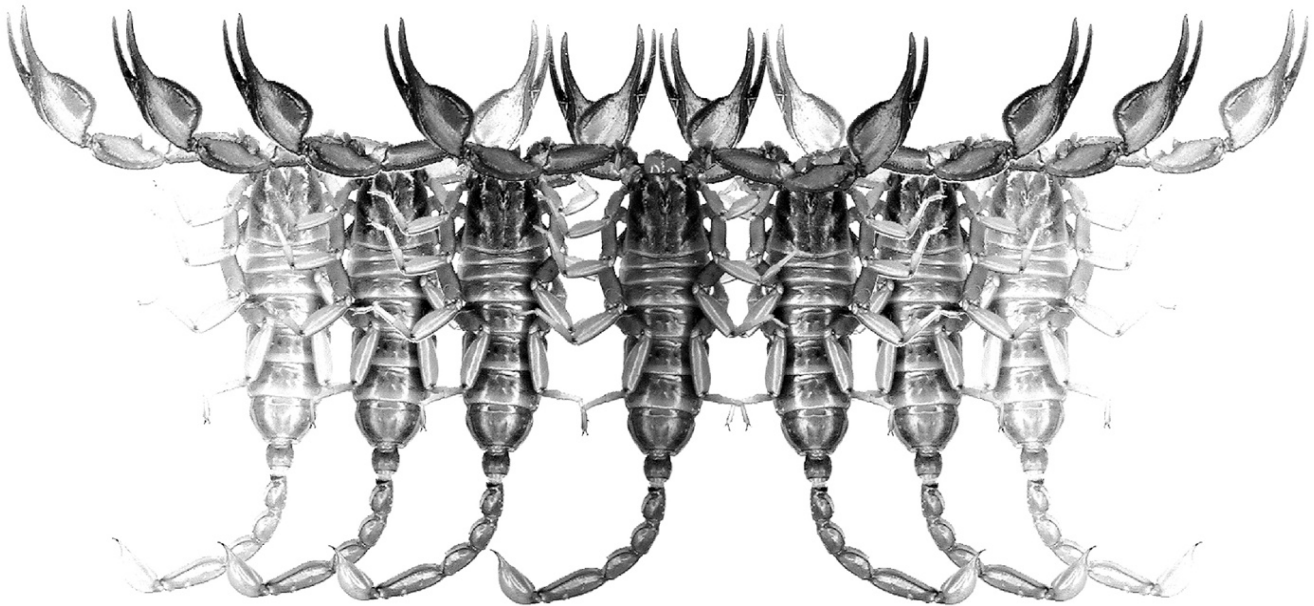


Euscorpius

Occasional Publications in Scorpiology



**Predation of *Ananteris* spp. (Scorpiones: Buthidae)
by ants and a social wasp (Hymenoptera: Formicidae,
Vespidae) in Panama, Central America**

Roberto J. Miranda, Luis F. de Armas & Roberto A. Cambra

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Predation of *Ananteris* spp. (Scorpiones: Buthidae) by ants and a social wasp (Hymenoptera: Formicidae, Vespidae) in Panama, Central America

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Summary

Two events of predation on *Ananteris* spp. were observed in the Parque Nacional Darién, Darién Province, Panama. The first case involved the social wasp *Agelaia centralis* (Cameron, 1907) (Vespidae); the second one, a ponerine ant *Leptogenys* cf. *cuneata* Latkce, 2011 (Formicidae). This is the first time that predation by a social wasp on a scorpion is observed. They also represent the first recorded predators for Panamanian *Ananteris* species.

Observations

Scorpions are predated by many vertebrates and arthropods (Polis et al., 1981; McCormick & Polis, 1990; Dupré, 2008; Lira et al., 2016; Rodríguez-Cabrera et al., 2020). Intraguild predation and cannibalism are an important factor in their population dynamics (Polis, 1981; Polis & McCormick, 1987). Among the hymenopterans, some ants (Formicidae) have been recorded as natural enemies of scorpions (Polis et al., 1981; Dupré, 2008), but there are no records of social wasps (Vespidae) predated on scorpions.

While some prey items of the Panamanian scorpions have been recorded (Miranda et al., 2015), data on their natural enemies are largely lacking. Social wasps belonging to the genus *Agelaia* Lepeletier, 1836 (Vespidae) predate on several orders of insects, spiders, and terrestrial egg masses of some tree-frogs, although they also feed on carrion, nectar, and pollen (Warkentin, 2000; Oliveira et al., 2010; Carpenter et al., 2012); their predation on scorpions has not been recorded previously.

We observed a social wasp *Agelaia centralis* (Cameron, 1907) eating an adult male of a small scorpion *Ananteris* sp. (cf. *leilae*) on a shrub, at 0.8 m above the ground, near Rancho Frío Station (08°02'N 77°43'W, approximately 100 m a. s. l.), on the trail to Cerro Pirre, Parque Nacional Darién, Darién Province, Panama, on August 02, 2002, at 09:00 hrs (Figs. 1–4). The wasp and its prey were collected with an entomological net and preserved in 75% ethanol.

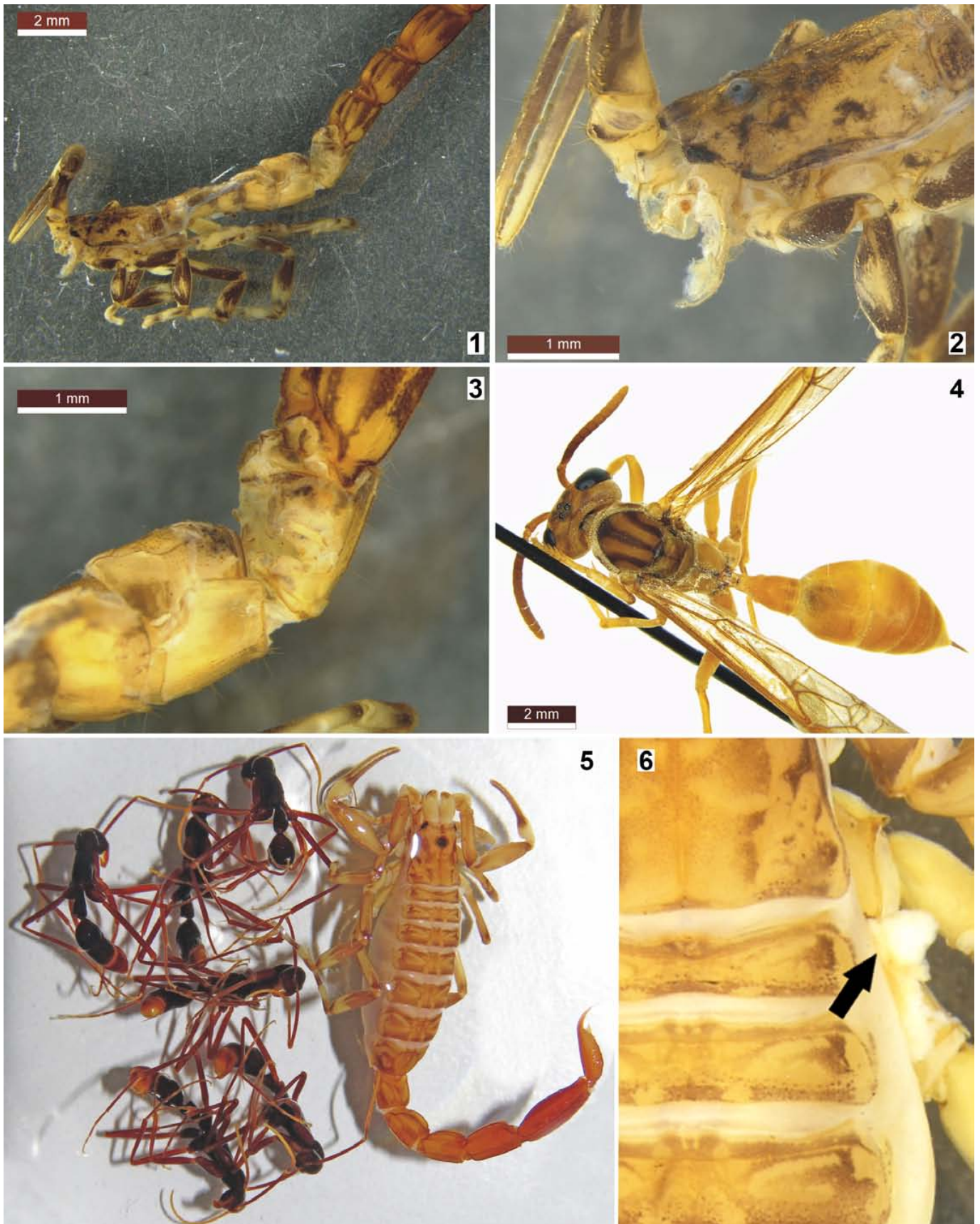
The second observed event of predation involved

ponerine ants. We observed an adult female of *Ananteris* sp. (cf. *platnicki*) that was carried, immobile, by six workers of *Leptogenys* cf. *cuneata* Latkce, 2011 (Formicidae: Ponerinae), in the forest litter, in Cana (07°45'27.6"N 77°39'03.7"W, 500 m a. s. l.), Parque Nacional Darién, Darién Province, on April 07, 1991, around 10:00 hrs (Figs. 5–6). The scorpion and the ants were collected and preserved in ethanol 75%.

Ponerine ants of the genus *Leptogenys* Roger are mostly of pantropical distribution (Bolton, 1995). The Neotropical *L. cuneata* is known from Peru, Ecuador (type locality), Colombia, and Panama (Bocas del Toro Province), but data on its feeding behavior are lacking (Latkce, 2011). It is known that some *Leptogenys* ants predate on arthropods (insects, millipedes, centipedes, isopods), although other invertebrates (planarians, snails) and rarely small frogs and snakes may be included in their diet (Wheeler, 1904; Lenko, 1966; Maschwitz et al., 1989; Steghaus-Kovac & Maschwitz, 1993; Peeters & De Greef, 2015).

Other ponerine ants, *Dinoponera quadricaps* Kempf, 1971 and *Ectatomma planidens* Borgmeier, 1939, have been recorded that prey on *Tityus stigmurus* (Thorell, 1876) and *Ananteris mauryi* Lourenço, 1982, respectively (Santos et al., 2017; Dionisio-da-Silva & Lira, 2019).

Army ants belonging to the subfamilies Ecitoninae and Dorylinae are well-known predators of several invertebrates and vertebrates. For example, the Neotropical *Eciton burchellii* (Westwood, 1842) have been recorded as predator of Amblypygi, Araneae, Opiliones, Schizomida, Scorpiones,



Figures 1–6: **Figures 1–4.** *Ananteris* sp. (cf. *leilae*). Adult male (1–3) from Panama, Darién Province, Cerro Pirre, Rancho Frío Station, preyed by a forager wasp *Agelaiia centralis* (4). Photo *ex situ*. **Figures 5–6.** *Ananteris* sp. (cf. *platnicki*) Adult female from Panama, Darién Province, Cana preyed by six workers of the ant *Leptogenys* cf. *cuneata* (5), detail of the damage (arrow) that the ants probably inflicted on the scorpion pleura (6). Photo *ex situ*.

Thelyphonida, and mites, whereas species of those arachnid orders, except Amblypygi, were also cited as prey of *Labidus praedator* (Smith, 1858) (Vieira & Höfer, 1994).

The only mention of natural enemies of Panamanian scorpions is that by E. Willis in Heatwole (1967: 17), who reported predation of unidentified species by the army ant *E. burchellii* in Barro Colorado Island. Therefore, the two herein recorded events of predation represent the first such known cases for Panamanian species of *Ananteris*. This is, also, the first record of a social wasp (Vespidae) predated on a scorpion.

Acknowledgments

Voucher specimens of both events of predation are deposited in the Museo de Invertebrados G. B. Fairchild (MIUP), Escuela de Biología, Facultad de Ciencias Naturales, Exactas y Tecnología, Universidad de Panamá, Panama City.

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