

First record of *Vitalius longisternalis* Bertani, 2001 (Araneae, Theraphosidae) in Argentina and notes on its natural history in Misiones province

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Abstract: This is the first record for the tarantula *Vitalius longisternalis* Bertani, 2001 in Parana and Araucaria Forests, Misiones province, northeastern Argentina. Specimens were found at Iguazú National Park and Urugua-í Wildlife Reserve. Data on its natural history is provided.

Key words: Tarantula, Parana, Araucaria Forest, distribution extension

Vitalius is a genus of theraphosidae tarantulas established by Lucas et al. (1993) by transferring the Brazilian species of *Pamphobeteus* Pocock, 1901. They are characterized by the male palpal bulb and spermathecae shape and by the male metatarsus closing over the tibial apophyses. Bertani (2001) revised and presented a cladogram for the relationships of the *Vitalius* species and also commented their zoogeography. Theraphosids housed in scientific collections are rare, perhaps because of the difficulty in collecting cryptic animals that live mainly in burrows or under rocks or logs and only under special conditions it is possible to collect more than a few individuals (Bertani 2001). Arguably, reports on geographic distribution are scarce and in the majority of papers, only the type localities are provided. In addition, some wide distributions reported for some species are based on a few misidentified individuals or on erroneous records. The *Vitalius* species occupy mainly forested regions and are mainly distributed in southeastern Brazil (Lucas et al. 1993; Bertani 2001). At present, two species are cited for Argentina, *V. paranaensis* Bertani, 2001 (Lucas et al. 1993; Bertani 2001) and *V. roseus* (Mello-Leitão, 1923) (Ferretti et al. 2015), both located northeastern at

the Parana and Araucaria Forests in Misiones province. In a recent survey to Misiones province, northeastern Argentina, we recorded individuals of *Vitalius longisternalis*.

Vitalius longisternalis (Figure 1a and 1b) was located in a recent campaign to the Parana and Araucaria Forests at northeastern Argentina, during 27 September – 4 October 2014, in two natural reserves: Iguazú National Park (25°31'05" S, 054°08'2.2" W) and Urugua-í Wildlife Reserve (25°58'33.1" S, 054°06'46.9" W). Spiders were located by active search and hand collection, during day and at night using head lamps. Collection permits (NEA 376 and FVS509) were provided by the APN (Administración de Parques Nacionales, Delegación Regional Noreste) and Ministerio de Ecología y Recursos Naturales Renovables de la Provincia de Misiones. This protected reserve has an area of about 3,243 ha and is located at the Parana Forest of higher Paraná (Figure 2). The vegetation is characterized by “lapachos” (*Tabebuia ipe* and *T. alba*), the “incienco” (*Myriocarpus frondosus*), the “petribi” (*Cordia trichotoma*) and “araucarias” (*Araucaria angustifolia*). Also there are many specimens of Lauraceae, such as *Nectandra megapotamica* and *N. lanceolata*; the “guatambú” (*Balfourodendrum riedelianum*) and “pindó” (*Arecastrum romanzofianum*). Most specimens were examined *in situ* at laboratory installations of the Urugua-í Wildlife Reserve and then released to their natural environment. Voucher specimens (two females, catalog numbers LZI 367, 368) are deposited at the arachnological collection of Laboratorio de Zoología de Invertebrados II, Universidad Nacional del Sur, Bahía Blanca, Argentina.

Individuals of *V. longisternalis* were identified following Bertani (2001). This species has been cited for the subtropical subcaducifolious forests of the states of



Figure 1. Adult female of *Vitalius longisternalis* Bertani, 2001, *habitus*, from Urugua-í Wildlife Reserve, Misiones province, Argentina. (a). Post-molt. (b). Pre-molt.



Figure 2. Parana forest where adults and juveniles of *Vitalius longisternalis* Bertani, 2001 where captured in Urugua-í Wildlife Reserve, Misiones province, Argentina.

Paraná and Santa Catarina, west of “Serra do Mar” in Brazil (Bertani 2001) (Figure 3).

Regarding the observation of some burrows of adult females of *V. longisternalis* we were able to estimate the spatial pattern or distribution of this species in a specific area. At the biological station of Urugua-í Wildlife Reserve, we studied an area of about 100 m × 80 m (approximately 8,000 m²). We recorded seven burrows and applied the methodology of the Average Nearest Neighbor Distance through the index “R” (Clark and Evans 1954). To evaluate the spatial distribution of *V. longisternalis* we measured the distance of one individual of the population and to the nearest neighbor (R) (Table 1). Then, the index R was calculated as follows:

$$R = \frac{O(\text{averd})}{E(\text{averd})}$$

Where O (averd) is the average distance of the observed distances, and E (averd) is the average distance of the estimated distances. An R index value among 0 – 1 indicates a cluster spatial distribution, whereas an index value higher than 1 but lower than 2 indicates a random spatial distribution.

Individuals of *V. longisternalis* can be easily distinguished from the other *Vitalius* species by the presence of a much longer than wide sternum (Bertani 2001) (Figures 4a and 4b). Morphometric from the sternum of adult females showed that measured 8.62 mm

Table 1. Distances matrix obtained by measuring burrows of *Vitalius longisternalis*.

	Burrow 1	Burrow 2	Burrow 3	Burrow 4	Burrow 5	Burrow 6	Burrow 7
Burrow 1	-						
Burrow 2	54.2	-					
Burrow 3	28.7	26.5	-				
Burrow 4	25.3	29.6	3.46	-			
Burrow 5	21.10	34.1	11.4	13.6	-		
Burrow 6	10.20	88.15	36.8	33.3	26.4	-	
Burrow 7	33	54.12	31.9	31.2	38.8	42.2	-

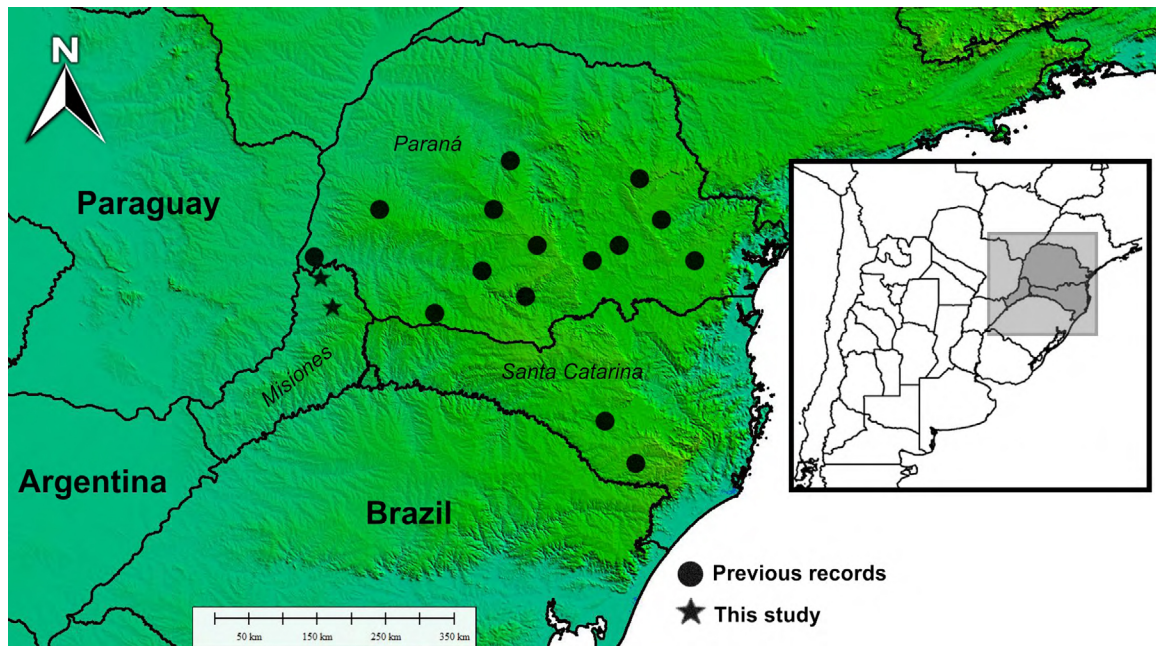


Figure 3. Map of the known distribution of *Vitalius longisternalis* Bertani, 2001 in Brazil (circles) and new records for this species in Argentina (stars).

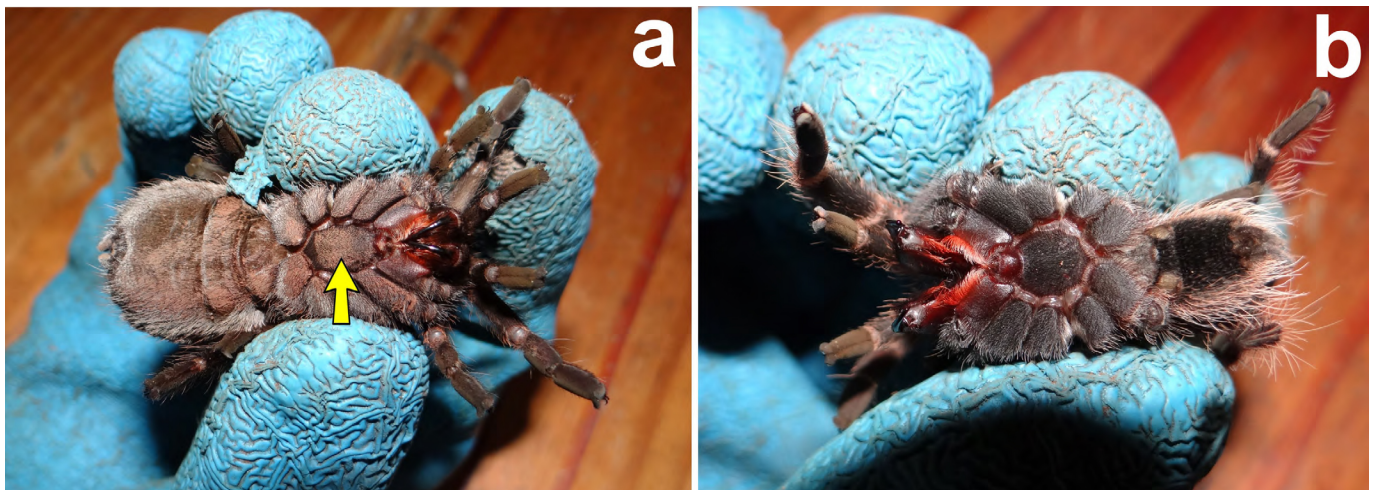


Figure 4. Sternum shape of adults of two *Vitalius* species. (A). *Vitalius longisternalis* Bertani, 2001 in ventral view showing the shape of the sternum (yellow arrow). (B). Adult female of *Vitalius paranaensis* Bertani, 2001 in ventral view.

± 0.52 long and $4.75 \text{ mm} \pm 0.71$ wide with a proportion of 1.81:1 ($n = 4$). Identification was also corroborated by examining the shape of the female's spermathecae (Figure 5). We only observed two juveniles under stones and one adult female of *V. longisternalis* inhabiting a deep burrow of this species at Iguazú National Park occurring in sympatry with *V. paranaensis* (Figures 6a and 6b). At Urugua-í Wildlife Reserve, we registered six small juveniles living under stones (Figures 6c and 6d) and fallen logs and seven adult females inhabiting burrows. The mean entrance diameter of the female's burrows (Figure 7a) were of $33.75 \text{ mm} \pm 6.6$ ($n = 7$), and the burrow length was of $293.33 \text{ mm} \pm 70.23$ ($n = 3$). No evidence of silk lining the burrow or closing the entrances were observed. The burrows were excavated cautiously thus the internal shape can be observed.



Figure 5. Spermathecae of a female of *Vitalius longisternalis* Bertani, 2001 in dorsal view.

Most burrows showed an almost vertical tube and then curved to an angle of about 90° that ended in a larger chamber (Figure 7b). The body size variation of females ($n = 4$) was: total length: 38.15mm \pm 1.66; carapace length: 13.57mm \pm 1.54; carapace width: 15.72mm \pm 1.44.

These new records highlight the need for a greater inventory effort in the Parana and Araucaria Forests, where less is known about the geographic distribution of most spider taxa. Inventories are especially high priority in this area, whose original extension has

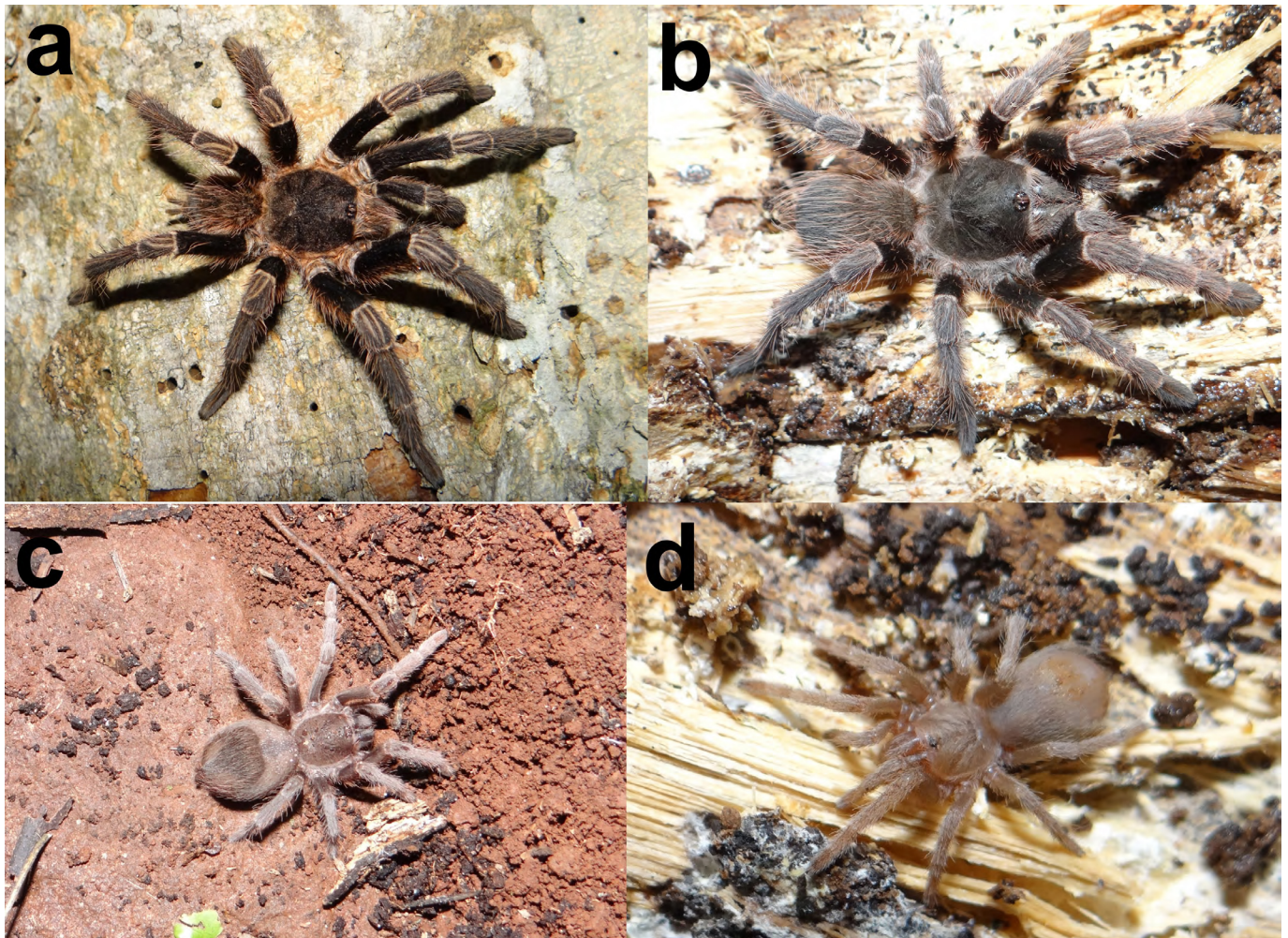


Figure 6. Sympatric species found at Iguazú National Park. (A). Adult male of *Vitalius paranaensis* Bertani, 2001, habitus. (B). Juvenile of *V. paranaensis*, habitus. (C and D). Juveniles of *Vitalius longisternalis* Bertani, 2001 found under stones or logs, habitus.

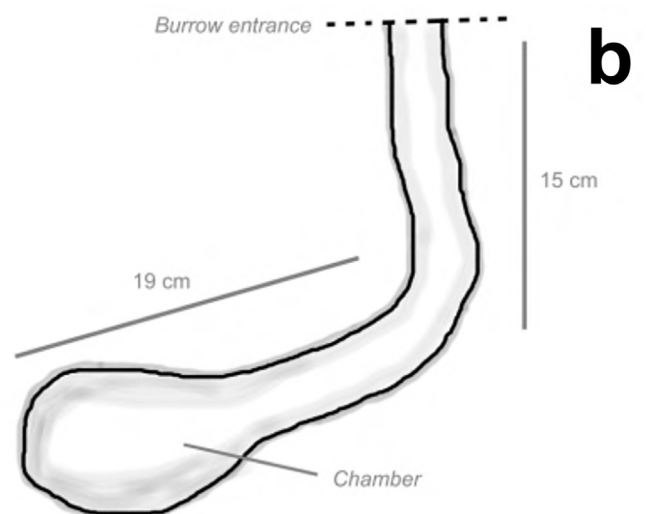


Figure 7. Burrows of *Vitalius longisternalis* Bertani, 2001. (A). Burrow entrance and a female waiting at night. (B). General burrow shape of a female in lateral view, excavated at the field.

been severely reduced due to a variety of historical anthropogenic impacts (Ribeiro et al. 2009). The records of *V. longisternalis* in Misiones province comprise a new national record and extends its distribution to western Parana and Araucaria Forests in Argentina, where it was not previously known to occur and now the account of species from *Vitalius* for Argentina is: *Vitalius paranaensis*, *V. roseus* and *V. longisternalis*. It likewise highlights the important role played by protected areas in conserving tarantulas.

The index value obtained for *V. longisternalis* was $R = 0.686$ and could be indicating a clustering spatial arrangement of the burrows. Although, we did not estimate the availability, abundance and spatial arrangement of the suitable sites for burrowing construction, a possible explanation of the aggregation could be that the poor dispersal capabilities of the spiderlings restrict them to settle into high density groups, composed primarily of siblings (Reichling et al. 2011). Moreover, the presence of young burrows observed in this area where adults are common provides additional support for this hypothesis (Ferretti et al. 2014), suggesting that the primary dispersal mode of this species is by walking.

The destruction of natural habitats of these spiders, their diversity, restricted distributions as well as their commercialization could be enough reasons to include species of *Vitalius* in the IUCN Red List. Furthermore, the record of populations of *V. longisternalis* in protected areas may help not only in the conservation of tarantulas' species but in maintaining the biodiversity of a highly threatened area which shows great ecological importance to invertebrate conservation as a whole.

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