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On the synonymy of the millipede genera *Riukiaria* Attems, 1938 and *Parariukiaria* Nguyen, 2016, with records of *Riukiaria* cf. *davidiani* Golovatch, 2014 from Sichuan, southern China (Diplopoda: Polydesmida: Xystodesmidae)

О синонимии многоножек-диплопод родов *Riukiaria* Attems, 1938 и *Parariukiaria* Nguyen, 2016, с находками вида *Riukiaria* cf. *davidiani* Golovatch, 2014 в Сычуани (Южный Китай) (Diplopoda: Polydesmida: Xystodesmidae)

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KEY WORDS: taxonomy, new synonymy, new combination, iconography, distribution, map.

КЛЮЧЕВЫЕ СЛОВА: таксономия, новая синонимия, новая комбинация, иконография, ключ, распространение, карта.

ABSTRACT. The genus *Parariukiaria* Nguyen, 2016 is formally synonymized with, and its type species *P. cucfuongensis* Nguyen, 2016, from northern Vietnam, transferred to, *Riukiaria* Attems, 1938, syn.n., hence also warranting the following new combination: *R. cucfuongensis* (Nguyen, 2016), comb.n. ex *Parariukiaria*. The species *Riukiaria* cf. *davidiani* Golovatch, 2014 is briefly illustrated based on fresh material, being recorded from several localities in Sichuan, China. The distributions of *Riukiaria* species in southern China and northern Vietnam are updated and mapped.

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РЕЗЮМЕ. Род *Parariukiaria* Nguyen, 2016 — новый младший синоним *Riukiaria* Attems, 1938, syn.n., а его типовой вид *P. cucfuongensis* Nguyen, 2016 из Северного Вьетнама образует следующую новую комбинацию: *R. cucfuongensis* (Nguyen, 2016), comb.n. Вид *Riukiaria* cf. *davidiani* Golovatch, 2014 кратко проиллюстрирован на основе нового материала, а также впервые указан для нескольких точек из Сычуани (Китай). Дана обновленная карта с распространением всех видов рода *Riukiaria* в Южном Китае и Северном Вьетнаме.

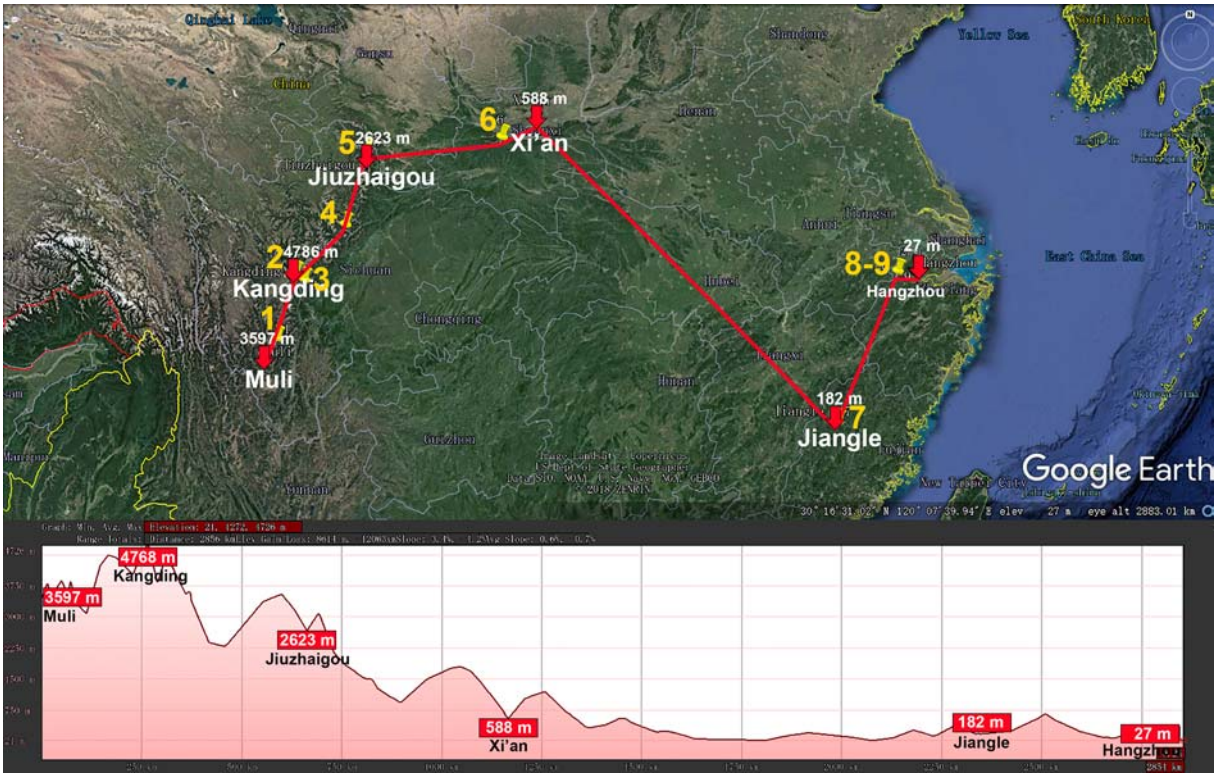
Introduction

According to the most modern concept [Shelley, Smith, 2018; Means *et al*., 2021a, b; Hennen *et al*., 2022; Vasquez-Valverde, Marek, 2022], the basically Holarctic millipede family Xystodesmidae presently encompasses 66 genera and *ca* 540 species, most of which occur in the Nearctic. Only few genera and species are known from Central and northern South America (to Ecuador in the south), the Antilles, the Mediterranean region, and East Asia. The largest East Asian genus *Riukiaria* Attems, 1938 currently contains 35 species or subspecies from southern Japan, southern Korea, Taiwan and China [Korsós *et al*., 2011; Golovatch, 2014, 2015; Nguyen, 2016].

As noted elsewhere [Golovatch, Liu, 2020], Nguyen [2016] seems to have erred in splitting *Riukiaria* into two genera, including a new genus, *Parariukiaria* Nguyen, 2016, to accommodate a new species from northern Vietnam and three previously described ones from southern China; no formal synonymy was then advanced though. As *Riukiaria* and *Parariukiaria* show a series of transitional stages in the reduction of a gonoprefemoral process, both may well be regarded as representing a single large genus, in which several peripheral, largely southernmost congeners demonstrate a more or less strongly suppressed process on the gonopodal prefemorite, from relatively small to totally missing. This results now in the following new formal synonymy and transfer: *Riukiaria* Attems, 1938 = *Parariukiaria* Nguyen, 2016,

Table. *Riukiaria* species in mainland China (after Golovatch, Liu [2020]) and northern Vietnam.
Таблица. Виды *Riukiaria* в континентальном Китае (по: Golovatch, Liu [2020]) и Северном Вьетнаме.

Species	Altitude	Provenance and references
1. *Riukiaria belousovi* Golovatch, 2014	4100	China, Sichuan, Muli County, SW of Wulaxixiang [Golovatch, 2014]
2. *R. capaca* Wang et Zhang, 1993	170	China, Fujian, Jiangle County Longqi Mountain [Wang, Zhang, 1993]
3. *R. cucfuongensis* (Nguyen, 2016)	*ca* 150	Vietnam, Ninh binh Province, Cuc Phuong National Park, forest [Nguyen, 2016]
4. *R. chinensis* Tanabe, Ishii et Yin, 1996	885	China, Zhejiang, Tian-mu Mountains [Tanabe *et al.*, 1996]
5. *R. davidiani* Golovatch, 2014	2810	China, Sichuan, Lixian County, SW of Tonghua [Golovatch, 2014]
6. *R. kabaki* Golovatch, 2014	4440	China, Sichuan, Kangding City, NNE of Walaxiang, NE of Yusicun [Golovatch, 2014]
7. *R. korolevi* Golovatch, 2014	2900	China, Sichuan, W of Jiuzhaigou [Golovatch, 2014]
8. *R. martensi* Golovatch, 2014	1700	China, Shaanxi, Mt. Taibaishan, southern slopes, above Houzhenzi, primary broadleaved forest [Golovatch, 2014]
9. *R. spatuliformis* Golovatch, 2015	2525	China, Sichuan, N of Luding City, N of Lanan [Golovatch, 2015]
10. *R. tianmu* (Tanabe, Ishii et Yin, 1996)	885	China, Zhejiang, Tian-mu Mountains [Tanabe *et al.*, 1996; Golovatch, 2014]



Map 1. Distributions, both geographic and altitudinal, of *Riukiaria* species in continental China (after Golovatch, Liu [2020]). Red lines show the transect Muli – Kangding – Jiuzhaigou – Xi'an – Jiangle – Hangzhou, along which the elevations are crudely indicated below. **1** — *R. belousovi*, **2** — *R. kabaki*, **3** — *R. spatuliformis*, **4** — *R. davidiani*, **5** — *R. korolevi*, **6** — *R. martensi*, **7** — *R. capaca*, **8** — *R. chinensis*, **9** — *R. tianmu*.

Карта 1. Географическое распространение и вертикальное распределение видов рода *Riukiaria* в материковом Китае (по: Golovatch, Liu [2020]). Красные линии показывают трансекту Muli – Kangding – Jiuzhaigou – Xi'an – Jiangle – Hangzhou, вдоль которой внизу отмечены примерные высоты.

syn.n., and *R. cucfuongensis* (Nguyen, 2016), comb.n. ex *Parariukiaria*, to be discussed in due detail further below.

The following ten *Riukiaria* species are currently known to occur in continental China [Golovatch, Liu, 2020] and northern Vietnam, all listed in a tabular form (Table). All Asian species of Xystodesmidae are epigean, including all nine described species of *Riukiaria* in mainland China which span across the central and southern parts of the country and occur in lowland to high-montane habitats, up to nival ones (170–4440 m a.s.l., Table, Map 1).

Material and methods

All material underlying the present note was taken by I. Belousov and his collaborators (all St. Petersburg, Russia) during their field trips to China in 2015 and 2017. The specimens remain stored in 75% alcohol and all are deposited in the collection of the Zoological Museum, Moscow State University (ZMUM).

Digital images of the specimens were taken in the laboratory and assembled using Zerene Stacker software. Map 2 was generated using QGIS 3.14.15-Pi software.

Taxonomic part

Genus *Riukiaria* Attems, 1938

= *Rhysolus* Chamberlin, Wang, 1953 (see Hoffman [1980])
= *Sinoria* Tanabe, Ishii et Yin, 1996 (see Golovatch [2014])
= *Parariukiaria* Nguyen, 2016, **syn.n.!**

Type species: *R. pugionifera* Verhoeff, 1936 (designated by Attems [1938])

HISTORY. *Riukiaria* was first invalidly proposed without a type species by Verhoeff [1936], but later Attems [1938] typified the genus, and hence became its author, through designating *R. pugionifera* Verhoeff, 1936 as type species. A nice and still relevant review of *Riukiaria* belongs to Korsós *et al.* [2011], to be updated only by several additional species described since by Golovatch [2014, 2015] and Nguyen [2016]. With its 35 component species or subspecies, this genus dominates the xystodesmid fauna of East Asia.

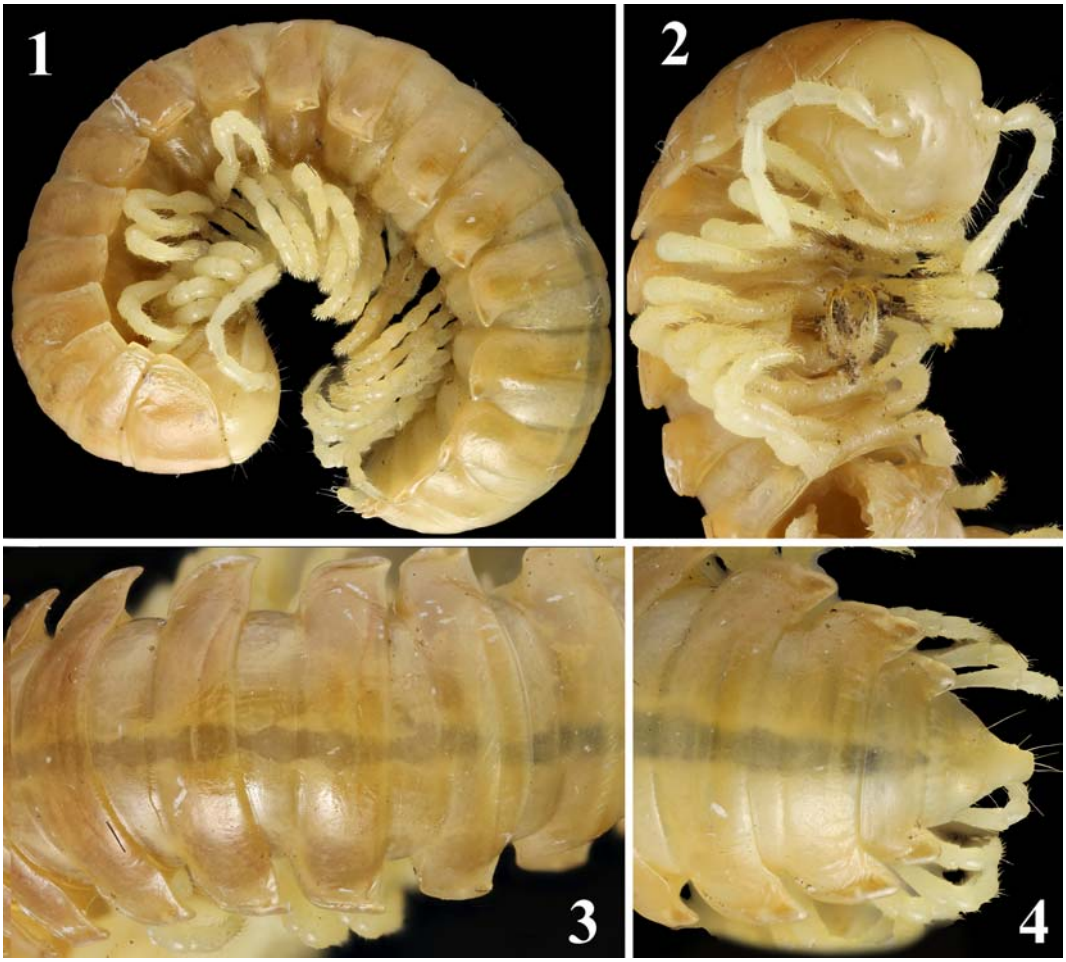
Riukiaria is a large genus of East Asian Xystodesmini and formerly it was believed to differ from the morphologically most similar and partly sympatric *Xystodesmus* Cook, 1895 by the following characters of gonopodal structure: "(1) gonocoxae have one macroseta; (2) posterolateral corners of paranota are rounded on segments 1–4 and acutely produced on segments 5–18; (3) metatergites have rows of tubercles. … These possible synapomorphies suggest that the two genera are closely related to each other" [Tanabe, Shinohara, 1996, p. 1479]. However, because Korsós *et al.* [2011] questioned characters 2 and 3, while Golovatch [2014] dismissed character 1, the only real evidence of the particularly close relations of *Riukiaria* and *Xystodesmus* comes from gonopodal structure, as well as molecular data [Sota, Tanabe, 2010; Korsós *et al.*, 2011]. Concerning the latter, using mitochondrial COI-COII sequences and maximum likelihood analysis, selected species of *Riukiaria* and *Xystodesmus* (as outgroup to *Parafontaria*) came out together as sister groups [Sota, Tanabe, 2010].

DIAGNOSIS AND EVOLUTIONARY TRENDS. Morphologically, *Riukiaria* differs from *Xystodesmus* in the less elaborate and largely forceps-shaped gonopodal telopodite, in which among the two main branches, solenomere and prefemoral process, the former is always longer to much longer than the latter, if any, while the gap between both is very considerable. In contrast, the solenomere and prefemoral process in *Xystodesmus* are quite variable in length and shape, both lying clearly adjacent and/or clearly appressed to each other, forming no considerable gap between them. In addition, all six *Xystodesmus* species are endemic to southern Japan (Honshu, Shikoku, Kyushu and the Ryukyus) [Tanabe, Shinohara, 1996], whereas *Riukiaria* species occur not only in Japan, but also in South Korea, Taiwan, continental China and northern Vietnam [Korsós *et al.*, 2011; Golovatch, 2014, 2015; Nguyen, 2016].

A typical gonopod in *Riukiaria* shows both solenomere and prefemoral process strong, stout and simple, with the former branch being only slightly longer than the latter one and usually (sub)acuminate [Wang, Zhang, 1993; Tanabe *et al.*, 1996; Korsós *et al.*, 2011]; the oblique sulcus/line demarcating the acropodite/solenomere, the latter occasionally being at most only very slightly twisted, from the prefemorite (= densely setose part) is weak to wanting, especially so on the lateral side. The gonocoxite, in addition to the usual distomedial cannula, is occasionally equipped with a small apicoventral or apicodorsal outgrowth/apophysis [Tanabe *et al.*, 1996; Korsós *et al.*, 2011]. Like in apparently all Xystodesmidae, the seminal groove in *Riukiaria* always ends up terminally on the solenomere.

Further evolutionary modifications and complications concern the solenomere which becomes increasingly slender and elongate, usually also acuminate and curved mesad at least distally, up to (sub)circular. Only very seldom does the solenomere carry a distomesal branch (*R. kabaki*), usually being simple and ribbon-shaped. The shape and size of the prefemoral process, however, is much more variable, this usually being prominent, sometimes even with a distal side branch (e.g., *R. martensi*), but some of the southern mainland congeners demonstrate the prefemoral process growing increasingly reduced to totally suppressed, *vs* an invariably very strongly elongate and slender solenomere. The latter thereby remains either nearly straight, only distally curved mesad and occasionally even sinuate (*R. korolevi*, *R. belousovi*) or very clearly (sub)circular (*R. martensi*, *R. kabaki*, *R. davidiani*, *R. spatuliformis*), obviously regardless of the evolution of the prefemoral process. This latter is strong and complex in *R. martensi*, still sufficiently strong, but rather simple in *R. davidiani* (Figs 7, 8), *R.* cf. *davidiani* (Figs 9, 10) or *R. spatuliformis*, definitely reduced down to a short spine (*R. kabaki, R. belousovi*) or lobule (*R. cucfuongensis*) and apparently barely functional in sperm transfer, to ultimately become fully suppressed and thus totally non-functional (*R. korolevi*). This reductionist trend is rather gradual and it nicely bridges the typical members of *Riukiaria* to the ex-*Parariukiaria* species with increasingly strongly suppressed prefemoral processes. Hence the new formal synonymy.

Interestingly, a similar evolutionary trend in complicating the structure of the gonopodal acropodite/solenomere can be observed in the northernmost Asian xystodesmid genus *Levizonus* Attems, 1898 as well, with eight presently accepted species which occur in the Russian Far East (Maritime Province), North Korea, Japan (Hokkaido), and northeastern China (Jilin Province). *Levizonus* species lack any prefemoral outgrowths, but the solenomere branch varies between species from stouter, stronger and nearly straight,



Figs 1–4. *Riukiaria* cf. *davidiani* Golovatch, 2014, ♂ from near Ershili, 1 — habitus, lateral view; 2 — anterior part of body, ventral view; 3, 4 — middle and posterior parts of body, respectively, dorsal views. Pictures by K. Makarov, taken not to scale.

Рис. 1–4. *Riukiaria* cf. *davidiani* Golovatch, 2014, ♂ из окрестностей Ershili, 1 — общий вид, сбоку; 2 — передняя часть тела, снизу; 3, 4 — соответственно средняя и задняя части тела, сверху. Фотографии К. Макарова, сняты без масштаба.

through longer and only moderately curved, to particularly long and (sub)circular [Tanabe, 1994; Mikhaljova, 2021].

BRIEF DESCRIPTION OF *RIUKIARIA*. Body with 20 rings, medium- to moderately large-sized (adults 18–65 mm long and 4.0–11.5 mm wide, ♀♀ usually being somewhat larger than ♂♂); more often with a distinct colour pattern, but in mainland congeners usually pale and (nearly) monochromous, tegument smooth and shining; metaterga usually with neither bosses nor areations, nor setae; only rarely each metatergum with three transverse rows of distinct tubercles, more usually only in places sometimes very faintly rugulose, and only posterior margin sometimes ridged. Head smooth, with lobed genae, three small teeth centrally at anterior margin of labrum; antennae moderately long (at most reaching past ring 3 dorsally), slender and subfiliform. Dorsum strongly convex; paraterga very evident, set low and strongly declivous, lateral calluses clear-cut and mostly acute to rounded caudally; pore formula normal (5, 7, 8, 10, 12, 13, 15–19), ozopores lying at lateral edge at about caudal 1/3 of metatergal length off caudal corner inside small pits.

Sternal apodemes long and straight. Sterna mostly smooth, without modifications, very narrow between legs 1 and 2, in ♂ clearly broader until segment 7, especially broad behind gonopods. Gonapophyses on ♂ coxae 2 clear-cut mesal processes/cones. Gonopodal aperture on ♂ ring 7 wide, elliptical, about twice as wide as long.

Gonopods *in situ* deeply sunken to clearly exposed, *in situ* with acropodites crossing each other distally. Gonocoxite short and subcylindrical, as usual with a long and strongly curved cannula apicomesally and with 0–2 macrosetae distodorsolaterally, only rarely equipped with a small apicodorsal or apicoventral tooth/apophysis. Gonopodal telopodite typically bipartite and forceps-shaped [Korsós *et al.*, 2011], represented by a considerable, very densely setose prefemorite and a longer to much longer acropodite. Prefemorite at most only poorly demarcated from acropodite by a sulcus or line on mesal side alone, usually bearing a more or less strong/evident process, exceptionally this being fully suppressed. Acropodite = solenomere always longer than prefemoral process, strong and stout to long and slender, curved mesad all along or only distally, up to coiled and circular, usually ribbon-shaped and simple, only occasionally with a mesal branch distally.

Riukiaria cf. *davidiani* Golovatch, 2014
Figs 1–6, 9, 10; Map 2.

Riukiaria davidiani Golovatch, 2014: 198 (original description).

Figs 5, 6. *Riukiaria* cf. *davidiani* Golovatch, 2014, ♂ from near Dadiancun, habitus, lateral and dorsal views, respectively. Pictures by K. Makarov, taken not to scale.

Рис. 5, 6. *Riukiaria* cf. *davidiani* Golovatch, 2014, ♂ из окрестностей Dadiancun, общий вид, соответственно сбоку и сверху. Фотографии К. Макарова, сняты без масштаба.

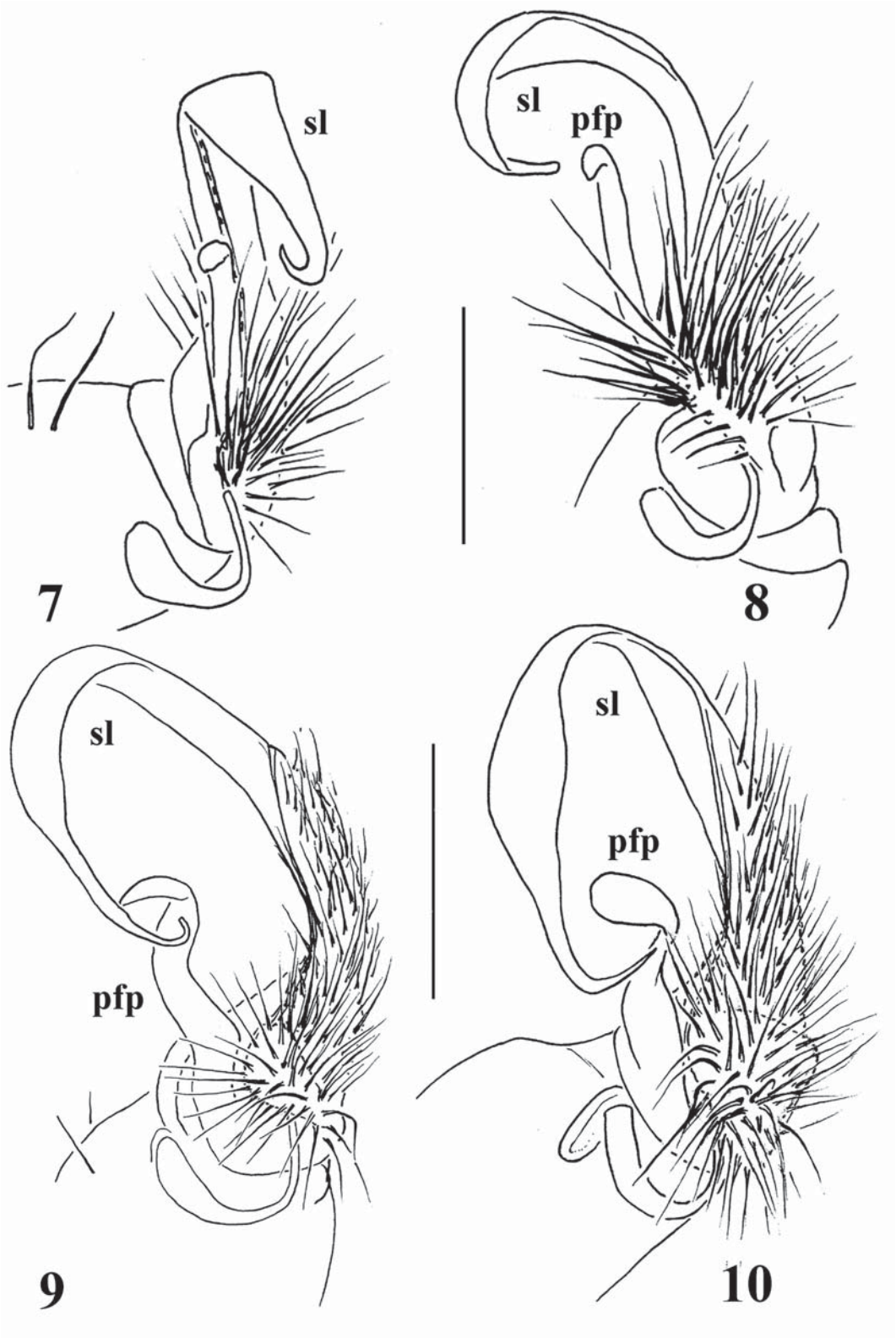
Riukiaria davidiani — Nguyen, 2016: 332 (listing); Golovatch, Liu, 2020: 174, 181 (listing and map).

MATERIAL. 1 ♂ (ZMUM), Sichuan Prov., N of Wenchuan, NE of Longxixiang, 2.4 km NNE of Ershili, N 31º38′54″, E 103º37′29″, 3140 m a.s.l., 4.VII.2015, I. Belousov, I. Kabak & G. Davidian leg.; 1 ♂ (ZMUM), Sichuan Prov., Maoxian–Songpan road, 4.7 km NE of Dadiancun, N 31º58′19″, E 103º41′56″, 2595 m a.s.l., 28.VI.2015, I. Belousov, I. Kabak & G. Davidian leg.; 1 subadult ♀ (ZMUM), Sichuan Prov., Maoxian–Songpan road, 1.4 km SW of Maangyao, N 31º59′28″, E 103º44′5″, 3580 m a.s.l., 30.VI.2015, I. Belousov, I. Kabak & G. Davidian leg.; 2 ♂♂ (ZMUM), China, Sichuan Prov., N of Lixian, Mengdonggou & Lianghekou divide, W of Xing, Fanweizi, N 31º45′27″, E103º16′40″, 4055 m a.s.l., 14.VI.2017, I. Belousov & I. Kabak leg.; 1 ♂ (ZMUM), Sichuan Prov., Lixian, NNW of Xuecheng, Ertaizi, Machingou River, N 31º42′48″, E 103º16′23″, 3110 m a.s.l., 12.VI.2017, I. Belousov & I. Kabak leg.

REMARKS. Based on the gonopod structure, the above samples are best identifiable as belonging to *R. davidiani*. The species has been described from the holotype ♂ coming from near Tonghua, Lixian County, Sichuan Province, China, taken at 2810 m a.s.l. [Golovatch, 2014]. In fact it is the largely high-montane province of Sichuan in continental China that appears to represent a hotspot of *Riukiaria* diversity, whence four additional congeners have already been described [Golovatch, 2014, 2015] (Map 2). The above new samples agree very closely with the description of *R. davidiani*, likewise being uniformly light brown-yellow with olive tint (Figs 1–6) and only slightly varying in size: adults *ca* 19–22 mm long and 4.0–5.1 mm wide, *vs* 26 and 5.5 mm, respectively, in the holotype. In addition, *R. davidiani* and *R.* cf. *davidiani* come from a single and relatively small area in Sichuan (Map 2) and occur at elevations ranging from *ca* 2800 to 4055 m a.s.l. The main morphological character that brings them together is the general shape of the gonopodal telopodite, in which the solenomere (**sl**) is very long, subcircular and acuminate, whereas a medium-sized prefemoral process (**pfp**) is more variable in shape and it reaches the **sl** tip which is always bent mesad, attenuated and acuminate to more or less broadly rounded (Figs 7–10). In addition, there are two gonocoxal setae in *R. davidiani* and *R.* cf. *davidiani* from near Ershili (Fig. 9), *vs* none in *R.* cf. *davidiani* from near Dadiancun (Fig. 10). The ♂♂ from Fanweizi are nearly identical in gonopodal structure to *R. davidiani* (Figs 7, 8).

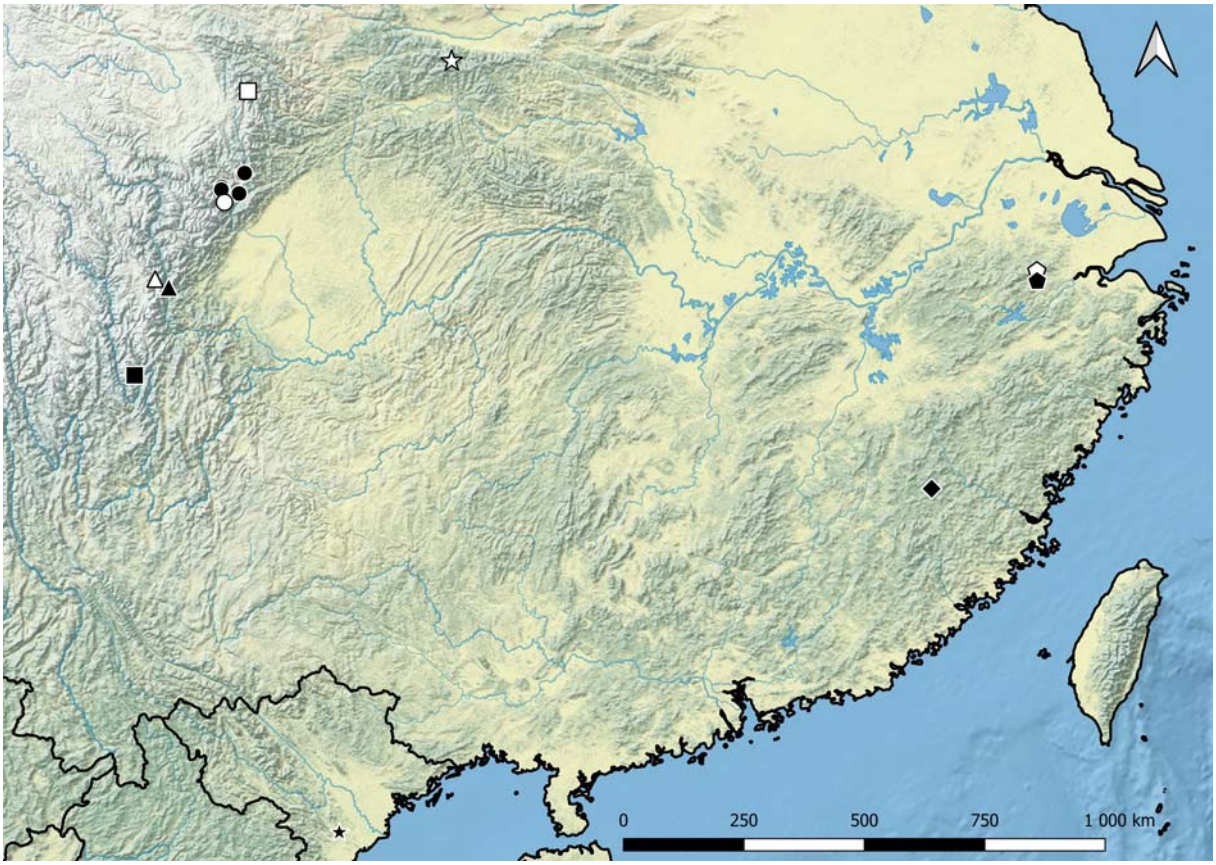
Because such variations seem too minor to describe as species or two different from *R. davidiani*, in the lack of representative material, I am inclined to treat them as belonging to *R.* cf. *davidiani*. In addition, because molecular evidence is still missing to evaluate inter- *vs* intraspecific variations in most *Riukiaria* species, hence the above qualifications.

Basically, Xystodesmidae seem to represent a millipede group rather uncommon and difficult to find in China or Vietnam. Unfortunately, material always appears to be scant



Figs 7–10. Left gonopods of *Riukiaria davidiani* Golovatch, 2014, ♂ holotype from near Tonghua (after Golovatch [2014]) (7, 8) and *Riukiaria* cf. *davidiani* Golovatch, 2014, ♂ from near Ershili (9) or Dadiancun (10), mesal views. Abbreviations: pfp — prefemoral process; sl — solenomere. Scale bars: 0.5 mm.

Рис. 7–10. Левые гоноподы *Riukiaria davidiani* Golovatch, 2014, голотип ♂ из окрестностей Tonghua (по: Golovatch [2014]) (7, 8) и *Riukiaria* cf. *davidiani* Golovatch, 2014, ♂ из окрестностей Ershili (9) и Dadiancun (10), изнутри. Обозначения: pfp — префеморальный отросток; sl — соленомер. Масштаб: 0,5 мм.



Map 2. Distribution of *Riukiaria* species in continental China and Vietnam. Designations, from north to south: *R. martensi* — open star; *R. korolevi* — open square; *R.* cf. *davidiani* — filled circles; *R. davidiani* — open circle; *R. tianmu* — white pentagon + *R. chinensis* — filled pentagon; *R. kabaki* — open triangle; *R. spatuliformis* — filled triangle; *R. belousovi* — filled square; *R. capaca* — filled diamond; *R. cucfuongensis* — filled star.

Карта 2. Распространение видов рода *Riukiaria* в материковом Китае и Вьетнаме. Обозначения, с севера на юг: *R. martensi* — пустая звезда; *R. korolevi* — пустой квадрат; *R.* cf. *davidiani* — зачерненные кружки; *R. davidiani* — пустой кружок; *R. tianmu* — пустой пятиугольник + *R. chinensis* — зачерненный пятиугольник; *R. kabaki* — пустой треугольник; *R. spatuliformis* — зачерненный треугольник; *R. belousovi* — зачерненный квадрат; *R. capaca* — зачерненный ромб; *R. cucfuongensis* — зачерненная звезда.

and the available records often come from montane places difficult to access [Golovatch, 2014, 2015]. Coupled with an almost non-existing molecular record, this strongly hampers further progress in the study of East Asian xystodesmids. Southern China and northern Vietnam seem to represent the southern range limit for both the genus *Riukiaria* and the entire family Xystodesmidae in Asia.

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References

Attems C. 1938. Myriapoda 3, Polydesmoidea II. Fam. Leptodesmidae, Platyrhachidae, Oxydesmidae, Gomphodesmidae // Das Tierreich. Lfg.69. S.1–486.

Golovatch S.I. 2014. The millipede genus *Riukiaria* Attems, 1938 in continental China, with descriptions of new species (Diplopoda: Polydesmida: Xystodesmidae) // Zootaxa. Vol.3793. No.1. P.188–200.

Golovatch S.I. 2015. Two new species of the millipede order Polydesmida from southern China (Diplopoda) // Zoologicheskii zhurnal. Vol.94. No.9. P.1023–1028.

Golovatch S.I., Liu W.X. 2020. Diversity, distribution patterns, and fauno-genesis of the millipedes (Diplopoda) of mainland China // ZooKeys. Vol.930. P.153–198.

Hennen D.A., Means J.C., Marek P.E. 2022. A revision of the *wilsoni* species group in the millipede genus *Nannaria* Chamberlin, 1918 (Diplopoda, Polydesmida, Xystodesmidae) // ZooKeys. Vol.1096. P.17–118.

Hoffman R.L. 1980 (for 1979). Classification of the Diplopoda. Genève: Muséum d'histoire naturelle. 237 p.

Korsós Z., Nakamura Y., Tanabe T. 2011. Two new millipede species of the genus *Riukiaria* (Diplopoda, Polydesmida, Xystodesmidae) endemic to the Ryukyu Archipelago, Japan // Zootaxa. Vol.2877. P.55–68.

Means J.C., Hennen D.A., Marek P.E. 2021a. A revision of the *minor* species group in the millipede genus *Nannaria* Chamberlin, 1918 (Diplopoda, Polydesmida, Xystodesmidae) // ZooKeys. Vol.1030. P.1–180.

Means J.C., Hennen D.A., Tanabe T., Marek P.E. 2021b. Phylogenetic systematics of the millipede family Xystodesmidae // Insect Systematics and Diversity. Vol.5. No.2. Art.e1. https://doi.org/10.1093/isd/ixab003

Mikhaljova E.V. 2021. Review of the millipede genus *Levizonus* Attems, 1898, with description of a new species from the Far East of Russia (Diplopoda, Polydesmida, Xystodesmidae) // European Journal of Taxonomy. Vol.751. P.159–184.

Nguyen D.A. 2016. Discovery of a new millipede species in northern Vietnam, and the proposal of a new genus, *Parariukiaria* (Diplopoda, Polydesmida, Xystodesmidae) // Zootaxa. Vol. 4121. No.3. P.331–336.

Sota T., Tanabe T. 2010. Multiple speciation events in an arthropod with divergent evolution in sexual morphology // Proceedings of the Royal Society, B – Biological Sciences. Vol.277. Issue 1682. P.689–696.

Shelley R.M., Smith J.M. 2018. Expanded concept and revised taxonomy of the milliped family Xystodesmidae Cook, 1895 (Polydesmida: Leptodesmidea: Xystodesmoidea): incorporations of Euryuridae Pocock, 1909 and Eurymerodesmidae Causey, 1951, taxon revivals/proposals/transferrals, and a distributional update // Insecta Mundi. No.0660. P.1–41.

Tanabe T. 1994. The millipede genus *Levizonus* (Polydesmida, Xystodesmidae) in Japan // Japanese Journal of Entomology. Vol.62. No.1. P.101–113.

Tanabe T., Shinohara K. 1996. Revision of the millipede genus *Xystodesmus*, with reference to the status of the tribe Xystodesmini (Diplopoda: Xystodesmidae) // Journal of Natural History. Vol.30. P.1459–1494.

Tanabe T., Ishii K., Yin W.Y. 1996. Two new xystodesmid millipeds from the Tian-mu Mountains, Zhejiang Province, China // Edaphologia. No.57. P.13–19.

Vasquez-Valverde L.F., Marek P.E. 2022. Phylogenetic review of the millipede genus *Cherokia* Chamberlin, 1949 (Polydesmida, Xystodesmidae) // ZooKeys. Vol.1106. P.141–163.

Verhoeff K.W. 1936. Zur Kenntnis ostasiatischer Strongylosomiden und Fontariiden. 149. Diplopoden-Aufsatz // Zoologischer Anzeiger. Bd.115. S.297–311.

Wang D.Q., Zhang C.Z. 1993. Diplopoda: Chilopoda // Huang C.M. (ed.). Animals of Longqi Mountain. The Series of the Bioresources Expedition to the Longqu Mountain Nature Reserve // China Forestry Publishing House, Beijing. Vol.8. P.845–851 [in Chinese, English summary].

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