



## Correspondence

### **Four new generic and 14 new specific synonymies in Pholcidae, and transfer of *Pholcoides* Roewer to Filistatidae (Araneae)**

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The diversity of Neotropical pholcids is extraordinary, but our knowledge about this diversity is still fragmentary (Huber 2000). This is especially true at the level of species, where many dozens, more probably hundreds, of species remain undescribed. Evidence for this high number comes from regional surveys that yielded dozens of species within relatively limited geographic areas (e.g. Silva 1996; Florez 1996), and from the low degree of species overlap between localities (e.g. in the Brazilian Atlantic Forest, B. A. Huber, unpublished data). Venezuela may well be among the nations with the highest diversity, and the recent increase in genus and species numbers partly reflects this situation.

However, most of South American pholcid diversity is restricted to pristine forests. Primary forests often house a dozen species within a five minutes walk; degraded secondary forests usually contain no more than one to four species; plantations, pastures and similar unnatural habitats are mostly entirely devoid of pholcid spiders. Several pholcids, however, have successfully followed humans around the globe, and some of them are regular inhabitants of houses and other man-made structures in the New World tropics. The most successful of these is probably *Physocyclus globosus* (Taczanowski, 1874), followed by *Micropholcus fauroti* (Simon, 1887), *Modisimus culicinus* (Simon, 1893), *Crossopriza lyoni* (Blackwall, 1867), *Artema atlanta* Walckenaer, 1837, and *Smeringopus pallidus* (Blackwall, 1858). Three further species of the family are widespread in more temperate regions, *Pholcus phalangioides* (Fuesslin, 1775), *Spermophora senoculata* (Dugès, 1836), and *Holocnemus pluchei* (Scopoli, 1763). Current knowledge strongly suggests that none of these genera originated in South America. Thus, any representative of these genera found in South America, especially in human buildings, should by default be suspected to be one of the species listed.

The present paper largely originated from such a default assignment. Three recent publications by González-Sponga (2004, 2006, 2007) give descriptions of two new genera and 14 new species that all immediately seemed to represent three of the synanthropic species listed above (*Physocyclus globosus*, *Micropholcus fauroti*, *Crossopriza lyoni*). Many of the drawings, even though simple and iconographic, clearly show the species-specific characters of one of the three candidates for senior synonymy; most specimens were collected in houses, the rest in or close to cities or villages.

However, it would seem utterly improbable that a single species be described under four to five different names in a single paper, with each "species" represented by adult males and females. While there are some cases where species limits are difficult to infer due to unusual genital variation within species or little variation among species, this is certainly not the case with the synanthropics. Human transport has not only facilitated the rapid spread of these species, but at the same time it ensures constant gene flow among populations, effectively impeding speciation and associated morphological divergence. Therefore, it seemed essential to consult the type specimens of González-Sponga's new species. This was not possible. Repeated letters since 1999 (the latest two in May 2008, including an invitation for coauthorship of the present paper) have never resulted in any response, and during a visit to Venezuela in 2002 I was not allowed to see his collection that is deposited in his house. Since I have not been able to see the types, the justifications for the synonymies below are more detailed than usual.

Finally, this note also deals with three monotypic genera described by Roewer (1960) and González-Sponga (2003) that are either synonymized or transferred to another family. In all these cases, the species status remains unclear and must await future taxonomic revisions of the respective genera. For the synanthropic species, only the literature with the most useful drawings is cited. For a complete list, see Platnick (2008).

## ***Crossopriza* Simon, 1893**

*Tibiosa* González-Sponga, 2006: 10-11; type species: *T. caracensis* González-Sponga, 2006; new synonymy.

## ***Crossopriza lyoni* (Blackwall, 1867)**

*Tibiosa caracensis* González-Sponga, 2006: 11-13; pl. 1, figs. 1-10; new synonymy.

*Tibiosa casanaimensis* González-Sponga, 2006: 14-16; pl. 2, figs. 1-9; new synonymy.

*Tibiosa coreana* González-Sponga, 2006: 17-19; pl. 3, figs. 1-9; new synonymy.

*Tibiosa guayanesa* González-Sponga, 2006: 20-22; pl. 4, figs. 1-9; new synonymy.

*Tibiosa moraensis* González-Sponga, 2006: 23-25; pl. 5, figs. 1-9; new synonymy.

*Justification of synonymies.* Three lines of evidence strongly support the synonymies: the characters used by González-Sponga (2006) to diagnose the species, the biogeography of *Crossopriza*, and the microhabitats of the “new” species.

*Characters.* Male palps, male chelicerae, and the female epigynum are the most important characters to diagnose species in Pholcidae. Most of González-Sponga’s (2006) drawings of these characters are fairly good and clearly indicative of *C. lyoni* (for drawings, see Millot 1946, Beatty et al. 2008). However, in only one palp is the bulb in its natural position (plate 3); in the others it is slightly to strongly (plates 1, 4) rotated which produces significantly different views. By manipulating a bulb under a dissecting microscope, all these views can easily be reproduced. All drawings of male chelicerae clearly show the two pairs of very distinctive apophyses that characterize *C. lyoni* but do not occur in this conformation in any other described or undescribed species seen by the author (see below).

Two of the epigyna in González-Sponga (2006, plates 1, 5) are fairly good representations of what is seen in adult *C. lyoni* females. Plate 2 probably shows a male genital area. The anterior structures shown are light spots in the otherwise black area in front of the epigastric furrow; they occur in variable shape and size in juveniles and adults of both sexes. The posterior structure probably represents the small brown plate in front of the male gonopore. The “epigynum” in plate 4 is probably from a juvenile specimen. In plate 3, figs. 8 and 9 are almost certainly from *Artema atlanta*. Both the round abdomen and the distinctive epigynum strongly hint at that species.

Most drawings of palpal endites are appropriate and show the usual variation (both true and artificial) seen in these—in pholcids otherwise taxonomically barely informative—structures. On plate 2, the endites are probably covered by a piece of dirt or an extrusion of internal fluids.

Carapace shape is rarely a distinctive character within pholcid genera, and all the variation shown in González-Sponga’s (2006) drawings can easily be attributed to small differences in the angle of view and to slight deformations of the soft lateral margins. Differences in the angle of view also explain the minimal differences shown in the positions of the eyes.

The sternum in *Crossopriza lyoni* has a straight posterior border between the joints of the fourth leg coxae. The lateral extensions shown by González-Sponga (2006) are in fact extensions of the carapace that reach ventrally on both sides of the petiole and almost contact the sternum. The median extension is in fact an unpaired sclerite on the petiolus. The borders of all these sclerites are often poorly visible due to underlying patterns of dark pigment in the soft tissue directly under the cuticle.

Finally, size measures are a difficult character to separate species. Except for one species, all male tibia 1 measures (10.1-15.8 mm) fall within the range of *C. lyoni*. The only exception (table 2) is clearly an error: in this male, leg 1 has the shortest tibia of all legs, while in fact it should have the longest (like the female and like all other “species”). In at least two cases (tables 2, 3, male legs 1) leg length calculations are wrong, further eroding confidence in these measurements.

*Biogeography.* *Crossopriza lyoni* is a cosmopolitan spider that has been collected in many countries including North, Central, and South America. I have seen specimens from many countries, including Argentina, Paraguay, Brazil, Nicaragua, USA (Huber et al. 1999), Venezuela (listed in Colmenares-García 2008), and Haiti (unpublished). Except for *C. lyoni*, *Crossopriza* is restricted to Africa north of the Equator and the Arabian Peninsula. I have seen congeneric species (described and undescribed) from Ivory Coast, Burkina Faso, Ghana, Equatorial Guinea, Chad, Congo DR, Sudan, Ethiopia, Yemen, and Oman. A taxonomic revision of this material is in preparation.

*Microhabitat.* Four of González-Sponga’s (2006) “new species” were collected in human buildings. One was additionally found under waist, one on the walls of a dry ravine. For the fifth species, no data on microhabitat are given. Human constructions and their surroundings are the typical habitat of *C. lyoni*.

### ***Micropholcus* Deeleman-Reinhold & Prinsen, 1987**

*Mariguitaia* González-Sponga, 2004: 64; type species: *M. divergentis* González-Sponga, 2004; new synonymy.

#### ***Micropholcus fauroti* (Simon, 1887)**

*Mariguitaia divergentis* González-Sponga, 2004: 64-67; pl. 1, figs. 1-9; new synonymy.

*Mariguitaia museorum* González-Sponga, 2004: 68-70; pl. 2, figs. 1-9; new synonymy.

*Mariguitaia neoespartana* González-Sponga, 2004: 70-72; pl. 3, figs. 1-9; new synonymy.

*Mariguitaia sucrensis* González-Sponga, 2004: 72-75; pl. 4, figs. 1-7; new synonymy.

*Justification of synonymies.* Two lines of evidence strongly support the synonymies: the characters used by González-Sponga (2004) to diagnose the species, and the microhabitats of the “new” species. Biogeographic data support the conclusions.

*Characters.* As for *Tibiosa* above, most of González-Sponga’s (2004) drawings of the palps are good enough to immediately hint at *M. fauroti* (drawings in Millot 1941, 1946, Deeleman-Reinhold & Prinsen 1987, Saaristo 2001, Beatty et al. 2008). The retrolateral views all show the characteristic dorsal hinged process of the procurus. No comparable structure exists in any other known pholcid. More difficult to interpret are the prolateral views, especially the bulbular projections. In *M. fauroti*, the bulb bears several very complex projections that are partly sclerotized and partly transparent. This, together with the small size (about 0.2 mm) makes these projections difficult to understand. Nevertheless, the drawings all show the principal lines seen in *M. fauroti*.

Among the drawings of the male chelicerae, only the one in plate 3 comes very close to the actual situation in *M. fauroti*, with one pair of distal and two pairs of proximal projections. In all other drawings, the lateral proximal pair is missing. These proximal apophyses are difficult to see unless the chelicerae are detached from the specimen. The drawing in plate 1 suggests that González-Sponga did not detach the chelicerae: it shows the chelicerae together with the palpal endites, erroneously fused into a single structure.

The epigynum of *M. fauroti* is an externally simple oval plate with a transparent knob on its posterior border. The most distinctive feature is a median crescent-shaped internal structure visible through the cuticle. This is shown in all epigynal drawings in González-Sponga (2004). Lateral structures of similar shape but variable size (as in plates 2 and 3) are more or less visible in most *M. fauroti* females.

All species diagnoses in González-Sponga (2004) include measurements, but in which sense these are supposed to be diagnostic is not stated. All measures are clearly within the range of *M. fauroti* (e.g. tibia 1 length: 22 males from around the world: 5.0-7.0 mm, 39 females: 4.4-5.6; unpublished data). The four males and three females measured by González-Sponga (2004) are in fact surprisingly similar (e.g. tibia 1 length, males: 5.7-6.2 mm, females: 4.8-5.1). As for carapace shape and eye positions, see *Tibiosa* above.

Finally, one surprising character emphasized by González-Sponga (2004) is the single trichobothrium on the male palpal tibia in all “new species”. All *M. fauroti* specimens (in fact all pholcids) I have ever seen have two trichobothria on the palpal tibiae. Since both trichobothria are equally easy (or difficult) to see, I have no explanation for this. A single trichobothrium was described by the same author for *Anomalaia* (now *Metagonia*) *mariguitarensis* (González-Sponga 1998); subsequent study has shown that it also has two trichobothria (Huber 2000).

*Microhabitat.* In the introduction, González-Sponga (2004) writes that *Mariguitaia* occurs “both in forests and in human dwellings” (my translation). However, three species were found in buildings only, the fourth under shrubs in the village of Mariguitar. No specimen was collected in a forest.

*Biogeography.* The original distribution of *Micropholcus* is difficult to reconstruct. Only one congener of the type species is known: *Micropholcus jacominae* Deeleman & van Harten, 2001 from Yemen. *Micropholcus fauroti* is widely distributed around the world (Deeleman & Prinsen 1987, Saaristo 2001). I have seen *M. fauroti* from many countries, including Venezuela (Península de Paraguaná: Coro), Cuba, the Dominican Republic, and the USA (unpublished). A further record for Venezuela (Zulia: Maracaibo) was recently published by Colmenares-García (2008). The fewer records for this species than for *C. lyoni* and *P. globosus* may partly be due to the small size and pale colour of this species.

### ***Physocyclus* Simon, 1893**

#### ***Physocyclus globosus* (Taczanowski, 1874)**

*Physocyclus boconoensis* González-Sponga, 2007: 56-57, 67, pl 1 figs. 1-9; new synonymy.

*Physocyclus borburatensis* González-Sponga, 2007: 58-60, 67, pl 2 figs. 1-9; new synonymy.

*Physocyclus cariacensis* González-Sponga, 2007: 60-62, 68, pl 3 figs. 1-9; new synonymy.

*Physocyclus guatirensis* González-Sponga, 2007: 62-64, 68, pl 4 figs. 1-9; new synonymy.

*Physocyclus monaguensis* González-Sponga, 2007: 64-66, 69, pl 5 figs. 1-9; new synonymy.

*Justification of synonymies.* Several lines of evidence strongly support the synonymies: the characters used by González-Sponga (2007) to diagnose the species, the biogeography of *Physocyclus*, the microhabitats of the “new” species, and genetic data of populations of *P. globosus* from several countries, including the type locality of *P. cariacensis* in Venezuela.

*Characters.* As in the cases above, most of González-Sponga’s (2007) drawings, even though minimalist, clearly point at *P. globosus* (see drawings in Huber & Eberhard 1997, Saaristo 2001, Beatty et al. 2008). Plates 1 and 5 show all the characteristic traits of the species: the shapes of procurus and “embolar division” (embolus with attached sclerite); the small cone-shaped projections frontally on the male chelicerae; the distinctive triangular epigynum with median frontal projection. In plate 2 the distal spine on the procurus seems to be missing (or it is drawn in a too proximal position). Plate 3 is the only one in which the labium is correctly drawn. In all others, the whitish-transparent frontal part is missing and only the brown posterior part is shown. The procurus in this plate differs because it is shown as a slightly dorsal view, and in the drawing of the chelicerae the tips of the palpal endites are included. In plate 4 the bulb is rotated away from its normal position and as a result the embolar division is shown in dorsal view. All other minor differences can either be easily explained by slightly different angles of view (e.g. carapace shape and eye positions, see above) or by natural variation. For example, the conical projections on the male chelicerae vary slightly in number and position, sometimes even resulting in asymmetry (e.g. fig. 2 in Huber & Eberhard 1997).

The measurements include so many errors that they are difficult to evaluate. For example, in table 1, legs 3 are longer than legs 4 in both males and females. In all other species (and in fact in all other known pholcids) legs 4 are considerably longer than legs 3. In the same table, the ratio of carapace width/length is 2.5 while in the respective figure it is about 1.1-1.3 (depending on whether the clypeus is included or not). In table 5, the male leg 1 has the shortest femur of all legs, while in fact it should have the longest (like the female and like all other species). In general, however, the data mostly fall within the range of a Costa Rican population of *P. globosus* (Huber 1996). For example, male tibia 1 in that study ranged from 7.9-12.3 mm (in González-Sponga’s specimens the range is 7.7-12.3); carapace width ranged from 1.5-2.2 mm (in González-Sponga’s specimens the range is 1.5-2.0).

*Biogeography.* The distribution of the genus *Physocyclus* given by González-Sponga (2007) (West Africa, tropical Asia, North, Central, and South America, Antilles) is in fact approximately the distribution of *P. globosus* (which actually includes all tropical regions of the world). All other congeners are restricted to North and Central America, ranging from Costa Rica to the USA. The only exception is the dubious *P. viridis* Mello-Leitão from Brazil, which – judging from the original drawings (the type is lost) – “is almost certainly misplaced” (Huber 2000: 149). During an expedition to Venezuela in 2002, we found *P. globosus* in several places, including Mariguitar, the type locality of *P. cariacensis*. As expected, we found no other species of *Physocyclus*.

*Microhabitat.* Five of González-Sponga’s (2007) “new species” were collected in human buildings. One was additionally found under rocks and between buttresses of trees in the village of Barburata. Human constructions and their surroundings are the typical habitat of *P. globosus*.

*Genetic data.* Gene sequence data of *P. globosus* from Venezuela (Mariguitar, the type locality of *P. cariacensis*), Guatemala, and the Comoro Islands (Astrin et al. 2006) showed that they are almost identical: 16S p-distances between specimens from Venezuela and other localities ranged from 0.3-1.7%. On the other hand, distances between *P. globosus* populations and an unidentified Mexican species ranged from 23.7-24.0% (Astrin et al. 2006; raw data unpublished).

## **Artema Walckenaer, 1837**

*Pholciella* Roewer, 1960: 42, monotypic; type species: *P. ziaretana* Roewer, 1960; new synonymy.

### **Artema ziaretana (Roewer, 1960) new combination**

*Pholciella ziaretana* Roewer, 1960: 42-43, figs. 13a-d.

*Type material.* 1 juvenile holotype, “Ziaret Ghourambar” (near Jalalabad), Afghanistan; under stones on hill, 5.i.1958, with original label “Pholciella n. g., ziaretana n. sp., 1♀ Typus A 436”, in Naturhistoriska Museet, Göteborg, Sweden, examined.

*Justification of synonymy.* The juvenile specimen shows all the characters typical for *Artema*: high globose abdomen, distinctive arrangement of large black marks on abdomen, large anterior median eyes, deep thoracic groove, large body size. The only similar genus in mainland Asia is *Tibetia* Zhang, Zhu & Song, 2006, a genus that itself may be a synonym of *Artema*. *Artema* is now composed of five nominal species, including two from Afghanistan (*A. magna* Roewer, 1960 and *A. ziaretana*), but the genus has never been revised and except for the cosmopolitan *A. atlanta* Walckenaer, all species are very poorly known.

## ***Pholcoides* Roewer 1960, Filistatidae, new family assignment**

*Pholcoides* Roewer, 1960: 40-41, monotypic; type species: *P. afghana* Roewer, 1960.

### ***Pholcoides afghana* Roewer, 1960**

Roewer 1960: 41-42, figs. 12a-d.

*Type material.* 1♀ (or juvenile?) holotype, “Qal’eh Lakou”, Kabul Valley, Afghanistan; 7.vii.1957, with original label “*Pholcoides* n. g., *afghana* n. sp., 1♀ Typus A 254”, in Naturhistoriska Museet, Göteborg, Sweden, examined.

*Note.* Several genera of Filistatidae occur in Asia, and *Pholcoides* may well be a synonym of one of them. However, being no expert for Filistatidae, it is certainly preferable to leave this problem to a future revisor of Filistatidae.

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Page 67, after line 39, the following section was inadvertently deleted due to a printer error:

***Coryssocnemis* Simon, 1893**

*Carupania* González-Sponga, 2003: 92; monotypic; type species: *C. tarsocurvipes* González-Sponga, 2003; new synonymy.

***Coryssocnemis tarsocurvipes* (González-Sponga, 2003) new combination**

*Carupania tarsocurvipes* González-Sponga, 2003: 92-94; figs. 1a-j.

*Type material.* Male holotype, 7♂ 41♀ paratypes from Venezuela, Estado Sucre, near Carupano (details in González-Sponga, 2003); not examined.

*Justification of synonymy.* *Carupania tarsocurvipes* clearly shows all the diagnostic characters of *Coryssocnemis* (Huber 2000): simple procurus with dorsodistal black spine; male chelicerae with short, pointed apophyses and pair of very distinctive apophyses that are bent upwards.

This species is very similar to *C. simla* Huber from Trinidad. Specimens from Cascada el Chorro (only about 50 km SW of Carupano and thus very likely conspecific with *C. tarsocurvipes*), have been sequenced and compared with unambiguous *C. simla* specimens from Trinidad (Astrin et al. 2006; assigned to *C. simla* by these authors based on morphological similarity). P-distances were unusually high for within-species comparisons, but at the same time lower than usual among-species distances (16S: 12.2%; COI: 8.3%), making this one of those cases where species delimitation was considered difficult by Astrin et al. (2006). Since this remains an ambiguous case, it seems preferable not to synonymize the two species until further studies at the level of populations are available.