Amblypygi (Arachnida) predated by bats (Chiroptera): when whipscorpion means whip spider

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Abstract: The unidentified Panamanian arachnids, recorded as whipscorpions, preyed on by the bats *Lophostoma sylvicolum* and *Trachops cirrhosus* (Chiroptera: Phyllostomidae) on Barro Colorado Island, Canal Zone, were later mentioned as Thelyphonida. Nevertheless, they actually were whip spiders, also known as tailless whipscorpions (order Amblypygi), possibly *Phrynus barbadensis* and/or *Paraphrynus laevifrons*. These two bat species are the only ones known as predators of amblypygids. An updated list of the vertebrates that prey on whip spiders is provided. Also, it is strongly suggested that, in order to avoid any confusions, vernacular names should always be accompanied by the proper scientific names.
Key words: Amblypygi, Thelyphonida, *Lophostoma sylvicolum*, *Trachops cirrhosus, Paraphrynus laevifrons*, *Phrynus barbadensis,* vinegaroons, Chiroptera, predation, Panama.

Amblypygi (Arachnida) depredados por murciélagos (Chiroptera): cuando *whipscorpion* quiere decir *whip spider*
Resumen: Los arácnidos panameños, reportados como vinagrillos (*whipscorpions*), depredados por los murciélagos *Lophostoma sylvicolum* y *Trachops cirrhosus* (Chiroptera: Phyllostomidae) en la isla de Barro Colorado, Zona del Canal, fueron más tarde citados como Thelyphonida, pero realmente eran amblipígidos (tambien llamados *whip spiders* y *tailles whipscorpions*; orden Amblypygi), posiblemente *Phrynus barbadensis* y/o *Paraphrynus laevifrons*. Estas son las dos únicas especies de murciélagos para las que se ha reportado el consumo de amblipígidos. Se incluye una lista actualizada de los vertebrados que depredan amblipígidos y, además, se recomienda enfáticamente que, para evitar posibles confusiones, los nombres vernáculos siempre vayan acompañados del correspondiente nombre científico.
Palabras clave: Amblypygi, Thelyphonida, *Lophostoma sylvicolum*, *Trachops cirrhosus, Phrynus barbadensis*, *Paraphrynus laevifrons,* Chiroptera, depredación, Panamá.

In a recent paper, Leal *et al*. (2019: 340, table 1), mentioned as Thelyphonida the unidentified Panamanian whipscorpions recorded by Bonaccorso (1979: 386, 387) as prey of the bat *Trachops cirrhosus* (Spix, 1823) (Chiroptera: Phyllostomidae: Phyllostominae). Indeed, as whipscorpion is one of the common names for members of the order Thelyphonida Latreille, 1804, Leal *et al*. (2019) mechanically assigned the recorded arachnids to this taxon.

The vinegaroons or whip scorpions (Thelyphonida) are represented in Central America for three genera: *Mayacentrum* Víquez & Armas, 2006, *Mimoscorpius* Butler, 1872, and *Valeriophonus* Víquez & Armas, 2005, but none have been recorded from Panama (Harvey, 2003; Armas, 2004). The first genus is only known from Nicaragua, El Salvador, Honduras, Guatemala and southwestern Mexico (Viquez & Armas, 2006; L. F. de Armas, unpublished data); the latter is monotypic and restricted to southwestern Costa Rica (Víquez & Armas, 2005); whereas *Mimoscorpius* is distributed in southwestern Guatemala (Víquez & Armas, 2006; Huff *et al*., 2008).

As at the present-day recognized, the genus *Mastigoproctus* Pocock, 1894 has a disjunct distribution: North America, South America and the Greater Antilles (Barrales-Alcala *et al*., 2018), being absent in Central America. Other genus, *Thelyphonellus* Pocock, 1894, is only known from northern South America (Giupponi & Vasconcelos, 2007).

As stated by Bonaccorso (1979: 38) the bats were collected in areas of the Canal Zone [mainly on Barro Colorado Island (9°10'N, 79°51'W)], Panama; consequently there are not doubts that their prey are from Panamanian localities. The Canal Zone and nearest areas has been intensely explored during more than a century, but no thelyphonids (whipscorpions) have been found. Therefore, it is evident that the recorded "whipscorpions" are actually whip spiders (order Amblypygi Thorell, 1883), also known as tailless whipscorpions (Breene *et al*., 2003). In Barro Colorado Island, at least *Phrynus barbadensis* (Pocock, 1894) (cited as *Phrynus gervaisii* by Le Clerc *et al*., 1987; Pérez, 1996 and Peretti, 2002) is well represented. Other possible amblypygid species in this area would be *Paraphrynus laevifrons* (Pocock, 1894).

Definitely, when Bonaccorso (1979: 386, 387), Humphrey *et al*. (1983: 287) and Reid (2009: 99) referred whipscorpions as preyed by *Lophostoma sylvicolum* d'Orbigny, 1836 (cited in the two first papers as *Tonatia sylvicola*) and *Trachops cirrhosus*, they really were referring to whip spiders (possibly *Ph. barbadensis* and/or *Pa. laevifrons*, according to Torres *et al*., 2019: 16). These are the only bats that have been recorded as predators of amblypygids (Table I).

Table I. Vertebrates recorded as predators of amblypygids (modified from Torres *et al*., 2019).

Predator	Prey	References
Solenodon cubanus Peters, 1861 (Mammalia: Soricomorpha)	*Paraphrynus robustus* (Franganillo, 1930) (Phrynidae)	Armas (1987: 1)
Lophostoma sylvicolum (Chiroptera: Phyllostomidae)	Unidentified Phryninae [cited as whipscorpions; possibly *P. barbadensis* (Pocock, 1894) and/or *Paraphrynus laevifrons* (Pocock, 1894)]	Bonaccorso (1979: 386, 404-405)
Trachops cirrhosus (Chiroptera: Phyllostomidae)	Unidentified Phryninae [cited as whipscorpions; possibly *P. barbadensis* and/or *Paraphrynus laevifrons* (Pocock, 1894)]	Bonaccorso (1979: 387)
Anolis bartschi (Cochran, 1928) (Reptilia: Dactyloidae)	*Phrynus* sp. [possibly *P. marginemaculatus* C. L. Koch, 1840 and/or *P. pinarensis* Franganillo, 1930].	García-Padrón *et al*. (2020: 181)
Varanus salvator (Laurenti, 1768) (Reptilia: Varanidae)	*Catageus dammermani* Roewer, 1928 (Charontidae)	Dammerman (1948: 495)
Eleutherodactylus zeus Schwartz, 1958 (Anura: Eleutherodactylidae)	*Phrynus* sp.	García-Padrón *et al*. (2021: 48)

The list of recorded predators of the whip spiders includes three mammals, two lizards, a frog, and ten arachnids, mainly scorpions and whip spiders (intraguild predation and cannibalism), but also spiders (Torres *et al*., 2019; this paper).

The moral of this story is that, for avoiding any possible confusion, vernacular names must be accompanied by its corresponding scientific names.

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