



Short Communication

First host record of *Epipompilus* (Hymenoptera: Pompilidae) from Brazil and discussion of prey carriage mechanism



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ABSTRACT

We register for first time the occurrence of *Epipompilus tucumanus* Evans, 1967 in Brazil, and record the spider *Ariadna boliviensis* Simon, 1907 as its host. The observations were made in the National Park of Chapada dos Guimarães, Mato Grosso, Brazil. The prey carriage mechanism is described for first time for this genus, and we provide a video showing this behavior.

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The spider wasp genus *Epipompilus* Kohl, 1884 comprises 51 species, 17 of which occur in the Neotropical Region and 34 in the Australian Region (Evans, 1953; Elliot, 2007). The biology of this genus is poorly known, and prey has been reported for only two species: *E. insularis* Kohl, 1884 (Pollard, 1982; Harris, 1987) and *E. platensis* (Roig-Alsina and Barneche, 2017). Six spider families have been reported up to now as *Epipompilus* host: Clubionidae, Desidae, Heteropodidae, Salticidae, Sparassidae and Segestriidae (Evans, 1972; Pollard, 1982; Harris, 1987; Shimizu, 1994; Roig-Alsina and Barneche, 2017).

Evans (1967) describes *Epipompilus tucumanus* from Tucuman and Jujuy (Argentina) in Chacoan biogeographical province, and also from San Esteban, Venezuela, at the Venezuelan biogeographical province. Evans (1976) added another locality from Buena Vista in Santa Cruz, Bolivia, at Rondonian biogeographical province.

On March 28, 2016, around 11 AM, at the National Park of Chapada dos Guimarães, MT, Brazil (−15.4069° −55.8239°, 610m asl.) (Fig. 1), two of us (B.M.T. and V.M.L.) observed a female of *E. tucumanus* (Fig. 2) carrying a cursorial spider on a trail inside the Cerrado *sensu stricto*. According to Morrone (2014) this site is located in the Cerrado biogeographical province, Chacoan sub-region, and Chacoan dominion. The climate of this

region is classified by Köppen into Tropical with dry winter (Aw) (Alvares et al., 2013). The wasp was collected and deposited in the Hymenoptera collection of the Museu de Biodiversidade (MuBio), Universidade Federal da Grande Dourados (UFGD), Mato Grosso do Sul State, Brazil (voucher number Hym-00191-P). The spider was determined by Dr. Antônio D. Brescovit, and deposited in the arachnid's collection of the Instituto Butantan, São Paulo State, Brazil (voucher number IBSP-211845).

We sent pictures of the specimen collected in Chapada dos Guimarães to Dr. Arturo Roig-Alsina for identification, and we compared it with the images of the holotype available at <https://mczbase.mcz.harvard.edu/guid/MCZ:Ent:31320>. We agree that the specimen is a variation of *E. tucumanus* Evans (1967). It differs from Evans's description by the followings characters: 1- the ivory-white spot is present only on the scape (Fig. 3), Evans (1967) comments that such spots are present on the first three antennal segments; 2- the mesoscutum is wholly black, without ferruginous midline posteriorly (Fig. 4); 3- the whitish band on the posterior margin of the pronotum has no rufous border (Figs. 3 and 4); 4- the first gastral segment and the basal 2/3 of tergum II are ferruginous, with the remainder black (Fig. 5); 5- the whitish markings on meso- and hindtibiae are reduced on the outer and the inner surface (Fig. 6); 6- the clypeus is 2.0× as wide as its median length (Fig. 7); 7- the middle interocular distance equals 0.51× width of the head (Fig. 7); 8- the lower interocular distance is equal to 0.9× of the upper one (Fig. 7); 9- unlike the holotype, our specimen has oval

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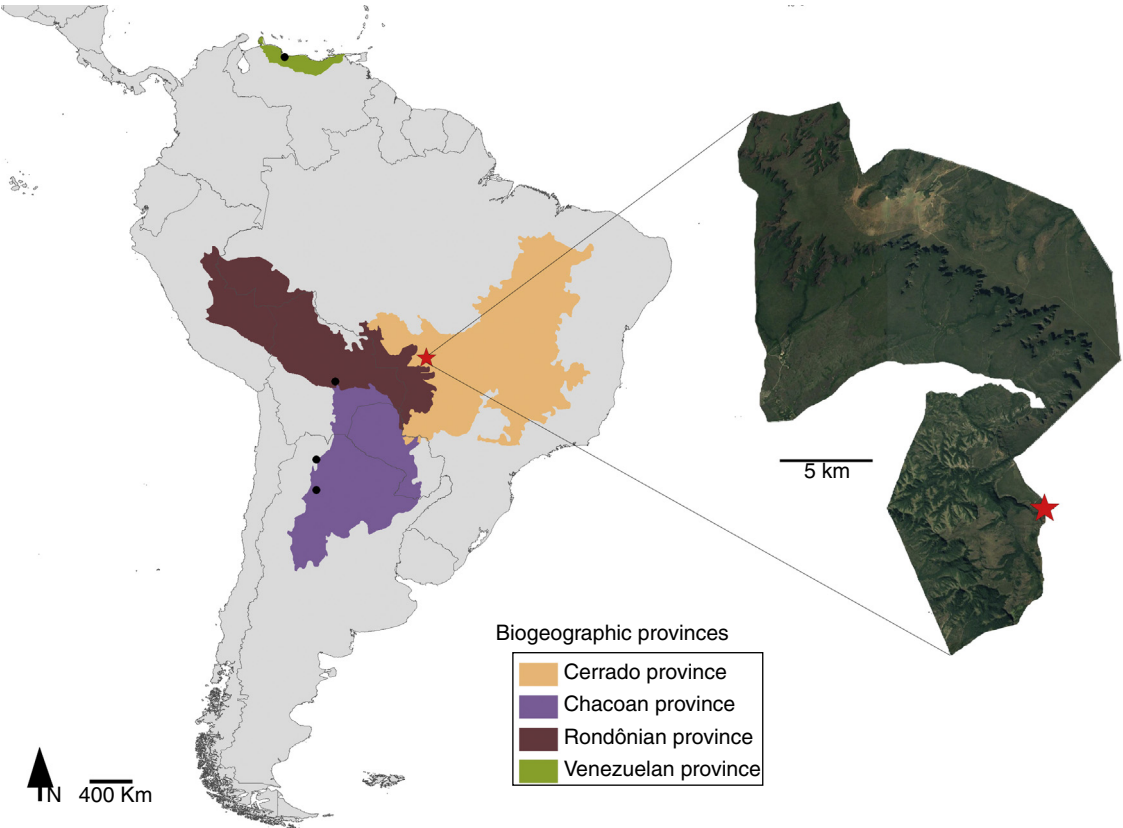


Fig. 1. Collecting localities of *Epipompilus tucumanus* Evans, 1967 in South America, with biogeographic provinces (Morrone, 2014), including the type locality and Evans (1976) record. Highlighting the Chapada dos Guimarães National Park limits, with our collecting point (red star).



Fig. 2. *E. tucumanus* ♀ lateral habitus.



Fig. 3. *E. tucumanus* ♀ dorsal view of head and thorax.



Fig. 4. *E. tucumanus* ♀ thorax in lateral view.



Fig. 5. *E. tucumanus* ♀ metasoma in dorsolateral view.



Fig. 8. *E. tucumanus* ♀ front ventral view of head.



Fig. 6. *E. tucumanus* ♀ hind tibia.



Fig. 9. *Ariadna boliviana* dorsal view.



Fig. 7. *E. tucumanus* ♀ frontal view of head.



Fig. 10. *Ariadna boliviana* ventral view.

white spots between the antennal lobes and eyes (Fig. 8). In view of these differences possibly the specimen represents an undescribed species.

The spider captured by *E. tucumanus* is an adult female of *Ariadna boliviana* Simon, 1907 (Araneae: Segestriidae) (Figs. 9 and 10), and this is the first prey record for *E. tucumanus*. The genus *Ariadna* (Segestriidae) was recently registered as host of *Epipompilus platenis* from Argentina (Roig-Alsina and Barneche, 2017). This spider is nocturnal, sedentary and usually lives in silk tubes constructed in trunk or rock holes (Capocasale, 1998; Grismado, 2008). *Ariadna* Audouin, 1826 occurs on all continents except Antarctica, and *A. boliviana* is known from Brazil, Bolivia, Suriname and Paraguay (Giroti, 2013).

Epipompilus tucumanus, as other spider wasps, uses the mandibles for prey carrying. The wasp drags the spider walking sideways and sometimes backwards, mostly keeping it by the spinnerets, but also can hold the prey by the legs or chelicera to overcome obstacles in the leaf litter like twigs and stones (Videos 1 and 2).

The prey carriage mechanism is similar in *Dipogon* Fox, 1897 (Pompilidae), in which prey carriage occurs backwards and sideways, also the way these wasps hold their prey (Evans and Yoshimoto, 1962; Kurczewski et al., 2017). Evans (1962) classifies this behavior as a variation of Mandibular Mechanism type One (M1): simply grasp the host with their mandibles on any convenient part of the body and drag it backwards into a hole. Genise (1980) comments that this variant hardly is a transition between different

kinds of prey carriage mechanisms, and that carriage behavior is related to the prey size and weight, proposing an exclusive variant for mandibular carriage mechanism type (Variant 5).

The maternal behavior varies significantly in *Epipompilus*. Pollard (1982) and Harris (1987) observed in New Zealand that *E. insularis* oviposits on the spider's body immediately after having paralyzed it (the paralysis is very light and short); no transportation to a nest was observed. After laying the egg the wasp moves away and the spider retakes its normal activities until the wasp larva kills it. Evans (1953) expressed the sequence of behavior stated for *E. insularis* by the formula VPO (Venari = to hunt; Pungere = to sting the prey; Ovum parere = to lay the egg) or VO, and expressed the opinion that such ethological sequences represents primitive conditions within Aculeata. In contrast, *E. tucumanus* showed a more complex ethological sequence that should be described as VPTOC (Venari; Pungere; Transferre = to carry the prey; Ovum parere; Claudere = to close the cell); this last formula applies to every species of Pompilidae that carries its host to a nest and encloses it in a cell. Evans (op. cit.) thought that VPTOC is the most primitive behavioral sequence within Pompilidae, and that VPO could be derived from VPTOC.

Conflict of interest

The authors declare no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at [doi:10.1016/j.rbe.2018.08.003](https://doi.org/10.1016/j.rbe.2018.08.003).

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