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New records of the rare orb-weaving spider *Rubrepeira rubronigra* from Colombia, with notes on its natural history (Araneae: Araneidae)

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Abstract: Two new records of the rare orb-weaving spider *Rubrepeira rubronigra* (Mello-Leitão, 1939) are reported from Colombia, extending its known distribution to Putumayo and Vichada departments, in the Napo and Sabana provinces of the Neotropical region. Additionally, new high-definition photos of the habitus, ovisac and well-developed embryos are presented. New information on its natural history is included, along with a map with its currently known distribution in the Neotropical region.
Key words: Araneae, Araneidae, *Rubrepeira rubronigra*, embryos, Colombia, Eastern Llanos, Napo province, Sabana province, Neotropics.

Nuevo reporte de la rara araña tejedora *Rubrepeira rubronigra* de Colombia, y notas sobre su historia natural (Araneae: Araneidae)
Resumen: Se presentan dos nuevos reportes de la rara araña tejedora *Rubrepeira rubronigra* (Mello-Leitão, 1939) de Colombia, extendiéndose su distribución conocida a los departamentos de Putumayo y Vichada, en las provincias Napo y Sabana de la región Neotropical. Adicionalmente, se presentan nuevas fotos en alta definición de su habitus, ovisaco y embriones bien desarrollados. Finalmente, se incluyen nuevos datos de historia natural, junto con un mapa de su distribución conocida en la región Neotropical.
Palabras clave: Araneae, Araneidae, *Rubrepeira rubronigra*, embriones, Colombia, Llanos Orientales, Provincia Napo, Provincia Sabana, Región Neotropical.

Introduction

Orb-weaving spiders of the family Araneidae are one of the most common and diverse spider groups in tropical forests. In total, 3135 species in 174 genera have been described worldwide (World Spider Catalog, 2018) and about 1500 species and 65 genera have been reported from the New World (Levi, 2002). However, information about the diversity and distribution of araneids in Colombia is still scarce, with most of the records restricted to just some regions (Flórez & Sánchez, 1995; Gilede-Moncayo & Bello-Silva, 2000; Pinzon *et al.,* 2010). The genus *Rubrepeira* was described by Levi (2002) from a species known from a holotype female collected in the Eastern coast of Brazil, at Colatina, Espirito Santo state, originally described as *Verrucosa rubronigra* by Mello-Leitão (1939), and whose specimen is currently lost (Silva *et al.*, 2010). This genus includes spiders with low, flat and setose carapace, and an unusual shape of the abdomen, which has only one posterior and median projection and three pairs of lateral spine-shaped projections (Levi, 1992). Additionally, Levi (1992) recognized the absence of males of the species in collections, maybe due to their probable dwarf-sizes.

Currently, the genus is monotypic, and the only known species, *R. rubronigra*, is distributed from Mexico to Guyana, and Peru to Brazil (Levi, 1992; World Spider Catalog, 2018). This species presents at least two very different morphotypes *sensu* Levi (1992), one with females with a more triangular abdomen covering the posterior border of the prosoma, with more conical and shorter lateral projections, and absence of transversal stripes, and the other, with females with a slenderer and more quadrangular abdomen that covers about the posterior half of the prosoma, with longer and wider lateral projections and wide transversal stripes. In Colombia, this species has been reported from the Gorgona Island and the municipality of Guapí, Cauca department, in the Pacific coast of the country, and presents the first morphology described above. The females examined here represent new records of the species in the country, from the Amazonian department of Putumayo (Napo province), and the Eastern department of Vichada (Sabana province), both included in the Neotropical region (Morrone, 2014).

The material examined is deposited in the Arachnological collection of the Instituto de Ciencias Naturales (ICN-Ar), Universidad Nacional de Colombia, Bogotá, Colombia. The photographs were taken with a Leica MC-170 HD digital camera attached to a Leica M205A stereomicroscope, and then united by the image stacking software Leica Application Suite version 4.6.0. Measurements were taken with an AmScope MU300 digital camera, attached to an Advanced Optics JSZ-6 stereomicroscope. The information below in square brackets was added to complement the label data. Records without coordinates in the label were approximated to locations and/or municipalities via GoogleMaps©, and the gazetteers GeoLocator© and GeoNames©, by means of the point method, with datum WGS84. Measurements are in millimeters.

Results

***Rubrepeira rubronigra* (Mello-Leitão, 1939)**. Fig. 1-13.
Verrucosa rubronigra Mello-Leitão, 1939: 110, fig. 13.
Actinosoma riscoi Archer, 1971: 158, fig. 3-4.
Alpaida rubronigra Levi, 1976: 358.
Rubrepeira rubronigra Levi, 1992: 262, fig. 18-22 (transferred to *Rubrepeira*). World Spider Catalog, 2018.

MATERIAL EXAMINED. Colombia, Putumayo: Mocoa, Finca Locha, [1.16°N, 76.64°W], [600 masl], 1 female, 28/II/2016, C. Mora (ICN-Ar 8297). Vichada: Puerto Carreño, La Pedregoza Natural Reserve, [6.09°N, 67.94°W, ~60 masl], three females (with one ovisac) and one juvenile, 25/X/2014, J. Pinzón (ICN-Ar 8309).

DIAGNOSIS AND DESCRIPTION. *Rubrepeira rubronigra* is one of the most striking and easily distinguishable species in the family Araneidae. As described by Levi (1992), females present a setose carapace with the cephalic region low, and covered by a highly unusual abdomen, which has only one posterior projection and three pairs of lateral spine-shaped projections (Fig. 1, 4). The eyes are subequal in size. Ventrally, the abdomen has four pairs of medial black spots, dark-metallic bluish sternum, legs and spinnerets, and orange booklungs (Fig. 2). The diagnostic epigynum is as in Levi (1992: 261, fig. 18-19) (Fig. 3).

DISTRIBUTION AND MORPHOLOGICAL COMMENTS**.** The species is currently known from Mexico (Barranco?), Guyana (unknwon location), Venezuela (Delta Amacuro), Colombia (Cauca), Ecuador (Pichincha, Pastaza), Brazil (Pará, Amazonas, Espirito Santo), and Peru (Huánuco) (Fig. 13). Here we present two new additional records from Colombia, from the Putumayo (Napo province) and Vichada (Sabana province) departments, in the Neotropical region (Morrone, 2014). The two morphotypes described by Levi (1992)

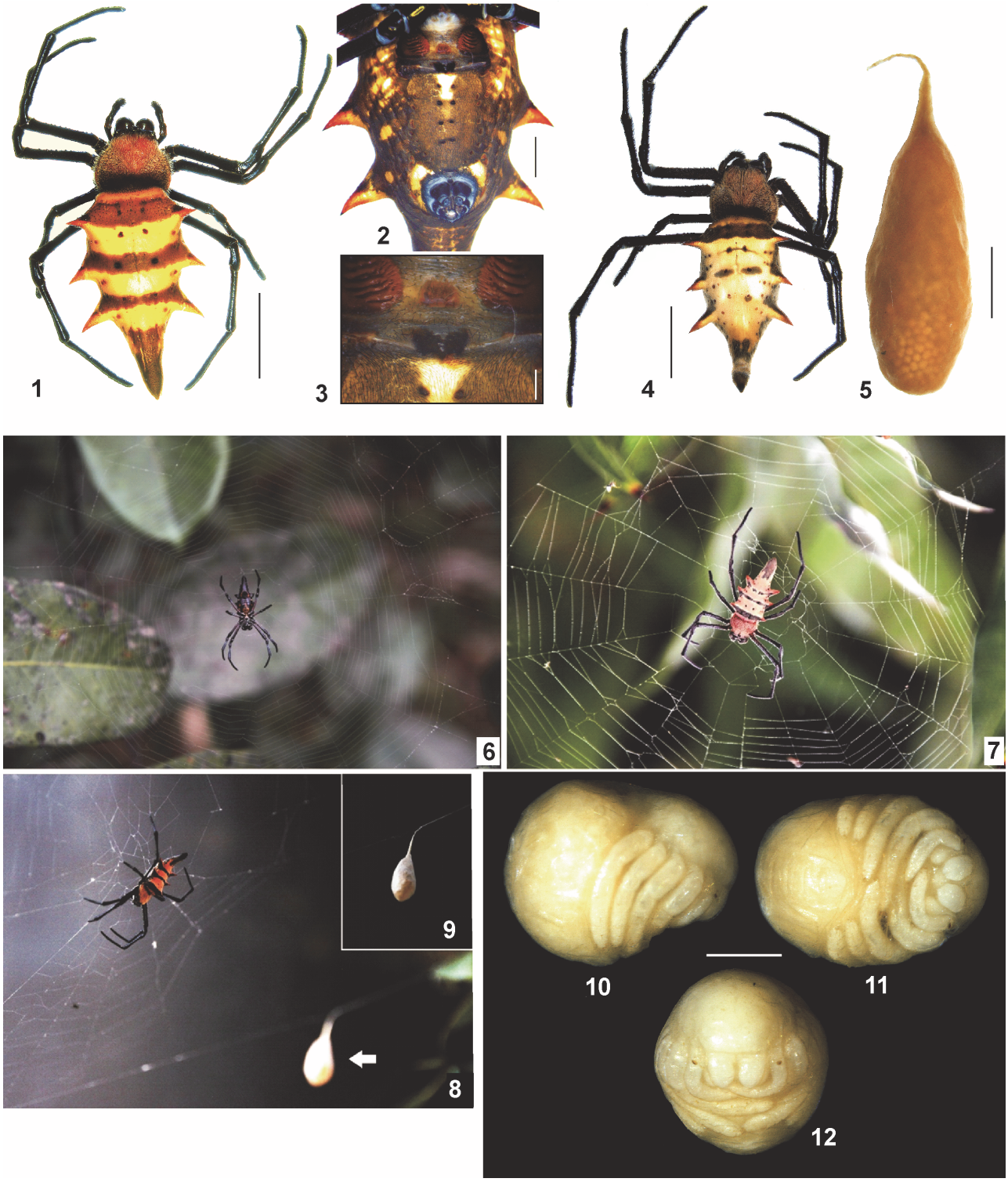


Fig. 1-12. *Rubrepeira rubronigra* (Mello-Leitão, 1939). **1-3**. Colombia, Putumayo (ICN-Ar 8297). **1.** female, habitus, **2.** same, ventral view of the abdomen, **3.** epigynum, ventral view. **4-5**. Colombia, Vichada (ICN-Ar 8309). **4.** female, habitus, **5.** ovisac. **6-9.** Colombia (Vichada). **6.** female juvenile, ventral view (XII/2011), **7.** female, dorsal view (XII/2014), **8.** female, lateral view (arrow showing peripheral placement of the ovisac in the web) (XII/2014), **9.** ovisac, detail. **Fig. 10-12.** Embryos from Colombia (ICN-Ar 8309). **10.** lateral view, **11.** ventral view, **12.** frontal view. Scale bars: 10 mm (**1, 4-5**), 2 mm (**2**), 0.5 mm (**3, 10-12**).

are observed among females examined here (variation in total length: 20.05-21.56), one of which is bigger and with transversal stripes (Fig. 1-3), and the other one that is smaller, pale and without the transversal stripes (Fig. 4). Ovisacs are elongated (Fig. 5, 9) and exhibit a very strong structure of interlaced orange threads; the collected ovisac contains numerous (n=1,007) rounded embryos, most of which are in an advanced stage of development, with chelicerae, palps and legs fully formed (Fig. 11-13). The female from Vichada (ICN-Ar 8297) presented the median lobe slightly rounded and slender, without a defined distal lobe, in the epigynum, in comparison with the epigynum illustrated by Levi (1992: 261, fig. 18-19).

NATURAL HISTORY. Specimens examined were collected from a house garden (Putumayo), in a very-intervened agro-ecosystem, surrounded by urban constructions; and in a farm garden (Vichada), surrounded by native grasslands and flooded forests, and plantations of acacia (*Acacia mangium* Willd.) and eucaliptus (*Eucalyptus pellita* F. Muell.). Several individuals were observed during various



Fig. 13. Known distribution of the orb-weaving spider *Rubrepeira rubronigra* (Mello-Leitão, 1939) in the Neotropical region.

trips to La Pedregoza Natural Reserve (Vichada) between 2011 and 2015 (Fig. 6-8). Many individuals were observed at the reserve facilities (including the collected specimens) where webs were commonly found attached to branches of Mango trees (*Mangifera indica* L.). Other females were observed at the same locality in natural habitats, some in webs attached to native riparian vegetation, shrubby vegetation in the natural savannahs (Fig. 7) and inside native inundated palm (*Mauritia flexuosa* L.) forests (Fig. 6), locally known as *Morichales*. Webs were generally spun in a circular fashion 1-3 m from the ground and ranged from 40-60 cm in diameter. Webs exhibited the typical architecture of the family, with a regular catching spiral followed by a free zone and an irregular closed hub at the center where the female hung upside down (Fig. 6-8). Various ovisacs were observed at the end of the rainy season (October-November) hanging from threads at the periphery of the web (arrow in Fig. 9).

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