

The first time: new record of *Ancylometes terrenus* (Araneae: Ctenidae) for the Amapá state, eastern Amazonia, with predation on giant tadpole of *Pseudis paradoxa* (Anura: Hylidae)

Matheus H. C. NASCIMENTO¹, Maria E. BARBOSA-FERREIRA¹,
Antonio D. BRESCOVIT², and Carlos E. COSTA-CAMPOS^{1,3,*}

1. Laboratório de Herpetologia, Departamento de Ciências Biológicas e da Saúde,
Universidade Federal do Amapá, Campus Marco Zero do Equador, 68.903-419, Macapá, AP, Brazil

2. Laboratório de Coleções Zoológicas, Instituto Butantan, Av. Vital Brasil, 1500, Butantã, 05503-900, São Paulo, SP, Brazil

3. Rede-BIONORTE, Programa de Pós-Graduação em Biodiversidade e Biotecnologia. 68902-280, Macapá, AP, Brazil

* Corresponding author: C.E. Costa-Campos, E-mail: dudueducampos@gmail.com

Received: 04 August 2023 / Accepted: 13 December 2023 / Available online: June 2024 / Printed: June 2024

Abstract. We report a case of predation by a larger ctenid spider, *Ancylometes terrenus*, on a giant tadpole of *Pseudis paradoxa*. This event was observed in a temporary pond at the Ariri community, north of the municipality of Macapá, state of Amapá, eastern Brazilian Amazonia. This is the first record of *A. terrenus* preying upon *P. paradoxa* and the first record of this spider for the state of Amapá. This observation provides an interesting addition to prey-predator interactions between anurans and spiders.

Keywords: eastern Amazonia, frog, neotropical region, wandering spider.

Anuran larval communities contribute largely to aquatic food webs as prey for a wide range of invertebrates and vertebrates (Wells 2007). Spiders of the genus *Ancylometes*, *Ctenus*, and *Thaumasia* have been recognized as one of the most important groups of tadpole predators in the Neotropics (Menin et al. 2005, Toledo 2005). Although most of these events are based on observations of single events, spiders are observed worldwide attacking and eating a wide variety of frogs (Menin et al. 2005, Nyffeler & Altig 2020).

Spider of the genus *Ancylometes* (Ctenidae) is the most common invertebrate amphibian predator, widely distributed in the Amazon region (Höfer & Brescovit 2000, Folt & Guyer 2021, Meneses et al. 2021). These spiders have nocturnal habits and are common in moist riverine vegetation in Neotropical forests. They live mainly on the ground, hiding during the day in natural crevices and ambushing prey at night (Höfer & Brescovit 2000, Menin et al. 2005, Figueiredo et al. 2020). *Ancylometes terrenus*

Höfer & Brescovit, 2000 was recorded so far for the Brazilian states of Acre, Amazonas, and Mato Grosso (<https://www.wandering-spiders.net/ancylometes/distribution>) and apparently, has a certain preference for *terra firme* habitats (Höfer & Brescovit 2000).

Frogs of the genus *Pseudis* (Hylidae) are unique among anurans in that body growth occurs mostly or entirely in the aquatic larval phase (Downie et al. 2009). *Pseudis paradoxa* (Linnaeus, 1758), known by its giant tadpoles, occurs in semi-permanent and permanent ponds in the Paraná and Amazon River basins (Garda et al. 2010), floating on the surface of the water, hidden amongst emergent vegetation (Bosch et al. 1996). Although the adults of this species have been reportedly preyed on by birds (González 1997, Prado 2003, Downie et al. 2009, Landgraf-Filho et al. 2019, Oliveira-Souza et al. 2020) and reptiles (Downie et al. 2009), no reports are available of predation on its tadpoles. Here, we document a predation attempt on *P. paradoxa* tadpole by *A. terrenus* in Amapá, Eastern

Amazonia.

We collected a sizeable wandering spider, *Ancylometes terrenus* and a *Pseudis paradoxa* tadpole in a temporary pond in a riverside community known locally as Ariri (0°17'58" N, 51°8'9" W) located north of Macapá, Amapá state, in eastern Amazonia, Brazil (Fig. 1) on February 09, 2023, at approximately 19:50 h. The

area is flooded by the black-water river Matapi and is composed of Amazonian savanna with large gallery forest areas and flooded forests (Silva et al. 2016). The tadpole is deposited in the Herpetological Collection of the Universidade Federal do Amapá (voucher HERPLAP 3911), and the spider in the Arachnological Collection of the Instituto Butantan (voucher IBSP 336786).

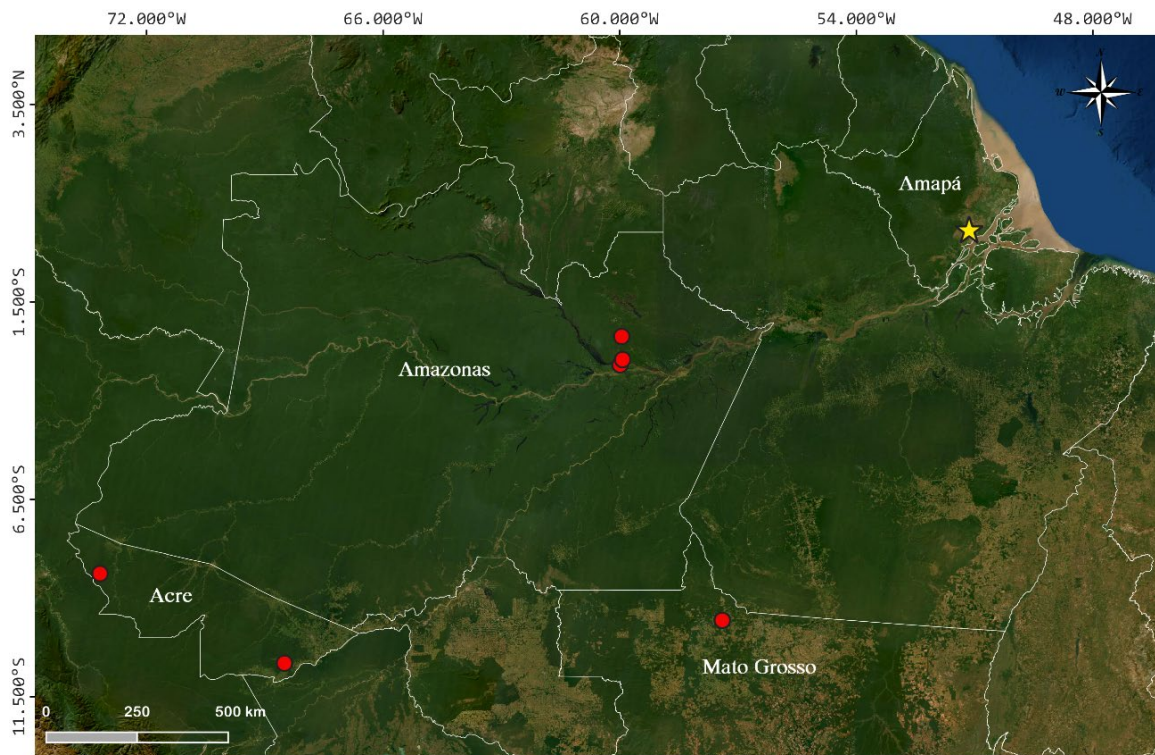


Figure 1. Map of the northern Brazil, with the previous known records of *Ancylometes terrenus*, represented by red circles (see Höfer and Brescovit, 2000). The new record in the state of Amapá reported here is represented by a yellow star (collected and recorded individual).

In a flooded area, we observed an adult female of *Ancylometes terrenus* preying upon a tadpole of the hylid species *Pseudis paradoxa*. The spider held its prey firmly with the chelicerae and pedipalps (Fig. 2). The tadpole had a tear in the ventral part near the belly, where the spider had inserted the chelicerae fangs. The tadpole was at Gosner stage 29 (Gosner 1960) and had a body length of 14.4 mm and a total length of 59.9 mm. The spider had a body length of 14.3 mm

(without the chelicerae).

Ancylometes terrenus was so far known to occur in the Brazilian states of Acre, Amazonas, and Mato Grosso (Höfer & Brescovit 2000); our record from Amapá is the first for eastern Amazonia (Table 1), extending the known distribution of this species by approximately 1.024 km to the east from the nearest locality at Smithsonian reserve at km 41, near Manaus, Amazonas state (2°22'39" S, 59°56'57" W).



Figure 2. *Ancylometes terrenus* (Ctenidae) holding a *Pseudis paradoxa* tadpole in a temporary pond in the Ariri riverside community, north of the municipality of Macapá, Amapá state, Brazil.

Table 1. Geographic coordinates (taken from the original work, Höfer & Brescovit, 2000) for the occurrence of *Ancylometes terrenus*.

Locality	Latitude	Longitude
Xapuri, Acre	10°39'12.48"S	68°30'13.50"W
Parque Nacional Serra do Divisor, Acre	8°22'58.27"S	73°10'53.26"W
Campus do Instituto Nacional de Pesquisas da Amazônia, Manaus, Amazonas	3° 5'40.93"S	59°59'21.94"W
Reserva Florestal Adolpho Ducke, Manaus, Amazonas	2°57'42.48"S	59°55'30.16"W
Smithsonian reserve at km 41 – PDBFF, Manaus, Amazonas	2°22'39.67"S	59°56'57.42"W
Apiacás, Mato Grosso	9°34'3.30"S	57°23'50.50"W
Riverside community "Ariri", Amapá (New record)	0°17'58.20"N	51° 8'8.88"W

This species was suspected to prefer *terra firme* habitats (Höfer & Brescovit 2000) but was observed in an inundated open area, preying on aquatic prey. However, only a few observations of this spider species from very few localities have been reported so far. Predation

observations are generally rare; therefore, hypotheses on prey or habitat preferences are on weak ground. Among invertebrates, generalist predators prey upon the anuran tadpoles, mainly by aquatic insects such as water bugs (Ceron et al. 2017). Predation on tadpoles is

known for wandering spiders of the pisaurid genus *Thaumasia* (Luiz et al. 2013, Machado & Lipinski 2014, Arrivillaga et al. 2019, Mamede & Nomura 2021). Several (Neotropical) pisaurids are known to prey on the water surface or underwater and are sometimes called fishing spiders. Despite the predation of frogs by *Ancylometes*, which has been reported previously (Figueiredo et al. 2020), the species of the genus are not considered fishing spiders.

Acknowledgments

We thank Instituto Chico Mendes de Conservação da Biodiversidade for the collection permits (ICMBio/SISBIO #48102-6). This study was supported by grants from the Conselho Nacional de Desenvolvimento Científico e Tecnológico – CNPq to ADB (grant PQ 303903/2019-8) and CECC (grant PQ 307697/2022-3)

References

- Arrivillaga, C., Oakley, J., Ebner, S. (2019): Predation of *Scinax ruber* (Anura: Hylidae) tadpoles by a fishing spider of the genus *Thaumasia* (Araneae: Pisauridae) in south-east Peru. *Herpetological Bulletin* 148: 41-42.
- Bosch, J., De la Riva, I., Márquez, R. (1996): The calling behavior of *Lysapsus limellus* and *Pseudis paradoxa* (Amphibia: Anura: Pseudidae). *Folia Zoologica* 45: 49-55.
- Ceron, K., Ferreira, V.L., Tomas, W.M., Santana, D.J. (2017): Battle of giants: Predation on giant tadpole of *Pseudis platensis* (Anura: Hylidae) by a giant water bug (Hemiptera: Belostomatidae). *Herpetology Notes* 10: 263-265.
- Downie, J.R., Ramnarine, I., Sams, K., Walsh, P.T. (2009): The paradoxical frog *Pseudis paradoxa*: larval habitat, growth and metamorphosis. *Herpetological Journal* 19: 11-19.
- Figueiredo, V.A.M.B., Melo, F.S., Tavares-Pinheiro, R., Brescovit, A.D., Costa-Campos, C.E. (2020): Predation on anurans by *Ancylometes rufus* (Araneae, Ctenidae) in Amapá state. *Herpetology Notes* 13: 397-399.
- Folt, B., Guyer, C. (2021): Habitat-dependent effects of predatory spiders on prey frogs in a Neotropical wet forest. *Journal of Tropical Ecology* 37(5): 214-221.
- Garda, A.A., Santana, D.J., São-Pedro, V.A. (2010): Taxonomic characterization of Paradoxical frogs (Anura, Hylidae, Pseudidae): geographic distribution, external morphology, and morphometry. *Zootaxa* 2666: 1-28.
- González, J.A. (1997): Seasonal variation in the foraging ecology of the Wood Stork in the southern Llanos of Venezuela. *The Condor* 99: 671-680.
- Gosner, K.L. (1960): A simplified table for staging anuran embryos and larvae with notes on identification. *Herpetologica* 16: 183-190
- Höfer, H., Brescovit, A.D. (2000): A revision of the Neotropical spider genus *Ancylometes* Bertkau (Araneae: Pisauridae). *Insect Systematics & Evolution* 31: 323-360.
- Landgraf-Filho, P., Aoki, C., Sousa, D.L.H.D., Souza, E.O.D., Brandão, R.A., Ávila, R.W., Oda, F.H. (2019): Escape or be preyed: new records and current knowledge on predators of Pseudinae frogs (Anura: Hylidae) in South America. *Acta Biológica Colombiana* 24(2): 397-402.
- Luiz, A.M., Pires, T.A., Dimitrov, V., Sawaya, R.J. (2013): Predation on tadpole of *Itapotihyla langsdorffii* (Anura: Hylidae) by the semi-aquatic spider *Thaumasia* sp. (Araneae: Pisauridae) in the Atlantic Forest, southeastern Brazil. *Herpetology Notes* 6: 451-452.
- Machado, M., Lipinski, V.M. (2014): Predation event on tadpole of *Scinax aromothyella* (Anura: Hylidae) by the fishing spider *Thaumasia velox* (Araneae: Pisauridae) in a rainforest of southern Brazil. *Herpetology Notes* 7: 517-518.
- Mamede, J.L., Nomura, F. (2021): *Dendropsophus minutus* (Hylidae) tadpole evaluation of predation risk by fishing spiders (*Thaumasia* sp.: Pisauridae) is modulated by size and social environment. *Journal of Ethology* 39: 217-223.
- Meneses, A.S.D.O., Corrêa, B.A.A.P., Fernandes, M.D.A.R., Lopes, B.E.P D.C., Citeli, N.K., Brandao, R.A. (2021): What size of Neotropical frogs do spiders prey on? *Biologia* 76: 919-932.
- Menin, M., Rodrigues, D.J., Azevedo, C.S. (2005): Predation on amphibians by spiders (Arachnida, Araneae) in the Neotropical region. *Phyllomedusa* 4 (1): 39-47.
- Nyffeler, M., Altig, R. (2020): Spiders as frog-eaters: a global perspective. *Journal of Arachnology* 48 (1): 26-42.
- Oliveira-Souza, A.E., Dias-Silva, G., Costa-Campos, C.E. (2020): Predation on the paradoxical frog *Pseudis paradoxa* (Anura, Hylidae, Pseudinae) by the great egret *Ardea alba* (Aves, Pelecaniformes, Ardeidae). *Herpetology Notes* 13: 965-967.
- Prado, C.P.A. (2003): *Leptodactylus chaquensis* (NCN), *Pseudis paradoxa* (Paradox Frog), and *Phrynohyas venulosa* (Veined Treefrog). Predation. *Herpetological Review* 34: 231-232.
- Silva, L.M.A., Lima, J.F., Tavares-Dias, M. (2016): Ictiofauna como indicadora da qualidade ambiental do Rio Matapi, Afluente do Rio Amazonas no estado do Amapá (Brasil). *Boletim de Pesquisa e Desenvolvimento Macapá, Embrapa Amapá*.
- Toledo, L.F. (2005): Predation of juvenile and adult anurans by invertebrates: current knowledge and perspectives. *Herpetological Review* 36(4): 395-400.
- Wells, K.D. (2007): *The ecology and behavior of amphibians*. Chicago, University Chicago Press.
- ****<https://www.wandering-spiders.net/ancylometes/distribution>, Accessed on 17 December 2023.