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# CANNIBALISM IN WHIP SPIDERS OF THE GENUS *PHRYNUS* SP. (ARACHNIDA: AMBLYPYGI) IN PANAMA: FIRST REPORT

# CANIBALISMO EN ARAÑAS LÁTIGO DEL GÉNERO *PHRYNUS* SP. (ARACHNIDA: AMBLYPYGI) EN PANAMÁ: PRIMER REGISTRO

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**ABSTRACT:** Intraguild predator-prey relationships have been widely documented in amblypygids except for cannibalism. This behavior, despite its few records, may be more frequent than known. We present the first case for Panama.

**KEYWORDS:** Competition, intraguild, predator, prey, territory.

**RESUMEN:** Las relaciones intragremio de depredador presa ha sido ampliamente documentada en amblipígidos a excepción del canibalismo, este comportamiento a pesar de sus pocos registros puede ser más frecuente de lo conocido, presentamos el primer caso para Panamá.

**PALABRAS CLAVE:** Competencia, depredador, intragremio, presa, territorio.

## INTRODUCTION

Amblypygi is an order of large predatory and nocturnal arachnids, including several species of which reside facultatively in caves and feed, generally, on arthropods (Chapin & Hebets 2016; Chapin, 2019), mollusks (Torres et al., 2019) as well as consume vertebrates (Owen & Cokendolpher, 2006), generating a relationship of intraguild predation; however, some conditions favor the occurrence of cannibalism, a behavior that has been poorly documented in whip spiders (Torres-Contreras, 2015; Chapin & Reed-Guy, 2017). Cannibalism can shape the demography of populations and the phenotypic development of individuals, favoring asymmetric cannibalism, predator larger than prey, to be more frequent with respect to symmetric cannibalism, predator, and prey of similar size (Chapin & Reed- Guy, 2017). Chapin (2015) describes the species *Phrynus longipes* as highly territorial and cannibalistic, while the other record of extant *Phrynus barbadensis* cannibalism (Torres-Contreras et al., 2015) in Colombia was documented as an observation during a field expedition.

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## RESULTS AND DISCUSSION

On March 2, 2024, between 11:40 p.m., an act of cannibalism among amblipigids (*Phrynus* sp.) was observed by Jesse Ashcroft and Euclides Alberto Rodríguez Núñez, in the town of the listening within the Portobelo National Park 9º 32´ 44´´ N 79º 40´13´´ W, 52 Meters above sea level (Figure 1A). The predator remained on the prey holding the entire body and feeding on the posterior-dorsal part of the cephalothorax of the prey. The event occurred at the base of the trunk of a strangler fig tree (*Ficus aurea*) near a ravine and a short distance away from the main road. The observation took 3 minutes, since during the photography process the predator released the prey and retreated, hiding inside a hole in the trunk of the tree where they were observed, approximately 1 meter from the ground. The dead specimen fell on a leaf of another plant that was next to the trunk of the tree where it was photographed in situ (Figure 1B); in this case the individuals were not collected. We consider predation as that of a female towards a male as suggested by McLean (2020) where they suggest that males generally have more elongated pedipalps and shorter spines than females. This type of cannibalistic interaction is frequent in caves due to the competition and density established in this type of habitat (Chapin & Reed-Guy, 2017), however, it is less frequent in open habitats, although it could be a more frequent phenomenon than we think is currently known (Armas, 2011; Torres-Contreras, 2015)

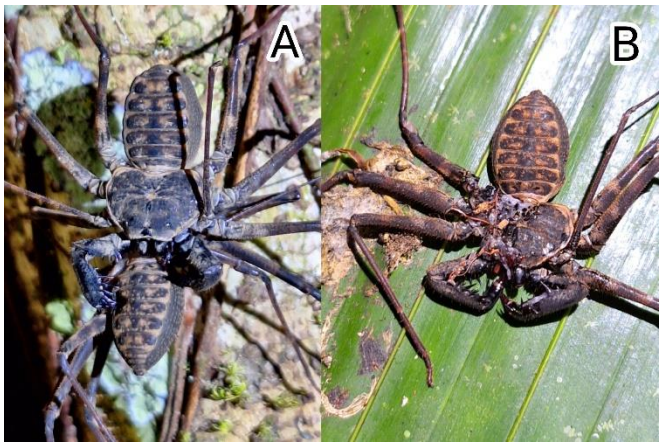


**Figure 1.** Canibalism of *Phrynus* sp. (A), Prey (B)

In this case we appreciate that neither of the two individuals involved in this record were molting, however, processes such as molting can favor predation, making the individual vulnerable during or immediately after being in this stage (Torres-Contreras, 2015).

The most extensive studies of the region (*P. longipes*) suggest that a preference for cannibalizing smaller prey of the same species is not observed, and that cannibalism seems to arise because of territorial competitions (Chapin & Hebets, 2016; Torres-Contreras et al., 2015) (Table 1). When a confrontation occurs between conspecifics in an individual's territory, a series of ritualized agonistic interactions are triggered that can culminate in cannibalism (Chapin, 2015; Chapin & Hebets, 2016; Chapin & Hill-Lindsay, 2016; McLean, 2020). In amblypygids, the combat usually does not come to physical contact, with the male with the longest pedipalps being the winner (Chapin & Reed-Guy, 2017) using only his antenniform legs and if there is physical combat, the loser will submit and may be cannibalized (McLean et al., 2020).

**Table 1.** known predation interactions between amblypygids.

| **Predator Invertebrates** | **Prey** | **References** |
|---|---|---|
| *Heterophrynus guácharo* Armas, 2015 | *Heterophrynus guacharo* (cited as *H. cervinus* Pocock, 1894) | Morales-Álvarez & González (1986) |
| *Phrynus longipes* (Pocock, 1893) | *Phrynus hispaniolae* Armas & Pérez, 2001 (cited as *Ph. leviil)* | Armas & Ramírez (1989) |
| *Phrynus barbadensis* | *Phrynus barbadensis* | Torres-Contreras *et al.* (2015) |
| *Heterophrynus caribensis* Armas et al., 2015 | *Phrynus barbadensis* | Torres et al., (2019) |

Behavioral assays carried out to investigate territorial behavior in *P. longipes* indicate that territorial cannibalism tends to occur between individuals of similar size (Chapin & Hill-Lindsay, 2016), placing this as symmetrical cannibalism (Chapin & Reed-Guy, 2017), although in laboratory conditions for this guild

asymmetric predation is considered the norm (Persson et al. 2004; Chapin & Hebets, 2016), it could be intuited that this type of predation relationship due to territoriality occurs between individuals of the same sex However, the known evidence is scarce, so further studies are required.

According to Réveillion et al. (2022) the positive allometry in the observed pedipalps of each species can be explained, at least in part, by this selection pressure that benefits individuals with larger pedipalps during territorial combats and could limit the risk of cannibalism.

This interaction has been poorly documented worldwide, being better studied in species that inhabit caves (Chapin & Reed-Guy, 2017) than in species from open habitats (Torres-Contreras et al., 2015), this record being the first for Panama and the Central American region.

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