

Predation on *Pseudopaludicola falcipes* (Hensel, 1867) (Anura: Leptodactyliadae) by *Lycosa thorelli* (Keyserling, 1877) (Araneae: Lycosidae)

Nadia Kacevas^{1,2,3,*}, Noelia Gobel³, Álvaro Laborda⁴, and Gabriel Laufer³

Complex life cycle organisms play an important part in the connection of aquatic and terrestrial ecosystems. Post-metamorphic amphibians transfer resources to the terrestrial environment, where they play the role of predators and prey. Spiders are frequent components of the diet of amphibians (Hecnar and M'Closkey, 1997; Toledo, 2005; Toledo et al., 2007), but they are also opportunistic hunters and cases of anuran predation are well known (Menin et al., 2005; Maffei et al., 2010). Especially the cursorial spiders of the families Pisauridae, Sparassidae, Ctenidae, Theraphosidae and Lycosidae have been widely reported consuming tadpoles and anuran adults in the Neotropical region (Menin et al., 2005).

Pseudopaludicola falcipes (Hensel, 1867) is a common small anuran (average 14 mm) that inhabits shallow ponds in grassland areas in Paraguay, central and north-eastern Argentina, southern Brazil, and Uruguay (Langone et al., 2015; Dias da Silva et al., 2018). This species, classified as Least Concern by IUCN red listing criteria, is tolerant to disturbed habitats and is frequent in farmlands and grasslands, in aquatic reservoirs and creeks (Lavilla et al., 2004). Although its trophic ecology is scarcely known, the evidence suggests that it preys on small prey,

especially Collembola, Acari and Araneae (Duré, 2002). *Pseudopaludicola falcipes* reproduce in spring and summer, in shallow ponds and has a short larval phase (Laufer and Barreneche, 2008).

Lycosa thorelli (Keyserling, 1877) is a medium size wolf spider. It occurs in South American grasslands from Colombia to Uruguay (World Spider Catalog, 2019). Their peak of activity occurs in spring and summer (Rubio et al., 2007; Costa and Simó, 2014) coinciding with most of local anuran's activity periods.

The aim of the present work is to report a case of predation on an adult specimen of *P. falcipes* (11.1 mm SVL) by a sub-adult *L. thorelli* (13.0 mm SVL)



Figure 1. *Pseudopaludicola falcipes* being preyed upon by a subadult of the spider *Lycosa thorelli* on the vegetation near a lotic water body. Locality of Aceguá, Cerro Largo, Uruguay. Photograph by Gabriel Laufer.

¹ Departamento de Ecología y Biología Evolutiva. Instituto de Investigaciones Biológicas Clemente Estable. Av. Italia 3318, 11600, Montevideo, Uruguay.

² Departamento de Biodiversidad y Genética. Instituto de Investigaciones Biológicas Clemente Estable. Av. Italia 3318, 11600, Montevideo, Uruguay.

³ Área Biodiversidad y Conservación. Museo Nacional de Historia Natural, 25 de Mayo 582, Montevideo, Uruguay.

⁴ Sección Entomología, Facultad de Ciencias, Universidad de la República, Iguá 4225, Montevideo, Uruguay.

* Corresponding author. E-mail: kacevas.nadia@gmail.com

(Fig. 1). The observation was made on November 25th, 2018 at 20.05 in a grassland environment next to a lotic water body in Aceguá, Cerro Largo Department, north-eastern Uruguay (31°54'33.3"S 54°07'58.1"W, about 160 m. a. s. l.). Air temperature was 13.9°C and humidity 80%. Other anuran species found at this site were *Boana pulchella*, *Pseudis minuta*, *Scinax granulatus*, *S. squalirrostris*, *Julianus uruguayus*, *Dendropsophus sanborni*, *D. minutus*, *Leptodactylus latrans*, *L. latinasus*, *Odontophrynus americanus* and *Phyllomedusa iheringii* (Gobel *et al.*, 2013). The subadult spider was collected and reared in the laboratory until it moulted and reached adulthood. It was determined as a female of *L. thorelli* comparing genital structures indicated in Simó *et al.* (2002) and was deposited in the entomological collection of Facultad de Ciencias, Uruguay (FCE-Ar 9792). The *P. falcipes* specimen was deposited in the collection of Museo Nacional de Historia Natural de Montevideo (MNHN-9869).

Although there are previous reports of *Pseudopaludicola* species predated by terrestrial spiders, this is the first report for *P. falcipes*. This species share habitat with many wolf spiders so we can expect this type of trophic interaction to be frequent in nature. Menin *et al.* (2005) suggested that there should be an interaction of intra-guild predation, because both spiders and amphibians are predators and prey in certain ecosystems. However, small sized anurans, such as *P. falcipes*, mostly ingest acari and collembola (Duré, 2002), and we expect this interaction not to be symmetrical, with spider predation as reported in this note being more frequent.

References

- Costa, F.G., Simó, M. (2014): Fenología de las arañas epigeas de una zona costera del sur de Uruguay: un estudio bianual con trampas de caída. *Boletín de la Sociedad Zoológica del Uruguay* **23**: 1–15.
- Duré, M.I. (2002): *Pseudopaludicola falcipes* (NCM). *Diet. Herpetological Review* **33**: 12.
- Dias da Silva, J., Moser, C.F., Dutra-Araújo, D., Oro, N., Tozetti, A.M. (2018): Diet of *Pseudopaludicola falcipes* (Anura: Leptodactylidae) in southern Brazil. *Herpetology Notes* **11**: 911–913.
- Gobel, N., Cortizas, S., Mautone, J.M., Borteiro, C., Laufer, G. (2013): Predation of *Pseudis minuta* Günther 1858, by *Lethocerus annulipes* (Heteroptera: Belostomatidae). *Cuadernos de Herpetología* **27**: 63–63.
- Hecnar, S.J., M'Closkey, R.T. (1997): The effects of predatory fish on amphibian species richness and distribution. *Biological conservation* **79**: 123–131.
- Langone, J.A., Lavilla, E.O., De Sá, R.O., Cardozo, D. (2015): Comments on the type locality, type series, and geographic distribution of *Pseudopaludicola falcipes* (Hensel, 1867) (Amphibia, Anura). *Zootaxa* **4058**: 145–150.
- Laufer, G., Barreneche, J.M. (2008): Re-description of the tadpole of *Pseudopaludicola falcipes* (Anura: Leiuperidae), with comments on larval diversity of the genus. *Zootaxa*, **1760**: 50–58.
- Lavilla, E., Aquino, L., Kwet, A., Baldo, D. (2004): *Pseudopaludicola falcipes*. The IUCN Red List of Threatened Species 2004. Available at <http://www.iucnredlist.org/>. Last accessed on 19 January 2019.
- Maffei, F., Ubaid, F.K., Jim, J. (2010): Predation of herps by spiders (Araneae) in the Brazilian Cerrado. *Herpetology Notes* **3**: 167–170.
- Menin, M., de Rodrigues, D.J., de Azevedo, C.S. (2005): Predation on amphibians by spiders (Arachnida, Araneae) in the Neotropical region. *Phyllomedusa* **4**: 39–47.
- Rubio, G.D., Minoli, I., Piacentini, L. (2007): Patrones de abundancia de cinco especies de arañas lobo (Araneae: Lycosidae) en dos ambientes del Parque Nacional Mburucuyá, Corrientes, Argentina. *Brenesia* **67**: 59–67.
- Simó, M., Seguí, R., Pérez-Miles, F. (2002): The copulatory organs of the cryptic species *Lycosa thorelli* and *Lycosa carbonelli* and their hybrid progeny, with notes on their taxonomy (Araneae, Lycosidae). *Journal of Arachnology* **30**: 140–145.
- Toledo, L.F. (2005): Predation of juvenile and adult anurans by invertebrates: current knowledge and perspectives. *Herpetology Review*. **36**: 395–400.
- Toledo, L.F., Ribeiro, R.S., Haddad, C.F.B. (2007): Anurans as prey: an exploratory analysis and size relationships between predators and their prey. *Journal of Zoology* **271**: 170–177.
- World Spider Catalog (2018): World Spider Catalog. Natural History Museum Bern. Available at: <http://wsc.nmbe.ch>. Last accessed on 19 January 2019.