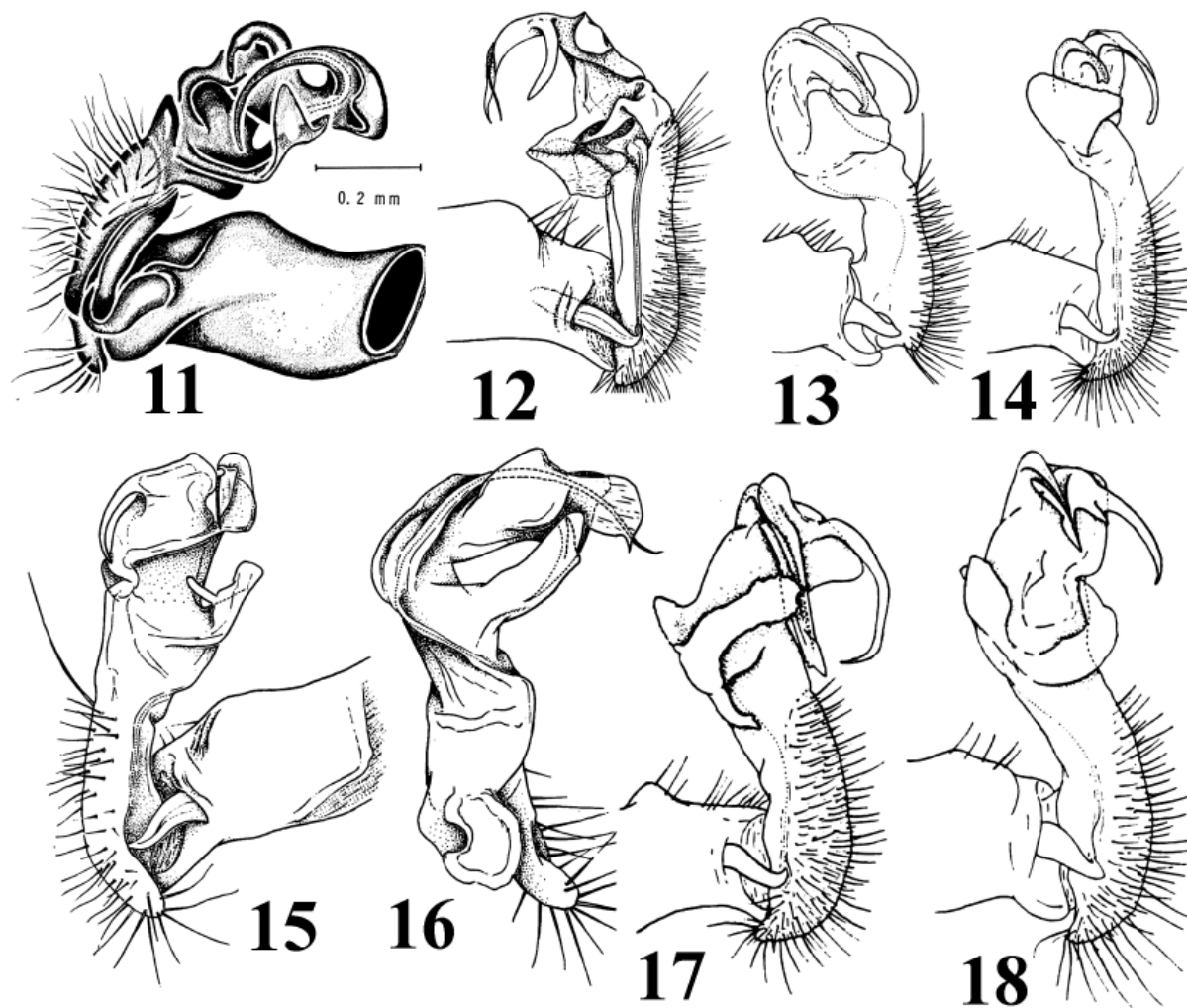
BRIEF DESCRIPTIVE NOTES. Length ca 12 mm, width/diameter 1.0 mm (vs 0.82 mm in Kraus [1960]). Coloration generally rather light grey-brown to red-brown (Figs 1–4), with a quite distinct pattern of light yellowish prozona, light brown legs and

antennae, only antennomeres 6–8 contrasting pallid (vs bleached horn brown with white antennae and legs in Kraus [1960]).

Body cylindrical, paraterga missing (Fig. 1). Sterna and legs without evident modifications, only anterior legs with tarsal brushes. Sterna with faint knob near each coxa (Fig. 4). Legs relatively short and slender, about as long as midbody height (Figs 1–4) (vs sterne with faint central or paramedian knobs between coxae 3–6 in Kraus [1960]).

The gonopods (Figs 5–10) are highly characteristic and most complex among congeners through the presence of as many as four processes on the acropodite: a distinct apical tooth (**a**), a long arm (**b**) at base of **a**, and a large unciform process (**c**) concealing a finger-shaped process **d**. Seminal groove moving laterad on a very short femorite to quickly proceed onto a long and flagelliform solenomere (**sl**), this latter concealed distally by a lobule (**lo**), but fully exposed apically.

REMARKS. Most of the gonopodal structures and their outlines are easy to recognize in Kraus' [1960] illustrations, reproduced here in Figs 15, 16. There can be no doubt concerning the identity of the new sample, even though there are a number of discrepancies, mostly quite minor, from the original description [Kraus, 1960]: larger body, a rather evident cingulated pattern, virtually unmodified sterne between coxae 3–6, only antennomeres 6–8 pallid etc. The most remarkable congruence, however, concerns the gonopodal structure, even though Kraus [1960] failed to depict a few details, somewhat simplifying the real complex picture (Figs 5–10, vs Figs 15, 16). In addition, both records of *E. connectens* come from Peruvian Amazonia.



Figs 11–18. Gonopods of *Ergethus* species: 11 — *E. perditus* Chamberlin, 1949, after Shear [1971]; 12 — *E. albipes* (Kraus, 1959), after Kraus [1959]; 13 — *E. castaneus* (Kraus, 1954), after Kraus [1954]; 14 — *E. jaujensis* (Kraus, 1955), after Kraus [1955]; 15, 16 — *E. connectens* (Kraus, 1960), after Kraus [1960]; 17 — *E. mamillatus* (Kraus, 1960), after Kraus [1960]; 18 — *E. muticus* (Kraus, 1955), after Kraus [1955].
Рис. 11–18. Гonoпoды видов рода *Ergethus*: 11 — *E. perditus* Chamberlin, 1949, no: Shear [1971]; 12 — *E. albipes* (Kraus, 1959), no: Kraus [1959]; 13 — *E. castaneus* (Kraus, 1954), no: Kraus [1954]; 14 — *E. jaujensis* (Kraus, 1955), no: Kraus [1955]; 15, 16 — *E. connectens* (Kraus, 1960), no: Kraus [1960]; 17 — *E. mamillatus* (Kraus, 1960), no: Kraus [1960]; 18 — *E. muticus* (Kraus, 1955), no: Kraus [1955].

To assess and show the variations in gonopodal structure among the seven *Ergethus* species known to date, Figs 11–18 are reproduced from the available sources. There is little doubt that, with further explorations in the Andes, more *Ergethus* spp. will be found and recorded.

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