The whip spider collection (Arachnida, Amblypygi) held in the Natural History Museum Vienna, Austria

Michael Seiter & Christoph Hörweg

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Abstract. We present data and remarks on the history and contents of the whip spider collection housed in the Natural History Museum of Vienna, Austria. The collection comprises a total of 167 specimens from 4 families, 10 genera and 27 species. It includes types of four species: Charinus ioanniticus (Kritscher, 1959), Damon brachialis Weygoldt, 1999, Phrynus parvulus (Pocock, 1902) and Paraphrynus mexicanus (Bilimek, 1867). Short notes on interesting objects and former curators are provided as well as an appendix with a list of species kept alive by Michael Seiter.

Keywords: museum’s collection history, NHMW, Reimoser, small arachnid order


Amblypygi, or so-called whip spiders, (order Arachnida) are tropical to subtropical organisms with special morphological traits among the arachnids. They are characterised by their dorso-ventrally flattened body and strong, raptorial pedipalps armed with spines. The first legs are extremely elongated and antenniform. These legs are very important during mating, hunting and antagonistic behaviour (Weygoldt 2000). According to Prendini (2011) recent Amblypygi currently include 5 families, 17 genera and 161 species; however Blick & Harvey (2011) mentioned 171 species, Seiter (2011) tallied 174 species and Harvey (2013) listed 186 species.

Worldwide, only a few scientists have recently worked regularly on whip spiders (e.g. Weygoldt 2000, 2002, Harvey 2003, 2007). Some studies focused on parthenogenesis (de Armas 2000, 2005, Weygoldt 2007), others compiled revisions of particular groups (Kraepelin 1895, Mullinex 1975, Garcia Acosta 1977, Quintero 1981, Weygoldt 1999, Rahmadi et al. 2011). In recent years the need for taxonomic data has increased because scientists have described numerous new species (Harvey & West 1998, de Armas & Teruel 2010, Rahmadi et al. 2010, 2011, de Armas 2012, Giupponi & Miranda 2012). For this reason it is necessary to know where the type material, and other specimens needed for comparison, are located. For the first time, precise data are here made available for the whip spiders in the collection of the Natural History Museum Vienna (NHMW).

Material and methods

The collection of Amblypygi (Arachnida) in the Natural History Museum Vienna (NHMW) was revised between April and June 2011. Acquisition (Fig. 1) and inventory books, as well as datasheets, were screened. A stereomicroscope (Wild/Leica M3Z) was used to investigate the specimens and photos were made with a Nikon DSII camera. The identity of specimens was verified in some cases and labels – if necessary – renewed. The labels usually include the name of the species, the date of collection and the location. Furthermore, the name of the collector and/or donator, the name of the person who determined the specimen (sometimes also the date of determination), the acquisition number and the inventory number are given (see Fig. 2). In many cases the sex had not been determined. This lack of information was tolerated to protect the structures of the genital operculum and surround-
ing areas. Most of the material is in good condition and can be used for scientific studies. All specimens, with a few exceptions that have been conserved dry, are stored in 70% ethanol (denatured). Some material might have been influenced by formalin at an earlier date, but no detailed information is available about this. Nomenclature follows Harvey (2003, 2013), since these works include the last complete listings.

Fig. 1: Extract from the acquisition book with the record (1871.IV) of the oldest amblypygi. Numbers 5–7: Neophrynus spp. from “Central America”. Neophrynus marginemaculatus has been transferred to Phrynus marginemaculatus C.L. Koch, 1840; Neophrynus palmatus has been transferred to Phrynus barbadensis (Pocock, 1894); Neophrynus whitei has been transferred to Phrynus asperatipes Wood, 1863.

Fig. 2: Typical labels in the collection of arachnids at the NHMW using the labels of the four type specimens of Amblypygi.
The oldest parts of the Arachnoidea collection itself may date back to the early 19th century; the oldest Amblypygi dates from 1871 (see Fig. 1). The curators responsible for the collection of arachnids, starting in 1878, were Carl Koelbel, Theodor Adensamer, Arnold Penther, Carl Attems, Otto Pesta, Eduard Reimoser, Hans Strouhal, Gerhard Pretzmann, Jürgen Gruber, Verena Stagl (for the collection history see Pesta 1940) and, today, the second author of this paper: Christoph Hörweg.

List of abbreviations: BMNH: British Museum (Natural History) in London, NHMW: Natural History Museum Vienna, sp.: species, leg. = legit (collected), det. = determinavit (determined), don. = (donated), ♂ = male / ♀ = female, ♂♂ = males / ♀♀♀ = females, HT = Holotype, LT = Lectotype, ST = Syntype

Results
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For whip spiders, relevant collectors/donators in former times were Theodor Adensamer, Dominik Bilimek and Eduard Reimoser (see Pesta 1940), and more recently Helmut Sattmann. Most of the material originated from Sri Lanka (as Ceylon), Mexico, Rhodes (Greece) and Oman. The specimens in the collection were formerly revised by Quintero in 1980 and Weygoldt in 1996 and 1998. Today, the whip spider collection holds a total of 167 specimens, including 27 species in 10 genera and 4 families (Tab. 1). It includes types of 4 species. Supplementary information about these species will be given below.

Type specimens
Charinidae Quintero, 1986
Charinus ioanniticus (Kritscher, 1959) (syntypes) = Lindosiella ioannitica Kritscher, 1959 (syn. by Weygoldt 1972)
This species was described by Kritscher 1959 as *Lindosiella ioannitica*, not only as a new species, but also within a new genus.

Location: GREECE, Island of Rhodes, City of Lindos. Found in crevices at the base and fundament of the so-called Johanniterburg, on 15th and 16th April 1959, leg. & det. Erich Kritscher

Inventory Number: NHMW 1427, 1

Remarks: In the original description, 8 specimens were mentioned, but there are in fact 9, including one prepared and positioned in the exhibition in the collection. The one in the exhibition is labelled as “Coty-
live in subterranean passages of the ancient city of Rhodes (a cave-like lifestyle) (Weygoldt 2005). This form of reproduction is very rare in whip spiders. It is known only in *Charinus acosta* (Quintero, 1983) (de Armas 2000, 2005) from Cuba. *C. ioanniticus* has also been reported from Turkey (Kovařík & Vlasta 1996, Weygoldt 2005, Seyyar & Demir 2007), Israel (Rosin & Shulov 1960) and Egypt (El-Hennawy 2002), but these populations all reproduce sexually.

**Phrynichidae** Simon, 1892

* Damon brachialis* Weygoldt, 1999 (holotype)

This species was described by Weygoldt (1999) in his revision of the genus *Damon*.


Inventory number: NHMW 1440, 1♂ (= HT)

Remarks: This specimen was initially determined (most likely by Kraepelin) as *Damon variegatus* (Perty, 1834) (see Fig. 2).

**Phrynidae** Blanchard, 1852

*Phrynus parvulus* (Pocock, 1902) (lectotype)

= *Tarantula marginemaculata yucatanensis* Werner, 1902 (syn. by Quintero 1981)

This specimen was revised and synonymised by Quintero (1981) in his overview of the amblypygid genus *Phrynus* in the Americas.

Location: BELIZE. Jukatan, 1902, leg. Schmarda & Werner

Inventory number: NHMW 1448, 1♂ (L T)

Remarks: Quintero (1981) mentions two male holotypes, one of *Phrynus parvulus* (Pocock 1902), with type locality in Tikal, Guatemala (specimen examined from BMNH), and this particular specimen from the NHMW, with type locality in Belize.

We consider this specimen as lectotype by inference of holotype by Quintero (1981), according to ICZN Art. 74.6.

*Paraphrynus mexicanus* (Bilimek, 1867) (syntypes)

= *Phrynus mexicanus* Bilimek, 1867 (transferred after Mullinex 1975)

= *Phrynus cacahuamilpensis* Herrera, 1892 (syn. by Garcia Acosta 1977)

These specimens were described by Bilimek (1867) as *Phrynus mexicanus*.

Location: In the cave Cacahuamilpa in Mexico sitting on rocks, 14.1.1866, leg. Bilimek, det. Kraepelin.

Inventory number: NHMW 1446, 2mm (ST)

Remarks: Another juvenile specimen was found several days later at the same locality (NHMW 1447). In the original description, however, only two adult males are mentioned.

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**Checklist of the collection**

The complete species list of the Amblypygi collection at the NHMW is summarized in Tab. 1.

**Conclusions**

The whip spider collection of the NHMW – with 167 specimens from 27 species – is considered to be a small one. Nonetheless, approx. 15% of the valid species of the world are deposited in the museum, and the collection has types of 4 species.

Note that the whip spider *Charinus ioanniticus* made it – as “object No. 59”, titled “European Première” – into the book Top 100 of the NHMW (Ott et al. 2012). It states: “As until the middle of the 20th century there was no indication that this group of spiders existed at all in Europe. When arachnologist Erich Kritscher discovered this sample of a new species hiding in a crack in the wall at the Castle of the Knights of St. John in Lindos in 1959, it was truly sensational news”. Interesting is also the comment on one (juvenile) specimen of *Charinus ioanniticus* (NHMW 1939) which was found dead in the spider net of *Pholcus* sp. (“von Pholcus gefesselt”).

We would also like to point out one fact that can cause taxonomic problems, using *Trichodamon princeps* Mello-Leitão, 1935 (NHMW 21842) as an example: The right basitibia of leg IV is not divided, but it is a principal character of this genus that it should be divided. All other morphological characters (two small tubercles above the cleaning organ on pedipalp distitarsus, ventral tibial spine I not bifid, etc.) are correct. This ‘non-divided’ part is caused by a formerly broken leg which was regenerated over several molts. As this is not uncommon in Amblypygi, it is worth mentioning here.

Note that many of the species mentioned here are being captive bred and are available for scientific research – see Appendix. Contact the first author for further information.

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Appendix

Checklist of the personal collection of Michael Seiter (as of 21.09.2013)

* means that from this species, individuals from more than one locality are available

**Charontidae (1)**

*Charon* cf. *grayi* (Gervais, 1842)*

**Phrynichidae (12)**

*Damon annulatipes* (Wood, 1869)

*Damon diadema* (Simon, 1876)

*Damon medius* (Herbst, 1797)*

*Damon tibialis* (Simon, 1876)

*Damon variegatus* (Perty, 1834)

*Euphrynichus amanica* (Werner, 1916)

*Euphrynichus bacillifer* (Gerstaecker, 1873)

*Phrynichus ceylonicus* (C.L. Koch, 1843)

*Phrynichus defersi arabicus* Simon, 1887

*Phrynichus exophthalmus* Whittick, 1940

*Phrynichus Jayakari* Pocock, 1894

*Phrynichus orientalis* Weygoldt, 1998

**Phrynidae (30)**

*Acanthophrynus coronatus* (Butler, 1873)

*Heterophrynus batesii* (Butler, 1873)

*Heterophrynus claphus* Pocock, 1903

*Paraphrynus aztecu*s (Pocock, 1894)

*Paraphrynus carolinac* Armas, 2012

*Paraphrynus cubensis* (Quintero, 1983)*

*Paraphrynus emaciatus* Mullinex, 1975

*Paraphrynus laevifrons* (Pocock, 1894)

*Paraphrynus mexicanus* (Bilimek, 1867)

*Paraphrynus raptator* (Pocock, 1902)

*Paraphrynus robustus* (Franganillo, 1930)*

*Paraphrynus* sp. (from Mexico)

*Paraphrynus viridiceps* (Pocock, 1893)*

*Phrynus asperatipes* Wood, 1863

*Phrynus barbadensis* (Pocock, 1894)*

*Phrynus damonidaeisis* Quintero, 1981*

*Phrynus decorates* Teruel & Armas, 2005*

*Phrynus eucharis* Armas & Pérez, 2002

*Phrynus exsul* Harvey, 2002

*Phrynus garrigoi* Armas, 1994

*Phrynus goesii* Thorell, 1889*

*Phrynus hispaniolae* Armas & González, 2002*

*Phrynus longipes* (Pocock, 1894)*

*Phrynus marginemaculatus* (C.L. Koch, 1840)*

*Phrynus noeli* Armas & Pérez, 1994

*Phrynus pulchripes* (Pocock, 1894)

*Phrynus* sp. (from Dominican Republic)

*Phrynus operculatus* Pocock, 1902

*Phrynus pinarensis* Franganillo, 1930*

*Phrynus whitei* Gervais, 1842*

**Charinidae (15)**

*Charinoides acosta* (Quintero, 1983)*

*Charinus australianus cavernicolus* Weygodt, 2006

*Charinus centralis* Armas & Ávila Calvo, 2000*

*Charinus cubensis* (Quintero, 1983)*

*Charinus ioanniticus* (Kritscher, 1959)

*Charinus neocaledonicus* Simon, 1895

*Charinus tomasmicheli* Armas, 2007

*Charinus wanlessi* (Quintero, 1983)

*Sax brachydactylus* Simon, 1892

*Sax buxtoni* (Gravely, 1915)

*Sax singaporae* Gravely, 1911

*Sax* sp. (from Indonesia, Bali)

*Sax* sp. (from Indonesia, Lombok)

*Sax* sp. (from Philippines)

*Sax yayukae* Rahmadi, Harvey & Kojima, 2010