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On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), XX

О нескольких новых или плохоизученных ориентальных Paradoxosomatidae (Diplopoda: Polydesmida), XX

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КЛЮЧЕВЫЕ СЛОВА: Diplopoda, Polydesmida, Paradoxosomatidae, таксономия, новые находки, новые виды, ключ, Непал, Индия, Китай, Индонезия.

ABSTRACT. This contribution is devoted to new records of several known, and to descriptions of the following nine new, species: *Tectoporus telnovi* sp.n., from New Guinea, Indonesia, *Beronodesmoides typicus* sp.n., *B. montigena* sp.n., *B. martensi* sp.n. and *Beronodesmus simplex* sp.n., all four from Nepal, *Hedinomorpha montana* sp.n., *H. yunnanensis* sp.n., *H. proxima* sp.n. and *Sigipinius dentiger* sp.n., all four from southern China. A key is provided to all seven currently known species of the Nepalese genus *Beronodesmoides* Golovatch, 2015.

РЕЗЮМЕ. Данное сообщение посвящено находкам нескольких известных, а также описаниям следующих девяти новых видов: *Tectoporus telnovi* sp.n., из Новой Гвинеи (Индонезия), *Beronodesmoides typicus* sp.n., *B. montigena* sp.n., *B. martensi* sp.n., *Beronodesmus simplex* sp.n., все четыре из Непала, *Hedinomorpha montana* sp.n., *H. yunnanensis* sp.n., *H. proxima* sp.n. и *Sigipinius dentiger* sp.n., все четыре из Южного Китая. Дан ключ для всех семи пока известных видов непальского рода *Beronodesmoides* Golovatch, 2015.

Introduction

This paper is devoted to new records of a few known, as well as to descriptions of nine new, species of paradoxosomatid millipedes from Nepal, China and Indonesia.

Material and methods

Most of the material is deposited in the collection of the Zoological Museum, Moscow State University, Russia (ZMUM). Several samples have been returned to the Natur-Museum Senckenberg (SMF), Frankfurt a.M., Germany, as indicated below.

Taxonomic part

Anoplodesmus tanjoricus (Pocock, 1892)

MATERIAL. 1 ♂ (ZMUM ρ3054), India, Goa State, Baga Anjuna, SW slope, 24–28.01.2012, leg. ?

REMARKS. The identity of the above sample is based on Jeekel's [1965] key and taxonomic notes. Thus, its sternal lobe between coxae 4 is low, subtrapeziform, setose, directed more ventrad than caudad, whereas the ventral femoral bulges are increasingly prominent on legs 4–7.

Kronopolites biagrilectus Hoffman, 1963

MATERIAL. 1 ♂ (ZMUM ρ3116), China, Yunnan Prov., SE of Deqen City, 3.3 km S of Gejiancun, N27º40′42″, E99º21′37″, 3210 m a.s.l., 24.VI.2015, leg. I. Belousov, I. Kabak & G. Davidian.

REMARK. This species, originally described from Jiangxi Prov., China [Hoffman, 1963], is quite common and widespread across southern China [Liu, in litt.].

Inversispina erectispina Golovatch, 2012

MATERIAL. 1 ♂ (ZMUM ρ3117), China, Yunnan Prov., between Tianbaoshan and Luzilashan, between Shuimofang and Xipazi, N27º37′31″, E100º2′2″, 3130 m a.s.l., 24.V.2015, leg. I. Belousov, I. Kabak & G. Davidian.

REMARK. This species, originally described from near Mianning and Pingchuan [Golovatch, 2012], later recorded also from near Wulaxixiang, all in Sichuan

Figs 1–4. *Beronodesmoides anteriporus* Golovatch, 2015, ♂ from near Yamputhin. 1 — habitus, lateral view; 2 — anterior half of body, ventral view; 3 — midbody segments, dorsal view; 4 — caudal end of body, dorsal view. Pictures by K. Makarov, not taken to scale.

Рис. 1–4. *Beronodesmoides anteriporus* Golovatch, 2015, ♂ из окрестностей Yamputhin. 1 — общий вид, сбоку; 2 — передняя половина тела, снизу; 3 — среднетуловищные сегменты, сверху; 4 — задняя часть тела, сверху. Фотографии К. Макарова, сняты без масштаба.

Prov. [Golovatch, 2013b], always taken between 2300 and 4150 m a.s.l., is being reported from Yunnan for the first time.

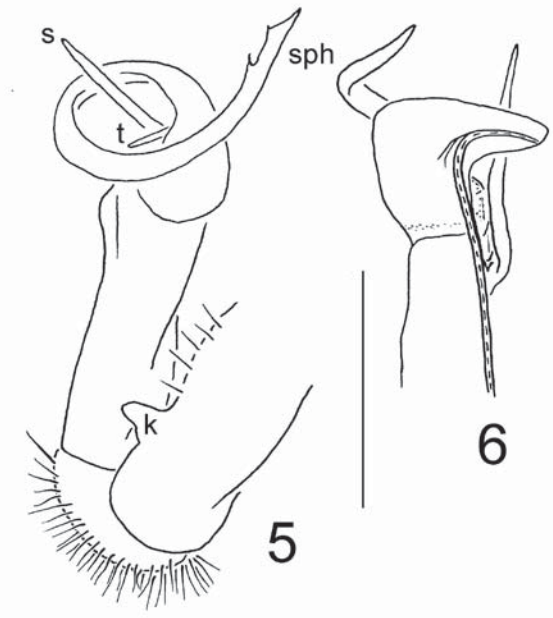
Beronodesmoides anteriporus Golovatch, 2015
Figs 1–6.

MATERIAL. 2 ♂♂, 9 ♀♀ (SMF), Nepal, Taplejung Distr., upper Simbua Khola valley, near Tseram, 3250–3350 m a.s.l., mature *Abies* and *Rhododendron* forest, 10–15.V.1988; 2 ♂♂, 8 juv. (SMF), Taplejung Distr., SE of Yamputhin to Yamputhin, 2000–1650 m a.s.l., forest (mainly *Alnus*), 26 & 30.IV.1988, all leg. J. Martens & W. Schawaller.

REMARKS. The above samples represent near-topotypes [Golovatch, 2015]. New illustrations are provided (Figs 1–6) not only to confirm the species identity, but also to show minor variations both in peripheral and gonopodal characters. Thus, one ♂ from near Yamputhin is mostly light brown (Figs 1–4), not almost pallid, the strictures between the pro- and metazonae ribbed, not striolate, and its gonopod is supplied with a somewhat longer and more slender tooth (**t**) at the base of spine **s**, while the solenophore (**sph**) is not so clearly fimbriate near the apex. The gonocoxite carries an evident, characteristic, midway, ventrolateral tubercle (**k**), and the solenomere is fully sheathed by **sph** (Figs 5 & 6).

Beronodesmoides lobatus Golovatch, 2015

MATERIAL. 1 ♂ (ZMUM ρ3128), Nepal, Sankhua Sabha Distr., descent from Meropapa La to Yumutanga River, 4600 m



Figs 5 & 6. *Beronodesmoides anteriporus* Golovatch, 2015, ♂ from near Yamputhin, left gonopod, lateral and mesal views, respectively. Scale bar: 0.5 mm.

Рис. 5 и 6. *Beronodesmoides anteriporus* Golovatch, 2015, ♂ из окрестностей Yamputhin, левый гонопод, соответственно сбоку и изнутри. Масштаб: 0,5 мм.

a.s.l., alpine meadows and dwarf *Rhododendron*, 25.V.1988, leg. J. Martens & W. Schawaller.

REMARK. The above sample is a near-topotype [Golovatch, 2015], also taken above 4000 m a.s.l.

Beronodesmus gorkhalis Golovatch, 2015

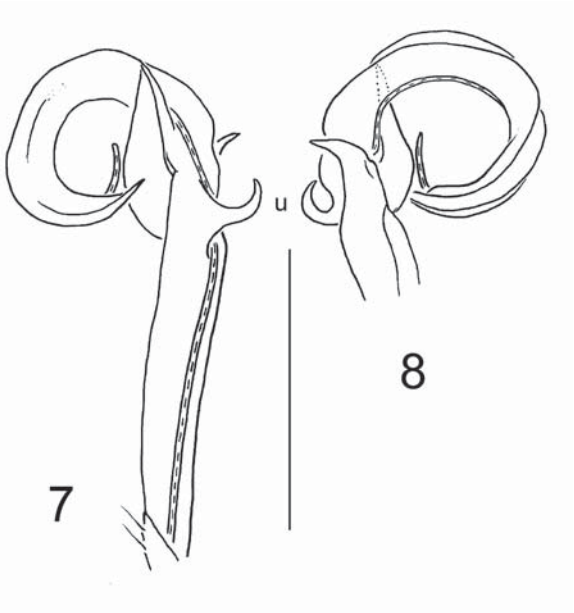
MATERIAL. 1 ♂ (ZMUM ρ3129), Nepal, Dolpo Distr., Gompa near Tarakot, 3300–3400 m a.s.l., *Picea-Betula* forest, NW macroslope of Dhaulagiri Mt. Range, 2–6.VI.1973, leg. J. Martens.

REMARK. The above sample represents a near-topotype [Golovatch, 2015], also taken above 3000 m a.s.l.

Beronodesmus latispinosus Golovatch, 2015
Figs 7 & 8.

MATERIAL. 1 ♂, 3 ♀♀ (SMF), Nepal, Taplejung Distr., upper Simbua Khola, ascent to pasture Lassetham, 3000–3150 m a.s.l., mixed *Tsuga-Rhododendron*-broadleaved forest, 15.V.1988, leg. J. Martens & W. Schawaller; 1 ♂, 1 ♀ (SMF), Nepal, Ilam Distr., Mai Pokhari, 2100–2200 m a.s.l., *Castanopsis* forest remains, 9–10.IV. 1988, leg. J. Martens & W. Schawaller; 1 ♂ (SMF), Panchthar Distr., above Mai Majuwa Khola, Dhorpar Kharka, 2700 m a.s.l., *Rhododendron* forest, 27 –28.VIII.1983, leg. J. Martens & B. Daams.

REMARKS. The above samples represent strict topotypes or a near-topotype, respectively [Golovatch, 2015]. Recently reported from Nepal, based on another ♂ near-topotype [Golovatch, 2016]. The ♂ from Dhorpar Kharka is somewhat disjunct in the gonopod showing a small, but evident distofemoral uncus (**u**) (Figs 7 & 8).



Figs 7 & 8. *Beronodesmus latispinosus* Golovatch, 2015, ♂ from Dhorpar Kharka, right gonopod, mesal and lateral views, respectively. Scale bar: 0.5 mm.

Рис. 7 и 8. *Beronodesmus latispinosus* Golovatch, 2015, ♂ из Dhorpar Kharka, правый гонопод, соответственно изнутри и сбоку. Масштаб: 0.5 мм.

Beronodesmus longispinus Golovatch, 2015

MATERIAL. 1 ♂, 4 ♀♀ (SMF), 1 ♂, 1 ♀ (ZMUM 3127), Nepal, Terhathum/Dhankuta Distr., Tinjura Dara, Chauki to Basantapur, 2550–2650 m a.s.l., broadleaved forest, 18.IX.1983; 2 ♂♂, 2 ♀♀ (SMF), Taplejung Distr., S of Gunsa, 4270 m a.s.l., alpine meadows, dwarf vegetation and stone looses, 10.IX.1983, all leg. J. Martens & B. Daams; 1 ♂, 1 ♀ (SMF), Gorkha Distr., Darondi Khola above Barpak, 3000–3300 m a.s.l., *Rhododendron* forest, Berlese extraction, 11.VIII.1983, leg. J. Martens & W. Schawaller.

REMARK. The above samples represent strict or near-topotypes [Golovatch, 2015].

Beronodesmus sinuatospinus Golovatch, 2015

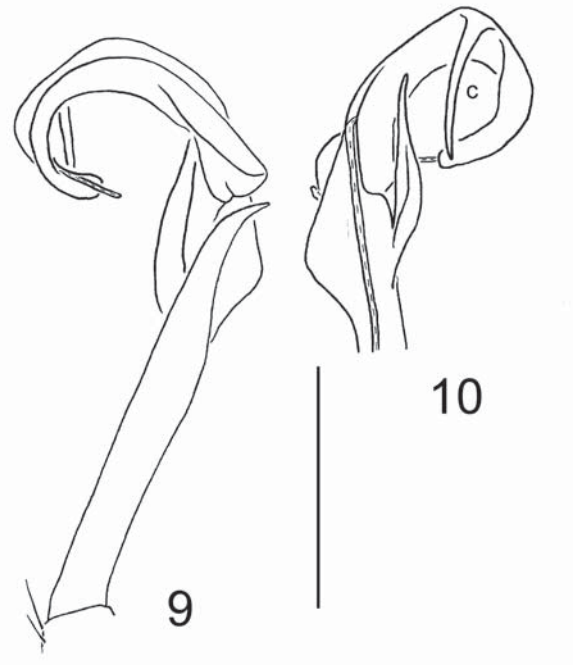
MATERIAL. 2 ♂♂ (SMF), Nepal, Ilam Distr., Mai Pokhari, 2150–2250 m a.s.l., minute remnant of broadleaved forest, 23–25.VIII.1983, leg. J. Martens & B. Daams.

REMARK. The above samples represent strict topotypes [Golovatch, 2015].

Beronodesmus distospinosus Golovatch, 2015
Figs 9 & 10.

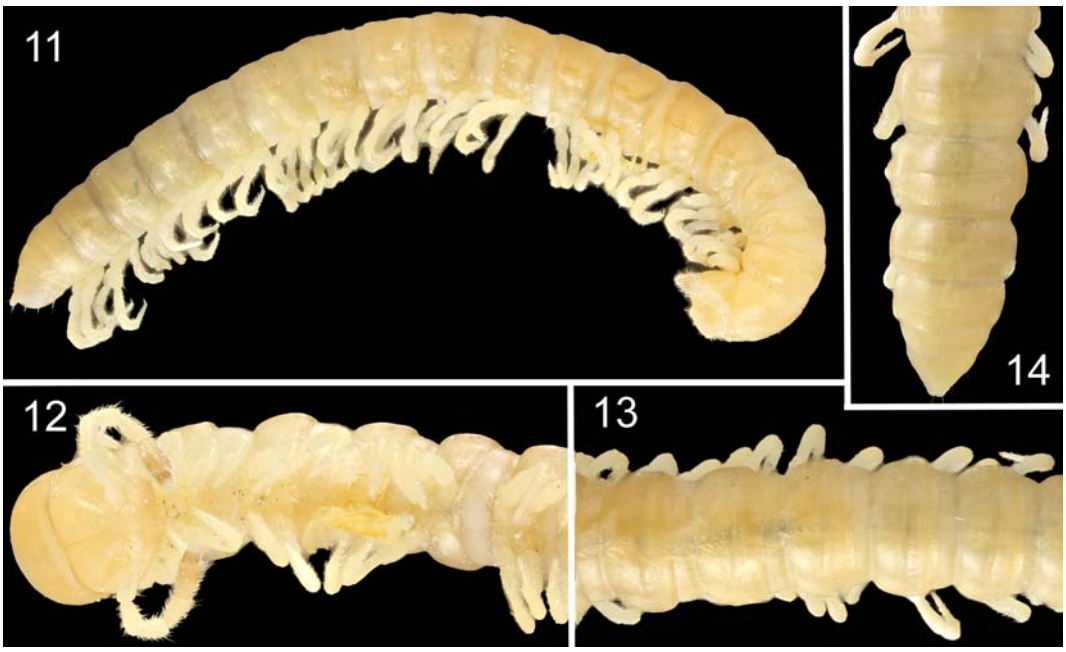
MATERIAL. 1 ♂, 1 ♀ (SMF), Nepal, Taplejung Distr., SE of Yamputhin to Yamputhin, 2000–1650 m a.s.l., forest (mainly *Alnus*), 26 & 30.IV.1988, leg. J. Martens & W. Schawaller.

REMARK. The above samples represent strict topotypes [Golovatch, 2015], the gonopod showing a little longer and more slender spine **c** on the solenophore (Figs 9 & 10) as compared to the typical condition.



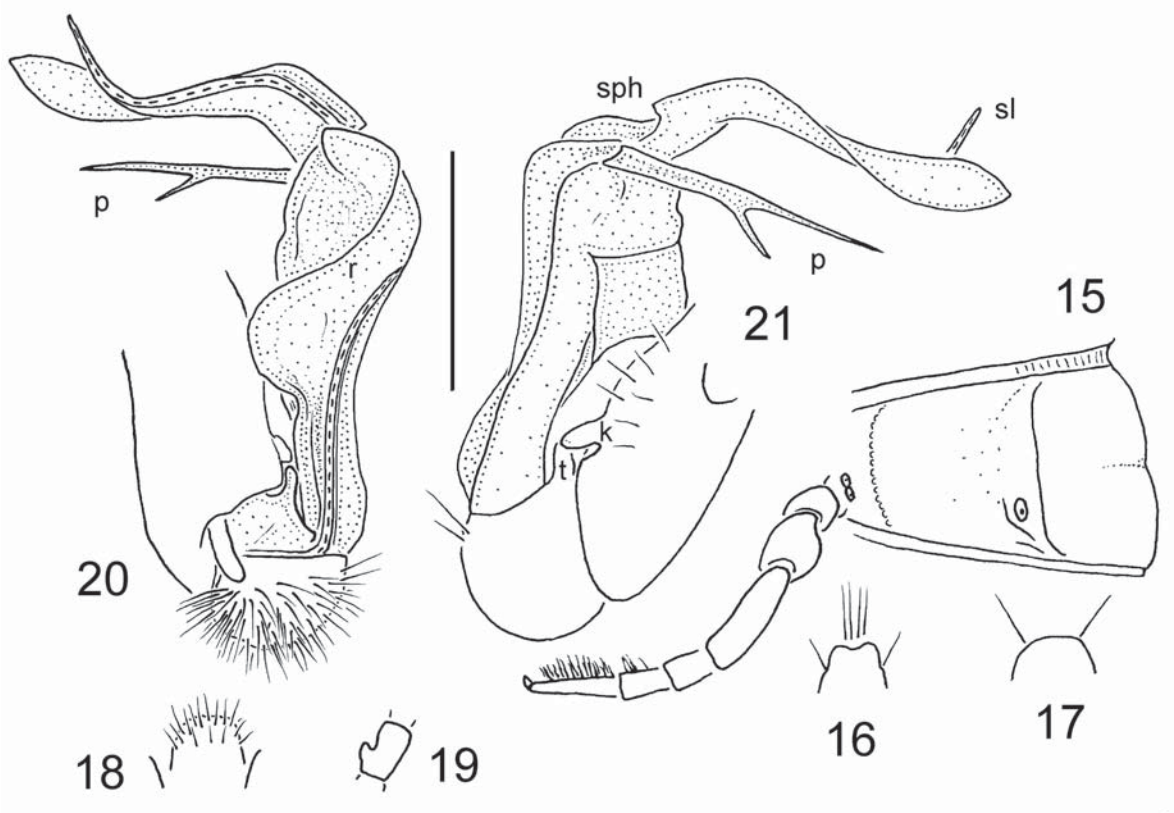
Figs 9 & 10. *Beronodesmus distospinosus* Golovatch, 2015, ♂ from near Yamputhin, left gonopod, lateral and mesal views, respectively. Scale bar: 0.5 mm.

Рис. 9 и 10. *Beronodesmus distospinosus* Golovatch, 2015, ♂ из окрестностей Yamputhin, левый гонопод, соответственно сбоку и изнутри. Масштаб: 0.5 мм.



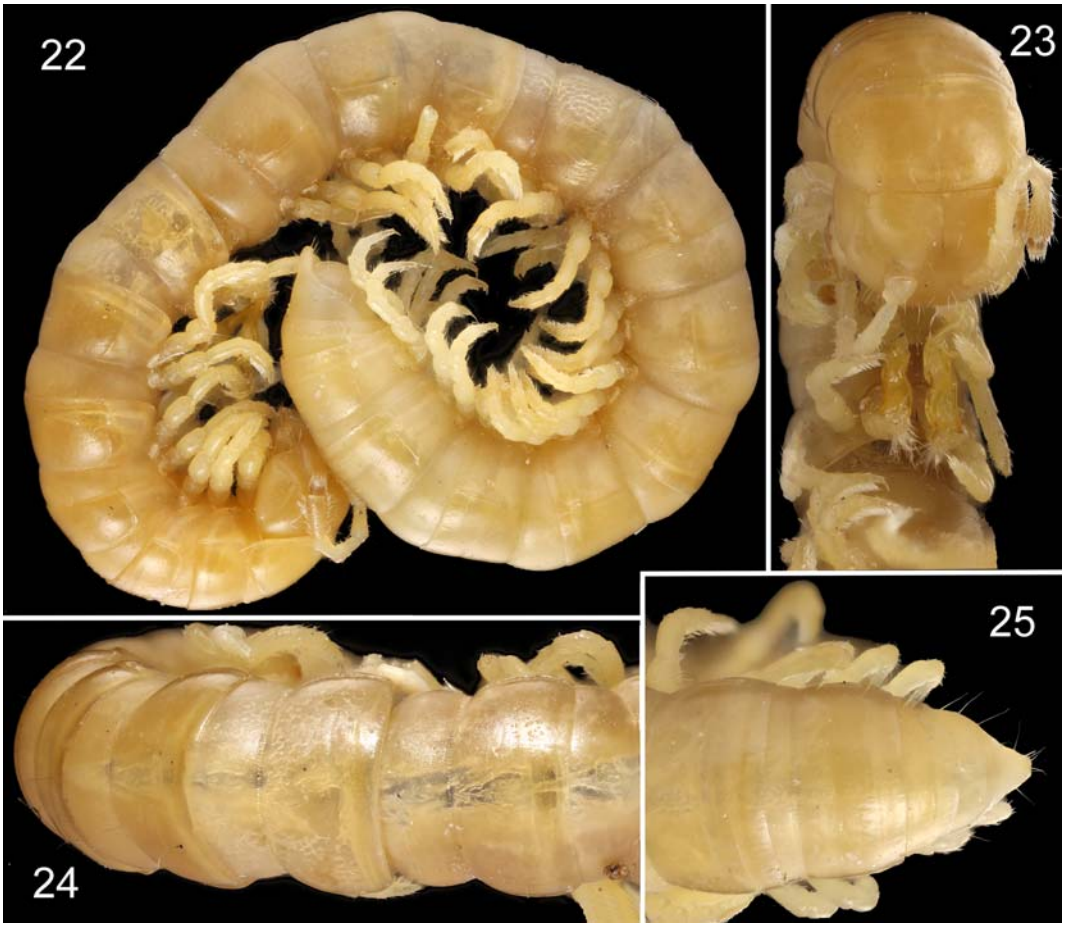
Figs 11–14. *Beronodesmoides typicus* sp.n., ♂ holotype. 11 — habitus, lateral view; 12 — anterior half of body, ventral view; 13 — midbody segments, dorsal view; 14 — caudal end of body, dorsal view. Pictures by K. Makarov, not taken to scale.

Рис. 11–14. *Beronodesmoides typicus* sp.n., голотип ♂. 11 — общий вид, сбоку; 12 — передняя половина тела, снизу; 13 — среднетуловищные сегменты, сверху; 14 — задняя часть тела, сверху. Фотографии К. Макарова, сняты без масштаба.



Figs 15–21. *Beronodesmoides typicus* sp.n., ♂ paratype. 15 — segment 10, lateral view; 16 — tip of epiproct, dorsal view; 17 — hypoproct, ventral view; 18 — sternal lobe between coxae 4, caudal view; 19 — femur 1, lateral view; 20 & 21 — left gonopod, mesal and lateral views, respectively. Scale bar: 0.2 (15–19) & 0.4 mm (20, 21).

Рис. 15–21. *Beronodesmoides typicus* sp.n., паратип ♂. 15 — сегмент 10, сбоку; 16 — конец эпипрокта, сверху; 17 — гипопрокт, снизу; 18 — стернальная пластинка между тазиками 4, сзади; 19 — бедро 1, сбоку; 20 и 21 — левый гонопод, соответственно изнутри и сбоку. Масштаб: 0,2 (15–19) и 0,4 мм (20, 21).



Figs 22–25. *Beronodesmoides martensi* sp.n., ♂ paratype. 22 — habitus, lateral view; 23 — anterior half of body, ventral view; 24 — midbody segments, dorsal view; 25 — caudal end of body, dorsal view. Pictures by K. Makarov, not taken to scale.

Рис. 22–25. *Beronodesmoides martensi* sp.n., паратип ♂. 22 — общий вид, сбоку; 23 — передняя половина тела, снизу; 24 — среднетуловищные сегменты, сверху; 25 — задняя часть тела, сверху. Фотографии К. Макарова, сняты без масштаба.

Delarthrum granulosum (Golovatch, 1994)

MATERIAL. 1 ♂ (SMF), Nepal, Sankhua Sabha Distr., bottom of Arun Valley between Hedagna and Num, 950–1000 m a.s.l., subtropical forest, 6–8.VI.1988, leg. J. Martens & W. Schawaller.

REMARK. The above sample represents a near-topotype taken from the very same Arun Valley [Golovatch, 1994, 2014b].

Delarthrum longisetum (Golovatch, 1994)

MATERIAL. 1 ♂ (SMF), Nepal, Dhading Distr., below Samari Banjyang, 1000–1300 m a.s.l.cultivated land, 23.VII.1983, leg. J. Martens & W. Schawaller.

REMARK. The above sample represents a near-topotype [Golovatch, 1994, 2014b].

Delarthrum spectabile (Golovatch, 1994)

MATERIAL. 1 ♂ (SMF), Nepal, Mustang Distr., Thakkhola, Kali Gandaki Valley between Annapurna and Dhaulagiri Himal, Chadziou Khola Valley, 2650 m a.s.l., dense, monsoon-influenced, primary, broadleaved forest in canyon, bamboo growth, VI–VII.1970, leg. J. Martens.

REMARK. The above ♂ is a strict topotype [Golovatch, 1994, 2014b].

Beronodesmoides typicus **sp.n.**
Figs 11–21.

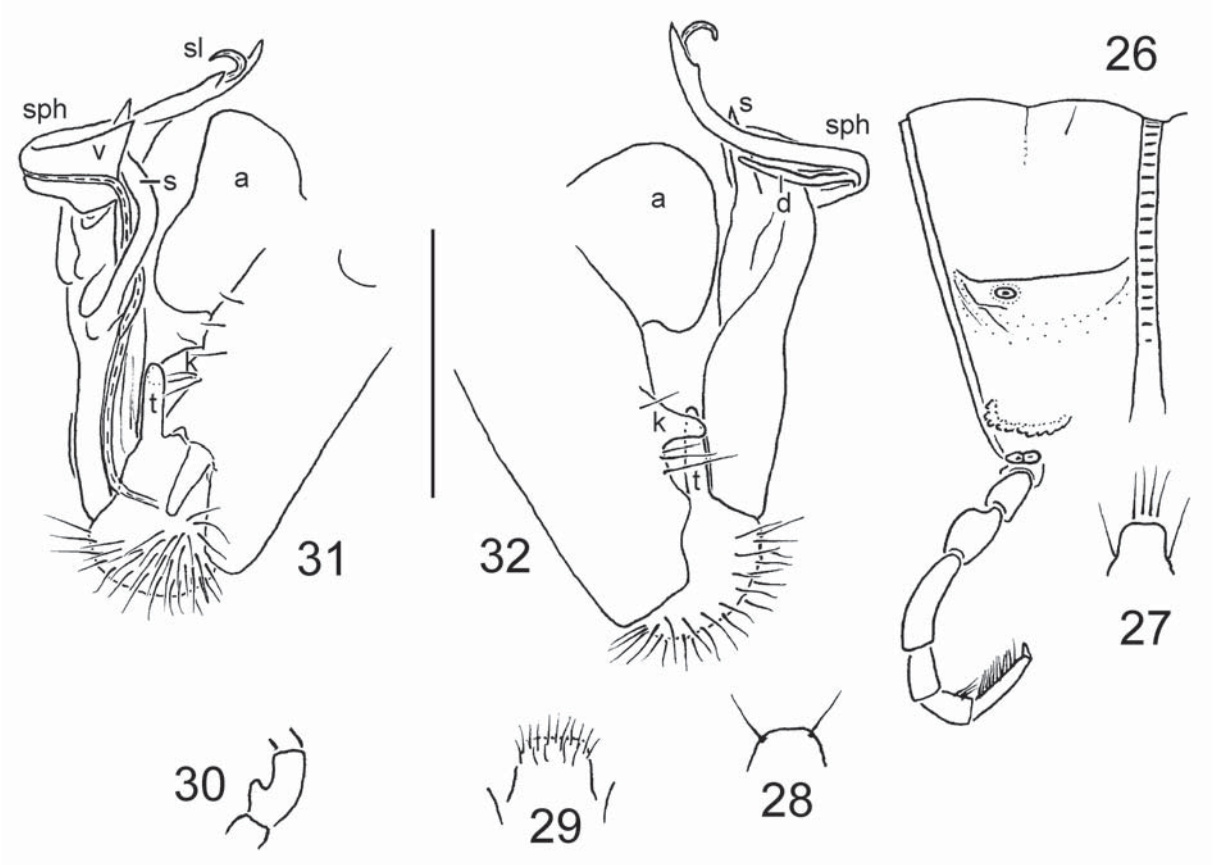
HOLOTYPE ♂ (SMF), Nepal, Gorkha Distr., Chuling Khola, Djinshi Kharka, 3400 m a.s.l., *Abies* forest and mountain pasture, 4–5.VIII.1983, leg. J. Martens & W. Schawaller.

PARATYPES: 1 ♂, 8 juv. (SMF), same data, together with holotype.

DIAGNOSIS. This new species seems to be similar to *B. anteriporus* Golovatch, 2015 or *B. montigena* sp.n. in showing both tubercles **k** and **t** on the gonopod, but the latter's solenophore is particularly simple, not coiled around spine **s** which is distinctly bifid (Figs 20 & 21). See also Key below.

NAME. To emphasize the typical facies of the new species; adjective.

DESCRIPTION. Length of both adult ♂♂ ca 13 mm, width of midbody pro- and metazonae 0.9–1.0 and 1.1–1.2 mm, respectively (♂). General coloration in alcohol yellowish to light brownish, with a distinct cingulated pattern of slightly darker metaterga, espe-



Figs 26–32. *Beronodesmoides martensi* sp.n., ♂ paratype. 26 — segment 10, lateral view; 27 — tip of epiproct, dorsal view; 28 — hypoproct, ventral view; 29 — sternal lobe between coxae 4, caudal view; 30 — femur 1, lateral view; 31 & 32 — right gonopod, mesal and lateral views, respectively. Scale bar: 0.2 (26–30) & 0.4 mm (31, 32).

Рис. 26–32. *Beronodesmoides martensi* sp.n., паратип ♂. 26 — сегмент 10, сбоку; 27 — конец эпипрокта, сверху; 28 — гипопрокт, снизу; 29 — стернальная пластинка между тазиками 4, сзади; 30 — бедро 1, сбоку; 31 и 32 — правый гонопод, соответственно изнутри и сбоку. Масштаб: 0,2 (26–30) и 0,4 мм (31, 32).

cially in anterior body half to 2/3; antennomeres 6 and 7 light brown, but tip pallid (Figs 11–14).

Clypeolabral region sparsely setose, vertigial one nearly bare; epicranial suture thin, superficial (Fig. 12). Antennae rather short and moderately clavate, in situ slightly extending back behind midway of segment 2 when stretched dorsally (♂); in length, antennomere 2 = 6 > 3 = 4 = 5 > 1 = 7; interantennal isthmus about as broad as diameter of antennal socket (Fig. 12).

In width, segment 3 = 4 < head = collum = 2 < 5–15; thereafter body gradually tapering towards telson. Tegument smooth and shining, prozonae shagreened. Collum broadly and regularly rounded laterally. Postcollum paraterga poorly-developed, mostly set low at about upper 1/3 of metazonae, only in segment 2 slightly drawn anteriorly, following paraterga obtuse-angled and clearly rounded caudally, never drawn behind rear tergal margin; calluses demarcated by a complete distinct sulcus only dorsally, only in about caudal 1/3 by a less distinct sulcus also ventrally; poriferous calluses a little thicker than poreless ones (Fig. 11). Ozopores lateral, placed inside an ovoid pit located mostly at about rear 1/3 of callus length. Tergal setae largely abraded, pattern poorly traceable due to insertion points, probably 2+2 in a transverse fore (= pre-sulcus) row; setae short, ca 1/4 as long as metazona. Transverse metatergal sulci thin, highly superficial, not reaching bases of paraterga, present on metaterga 5–18 (Figs 11 & 15). Stricture dividing pro- and metazonae rather thin and deep, faintly striolate at bottom down to paraterga. Axial line missing. Pleurosternal carinae very low, rather inconspicuous, granulated, arcuate ridges visible until segments of posterior 1/3 of body, best expressed on segment 7. Epiproct (Figs 11, 14 & 16) short, clearly flattened dorsoventrally, conical, slightly concave at apex, subapical lateral papillae poorly-developed. Hypoproct (Fig. 17) semi-circular, caudal 1+1 setae well separated, not borne on knobs.

Sterna sparsely setose, cross-impressions weak, without modifications other than a prominent, setose, roundly subtrapeziform lobe between coxae 4 (Fig. 18) and a pair of small bulges lying anterolaterally to gonopod coxae at edge of gonopod aperture. Legs short, stouter and longer in ♂ compared to juveniles, 1.1–1.2 times as long as midbody height (♂), prefemora slightly swollen laterally; in length, femora > tarsi > prefem-

Figs 33–36. *Beronodesmoides montigena* sp.n., ♂ paratype. 33 — habitus, lateral view; 34 — anterior half of body, ventral view; 35 — midbody segments, dorsal view; 36 — caudal end of body, dorsal view. Pictures by K. Makarov, not taken to scale.

Рис. 33–36. *Beronodesmoides montigena* sp.n., паратип ♂. 33 — общий вид, сбоку; 34 — передняя половина тела, снизу; 35 — среднетуловищные сегменты, сверху; 36 — задняя часть тела, сверху. Фотографии К. Макарова, сняты без масштаба.

ora = postfemora = tibiae > coxae (Fig. 15). Tarsal and distotibial brushes gradually thinning out towards midbody. Ventral parabasal adenostyles on femora 1 prominent (Fig. 19).

Gonopods (Figs 20 & 21) complex; coxite with a distinct tubercle (**k**) distoventrally close to midlength; prefemoral (= densely setose) part of telopodite short, about half as long as a stout, distally enlarged, simple, erect and untwisted femorite, with an evident distodorsal tubercle (**t**). Lateral face of femorite with a clear, longitudinal, sigmoid ridge (**r**) in distal 2/3. Distal half of telopodite strongly curved forward, solenophore (**sph**) demarcated from femorite both by a transverse cingulum and a long, needle-shaped, bifid, distofemoral process (**p**); solenomere (**sl**) flagelliform, as long as a lamellar, twisted, ribbon-shaped and apically acuminate **sph**.

Beronodesmoides martensi **sp.n.**
Figs 22–32.

HOLOTYPE ♂ (SMF), Nepal, Panchthar Distr., above Mai Majuwa Khola, Dhorpar Kharka, 2700 m a.s.l., *Rhododendron* forest, 27–28.VIII.1983, leg. J. Martens & B. Daams.

PARATYPES: 1 ♂, 3 ♀♀, 14 juv. (SMF), same data, together with holotype.

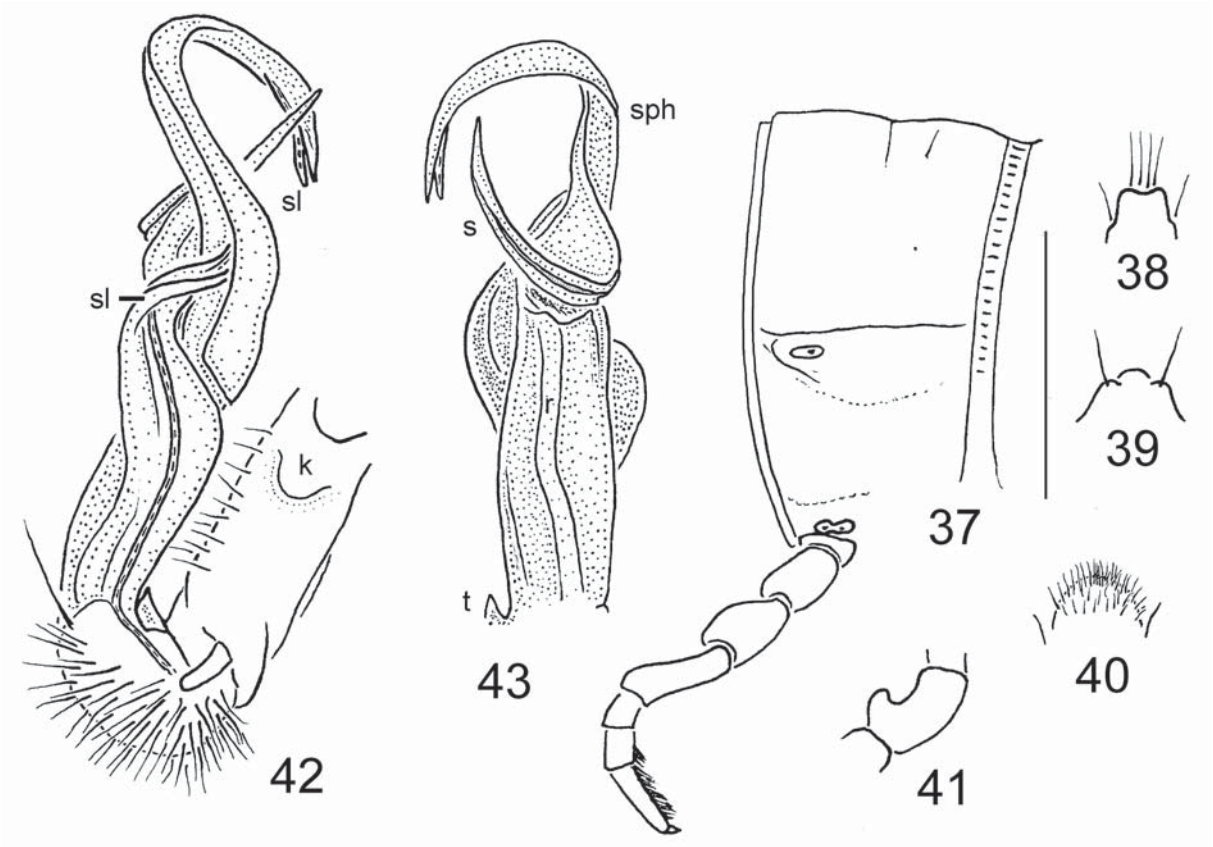
DIAGNOSIS. This new species joins the group of congeners that show the solenophore (**sph**) coiled around the distofemoral spine (**s**), but is clearly distinguished by a paramedian pair of very prominent, round protuberances (**a**) at the edge of the gonopod aperture placed anterolateral to the gonopod coxites, as well as by strong, finger shaped tubercles **k** and **t** (Figs 31 & 32). See also Key below.

NAME. Honours Jochen Martens, the main collector.

DESCRIPTION. Length of holotype ca 13 mm, width of midbody pro- and metazonae 1.2 and 1.4 mm, respectively; paratype ♂ ca 12 mm long, 1.0 and 1.2 mm wide on pro- and metazonae, respectively. Paratype ♀♀ ca 16–17 mm long, 1.7–1.9 and 1.9–2.1 mm wide on midbody pro- and metazonae, respectively. General coloration in alcohol nearly pallid, yellowish, to light brownish, only paratype ♂ marbled light brown; legs and venter lighter, antennomeres 6 and 7 light brown to brown.

All characters as in *B. typicus* sp.n., except as follows (Figs 22–32).

In length, antennomere 6 > 2 > 3 = 4 = 5 > 1 = 7; interantennal isthmus ca 1.2 times as wide as diameter of antennal socket (Fig. 23). In width, segment 3 = 4 < collum = 2 < 5–15 < head (♂). Stricture between pro-



Figs 37–43. *Beronodesmoides montigena* sp.n., ♂ paratype. 37 — segment 10, lateral view; 38 — tip of epiproct, dorsal view; 39 — hypoproct, ventral view; 40 — sternal lobe between coxae 4, caudal view; 41 — femur 1, lateral view; 42 & 43 — right gonopod, mesal and lateral views, respectively. Scale bar: 0.2 (38–41) & 0.4 mm (42, 43).

Рис. 37–43. *Beronodesmoides montigena* sp.n., паратип ♂. 37 — сегмент 10, сбоку; 38 — конец эпипрокта, сверху; 39 — гипопрокт, снизу; 40 — стернальная пластинка между тазиками 4, сзади; 41 — бедро 1, сбоку; 42 и 33 — правый гонопод, соответственно изнутри и сбоку. Масштаб: 0,2 (38–41) и 0,4 мм (42, 43).

and metazona clearly ribbed down to below paraterga (Fig. 26). Pleurosternal carinae in ♂ as granulated ridges traceable only until midbody segments (Fig. 26), especially evident on segment 7, in ♀ less conspicuous. Epiproct subtruncate (Fig. 27), hypoproct roundly subtrapeziform (Fig. 28).

A pair of very large, rounded bulges (**a**) lying anterolateral to gonopod coxites at edge of gonopod aperture (Figs 31 & 32). Legs ca 1.2–1.3 (♂) or 0.8–0.9 times (♀) as long as midbody height.

Gonopods (Figs 31 & 32) complex, in situ held subparallel to each other, only distal halves directed laterad; coxite long, subcylindrical, about half as long as telopodite, setose ventrolaterally, with a distinct tubercle (**k**) distoventrally; prefemoral (= densely setose) part of telopodite short, about half as long as a stout, distally enlarged, simple, erect and untwisted femorite, with a very evident, finger-shaped, distodorsal tubercle (**t**). Lateral face of femorite with only a vague, longitudinal, sigmoid ridge, but mesal side distally with both a long, slender, sigmoid spine (**s**) and beginning of a free, long, flagelliform solenomere (**sl**); solenophore (**sph**) coiled, lamellar, sheathing most of **sl**, almost as long, near base with a conspicuous, mesal, tooth-shaped velum (**v**), more distally with a long, slender, vermiform, lateral outgrowth (**d**) and an acuminate apex.

Beronodesmoides montigena **sp.n.**
Figs 33–43.

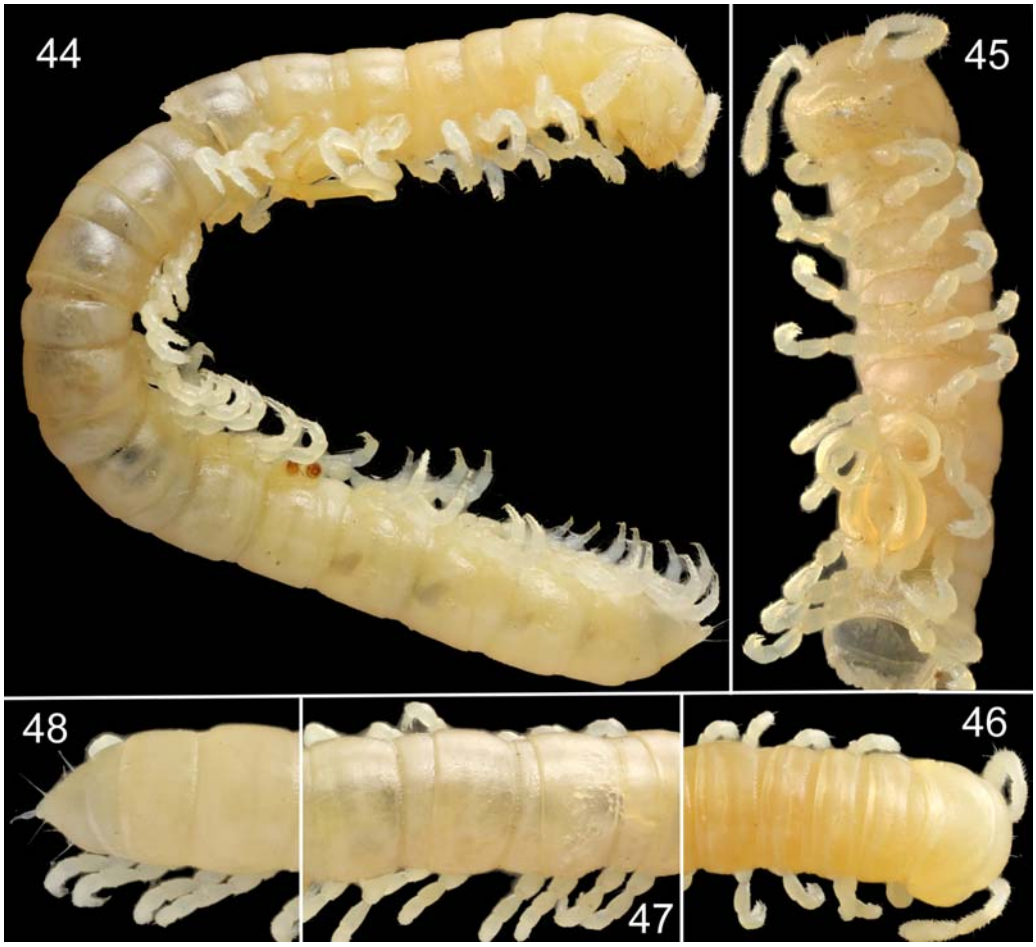
HOLOTYPE ♂ (SMF), Nepal, Solukhumbu Distr., Southwest Mt Everest region, Pare, 3550 m a.s.l., coniferous forest edge, 14–16.X.1970, leg. J. Martens.

PARATYPES: 1 ♂ (SMF), 1 ♂ (ZMUM ρ3131), same data, together with holotype.

DIAGNOSIS. This new species seems to be especially similar to *B. anteriporus* Golovatch, 2015 (see Figs 1–6), but differs in the ozopores being largely located closer to the paratergal caudal corner (ca 1/4 versus 1/3), the distogonofemoral spine **s** is stronger, coiled and devoid of parabasal teeth, and the solenophore (**sph**) is simple, acuminate and non-fimbriate distally (Figs 33–43). See also Key below.

NAME. To emphasize the high-montane encounter of this new species; noun in apposition.

DESCRIPTION. Length of holotype ca 13 mm, width of midbody pro- and metazonae 1.3 and 1.5 mm,



Figs 44–48. *Beronodesmus simplex* sp.n., ♂ paratype. 44 — habitus, lateral view; 45 & 46 — anterior part of body, ventral and dorsal views, respectively; 47 — midbody segments, dorsal view; 48 — caudal end of body, dorsal view. Pictures by K. Makarov, not taken to scale.

Рис. 44–48. *Beronodesmus simplex* sp.n., паратип ♂. 44 — общий вид, сбоку; 45 и 46 — передняя часть тела, соответственно снизу и сверху; 47 — среднетуловищные сегменты, сверху; 48 — задняя часть тела, сверху. Фотографии К. Макарова, сняты без масштаба.

respectively; paratype ♂♂ ca 14 mm long, 1.4 and 1.6 mm wide on pro- and metazonae, respectively. General coloration in alcohol creamy yellowish to brown; legs and venter lighter, antennomeres 6 and 7 light brown.

All characters as in *B. typicus* sp.n., except as follows (Figs 33–43).

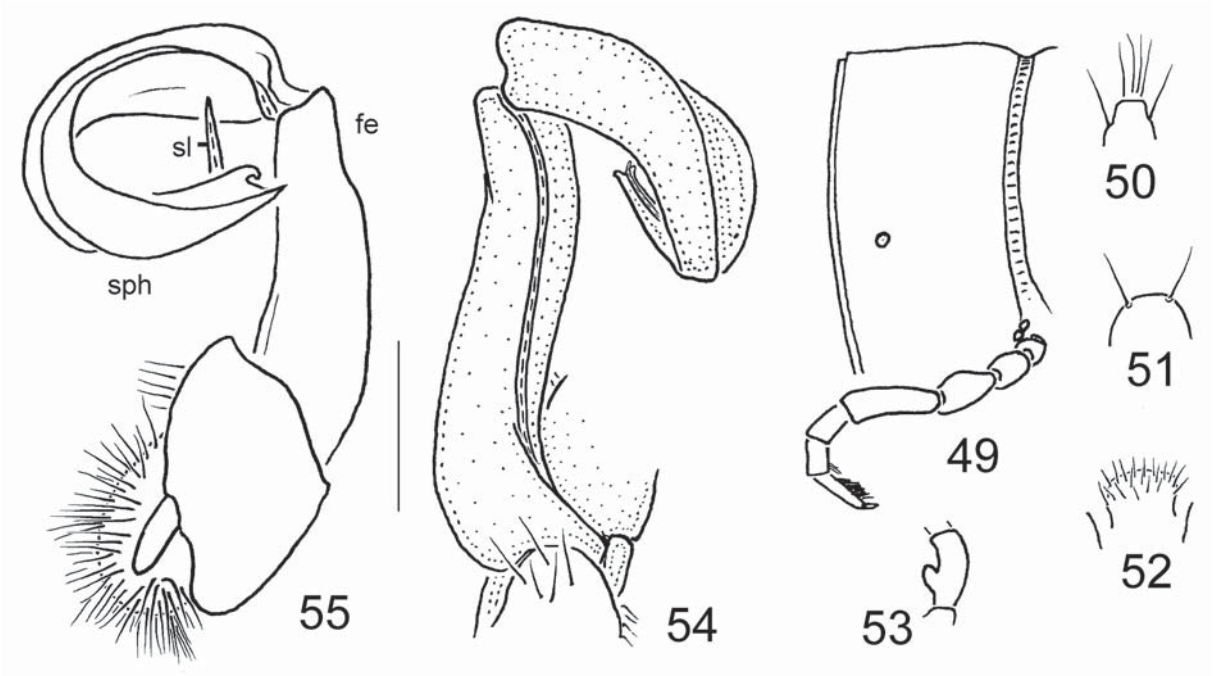
Interantennal isthmus ca 1.2 times as wide as diameter of antennal socket (Fig. 34). In width, segment 3 = 4 < collum = 2 < 5–15 < head (♂). Stricture between pro- and metazona clearly ribbed down to below paraterga (Fig. 37). Pleurosternal carinae as granulated ridges traceable only until midbody segments (Fig. 37), especially evident on segment 7. Hypoproct roundly subtriangular, setae borne on small knobs (Fig. 39).

Sternal lobe between coxae 4 semi-circular (Fig. 40).

Gonopods (Figs 42 & 43): coxite about as long as prefemoral and femoral parts combined, with a small, parabasal, rounded tubercle (**k**); prefemoral part with a small distolateral tooth (**t**); femorite stout and rather short, its lateral longitudinal ridge (**r**) evident and nearly straight; both spine (**s**) and solenomere (**sl**) distinctly coiled at base of a similarly coiled and lamellar solenophore (**sph**), the latter mostly ribbon-shaped, gradually attenuating towards an acuminate tip.

REMARKS. The genus *Beronodesmoides* Golovatch, 2015, has hitherto been known to comprise only four species, all from Nepal: *B. anteriporus* Golovatch, 2015 (the type-species), *B. lobatus* Golovatch, 2015, *B. bifidus* Golovatch, 2015, and *B. longifemoratus* Golovatch, 2016 [Golovatch, 2015, 2016]. To properly incorporate three new species and some of the new records above, as well as to update the previous key [Golovatch, 2015], the following new key can be presented.

1(2) Gonopod solenophore (**sph**) coiled around distofemoral spine (**s**) (Figs 5, 6, 31, 32, 42 & 43) 3
2(1) Gonopod solenophore (**sph**) not coiled around distofemoral spine (**s**) (Figs 20 & 21) 9
3(4) Gonopod femorite especially long and slender, >3 times as long as prefemoral part ..... *B. longifemoratus*



Figs 49–55. *Beronodesmus simplex* sp.n., ♂ paratype. 49 — segment 10, lateral view; 50 — tip of epiproct, dorsal view; 51 — hypoproct, ventral view; 52 — sternal lobe between coxae 4, caudal view; 53 — femur 1, lateral view; 54 & 55 — right gonopod, ventral and dorsal views, respectively. Scale bar: 0.2 (49–53) & 0.4 mm (54, 55).

Рис. 49–55. *Beronodesmus simplex* sp.n., паратип ♂. 49 — сегмент 10, сбоку; 50 — конец эпипрокта, сверху; 51 — гипопрокт, снизу; 52 — стернальная пластинка между тазиками 4, сзади; 53 — бедро 1, сбоку; 54 и 55 — правый гонопод, соответственно снизу и сверху. Масштаб: 0,2 (49–53) и 0,4 мм (54, 55).

4(3) Gonopod femorite much shorter and more stout, only ca 2 times as long as prefemoral part (Figs 5, 31, 32 & 42) 5

5(6) A paramedian pair of very large, rounded bulges (**a**) at edge of gonopod aperture anterolateral to gonopod coxites (Figs 31, 32). Gonopod coxite and prefemoral part each with a very evident, finger-shaped, distolateral tubercle (**k** and **t**, respectively, Figs 31 & 32). Solenophore with a characteristic velum and a vermiform process (**v** and **d**, respectively, Figs 31 & 32) .... *B. martensi* sp.n.

6(5) Such characters absent, tubercle **t** (if any) very small 7

7(8) Ozopores largely located at 1/3 of metatergal length off caudal tergal margin (Fig. 1). Distal spine **s** of gonopod femorite thinner, nearly straight and supplied at least with one evident parabasal tooth while solenophore (**sph**) more elaborate and fimbriate distally (Figs 5 & 6)..... ..... *B. anteriporus*

8(7) Ozopores largely located at 1/4 of metatergal length off caudal tergal margin (Figs 33 & 37). Distal spine **s** of gonopod femorite stronger, somewhat coiled and devoid of parabasal teeth while solenophore (**sph**) simple, acuminate and non-fimbriate distally (Figs 42 & 43).... ..... *B. montigena* sp.n.

9(10) Solenophore particularly simple, ribbon-shaped, slightly twisted, spine **s** clearly bifid (Figs 20 & 21) .... *B. typicus* sp.n.

10(9) Solenophore far more elaborate 11

11(12) Most of solenophore base a large, rounded, lateral lobe and a relatively short, simple, straight spine **s** .... *B. lobatus*

12(11) Solenophore lamellar, distal half with a long, ribbon-shaped, curved **s** and a bifid tip ..... *B. bifidus*

Beronodesmus simplex **sp.n.**
Figs 44–55.

HOLOTYPE ♂ (SMF), Nepal, Kaski Distr., above Dhumpus, 2100 m a.s.l., broadleaved forest, 10.V.1980, leg. J. Martens & A. Ausobsky.

PARATYPES: 4 ♂♂, 13 ♀♀, 1 juv. (SMF), 1 ♂, 1 ♀ (ZMUM ρ3130), same data, together with holotype.

DIAGNOSIS. Differs from all other species of *Beronodesmus* Golovatch, 2014, by the apparently most simple gonopod structure, in particular, the absence of distofemoral outgrowths. Nor does the solenophore show any considerable processes.

NAME. To emphasize the simple gonopod conformation.

DESCRIPTION. Length of holotype ca 8–9 (♂) to 10–11 mm (♀), width of midbody pro- and metazonae 0.7–0.8 and 0.8–0.9 mm (♂), or 1.0–1.2 and 1.1–1.3 mm (♀), respectively. Holotype ca 9 mm long, 0.8 and 0.9 mm wide on pro- and metazonae, respectively. General coloration in alcohol entirely pallid to creamy yellowish (Figs 44–48).

All characters as in *Beronodesmoides typicus* sp.n., except as follows (Figs 44–55).

Antennae short, slightly clavate, in situ drawn only behind collum when stretched dorsally. In width, collum < segment 2 = 3 < 4 d" 5–16 < head (♂). Body

Figs 56–60. *Hedinomorpha montana* sp.n., ♂ holotype. 56 — habitus, lateral view; 57 — anterior part of body, ventral view; 58 — midbody segments, dorsal view; 59 — caudal end of body, dorsal view; 60 — left gonopod in situ, lateral view. Pictures by K. Makarov, not taken to scale.

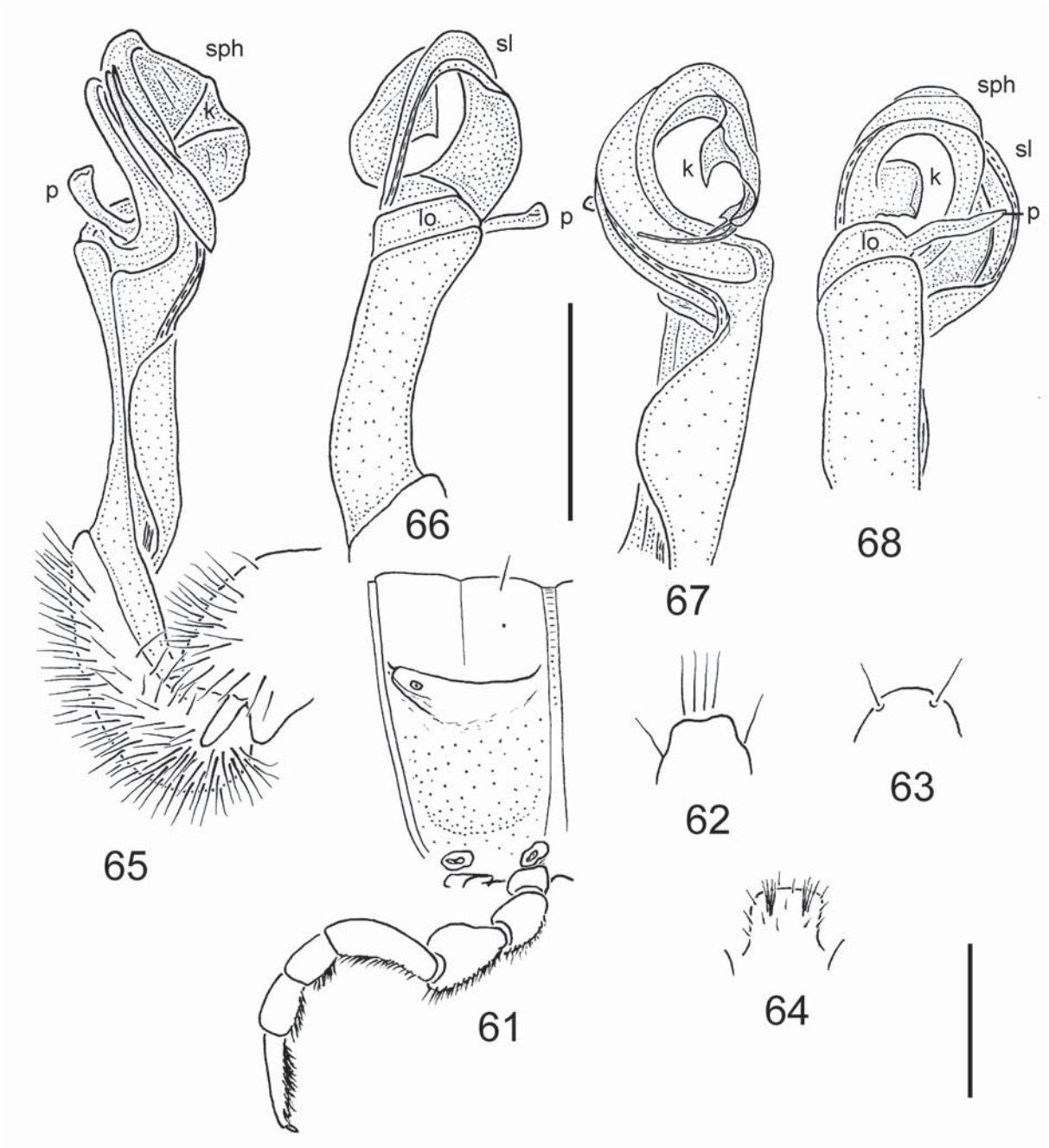
Рис. 56–60. *Hedinomorpha montana* sp.n., голотип ♂. 56 — общий вид, сбоку; 57 — передняя часть тела, снизу; 58 — среднетуловищные сегменты, сверху; 59 — задняя часть тела, сверху; 60 — левый гонопод на месте, сбоку. Фотографии К. Макарова, сняты без масштаба.

subcylindrical (Figs 44–49). Paraterga rudimentary, present as low ridges only on segment 2, thereafter missing. Tergal setae largely abraded, short, setation pattern untraceable. Stricture between pro- and metazona finely striolate down to well below paraterga (Figs 44 & 49). Pleurosternal carinae, axial line and transverse metatergal sulci wanting (Figs 44–49). Epiproct subtruncate (Figs 44, 48 & 50). Hypoproct semi-circular, setae not borne on knobs (Fig. 51).

Sternal lobe between coxae 4 subpentagonal (Fig. 52). Legs short, in ♂ slightly longer and crassate, prefemora slightly bulging laterad, 1.2–1.3 times as long as midbody height; in ♀ shorter and more slender, 0.8–0.9 times as long as midbody height; ♂ tarsal and distotibial brushes gradually thinning out towards midbody legs; ♂ femur 1 with a distinct adenostyle (Fig. 53)

Gonopods (Figs 54 & 55) very simple, in situ crossing each other (Fig. 45), coxite subcylindrical, about half as long as prefemoral and femoral parts combined, setose distoventrally, but devoid of a tubercle; prefemoral part about half as long as femorite, likewise devoid of a tubercle; femorite (**fe**) somewhat curved caudomesad, a little shorter than acropodite, very simple and slightly narrowed towards geniculation/cingulum demarcating subequally long and clearly coiled solenophore (**sph**) and solenomere (**sl**), the latter flagelliform and nearly fully sheathed by a lamellar **sph**.

REMARKS. The genus *Beronodesmus* Golovatch, 2014, has hitherto been known to comprise eight spe-



Figs 61–68. *Hedinomorpha montana* sp.n., ♂ holotype. 61 — segment 10, lateral view; 62 — tip of epiproct, dorsal view; 63 — hypoproct, ventral view; 64 — sternal lobe between coxae 4, caudal view; 65–68 — right gonopod, mesal, ventral, dorsal and lateral views, respectively. Scale bars: 0.5 mm.

Рис. 61–68. *Hedinomorpha montana* sp..n., голотип ♂. 61 — сегмент 10, сбоку; 62 — конец эпипрокта, сверху; 63 — гипопрокт, снизу; 64 — стернальная пластинка между тазиками 4, сзади; 65–68 — правый гоноподь, соответственно изнутри, снизу, сверху и сбоку. Масштаб: 0,2 (49–53) и 0,4 мм (54, 55).

cies, all from Nepal and all keyed: *B. pallidus* Golovatch, 2014 (the type-species), *B. gorkhalis* Golovatch, 2015, *B. minutus* Golovatch, 2015, *B. longispinus* Golovatch, 2015, *B. latispinosus* Golovatch, 2015, *B. curtispinus* Golovatch, 2015, *B. sinuatospinus* Golovatch, 2015, and *B. distospinosus* Golovatch, 2015, [Golovatch, 2014b, 2015]. The above new species fails to alter the generic diagnosis as formulated by Golovatch [2015].

Hedinomorpha montana **sp.n.**
Figs 56–68.

HOLOTYPE ♂ (ZMUM ρ3147), China, Yunnan Prov., NNE of Weixi City, 8.15 km ESE of Shajiama, N27º20′38″, E99º25′46″, 3575 m a.s.l., 8.VI.2015, leg. I. Belousov, I. Kabak & G. Davidian.

PARATYPES: 1 ♀ (ZMUM ρ3148), same data, together with holotype; 1 ♂, 3 ♀♀ (ZMUM ρ3149), Yunnan Prov., N of Weixi City, 2.95 km NW of Xugongqingshangcun, N27º39′20″, E99º

20′55″, 3080 m a.s.l., 21.VI.2015, leg. I. Belousov, I. Kabak & G. Davidian.

DIAGNOSIS. Using the latest available key [Golovatch, 2013b], this new species joins the group of *Hedinomorpha* species that show a normal, slender epiproct. Among those five congeners, *H. montana* sp.n. seems to be especially similar to *H. subnigra* Golovatch, 2013, also from Yunnan, in showing a medium-sized gonopostfemoral process **p**, combined with a prominent tooth **k** on the solenophore, but their shapes are different.

NAME. To emphasize the high-montane encounters of this new species; adjective.

DESCRIPTION. Length ca 24–26 mm (♂, ♀), width of midbody pro- and metazonae 2.4–2.5 and 2.8–3.0 (♂), or 3.2–3.3 mm and 3.6–3.9 mm (♀), respectively. Holotype ca 24 mm long, 2.4 and 2.8 mm wide on midbody pro- and metazonae, respectively. General coloration in alcohol mostly blackish; antennomeres 1–5, head, ozopore regions, venter and telson dark brown to brown; legs contrasting light yellow-brown (Figs 56–59). Sometimes ozopore regions reddish.

Clypeolabral region densely setose, vertigial one nearly bare; epicranial suture thin, especially superficial on occiput (Fig. 57). Antennae rather short and moderately clavate, in situ slightly extending back behind midway of segment 2 (♂) or collum (♀) when stretched dorsally; in length, antennomeres 3 = 5 > 2 = 4 = 6 > 1 = 7; interantennal isthmus about as broad as diameter of antennal socket (Fig. 57).

In width, head < collum = segment 3 = 4 < 2 < 5–16; thereafter body gradually tapering towards telson. Tegument smooth and shining, in places very delicately vermiformly striolate; prozonae shagreened; surface below paraterga striate-striolate and microgranulate; narrow rim in front of limbus often clearly scratched. Collum broadly and regularly rounded laterally. Postcollum paraterga medium-sized, mostly set low at about half of metazonae, only in segment 2 slightly drawn anteriorly and posteriorly, also rounded, largely directed more laterad than ventrad; caudal corner of following paraterga largely subrectangular and narrowly rounded, somewhat drawn behind rear tergal margin only in segment 18, moderately acute-angled only in segments 17–19; calluses demarcated by a complete distinct sulcus only dorsally, only in about caudal 1/3 by a less distinct sulcus also ventrally; poriferous calluses thicker and much higher than poreless ones (Fig. 56). Ozopores dorsolateral, placed inside an ovoid groove located mostly at about rear ¼ of callus length. Tergal setae largely abraded, pattern poorly traceable due to insertion points, probably 2+2 in a transverse fore (= pre-sulcus) row and at least 3+3 in a rear (post-sulcus) row; setae short, ca ¼ as long as metazona (Fig. 61). Transverse metatergal sulci thin, finely striolate at bottom, sigmoid medially, deep, (almost) reaching bases of paraterga, present on metaterga 5–18 (Figs 56, 58 & 59). Stricture dividing pro- and metazonae rather broad and shallow, faintly striolate at bottom down to paraterga. Axial line missing. Pleurosternal carinae small ridges on segment 2, clear bulges on segments 3–5 and 8, distinct, arcuated, well granulated ridges with rectangular caudal teeth on segments 6 and 7. Epiproct (Figs 56, 59 & 62) long, clearly flattened dorsoventrally, conical, very slightly concave to subtruncate at apex, subapical lateral papillae poorly-developed. Hypoproct (Fig. 63) semi-circular, caudal 1+1 setae well separated, not borne on knobs.

Sterna sparsely setose, cross-impressions weak, without modifications other than a prominent, setose, roundly subquadrate lobe between ♂ coxae 4 (Fig. 64) and a pair of small ridges lying anterolaterally to gonopod coxae at edge of gonopod aperture (Fig. 56). Legs rather long, stouter and longer in ♂ compared to ♀, 1.6–1.7 versus 1.1–1.2 times as long as midbody height, respectively, prefemora slightly swollen laterally; in length, femora > tarsi > prefemora = postfemora = tibiae > coxae (Figs 56 & 61). Tarsal, distotibial and prefemoral brushes present on all ♂ legs. Adenostyles missing.

Gonopods (Figs 60, 65–68) complex; coxites about half as long as telopodites (Fig. 60), densely setose distoventrally (Fig. 65); prefemoral (= densely setose) part of telopodite short, nearly as long as a stout, distally slightly enlarged, erect and untwisted femorite; the latter with two folds flanking a mesal groove, set off from acropodite by a clear transverse cingulum. Postfemoral portion disk-shaped, stout, with a lateral lobe (**lo**) crowned by a small, sublanceolate process (**p**) at base of a long, free, flagelliform solenomere (**sl**) almost fully sheathed by a lamellar, bulky, distinctly coiled, laterad directed, subcircular solenophore (**sph**) with its lamella lateralis showing a conspicuous tooth (**k**).

Hedinomorpha yunnanensis **sp.n.**

Figs 69–79.

HOLOTYPE ♂ (ZMUM ρ3150), China, Yunnan Prov., NNE of Weixi City, right tributary of Lapugon River, 5.2 km ENE of Jizong, N27º27′36″, E99º23′53″, 3480 m a.s.l., 5.VI.2015, leg. I. Belousov, I. Kabak & G. Davidian.

DIAGNOSIS. Using the latest available key [Golovatch, 2013b], this new species also joins the group of *Hedinomorpha* species that show a normal, slender epiproct. Among them, *H. yunnanensis* sp.n. seems to be especially similar to *H. jeekeli* (Golovatch, 2009), from Shaanxi, central China, in sharing a small peglike gonopostfemoral process **p**, much like that observed in the next new species to be described (see below), but the solenophore in this and next new species is broad and compact, versus slender and long.

NAME. To emphasize its provenance from Yunnan; adjective.

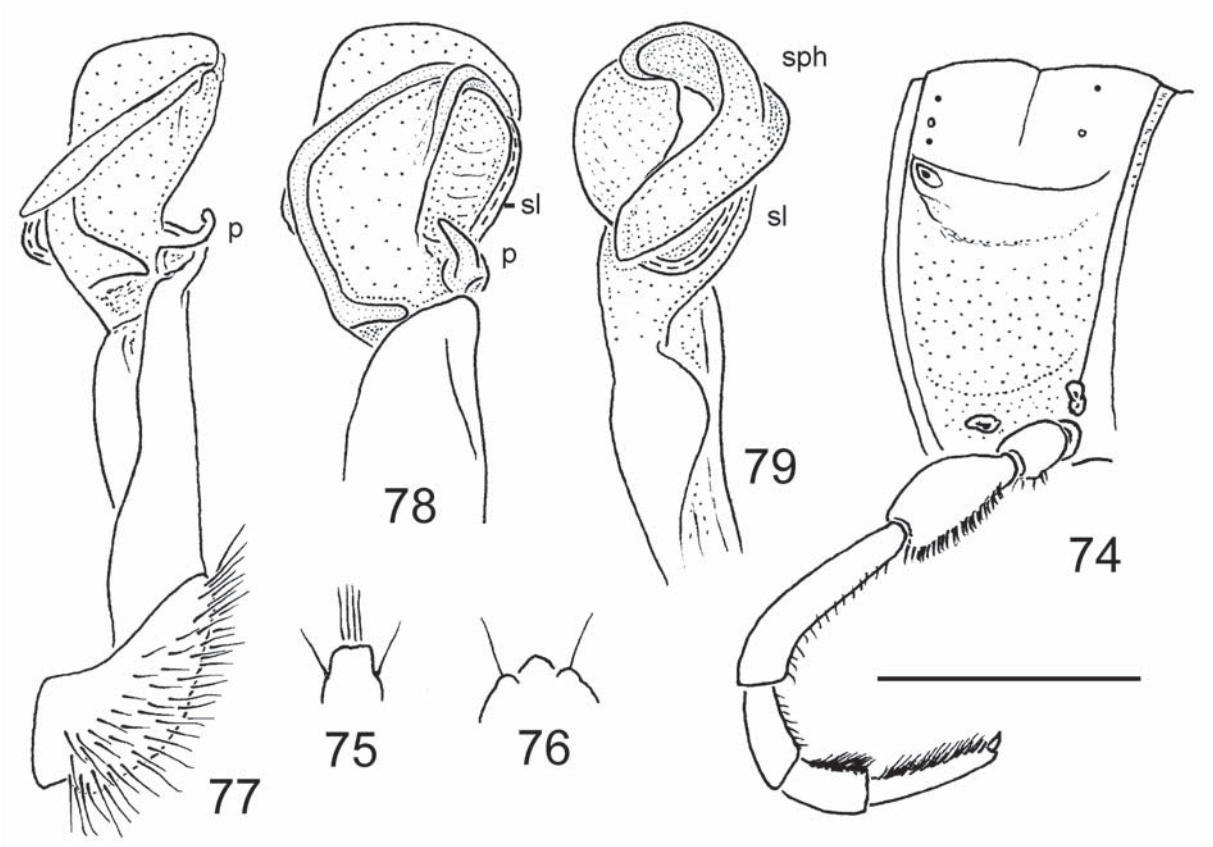
DESCRIPTION. Length ca 25 mm, width of midbody pro- and metazonae 2.9 and 3.2 mm, respectively (♂). General coloration in alcohol dark brown to blackish; antennomeres 1–5, head, ozopore regions, pleurosternal bulges, venter and telson brown to dark brown; legs contrasting light brown (Figs 69–73).

All characters as in *H. montana* sp.n., except as follows (Figs 69–79).

Figs 69–73. *Hedinomorpha yunnanensis* sp.n., ♂ holotype. 69 & 70 — anterior part of body, ventral and lateral views, respectively; 71 — remaining body part, lateral view; 72 — midbody segments, dorsal view; 73 — caudal end of body, dorsal view. Pictures by K. Makarov, not taken to scale.

Рис. 69–73. *Hedinomorpha yunnanensis* sp.n., голотип ♂. 69 и 70 — передняя часть тела, соответственно снизу и сбоку; 71 — остальная часть тела, сбоку; 72 — среднетуловищные сегменты, сверху; 73 — задняя часть тела, сверху. Фотографии К. Макарова, сняты без масштаба.

In width, head < collum < 2 < segment 3 = 4 < 5–16; thereafter body gradually tapering towards telson. Postcollum paraterga a little smaller, poorly-developed, mostly set low at about upper 1/3 of metazonae, largely directed more laterad than ventrad; caudal corner of following paraterga mainly subrectangular and narrowly rounded, somewhat drawn behind rear tergal margin only in segments 2 and 18, moderately acute-angled only in segments 17–19; calluses demarcated by a complete distinct sulcus only dorsally, only in about caudal 1/3 by a less distinct sulcus also ventrally; poriferous calluses thicker and much higher than poreless ones



Figs 74–79. *Hedinomorpha yunnanensis* sp.n., ♂ holotype. 74 — segment 10, lateral view; 75 — tip of epiproct, dorsal view; 76 — hypoproct, ventral view; 77–79 — left gonopod, mesal, ventral and lateral views, respectively. Scale bar: 2.0 (74–76) & 1.0 mm (77–79).

Рис. 74–79. *Hedinomorpha yunnanensis* sp..n., голотип ♂. 74 — сегмент 10, сбоку; 75 — конец эпипрокта, сверху; 76 — гипопрокт, снизу; 77–79 — левый гонопод, соответственно изнутри, снизу и сбоку. Масштаб: 2,0 (74–76) и 1,0 мм (77–79).

(Figs 80, 82–84). Ozopores lateral, placed inside an ovoid groove located mostly near caudal corner. Transverse metatergal sulci thin, more obliterate, finely striolate at bottom, non-sigmoid medially, not reaching bases of paraterga, present on metaterga 5–17 (Figs 80, 82–84). Pleurosternal carinae small granulate ridges on segments 2–4, clear bulges on segments 5 and 8–14, distinct, arcuated, well granulated ridges with rectangular caudal teeth on segments 6 and 7. Hypoproct (Fig. 76) subtriangular, caudal 1+1 setae well separated, borne on evident knobs.

Prefemoral brushes present on all legs, distotibial brushes until legs of segment 13, tarsal ones on all legs but last two pairs.

Gonopods (Figs 77–79) complex. Postfemoral portion inconspicuous, crowned by a very small prong (**p**); solenomere flagelliform, long, fully sheathed by solenophore (**sph**), the latter likewise bulky, strongly coiled and subcircular, but its lamella lateralis showing no conspicuous teeth.

Hedinomorpha proxima **sp.n.**
Figs 80–90.

HOLOTYPE ♂ (ZMUM ρ3151), China, Yunnan Prov., Tianbaoshan between Shangrila and Habaxue Shan, E slope, NW of Bengla, N27º37′53″, E99º57′50″, 3570 m a.s.l., 23.V.2015, leg. I. Belousov, I. Kabak & G. Davidian.

DIAGNOSIS. This new species seems to be especially similar to *H. yunnanensis* sp.n., based on the shared shapes of the gonopod solenophore and process **p**, but spine **s** is characteristic of *H. proxima* sp.n.

NAME. To emphasize its close similarity and geographical proximity to *H. yunnanensis* sp.n.; adjective.

DESCRIPTION. Length ca 25 mm, width of midbody pro- and metazonae 2.6 and 3.0 mm, respectively (♂). General coloration in alcohol dark brown to blackish; tip of epiproct and legs brown (Figs 80–83).

All characters as in *H. montana* sp.n., except as follows (Figs 80–90).

In width, head < collum = segment 3 = 4 < 2 < 5–16; thereafter body gradually tapering towards telson. Postcollum paraterga a little smaller, poorly-developed, mostly set low at about half of metazonae; caudal corner of following paraterga mainly obtuse-angled and rounded, somewhat drawn behind rear tergal margin only in segments 2, 17 and 18, acute-angled only in segments 17–19; calluses demarcated by a complete distinct sulcus only dorsally, only in about caudal 1/4 by a less distinct sulcus also ventrally; poriferous calluses thicker and much higher than poreless ones (Figs

Figs 80–83. *Hedinomorpha proxima* sp.n., ♂ holotype. 80 — habitus, lateral view; 81 — anterior part of body, ventral view; 82 — midbody segments, dorsal view; 83 — caudal end of body, dorsal view. Pictures by K. Makarov, not taken to scale.

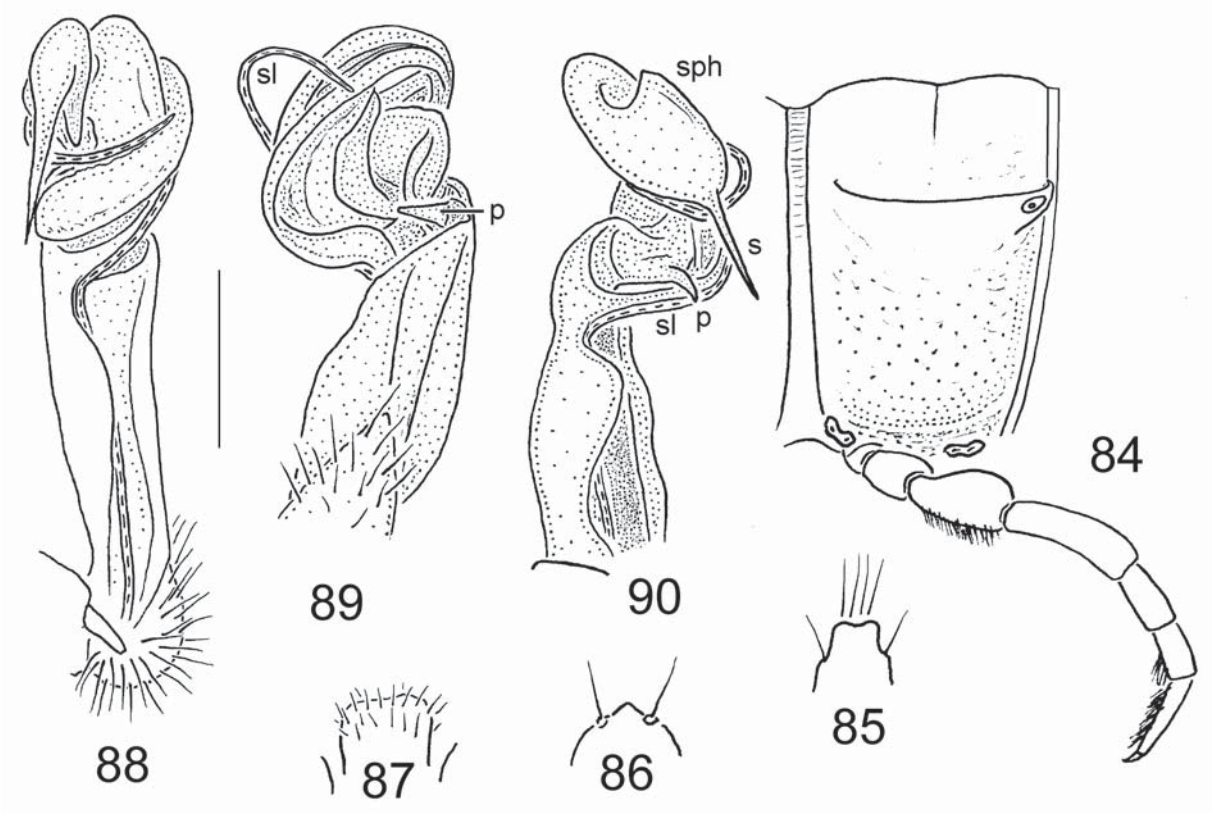
Рис. 80–83. *Hedinomorpha proxima* sp.n., голотип ♂. 80 — общий вид, сбоку; 81 — передняя часть тела, снизу; 82 — среднетуловищные сегменты, сверху; 83 — задняя часть тела, сверху. Фотографии К. Макарова, сняты без масштаба.

69–74). Ozopores lateral, placed inside an ovoid groove located mostly near caudal corner. Transverse metatergal sulci thin, more obliterate, finely striolate at bottom, sigmoid medially, not reaching bases of paraterga, present on metaterga 5–16 (Figs 80, 82–84). Pleurosternal carinae increasingly evident, granulate, arcuate ridges on segments 2–7, with obtuse-angled caudal teeth on segments 6 and 7, smaller ridges on segment 8, increasingly small bulges on a few following segments. Epiproct slightly convex on tip (Fig. 85). Hypoproct (Fig. 86) subtriangular, caudal 1+1 setae well separated, not borne on knobs.

Prefemoral brushes present on all legs, distotibial and tarsal ones absent only from last two leg-pairs.

Gonopods (Figs 88–90) complex. Postfemoral portion more evident and elongated, crowned by a very small peg (**p**); solenomere (**sl**) typical, very long and flagelliform; solenophore (**sph**) likewise bulky, strongly coiled and subcircular, its lamella lateralis showing a long conspicuous spine (**s**).

REMARKS. The genus *Hedinomorpha* Verhoeff, 1933, has hitherto been known to comprise the following eight species, all keyed [Golovatch, 2013b]: *H. bucharensis* (Lohmander, 1933), from Tajikistan (see also Golovatch [2016], as well as *H. biramipedicula* Zhang et Tang, 1985, *H. circofera* Golovatch, 2013, *H. hummeli* Verhoeff, 1933 (the type-species), *H. jeekeli* (Golovatch, 2009), *H. nigra* Golovatch, 2013, *H. re-*



Figs 84–90. *Hedinomorpha proxima* sp.n., ♂ holotype. 84 — segment 10, lateral view; 85 — tip of epiproct, dorsal view; 86 — hypoproct, ventral view; 87 — sternal lobe between coxae 4, caudal view; 88–89 — left gonopod, mesal, ventral and dorsal views, respectively. Scale bar: 1.0 (84–87) & 0.5 mm (88–90).

Рис. 84–90. *Hedinomorpha proxima* sp..n., голотип ♂. 84 — сегмент 10, сбоку; 85 — конец эпипрокта, сверху; 86 — гипопрокт, снизу; 87 — стернальная пластинка между тазиками 4, сзади; 88–90 — левый гоноподь, соответственно изнутри, снизу и сверху. Масштаб: 1,0 (84–87) и 0,5 мм (88–90).

ducta Golovatch, 2012, and *H. subnigra* Golovatch, 2013, all seven from China. The above three new congeners join *H. subnigra*, the only *Hedinomorpha* so far recorded from Yunnan.

Sigipinius dentiger **sp.n.**

Figs 91–101.

HOLOTYPE ♂ (ZMUM ρ3154), China, Yunnan Prov., Tianbaoshan between Shangrila and Habaxue Shan, E slope, NW of Bengla, N27º37′53″, E99º57′50″, 3570 m a.s.l., 23.V.2015, leg. I. Belousov, I. Kabak & G. Davidian.

PARATYPE ♂ (ZMUM), same data, together with holotype.

DIAGNOSIS. Using the latest available key [Golovatch, 2013b], as well as considering the most recently described congener, *S. spiniger* Golovatch, 2014, also from Yunnan, *S. dentiger* sp.n. is distinguished by the double sternal lobe between ♂ coxae 4, coupled with a short vermiform process **i** at the base of the postfemoral part of the gonopod, a smaller, dentiform, lateral branch **j** and a rather simple, slender, longer, distal branch **k** of the solenophore.

NAME. To emphasize the sharp lateral tooth (**j**) on the solenophore; noun in apposition.

DESCRIPTION. Length of both ♂♂, ca 21 mm (♂, ♀), width of midbody pro- and metazonae 2.4 and 2.7 mm, respectively (♂). General coloration in alcohol mostly dark brown to blackish; head, ozopore regions, venter and legs brown; collum, following metaterga and epiproct contrasting grey to yellow-brown (Figs 91–94).

Clypeolabral region densely, vertigial one sparsely, setose; epicranial suture thin, especially superficial on occiput (Fig. 92). Antennae short and moderately clavate, in situ slightly extending back behind collum when stretched dorsally (♂); in length, antennomeres 2–6 > 1 = 7; interantennal isthmus about as broad as diameter of antennal socket.

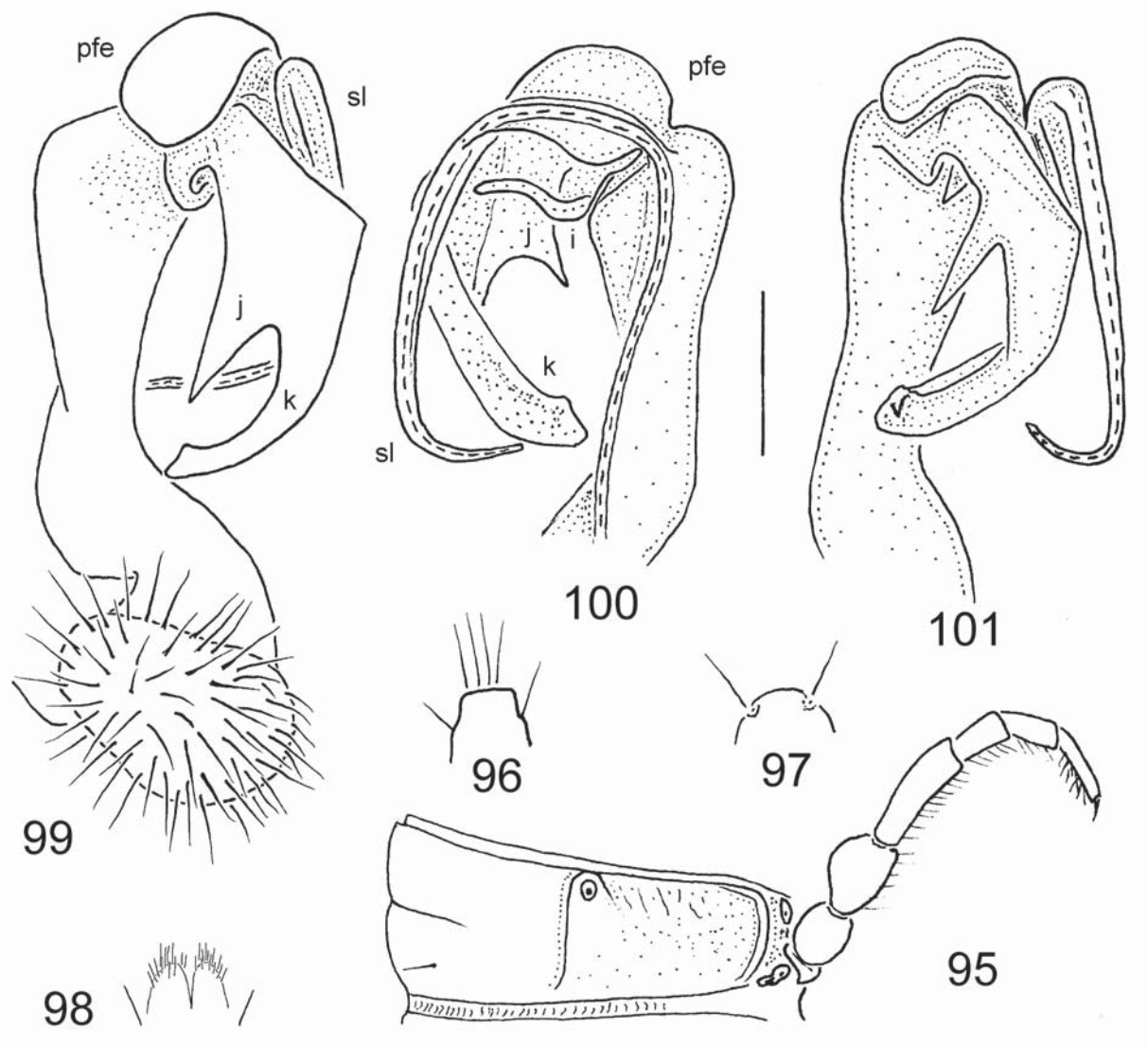
In width, segments 2–4 < head = collum < 5–15; thereafter body gradually tapering towards telson. Tegument smooth and shining, in places very delicately vermiformly striolate; prozonae shagreened; surface below paraterga striate-striolate and microgranulate. Collum broadly and rather regularly rounded laterally. Postcollum paraterga poorly-developed, mostly set low at about half of metazonae, fore shoulder subrectangular only in segment 2 (Fig. 104), thereafter clearly rounded; caudal corner always rounded, never pro-

Figs 91–94. *Sigipinius dentiger* sp.n., ♂ holotype. 91 — habitus, lateral view; 92 — anterior part of body, ventral view; 93 — midbody segments, dorsal view; 94 — caudal end of body, dorsal view. Pictures by K. Makarov, not taken to scale.

Рис. 91–94. *Sigipinius dentiger* sp.n., голотип ♂. 91 — общий вид, сбоку; 92 — передняя часть тела, снизу; 93 — среднетуловищные сегменты, сверху; 94 — задняя часть тела, сверху. Фотографии К. Макарова, сняты без масштаба.

duced behind rear tergal margin; lateral calluses very thin, each demarcated by a complete distinct sulcus only dorsally; poriferous calluses only a little higher than poreless ones. Ozopores lateral, placed inside an ovoid pit located near caudal corner of poriferous paraterga. Tergal setae largely abraded, very short, pattern poorly traceable due to insertion points, probably 2+2 in a transverse fore (= pre-sulcus) row (Fig. 95). Transverse metatergal sulci thin, finely striolate at bottom, faintly sigmoid medially, superficial, not reaching bases of paraterga, present on metaterga 5–18 (Figs 91, 93 & 95). Stricture dividing pro- and metazonae rather narrow and shallow, faintly striolate at bottom down to below paraterga. Axial line missing. Pleurosternal carinae evident, squarish to arcuate, increasingly faint ridges until segment 16 (Figs 91 & 95). Epiproct (Figs 91, 94 & 96) long, clearly flattened dorsoventrally, conical, subtruncate at apex, subapical lateral papillae poorly-developed. Hypoproct (Fig. 97) semi-circular, caudal 1+1 setae well separated, not borne on knobs.

Sterna sparsely setose, cross-impressions weak, without modifications other than a paramedian pair of high, basally contiguous, setose, roundly subquadrate lobes between coxae 4 (Fig. 98). Legs rather long, crassate, 1.5–1.6 times as long as midbody height (♂); prefemora slightly swollen laterally; in length, femora > tarsi > prefemora = postfemora = tibiae > coxae (Fig.



Figs 95–101. *Sigipinius dentiger* sp.n., ♂ holotype. 95 — segment 10, lateral view; 96 — tip of epiproct, dorsal view; 97 — hypoproct, ventral view; 98 — sternal lobe between coxae 4, caudal view; 99–101 — right gonopod, mesal, ventral and dorsal views, respectively. Scale bar: 0.2 (95–98) & 0.3 mm (99–101).

Рис. 95–101. *Sigipinius dentiger* sp..n., голотип ♂. 95 — сегмент 10, сбоку; 96 — конец эпипрокта, сверху; 97 — гипопрокт, снизу; 98 — стернальная пластинка между тазиками 4, сзади; 99–101 — правый гонопод, соответственно сбоку, изнутри и снизу. Масштаб: 0,2 (95–98) и 0,3 мм (99–101).

95). Tarsal brushes present only until legs 9 (♂). Adenostyles missing.

Gonopods (Figs 99–101) complex; coxites rather short, about half as long as telopodites, subcylindrical, densely setose distally; prefemoral (= densely setose) part of telopodite short, about half as long as a stout, distally slightly enlarged, mesally curved and untwisted femorite; the latter with folds marking a mesal groove, set off from acropodite by a clear transverse cingulum. Postfemoral portion (**pfe**) distinct, demarcated from solenophore (**sph**) by another sulcus, at base with a small vermiform process (**i**); **sph** with a strong, sharp, lateral tooth (**j**) before a slender distalmost branch **k**. Seminal groove and solenomere (**sl**) completely mesal, **sl** very long and flagelliform.

REMARKS. The endemic Chinese genus *Sigipinius* Hoffman, 1961, has heretofore been known to contain the following eight species, all high-montane: *S. campanuliformis* Golovatch, 2013, *S. complex* Golovatch, 2013, *S. grahami* Hoffman, 1961 (the type-species), *S. kabaki* Golovatch, 2013, *S. montanus* (Golovatch, 2009), *S. pinnifer* Golovatch, 2016, *S. simplex* Golovatch, 2013 and *S. spiniger* Golovatch, 2014. Most of them have been keyed [Golovatch, 2013b]. Only *S. campanuliformis* and *S. spiniger* have been described from Yunnan, whereas the other species seem to be

Figs 102–104. *Tectoporus telnovi* sp.n., ♂ holotype. 102 — habitus (segment 7 removed), dorsal view; 103 & 104 — anterior part of body, ventral and dorsal views, respectively. Pictures by K. Makarov, not taken to scale.

Рис. 102–104. *Tectoporus telnovi* sp.n., голотип ♂. 102 — общий вид (сегмент 7 удален), сверху; 103 и 104 — передняя часть тела, соответственно снизу и сверху. Фотографии К. Макарова, сняты без масштаба.

confined to the Sichuan (5) and Xinjiang Uygur (1) provinces.

Tectoporus telnovi **sp.n.**
Figs 102–108.

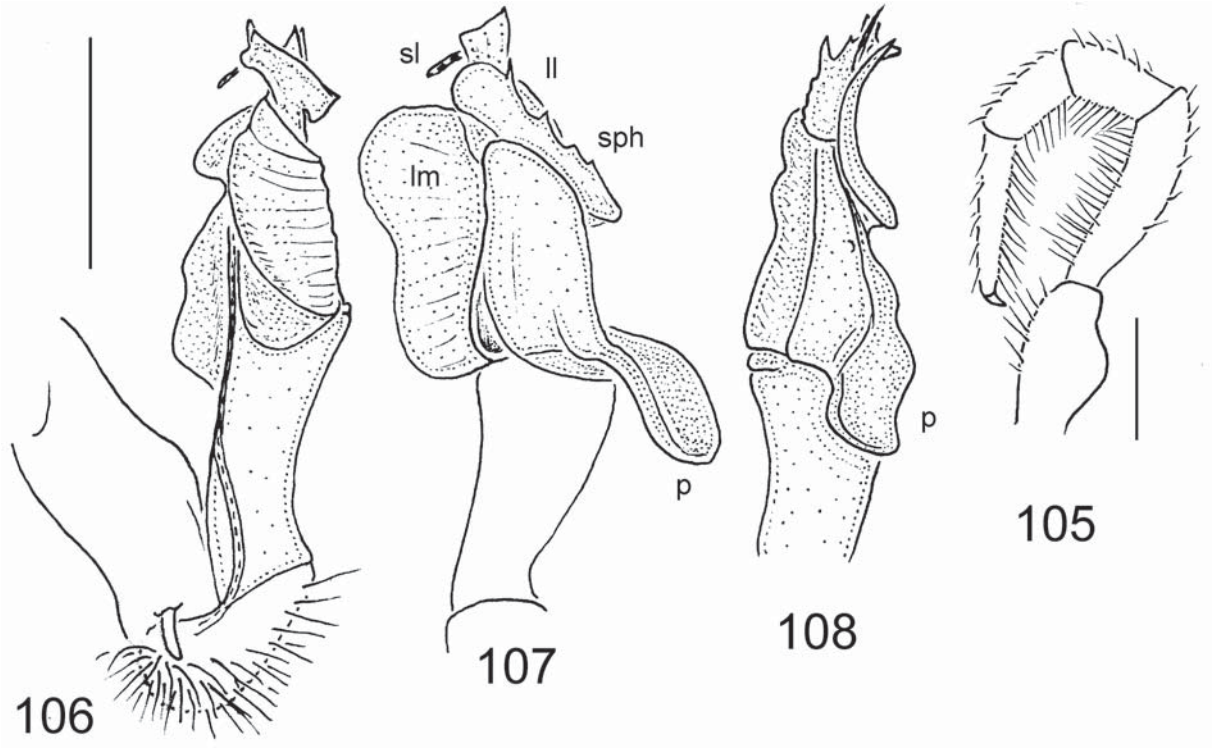
HOLOTYPE ♂ (ZMUM ρ3153), Indonesia, western New Guinea, Doberai Peninsula, 2.1–2.5 km NW of Ayamaru, forest and Frama Creek, primary lowland semi-dry rainforest on limestone, S1°15′30″, E132°11′13″, 265–310 m a.s.l., 2.IX.2015, leg. D. Telnov.

DIAGNOSIS. Differs from the *Tectoporus* species that lack a distolateral spine on the solenophore (Group 1 of Jeekel [1951] and Golovatch [1997]) in the densely and irregularly setose collum and metaterga, coupled with very small paraterga and the presence of a very prominent, laterobasal, spoon-shaped process (**p**) on a highly complex and bulky solenophore (cf. Golovatch & Stoev [2010]).

NAME. Honours Dmitri Telnov, the collector.

DESCRIPTION. Length ca 8 mm, width of midbody pro- and metazonae 0.6 and 0.8 mm, respectively (♂). General coloration in alcohol light brown, but distal antennomeres, tip of epiproct, venter and legs lighter grey-yellowish (Figs 102–104).

Head densely setose; epicranial suture thin, especially superficial on occiput (Figs 103 & 104). Anten-



Figs 105–108. *Tectoporus telnovi* sp.n., ♂ holotype. 105 — leg 7, lateral view; 106–108 — left gonopod, mesal, ventral and lateral views, respectively. Scale bars: 0.2 mm.

Рис. 105–108. *Tectoporus telnovi* sp.n., голотип ♂. 105 — нога 7, сбоку; 106–108 — левый гонопод, соответственно изнутри, снизу и сбоку. Масштаб: 0,2 мм.

nae short and moderately clavate, in situ slightly extending back behind segment 2 when stretched dorsally (♂); in length, antennomeres 2 = 6 > 3–5 > 1 = 7, 6th clearly largest; interantennal isthmus almost as broad as diameter of antennal socket.

Body moniliform. In width, collum < segments 3–4 < 2 < head = 5–16; thereafter body gradually tapering towards telson. Tegument smooth and shining; prozonae shagreened; surface below paraterga microgranulate. Collum broadly and rather regularly rounded laterally (Fig. 104). Postcollum paraterga poorly-developed, mostly set low at about upper 1/3 of metazonae, only in segment 2 slightly drawn anteriorly, never produced behind rear tergal margin; calluses demarcated by a nearly complete distinct sulcus only dorsally, only in about caudal half by a less distinct sulcus also ventrally; poriferous calluses much higher than poreless ones (Fig. 91). Ozopores lateral, placed inside an ovoid pit located near caudal corner of poriferous paraterga. Tergal setae largely abraded, 1/3–1/2 as long as metatergite, needle-shaped, easily traceable due to insertion points; setation abundant and irregular (Fig. 104). Transverse metatergal sulci thin, superficial, not reaching bases of paraterga, present on metaterga 5–18 (Figs 102 & 104). Stricture dividing pro- and metazonae deep and narrow, nearly smooth. Axial line missing. Pleurosternal carinae a small lappet on segment 2, thereafter missing. Epiproct long, clearly flattened dorsoventrally, conical, slightly concave apex, subapical lateral papillae poorly-developed. Hypoproct roundly subtriangular, caudal 1+1 setae well separated, borne on minute knobs.

Sterna sparsely setose, cross-impressions weak, without modifications other than a low, subquadrate, setose, central lobe between coxae 4 (Fig. 103). Legs rather long, crassate, beset with long setae ventrally, 1.7–1.8 times as long as midbody height (♂); prefemora slightly swollen laterally; in length, femora > tarsi > prefemora = postfemora = tibiae > coxae (Fig. 105). Tarsal brushes present only on legs 1. Adenostyles missing.

Gonopods (Figs 106–108) highly complex; coxites subcylindrical, rather long, about as long as femorites; prefemoral (= densely setose) part of telopodite short, about half as long as a stout, distally enlarged, mesally curved and untwisted femorite; the latter set off from acropodite by a clear transverse cingulum. Solenophore (**sph**) tripartite, bulky, at base with a prominent, spoon-shaped, lateral process (**p**). Lamina medialis (**lm**) a very large and rounded lobe, laminal lateralis (**ll**) more complex, with several teeth apically. Seminal groove fully mesal, solenomere (**sl**) starting mesally as well, long and flagelliform, only tip visible beyond **sph**.

REMARKS. The large genus *Tectoporus* Carl, 1902, has hitherto been known to contain 29 species ranging mostly across Indonesia, from Sumatra in the west to

Papua New Guinea in the east [Nguyen, Sierwald, 2013]. The new species clearly belongs to Group 1 of Jeekel [1951] and Golovatch [1997] which appears to dominate the *Tectoporus* fauna of New Guinea (six species, see review and key in Golovatch & Stoev [2010]).

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