

# One step forward and two steps back: on three jumping spiders described by H. D. Badcock deposited in the Natural History Museum, London, and two species newly recorded for Argentina (Araneae: Salticidae)

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**Abstract.** The holotypes of the three remaining valid species of South American jumping spiders described by H. D. Badcock are re-evaluated, following their recent examination and recuration. *Plexippus luteus* Badcock, 1932 was described based on an immature specimen which is not identifiable to species level. Prószyński (2017) regarded it as an "unrecognisable species" but did not formerly declare it a *species inquirenda* or *nomen dubium*. We illustrate the holotype, demonstrating it is indeed a juvenile and explicitly designating it as a ***nomen dubium***. *Psecas pulchra* is synonymised with *Psecas chapoda* (G. W. Peckham & E. G. Peckham, 1894) **syn. nov.** based on near-identical palp morphology. The genus *Mirandia* Badcock, 1932 is synonymised with *Gastromicans* Mello-Leitão, 1917 **syn. nov.**, with its monotypic type species newly combined as *Gastromicans australis* **comb. nov.** The first record of *G. australis* **comb. nov.** from Argentina is also reported, with a redescription of this species based on modern material collected by the second author. *Psecas chapoda* is also newly reported from Argentina.

**Keywords.** morphology, museums, salticid, taxonomy

## Introduction

A total of fifty available names were proposed for supposedly new spiders by Badcock (1932), reporting on an expedition that primarily spanned the Humid Chaco ecoregion (*sensu* Dinerstein *et al.* 2017), of Paraguay and a small portion of south-western Brazil. Seven genera were described, of which only two are currently valid, three are synonyms and the remaining two are *nomina dubia*. Of the 43 species described, only 13 remain valid, including the three aforementioned salticids. Of the remaining 30 species, six are *nomina dubia* and the remaining 24 are junior synonyms (World Spider Catalog 2023). Badcock (1932) described three new genera and nine new species of salticids from Paraguay. Of these, only one genus, *Mirandia* Badcock, 1932, and three species: *Plexippus luteus* Badcock, 1932, *Psecas pulchra* Badcock, 1932 and *Mirandia australis* Badcock, 1932 remain valid (World Spider Catalog 2023). When this entire group of spiders is considered, the number of truly valid species is dismal.

In this work, we illustrate the type specimens of the three remaining salticid taxa described by Badcock (1932), which are all deposited in the Natural History Museum, London (BMNH). We further report the first records of two relevant salticid species from Argentina.

## Material and methods

All photographs of types were made by DS using a Canon EOS 6D Mark II attached to a Leica MZ12.5 with images stacked using Helicon Focus software; photographs of non-types were made by MFN with a Canon EOS T3i professional camera attached to a Leica EZ4 stereomicroscope. The drawings of the genitalia and chelicerae were made by MFN using open-source software GIMP version 2.10.24, and a Wacom Intuos graphic tablet. Female genitalia were dissected as in Levi (1965). Maps were made using QGIS Geographic Information System, developed by the Open-Source Geospatial Foundation Project. The epigyne of the modern specimen of *G. australis* **comb. nov.** was placed into a ~15% NaOH solution to digest soft tissue. The epigyne was then cleared in clove oil.

*Abbreviations used in the text.* AL = abdomen length; BMNH = Natural History Museum, London, United Kingdom; CARTOUNNE = Colección de Artrópodos de la Universidad Nacional del Nordeste, Corrientes, Argentina; CH = carapace height; CL = carapace length; coll. = collector; colln. = collection; CW = carapace width; Cly = clypeus; Fe = femur; PERW = posterior eye row width; LOQ = length of ocular quadrangle (inclusive of ALE–PLE); MCZ = Museum of Comparative Zoology, Harvard University, Cambridge, United States; Me = metatarsus; Pa = patella; ALE–PME = distance between anterior lateral eyes and posterior median eyes; PME–PLE = distance between posterior median eyes and posterior lateral eyes; RTA = retrolateral tibial apophysis; Ta = tarsus; Ti = tibia; TL = total length.

## Taxonomy

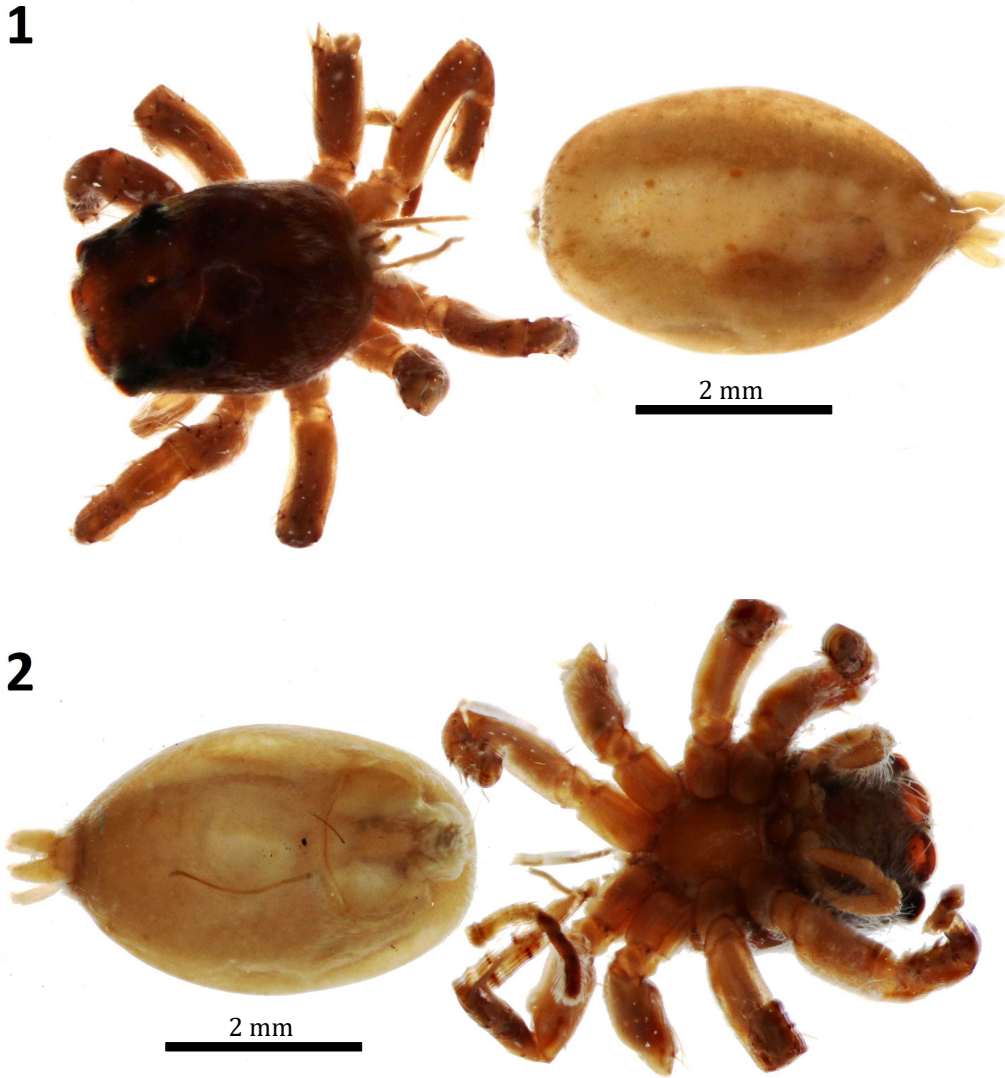
### *Plexippus luteus* Badcock, 1932 *nomen dubium*

*Plexippus luteus* Badcock, 1932: 44. (imm.)

*Plexippus luteus*: Prószyński (2017), 43.

*Type material.* Holotype imm. (BMNH 1932.9.2.74), Nanahua, Paraguayan Chaco, 01/03/1927, coll. G. S. Carter examined.

*Remarks.* The holotype of *P. luteus* is an immature (Figs. 1–2) and this was recognised by Badcock (1932). The World Spider Catalog (2023) mistakenly indicates that Badcock described this species as a male. *Plexippus luteus* is not able to be recognised based on the morphology of the specimen or from the original written description. Prószyński (2017) referred to this taxon as an "unrecognisable species," which is interpreted as a *species inquirenda* by the World Spider Catalog (2023), although that term was not used explicitly by Prószyński (2017). We agree that this species is unrecognisable, and that as a juvenile it may correspond to more than one species occurring at the type locality. We hereby formally propose *P. luteus* as a ***nomen dubium***.



**Figures 1-2.** *Plexippus luteus* Badcock, 1932 *nomen dubium* holotype immature (BMNH 1932.9.2.74). 1, Dorsal view. 2, Ventral view.

***Gastromicans australis* (Badcock, 1932) comb. nov.**

*Mirandia australis* Badcock, 1932: 47, fig. 39 (♀).

*Type material.* Holotype ♀ (BMNH 1932.9.2.77), Miranda, Paraguayan Chaco [now in Mato Grosso do Sul, Brazil], 06/09/1926, coll. G. S. Carter examined.

*Other material examined.* 1 ♀ (CARTROUNNE 8953), Argentina: Chaco: General San Martín: Parque Provincial Pampa del Indio (26°16'25"S, 59°58'39"N), coll. Nadal, Rubio, Zanone, *et al.*, 7 December 2017.

*Diagnosis.* *Gastromicans australis* **comb. nov.** resembles other *Gastromicans* species in having a recurved anterior eye row, ocular quadrangle wider than long, short vertical chelicerae, long narrow pedipalps, and numerous leg spines. This species resembles *G. albopilosa* in having chelicerae with a bicuspid retrolateral tooth, a small prolateral tooth, and a small medial tooth, but differs by having shorter insemination ducts with a different arrangement.



**Figures 3–6.** *Gastromicans australis* (Badcock, 1932) **comb. nov.** holotype female (BMNH 1932.9.2.77). **3**, Habitus, dorsal view. **4**, Habitus, latero-ventral view (not placed into full ventral view due to fear that multiple loose femora would fully dislodge). **5**, Epigyne, dorsal view. **6**, Epigyne, ventral view.

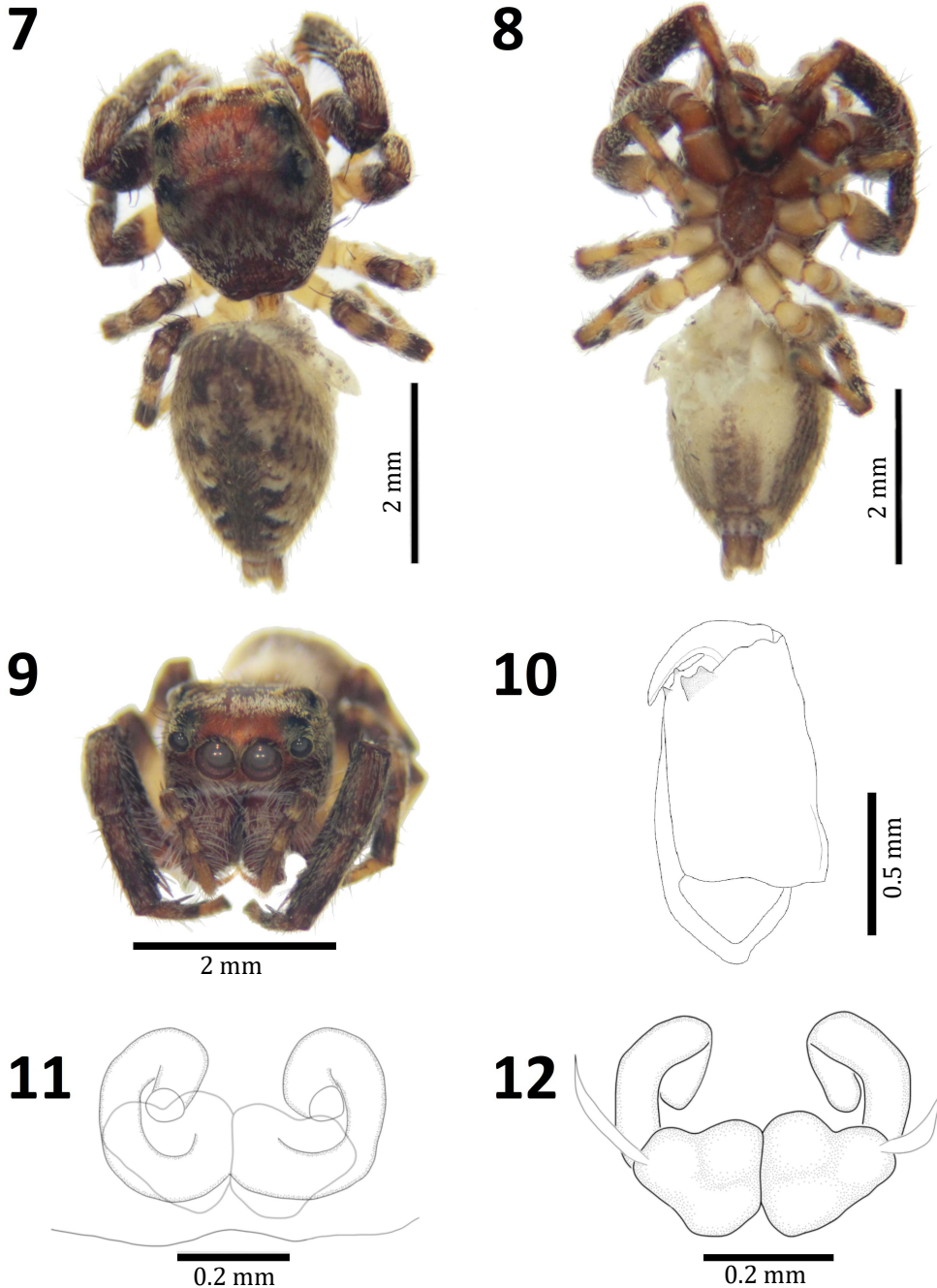
*Description of non-type female* (CARTROUNNE 8953). Dark brown carapace, except the head area, which is reddish brown, scattered feathery white hairs on the thoracic area and sides. Chelicerae brown, vertical, with a large bicuspid retrolateral tooth, a small prolateral tooth, and a small posterior medial tooth. Labium slightly longer than wide, brown with inner edge white. Endites brown with inner border white and bordered by hairs, almost the same size as the labium. Sternum brown, oval with straight anterior edge. First pair of legs dark brown, second to fourth pair light brown with dark brown rings from distal femur. Abdomen mottled and brown, at least five pairs of white spots on two longitudinal black bands, laterals with oblique white bands, ventrally with dull brown posterior area. Measurements: TL 4.66; carapace = CL 1.93, CW 1.85, CH 1.33. Cly AME 0.08; eyes = LOQ 0.93, AERW 1.55, PERW 1.63, ALE–PME 0.15, PME–PLE 0.35; sternum = SL 0.89, SW 0.55; pedipalp = Fe 0.67, Pa 0.30, Ti 0.33, Ta 0.59; pata I: Fe 1.48, Pa 0.96, Ti 1.11, Me 0.74, Ta 0.52; pata II: Fe 14.50, Pa 0.67, Ti 0.74, Me 0.67, Ta 0.41; pata III: Fe 1.04, Pa 0.67, Ti 0.59, Me 0.67, Ta 0.41; pata IV: Fe 1.33, Pa 0.67, Ti 0.81, Me 0.74, Ta 0.41. AL 2.52. SPINES: pedipalp = Fe d 1–1, Fe I d1–1–1,p2, Pa I p1, Ti I p1–1–1, Me I v2–2, Fe II d1–1,p2, Pa II p1, Ti II v1–1–2dist, Me II v2–2, Fe III d1–1,p2, Pa III r1, Ti III p1,r1,v2dist, Me III p1,r1, whorl6(4v,1p1r2d), Fe IV d1–1, 2pd, Pa IV r1, Ti IV p1–1, r1–1, v2dist, Me IV p1,r1, whorl4(p2,r2).

*Remarks.* The habitus and epigyne morphology of *Mirandia australis* (Figs. 3–6) is congruent with that of available illustrations of the genus *Gastromicans* Mello-Leitão, 1917 (Metzner 2023), although it is not synonymous with the six (of seven) current species for which females are known: *G. albopilosa* (Simon, 1903), *G. hondurensis* (G. W. Peckham & E. G. Peckham, 1896), *G. levispina* (F. O. Pickard-Cambridge,

1901), *G. noxiosa* (Simon, 1886), and *G. vigens* (G. W. Peckham & E. G. Peckham, 1901). Therefore, we synonymise *Mirandia* with *Gastromicans* **syn. nov.** and regard its type species as valid, newly combined as *Gastromicans australis* **comb. nov.**

Since the holotype is fragile, extensive measurements were not made in order to not risk further damage. Fortunately, the discovery of a non-type female from Argentina (Figs. 7–12) by MFN allows us to make a detailed redescription of this species.

*Distribution.* Argentina (new record) and Brazil (Fig. 18).



**Figures 7–12.** *Gastromicans australis* (Badcock, 1932) **comb. nov.** non-type female (CARTROUNNE 8953). **7**, Habitus, dorsal view. **8**, Habitus, ventral view. **9**, Habitus, frontal view. **10**, Chelicera, retrolateral view. **11**, Epigyne, dorsal view. **12**, Epigyne, ventral view.

***Psecas chapoda* (G. W. Peckham & E. G. Peckham, 1894)***Epinga chapoda* Peckham & Peckham, 1894: 95, pl. 9, fig. 1 (♂♀).*Psecas chapoda*: Simon (1903), 1050.*Psecas pulchra* Badcock, 1932: 39, fig. 30 (♂). **syn. nov.***Psecas chapoda*: Pett, Rubio & Stolar (2021), 927, figs. 8F–G (♂♀).

**Type material.** Syntypes 2 ♂♂, 1 ♀ *Epinga chapoda* (MCZ IZ-20763), Brazil, Chapoda, coll. H. H. Smith, G. W. and E. G. Peckham colln., not examined; holotype ♂ *Psecas pulchra* (BMNH 1932.9.2.68), Makthlawaiya, Paraguayan Chaco, 08/04/1927, coll. G. S. Carter, examined.



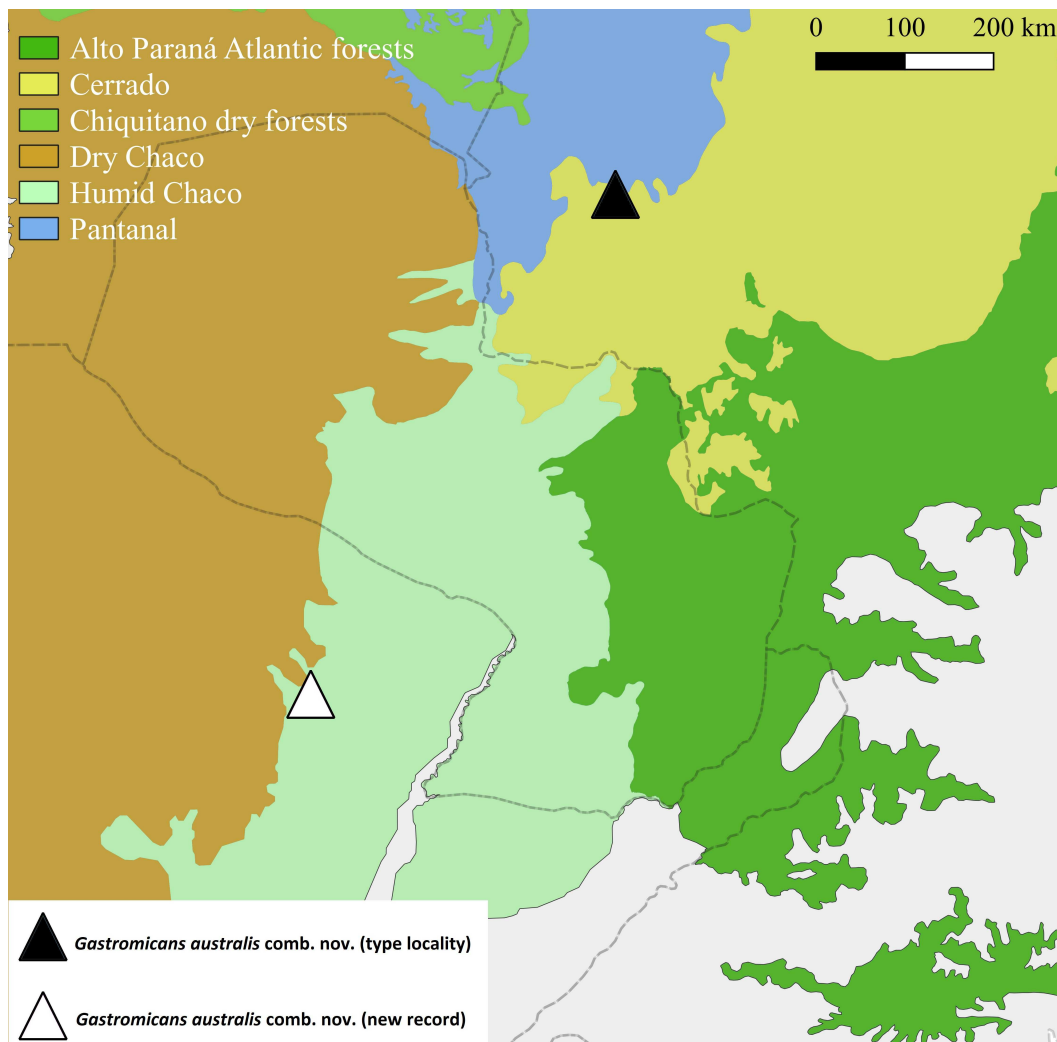
**Figures 13–17.** *Psecas pulchra* Badcock, 1932 (= junior synonym of *Psecas chapoda* (G. W. Peckham & E. G. Peckham, 1894) **syn. nov.**) holotype male (BMNH 1932.9.2.68). **13**, Habitus, dorsal view. **14**, Habitus, ventral view. **15**, Palp, prolateral view. **16**, Palp, ventral view. **17**, Palp, retrolateral view (retrolateral tibial apophysis traced with white outline for clarity).

**Other material examined.** 1 ♂ (CARTROUNNE 9264), Argentina: Corrientes: San Martín: Paraje Tres Cerros: Cerro Capará (29°09'16.02"S, 56°51'45.86"W), coll. Cuaranta, 7 May 2018; 1 ♀ (CARTROUNNE 9780), Argentina: Chaco: Gral. San Martín: Selva del Río de Oro (26°48'20.8"S, 58°56'34.3"W), coll. Nadal, 26 April 2022; 1 ♀ (CARTROUNNE 9781), Argentina: Chaco: Gral. San Martín: Pampa del Indio (26°07'42"S, 59°58'11"W), coll. Nadal, Got & Bareiro, 26 March 2022; 1 ♀ (CARTROUNNE 9783), Argentina: Chaco: Gral. San Martín: Pampa del Indio (26°07'42"S, 59°58'11"W), coll. Nadal, Got & Bareiro, 26 March 2022; 1 ♂ (CARTROUNNE 9784), Argentina: Chaco: Gral. San Martín: Pampa del Indio (26°07'42"S, 59°58'11"W), coll. Nadal, Got & Bareiro, 26 March 2022; 1 ♂ (CARTROUNNE 9785),

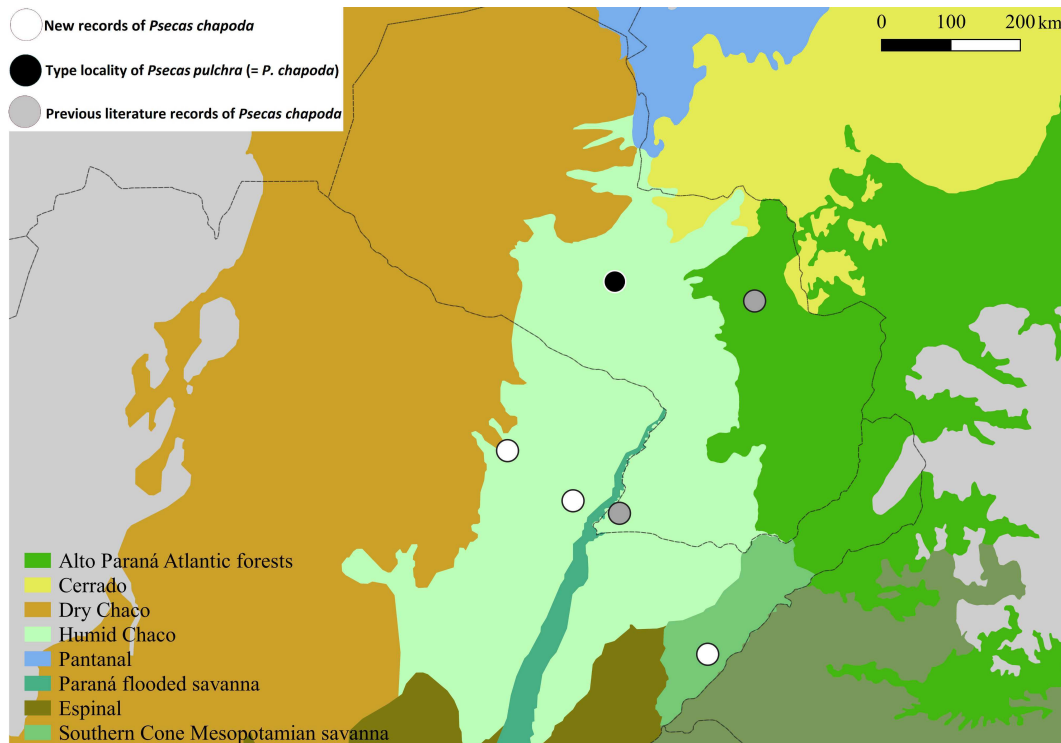
Argentina: Chaco: Gral. San Martín: Pampa del Indio (26°07'42"S, 59°58'11"W), coll. Nadal, Got & Bareiro, 26 March 2022.

**Remarks.** The holotype male of *P. pulchra* has a habitus and palpal morphology (Figs. 13–17) that is entirely congruent with that of *P. chapoda*, which was recently illustrated by Pett, Rubio & Stolar (2021). Therefore, we propose *P. pulchra* as a junior synonym of *P. chapoda* **syn. nov.** Non-type specimens collected, or otherwise examined, by MFN also confirm the presence of *P. chapoda* in Argentina, representing a new country record for this taxon.

**Distribution.** Argentina (new record), Brazil and Paraguay (Fig. 19).



**Figure 18.** Map showing the distribution of *Gastromicans australis* (Badcock, 1932) **comb. nov.** overlaid with ecoregions (*sensu* Dinerstein *et al.* 2017).



**Figure 19.** Map showing the distribution of *Psecas chapoda* (G. W. Peckham & E. G. Peckham, 1894) overlaid with ecoregions (*sensu* Dinerstein *et al.* 2017).

## Discussion

The present work rejects the validity of three more names proposed by Badcock (1932), leaving only a single valid salticid (species) name from this work. More broadly, only four spider species of other families described by Badcock (1932) remain untreated in a modern framework, including the type species of his last-surviving genus *Nothroctenus* Badcock, 1932 (Ctenidae). It is important that these final taxa be examined, and their identities clarified.

In the context of Paraguayan arachnology, this work continues recent efforts to enhance our knowledge of the diversity and distribution of salticids in Paraguay (e.g. Pett, Rubio & Stolar 2021). The clarification of the identities and localities of three species herein reduces the number of salticids recorded from Paraguay to 70 (inclusive of one species previously omitted by Pett, Rubio & Stolar 2021). The type locality of *Gastromicans australis* **comb. nov.** is Miranda, Mato Grosso do Sul, rather than in Paraguay as commonly mistaken when referencing Badcock (1932). The new record from General San Martín, Chaco, Argentina demonstrates this species may be found in both the Humid Chaco and Cerrado ecoregions locally. Despite the lack of current published records from Paraguay of *G. australis* **comb. nov.**, its distribution is likely to include the numerous Paraguayan departments that encompass those ecoregions, although this must be confirmed through future field work. The senior synonym of *Psecas pulchra*, *P. chapoda*, was already known from the Humid Chaco in Paraguay, and the record provided by Badcock (1932) provides another record from this ecoregion.

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