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Presence of the genus *Hapalopus* Ausserer, 1875 (Araneae: Theraphosidae) in Honduras, and field observations on cannibalism

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Abstract: Field records of tarantula cannibalism that do not involve sexual cannibalism are scarce in the literature. We present here an event of cannibalism by an adult individual of *Hapalopus* sp. (Theraphosidae) on a conspecific juvenile. This event was recorded during a field trip in a fragment of broadleaf forest associated with banana farming areas. This is the first record of tarantula cannibalism in the Honduran forests, and also the first record of the genus *Hapalopus* Ausserer, 1875 from Honduras.
Key words: Araneae, Theraphosidae, ecology, microhabitat, natural history, Honduras.

Presencia del género *Hapalopus* Ausserer, 1875 (Araneae: Theraphosidae) en Honduras y observaciones de campo sobre canibalismo
Resumen: Son escasos en la literatura los registros de campo de canibalismo en tarántulas que no implican canibalismo sexual. Aquí presentamos un caso de canibalismo por parte de un individuo adulto de *Hapalopus* sp. (Theraphosidae) sobre un juvenil conespecífico. Este evento se registró durante una salida de campo en un fragmento de bosque latifoliado asociado a áreas de cultivo de banana. Este es el primer registro de canibalismo de tarántulas en los bosques hondureños y, además, el primer registro del género *Hapalopus* Ausserer, 1875 en este país centroamericano.
Palabras clave: Araneae, Theraphosidae, ecología, microhábitat, historia natural, Honduras.

Currently, almost 50,220 species of spiders grouped into 132 families are known (World Spider Catalog, 2022). All of them are carnivores, some specialized as web builders, and others live in burrows or are wandering species that use circumstantial refuges (Foelix, 2011; Platnick, 2020; Pérez-Miles, 2020a). The order Araneae, which includes spiders, is divided into three suborders: Mesothelae, Araneomorphae, and Mygalomorphae (Pérez-Miles, 2020a). The mygalomorph spiders of the Theraphosidae family, commonly known as tarantulas, are one of the most famous and diverse groups of arachnids, including the largest spider species in the world (Pérez-Miles, 2020a). The family Theraphosidae is represented by more than 1000 species, distributed in all terrestrial ecosystems, except Antarctica (Platnick, 2020; Pérez-Miles, 2020a).

Mygalomorph spiders comprise burrowing, terrestrial, and arboreal taxa with diverse ecological adaptations and natural histories (Foelix, 2011). They are distributed mainly in tropical and subtropical regions and occupy habitats from sea level to over 4,000 m and are also found in caves at depths of up to 800 m (Ferretti *et al*., 2018; Mendoza & Francke, 2018). Generally, males are easily observed wandering during the day in search of females, while adult females remain within their roosts most of the time, leaving the burrow only to capture prey and discard cocoons or food (Costa & Pérez-Miles, 2002; Álvarez *et al*., 2016; Pérez-Miles, 2020a).

This report is based on observations made during field surveys at 15:20 hours on 7 March 2020 in a fragment of broadleaf forest near the banks of the Ulúa River (Figure 1); near the banana crops of the CASMUL cooperative, in the northern region of Honduras (Figure 2), municipality of San Manuel, Cortés, with coordinates 15.343080, -87.888474, [32 m a.s.l.]. The cannibalism event was photographed and before concluding, the specimens were collected manually, using entomological forceps, and were preserved in 70% alcohol for subsequent laboratory examination, additionally, ecological data were noted. They were subsequently deposited in the scientific collection of the Natural History Museum of the National Autonomous University of Honduras, San Pedro Sula, Honduras. Identification was performed using the taxonomic keys for family (Jocqué & Dippenaar-Schoeman, 2007; Platnick, 2020) and genus (Pérez-Miles, 2020b; Gabriel & Sherwood, 2022). It should be noted that due to the pandemic situation in Central America, the adult specimen collected is currently under taxonomic review at the specific level.

Hapalopus sp.

Figs. 1-3.

MATERIAL EXAMINED: 1 ♂, San Manuel, Cortés, Honduras, 15.343080, -87.888474, 32 m a.s.l., 7 III 2020, fragment of broadleaf forest near the banks of the Ulúa River, collected by hand, T. López, K. Gonzales, A. Vindel, leg. (Deposited in MVS-I 00300). 1 juvenile, same locality data (deposited in MVS-I 00300).

DIAGNOSIS. According to Pérez-Miles & Perafán (2020), males of the species of the genus *Hapalopus* Ausserer 1875, can be easily distinguished by the present combination of characters such as: punctate or striped abdominal pattern (Figure 3), palpal bulb with shaped like a prolateral inferior keel ring, and retrolateral face of the palpal tibia with a process or field of spines; metatarsus I strongly curved.

FIELD OBSERVATIONS ON CANNIBALISM. We detected a male *Hapalopus* sp. (Araneae: Theraphosidae) on herbaceous vegetation and plantain remains, at ground level on a sandy substrate (Figure 2), with its chelicerae inserted into the ventral portion of the body of a conspecific juvenile (Araneae: Theraphosidae) (Figures 4A-B). When disturbed, the predator fled over the vegetation with the mygalomorph in its mouthparts, without releasing its prey (Figure 4C).

DISTRIBUTION. Species of the genus *Hapalopus* Ausserer 1875 occur in Brazil, Bolivia, Colombia, Guyana, Panamá, Venezuela (World Spider Catalog, 2022), Honduras* (Table I).

Information on predator-prey interactions is a source that allows us to better understand natural history data (Van den Burg, 2020; de Armas, 2020). The tarantulas are predators that can be considered generalists with powerful chelicerae capable of feeding on invertebrates to small vertebrates, occupying different microhabitats from the soil, the litter, and the shrub layer to the trees and/or under bark (Butler & Main, 1959; Pompozzi & Copperi, 2018; Lapinski, 2020; Andrade *et al*., 2022). The behavior of sexual cannibalism may be widespread among some arthropods, in which one member of a male-female pair that courts or copulates consume the other (Rabaneda-Bueno *et al*., 2008). However, records between individuals' conspecifics are scarce in the arachnid literature (Elgar, 1992; Foelix, 2011; Andrade *et al*., 2022).

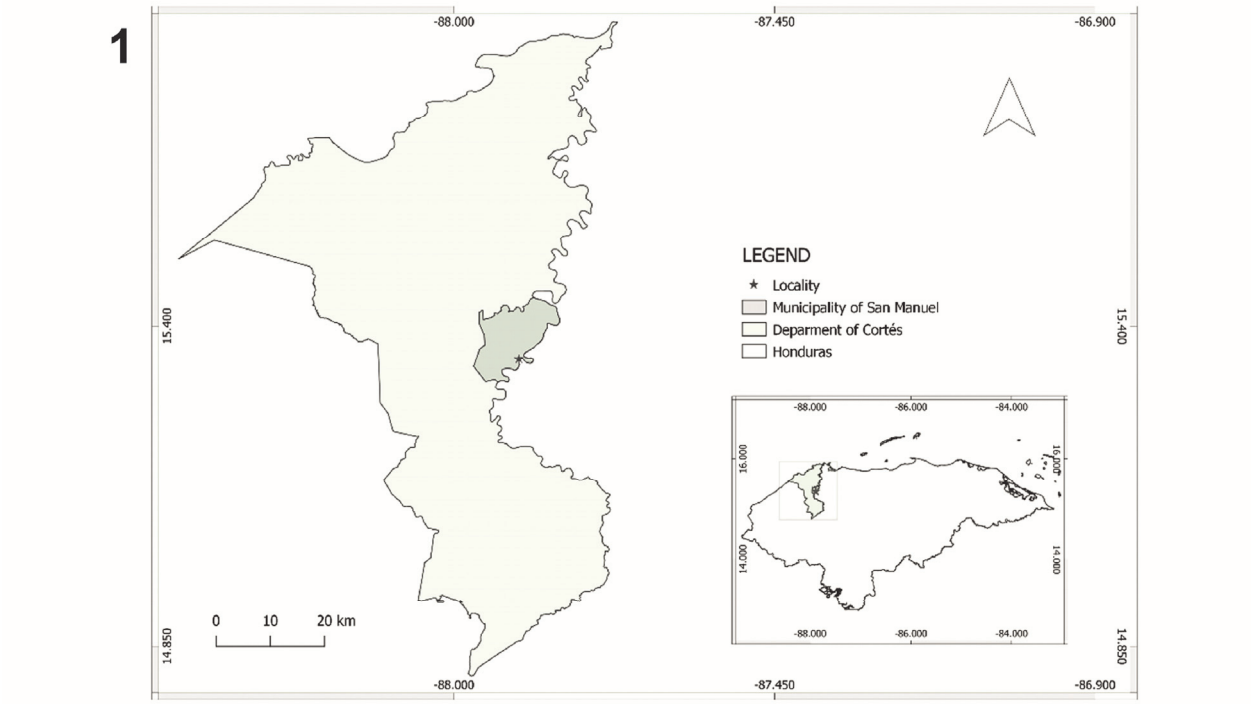












Fig. 1. Location of the study area where the cannibalism event was recorded San Manuel Cortés, Honduras. **Fig. 2.** Locality, Fragment of Tropical Humid Forest, associated with areas of banana cultivation, San Manuel Cortés, Honduras. **Fig. 3.** Habitus, male *Hapalopus* sp. (Theraphosidae) live from San Manuel, Cortés, Honduras. (Photo by Anibal Vindel). **Fig. 4.** Male of *Hapalopus* sp. (Theraphosidae) predating on a juvenile conspecific in a locality of the San Manuel, Cortés, Honduras. A, The capture of the prey. B, Immobilization captured prey. C, Eating captured prey.

Table I. Known distribution of the tarantula species of the genus *Hapalopus* Ausserer 1875 in America.

Species	Sex	Distribution	Reference
Hapalopus aymara Perdomo, Panzera & Pérez-Miles, 2009	♀♂	Brazil, Bolivia	Perdomo *et al*., 2009; Fonseca-Ferreira *et al*., 2017; World spider catalog, 2022
Hapalopus butantan (Pérez-Miles, 1998)	♀♂	Brazil	Pérez-Miles, 1998; Fukushima *et al*., 2005; World spider catalog, 2022
Hapalopus coloratus (Valerio, 1982)	♀	Panamá	Gabriel & Sherwood, 2022; World spider catalog, 2022
Hapalopus formosus Ausserer, 1875	♀♂	Colombia	Ausserer,1875; Schmidt, 2003; World spider catalog, 2022
Hapalopus gasci (Maréchal,1996)	♀	French Guiana	More & Bertani, 2020; World spider catalog, 2022
Hapalopus lesleyae Gabriel, 2011	♂	Guyana	Gabriel, 2011; World spider catalog, 2022
Hapalopus nigriventris (Mello-Leitão, 1939)	♀	Venezuela	World spider catalog, 2022
Hapalopus serrapelada Fonseca-Ferreira, Zampaulo & Guadanucci, 2017	♀♂	Brazil	Fonseca-Ferreira *et al*., 2017; World spider catalog, 2022
Hapalopus sp.	♂	Honduras	This study
Hapalopus triseriatus Caporiacco, 1955	♀	Venezuela	Caporiacco, 1955; World spider catalog, 2022
Hapalopus variegatus (Caporiacco, 1955)	♀	Venezuela	Gabriel, 2016; World spider catalog, 2022

In the absence of extensive data on the frequency of cannibalism in many families in nature, the data available from field studies, and from evidence accumulated from field experiments and laboratory studies in which habitat structure and densities of conspecifics and alternative prey are similar to natural conditions, suggest that non-sexual cannibalism may be an important foraging behavior in some families of spiders, especially wandering spider families (Edgar, 1969; Wise, 1993; 2006; Foelix, 2011). Similarly, non-sexual cannibalism suggests a connection between sexual and agonistic behavior, and some intraspecific interactions could play an important role in spatial distribution and could lead to behavioral adaptations to spatial distribution and could lead to behavioral adaptations of territoriality (Perez-Miles & Costa 1992; Ferretti & Pérez-Miles, 2011). Therefore, this case of cannibalism can be attributed to the defenseless condition of the juvenile.

Cannibalism and intraguild predation among conspecifics of *Hapalopus* sp. could be a more frequent phenomenon; however, data on the natural diet, behavior, and ecology of this group of arachnids in Honduras is still scarce. Finally, this recorded predation event expands the list of invertebrate predators on tarantulas and, also, is the first-time report of the genus *Hapalopus* Ausserer, 1875 in Honduras, representing the most northern locality for this genus that is mainly a South American taxon. In this sense, more studies are required to better understand the predator-prey interactions in tarantulas, as well as the ecological implication of these interactions in their respective populations.

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