

# Predation by banana spiders (genus *Cupiennius*) on the treefrog *Dendropsophus carnifex* (Duellman, 1969) in Ecuador

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Among arthropods, spiders are one of the main opportunistic predators of amphibians (Hayes, 1983; Menin et al., 2005; Toledo, 2005). Spiders in the genus *Cupiennius* Simon, 1891 (Trechaleidae), known commonly as banana spiders, are distributed throughout central and southern America (Bart et al., 1988), where they are known predators of amphibians, including tadpoles and frogs (Szelistowski, 1985; Menin et al., 2005; Rios-Rodas et al., 2016). Anurans are important to the natural functioning of ecosystems and play essential roles in the food chain, acting as both important predators and prey (Whiles et al., 2006; Toledo et al., 2007), and natural history observations of predation upon anurans are relevant for a better understanding of their position in the food web. *Dendropsophus carnifex* (Duellman, 1969) is a small treefrog (maximum snout-vent length 32.5 mm) known from Ecuador. Its geographic range is quite small, although it is very common locally, and it is found at elevations of 1276–2456 m on the western slopes of the Ecuadorian Andes (Frost, 2020). The species is largely found in cloud forest but can also be found in disturbed areas, including plantations, gardens, and permanent or temporary ponds (Duellman 1969; Ron et al., 2019). We here report a case of predation involving *Dendropsophus carnifex* (Anura: Hylidae) and a banana spider.

The predation event occurred on 6 March 2020 at 22:00 h in Mindo, Pichincha Province, Ecuador (0.0420°S, 78.4517°W; elevation 1270 m). The observation was made near an artificial pond with tall grass, where *D. carnifex* are very abundant and found naturally. The spider was discovered in the open on

a plant leaf (around 1 m above the ground) as it was consuming a subadult treefrog (Fig. 1). Both specimens were collected and deposited in the collection of the Zoology Museum at the Pontificia Universidad Católica del Ecuador (QCAZ). Although we did not observe the capture itself, the frog was still alive during our initial observation and exhibited slow hind limb movements.

To the best of our knowledge, our observation is the first published report of banana spider predation on *D. carnifex*, although predation by this type of spider on other species in the genus *Dendropsophus* is well known (Table 1). Indeed, members of six different spider families are known predators of *Dendropsophus*, including Araneidae, Ctenidae, Lycosidae, Nephilidae, Pisauridae, and Trechaleidae (Lira et al., 2020). As reports from the literature show, ctenid spiders are the most common spider predator of these treefrogs.

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**Figure 1.** Predation of *Dendropsophus carnifex* by a banana spider, genus *Cupiennius*. Photos by Vincent Prémel.

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**Table 1.** Documented spider predation events on species in the treefrog genus *Dendropsophus*, adapted from Lira et al. (2020).

Frog Species	Spider Taxon	Reference
<i>D. branneri</i>	<i>Thaumasia</i> sp. (Pisauridae)	Baracho et al. (2014)
<i>D. branneri</i>	<i>Nephila clavipes</i> (Nephilidae)	Souza et al. (2019)
<i>D. branneri</i>	<i>Ctenus</i> sp. (Ctenidae)	Lira et al. (2020)
<i>D. brevifrons</i>	<i>Ancylometes rufus</i> (Ctenidae)	Pinto and Costa-Campos (2017)
<i>D. carnifex</i>	<i>Cupiennius</i> sp. (Trechaleidae)	This study
<i>D. ebraccatus</i>	<i>Cupiennius coccineus</i> (Trechaleidae)	Szelistowski (1985)
<i>D. ebraccatus</i>	Ctenidae	Donnelly and Guyer (1994)
<i>D. elegans</i>	<i>Ancylometes</i> sp. (Ctenidae)	Serafim et al. (2007)
<i>D. elegans</i>	<i>Phoneutria nigriventer</i> (Ctenidae)	Santana et al. (2009)
<i>D. haddadi</i>	<i>Parawixia kochi</i> (Araneidae)	Sena and Solé (2019)
<i>D. kamagarini</i>	<i>Phoneutria</i> sp. (Ctenidae)	Von May et al. (2019)
<i>D. leali</i>	<i>Ancylometes</i> sp. (Ctenidae)	Von May et al. (2019)
<i>D. leucophyllatus</i>	<i>Ancylometes</i> sp. (Ctenidae)	Jansen and Schulze (2008)
<i>D. melanargyreus</i>	<i>Ancylometes rufus</i> (Ctenidae)	Moura and Azevedo (2011)
<i>D. melanargyreus</i>	<i>Ancylometes concolor</i> (Ctenidae)	Fadel et al. (2019)
<i>D. microcephalus</i>	<i>Cupiennius salei</i> (Trechaleidae)	Ríos-Rodas et al. (2016)
<i>D. microps</i>	<i>Thaumasia velox</i> (Pisauridae)	Bovo et al. (2014)
<i>D. minutus</i>	<i>Dolomedes</i> sp. (Pisauridae)	Bastos et al. (1994)
<i>D. minutus</i>	<i>Ancylometes rufus</i> (Ctenidae)	Bernarde et al. (1999)
<i>D. minutus</i>	<i>Ancylometes concolor</i> (Ctenidae)	Bernarde et al. (1999)
<i>D. minutus</i>	<i>Ancylometes</i> sp. (Ctenidae)	Bernarde et al. (1999)
<i>D. minutus</i>	<i>Ancylometes rufus</i> (Ctenidae)	Menin et al. (2005)
<i>D. minutus</i>	<i>Dolomedes</i> sp. (Pisauridae)	Pombal jr. (2007)
<i>D. minutus</i>	<i>Ancylometes concolor</i> (Ctenidae)	Bocchiglieri et al. (2010)
<i>D. minutus</i>	<i>Thaumasia velox</i> (Pisauridae)	Bovo et al. (2014)
<i>D. minutus</i>	<i>Aglaoctenus oblongus</i> (Ctenidae)	Abegg et al. (2014)
<i>D. minutus</i>	<i>Thaumasia</i> sp. (Pisauridae)	Moura et al. (2019)
<i>D. minutus</i>	<i>Parawixia</i> sp. (Araneidae)	Moura et al. (2019)
<i>D. nanus</i>	<i>Thaumasia</i> sp. (Pisauridae)	Pramuk and Alamillo (2002)
<i>D. pseudomeridianus</i>	<i>Hogna</i> sp. (Lycosidae)	Folly et al. (2014)
<i>D. sanborni</i>	<i>Diapontia</i> cf. <i>uruguayensis</i> (Lycosidae)	Del-Grande and Moura (1997)
<i>D. sarayacuensis</i>	<i>Ancylometes rufus</i> (Ctenidae)	Rodrigues and Arruda (2007)
<i>D. sarayacuensis</i>	<i>Ancylometes</i> sp. (Ctenidae)	Von May et al. (2019)
<i>D. werneri</i>	Lycosidae	Oliveira et al. (2010)

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