

An annotated catalogue of the theraphosid spiders held in the collections of the Manchester Museum (Araneae: Theraphosidae)

Danniella Sherwood

Arachnology Research Association
email: danni.sherwood@hotmail.com

Dmitri V. Logunov

The Manchester Museum,
The University of Manchester,
Oxford Road,
Manchester M13 9PL

Ray Gabriel

Arachnology Research Association

Abstract

An annotated catalogue of all specimens of the family Theraphosidae Thorell, 1869 held in the collections of the Manchester Museum is presented.

Keywords: curation • history • labels • museums • specimens • United Kingdom

Introduction

The Manchester Museum (MMUE) is a large university museum with an internationally important entomological collection, accounting for over two and a half million specimens, which are thought to make up the third/fourth largest depository in the United Kingdom (depending on group). It is one of 32 museums in England with designated collections, announced by the Secretary of State on 24th June 1997 (Report 1996–1997). Designation is a category given by the Government to identify non-national British museums with collections of pre-eminent importance; for further details see Alberti (2009) and Logunov & Merriman (2012). The Museum's spider collection consists of some 180,000 specimens belonging to more than 4500 species (DVL pers. data).

According to Blackwall (1833), *Avicularia elegans* (Blackwall, 1833) was the first theraphosid species ever acquired by the Manchester Museum. Blackwall (1833: 442) wrote that several specimens of this species belonging to the Society for the Promotion of Natural History (SPNH) were deposited in the Museum; see Kargon (1977) for further details about the SPNH. Unfortunately, the location of these specimens remains unknown, and the corresponding museum register book does not contain any record of them. It is known, however, that the insect collections inherited by the Manchester Museum from the SPNH “suffered so much from exposure to the light and other causes that very few specimens were in a fit state for exhibition, and it was therefore necessary to commence the collection de novo” (Report 1890–1894: 16). Therefore, it is reasonable to assume that the series of *A. elegans* (which were probably dried pinned specimens; this being the main method of

preservation for insects and arachnids during that time period) also did not survive and this name is currently treated by the World Spider Catalog (2022) as a *nomen dubium*.

In the late 19th–early 20th centuries, spiders were acquired by the Manchester Museum only occasionally; e.g. *Aphonopelma hentzi* Girard, 1853 (see below). Yet, the provenance and locality information of such specimens could be doubtful (e.g. Theraphosinae sp. indet., MMUE G663; see below). The first methodical spider collection that is still available in the Manchester Museum was donated by a local businessman and spider enthusiast Henry Wybrow Freston (1867–1936) in 1910 and comprised 273 species. Since then, the museum has acquired many personal spider collections, including those of such notable British arachnologists as David Mackie (1902–1984), Alexander La Touche (1896–1981), Ted Locket (1900–1991), Eric Duffey (1922–2019), and others. A brief summary of the major spider collection acquisitions at the Manchester Museum and a detailed account on the collection of J. A. Murphy and F. Murphy was presented by Arzuza Buelvas (2018). A full account of the history of Museum's arachnological collections and its type catalogue will be provided in the future by DVL (in prep.).

In this work, we provide a catalogue of all known specimens of the family Theraphosidae Thorell, 1869 held in MMUE, with additional discussion on some select taxa. For simplicity, all the published Museum Reports that are cited in the text are hereinafter referred to as Report followed by the corresponding years, and in the list of cited literature a single reference is given to all of them (94 Reports altogether).

Material and methods

Specimens were examined under a Leica MZ12.5 stereomicroscope, photographs of palpal bulbs and spermathecae were made using a Canon EOS 6D Mark II attached to a Leica MZ12.5 with images stacked using Helicon Focus software. Abbreviations, Institutes: MMUE = Manchester Museum, University of Manchester, United Kingdom. Other: coll. = collector; det. = determined by, imm. = immature. Abbreviations for museum collections follow Evenhuis (2007). Information from data labels from the Murphy spider collection are complemented by more detailed information, if any, that is available in the electronic catalogue of this collection; and, where it is present, is given in [].

Avicularia avicularia (Linnaeus, 1758)

Material examined: 1 imm. ♂ (MMUE, G4682), Trinidad, 1926; accessioned 16 September 1926, don. Prof J. S. Dunkeley, *Avicularia avicularia* det. D. Sherwood 01 November 2021.

Remarks: A single immature male of *A. avicularia* is present in a jar labelled “Trinidad” alongside an adult female of *Tliltocatl* aff. *albopilosus* (see below); the latter

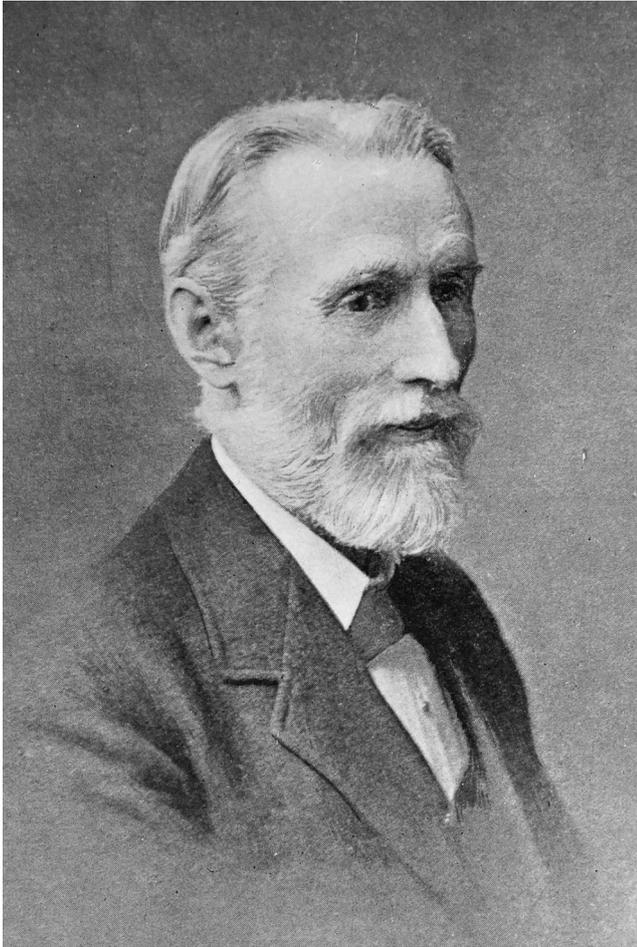


Fig. 1: Robert Standen (1854–1925), a famous British conchologist and Assistant Keeper of Zoology of the Manchester Museum in the period of 1890–1925, who made all the educational exhibits of tarantulas discussed in the present work and many more of different groups in the Museum; see Jackson (1925) about him.

clearly having been added to the jar at a later date because the genus *Tliltocatl* Mendoza & Francke, 2020 is endemic to Mesoamerica (World Spider Catalog 2021). In contrast, *A. avicularia* is well recorded from Trinidad (Fukushima & Bertani 2017).

***Aphonopelma chiricahua* Hamilton, Hendrixson & Bond, 2016**

Material examined: 1♂ (MMUE, G7572.20815), USA, SWRS, Portal, Cochise Co., Ariz., [1800 m] coll. V. Roth, Dec. 77, A134, *Aphonopelma* sp. det. J. A. Murphy, “J. Murphy’s Spider collection—A134”, *Aphonopelma chiricahua* det. D. Sherwood 21 April 2021.

Remarks: This single male of *A. chiricahua* represents the first specimen record, to our knowledge, of this species in a museum outside the United States. This specimen was collected by the notable arachnologist Vincent Roth (1924–1997) at the Southwest Research Station (SWRS), a field station of the American Museum of Natural History (where Roth worked for many years) and known locality of *A. chiricahua* (see Hamilton *et al.* 2016). Unfortunately, both palpal bulbs are snapped approximately halfway down



Figs. 2–4: *Brachypelma* sp. from Tepic, Mexico (MMUE, G1823). **2** original educational exhibit; **3** male palp, retrolateral view (as a consequence of being attached to the palp, the palpal bulb itself is in a ventro-lateral view); **4** male palp, prolateral view (as a consequence of being attached to the palp, the palpal bulb itself is in dorso-prolateral view). Scale bars = 2 cm (2), 2 mm (3–4).

the embolus, and the apical halves are not present in the tube. Nonetheless, identification to species level can be made based on metatarsus IV scopulation, leg morphometrics and body size, all of which are distinct in *A. chiricahua* in comparison to other known congeners which occur near to the SWRS.

***Aphonopelma hentzi* (Girard, 1853)**

Material examined: 1 [sex indeterminable] (MMUE, G7669), no exact locality, date or collector name known (dried specimen), accessioned 10 November 1897, don. H. Brazenor, *Aphonopelma hentzi* det. D. Sherwood 27 October 2021.

Remarks: The MMUE’s Register Book contains no records for 1897, and the Museum’s Report (1897–1898) has no mention of H. Brazenor or this specimen. Therefore, it is enigmatic, and we can only present the data found on the original data label; the specimen was re-accessioned on 11 November 2021 (G7669). As the specimen is glued to the bottom of the box the specimen cannot be orientated ventrally to determine its sex.

***Aphonopelma seemanni* (F. O. Pickard-Cambridge, 1897)**

Material examined: 1♂ (MMUE, G7485), captive-bred specimen from the Manchester Museum’s vivarium, died 25 September 2008, don. D. Smy, *Aphonopelma seemanni* det. D. Sherwood 27 October 2021.

***Aphonopelma* sp.** (Fig. 24)

Material examined: 1 ♂ (MMUE, G7670), no exact locality, date or collector name known [possibly J. Hardy (see below)], an educational exhibit in square glass jar, *Aphonopelma* sp. det. D. Sherwood and R. Gabriel 30 October 2021.

Remarks: The jar contains a female and male displayed to show the main morphological features of spiders. Apparently, these are further tarantula specimens dissected and mounted by Robert Standen (1854–1925) who was Assistant Keeper of Zoology at that time (Fig. 1; see also Jackson, 1925). In the Museum's Report (1912–1913: 11), it is said that Mr Standen arranged and mounted a selection of arachnid specimens for exhibition, one of which was likely to be this educational exhibit; this sample was re-accessioned on 11 November 2021 (G7670). The female does not appear to be conspecific to the male, the latter of which belongs to the group of *Aphonopelma* species which occur only in the United States and Northern Mexico (including Baja California). Without a robust locality it is difficult to determine the male at the species level based only on its palpal bulb morphology, as this is very homogenous within this group (Hamilton *et al.* 2016). Based on the Museum's Report (1911–1912: 31), it is possible to assume that this female could be the "specimen of *Mygale* from California" donated by J. R. Hardy, yet with no reference on whether it was used for making such an educational exhibit.

***Brachypelma klaasi* (Schmidt & Krause, 1994)** (Figs. 27–28)

Material examined: 1 ♀ exuvia (MMUE, G7636.1), captive-bred specimen donated to the Manchester Museum on 20 November 2019, don. G. Woodhead, *Brachypelma klaasi* det. D. Sherwood 27 October 2021.

***Brachypelma* sp.**

Material examined: 1 imm. (MMUE, 7572.21050), no exact locality or date known, present from P. Nussle, 1983, *Brachypelma smithi*, sub, A.188, det. F. M. Murphy 1983, J. Murphy's Spider collection—A188, *Brachypelma* sp., impossible to tell if *B. smithi* or *B. hamorii*, det. D. Sherwood 21 April 2021.

Remarks: A small juvenile of the genus *Brachypelma* Simon, 1891 presented as a gift to the Murphys was initially determined as *Brachypelma smithi* (F. O. Pickard-Cambridge, 1897) by Frances in 1983. It must be stressed that, at the time, this was the only known species of the genus from the area and was the only possible species it could be determined as. However, a recent study found two species similar in habitus, but separated by a biogeographical barrier, existed in material which was historically referred to as *B. smithi* (see Mendoza & Francke 2017). Most of the material circulated in the pet trade in the 1980s onwards actually corresponds to *Brachypelma hamorii* Tesmoingt, Cleton &

Verdez, 1997 which was described two years after Frances's death. The type specimens were never deposited in a public collection and, as a result, a neotype had to be designated (see Mendoza & Francke 2017). Because the features which delineate *B. smithi* and *B. hamorii* are not interpretable in juveniles (i.e. genital organ morphology), it is impossible in the present day to determine whether the juvenile present in the MMUE collections is *B. smithi* s. s. or corresponds to the latterly described *B. hamorii*.

***Brachypelma* sp.** (Figs. 2–4)

Material examined: 1 ♂ (MMUE, G1823), Tepic, Mexico, [originally in a square glass jar, as an educational exhibit, removed to a standard collection jar in October 2021], no date known, accessioned 11 June 1912, don. J. R. Hardy, *Brachypelma* sp. det. D. Sherwood and R. Gabriel 30 October 2021.

Remarks: An adult male of a *Brachypelma* species, supposedly from Tepic, Mexico was used as a teaching specimen in the museum and was probably prepared by Robert Standen (see above; Fig. 1). The only species of *Brachypelma* known from Tepic is *Brachypelma emilia* (White, 1856) but the palpal bulb of the MMUE specimen (Figs. 3–4) has some slight differences to *B. emilia* in terms of the extent and position of the keels and furthermore, the specimen shows no evidence of dark colouration to the caput (Fig. 2) which is present (in varying degrees, but always present) in *B. emilia*. The possibility the colouration of the caput may have faded due to long-term preservation is possible, but it does not explain the apparent differences in palpal bulb morphology. We therefore err on the side of caution and determine this specimen simply at the generic level.

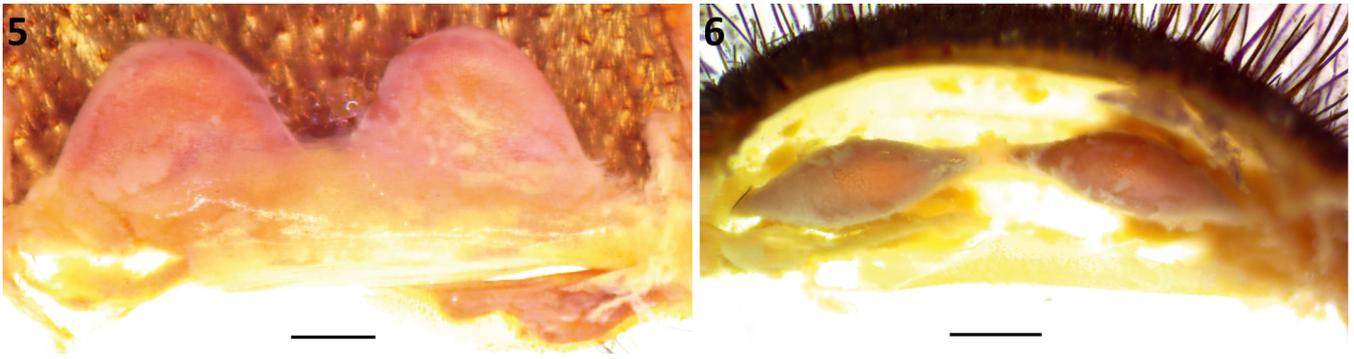
***Eupalaestrus* sp.**

Material examined: 1 ♂ (MMUE, G7673.1), dried and pinned, [no other data], *Eupalaestrus* sp. det. D. Sherwood 07 December 2021.

Remarks: Given the lack of provenance, and the similarity of the palpal bulb to more than one species of the genus *Eupalaestrus* Pocock, 1901, we opt to determine this specimen at the generic level only.

***Grammostola cf. porteri* (Mello-Leitão, 1936)**

Material examined: 1 ♀ exuvia (MMUE, G7636.3), captive-bred specimen donated to the Manchester Museum on 20 November 2019, don. G. Woodhead, *Grammostola cf. porteri* det. D. Sherwood 27 October 2021.



Figs. 5–6: *Haplopelma* aff. *schmidti* von Wirth, 1991 female (MMUE, G7573.45). **5** spermathecae, dorsal view; **6** same, apical view. Scale bars = 1mm.

***Haplopelma* aff. *schmidti* von Wirth, 1991** (Figs. 5–7)

Material examined: 1 ♀ (MMUE, G7573.45), Vietnam, Tuyen Quang Prov., c. 5 km E of Na Hang, 22°20'59"N 105°25'36"E, 290 m; 04–13 November 2015, coll. D. V. Logunov, “Theraphosidae 1 ♀”, *Haplopelma* aff. *schmidti* det. D. Sherwood and R. Gabriel 30 October 2021.

Remarks: An adult female with some taxonomic affinity to *H. schmidti*, but having much longer and widely spaced spermathecal receptacles (Figs. 5–6) in contrast to published illustrations of the spermathecae of this species (cf. von Wirth 1991; Zhu & Zhang 2008), is present in the collections. As there has been no work published on the variation of ornithoctonine spermathecae intraspecifically and because no males from the locality are available, we present this specimen tentatively as *H. aff. schmidti* and cannot eliminate the possibility it may represent an undescribed cryptic species until such time as adult males from the locality can be collected and examined. If this female specimen

is *H. schmidti* s. s., it is a new range extension for that taxon (Fig. 7).

It is important to note that the currently unsatisfactory state of terrestrial ornithoctonine taxonomy contributed significantly to our inability to confidently assign this specimen to species level. Furthermore, the synonymy of the genera *Cyriopagopus* Simon, 1887 and *Haplopelma* Simon, 1892 by Smith & Jacobi (2015) is entirely erroneous and was not based on examination of the generotype of *Haplopelma* (see Gabriel & Sherwood 2019). We think it quite likely that species of *Haplopelma* with a single, fused, spermathecal receptacle may in the future need to be moved to a separate genus as the generotype *Haplopelma doriae* (Thorell, 1890) has two separate spermathecal receptacles – a significantly divergent morphology. The genus *Melopoeus* Pocock, 1895 may be a suitable choice, and is presently in synonymy. However, a formal transfer would need to be done in a detailed revision of the group.

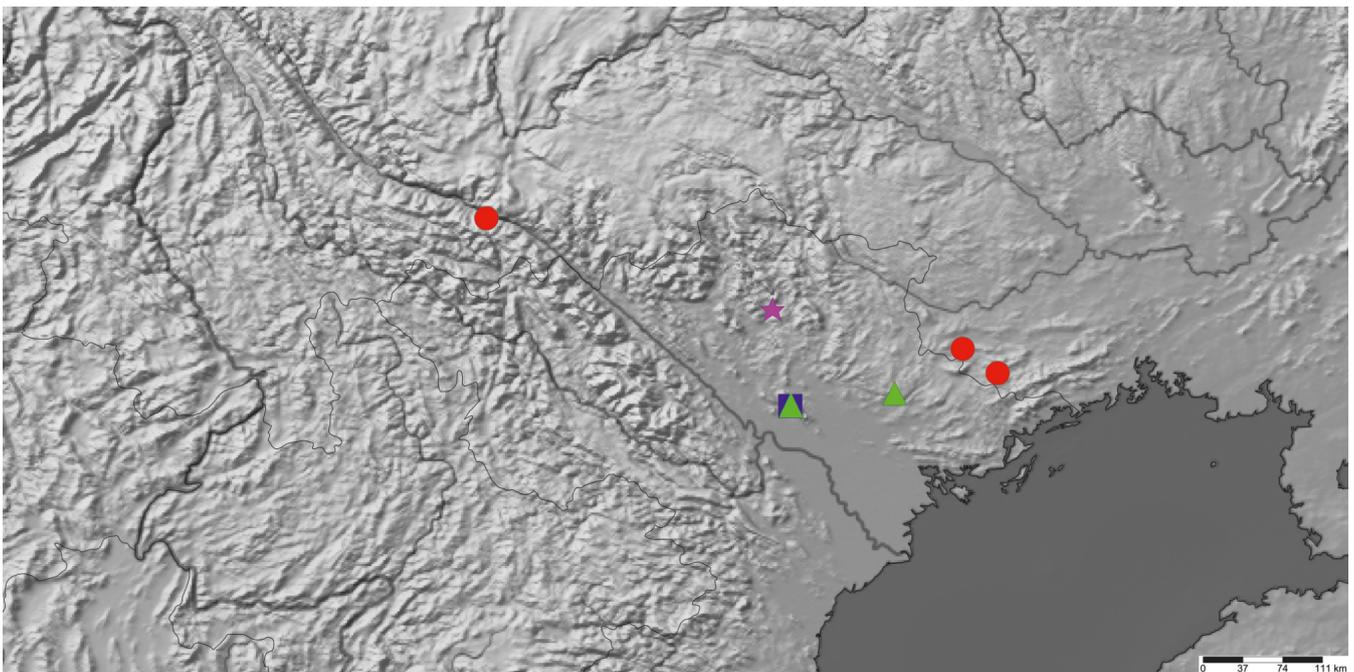


Fig 7: Map showing previous distribution records of *Haplopelma schmidti* von Wirth, 1991 (red circles = records from Wang, Peng & Xie 1993 (as the new species *Selenocosmia huwena*, excluding erroneous male record from Menghai county); green triangles = records from Pham & Vu 2005 (as *Ornithoctonus huwena*); blue square = type locality of *H. schmidti* per von Wirth, 1991 (verbatim: Nord-Vietnam: Tam Dao Gebirge, 1000 m über N.N.); pink star = record of the female of *H. aff. schmidti* reported herein.



Figs. 8–12: *Idiothele nigrofulva* (Pocock, 1898) male (MMUE, G7572.21484), palpal bulb (left hand side). **8** prolateral view; **9** retrolateral view; **10** dorsal view; **11** ventral view; **12** apical view. Scale bars = 1 mm.

Harpactirinae sp. indet.

Material examined: 1 imm. (MMUE, G7572.4384), Kenya, Kilifia Coast [Coast Kilifi], scrub on shore, 03 September 1985, ♀? *Harpactirella* sp., 6003, Murphy coll, ♀? *Harpactirella*? JAM 86, 6003, shore Kilifi, 03 September 1977, “J. Murphy’s Spider collection—6003, Harpactirinae sp. indet. det. D. Sherwood 21 April 2021.

Remarks: A very small and fragile specimen, previously determined as *Harpactirella* sp., is not determinable below the subfamily level because of its immaturity. However, it is highly unlikely to be a species of *Harpactirella* Purcell, 1902 because this genus is restricted to Southern Africa. DS has seen other historical material in another museum from a nearby location which corresponded to the genus *Pterinochilus* Pocock, 1897 and this may be a more likely candidate as presence of retrolateral cheliceral scopulae is ontogenetic and small juveniles of *Pterinochilus* lack this character during early life stages (DS and RG pers. obs.). However, other harpactirine genera in the area cannot be explicitly ruled out either, hence our preference here for a more general determination.

Hysterochrates sp. (Fig. 25)

Material examined: 1 ♂ (MMUE, G1822), no exact locality, date or collector name known, an educational exhibit in square glass jar, *Hysterochrates* sp. det. D. Sherwood 27 October 2021.

Remarks: This specimen is mentioned in the MMUE Register Book as “*Mygale avicularia*” under the accession number G1822, with the locality being (erroneously) described as ‘S. America’; records indicate it was donated to MMUE on 11 June 1912. It is easily diagnosed as a male of the genus *Hysterochrates* Simon, 1892 based on palpal bulb morphology.

Hysterochrates sp. indet.

Material examined: 2 imm. ♀ (MMUE, G7520.1-2), Cameroon, January 2010, ex. Lee (dried specimens, presumably from pet trade importation); accessioned 30 March 2012, don. R. Gallon, *Hysterochrates* sp. det. R. Gallon March 2010, *Hysterochrates* sp. indet. det. D. Sherwood 27 October 2021.

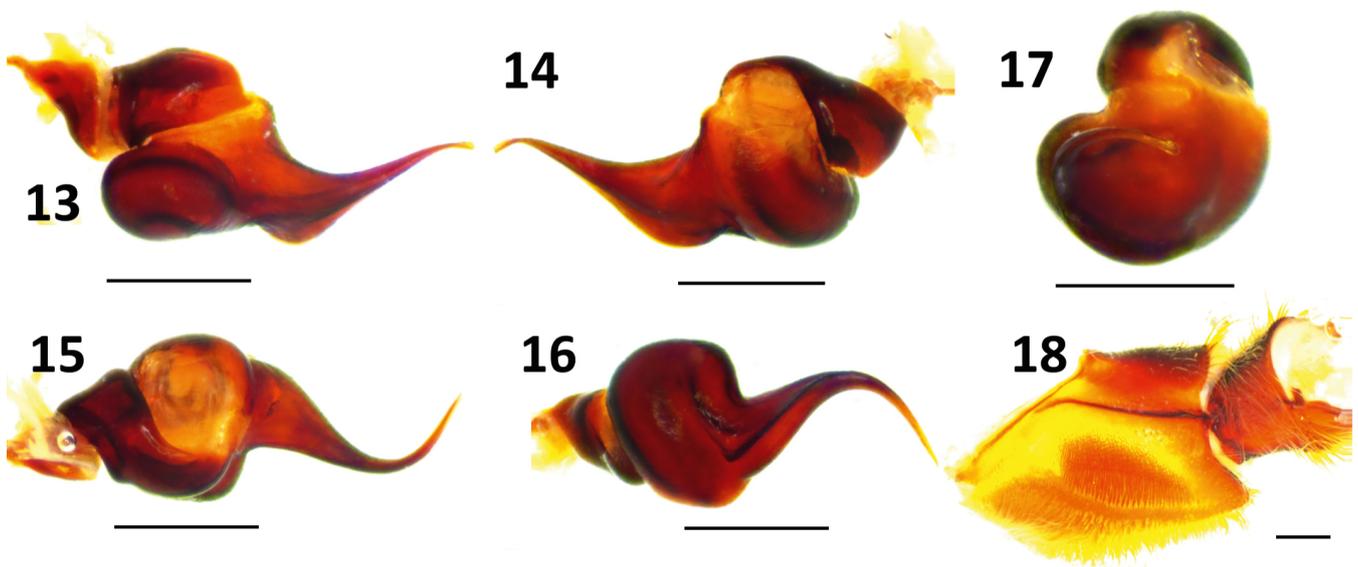
Idiothele nigrofulva (Pocock, 1898) (Figs. 8–12)

Material examined: 1 ♂ (MMUE, G7572.21484), Zimbabwe, [spring] 1987, coll. E. Milner, d.b. Sept. 1987, *Pterinochilus* sp., A.207, det. J. A. Murphy 1987, J. Murphy’s Spider collection—A207, *Idiothele nigrofulva* det. D. Sherwood 21 April 2021.

Remarks: A single adult male of *I. nigrofulva* is present for which we provide the first digital images of the palpal bulb (Figs. 8–12). This species is widely distributed across Southern Africa (Gallon 2002, 2004, 2010) and has two junior synonyms: *Pterinochilus crassispina* Purcell, 1902 and *Harpactirella leleupi* Benoit, 1965. The palpal bulb of this species is superficially similar to some species of *Harpactira* Ausserer, 1871 and DS gratefully acknowledges the help of Richard Gallon for discussions and assistance relating to this specimen.

Lasiadora parahybana Mello-Leitão, 1917 (Figs. 29–30)

Material examined: 1 ♀ exuvia (MMUE, G7636.2), captive-bred specimen donated to the Manchester Museum on 20 November 2019, don. G. Woodhead, *Lasiadora parahybana* det. D. Sherwood 27 October 2021.



Figs. 13–18: *Phlogiellus inermis* (Ausserer, 1871) male (MMUE, G7572.21011), 13–17 palpal bulb (left hand side). **13** prolateral view; **14** retrolateral view; **15** dorsal view; **16** ventral view; **17** apical view **18** maxilla prolateral view. Scale bars = 1 mm.

Mygalomorphae sp. indet.

Material examined: 1 imm. (MMUE, G7572.20782), [Kenya, Rift Val.], Kongelai, [1400 m, riverside scrub], 17 August 1972, d. April 1975, theraphosid?, J. Murphy's Spider collection—A85, Mygalomorphae sp. indet., fragmented, det. D. Sherwood 21 April 2021

Remarks: An unidentifiable mygalomorph juvenile from Kongelai, Kenya is fragmented and in poor condition. As a result, identification below even that of the infraorder Mygalomorphae Pocock, 1892 was impossible. It is included in this catalogue due to the prior postulation that it may be a theraphosid. It may well be a theraphosid, but we cannot be sure due to the condition of the specimen.

***Nhandu chromatus* Schmidt, 2004**

Material examined: 1♀ (MMUE, F3535.1), dried, captive-bred specimen, purchased in Prague in October 2018, don. D. V. Logunov, *Nhandu chromatus* det. D. Sherwood 27 October 2021.

***Poecilotheria subfusca* Pocock, 1895**

Material examined: 1 imm. ♀ (MMUE, G7673.2), dried and pinned specimen, [no other data], *Poecilotheria subfusca* det. D. Sherwood 07 December 2021.

***Phlogiellus inermis* (Ausserer, 1871) (Figs. 13–18)**

Material examined: 1♂ (MMUE, G7572.21011), Singapore, Kent Ridge Road, [60 m, leaf litter], imm. c. 24 March 1986, k. 28 January 1988, *Phlogiellus inermis* Ausserer, 1871, A.209, det. J. A. Murphy 1988, J. Murphy's Spider

collection—A.209, *Phlogiellus inermis* det. D. Sherwood 21 April 2021.

Remarks: The male, re-examined for this article, (Figs. 13–18) was already correctly identified 33 years prior by John Murphy. Originally described in the genus *Ischnocolus* Ausserer, 1871, it was transferred to *Phlogiellus* Pocock, 1897 by Simon (1903). *P. inermis* was discussed and figured in Murphy & Murphy (2000: 74–75).

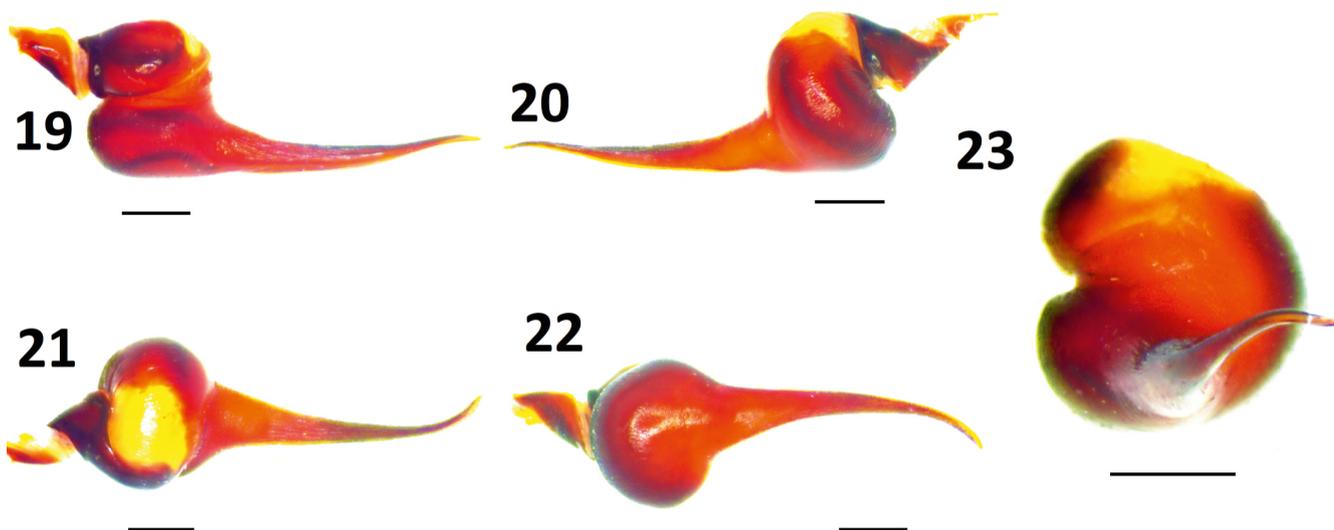
***Phlogiellus obscurus* (Hirst, 1909)**

Material examined: 2 imm. (MMUE, G7572.20796), Sabah, Ulu Dusun, 30 miles W. of Sandakan, [100 m] 28–31 January 1976 [in the electronic catalogue of the Murphy collection only the date of 28 January 1976 is given], lowland forest, [station grounds], [coll.] E. W. Classey, ♀♀ *Phlogiellus* sp., J. Murphy's Spider collection—A109, *Phlogiellus obscurus* det. D. Sherwood 21 April 2021.

Remarks: *P. obscurus* was originally described in the genus *Selenocosmia* Ausserer, 1871 where it remained for over one hundred years until was transferred to *Phlogiellus* by Nunn *et al.* (2016) based on palpal bulb, leg scopula and foveal morphology in addition to the presence of a third tarsal claw on tarsus IV. The two immature specimens were determined based on locality and stridulation organ morphology.

***Psalmopoeus cambridgei* Pocock, 1895**

Material examined: 1♀ (MMUE, G1320), ex W. Indies, from bananas in Manchester Market, no date (dried specimen), accessioned 31 January 1910 [as *Mygale* sp.], don. J. W. Dunn, *Psalmopoeus cambridgei* det. D. Sherwood and R. Gabriel 30 October 2021; 1♀ (MMUE, G1017), ex W. Indies, from bananas in Manchester Market, no date known



Figs. 19–23: *Psalmopoeus reduncus* (Karsch, 1880) male (MMUE, F3441.132), palpal bulb (left hand side). **19** prolateral view; **20** retrolateral view; **21** dorsal view; **22** ventral view; **23** apical view. Scale bars = 1 mm.

(dried specimen), don. G. W. Eckersley, *Psalmopoeus cambridgei* det. D. Sherwood and R. Gabriel 30 October 2021.

Remarks: Based on the style and appearance of the storage boxes, both specimens were acquired during the time when John R. Hardy was in charge of the Manchester Museum's zoology and entomology collections (1881–1918). Similar boxes were commonly used by J. Hardy for making educational sets with dried specimens of insects and other invertebrates; apparently identified by him as well.

In the MMUE's Register Book, there is a record of *Mygale avicularia* (G1017) from Jamaica donated by Mr Eckersley on 03 August 1904; this acquisition is also mentioned in the Museum's Report (1904–1905: 24) as "Mr Eckersley. Bird-eating spider (*Mygale avicularia*)". Since it is the only spider record with the name of Eckersley we have been able to trace, it is safe to accept that both records describe the second boxed specimen mentioned above. The reference to 'bananas in Manchester Market' was apparently added later by J. Hardy.

Psalmopoeus reduncus (Karsch, 1880) (Figs. 19–23)

Material examined: 1♂ (MMUE, G7609.21), Costa Rica, Turrialba nr Turrialtico lodge [9°53'39.9"N 83°38'23.4"W], 17–19 April 2017, [coll.] D. V. Logunov, Theraphosidae 1♂, *Psalmopoeus reduncus* det. D. Sherwood 21 April 2021; 1♂ (MMUE, F3474.216), Costa Rica, Turrialba nr Turrialtico lodge, 15–19 June 2016, D. V. Logunov, Theraphosidae 1♂, *Psalmopoeus reduncus* det. D. Sherwood 21 April 2021; 1♂ (MMUE, F3441.132), Costa Rica, Turrialba nr Turrialtico lodge, 12–16 June 2014, D. V. Logunov, *Psalmopoeus reduncus* det. D. Sherwood 21 April 2021.

Remarks: The type series of *P. reduncus* was recently redescribed by Gabriel & Sherwood (2020) who noted that its distribution range was likely to be in the Cordillera Cen-

tral, as originally suggested by Valerio (1979). Examination of three adult male psalmopoes collected by DVL and deposited in the MMUE collections reveals three males of *P. reduncus* from the Cordillera Central, thus providing evidence to support the conclusions of Valerio (1979) and Gabriel & Sherwood (2020). As the palpal bulb of the lectotype male is still attached to the cymbium (and cannot be dissected as the specimen is a fragile, dried, and ex-pinned specimen), we herein provide images of the palpal bulb of one of the MMUE non-type males, to show the palpal bulb in the standard views when not attached to the cymbium (Figs. 19–23).

Pterinochilus murinus Pocock, 1897

Material examined: 1 imm. (MMUE, G7572.20818), House Kilifi [coast], Kenya [10 m, leaf litter], 24 September 1977, A137, d. 13 May 1978, *Harpactira* sp., Raven 95, J. Murphy's Spider collection—137, *Pterinochilus murinus* det. D. Sherwood 21 April 2021.

Remarks: A single immature of *P. murinus* is readily identifiable based on the presence of thorn-like setae on the prolateral face of the maxilla (*sensu* Gallon 2002). The specimen was previously misidentified by a previous worker as belonging to the genus *Harpactira* but does not possess the diagnostic characteristics of this genus. Indeed, no species of *Harpactira* s. s. are known to occur in Kenya.

Selenocosmiinae sp. indet.

Material examined: 1 imm. (MMUE, G7572.21495), [Papua] New Guinea, [Morobe Dis.], Wau 26/31 July 1974, [coll. E. W. Classey], J. Murphy's Spider collection—A223, *Selenocosmiinae* sp. det. D. Sherwood 21 April 2021.

Remarks: Unfortunately, due to its immaturity, the characters used to fully delineate the different genera of this sub-



Figs. 24–26: Educational exhibits in square glass jars prepared by Robert Standen, Assistant Keeper of Zoology of the Manchester Museum in 1912. **24** male of *Aphonopelma* sp. and female of Theraphosidae sp. indet. (G7670); **25** male of *Hysteroocrates* sp. (G1822); **26** dissected female of Theraphosidae sp. indet. (G3124). Scale bars = 20 mm.

family cannot be interpreted in this specimen and thus determination is not possible below that of the subfamily level.

Selenocosmiinae sp. indet.

Material examined: 1 imm. (MMUE, G7572.21519), Philippines, present from V. H-Williams, Theraphosid, A.254, J. Murphy's Spider collection—A254, Selenocosmiinae sp. det. D. Sherwood 21 April 2021.

Remarks: As with the specimen discussed immediately above, determination is not possible below that of the subfamily level.

Tapinauchenius sp.

Material examined: 1 imm. ♂ (MMUE, G4727), *Psalmopoeus* sp.?, see G.4727 [imported (West Indies?), 07 December 1956], *Tapinauchenius* sp. det. D. Sherwood 21 April 2021.

Remarks: An immature male of the genus *Tapinauchenius* Ausserer, 1871 was determined based on the absence of primary or secondary lyra on the proteral maxilla. The museum label present with the specimen notes that the entry for the accession number G4277 should be consulted in the MMUE Register Book. The corresponding entry in the accession book states this specimen (erroneously identified therein as "*Psalmopoeus* sp.") was a stowaway imported into Manchester, possibly from the West Indies, donated to the museum on the 7th December 1956 by R. Chapman. The corresponding Annual Report (Report 1956–1957: 15) states only the name of the spider and donor, with no further details on the origin of the specimen.

Theraphosidae sp. indet. (Fig. 26)

Material examined: 1 ♀ (MMUE, G3124), no exact locality, date or collector name known (in glass box, an educational exhibit), Theraphosidae sp. indet. det. D. Sherwood and R. Gabriel 30 October 2021.

Remarks: In the MMUE Register Book, this specimen (G3124), is recorded as "*Mygale avicularia* (Dissection) from the Entomology Research Collection; accessioned 17 July 1913, donor?". The original label is detached from the jar and torn apart. Apparently, it is another tarantula specimen dissected and mounted by Robert Standen (Fig. 1) for exhibition (Report 1912–1913: 11).

Theraphosidae sp. indet.

Material examined: 1 ♀ (MMUE, G7671), no exact locality, date or collector name known, an educational exhibit in square glass jar, the specimen was re-accessioned on 11 November 2021 (G7671), Theraphosidae sp. indet. det. D. Sherwood and R. Gabriel 30 October 2021.

Remarks: The jar contains a moulting tarantula specimen that is partly out of its old skin. No labels are attached to the jar. Apparently, it is another tarantula specimen dissected and mounted by Robert Standen for exhibition (Report 1912–1913: 11).

Theraphosidae sp. indet. (Fig. 24)

Material examined: 1 ♀ (MMUE, G7670), no exact locality, date or collector name known, an educational exhibit in square glass jar, the specimen was re-accessioned on 11



Figs. 27–30: Exuviae of captive-bred females mounted and donated to the Manchester Museum by G. Woodhead in November 2019. **27–28** *Brachypelma klaasi* (Schmidt & Krause, 1994) (MMUE, G7636.1); **29–30** *Lasiodora parahybana* Mello-Leitão, 1917 (G7636.2). Scale bars = 2 cm.

November 2021 (G7670), Theraphosidae sp. indet. det. D. Sherwood and R. Gabriel 30 October 2021.

Remarks: See the above section on *Aphonopelma* sp. Despite belonging to two different species, the male and female of this anatomical exhibit are preserved together in the same jar and therefore are provided with the same accession number (G7670).

Theraphosinae sp. indet.

Material examined: 1 [sex indeterminable] (MMUE, G663), Cape of G. Hope, no date or collector name known; accessioned 11 January 1894 (dried specimen), don. Mr Leech, Theraphosinae sp. indet. det. D. Sherwood and R. Gabriel 30 October 2021.

Remarks: It is not possible to determine this species below the subfamily level, but examination shows it is a theraphosine. The locality given on the data label is thus erroneous.

***Tiltocatl* aff. *albopilosus* (Valerio, 1980)**

Material examined: 1♀ (MMUE, G7672), no exact locality, date or collector name known, [originally placed together with a specimen of *A. avicularia* from Trinidad; see below], *Tiltocatl* aff. *albopilosus* det. D. Sherwood 01 November 2021.

Remarks: As discussed above (see *A. avicularia*) an adult female of *Tiltocatl* aff. *albopilosus* (Valerio, 1980) is present in a jar labelled “Trinidad” alongside an immature male of *A. avicularia*. Unlike that species, *Tiltocatl* spp. do not occur in Trinidad nor, indeed, in South America at all, thus this female specimen has been added to the jar erroneously. The species complex encompassing *T. albopilosus* likely contains cryptic species (work in preparation) and the spermathecae of females is comparatively homogenous. Thus, given this and the lack of reliable locality data, it is not possible to conclusively state whether this specimen is *T. albopilosus* s. s. or whether it may correspond to one of the potential cryptic species.

Tliltocatl sp. indet.

Material examined: 1♀ exuvia (MMUE, G7636.4), captive-bred specimen donated to the Manchester Museum on 20 November 2019, don. G. Woodhead, *Tliltocatl* sp. indet. det. D. Sherwood 27 October 2021.

Remarks: This exuvia is derived from a pet trade specimen. The spermathecae between the various species currently known in *Tliltocatl* are somewhat homogenous. Given this and the unknown provenance of this specimen, we therefore determine it only at the generic level.

Discussion

The theraphosid collection of the Manchester Museum is varied, with taxa from across the globe, including specimens from the large spider collection assembled by the late John A. Murphy (1922–2021) and his wife Frances M. Murphy (1926–1995), two exemplary arachnologists who contributed greatly to British and international arachnology. Like some other British museums (e.g. Grant Museum of Zoology and Comparative Anatomy; see Sherwood 2020) there is a mix of exuviae (Figs. 27–30), spirit-preserved specimens, and dried (pinned) specimens which reflects the fact these institutions are also teaching facilities. Teaching display specimens (Figs. 24–26) are also common in many other British museums attached to universities (pers. obs.).

In addition to the first record of *A. chiricahua* outside of an United States museum, several specimens imported in fruit are present, with the specimen of *Tapinauchenius* sp. seemingly the first report in the literature of this genus being found in fruit importation. Importation of theraphosids in fruit has occurred for over a century, and some cases still occur today (e.g. Sherwood 2021; Sherwood & Gabriel 2021) and this topic will be discussed in the future in a comprehensive manuscript (Sherwood *et al.* in prep.).

Acknowledgements

We thank two anonymous reviewers whose comments improved the manuscript. DS also thanks Richard Gallon (United Kingdom) for informative insights on African theraphosid ontogeny and biogeography.

References

- ALBERTI, S. 2009: *Nature and culture. Objects, disciplines and the Manchester Museum*. Manchester: Manchester University Press.
- AUSSERER, A. 1871: Beiträge zur Kenntniss der Arachniden-Familie der Territelariae Thorell (Mygalidae Autor). *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien* **21**: 117–224, pl. I.
- BENOIT, P. L. G. 1965: Etudes sur les Barychelidae du Centre Africain (Araneae – Orthognatha) II. – Leptopelmatinae nouveaux. *Revue de Zoologie et de Botanique Africaines* **71**: 297–303.
- ARZUZA BUELVAS, D. 2018: The Murphy spider collection at the Manchester Museum: a valuable research resource for arachnologists. *Journal of Natural Science Collections* **6**: 48–59.
- BLACKWALL, J. 1833: Characters of some undescribed genera and species of Araneidae. *London and Edinburgh Philosophical Magazine and Journal of Science, series 3* **3**: 104–112, 187–197, 344–352, 436–443.
- EVENHUIS, N. L. 2007: *The insect and spider collections of the world*, online at: <http://hbs.bishopmuseum.org/codens>
- FUKUSHIMA, C. S. & BERTANI, R. 2017: Taxonomic revision and cladistic analysis of *Avicularia* Lamarck, 1818 (Araneae, Theraphosidae, Aviculariinae) with description of three new aviculariine genera. *ZooKeys* **659**: 1–185.
- GABRIEL, R. & SHERWOOD, D. 2019: The revised taxonomic placement of some arboreal Ornithoctoninae Pocock, 1895 with description of a new species of *Omothymus* Thorell, 1891 (Araneae: Theraphosidae). *Arachnology* **18**: 137–147.
- GABRIEL, R. & SHERWOOD, D. 2020: Revised taxonomic placement of some Mesoamerican *Psalmopoeus* Pocock, 1895, with description of three new species (Araneae: Theraphosidae). *Arachnology* **18**: 387–398.
- GALLON, R. C. 2002: Revision of the African genera *Pterinochilus* and *Eucratoscelus* (Araneae, Theraphosidae, Harpactirinae) with description of two new genera. *Bulletin of the British Arachnological Society* **12**: 201–232.
- GALLON, R. C. 2004: *Harpactirella leleupi* Benoit, 1965 is a junior synonym of *Idiothele nigrofulva* (Pocock, 1898) (Araneae, Theraphosidae, Harpactirinae). *Bulletin of the British Arachnological Society* **13**: 95–96.
- GALLON, R. C. 2010: On some southern African Harpactirinae, with notes on the eumenophorines *Pelinobius muticus* Karsch, 1885 and *Monocentropella* Strand, 1907 (Araneae, Theraphosidae). *Bulletin of the British Arachnological Society* **15**: 29–48.
- HAMILTON, C. A., HENDRIXSON, B. E. & BOND, J. E. 2016: Taxonomic revision of the tarantula genus *Aphonopelma* Pocock, 1901 (Araneae, Mygalomorphae, Theraphosidae) within the United States. *ZooKeys* **560**: 1–340.
- HIRST, A. S. 1909: On some new or little-known mygalomorph spiders from the Oriental Region and Australasia. *Records of the Indian Museum* **3**: 383–390.
- JACKSON, J. W. 1925: Obituary notice: Robert Standen. *Journal of Conchology* **17**: 225–235
- KARGON, R. H. 1977: *Science in Victorian Manchester. Enterprise and expertise*. Baltimore & London: Johns Hopkins University Press.
- KARSCH, F. 1880: Arachnologische Blätter (Decas I). *Zeitschrift für die Gesammten Naturwissenschaften, Dritte Folge* **5**: 373–409.
- LINNAEUS, C. 1758: *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species cum characteribus differentiis, synonymis, locis. Editio decima, reformata*. Holmiae: Salvius.
- LOGUNOV, D. V. & MERRIMAN, N. (eds.) 2012: *The Manchester Museum: window to the world*. London: Third Millennium.
- MELLO-LEITÃO, C. F. DE 1917: Notas arachnológicas. 5, Especies novas ou pouco conhecidas do Brasil. *Brotéria, Série Zoológica* **15**: 74–102.
- MELLO-LEITÃO, C. F. DE 1936: Étude sur les arachnides de Papudo et Constitution (Chili), recueillis par le prof. Dr Carlos E. Porter. *Revista Chilena de Historia Natural* **40**: 112–129.
- MENDOZA, J. I. & FRANCKE, O. F. 2017: Systematic revision of *Brachypelma* red-kneed tarantulas (Araneae: Theraphosidae), and the use of DNA barcodes to assist in the identification and conservation of CITES-listed species. *Invertebrate Systematics* **31**: 157–179.
- MENDOZA, J. & FRANCKE, O. 2020: Systematic revision of Mexican threatened tarantulas *Brachypelma* (Araneae: Theraphosidae: Theraphosinae), with a description of a new genus, and implications on the conservation. *Zoological Journal of the Linnean Society* **188**: 82–147.
- MURPHY, F. & MURPHY, J. 2000: *An introduction to the spiders of South-East Asia with notes on all the genera*. Kuala Lumpur: Malaysian Nature Society.
- NUNN, S. C., WEST, R. C. & VON WIRTH, V. 2016: A revision of the selenocosmiine tarantula genus *Phlogiellus* Pocock 1897 (Araneae: Theraphosidae), with description of 4 new species. *International Journal of Zoology* **2016**: 1–54.
- PHAM, D. S. & VU, Q. C. 2005: One new record of the family Theraphosidae (Arachnida: Araneae) for Vietnam. *Tap chí Sinh học* **27**: 11–15.
- PICKARD-CAMBRIDGE, F. O. 1897: Arachnida – Araneida and Opiliones. *Biologia Centrali-Americana, Zoology* **2**: 1–40, pl. 1–3.

- POCOCK, R. I. 1892: *Liphistius* and its bearing upon the classification of spiders. *Annals and Magazine of Natural History, decade 6* **10**: 306–314.
- POCOCK, R. I. 1895: On a new and natural grouping of some of the Oriental genera of Mygalomorphae, with descriptions of new genera and species. *Annals and Magazine of Natural History, decade 6* **15**: 165–184.
- POCOCK, R. I. 1897a: On the spiders of the suborder Mygalomorphae from the Ethiopian Region, contained in the collection of the British Museum. *Proceedings of the Zoological Society of London* **65**: 724–774, pl. 46–48.
- POCOCK, R. I. 1897b: Spinnen (Araneae). In W. Kükenthal (ed.), *Ergebnisse einer zoologische Forschungsreise in dem Molukken und Borneo. Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft* **23**: 591–629.
- POCOCK, R. I. 1898: On the Arachnida taken in the Transvaal and in Nyasaland by Mr W. L. Distant and Dr Percy Rendall. *Annals and Magazine of Natural History, decade 7* **1**: 308–321.
- POCOCK, R. I. 1901: Some new and old genera of S.-American Aviculariidae. *Annals and Magazine of Natural History, decade 7* **8**: 540–555.
- PURCELL, W. F. 1902: On the South African Theraphosidae or “Baviaan” spiders, in the collection of the South African Museum. *Transactions of the South African Philosophical Society* **11**: 319–347.
- REPORTS 1889–2003: *The Manchester Museum*. Manchester: University of Manchester.
- SCHMIDT, G. & KRAUSE, R. H. 1994: Eine neue Vogelspinnen-Spezies aus Mexico, *Brachypelmides klaasi* sp. n. (Araneida, Theraphosidae, Theraphosinae). *Studies on Neotropical Fauna and Environment* **29**: 7–10.
- SCHMIDT, G. 2004: Der Doppelgänger von *Acanthoscurria geniculata* (C.L. Koch, 1841) heist *Nhandu chromatus* sp. n. (Araneae: Theraphosidae: Theraphosinae). *Tarantulas of the World* **92**: 6–11.
- SHERWOOD, D. 2020: The theraphosid collection of the Grant Museum of Zoology and Comparative Anatomy (Araneae, Theraphosidae). *Newsletter of the British Arachnological Society* **147**: 7–8.
- SHERWOOD, D. 2021: On a theraphosid spider discovered as a stowaway in fruit from the Dominican Republic (Araneae: Theraphosidae). *Newsletter of the British Arachnological Society* **150**: 4–5.
- SHERWOOD, D. & GABRIEL, R. 2021: On a juvenile of the genus *Euathlus* Ausserer, 1875 found in the United Kingdom in imported blueberries from Chile (Araneae: Theraphosidae). *Revista Ibérica de Aracnología* **38**: 203–204.
- SIMON, E. 1887: Étude sur les arachnides de l’Asie méridionale faisant partie des collections de l’Indian Museum (Calcutta). I. Arachnides recueillis à Tavoy (Tenasserim) par Moti Ram. *Journal of the Asiatic Society of Bengal, Part II (Natural Science)* **56**: 101–117.
- SIMON, E. 1891: Liste des espèces de la famille des Aviculariidae qui habitent le Mexique et l’Amérique du Nord. *Actes de la Société Linéenne de Bordeaux* **44**: 307–339.
- SIMON, E. 1892: *Histoire naturelle des araignées. Deuxième édition, tome premier*. Paris: Roret: 1–256.
- SIMON, E. 1903: *Histoire naturelle des araignées. Deuxième édition, tome second*. Paris: Roret: 669–1080.
- SMITH, A. M. & JACOBI, M. A. 2015: Revision of the genus *Phormingochilus* with the description of three new species from Sulawesi and Sarawak and notes on the placement of the genera *Cyriopagopus*, *Lampropelma* and *Omothymus*. *Journal of the British Tarantula Society* **30**: 25–48.
- TESMOINGT, M., CLETON, F. & VERDEZ, J. M. 1997: Description de *Brachypelma annitha* n. sp. et de *Brachypelma hamorii* n. sp. mâles et femelles, nouvelles espèces proches de *Brachypelma smithi* (Cambridge, 1897) du Mexique. *Arachnides* **32**: 8–20.
- THORELL, T. 1869: On European spiders. Part I. Review of the European genera of spiders, preceded by some observations on zoological nomenclature. *Nova Acta Regiae Societatis Scientiarum Upsalien-sis, series 3* **7**: 1–108.
- THORELL, T. 1890: Studi sui ragni Malesi e Papuani. IV, 1. *Annali del Museo Civico di Storia Naturale di Genova* **28**: 5–421.
- VALERIO, C. E. 1979: Arañas terafósidas de Costa Rica (Araneae: Theraphosidae). II. *Psalmopoeus reduncus*, redescrpción, distribución y el problema de dispersión en terafósidas. *Revista de Biología Tropical* **27**: 301–308.
- VALERIO, C. E. 1980: Arañas terafósidas de Costa Rica (Araneae, Theraphosidae). I. *Sericopelma* y *Brachypelma*. *Brenesia* **18**: 259–288.
- VON WIRTH, V. 1991: Eine neue Vogelspinnenart aus Vietnam *Haplopelma schmidti* sp. n. (Araneae: Theraphosidae: Ormithoctoninae). *Arachnologischer Anzeiger* **18**: 6–11.
- WANG, J. F., PENG, X. J. & XIE, L. P. 1993: One new species of the genus *Selenocosmia* from south China (Araneae, Theraphosidae). *Acta Scientiarum Naturalium Universitatis Normalis Hunanensis* **16**: 72–74.
- WORLD SPIDER CATALOG 2022: *World spider catalog, version 22.5*. Bern: Natural History Museum, online at: <http://wsc.nmbe.ch>