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Sclerodermus* versus *Scleroderma* (Hymenoptera: Bethyilidae)**Sclerodermus* vs. *Scleroderma* (Hymenoptera: Bethyilidae)**

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Bethyilidae comprise 96 valid genera (Azevedo *et al.*, 2018). One of these genera has been written with two different spellings, *Sclerodermus* and *Scleroderma*. The former is ambiguously attributed to Latreille (1809) or Klug (1809) and the latter to Westwood (1839). Since the description of the genus, several authors have referred to it as *Scleroderma* (e.g., Berland, 1928; Maneval, 1932; García del Cid, 1941; Bernard & Jacquemin, 1948; Lahourcade, 1963; Evans, 1964; Dauphin & Castro, 1991; Jeremias *et al.*, 2005; Lembo *et al.*, 2008; Fuentes *et al.*, 2009, and see below), while others have referred to it as *Sclerodermus* (e.g., Gordh & Móczár, 1990; Pérez-Irezábal, 2003; Papini, 2014; Jirón *et al.*, 2016; Karimi *et al.*, 2017; Skvarla, 2018; Verdugo & Tussac, 2001; Azevedo *et al.*, 2018; Rond, 2019, and see below). However, this ambiguous usage is wrong and one spelling must be rejected.

The main goal of this contribution is to check if both names are available and, if so, which one has priority under the scope of the International Code of Zoological Nomenclature (ICZN, 1999).

The history begins with Volume 4 of Latreille's (1809: 118) «Genera Crustaceorum et Insectorum...», in which he considered that specimens (named by Klug as «*Sclerodermus*») belonged to the genus *Methoca* Latreille, 1805 (correctly *Methocha* Latreille, 1804, according to Agnoli (2005)). The name *Sclerodermus* was undoubtedly given by Klug, which Latreille (1809) mentioned («*Sclerodermus* Klug»), but Latreille did not describe it as such since he considered it to be a junior synonym of *Methoca*, and therefore not a valid name. For this reason (see ICZN, 1999: Article 11.5), the name *Sclerodermus* is not available from that publication. Latreille (1809: 119) included and differentiated two species in the genus *Methoca*, *M. ichneumonides* Latreille (defined as: «*Truncus nodosus, articulatus*») and «*Sclerodermus domesticus*, Klug» (defined as: «*Truncus elongato-cubicus, supra planus*»). These short descriptions provide characters

to differentiate the species. So, the specific name *domesticus* is accompanied by a description, and is therefore available from Latreille (1809), but as authored by Latreille only (not Klug as Latreille wrote), since Klug had not provided the description or published the name (see ICZN, 1999: Articles 50.1 and 50.1.1). (In this context, we also have to mention Guérin (1839: 630) who was the first author to state that Klug never described «*Sclerodermus*».) The fact that the generic name was unavailable has no effect on the availability of the species name (ICZN, 1999: Article 11.9.3.1).

In his subsequent one-volume exposition on his rationales for developing a natural system of the crustaceans, arachnids and insects, and a review of their genera («*Considérations Générales sur l'Ordre Naturel des Animaux...*»), Latreille (1810: 314) used the name *Sclerodermus* as a valid genus and described it for the first time. He also specified its type species as «*Sclerodermus domesticus*, Klug» (Latreille, 1810: 437), but did not indicate that the genus was one which he had proposed himself (it was not asterisked), presumably because he considered Klug the first to have done so, although Klug had not actually published the name. Surprisingly, this study has apparently gone unnoticed by all authors to date and nobody has used the correct Latreille work to establish the availability of *Sclerodermus*. The reason it has been overlooked remains a mystery, but perhaps people just erroneously assumed that the work was merely a summarized version of the major «Genera» work. Further confusion resulted from the fact that in the first edition of Cuvier's «*Le Règne Animal...*» Latreille (1817: 491) used only the colloquial French version («*sclérodermes*»), but in the second edition (Latreille, 1829: 316) he used the spelling «*Scleroderma*» as the formal name and attributed it to Klüg [*sic*], and in the third edition the spelling was again «*Scleroderma*» attributed to Klüg (Cuvier, 1836: 191). The first author to use the spelling «*Scleroderma*» (without any author attribution) was apparently Oken (1817: «1178») in his comparison of his own and Cu-

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vier's classifications. The change in spelling was presumably to agree with the proper transliteration of the Greek δέρμα (= *derma*, meaning «skin»), a neuter noun, instead of the irregular masculine latinization, but this change is an incorrect subsequent spelling (ICZN, 1999: Article 33.3) and is not available, although it was subsequently often adopted.

Most significantly, Westwood (1839) used the spelling *Scleroderma* in his monograph of the genus, although he quoted Latreille (1809: 119) as mentioning «*Sclerodermus domesticus*» and Latreille (1829) as including «*Scleroderma*» between *Myrmecodes* and *Methoca*. He also stated: «As far as I am aware, no further description either generic or specific has ever been published», apparently being unaware of Latreille's (1810) treatment. Westwood (1839: 164) gave both spellings as a heading («*Scleroderma*, Klug. MSS. *Sclerodermus*, Latreille olim.») and therefore demonstrably intended the change from the original spelling. *Scleroderma* Westwood, 1839 is, therefore, an «unjustified emendation» (ICZN, 1999: Article 33.2.3) and is a separately available name and an objective junior synonym of *Sclerodermus* Latreille, 1810.

Lepeletier de Saint Fargeau (1845: 573–574) under «*Methoca*» considered «*Sclerodermus domesticus* Klug» to be a synonym of «*Methoca domestica* Latr.», but, inexplicably, also treated the genus «*Schroderma* Klug» separately, giving the characters stated by Latreille (1829) for *Scleroderma* as distinctive. He also commented that, although neither he nor Latreille had seen any species of the genus, it should meanwhile be linked with *Methoca*. The changed spelling was most likely merely the result of a transcription error (the *le* having been read as *h*).

Giraud (1856: 180–181), on the basis of two mating pairs, identified «*Methoca domestica*» of Latreille ([1809]) (= «*Sclerodermus domesticus* (Klug)» of Latreille (1810)) as being the female of «*Bethylus depressus*» of Fabricius ([1804]), and to be the female of the type species of the genus *Pristocera* Klug, [1808], but did not comment on the spelling of *Sclerodermus*.

Even in the mid-20th century, Lahourcade (1963: 849) commented that the description of the genus «*Scleroderma*» was merely outlined by Latreille at the beginning of the previous century, and was not explicitly detailed until Westwood's (1839) work. He did not mention the date of Latreille's description and did not use the original spelling.

In conclusion, *Sclerodermus* Latreille, 1810 (not 1809) is the oldest available name and its type species is *Scleroderma domesticus* Latreille, 1809 (not Klug). *Scleroderma* Westwood, 1839 is therefore identified as a junior objective synonym of *Sclerodermus* Latreille, 1810. The names and authorships for the genus published over time by taxonomists are summarized as follows, including only references considered to be of particular significance:

Sclerodermus Latreille, 1809: 118 [*nomen nudum*, considered erroneously as an available name by different authors]: Bridwell (1919: 26), Gordh & Moczar (1990: 156), Skvarla (2018: 752), Azevedo *et al.* (2018: 245).

Sclerodermus Latreille, 1810: 314 [σκληρός (= sklēros) hard (adj.) + δέρμα (= derma, but *dermus* after irregular latinization) skin (masculine noun); available name].

Scleroderma Klug, 1809 [incorrect subsequent spelling (unavailable name) and erroneous authorship]: Latreille (1829: 316), Westwood (1839: 164), Guérin (1839: 630), Blanchard (1840: 374), Lucas (1849: 322), Foerster (1856: 96), Walker (1871: 59), Saunders (1881: 109), Westwood (1881: 117), Ashmead (1902: 272), Kieffer (1914: 253), Berland (1928: 124), Bernard & Jacquemin (1948: 160), Nicoli & Erlande-Branderburg (1957: 551).

Schroderma Klug, 1809 [incorrect subsequent spelling (unavailable name) and erroneous authorship]: Lepeletier de Saint Fargeau (1845: 646).

Scleroderma Latreille, 1809 [incorrect subsequent spelling (unavailable name) and erroneous year of descriptor]: Oken, (1817: 1178), Cuvier (1836: 191), Ashmead (1893: 40), Ashmead (1902: 270), Kieffer (1904: 373), Kieffer (1905: 103), Kieffer (1908: 41), Muesebeck & Walkley (1951: 728), Ogloblin (1954: 101), Lahourcade (1963: 849), Evans (1964–65: 173), Yang *et al.* (2012: 619).

Sclerodermus Klug, 1810 [erroneous authorship]: Blanchard (1840: 375).

Scleroderma Westwood, 1839: 164 [unjustified emendation (neuter noun), available name] **objective synonymy**.

Sclerochroa Foerster, 1850: 502–503 [unnecessary new name for *Scleroderma* because of homonymy with *Scleroderma* Person, 1801, a genus of fungi (available name), synonymy automatic and by Ashmead, 1893: 40].

Ateleoapterus Foerster, 1856: 95–96 [Synonymy by Azevedo *et al.*, 2018: 246].

Schleroderma Costa 1864: 131 [incorrect subsequent spelling (unavailable name)].

Neoscleroderma Kieffer, 1905: 106 [Synonymy by Evans, 1964: 174].

Lepidosternopsis Ogloblin, 1954 [«1953»]: 101–102 [Synonymy by Lanes & Azevedo, 2008: 83].

Sclerodermus includes, according to Azevedo *et al.* (2018), a total of 81 extant species and a single fossil. In 2011 and 2018 Celso Azevedo visited the Museum für Naturkunde in Berlin, where several holotypes of *Sclerodermus* species are deposited, and studied a specimen with some labels bearing data as given in the original publication for the type of *Scleroderma abdominalis* Westwood, 1839. The specimen is a male of *Pseudisobrachium* Kieffer, 1904 (Pristocerinae) according to the morphology of the eyes (Azevedo *et al.*, 2018: 25) a character which differentiates tribes; consequently, the species was transferred to *Pseudisobrachium* by Azevedo *et al.* (2018). This is the only specimen in that collection with the labels of *S. abdominalis*. The original description by Westwood (1839) is specified as of a female and this is confirmed by the features described; the mentioned specimen thus can-

not possibly be the holotype of this species. Probably, the labels were changed by mistake, or the females are lost in this Museum. For these reasons, this species is transferred back to *Sclerodermus*, while hoping to find the female (or females) used to describe this species. *Pseudisobrachium abdominalis* (Westwood, 1839) (correctly *abdominale*) is hereby transferred back to *Sclerodermus* as *Sclerodermus abdominalis* Westwood, 1839, **comb. rev.**, so that the current number of species included in *Sclerodermus* is 82.

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