

## Article

# First record of the tarantula genus *Bumba* (Araneae: Theraphosidae) from Bolivia, with the description of a new species

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Received 17 June 2021

Accepted 2 September 2021

Published 29 October 2021

DOI 10.1590/1678-4766e2021025

**ABSTRACT.** A new species of *Bumba* Pérez-Miles, Bonaldo & Miglio, 2014 is described and illustrated. This species comprises the first record of the genus for Bolivia. *Bumba paunaka* sp. nov. differs from the other species in the genus in the black longitudinal band on abdomen, in the long and slender embolus of the palpal bulb and in the thin and long subapical spine of the retrolateral branch of tibial apophysis. Females additionally differ in the spermathecal morphology. Finally, a distribution map for all known species of *Bumba* is presented.

**KEYWORDS.** Taxonomy, spiders, Mygalomorphae, Theraphosinae, distribution.

The genus *Bumba* Pérez-Miles, Bonaldo & Miglio, 2014 was originally described by PÉREZ-MILES (2000) under the name *Iracema*. Since this name was preoccupied by the Pisces *Iracema* Triques, 1996, this name was replaced by *Maraca* Pérez-Miles, 2006. However, this last name was previously used to name a Neotropical cockroach (HEBARD, 1926). Then, the name *Bumba* was proposed by PÉREZ-MILES *et al.* (2014) to remove the generic homonymy for *Maraca*. The type species was established as *Bumba cabocla* (Pérez-Miles, 2000) recorded from the Maracá Island, State of Roraima northern Brazilian Amazonia. *Bumba horrida* (Schmidt, 1994) was transferred from *Paraphysa* Simon, 1892 to *Iracema* by BERTANI & CARLA-DA-SILVA (2003), and consequently, by the homonymy, now fall into *Bumba*. This species is distributed in Brazil, at the states of Amazonas and Roraima, and Venezuela (BERTANI & CARLA-DA-SILVA, 2003; LUCAS *et al.*, 2020). PERAFÁN & PÉREZ-MILES (2014) transferred *Euathlus pulcherrimaklaasi* (Schmidt, 1991) to *Maraca*, extending to Ecuador the distribution of the genus. Then, the new combination *Bumba pulcherrimaklaasi* (Schmidt, 1991) was proposed by PÉREZ-MILES *et al.* (2014). The same authors described the new species *Bumba lennoni* Pérez-Miles, Bonaldo & Miglio, 2014, distributed at the state of Pará (PÉREZ-MILES *et al.*, 2014; LUCAS *et al.*, 2020). Recently, LUCAS *et al.* (2020) transferred *Homoeomma humile* Vellard, 1924 into *Bumba* and *B. pulcherrimaklaasi* to *Cyclosternum* Ausserer, 1871. Thus, *Bumba humile* (Vellard, 1924) is present in Brazil, at the states of Goiás, Minas Gerais, Bahia and São Paulo (LUCAS *et al.*, 2020). LUCAS *et al.* (2020) also synonymized

*B. cabocla* with *B. horrida* and described four new species from Brazil and Paraguay: *Bumba tapajos* Lucas, Passanha & Brescovit, 2020 from Brazil at the state of Pará; *B. cuiaba* Lucas, Passanha & Brescovit, 2020 and *B. rondonia* Lucas, Passanha & Brescovit, 2020, both from Brazil at the states of Mato Grosso and Rondônia; *B. mineiros* Lucas, Passanha & Brescovit, 2020 from Paraguay and Brazil at the states of Goiás, Mato Grosso and Mato Grosso do Sul. Thus, the genus includes seven formerly described species (WORLD SPIDER CATALOG, 2021) distributed in Brazil, Venezuela and Paraguay (PÉREZ-MILES, 2000; BERTANI & CARLA-DA-SILVA, 2003; PÉREZ-MILES *et al.*, 2014; LUCAS *et al.*, 2020).

During the examination of the spider collection from the *Instituto Argentino de Investigaciones de las Zonas Áridas* (CAI), Mendoza, Argentina and specimens from the American Museum of Natural History, New York, USA, a new species of *Bumba* was identified. This new species comprises the first of the genus described for Bolivia. Also, illustrations of diagnostic structures and a distribution map are presented.

## MATERIAL AND METHODS

Abbreviations: ALE, anterior lateral eyes; AME, anterior median eyes; ap, apical; Cy, cymbium; D, dorsal; P, prolateral; PB, prolateral branch of tibial apophysis; PI, prolateral inferior keel; PLE, posterior lateral eyes; PLS, posterior lateral spinnerets; PME, posterior median eyes; PMS, posterior median spinnerets; PS, prolateral superior keel; R, retrolateral; RB, retrolateral branch of tibial apophysis; Rp, retrolateral process; Ti, tibia.

All measurements are given in millimeters and were made with digital dial calipers with an error of 0.01 mm, rounded up to one significant decimal where appropriate. In addition, an Olympus stereoscopic microscope equipped with a calibrated ocular micrometer scale was used. The total lengths do not include chelicerae and spinnerets. Appendage measurements were based on left appendages in the dorsal view. Lengths of leg articles were taken from the mid-proximal point of articulation to the mid-distal point of the article (*sensu* COYLE, 1995; BOND, 2012). Images of preserved material were taken with a Leica S APO stereomicroscope with MShot digital coupled camera and stacked using the Helicon Focus Software. Specimens are deposited at the arachnological collection of the *Instituto Argentino de Investigaciones de las Zonas Áridas* (CAI), Mendoza, Argentina and at the American Museum of Natural History, New York, USA (AMNH). Spine notation follows PETRUNKEVITCH (1925). Urticating setae terminology follows COOKE *et al.* (1972).

## RESULTS

### *Bumba* Pérez-Miles, Bonaldo & Miglio, 2014

*Iracema* PÉREZ-MILES, 2000:141. Type species: *Iracema cabocla* Pérez-Miles, 2000 (original designation, currently *Bumba horrida* (Schmidt, 1994), synonymy by LUCAS *et al.* (2020).

*Maraca* PÉREZ-MILES, 2006:247 (new name for *Iracema*, preoccupied by TRIQUES, 1996).

*Bumba* PÉREZ-MILES, BONALDO & MIGLIO, 2014:3 (new name for *Maraca*, preoccupied by HEBARD, 1926).

Diagnosis. *Bumba* is characterized by the type IV urticating setae present, retrolateral process on male palpal tibia, palpal bulb resting in a ventral distal excavation of palpal tibia and a denticulate row in the median region of the inferior prolateral keel, metatarsus I passes between the two branches of tibial apophysis when flexed, presence of spiniform setae on prolateral and retrolateral sides of maxillae and coxae I-IV (PÉREZ-MILES, 2000; BERTANI & CARLA-DA-SILVA, 2003; PÉREZ-MILES *et al.*, 2014; LUCAS *et al.*, 2020).

#### *Bumba paunaka* sp. nov.

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(Figs 1–22, Tabs I, II)

Type material. Holotype ♂, BOLIVIA, Santa Cruz: San Miguel de Velasco (16°41'54.96"S, 60°58'5.16"W, 493m), 21.VII.2014, L. López & G. Zalazar col. (CAI 3500). Paratype ♀, BOLIVIA, La Paz: San Lorenzo, 12 km from Caranavi, 1-2.I.1991, Goloboff, Santisteban & Mc Hugh col. (AMNH).

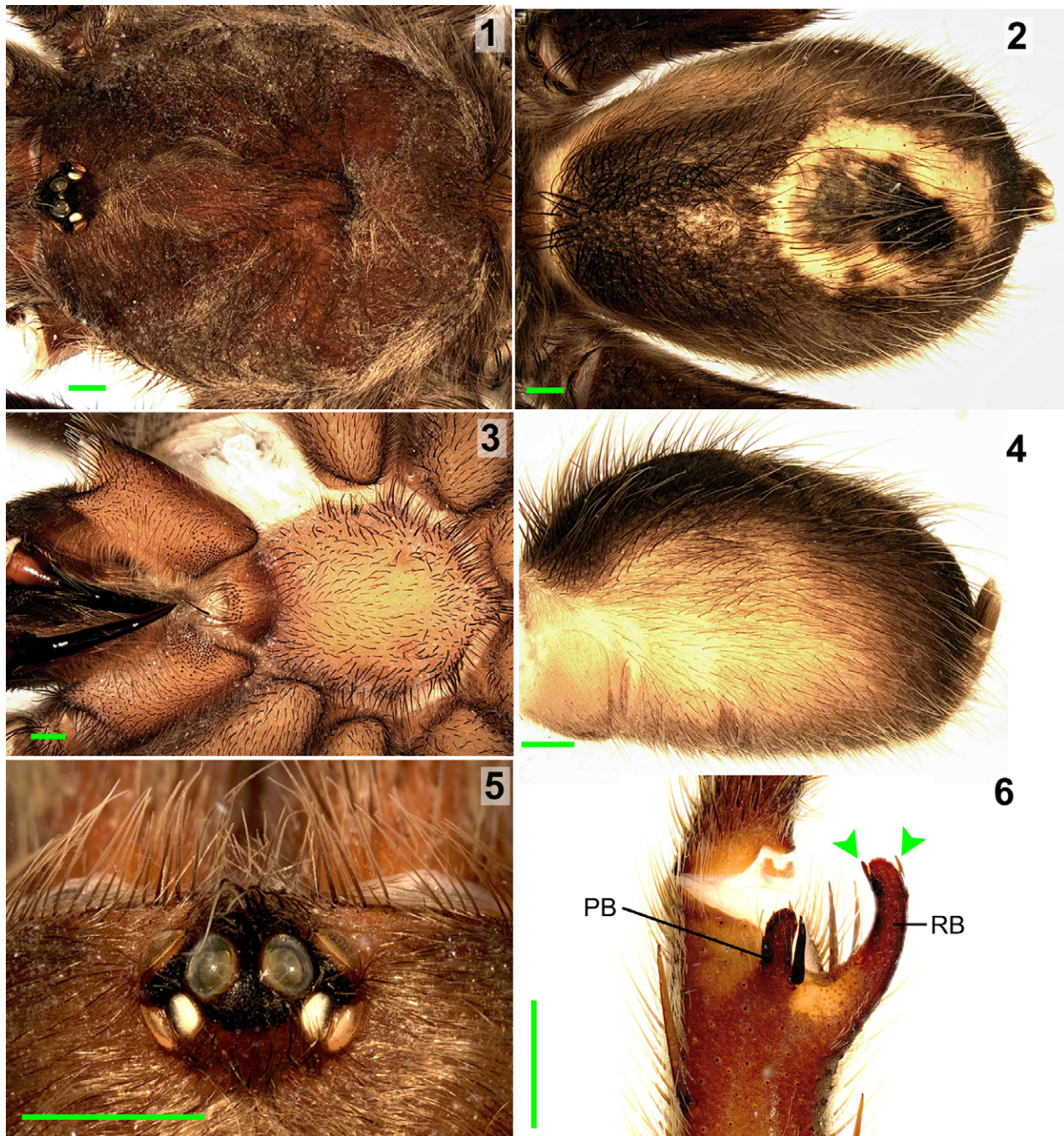
Etymology. Noun in apposition that refers to the name of the language from the Chiquitania region of Bolivia, near to the department of Santa Cruz, where this new species was found.

Diagnosis. *Bumba paunaka* sp. nov. resembles *B. cuiaba* due to the black longitudinal band on dorsal abdomen,

more noticeable in male (Figs 2, 4, 20), however, it is much wider in *B. paunaka* sp. nov. than in *B. cuiaba*. In addition, the male differs from *B. cuiaba* by the longer and slender embolus (Figs 7–12) and the subapical spine of the retrolateral branch of tibial apophysis being thinner and longer (Fig. 6). Male of *B. paunaka* sp. nov. resembles those of *B. mineiros* and *B. rondonia* by the palpal bulb with a long and thin embolus with weakly developed keels, but it can be distinguished by the absence of a tooth on PI. Additionally, female of *B. paunaka* sp. nov. can be distinguished from all other species by the spermathecae with circular lobed seminal receptacles with very short necks (Fig. 21).

Description, holotype male. Color in alcohol: carapace and legs brown with long golden hairs mainly on carapace margin (Fig. 1). Abdomen light brown with a median dorsal wide black band (Figs 2, 4). Total length 20.2. Carapace 9.1 long, 7.9 wide. Abdomen 10.3 long, 6.5 wide. Fovea deep procurved, 1.8 wide (Fig. 1). Eye tubercle: 1.1 long, 1.5 wide. Clypeus narrow, 0.4. Anterior row of eyes procurve, posterior recurve (Fig. 5). Eyes sizes and inter-distances: AME 0.36, ALE 0.38, PME 0.19, PLE 0.27, AME-AME 0.18, AME-ALE 0.15, PME-PME 0.67, PME-PLE 0.08, ALE-PLE 0.17. Labium: 0.7 long, 1.2 wide, with 23 cuspules (Fig. 3). Sternum 3.7 long, 3.1 wide. Cheliceral furrow with 10 large teeth on promargin and a group of 12 smaller basal teeth on retromargin. Maxillae with *ca.* 109 cuspules on each side (Fig. 3). Length of legs and palpal segments in the Tab. I. Spination: all femora and tarsi without spines. Patellae: palp 1 P; I 1 P; II 1 P; III-IV 0. Tibiae: palp 1-2 P; I 1-1-1 P, 1 V, 2-1-1 R; II 1-1-1 P, 2-1-2 V, 2-1-2 R; III 2-2-1-2 P, 2-1-2 V, 1-1-1 R; IV 2-1-2-1 P, 1-1-2 V, 1-1-1-2 R. Metatarsi: I 1-1 P, 1 V; II 1-1-1 P, 1-1-1 V, 1 R; III 1-1-1-2 P, 2-2 V, 1-1-2 R; IV 1-2-1-2 P, 2-2-1-2 V. Scopulae: Tarsi I–IV densely scopulate, with lines of strong setae on longitudinal divisions increasing in wide from legs I to IV. Metatarsus I scopulate on distal half, II on distal third, III on distal fourth and IV only apical, distal fifth. Tibia I with two tibial apophysis originating from a common base, the retrolateral branch with a long and slender subapical spine and a shorter and strong spine on the inner side, and a long and strong spine on the retrolateral side of the prolateral shorter branch (Fig. 6). Metatarsus of leg I flexes between both branches of tibial apophysis, touching their medial portion. Palpal tibia with ventral excavation and a slightly developed retrolateral process (Figs. 13–15). Male palpal bulb with long embolus, longer than tegulum, PI and PS very weakly developed, almost inconspicuous, extending close together from the basal embolus to the apical end (Figs. 7–12). Urticating setae type III and IV present. Spinnerets: PMS, 0.3 long; PLS, 0.4 basal, 0.3 middle, 0.5 domed distal.

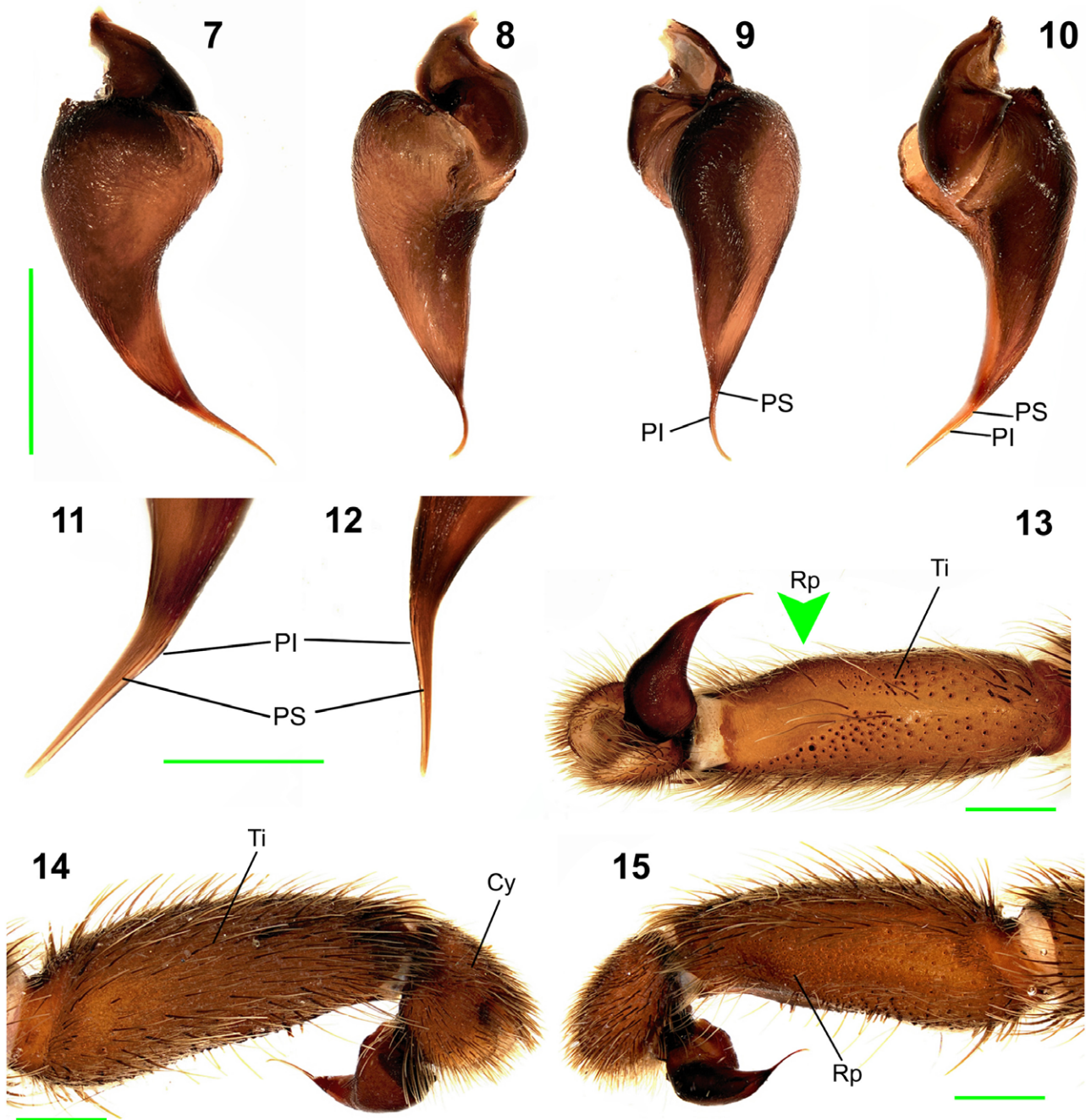
Paratype female. Color in alcohol: same as in male, excepting the dorsal wide black band also extends to the lateral on proximal abdomen. (Figs 19–20). Total length 25.91. Carapace 12.48 long, 10.99 wide. Abdomen 13.43 long, 9.05 wide. Fovea deep slightly procurved, 2.23 wide (Fig. 16). Eye tubercle: 1.24 long, 1.92 wide. Clypeus narrow, 0.43. Anterior row of eyes slightly procurve, posterior recurve (Fig. 17).



Figs 1-6. *Bumba paunaka* sp. nov., holotype male: 1, carapace, dorsal view; 2, abdomen, dorsal view; 3, labium, sternum and maxillae; 4, abdomen, lateral view; 5, eyes, dorsal view; 6, tibial apophysis, proventral view; PB, prolateral branch; RB, retrolateral branch. Green arrows indicate the subapical spines on the retrolateral branch of tibial apophysis. Scale bars = 1mm.

Eyes sizes and inter-distances: AME 0.24, ALE 0.54, PME 0.25, PLE 0.46, AME-AME 0.31, AME-ALE 0.19, PME-PME 0.84, PME-PLE 0.07, ALE-PLE 0.21. Labium 1.18 long, 1.61 wide, with 149 cuspules (Fig. 18). Sternum 4.99 long, 4.72 wide. Cheliceral furrow with 9 large teeth and 1 small on promargin and a group of 24 smaller basal teeth on retromargin. Maxillae with *ca.* 225 cuspules on each side (Fig. 18). Length of legs and palpal segments in the Tab. II. Tarsi I-IV fully scopulated and complete. Tarsus IV with 5 lines of long setae. Metatarsus I fully scopulated,

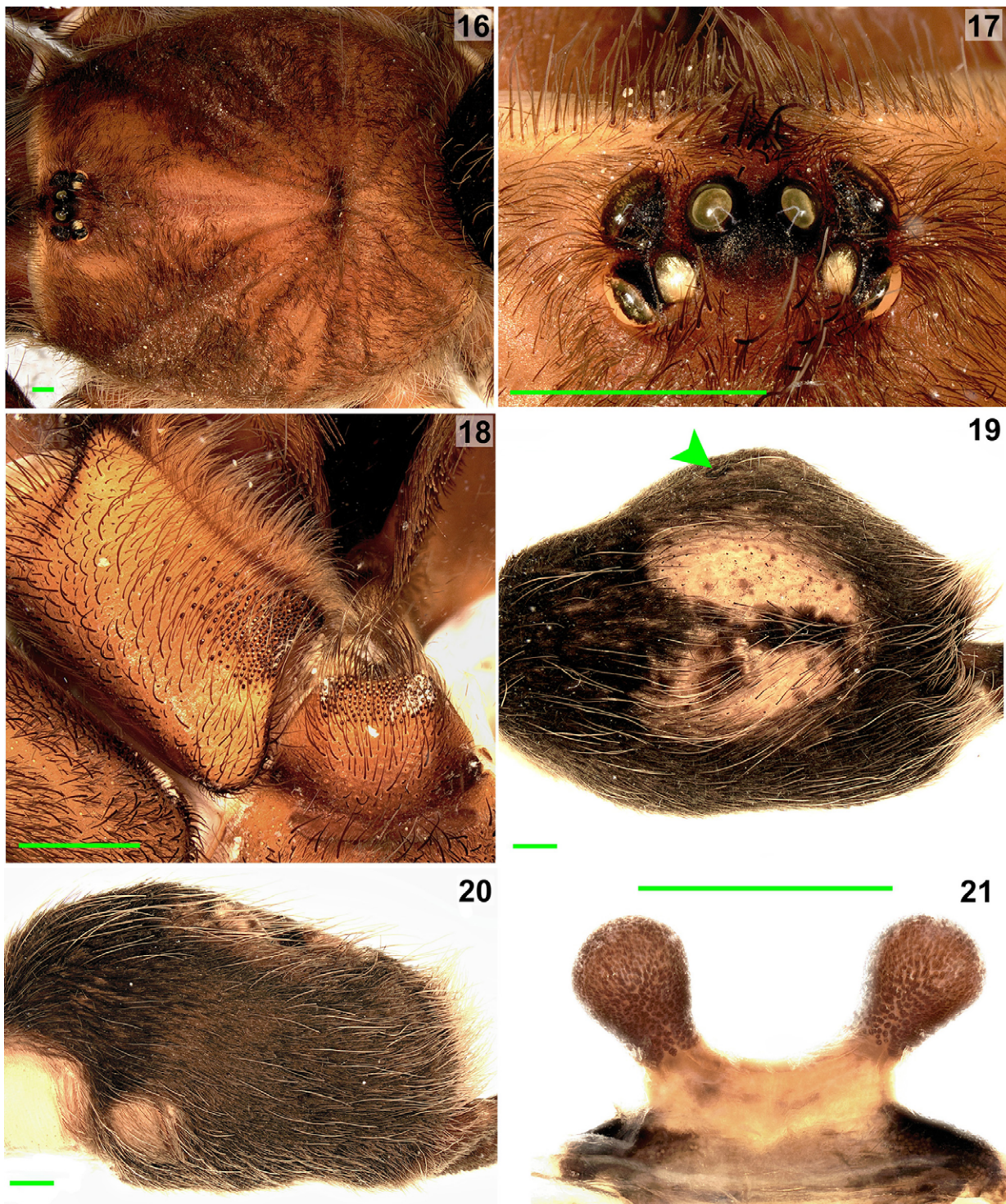
II 3/4 apical scopulated, III 1/2 apical scopulated, IV 1/4 apical scopulated. Spination: femora: palp and legs I-IV, 0. Patellae: palp and legs I-IV, 0. Tibiae: palp 1-1V, 2-2R; I 1P, 1-1V; II 1-2P, 1-2V; III 1-1-1P, 1-1V, 1-1R; IV 2-3V, 1-1-1R. Metatarsi: I 3(ap)V; II 1-1V; III 1-1-1P, 2-2-2V, 1-1R; IV 1-2-1P, 1-1-1-1-3V, 1-1-1R. Tarsi of palp and legs I-IV, 0. Spermathecae with circular lobed seminal receptacles with very short necks (Fig. 21). Urticating setae type III and IV present. Spinnerets: PMS, 1.43 long; PLS, 2.03 basal, 1.84 middle, 2.56 domed distal.



Figs 7-15. *Bumba paunaka* sp. nov., holotype male, bulb: 7, retrolateral view; 8, ventral view; 9, dorsal view; 10, prolateral view; 11, detail of palpal bulb embolus at prolateral view; 12, detail of palpal bulb embolus at dorsal view. Palpal tibia and cymbium: 13, ventral view (green arrow indicates the retrolateral process); 14, prolateral view; 15, retrolateral view (Cy, cymbium; PI, prolateral inferior keel; PS, prolateral superior keel; Rp, retrolateral process; Ti, tibia). Scale bars = 1 mm.

**Remarks.** In order to assure that the specimens are conspecific, I relied on the morphological general aspect such as the body size and more importantly the coloration pattern and the presence of the dark band at dorsal abdomen, since it seems to be a diagnostic character that is present in just two species (*B. cuiaba* and *B. paunaka* sp. nov.), which is wider in specimens of *B. paunaka* sp. nov. In addition, although the geographic distance that exists between the specimens

examined is considerable (about 700 km in straight line), particularly, they both inhabit the Southwest Amazon moist forest ecoregion, which are characterized by Amazonian areas of low lands extended in the north and northeastern Bolivia and along the Andean foothills reaching Santa Cruz de la Sierra (with altitudes about 500-600 m in La Paz and Beni departments; and 300-400 in Cochabamba and Santa Cruz departments) (OLSON *et al.*, 2001; HERZOG *et al.*, 2005).



Figs 16-21. *Bumba paunaka* sp. nov., paratype female: 16, carapace, dorsal view; 17, eyes, dorsal view; 18, labium and maxillae. Abdomen: 19, dorsal view; 20, lateral view; 21, spermathecae, dorsal view. Green arrow indicates an oval small scar and a lateral abnormal expansion of the abdomen. Scale bars = 1 mm.

The paratype female presents an abnormal lateral expansion of the abdomen and under a close examination of the area, a small oval scar largely sclerotized was observed (Fig. 19). This could be the result of an injury caused by the penetration of a parasitoid Acroceridae (Diptera) larvae into the body of the spider, which searches for the soft tissues like the abdomen or the articulations (BARNECHE *et al.*, 2013;

GABELLONE *et al.*, 2020). Unfortunately, the impossibility to dissect the abdomen of the female due to the designation as paratype and being the only individual do not allow making a further confirmation of this observation.

Distribution. Central Bolivia, at the departments of La Paz and Santa Cruz (Fig. 21).

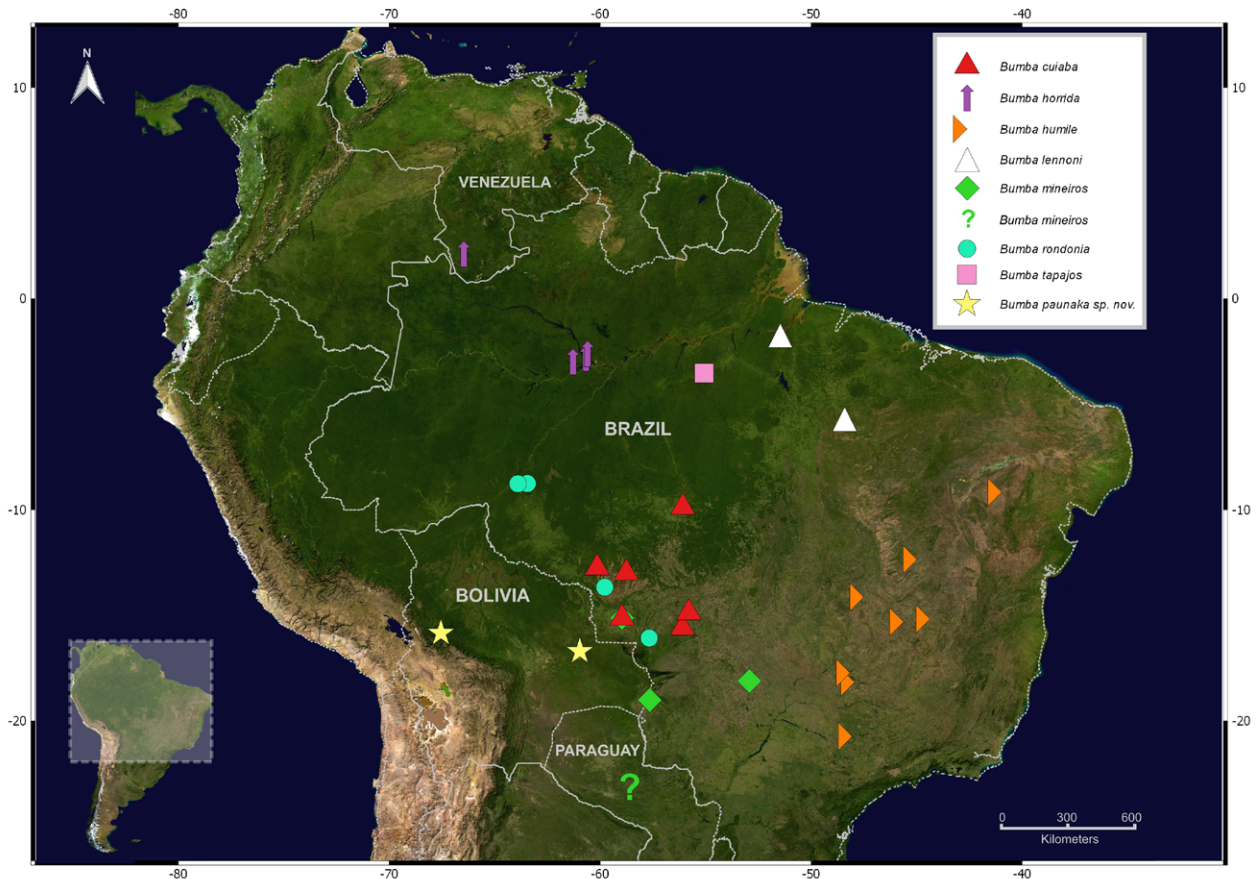


Fig. 22. Distribution map of the known species of *Bumba*. The green question mark indicates the unknown precise locality of *B. mineiros* in Paraguay.

Tab. I. *Bumba paunaka* sp. nov., length of leg and palpal segments of holotype male.

	I	II	III	IV	Palp
Femur	7.1	6.6	6	6.5	4.1
Patella	3.7	3.2	3	3.7	2.6
Tibia	6	4.6	4.3	6.1	4
Metatarsus	5.8	5.2	6.2	9.3	-
Tarsus	2.9	3.2	3.1	3.4	1.7
Total	25.5	22.8	22.6	29	12.4

Tab. II. *Bumba paunaka* sp. nov., length of leg and palpal segments of paratype female.

	I	II	III	IV	Palp
Femur	8.6	8.1	7.3	9.8	5.7
Patella	5.1	4.3	3.7	4.6	3.8
Tibia	7.1	5.5	4.6	6.8	4.7
Metatarsus	5.6	5.2	4.9	8.2	-
Tarsus	3.6	3.6	3.2	4.3	4.1
Total	30	26.7	23.7	33.7	18.3

## DISCUSSION

The genus *Bumba* comprises eight described species exclusively from the Neotropical region (WORLD SPIDER CATALOG, 2021). The distribution extends from Venezuela at the north and Paraguay as the southern record for the genus (LUCAS *et al.*, 2020). Most of the species are distributed in Brazil, mainly at the State of Mato Grosso (LUCAS *et al.*, 2020). In the present work *Bumba* is recorded for the first time in Bolivia with the new species *B. paunaka* sp. nov. The eastern locality of *B. paunaka* sp. nov. is geographically close to the Brazilian species *B. cuiaba*, *B. mineiros* and *B. rondonia* (LUCAS *et al.*, 2020). *Bumba paunaka* sp. nov. is the second known species of the genus together with *B. cuiaba* that are distinguished from the remaining species by the black longitudinal band at dorsal abdomen (Figs 2, 20). However, the much wider black band, the morphology of the male palpal bulb, the tibial apophysis and the female spermathecae clearly differ between these two species.

Regarding the presence of a process on the retrolateral face of palpal tibia used as a diagnostic character (PÉREZ-MILES, 2000; BERTANI & CARLA-DA-SILVA, 2003; PÉREZ-MILES *et al.*, 2014; LUCAS *et al.*, 2020), the examination

of this structure in *B. paunaka* sp. nov. showed that it is slightly developed (Fig. 13), whereas in other species such as *B. lennoni* this structure is readily visible (PÉREZ-MILES *et al.*, 2014, fig. 8). The spermathecae of female of *B. paunaka* sp. nov. clearly differ from most species of *Bumba* by the absence of a constriction between the duct and the receptacle. However, the general aspect of the spermathecae of *B. paunaka* sp. nov. with short ducts and circular seminal receptacles without evidence of bearing large lobes resemble to that of *B. lennoni* (PÉREZ-MILES *et al.*, 2014; LUCAS *et al.*, 2020).

**Acknowledgements.** Special thanks to Susana Lagos Silnik (CAI) and Lou Sorkin (AMNH) for loaning the specimens studied. Nelson Ferretti is a researcher at *Consejo Nacional de Investigaciones Científicas y Técnicas* (CONICET).

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