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Correct Authorships, Synonymies, and Remarks on the Type Series of Fourteen Names of Centipedes Introduced by Yoshioki Takakuwa in 1934 and *Mecistocephalus takakuwai* (Chilopoda: Geophilomorpha and Scolopendromorpha)

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The authorships of 14 species-group names of chilopods introduced by Yoshioki Takakuwa in 1934 are clarified. Four names, viz., *Dicellophilus latifrons* Takakuwa, 1934, *Tygarrup moiwaensis* Takakuwa, 1934, *Prolamnonyx obtusus* Takakuwa, 1934, and *P. dentatus* Takakuwa, 1934 should be attributed to Takakuwa's work published in Japanese in April 1934 in Volume 2, Issue No. 4 of the journal *Shokubutsu oyobi Dobutsu* (=*Botany and Zoology*). The specific names of two other *Mecistocephalus* species, viz., *M. ongi* Takakuwa, 1934 and *M. brevisternalis* Takakuwa, 1934, should be attributed to the Takakuwa's work published in German in April 1934, in Volume 14, Issue No. 3 of the journal *Annotationes Zoologicae Japonenses*. The correct attributions of six more names, viz., *Geophilus monoporus* Takakuwa, 1934, *Nesogeophilus kozuensis* Takakuwa, 1934, *N. tiosianus* Takakuwa, 1934, *N. littoralis* Takakuwa, 1934, *Thalthybius tenuicollis* Takakuwa, 1934, and *Cryptops japonicus* Takakuwa, 1934, is to Takakuwa's work published in Japanese in September 1934, in Volume 46, Issue No. 551 of the journal *Dobutsugaku Zasshi*. In addition to the 14 species-group names, the correct attribution of *Mecistocephalus takakuwai*, which has traditionally been attributed to the work by Karl W. Verhoeff published in November 1934, is clarified. This species was described by Takakuwa in the work published in April 1934, but nonetheless, it is concluded that its correct attribution is to Takakuwa's work published in Japanese in October 1932 in Volume 30, Issue No. 47 of the journal *Hakubutsugaku Zasshi*. Synonymies showing earlier authors' attributions are given for each of these species, and, when possible, the composition of the original type series of each of these species is inferred. In 1955 some of the type material was still said to exist, but by now all of Takakuwa's specimens of these species seem to have been lost.

Key Words: Myriapoda, ICZN, correct authorship, publication date, type series, synonymies, ChiloBase 2.0.

Introduction

Yoshioki Takakuwa (1872–1960), recognized as the first Japanese myriapodologist, published 96 works on the taxonomy and morphology of both centipedes and millipedes (Miyosi 1959). In 1934, Takakuwa published seven taxonomic papers on chilopods, in which 14 new species-group names were introduced (Table 1), while sometimes presenting almost the same content in different works. For example, the same four nominal species were erected in Takakuwa (1934a, b), viz., *Prolamnonyx dentatus* Takakuwa, 1934, *P. obtusus* Takakuwa, 1934, *Dicellophilus latifrons* Takakuwa, 1934, and *Tygarrup moiwaensis* Takakuwa, 1934. Altogether, 12 of these 14 species-group names were introduced twice or even three times by Takakuwa in 1934, leading to confusion concerning the correct attributions of these names. To solve this problem, it was first necessary to elucidate the publication dates of the Takakuwa's seven works published in 1934 (Table 1) and clarify the correct authorships of all the 13 specific names and one subspecific name established in these works.

Takakuwa (1934a) was published in Japanese in Volume 2, Issue No. 4 of the journal *Shokubutsu oyobi Dobutsu* (=*Botany and Zoology*), on 1 April 1934, according to the imprint of the issue. Takakuwa (1934b), published in German, appeared in Volume 14, Issue No. 3 of the journal *Annotationes Zoologicae Japonenses*, with the publication date of 25 April 1934 indicated in the Table of Contents of the issue. Takakuwa (1934c) was published in Japanese in Volume 2, Issue No. 5 of *Shokubutsu oyobi Dobutsu* on 1 May 1934, according to the imprint of the issue. Takakuwa (1934d), also published in Japanese, appeared in Volume 24, Issue No. 132 of *Transactions of the Natural History Society of Formosa*; the imprint of the issue indicates that the work was published on 30 June 1934. Takakuwa (1934e) was published in Japanese in Volume 46, Issue No. 551 of the journal *Dobutsugaku Zasshi*, its publication date of 15 September 1934 being indicated on both the front cover and in the header of the first page of the issue. Takakuwa (1934f) was published in German, in Volume 13, Issue No. 4 of *Transactions of the Sapporo Natural History Society*, with the publication date shown as 20 December 1934 on the inside back

Table 1. Journal, Volume and Issue numbers, pages, and publication dates of Takakuwa's works published in 1934.

Reference	Journal	Volume and Issue No.	Pages	Publication date
Takakuwa (1934a)	Shokubutsu oyobi Dobutsu	2(4)	706–712	1 April
Takakuwa (1934b)	Annotationes Zoologicae Japonenses	14(3)	355–363	25 April
Takakuwa (1934c)	Shokubutsu oyobi Dobutsu	2(5)	878–884	1 May
Takakuwa (1934d)	Transactions of the Natural History Society of Formosa	24(132)	221–225	30 June
Takakuwa (1934e)	Dobutsugaku Zasshi	46(551)	383–390	15 September
Takakuwa (1934f)	Transactions of the Sapporo Natural History Society	13(4)	398–406	20 December
Takakuwa (1934g)	Transactions of the Natural History Society of Formosa	24(135)	494–498	30 December

cover of the issue and also in the footer of the issue's index. Takakuwa (1934g), published in Japanese with the taxonomic description both in Japanese and German, was published in Volume 24, Issue No. 135 of *Transactions of the Natural History Society of Formosa* on 30 December 1934, the date indicated in the imprint of the issue. According to Article 21.2 of the International Code of Zoological Nomenclature (hereinafter, Code; International Commission on Zoological Nomenclature 1999), "The date of publication specified in a work is to be adopted as correct in the absence of evidence to the contrary", and we are unaware of any evidence to the contrary for any of these works.

Nomenclatural History

Seven names introduced in Takakuwa (1934a–d). Takakuwa (1934a) provided an identification key for Japanese species of Mecistocephalidae. In the key, four species names, viz., *Dicellophilus latifrons* Takakuwa, 1934 [currently synonymized with *D. pulcher* (Kishida, 1928)], *Tygarrup moiwaensis* Takakuwa, 1934 (currently *Partygarrupius moiwaensis*), *Prolamnonyx obtusus* Takakuwa, 1934 (currently *Arrup obtusus*), and *P. dentatus* Takakuwa, 1934 (currently *A. dentatus*) appeared in print for the first time without being indicated as new, along with another five previously known species.

Takakuwa (1934b) then provided detailed descriptions of these same four nominal species from Japan, this time explicitly new, along with descriptions of two other explicitly new species from Taiwan and the Marshall Islands, *Mecistocephalus ongi* Takakuwa, 1934 and *M. brevisternalis* Takakuwa, 1934, respectively. Under the same binomina, the first four species, and then the latter two, were again described as "new species" in Takakuwa (1934c) and Takakuwa (1934d), respectively; the latter two were also listed in Takakuwa (1934c) without description. Takakuwa (1934d) also contained a description of a scolopendromorph *Rhysida longipes brevicornis* Takakuwa, 1934, explicitly as a new subspecies.

The authorship of *D. latifrons*, *T. moiwaensis*, *P. obtusus*, and *P. dentasus* has been attributed mainly to Takakuwa (1934b) (e.g., Takakuwa 1938a, 1940a; Verhoeff 1939; Attems 1947; Takashima and Shinohara 1952; Takashima 1955; Crabill 1964; Shinohara 1965, 1972; Titova 1975, 1983; Uliana et al. 2007). The other two names, *M. ongi* and *M. brevisternalis*, have sometimes been attributed to Takakuwa (1934b) (Verhoeff 1937, 1939; Takakuwa 1938a; Chamberlin 1953), but other works have treated Takakuwa (1934d) as the source of their original descriptions (Takakuwa 1939a, 1942; Takashima 1955; Wang and Mauriès 1996; Uliana et al. 2007). The entries for *D. latifrons*, *T. moiwaensis*, *P. obtusus*, and *P. dentasus* in the influential database ChiloBase 2.0 (Bonato et al. 2016a–d) adopt Takakuwa (1934b), not Takakuwa (1934a), as the source of the original descriptions of these species, while the entries for *M. ongi* and *M. brevisternalis* (Bonato et al. 2016e, f) refer to Takakuwa (1934d) instead of Takakuwa (1934b).

The question arises as to whether the inclusion of the first four named species in the key in Takakuwa (1934a) satisfies the conditions of Article 13.1.1 of the Code for availability. We regard the morphological characters featured for each species in the key as a description or definition that purports to differentiate the respective taxon, as required by this Article. Therefore, the four names, viz., *D. latifrons*, *T. moiwaensis*, *P. obtusus*, and *P. dentatus* should be attributed to Takakuwa (1934a) whereas only *M. ongi* and *M. brevisternalis* are to be attributed to Takakuwa (1934b). Meanwhile, the authorship of *R. l. brevicornis* has been correctly attributed to Takakuwa (1934d) in subsequent publications (e.g., Takakuwa 1938a; Takashima 1954; Chao and Chang 2003; Siriwut et al. 2018) as well as Chilobase 2.0 (Bonato et al. 2016g).

Six species introduced in Takakuwa (1934e, f). Takakuwa (1934e) established five geophilomorph species from Japan, viz., *Geophilus monoporus* Takakuwa, 1934, *Nesogeophilus kozuensis* Takakuwa, 1934 (currently *Tuoba kozuensis*), *N. tiosianus* Takakuwa, 1934 (currently *T. tiosiana*), *N. littoralis* Takakuwa, 1934 (currently *T. littoralis*), and *Thalthybius tenuicollis* Takakuwa, 1934 (currently *Ityphilus tenuicollis*), and a scolopendromorph, *Cryptops japonicus* Takakuwa, 1934, from Japan, along with a description of the geophilomorph *G. proximus* C. L. Koch, 1847 obtained from Aomori Prefecture, Japan. In the same year, usually using the same names (for exceptions, see the synonymies below), Takakuwa (1934f) again described these six nominal taxa as "new species".

Authorship of these six specific names has been cited as

both Takakuwa (1934e) (Takakuwa 1939a; Takashima 1954; Bonato et al. 2007) and Takakuwa (1934f) (e.g., Takakuwa 1938a; Takashima 1955; Barber 2009; Lewis 2013). The entries for *N. kozuensis*, *N. tiosianus*, *N. littoralis*, *T. tenuicollis*, and *C. japonicus* in ChiloBase 2.0 (Bonato et al. 2016h–l) adopt Takakuwa (1934f) as the authorship of each name. The entry for *G. monoporus* in ChiloBase is exceptional in citing Takakuwa (1934e) as the original publication of the specific name (Bonato et al. 2016m).

As was mentioned in the Introduction, the six aforementioned species names were each provided with a description that satisfies Article 13.1.1 of the Code at their first appearance in Takakuwa (1934e). We therefore agree with Takashima (1954) and Bonato et al. (2007, 2016m) that the correct attribution of all six names is to Takakuwa (1934e).

A species described by Takakuwa (1934g). The original description of the geophilomorph *Orphnaeus platypedatus* Takakuwa, 1934 from the Marshall Islands (currently *Marshallopus platypedatus*) appeared in Takakuwa (1934g), Takakuwa's last publication in 1934, along with a description of specimens of *Orphnaeus brevilabiatus* (Newport, 1845) from Taiwan. The authorship of *O. platypedatus* has always been correctly attributed to Takakuwa (1934g) in subsequent literature (Takakuwa 1938a, 1939a, 1940a) as well as Chilobase 2.0 (Bonato et al. 2016n).

Authorship of *Mecistocephalus takakuwai*. Takakuwa (1932) gave detailed account on external anatomy of "*Mecistocephalus takakuwai* Verhoeff", indicating that the taxon was named by Karl W. Verhoeff but "yet to be published" at that time. This work appeared in Volume 30, Issue No. 47 of the journal *Hakubutsugaku Zasshi*; the imprint of the issue shows the publication date as 25 October 1932. Takakuwa (1934a) again introduced the same taxon as "*Mecistocephalus takakuwai* Verhoeff (n. sp)". The authorship of this nominal species has been traditionally attributed to Verhoeff (1934), published in Volume 66, Issue No. 1 of the journal *Zoologische Jahrbücher* (e.g., Takakuwa 1938a; Attems 1947; Chamberlin and Wang 1952; Takashima and Shinohara 1952; Murakami 1975; Moritz and Fischer 1979; Bonato et al. 2016o). This work was published on 16 November 1934, according to the table of contents of the volume.

Takakuwa (1932) was published as the eighth part of "Miscellaneous Notes on Centipedes", which is a series of publications focused on internal and external anatomy of Scutigeromorpha, Lithobiomorpha, Scolopendromorpha, and Geophilomorpha. The introduction of this work implies that he intended to provide morphological features of "*takakuwai*" as an example of geophilomorph centipede, not to establish "*takakuwai*" as a new taxon. However, his detailed description that can differentiate *M. takakuwai* from other *Mecistocephalus* species satisfied Article 13.1.1 of the Code for availability of the name. Therefore, we reach the conclusion that Takakuwa alone was responsible for the act and satisfying the criteria of availability in the work published in 1932, and the authorship of *M. takakuwai* should be attributed to Takakuwa (1932).

Table 2. Correct attribution of each species-group name described by Takakuwa in 1934 and *Mecistocephalus takakuwai*.

Species-group name	Correct Authorship
Ityphilus tenuicollis	Takakuwa (1934e)
Geophilus monoporus	Takakuwa (1934e)
Tuoba kozuensis	Takakuwa (1934e)
Tuoba littoralis	Takakuwa (1934e)
Tuoba tiosiana	Takakuwa (1934e)
Arrup dentatus	Takakuwa (1934a)
Arrup obtusus	Takakuwa (1934a)
Dicellophilus latifrons	Takakuwa (1934a)
Mecistocephalus brevisternalis	Takakuwa (1934b)
Mecistocephalus ongi	Takakuwa (1934b)
Mecistocephalus takakuwai	Takakuwa (1932)
Partygarrupius moiwaensis	Takakuwa (1934a)
Marshallopus platypedatus	Takakuwa (1934g)
Cryptops japonicus	Takakuwa (1934e)
Rhysida longipes brevicornis	Takakuwa (1934d)

Nomenclatural Conclusions

Part of Takakuwa's myriapod collection was once kept by the late Dr. Yasunori Miyosi (Takashima 1954, 1955), but these specimens are believed to have been lost (see Chao and Chang 2008). We had the opportunity to examine a small number of specimens (hereinafter referred to as the 'Miyosi Collection') and a large collection of reprints that were salvaged from among Miyosi's personal effects in the 1990s. The 14 species-group names established by Takakuwa (1934a), Takakuwa (1934b), Takakuwa (1934d), Takakuwa (1934e), and Takakuwa (1934g), and additionally, *M. takakuwai* are listed below under their correct authorship (see Table 2), with their Japanese names following Murakami (1993) and Shinohara et al. (2015), or Takakuwa (1940a, b).

Contrary to the usual format for synonymies, within a genus, works citing the name of a nominal species in its original contribution and explicitly attributing its authorship to the same work by Takakuwa are listed together, followed by all those assigning the species to the same genus but with no author attribution, with variant spellings noted in annotations to both kinds of entry. Further listings in different generic combinations follow the usual format for synonymies, with annotations concerning authorship attribution. A few nomenclatural remarks—also regarding the Japanese name—are also provided for each species, including any relevant results of our investigation of the Miyosi Collection.

Order **Geophilomorpha** Pocock, 1896
Family **Ballophilidae** Cook, 1896
Genus ***Ityphilus*** Cook, 1899
Ityphilus tenuicollis (Takakuwa, 1934e)
[Japanese name: Sakibutojimukade]

Talthybius [sic] *tenuicollis* Takakuwa, 1934e: 388–389, figs 11–13 (available name); Murakami 1975: 158.

Thalthybius tenuicolis [sic] Takakuwa, 1934f: 398–399, figs 1, 2 (invalidly described as new).
Thalthybius tenuicollis (without attribution): Takakuwa 1940a: 43–44, figs 41–44 (as *Thalthybius tenuicolis*); Takakuwa in Kishida and Takakuwa 1949: 934, fig. 2671 (as *Thalthybius tenuicolis*); Miyosi and Takakuwa 1971: 735 (as *Thaltybius tenuicolis*).
Ityphilus tenuicollis: Bonato et al. 2007: 6 [authorship attributed to Takakuwa (1934e)]; Shinohara et al. 2015: 894, fig. 3 (without attribution).

Type series. Four localities are listed in both Takakuwa (1934e) and Takakuwa (1934f). Because Takakuwa (1934e) did not designate a holotype, this implies that the original material consisted of syntypes from all four sites. While Takashima (1955) wrote that a "holotype" was preserved by Miyosi, no such specimen was found in the Miyosi Collection by the authors, and the entire type series seems to have been lost. Under Article 74.5 of the Code, Takashima's use of the term "holotype" does not constitute a valid lectotype designation because he did not explicitly state that he was selecting a particular specimen to serve as the name-bearing type.

Type locality. According to Takakuwa (1934e, f), this species was collected from Tokyo in eastern Honshu, Hiroshima in western Honshu, and Kagoshima and Shibushi in Kyushu. Under Articles 73.2.3 and 76.1 of the Code, the type locality encompasses all four places, although Takashima (1955) invalidly attempted to restrict the type locality to Hiroshima; we could not confirm whether this was the site of collection of the above-mentioned supposed "holotype".

Japanese name. The name "Sakibutojimukade" was introduced by Takakuwa (1934e).

Remarks. The authorship of *tenuicollis* in ChiloBase 2.0 (Bonato et al. 2016k) should be emended from Takakuwa (1934f) to Takakuwa (1934e).

The specific name was spelled as *tenuicollis* in the original description (Takakuwa 1934e) and Takakuwa (1939b), but an alternative spelling *tenuicolis* (single "l") was used in Takakuwa (1934f) and most of his subsequent publications (Takakuwa 1938a, 1939a, 1940a, 1943; Takakwua in Kishida and Takakuwa 1949; Miyosi and Takakuwa 1971), as well as in works by other authors (Takashima 1955; Takano 1980). One might argue that *tenuicolis* is to be deemed the correct original spelling by prevailing usage under Article 33.3.1 of the Code. However, only Takakuwa (1939a) explicitly attributed *tenuicolis* to Takakuwa (1934e), the work in which *tenuicollis* was established, while Takakuwa (1938a) attributed *tenuicolis* to Takakuwa (1934f) and the rest made no attribution. Therefore, Article 33.3.1 can be applied only with difficulty, and we agree with Murakami (1975) that *tenuicolis* is to be regarded as an incorrect subsequent spelling of *tenuicollis*.

Family **Geophilidae** Leach, 1816
Genus ***Geophilus*** Leach, 1814
Geophilus monoporus Takakuwa, 1934e
[Japanese name: Hitoana-tsuchimukade]

Geophilus monoporus Takakuwa, 1934e: 384–385, figs 3, 4 (available name).
Geophilus monoporus Takakuwa, 1934f: 403–404, figs 9–11 (invalidly described as new).
Geophilus monoporus (without attribution): Takakuwa 1940a: 103, fig. 109; Bonato et al. 2006: 419.
Mesogeophilus monoporus: Attems 1947: 124 (also as *Geophilus monoporus* on p. 116) [Takakuwa (1934f) cited as original description]; Shinohara et al. 2015: 894, 907, fig. 10 (894) (no attribution).

Type series. No types were designated in the original description (Takakuwa 1934e), and the composition of the original material was not indicated. According to Takashima (1954, 1955), the type specimen(s) of this species might have been lost during World War II.

Type locality. Choshi, Chiba Prefecture [as Tyosi (Tiba) in Takakuwa (1934f)], Honshu, Japan.

Japanese name. Takakuwa introduced a Japanese name, "Hitoana-tsuchimukade", for *G. monoporus* (Takakuwa 1934e, 1937, 1938b, 1939a, 1940a). After Attems (1947) moved the species to *Mesogeophilus*, "Hoso-tsuchimukade" has been used as the Japanese name for this species as well as the genus (Murakami 1993; Shinohara et al. 2015). Because Bonato et al. (2006) have again classified it under *Geophilus*, we propose the resurrection of "Hitoana-tsuchimukade" as the most appropriate Japanese name for *G. monoporus*.

Remarks. In ChiloBase 2.0 (Bonato et al. 2016m) the authorship of this species is correctly cited as Takakuwa (1934e). Takakuwa (1938a) cited Takakuwa (1934f), stating "Trans. Nat. His. Soc. Sapporo, Vol. 8, pt. 4, 1934", but Takakuwa (1934f) was actually published in Volume 13, Issue No. 4 of *Transactions of the Sapporo Natural History Society*.

Genus ***Tuoba*** Chamberlin, 1920a
Tuoba kozuensis (Takakuwa, 1934e)
[Japanese name: Shimajimukade]

Nesogeophilus kozuensis Takakuwa, 1934e: 385–386, figs 5–7 (available name).
Nesogeophilus kozuensis Takakuwa, 1934f: 400–402, fig. 5 (invalidly described as new).
Nesogeophilus kozuensis (without attribution): Takakuwa 1940a: 107–108, figs 112–114.

Type series. No types were designated in the original description (Takakuwa 1934e), although Takakuwa (1934e, f) indicate that the descriptions were based on multiple specimens, including at least one male and one female. Takashima (1955) reported that 13 syntypes were preserved by Miyosi, but we found none of the 13 syntypes in the Miyosi

Collection and assume they have been lost.

Type locality. Kozu, Odawara City, Kanagawa Prefecture, Honshu, Japan.

Japanese name. The name "Shimajimukade" was introduced by Takakuwa (1934e).

Remarks. Although the entry for this species in ChiloBase 2.0 (Bonato et al. 2016h) refers to both of Takakuwa (1934e) and Takakuwa (1934f) as the original publications for this species, the authorship of *kozuensis* is attributed to Takakuwa (1934f). This should be corrected to Takakuwa (1934e) in accordance with the actual precedence of the two works.

Tuoba littoralis (Takakuwa, 1934e)
[Japanese name: Iso-shimajimukade]

Nesogeophilus littoralis Takakuwa, 1934e: 387–388, figs 9, 10 (available name).
Nesogeophilus littoralis Takakuwa, 1934f: 402–403, figs 6–8 (invalidly described as new).
Nesogeophilus littoralis (without attribution): Takakuwa 1940a: 109–110, figs 116, 117; Shinohara 1961: 76, 79, 80, pl. 8, fig. 7; Shinohara et al. 2015: 895, 907, fig. 3 (895).

Type series. Takakuwa (1934e) did not designate the types, although Takakuwa (1934e, f) imply that the original material included at least one male and one female. Takashima (1955) stated that 20 syntypes existed, but nonetheless no such specimens were found in the Miyosi Collection, and therefore, they may have been lost.

Type locality. Manazuru Town, Kanagawa Prefecture, Honshu, Japan.

Japanese name. The name"Iso-shimajimukade" was introduced by Takakuwa (1934e).

Remarks. The entry for this species in ChiloBase 2.0 (Bonato et al. 2016j) cites both Takakuwa (1934e) and Takakuwa (1934f) as the original publications for this species, but the authorship of *littoralis* is attributed to Takakuwa (1934f). This should be corrected to Takakuwa (1934e) in accordance with the actual precedence of the two works.

Tuoba tiosiana (Takakuwa, 1934e)
[Japanese name: Choshi-shimajimukade]

Nesogeophilus tiosianus Takakuwa, 1934e: 386–387, fig. 8 (available name); Takakuwa 1942: 19.
Nesogeophilus tiosianus Takakuwa, 1934f: 399–400 (invalidly described as new).
Nesogeophilus tiosiensis [sic]: Takakuwa 1934f: 400, figs 3, 4 (incorrect subsequent spelling).
Nesogeophilus tiosianus (without attribution): Takakuwa 1940a: 108–109, fig. 115.

Type series. No types were designated in the original description (Takakuwa 1934e), although Takakuwa (1934e, f) imply that he examined at least one male and one female. While examining the Miyosi collection we found none of the four syntypes reported by Takashima (1955) and assume they have been lost.

Type locality. Choshi, Chiba Prefecture [as Tyosi (Tiba) in Takakuwa (1934f)], Honshu, Japan.

Japanese name. The name "Choshi-shimajimukade" was introduced by Takakuwa (1934e).

Remarks. Chamberlin (1920a) did not explicitly state the etymology of the generic name, and moreover, he included its type species *T. curticeps* Chamberlin, 1920 only within the genus. According to Article 30.2.4 of the Code, therefore, the gender of the generic name *Tuoba* is feminine (see Jones 1998). The ending of the adjectival specific name thus must be changed accordingly from masculine *-us* to feminine *-a*, yielding the combination *Tuoba tiosiana* (a mandatory change under Article 34.2 of the Code).

The entry for this species in ChiloBase 2.0 (Bonato et al. 2016i) refers to both Takakuwa (1934e) and Takakuwa (1934f) as the original publications for this species, but the authorship of *tiosianus* is attributed there to Takakuwa (1934f). This should be corrected to Takakuwa (1934e) in accordance with the actual precedence of the two works.

Takakuwa (1938a) erroneously cited Takakuwa (1934f) as "Trans. Nat. His. Soc. Sapporo, Vol. 18, pt. 4, 1934" (see Remarks for *G. monoporus*).

Family **Mecistocephalidae** Bollmann, 1893
Genus ***Arrup*** Chamberlin, 1912
Arrup dentatus (Takakuwa, 1934a)
[Japanese name: Shimizu-tsumejimukade]

Prolamnonyx dentatus Takakuwa, 1934a: 707 (key; available name).
Prolamnonyx dentatus Takakuwa, 1934b: 359–360, figs 7, 8 (invalidly described as new); Attems 1947: 105 (key); Titova 1975: 45, 47, fig. 4B (key).
Prolamnonyx dentatus Takakuwa, 1934c: 883–884, figs 27–33 (invalidly described as new).
Prolamnonyx dentatus (without attribution): Takakuwa 1940a: 94–96, figs 98–100.
Arrup dentatus: Crabill 1964: 166 (list) [Takakuwa (1934b) cited as original description]; Foddai et al. 2003: 1261, table 1 [without attribution]; Bonato et al. 2003: table 1, figs 10, 12 [Takakuwa (1934c) cited as original description]; Uliana et al. 2007: 13–15, figs 10–13 [authorship attributed to Takakuwa (1934b)]; Shinohara et al. 2015: 908 (list; without attribution).

Type series. No types were designated in Takakuwa (1934a–c), although Takakuwa (1934b, c) imply that the descriptions were based on multiple specimens. Takashima (1955) reported that 11 syntypes were preserved by Miyosi, but we found none of the syntypes in the Miyosi Collection and assume they have been lost.

Type locality. Takakuwa (1934a) did not state the type locality. Jozankei [as "Zyôzankei (bei Sapporo)" in Takakuwa (1934b)], Sapporo, Hokkaido, was mentioned as the locality of this species in Takakuwa (1934b, c).

Japanese name. Takakuwa (1934c) introduced a Japanese name for this species, "Shimizu-nagazujimukade",

which he later shortened to "Shimizu-jimukade" (Takakuwa 1938b, 1939a), with one more change (Takakuwa 1940a) to "Shimizume-jimukade". This last name is obviously an error of "Shimizu-tsumejimukade", as used by Murakami (1993) and Shinohara et al. (2015); we adopt this final spelling as current.

Remarks. The authorship of this species is cited as Takakuwa (1934b) in ChiloBase 2.0 (Bonato et al. 2016d) but should be corrected to Takakuwa (1934a).

Arrup obtusus (Takakuwa, 1934a)
[Japanese name: Nibuzume-jimukade]

Prolamnouyx [sic] *obutusus* [sic] Takakuwa, 1934a: 707 (key; incorrect original spelling of *obtusus*; an available name).

Prolamnonyx obtusus Takakuwa, 1934b: 358–359, fig. 6 (invalidly described as new); Attems 1947: 105 (key); Takashima and Shinohara 1952: 9.

Prolamnonyx obtusus Takakuwa, 1934c: 882, figs 23–26 (invalidly described as new).

Prolamnonyx obtusus (without attribution): Takakuwa 1940a: 93–94, fig. 97 (also cited as *P. obstusus* on p. 91).

Arrup obtusus: Crabill 1964: 166 (list) [Takakuwa (1934b) cited as original description]; Foddai et al. 2003: 1261, table 1 (no attribution); Uliana et al. 2007: 15–16 [authorship attributed to Takakuwa (1934b)].

Type series. No types were designated in Takakuwa (1934a–c), and these works have no implication of the composition of the original material. Takashima (1955) stated that a holotype was preserved by Miyosi, but we found no such specimen in the Miyosi Collection and assume it has been lost.

Type locality. Takakuwa (1934a) did not mention the type locality, while Takakuwa (1934b) stated that the locality of this species was "Tokyo", and Takakuwa (1934c) mentioned Kojimachi (currently in Chiyoda District, Tokyo) as the locality.

Japanese name. The Japanese name that was first introduced by Takakuwa (1934c) was "Nibuzume-nagazujimukade", but the shorter name "Nibuzume-jimukade" has been used in subsequent publications (Takakuwa 1938b, 1939a, 1940a; Murakami 1993) and is adopted here.

Remarks. The authorship of this species in ChiloBase 2.0 (Bonato et al. 2016c), currently given as Takakuwa (1934b), should be corrected to Takakuwa (1934a).

This species first appeared in Takakuwa (1934a) as *Prolamnouyx* [sic] *obutusus* [sic]. The generic name is obviously a misspelling of *Prolamnonyx* Silvestri, 1919. The species epithet is presumably based on the thick, short and blunt pretarsus of the locomotory legs, a feature used in Takakuwa's (1934a) key as "*各歩肢の爪は太短く鈍く頭*" [possibly a misprint for "*鈍頭*", as described in Takakuwa (1934c)]. However, the Latin adjective corresponding to "obtuse" is *obtusus*, the name used in Takakuwa's (1934b, c) two subsequent descriptions of the same taxon. Although these later usages are not admissible in judging whether "*obutusus*" is a *lapsus calami*, we deem it obviously to be one, therefore to be corrected as "*obtusus*", in accordance with Article 32.5.1 of the Code.

Genus ***Dicellophilus*** Cook, 1896
Dicellophilus latifrons Takakuwa, 1934a
[Japanese name: Hirozu-jimukade]

Mecistocephalus pulcher Kishida, 1928: 300–303 (as *Mecistocephalus pulcher* Kishida, 1925 [sic]) (senior subjective synonym).

Dicellophilus latifrons Takakuwa, 1934a: 707 (key; available name).

Dicellophilus latifrons Takakuwa, 1934b: 355–356, figs 1–3 (invalidly described as new); Takakuwa 1940a: 82–83, figs 84, 85; Attems 1947: 103 (key); Takashima and Shinohara 1952: 8, 14 (key).

Dicellophilus latifrons Takakuwa, 1934c: 878–879, figs 13–15 (invalidly described as new); Bonato et al. 2003: 550, 551, 575, fig. 13.

Dicellophilus latifrons (without attribution): Takakuwa in Kishida and Takakuwa 1949: 936, fig. 2675; Miyosi and Takakuwa 1971: 737.

Dicellophilus pulcher: Uliana et al. 2007: 27–30, figs 32–35 [Kishida (1928) cited as original description, with authorship of *latifrons* attributed to Takakuwa (1934b)]; Bonato et al. 2010: 524, 525, figs 5–9, tables 1, 3 [Kishida (1928) cited as original description, with authorship of *latifrons* attributed to Takakuwa (1934b)]; Shinohara et al. 2015: 895, 909, fig. 9 (895) (no attribution).

Type series. No types were designated in Takakuwa (1934a–c), but since seven localities are listed by Takakuwa (1934b, c), there must have been originally at least seven syntypes. None of the five syntypes reported by Takashima (1955) could be found in the Miyosi Collection by the authors, and thus may have been lost.

Type locality. No localities were stated in the original description (Takakuwa 1934a). Takakuwa (1934b) listed following sites as the localities of this species: "Kaibara (Hyogo)" (currently in Tamba City, Hyogo Prefecture), "Masudo (bei Tokyo)" (possibly misread of Masuko Village, currently in Akiruno City, Tokyo), "Komono (Miye)" (= Komono Town, Mie Prefecture), "Ikao (Gumma)" (= Ikao Township Shibukawa City, Gunma Prefecture), "Ōta (Gumma)" (=Ota City, Gunma Prefecture), "Odawara (Kanagawa)", and "Suwa (Nagano)".

Japanese name. Takakuwa (1934c) introduced the Japanese name "Hironagazu-jimukade" for *D. latifrons*, subsequently cited as "Hirozu-jimukade" (Takakuwa 1938b, 1939a, 1940a; Murakami 1993). Shinohara et al. (2015) gave "Hirozu-jimukade" as the Japanese name for *D. pulcher* (see below).

Remarks. In ChiloBase 2.0 (Bonato et al. 2016a), the authorship of the nominal species *D. latifrons*, now incorrectly cited as Takakuwa (1934b), should be corrected to Takakuwa (1934a). Uliana et al. (2007) synonymized this species with *D. pulcher*, which had originally been described

as "*Mecistocephalus pulcher* Kishida, 1925, n. sp.", with the Japanese name "Oyama-jimukade". Uliana et al. (2007) suggested that 1925 may refer to the year when the holotype was collected.

Genus ***Mecistocephalus*** Newport, 1842
Mecistocephalus brevisternalis Takakuwa, 1934b
[Japanese name: Itaya-nagazujimukade]

Mecistocephalus brevisternalis Takakuwa, 1934b: 362–363, fig. 11 (available name); Verhoeff 1937: 235; Verhoeff 1939: 86.
Mecistocephalus brevisternalis Takakuwa, 1934c: 884 (list).
Mecistocephalus brevisternalis Takakuwa, 1934d: 223–224, figs 2, 3 (invalidly described as new); Takakuwa 1942: 17; Uliana et al. 2007: 41–42, fig. 52.
Mecistocephalus brevisternalis (without attribution): Attems 1938: 365 (list); Takakuwa 1940a: 68–69, fig. 64; Attems 1947: 101 (list).

Type series. No types were designated in Takakuwa (1934b–d), and these works have no implication of the composition of the original material. Takashima (1955) reported the existence of two syntypes preserved by Miyosi, but no such specimens were found in the Miyosi Collection by the authors, and thus they seem to have been lost.

Type locality. Marschialinseln (=Marshall Islands) (Takakuwa 1934b). Takakuwa (1939a, 1940a, 1942) subsequently mentioned Jaluit Atoll (in Marshall Islands) as the locality of this species.

Japanese name. The name "Itaya-nagazujimukade" was introduced by Takakuwa (1934b).

Remarks. The authorship of this species in ChiloBase 2.0 (Bonato et al. 2016f), currently given as Takakuwa (1934d), should be corrected to Takakuwa (1934b).

Takakuwa (1934d) was erroneously cited as "Takakuwa (1932)" in Verhoeff (1939) and Takakuwa (1940a). This may be explained by a reprint of Takakuwa (1934d) preserved in Miyosi's personal collection of myriapod publications: the front cover of the reprint indicates that this work was published in "June, 1932", apparently a misprint for "June, 1934".

Mecistocephalus ongi Takakuwa, 1934b
[Japanese name: On-nagazujimukade]

Mecistocephalus ongi Takakuwa, 1934b: 360–362, figs 9, 10 (available name); Verhoeff 1939: 86.
Mecistocephalus ongi Takakuwa, 1934c: 884 (list).
Mecistocephalus ongi Takakuwa, 1934d: 221–222, fig. 1 (invalidly described as new); Takakuwa 1942: 17; Uliana et al. 2007: 44–45, fig. 53.
Mecistocephalus ongi (without attribution): Takakuwa 1940a: 69–70, fig. 65; Attems 1947: 100, 101 (key); Shinohara et al. 2015: 908 (key).

Type series. No types were designated in Takakuwa (1934b–d), although Takakuwa (1934b, d) imply that the descriptions were based on multiple specimens. None of the two syntypes reported by Takashima (1955) could be found in the Miyosi Collection by the authors, and thus they may have been lost.

Type locality. Tainan City, Taiwan.

Japanese name. The name "On-nagazujimukade" was introduced by Takakuwa (1934b).

Remarks. The authorship of this species in ChiloBase 2.0 (Bonato et al. 2016e), currently given as Takakuwa (1934d), should be corrected to Takakuwa (1934b).

This species was cited as "*M. ongi* Takakuwa, 1932" in Murakami (1993). As was noted in connection with *M. brevisternalis* above, a misdated reprint may explain why Takakuwa (1940a) erroneously cited Takakuwa (1934d) as "Takakuwa (1932)" and the reason for the error in Murakami (1993).

Mecistocephalus takakuwai Takakuwa, 1932
[Japanese name: Taka-nagazujimukade]

Lamnonyx diversisternus Silvestri, 1919: 81, fig. 23 (senior subjective synonym).
Mecistocephalus diversisternus: Chamberlin 1920b: 185 (list); Uliana et al. 2007: 56–59; Shinohara et al. 2015: 908 (key), fig. 5.
Mecistocephalus takakuwai: Takakuwa 1932: 37–45 (available name; attributed to Verhoeff).
Mecistocephalus takakuwai Takakuwa, 1934a: 710–711, figs 1, 2, 8–10 (attributed to Verhoeff).
Mecistocephalus takakuwai: Takakuwa 1934b: 363 (list; attributed to Verhoeff); Takakuwa 1934c: 884 (ditto).
Mecistocephalus takakuwai Verhoeff, 1934: 36–38, figs 58–60 (invalidly described as new); Takakuwa 1940a: 62–63, figs 1–11, 56; Attems 1947: 102 (key); Takashima and Shinohara 1952: 7, fig. 1C; Murakami 1975: 157–158.
Mecistocephalus takakuwai (without attribution): Takakuwa in Kishida and Takakuwa 1949: 935, fig. 2673; Miyosi and Takakuwa 1971: 736.

Type series. No types were designated in Takakuwa (1932), and this work has no implication of the composition of the original material. Takakuwa (1934a) did neither designate types nor indicate the composition of the material. According to Moritz and Fischer (1979), two specimens traditionally treated as "syntypes", examined by Verhoeff (1934), are preserved at the Museum of Natural History, Berlin.

Type locality. Although Takakuwa (1932) did not refer the type locality, he stated that this species was common in Tokyo and adjacent areas, and also found in "Akita, Hyogo, Ehime and so forth". Takakuwa (1934a) listed "Tokyo and adjacent area", "Akita City" (in Akita Prefecture), "Sanda, Hyogo Prefecture", "Imabari City" (in Ehime Prefecture), "Izu-oshima Island", "Hiroshima City" (in Hiroshima Prefecture), "Toshita (possibly in Aso District), Kumamoto Prefecture", "Oita City" (in Oita Prefecture) as the localities. Verhoeff's (1934) description was based on 10 specimens from "Umgebung von Tokyo" (=vicinity of Tokyo).

Japanese name. The first appearance of a Japanese

name was in Takakuwa (1932), as "Takakuwa-jimukade", modified to "Takakuwa-nagazujimukade" in Takakuwa (1934a) while also appearing as "Takakuwa-jimukade" in the captions of the latter work's figs 1, 2, and 8–10. Takakuwa (1938b) shortened the new spelling to "Taka-nagazujimukade", which is the form used in subsequent publications (e.g., Takakuwa 1939a, b, 1940a; Murakami 1993) and by us.

Remarks. ChiloBase 2.0 (Bonato et al. 2016o) cites Verhoeff (1934) as the author of the specific name *takauwai*; this should be corrected to Takakuwa (1932). Uliana et al. (2007) synonymized this species with *M. diversisternus* (Silvestri, 1919).

Genus ***Partygarrupius*** Verhoeff, 1939
Partygarrupius moiwaensis (Takakuwa, 1934a)
[Japanese name: Moiwajimukade]

Tygarrup moiwaensis Takakuwa, 1934a: 707 (key; available name).
Tygarrup moiwaensis Takakuwa, 1934b: 357–358, figs 4, 5 (invalidly described as new).
Tygarrup moiwaensis Takakuwa, 1934c: 879–880, figs 16–19 (invalidly described as new).
Tygarrup moiwaensis (without attribution): Takakuwa 1940a: 84–86, figs 86, 87.
Tygarrup (*Partygarrupius*) *moiwaensis*: Verhoeff 1939: 87 (key) [Takakuwa (1934b) cited as original description]; Attems 1947: 105 (list) (ditto).
Partygarrupius moiwaensis: Foddai et al. 2003: 1253–1254, table 1 [without attribution]; Uliana et al. 2007: 62–63, figs 71–72 [authorship attributed to Takakuwa (1934b)]; Shinohara et al. 2015: 895, 908, fig. 8 (895) (without attribution).

Type series. No types were designated in Takakuwa (1934a–c), although Takakuwa (1934b, c) indicate that the descriptions were based on multiple specimens. While examining the Miyosi collection we found neither of the two syntypes reported by Takashima (1955) and assume they have been lost.

Type locality. Takakuwa (1934a) did not refer the type locality. Mt. Moiwayama, Sapporo, Hokkaido, was mentioned as the locality of this species in Takakuwa's subsequent publications (Takakuwa 1934b, c).

Japanese name. A Japanese name for this species first appeared in Takakuwa (1934c), as "Moiwa-nagazujimukade", subsequently shortened to the form adopted here, "Moiwajimukade" (Takakuwa 1938b, 1939a, 1940a; Murakami 1993).

Remarks. In ChiloBase 2.0 (Bonato et al. 2016b), the authorship of this species is attributed to Takakuwa (1934b) but should be corrected to Takakuwa (1934a).

Family **Oryidae** Cook, 1896
Genus ***Marshallopus*** Verhoeff, 1937
Marshallopus platypedatus (Takakuwa, 1934g)
[Japanese name: Sajiashi-jimukade]

Orphaneus [sic] *platypedatus* Takakuwa, 1934g: 495–498, figs 1–5 (available name).
Marshallopus platypedatus: Verhoeff 1937: 227; Takakuwa 1940a: 49–50, figs 47–49; Takakuwa 1942: 16, 17.

Type series. Takakuwa (1934g) did not designate any types, but stated that the description was based on a single specimen. According to Takashima (1954, 1955), the holotype of this species may have been lost during World War II.

Type locality. Marschialinseln (= Marshall Islands). Takakuwa (1940a, 1942) subsequently mentioned Jaluit Atoll (in Marshall Islands) as the locality of this species.

Japanese name. A Japanese name first appeared in Takakuwa (1934g), as "Madara-hiratahige-jimukade", subsequently modified to "Heraashi-jimukade" (Takakuwa 1938b, 1939a). Takakuwa further modified the Japanese name as "Sajiashi-jimukade" in Takakuwa (1940), the name used by Murakami (1993) and adopted here.

Remarks. In ChiloBase 2.0 (Bonato et al. 2016n), the authorship of this species is correctly cited as Takakuwa (1934g).

Order **Scolopendromorpha** Pocock, 1895
Family **Cryptopidae** Kohlrausch, 1881
Genus ***Cryptops*** Leach, 1814
Cryptops japonicus Takakuwa, 1934e
[Japanese name: Nihon-menashimukade]

Cryptops japonicus Takakuwa, 1934e: 389–390, fig. 14 (available name).
Crytops [sic] *japonicus* Takakuwa, 1934f: 404–405 (invalidly described as new; also as *Cryptops japonicus* on p. 405, figs 12, 13); Takakuwa 1936: 236–237; Song et al. 2010: 378, table 1; Lewis 2013: 15, figs 37, 38.
Cryptops japonicus (without attribution): Takakuwa 1940b: 63–65, figs 66–68; Takakuwa in Kishida and Takakuwa 1949: 940, fig. 2689; Miyosi and Takakuwa 1971: 733; Chao and Chang 2003: 4, fig. 16, table 1; Chao and Chang 2008: 14, fig. 9E, F; Shinohara et al. 2015: 879, 893, 905, fig. 5 (893).

Type series. Takakuwa (1934e) did not designate any types, but did state that the description was based on five specimens, which consisted of a male and four females, while Takashima (1954) stated four syntypes were preserved by Miyosi. We could not find any of the syntypes in the Miyosi Collection and assume they have been lost.

Type locality. Kokura (now in Kitakyushu City, Fukuoka Prefecture), Kyushu, Japan.

Japanese name. The name "Nihon-menashimukade" introduced by Takakuwa (1934e) for this species.

Remarks. In ChiloBase 2.0 (Bonato et al. 2016l), the authorship of *japonicus* is cited as Takakuwa (1934f) but

should be corrected to Takakuwa (1934e).

Family **Scolopendridae** Leach, 1814
Genus ***Rhysida*** Wood, 1862
Rhysida longipes brevicornis Takakuwa, 1934d
[Japanese name: On-rishidamukade]

Branchiostoma longipes Newport, 1845: 411 (senior subjective synonym).
Rhysida longipes brevicornis Takakuwa, 1934d: 224–225, fig. 5 (available name).
Rhysida longipes brevicornis (without attribution): Takakuwa 1940b: 53–55, figs 56–58; Shinohara et al. 2015: 877, 904.
Rhysida longipes longipes: Chao and Chang 2003: 4 (list), 8, table 1 (list), figs 10–11; Chao and Chang 2008: 1, 6, 10, 11, 15, table 3, figs 7, 8.
Rhysida longipes: Siriwut et al. 2018: 1013 (key), 1017–1022, figs 5, 7, 8; Joshi et al. 2020: 840–843, table 1 (list), figs 8, 9.

Type series. No types were designated, and the composition of the specimens was not explicitly stated in the original description (Takakuwa 1934d). Takashima (1954) reported that a holotype was preserved, but we could not find the holotype in the Miyosi Collection and thus assume it has been lost.

Type locality. Tainan, Taiwan.

Japanese name. The name "On-rishidamukade" was introduced by Takakuwa (1934d).

Remarks. In ChiloBase 2.0 (Bonato et al. 2016g), the authorship of *brevicornis* is correctly cited as Takakuwa (1934d), but nonetheless, this subspecies was synonymized with *R. l. longipes* (Newport, 1845) by Chao and Chan (2003).

Takakuwa (1938a) erroneously cited Takakuwa (1934d) as "Trans. Nat. His. Soc. Formosa, Vol. 24, No. 132, 1932", and Murakami (1993) listed *brevicornis* as "*Rhysida longipes brevicornis* Takakuwa, 1932". As was noted in connection with *M. brevisternalis* and *M. ongi*, a misdated reprint of Takakuwa (1934d) may explain the cause of these errors.

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