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## Description of the female of the cellar spider *Mesabolivar guapiara* (Araneae, Pholcidae) from Mata Atlântica, Brazil

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Among South American pholcid genera, *Mesabolivar* Gonzales-Sponga, 1998 is the largest with 94 species (World Spider Catalog 2019). Over the last two decades, most of these species were described from forest and caves (Huber 2000, 2018a; Huber 2005; Machado *et al.* 2007a,b,c, 2013). Besides a well-resolved taxonomy, many *Mesabolivar* species' natural history is described. Such kind of information has been used both to quantify the spider diversity in caves and to hypothesize how species arrived and diversified into or around caves (Huber 2018b). Here, we describe the female of *Mesabolivar guapiara* (Huber 2000) for the first time, illustrating the diagnostic features of both sexes and new distributional data are provided from caves and their surroundings.

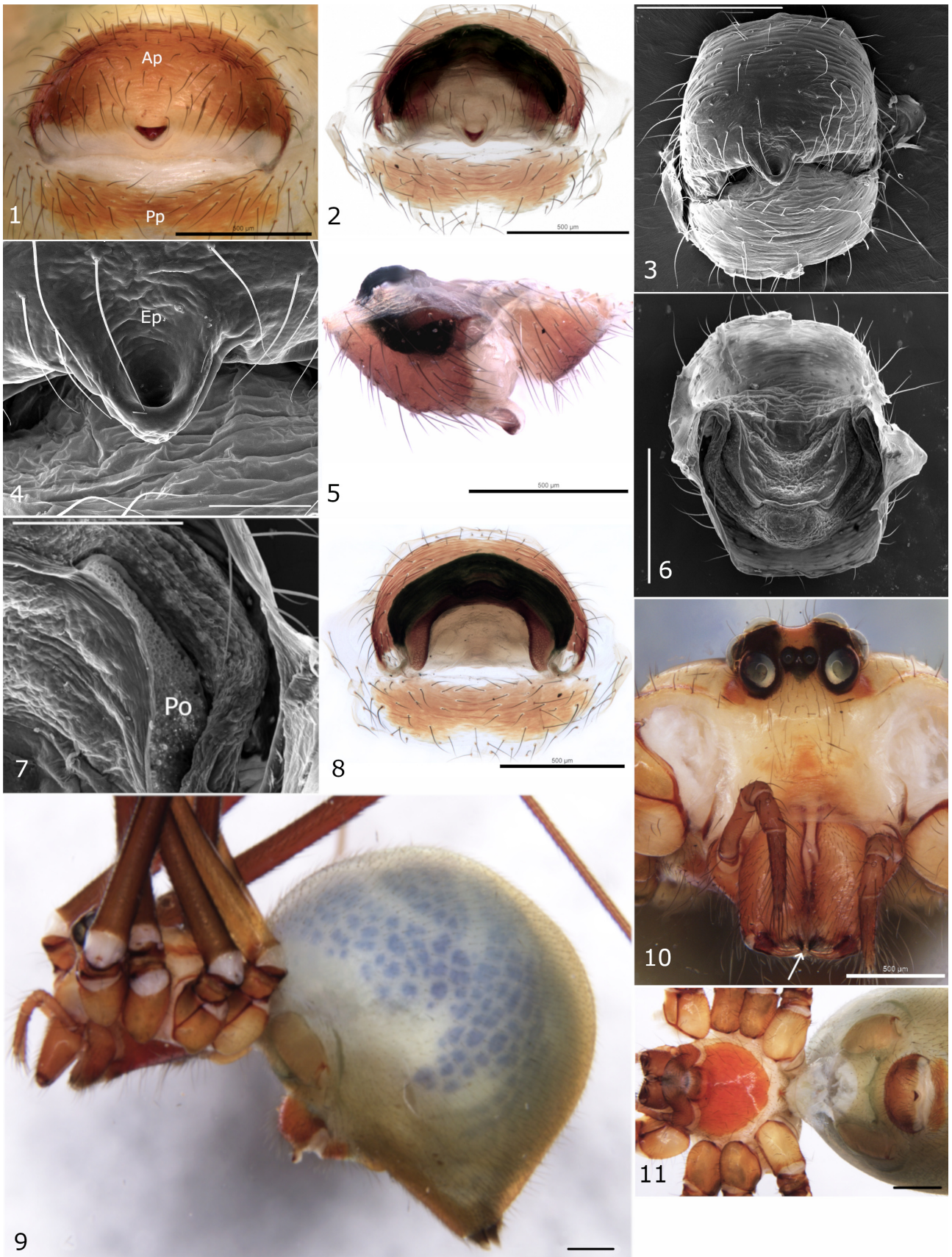
The specimens examined are deposited in the following institutions: Instituto Butantan (IBSP, A.D. Brescovit), Museu de Ciências e Tecnologia da Pontifícia Universidade Católica do Rio Grande do Sul (MCTP, R.A. Teixeira), Museu de História Natural do Capão da Imbuia (MHNCI, M. Zamoner). Female genitalia was digested using pancreatin (5 hours period) and clarified with clove oil before photographing. Images were taken with a Leica M205A Multipurpose Zoom Microscope (at the Museu de Ciências e Tecnologia) and mounted using the Leica Application Suite (LAS) for Windows. For scanning electron microscopy (SEM) images, genitalia structures were previously treated on a gradually ethanol dehydration series (80%, 90%, 100%). SEM was performed with a Philips XL 30 Field Emission ESEM at Centro de Microscopia e Microanálise (CEMM) of the Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS). Distribution map was prepared with ArcGis. Measurements are presented in millimeters and description style follows Huber (2000). Abbreviations: ALE, anterior lateral eyes; AME, anterior median eyes; l/d, length/diameter; PLE, posterior lateral eyes; PME, posterior median eyes.

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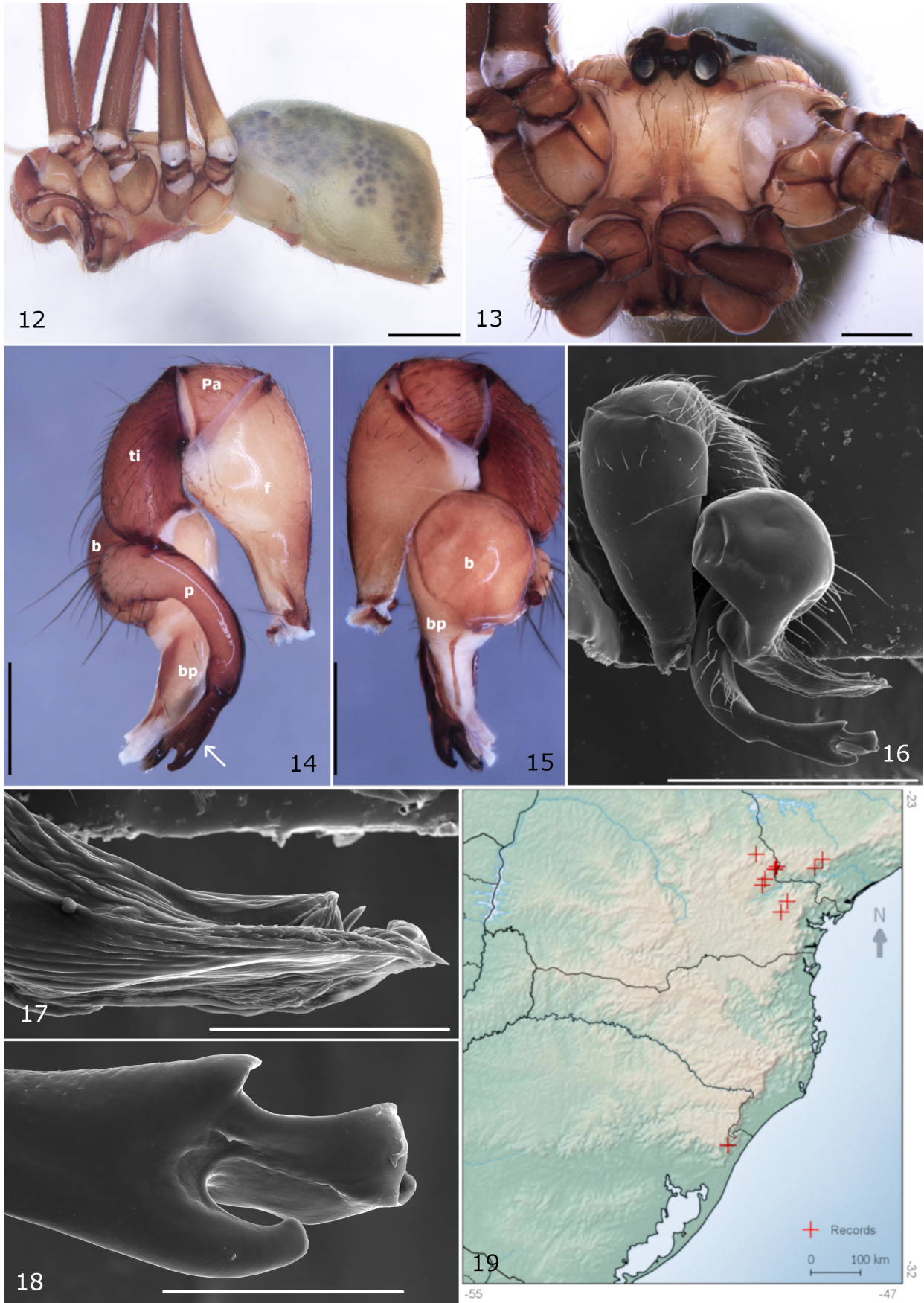
### *Mesabolivar guapiara* Huber, 2000 (Figs 1–19)

*Mesabolivar guapiara* Huber, 2000: 189 (figs 864–868; male holotype from Fazenda Intervalles, 15km E Guapiara, São Paulo, Brazil, Feb.1990, W.G. Eberhard *leg.*, deposited in MCZ, not examined).

**Material examined: BRAZIL, São Paulo:** 1♀1♂, Ribeirão Grande (Gruta da Mãozinha, Parque Estadual Intervalles—Bocaina/Lajeado, 24°16'23"S, 48°26'56"W), 26-30.III.2009, F. Pellegatti Franco *et al. leg.* (IBSP 198438); 1♂, Iporanga (PETAR—Caboclos, Gruta Aranhas, 24°26'04"S, 48°35'20"W), 26-30.III.2009, F. Pellegatti Franco *et al. leg.* (IBSP 198433). **Paraná:** 1♀, Jaguaiaíva (Parque Estadual do Cerrado, 24°10'37"S, 49°39'40"W), 22.X.1995, L. Mestre *leg.* (IBSP 11795); 1♂, Sengés (Gruta do Pinhalzinho, Ouro Verde, 24°24'14"S, 49°16'42"W), 23.IV.2015, B.G.S. Nogueira *leg.* (MHNCI); 1♂, (MHNCI); 1♀, 23.IV.2016, K. Mise *leg.* (MHNCI); 1♀, 23.IV.2016 T. Kardush *leg.* (MHNCI); 1♀1♂, 28.VII.2016 W. Paredes-Munguia *leg.* (MCTP-43005); 1♀1♂, 23.IV.2016, W. Paredes-Munguia *leg.* (MHNCI); 1♀, 09.IX.2017, K. Mise *leg.* (MHNCI); 1♂, (MHNCI); 1♂, 09.IX.2017, D.C.S. Plazas *leg.* (MHNCI); 1♀, (MHNCI); 1♀, Dr. Ulysses (Gruta da Volta, 24°27'13"S, 49°19'01"W), 13-14.X.2000, R. Pinto da Rocha *leg.* (MZSP 14894); 1♂, 27.II.2017, T. Kardush *leg.* (MHNCI); 1♀1♂, (MHNCI); 1♂, (MHNCI); 1♀, 08.IX.2017, G.S. Ghedin *leg.* (MHNCI); 1♀, 08.IX.2017, K. Mise *leg.* (MHNCI); 1♂, 08.IX.2017, W. Paredes-Munguia *leg.* (MHNCI); 1♂, Castro (Pinheiro Seco, 24°44'22"S, 49°32'54"W),



**FIGURES 1–11.** *Mesabolivar guapiara* (Huber 2000), female. 1–5. Epigynum (3, 4 SEM). 1–4. Ventral (2, cleared; 4, epigynal pocket detail). 5. Lateral. 6–8. Vulva dorsal (6, 7 SEM) (7, pore plate detail; 8, cleared). 9–11. Habitus (9, lateral; 10, frontal; 11, ventral). Scale bars: 1–3, 5, 6, 8, 10, 500  $\mu$ m; 4, 100 $\mu$ m; 7, 200 $\mu$ m; 9, 11, 1mm. Ap, Anterior plate, Pp, Posterior plate, Ep, Epigynal pocket, Po, Pore plate, white arrow, ventral cheliceral apophyses.



**FIGURES 12–19.** *Mesabolivar guapiara* (Huber 2000), male, and records of the species. **12–13.** Habitus (12, lateral; 13, frontal). **14–18.** Left palp (16–18 SEM) (14, 16–18, prolateral, white arrow sclerotized procurus; 15, retrolateral; 17 bulbal process membranous tip; 18, procurus tip). **19.** Record on Southeast and Southern Brazil.

29.X.2016, K. Mise *leg.* (MHNCI); 1♀2♂, Tunas do Paraná (Gruta dos Jesuítas, Parque Estadual Campinhos, 25°02'21"S, 49°05'30"W), 21.III.2017, T. Kardush *leg.* (MCTP-43004); 1♀1♂, 28.VII.2017, W. Paredes-Munguia *leg.* (MCTP-43003); 1♀, Colombo (Gruta de Bacaetava, 25°13'54"S, 49°12'26"W), 21.VI.1999, R. Pinto da Rocha *leg.* (MZSP 18961). **Rio Grande do Sul:** 1♂, São Francisco de Paula (Potreiro Velho, Pró-Mata, 29°28'50"S, 50°10'28"W), 30.IV.2001, R. Baldisera *leg.* (MCTP-15928); 1♂, 01.X.2001, L. A. Bertonecello *leg.* (MCTP-24873); 1♂, 01.V.2002, L.A. Bertonecello *leg.* (MCTP-24867); 1♂ (MCTP-24886); 1♂, 24-26.IV.2006, A. A. Lise *leg.* (MCTP-35724).

**Diagnosis.** Males of *M. guapiara* can be distinguished from those of *M. brasiliensis* (Moenkhaus, 1898) by the procurus strongly curved basally (Figs 12, 14) and highly sclerotized distally (Figs 14–16, 18), whereas *M. brasiliensis* present a distally widened and sclerotized procurus (Huber 2000: figs 844–845). Females of *M. guapiara* can be distinguished by the epigynum and pocket conspicuous (Figs 1–5), and by the pore plates longer than wide (Figs 6–8), whereas *M. brasiliensis* (Moenkhaus, 1898) present inconspicuous epigynum and pocket (Huber 2000: fig. 850), and a round pore plate (Huber 2000: fig. 840).

**Description.** Male described by Huber (2000: 222).

Female (MCTP 43003). Total length (N=18) 4.3, carapace width (N=18) 19.1; leg I: 55.29 (13.8+0.7+13.7+24.3+2.9), tibia II: 9.4, tibia III: 7.2, tibia IV: 9.5; tibia I/d: 113.9. Prosoma shape as *iguazu* species group (Huber 2018: figs 378–389); distance PME-ALE about 6% of PME diameter. Carapace yellow, with brown median mark, ocular area brown, clypeus yellow, sternum orange. Chelicerae light brown with a pair of black distal apophysis. Palps ochre yellow to light brown, femur narrow (Figs 9–10). Legs ochre, femora and tibiae with light tips; legs without spines, without curved and vertical hairs, trichobothrium on the tibia and basal portion of the metatarsi, in both located on the dorsal view, tarsus I with more than 30 pseudosegments. Ophistosoma greenish gray, with dorsal and lateral surface covered with dark patchy marks, and with a ventral light brown area (Fig. 9, 11). Epigynum with an anterior plate dome-shaped without any bulge (Fig. 1); posterior plate smooth with width similar to the anterior plate (Figs 2–3). Borders of the anterior and posterior plates straight and quite membranous (Figs 2–3). Internal genitalia with a pair of large porous plate (Po) converging anteriorly (Figs 6–8).

**Variation.** Males (n=10) have tibia I with 14.3 on average, ranging from 11.3 to 16.9; females (n=12) with 12.7 on average, ranging from 9.6 to 14.1.

**Comments.** Only specimens from São Paulo and Paraná were reported from caves (Fig. 19). Although *Mesabolivar* Gonzales-Sponga, 1998 belongs to a monophyletic subfamily (Modisiminae) characterized by a high degree of species adapted to various environments including cavern-rich geographical areas (Huber 2018b), no evidence of morphological adaptation to caves occur in this species. Specimens from Rio Grande do Sul and Paraná were relatively smaller and pallid than those from São Paulo.

**Distribution.** Brazil (São Paulo, Paraná and Rio Grande do Sul)

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