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Abaycosa a new genus of South American wolf spiders (Lycosidae: Allocosinae)

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http://zoobank.org/022E47BD-5A5D-447A-87F9-E3E0D58E5F8B

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Abstract

The taxonomy and systematics of the subfamily Allocosinae are poorly known, especially in South America. In the last century, several species have been described in genera from other subfamilies or transferred to them creating great confusion in the knowledge of Allocosinae. In this study we propose the new genus, *Abaycosa* **gen. nov.** to contain two species previously described, *Orinocosa paraguensis* (Gertsch & Wallace 1937) and *Pardosa nanica* Mello-Leitão 1941. Additionally, we propose two synonyms, *Pardosa flammula* Mello-Leitão 1945 as a junior synonym of *Abaycosa nanica* (Mello-Leitão 1941), **comb. nov.** and *Alopecosa rosea* Mello-Leitão 1945 as a junior synonym of *Abaycosa paraguensis* (Gertsch & Wallace 1937), **comb. nov.** The results of the phylogenetic analysis using molecular characters place *Abaycosa* in the subfamily Allocosinae, which is also supported by morphological data. *Abaycosa* can be distinguished from the remaining Allocosinae by the following characters: in males by the presence of only one distal macrosetae and a patch of flat setae on the tip of the cymbium, in females by the ventral position of the vulval chamber and by the short and stout stalk of the spermathecae.

Keywords

Molecular markers, phylogeny, taxonomy, Neotropical, Maximum likelihood, Araneae

1. Introduction

One of the most controversial issues in South American lycosid taxonomy is that most species were described and placed within Holarctic genera (i.e., *Lycosa*, *Pardosa*, *Alopecosa*, *Arctosa*). Furthermore, Roewer (1955, 1959) reassigned several described species of Lycosidae to other genera in the family, based mainly on highly variable characters, using in most cases the original description as a source of data without explaining the reason for those changes (Simó et al. 2017). This problem was solved in some subfamilies such as Sosippinae, Artoriinae, and Zoicinae (Piacentini and Grismado 2009; Piacentini 2014; Piacentini et al. 2017) but species within the South American Lycosinae, Pardosinae and Allocosinae are still probably misplaced. This became more visible in the recent phylogeny of Lycosidae based on molecular data (Piacentini and Ramírez 2019), who demonstrated that all South American species of those subfamilies were misplaced at the generic or even at the subfamily level. The subfamily Allocosinae was proposed by Dondale (1986) to include those species with a terminal apophysis in the bulb of the male in the form of a "beak" and a bifid median apophysis while females possessed an epigynum without a median septum and atrium. This author also recognized two groups within the subfamily, the *Allocosa* group, with representatives from North and Central America (Dondale and Redner 1983), characterized by a glabrous prosoma and the *Moenkhausiana* group, which includes South American species, characterized by an elongated and thin cymbium and highly developed anterior spinnerets. Dondale and Redner (1990) suggested that Allocosinae of South America are mostly unknown and they would not be congeneric with those of Central and North America. Despite recent contributions (Brescovit and Taucare-Ríos 2013; Simó et al. 2017), the taxonomic knowledge of South American species of Allocosinae remains scarce because many of the species were described based on a single sex, possess descriptions that are insufficiently informative, and/or are poorly illustrated. This makes recognition difficult at the species level, especially since members of this group possess great morphological similarity in their sexual characters (Simó et al. 2017). Recently contributions placed four South American species in the Allocosinae subfamily: *Arctosa sapiranga* Silva and Lise 2009, *Gnatholycosa spinipalpis* Mello-Leitão 1940, *Pardosa flammula* Mello-Leitão 1945 (Piacentini and Ramírez 2019) and *Paratrochosina amica* (Mello-Leitão 1941) (Gonnet et al. 2021). During the study of several arachnological collections of South America we revised material of three species that present morphological characters which confirm that they belong to the subfamily Allocosinae: *Orinocosa paraguensis* (Gerch and Wallace 1937), *Pardosa nanica* Mello-Leitão 1941, *Pardosa flammula* Mello-Leitão 1945 and *Alopecosa rosea* Mello-Leitão 1945. This study aims to establish the new Allocosinae genus *Abaycosa* **gen. nov.** to include two species *O. paraguensis* and *P. nanica.* Additionally we propose two synonyms: *P. flammula* as junior synonym of *Abaycosa nanica* **comb. nov.** and *A. rosea* as junior synonym of *Abaycosa paraguensis* **comb. nov.** Additionally, we evaluate the phylogenetic position of both species within Lycosidae using molecular characters and we extend the known of its geographical distribution.

2. Material and methods

2.1. Specimens and figures

Specimens are deposited in the following arachnological collections (curators in parenthesis): Facultad de Ciencias, Universidad de la República, Montevideo (FCE-Ar, M. Simó); Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires, Argentina (MACN-Ar, M. Ramírez); Museo de La Plata, Argentina (MLP, L. Pereira and C. Damborenea); Instituto Butantan, São Paulo, Brazil (IBSP, A.D. Brescovit) and Museu de Ciências e Tecnologia da Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, Brazil (PUCRS, R. Teixeira). Drawings were made digitally in the graphic design software Photoshop CS5 based on a microscope photograph. The internal genitalia were cleared in clove oil, and, in the cases of non-type specimens, digested with Enzymatic Cleaner (Ultrazyme®) or Pancreatin. The expansion of the male copulatory bulb was made by placing the palp in a 10% KOH solution, and then in distilled water, cycling until the bulb was fully expanded. Photographs of the preserved specimens were taken with a Leica DFC 290 digital camera mounted on a Leica M165 C stereoscopic microscope or with a digital camera Nikon D3000 attached to a microscope Nikon YS100. The focal planes were combined with Helicon Focus 4.62 Pro (www.heliconsoft.com). Before examination on the Scanning Electron Microscope (SEM), body parts were subjected to ultrasonic cleaning, critical point drying and coated with gold using a sputter coater. Images were obtained with a Jeol JSM-5900 (SEM) from Facultad de Ciencias, Universidad de la República, Uruguay. The distribution maps were created with SimpleMappr (http://www.simplemappr.net). The localities whose coordinates were not provided on the label were estimated using Google Earth (http://www.google.com/earth/index.html) and annotated between brackets.

2.2. Abbreviations and terminology

The species descriptions and measurements follow Piacentini and Grismado (2009). The macrosetae notation follows Ramírez (2003). The nomenclature of the copulatory organs follows Sierwald (2000). The following abbreviations are used in species descriptions: AER anterior eye row; AL abdomen length; ALE anterior lateral eyes; AME anterior median eyes; CH carapace height; CL carapace length; CW carapace width, taken in the fovea zone; FD fertilization ducts; HS head of spermatheca; MA median apophysis; PLE posterior lateral eyes; PME posterior median eyes; TA, terminal apophysis; TL total length; PA, palea; SS, stalk of the spermathecae; ST, subtegulum; VC, vulval chamber; T, tegulum; E, embolus. All measurements are in millimetres.

Table 1. Specimens and sequences accession numbers included in the study with details of DNA Code, Voucher number, Sex (M: male, F: female) and collection locality.

Species	DNA Code	Voucher number	Sex	Locality	*cox1*	*nad1*	*12S*	*h3*
Abaycosa nanica	LNP-04684	MACN-Ar 35792	M	Córdoba, Argentina (–31.639840, –64.411369)	SPDAR1414-16	—	—	—
Abaycosa nanica	LNP-04685	MACN-Ar 35798	F	Córdoba, Argentina (–31.639840, –64.411369)	SPDAR1415-16	—	—	—
Abaycosa nanica	AbnaAL76_h	FCE-Ar 10124	F	Entre Ríos, Argentina (–31.866538, –58.208497)	OL960042	OL956803	OL956807	OL956799
Abaycosa nanica	AbnaAL06_h	FCE-Ar 12535	F	Montevideo, Uruguay (–34.732195, –56.322899)	OL960040	OL956801	OL956805	OL956797
Abaycosa nanica	AbnaAL07_m	FCE-Ar 12536	M	Montevideo, Uruguay (–34.895613, –56.138703)	OL960041	OL956802	OL956806	OL956798
Abaycosa paraguensis	AbpaAL03_h	FCE-Ar 12533	F	Canelones, Uruguay (–34.761432, –55.694725)	OL960038	OL956800	—	OL956795
Abaycosa paraguensis	AbpaAL04_m	FCE-Ar 12533	M	Canelones, Uruguay (–34.761432, –55.694725)	OL960039	—	OL956804	OL956796

2.3. Molecular data collection

Genomic DNA was extracted from 5 individuals, including male and female of *Abaycosa nanica* and *Abaycosa paraguensis*, fixed in alcohol 95% and stored at –20º. The DNA extraction codes of all individuals with their respective sex and sampling locality are shown in Table 1. Laboratory procedures were performed at Departamento de Biodiversidad y Genética, Instituto de Investigaciones Biológicas Clemente Estable, Montevideo, Uruguay, following the protocols described in Planas et al. (2013) and Wheeler et al. (2016). Genomic DNA was extracted from left legs of the specimens using the DNeasy Tissue Kit (Qiagen) and following the manufacturer guidelines. The selection of the markers followed the availability of previously published data. We amplified by PCR (Polymerase Chain Reaction) and sequenced partial fragments of the mitochondrial genes cytochrome c oxidase subunit I (*cox1*), 12S rRNA (*12S*) and NADH deshydrogenase subunit I (*nad1*) using the primer pairs C1-J-1490 (Folmer et al. 1994) and C1-N-2662 (Porricosa-R1 (new primer designed for this study): 5’-AAGGAAATCAATAAGTA-ATTCCAGCT-3’), SR-J-14233 (Simon et al. 1994) and SR-N-14503 (Croom et al. 1991), and TL-1-N-12718 (Hedin, 1997) and M510 (Murphy et al. 2006), respectively. A partial fragment of the nuclear gene Histone 3 (*h3*) was also sequenced with the primer pairs H3F and H3R (Colgan et al. 1998). Polymerase chain reaction was carried out following the protocol for Taq DNA Polymerase with Standard Taq Buffer (M0273, New England Biolabs Inc.). PCR conditions were as follows: initial denaturing step at 95 °C for 3 min; followed by 35 cycles of 95°C for 30 s, from 42 to 48°C for 45 s (depending on the primers), and extension at 68°C for 45 s; with a final extension step at 68°C for 5 min. For the *cox1* and *nad1* genes fragments, a successful amplification was achieved with an annealing temperature at 45°C, for the *12S* was at 42°C, while for *h3* was from 48°C. The PCR products were visualized by electrophoresis in 1% agarose gel and purified with FastAP Thermosensitive Alkaline Phosphatase and Exonuclease I enzymes (Thermo Fisher Scientific). PCR products were sequenced in both directions using the Sequencing Service of Humanizing Genomics Macrogen, Seoul, Korea. DNA sequences were edited using the free trial version of the Geneious software and deposited in GenBank (OL956795 to OL956807, and OL960038 to OL960042) (Table 1).

2.4. Phylogenetic analyses

Analyses were conducted including the sequences generated in this study (Table 1) and sequences of *cox1, nad1*, *12S*, *h3* and *28S* genes deposited in GenBank and BOLD System from representatives of subfamilies of Lycosidae (Table 1 supplementary material). The representatives of the subfamily were selected following the molecular phylogeny published by Piacentini and Ramirez (2019), and the genus *Cupiennius,* of the closely related family Trechaleidae, was included as an outgroup to root trees. The alignment of the *cox1, nad1* and *h3* sequences was trivial since no insertions/deletions were observed. The sequences of *12S* and *28S* were aligned using the online version v.7 of the automatic alignment program MAFFT (Katoh et al. 2002) using the G-INS-i algorithm and the output alignment was processed with the online version of GBlocks (Castresana 2000), selecting the options for a less stringent selection to remove positions of ambiguous homology. The best partition scheme was selected with PartitionFinder2 (Lanfear et al. 2017), and maximum likelihood (ML) analysis was performed with RAxML v8 (Stamatakis 2014). Both analyses were run remotely

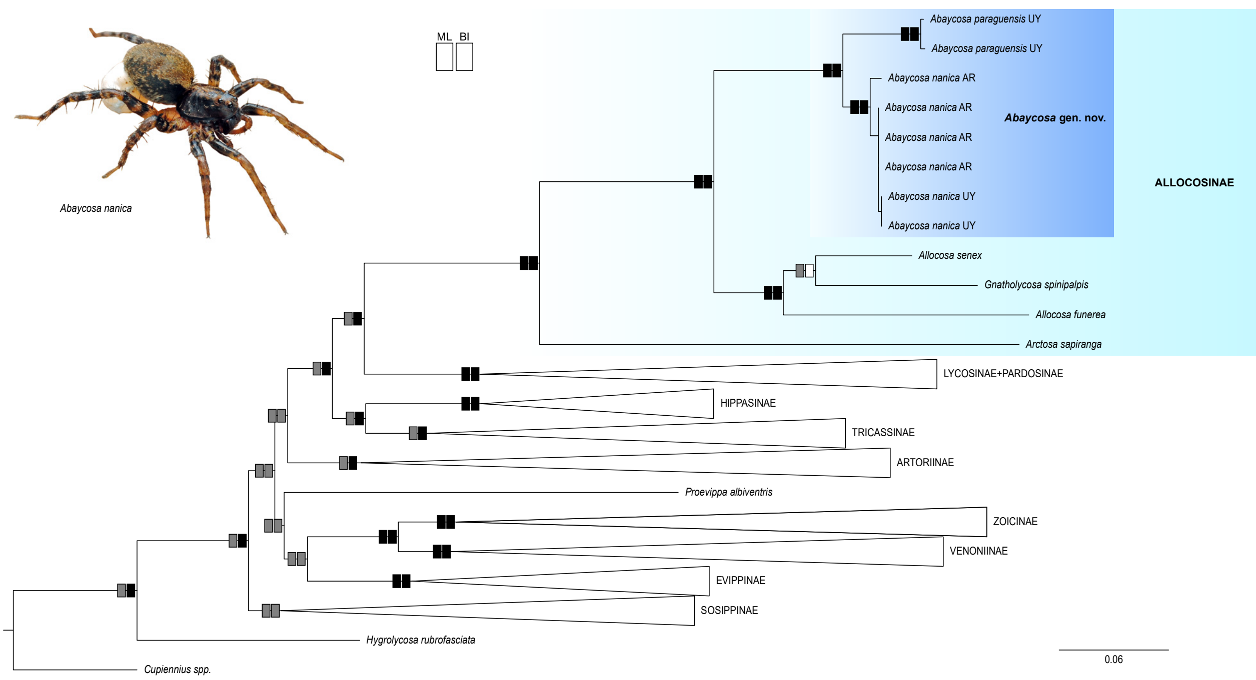

Figure 1. Maximum likelihood (ML) tree topology obtained under partition scheme by gene and full codon partition of the protein coding genes. Bars on branches denote clade support under ML and Bayesian inference (BI) (black, ML bootstrap > 75%, and Bayesian *PP* > 0.95; grey, clade recovered but with support below the threshold values above; white, clade not recovered in the analyses).

at the CIPRES portal (Miller et al. 2010). ML analyses were conducted using independent GTR + G substitution models for each partition, and selecting the rapid bootstrapping algorithm and the search for the best-scoring ML tree in one single run. The majority-rule criterion was used to automatically halt bootstrapping. Bayesian inference (BI) analysis was performed using MrBayes 3.2.6 (Ronquist et al. 2012). The tree search was conducted with two independent runs consisting of six MCMC chains with 10.000.000 generations and sampling every 1000 generations. The first 10% of each search was discarded as 'burn-in'. The program TRACER ver. 1.6 (Rambaut et al. 2014) was used to ensure that the Markov chains had reached stationarity by examining the effective sample size values. The trees were visualized with the program FigTree v1.4.4.

3. Results

3.1. Phylogenetic placement in the subfamily

The final matrix was composed of 108 taxa and 3068 characters (1278 for *cox1*, 615 for *nad1*, 244 for *12S*, 327 for *h3* and 604 for *28S*). The Partition Finder analysis indicated that the best partition scheme was to consider independent models for each gene and codon position in the protein-coding genes. The best fit substitution model GTR+I+G was selected for *cox1* and *nad1* 1st positions, *cox1* 2nd positions, and *28S*; HKY+G for *cox1* 3rd positions; TVM+I+G for *nad1* 2nd positions; HKY+I+G for *nad1* 3rd positions; GTR+G for *12S*; SYM+G for *h3* 1st position; K81 for *h3* 2nd position and TVMef+G for *h3* 3rd positions. Results of ML and BI phylogenetic analyses are summarized in Fig. 1. Both analyses supported the monophyly of the Allocosinae. All the sequenced individuals of *Abaycosa* form a monophyletic group that are placed in Allocosinae and both species of the genus are reciprocal monophyletic. The tree obtained in the ML analysis showed a topology similar to the BI tree, except for the relative position of three species: *Allocosa funerea* as sister group of *Allocosa senex* + *Gnatholycosa spinipalpis* instead of *Gnatholycosa spinipalpis* sister of *Allocosa funerea* + *Allocosa senex*. However, these relationships presented low support in both analyses. In addition, some differences in the relationships of other Lycosidae subfamilies were observed in the topology compared with the obtained tree by Piacentini and Ramírez (2019), however these differences showed low support.

3.2. Taxonomy

3.2.1. *Abaycosa* gen. nov.

http://zoobank.org/99081BB1-4D9A-4D40-9852-AE0BDAC-49C2D

Type species. *Pardosa nanica* Mello-Leitão, 1941**.**

Etymology. The generic name derived from the combination of "Abáy", which means spider in the language of the Chaná, an indigenous group native to the basins of the Paraná and Uruguay rivers. This language is considered critically endangered by the United Nations Education-

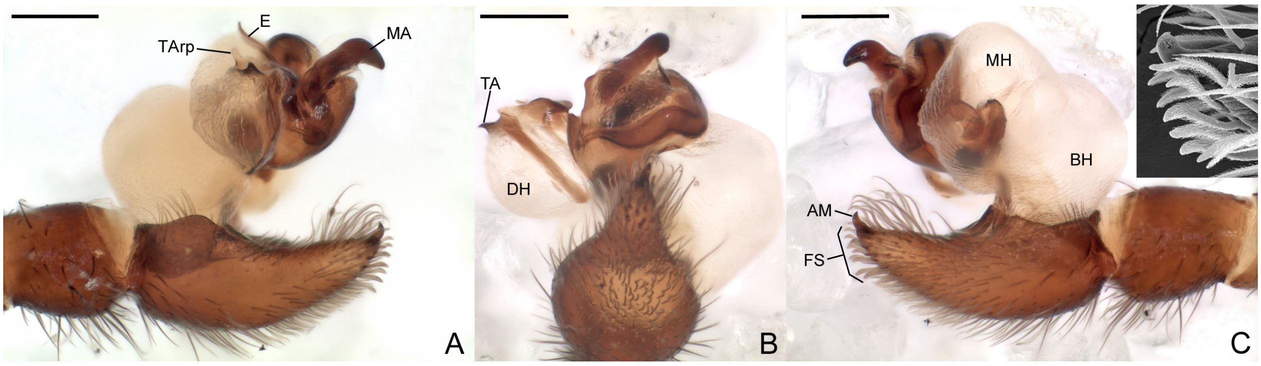

Figure 2. *Abaycosa nanica* (Mello-Leitão), expanded male genitalia (MACN-Ar 41946). A prolateral view. B anterior view. C retrolateral view; detail of the patch of flat setae on the dorsal tip of the cymbium and apical macrosetae. E embolus, MA median apophysis, TA terminal apophysis, TArp retrolateral projection of the terminal apophysis, MH median hematodocha, DH distal hematodocha, BH basal hematodocha, FS flat setae, AM apical macrosetae. Scale bar, 0.10 mm.

al, Scientific and Cultural Organization (UNESCO) and "cosa" a common ending of lycosids genera.

Diagnosis. Males of *Abaycosa* can be distinguished by the presence of only one distal macrosetae on the tip of the cymbium, short and curved ventrally (Fig. 2). Males can also be separated from the remaining South American Allocosinae by the palpal tibia, which is almost as long as wide (Fig. 2), resembling North American representatives of *Allocosa*. Males of *Abaycosa* differ from males of North American *Allocosa* by having a patch of flat setae on the dorsal tip of the cymbium (Fig. 2). Females of *Abaycosa* can be distinguished by the ventral position of the vulval chamber and by the short and stout stalk of the spermathecae (Fig. 3C, D).

Description. Small sized wolf spiders (males 3.72–4.50, females 3.99–6.38), carapace dark brown with a light brown median band. Sternum variable in coloration from black to brownish yellow. Chelicerae dark brown with three retromarginal teeth. Abdomen light brown with two dark brown lateral bands and a brown lanceolate mark in the cardiac area with a dark brown outline; venter brownish yellow, usually with two middle dark lines (Figs. 4, 5). Legs brown with dark annulations, proximal articles darker than distal, without scopula, leg formula 4123 or 4132. Palp of male with tibia long as wide (Figs. 2; 6G–I; 7G–I). Cymbium with only one distal macrosetae and flat setae on the tip (Fig. 2C); tegulum large occupying most of ventral side of bulb (Fig. 3E, H). Sierwald conductor long and triangular (Fig. 6C); median apophysis transversal, composed by an apical arm, pointed ventrally and a basal projection that could be curved apically in *A. nanica* (Fig. 3E, F) or ventrally in *A. paraguensis* (Fig. 3G, H). Embolous C-shaped, not visible on ventral view; distal part of the bulb with a terminal apophysis beaklike, pointing retrolaterally in *A. nanica* (Fig. 6F) or basally in *A. paraguensis* (Fig. 7F), and a projection on the retrolateral side, hooked in *A. nanica* (Fig. 6C) and straight in *A. paraguensis* (Fig. 7F). Epigynal plate without atria, with two parallel furrows in *A. nanica* (Figs. 3A; 8A) that are absent in *A. paraguensis* (Figs. 3B; 9A). Vulva composed of a rounded vulval chamber and stout spermathecae, with heads of about the same size as the stalk and base (Fig. 3C, D).

3.2.2. *Abaycosa nanica* (Mello-Leitão, 1941) new comb.

http://www.wsc.nmbe.ch/lsid/urn:lsid:nmbe.ch:spidersp:018644

Figs. 2–6; 8; 10

Pardosa nanica Mello-Leitão, 1941: 209, figs. 11-12. Female holotype from Calchaquí, Santa Fé, Argentina (MLP 15100), examined.

Pardosa flammula Mello-Leitão, 1945: 251, fig. 34. Male holotype from Rosario del Tala, Entre Ríos, Argentina (MLP 16520), examined. **Syn. n.**

Diagnosis. *Abaycosa nanica* resembles *Abaycosa paraguensis* in the coloration pattern and the presence of only one distal macrosetae on the tip of the male cymbium. Males can be recognized by the basal branch of the median apophysis curved apically (Figs. 3E, F; 6B) and females by the separated copulatory openings (Figs. 3C; 8B), that are almost touching on the middle in *A. paraguensis* (Figs. 3D; 9B).

Synonymy. After comparing the type of *P. flammula* with several specimens of *A. nanica* collected together in pitfall traps, we did not find morphological differences in the male genital features of both species.

Description. Male (MACN-Ar 41946)**.** Dorsal shield of prosoma dark brown with an irregular paler median band. Sternum, and coxae II–IV yellowish brown with coxa I, labium and endites darker. Chelicerae dark brown, covered with brown bristles. Opisthosoma light brown with two dark brown bands, a brown lanceolate mark in the cardiac area with a dark brown outline and a pattern of light and dark spots posterior to the cardiac mark. Venter brownish yellow with two middle dark lines; spinnerets brownish yellow. Legs, femora almost entirely dark brown, femora I–II with a distal pale ring, III–IV with a basal pale ring. The other segments of leg I–II brown-

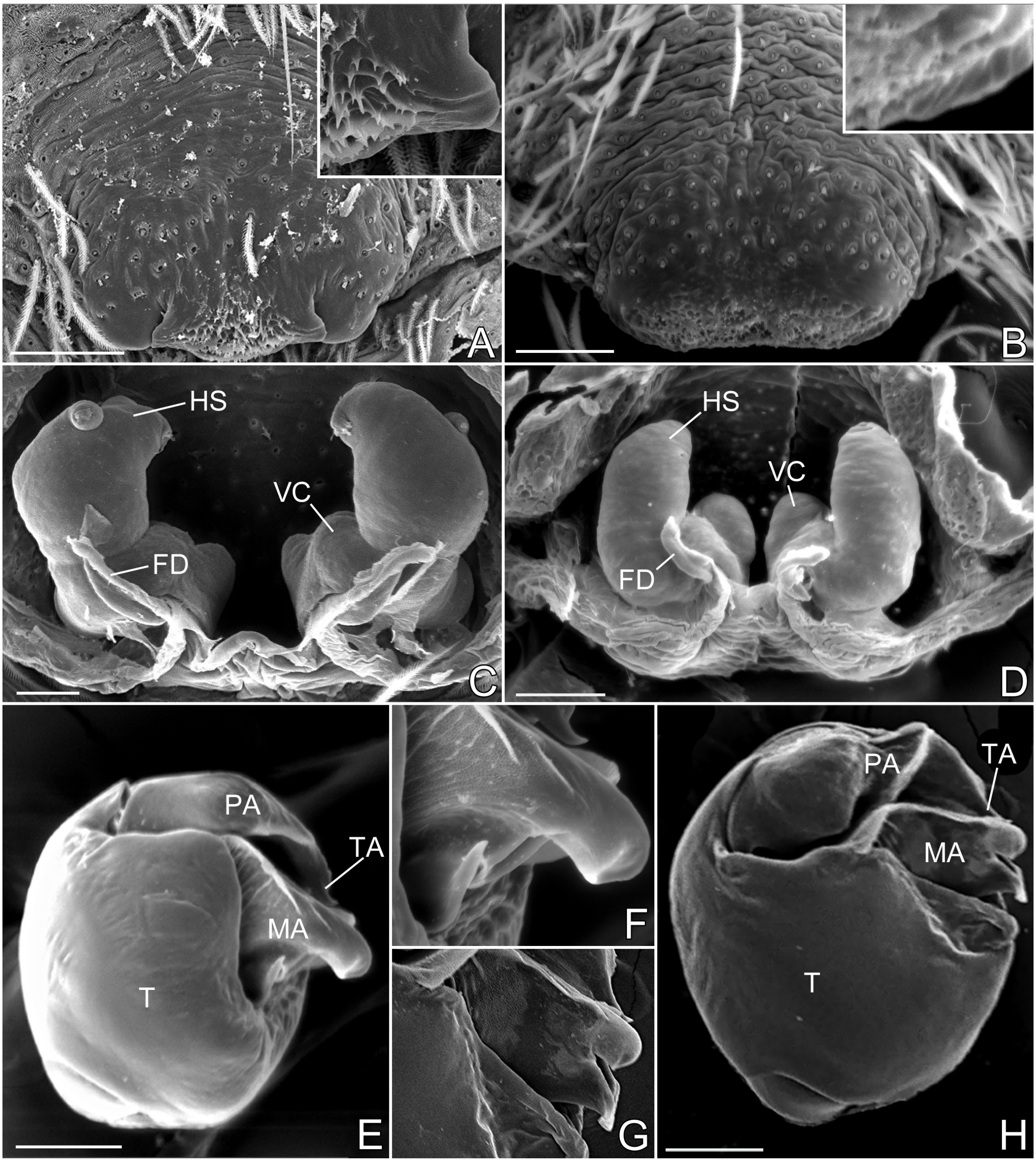

Figure 3. SEM micrographs of genitalia. A, C, E, F: *Abaycosa nanica* (Mello-Leitão). B, D, G, H: *Abaycosa paraguensis* (Gertsch & Wallace). A, B: Epigyne, ventral view, in top right corner detail of the posterior margin. C, D: Vulva, dorsal view. E, H: Male bulb ventral view. F, G: Male bulb ventral view, detail of the median apophysis. Abbreviations: FD fertilization ducts, HS head of spermatheca, MA median apophysis, PA palea, T tegulum, TA terminal apophysis, VC vulval chamber. Scale bars, A, B, D, E, H 0.10 mm, C 0.05 mm.

ish yellow, except tibia II, which has a basal dark brown ring. In legs III–IV the other segments have dark areas (Figs. 4A; 5A, B). Leg formula IV > I > III > II. Bulb with a median apophysis transverse, bifid, with an apical branch ventrally curved and the basal branch apically curved (Figs. 3E, F; 6B). Median apophysis with a dorsal channel that ends on the basal branch (Fig. 3F; 6C). Sierwald conductor long and triangular (Fig. 6C). Embolus curved and slender, almost perpendicular to the longitudinal axis of the bulb, resting on the dorsal projection of the MA. Distal part of the bulb with a terminal apophysis beaklike, pointing retrolaterally and a hooked projection on the retrolateral side (Fig. 6C, F). — *Spination pattern*: femur **I p**0-0-d1, **d**1-1-1, **II p**0-0-d1, **d**1-1-1, **III p**0-1-1, **d**1-1-1ap, **r**0-1-1, **IV p**0-0-d1, **d**1-1-1, **r**0-0-d1; patella **III p**1, **r**1, **IV p**1, **r**1; tibia **I p**1-1, **v**2-2-2ap, **II p**d1-d1, **v**r1-r1-2ap, **III p**1-1, **d**1, **r**1-1, **v**p1-p1-2ap, **IV p**1-1, **d**1, **r**1-1, **v**p1-2-2ap; metatarsus **I p**0-d1-1ap, **r**0-0-1ap, **v**2-2-

2ap, **II p**0-d1-1ap, **r**0-0-2ap, **v**2-2-3ap, **III p**d1-d1-1ap, **r**1-1-2ap, **v**2-2-3ap, **IV p**d1-d1-1ap, **r**d1-d1-1ap, **v**2-2-3ap.

Female (MACN-Ar 41946)**.** Coloration as in male, except by the legs, lighter, brownish yellow with dark spots. Venter of abdomen without dark marks (Figs. 4B; 5C, D). Leg formula IV > I > III > II. Epigyne: square flat plate, densely covered by setae. Copulatory openings situated on the posterior margin of the epyginal plate (Figs. 3A, 8A). In dorsal view, spermathecae with a short stalk and triangular heads; vulval chambers located ventrally to base of spermathecae, rounded and smaller than the spermathecae head (Figs. 3C; 8B). — *Spination pattern*: femur **I p** 0-0-d1, **d** 1-1-1, **II p** 0-0-d1, **d** 1-1-1, **III p** 0-1-1, **d** 1-1-1ap, **r** 0-0-1, **IV p** 0-0-d1, **d** 1-1-1, **r** 0-0-d1; patella **III p** 1, **r** 1, **IV p** 1, **r** 1; tibia **I p** d1-1, **v** 2-2-p1ap, **II p** d1-1, **v** r1-r1-p1ap, **III p** 1-1, **d** 1, **r** 1-1, **v** p1-2ap, IV **p** 1-1, **d** 0-1, **r** 1-1, **v** p1-2-2ap; metatarsus **I p** 2-2-2ap, **r** 0-0-1ap, **v** 2-2-3ap, **II p** 1-1-1ap, **r** 0-0-2ap, **v** 2-2-3ap, **III p** 1-1-1ap, **r** 1-1-2ap, **v** 2-2-3ap, **IV p** 1-1-1ap, **r** 1-1-1ap, **v** 2-2-3ap.

Measurements. Male, MACN-Ar 41946 (Female, MACN-Ar 41946): TL 3.20 (4.66), CL 1.93 (2.30), CW 1.27 (1.63), CH 0.60 (0.67), AL 1.47 (2.33). Eyes: AME 0.07 (0.07), ALE 0.06 (0.08), PME 0.16 (0.18), PLE 0.11 (0.10). Row of eyes: AER 0.33 (0.37), PMR 0.57 (0.50), PLR 0.56 (0.58). Sternum (length/width) 0.5/0.33 (0.58/0.47). Labium (length/width) 0.19/0.28 (0.23/0.30). Legs: length of segments (femur + patella/tibia + metatarsus + tarsus = total length): **I** 1.33 + 1.53 + 0.90 + 0.60 = 4.36, **II** 1.20 + 1.33 + 0.83 + 0.63 = 3.99, **III** 1.17 + 1.33 + 0.97 + 0.57 = 4.04, IV 1.87 + 2.03 + 1.73 + 0.80 = 6.43, (**I** 1.03 + 1.33 + 0.87 + 0.57 = 3.80, **II** 1.00 + 1.10 + 0.80 + 0.53 = 3.43, **III** 1.00 + 1.10 + 0.87 + 0.50 = 3.47, **IV** 1.40 + 1.60 + 1.37 + 0.67 = 5.04).

Variation. Male (Female) (range, mean±s.d.): TL 3.06–4.39, 3.71±0.47; CL 1.67–2.30, 2.00±0.17; CW 1.17–1.60, 1.39±0.14; n = 10 (TL 3.99–6.38, 4.93±0.86; CL 2.00–2.60, 2.28±0.18; CW 1.40–1.80, 1.63±0.15; n = 10).

Distribution. Known from north Paraguay, south of Bolivia and Brazil, north Argentina and Uruguay (Fig. 10A).

Natural history. Most of the specimens were recorded in different open environments such as grasslands or savannas and in anthropized environments in the Pampas and Chaco provinces and scarce records from Atlantic and Paraná provinces. Adults of this species were collected with pitfall traps across the year in several surveys in Argentina (Argañaraz et al. 2020; Pinto et al. 2021; Zapata and Grismado 2015) and Uruguay (information based on collection data) which suggest that they are active hunters.

Other material examined. BOLIVIA: **Chuquisaca**: Tomina: Padilla, Comunidad de Pedernal (19.308893, 64.302679), Izquierdo, M.A., 6-9.x.2011, hand collecting, 1♂ (MACN-Ar 41955). **BRAZIL**: **Mato Grosso do Sul:** Anaurilândia [22.184613, 52.718966], Cunha, F.S. and Souza, C.R., 05-11.iii.2001, 1♀ (IBSP 53367). **Minas Gerais**: Belo Horizonte [19.865775, 43.967055], Campus da UFMG, Santos, A.J., 05.iii.2007, 1♂ (IBSP 72966). **São Paulo**: Campinas [22.817700, 47.065180], Campus da Unicamp, Santos, A.J., 27.i.2007, 1♂ (IBSP 72973); São Paulo [23.567766, 46.721247], Campus IBSP, Ruiz, 01.xii.2004, 1♂ (IBSP 56953). **Rio Grande do Sul**: Santana do Livramento [30.811497, 55.548147], Cerro Verde, Dias, J.A., 03–09.xi.2006, 68♂ 6♀ 1 immature (IBSP 79898); Eldorado Do Sul [29.998491, 51.309950], 01.v.1996, 5♂ 2♀ (PUCRS 12580); Sao Borja, Reserva Sao Donato [29.019722, 56.173055], 11.x.2012, 5♂ 2♀ (PUCRS 37021); same data, 11.x.2012, 10♂ 5♀ (PUCRS 37019); same data, 4♂ 15♀ (PUCRS 37009); same data, 2♂ 2♀ (PUCRS 37008); same data, 4♂ 9♀ (PUCRS 36989); same data, 2♂ 4♀ (PUCRS 36987); same data, 6♂ 2♀ (PUCRS 36981); same data, 1♂ 1♀ (PUCRS 36976); same data, 2♂ 9♀ (PUCRS 36973); same data, 2♂ 10♀ (PUCRS 36968); same data, 7♂ 1♀ (PUCRS 36961); same data, 6♂ 7♀ (PUCRS 36960); same locality, 10.vii.2012, 14♂ 7♀ (PUCRS 36241); same data, 9♂ 3♀ (PUCRS 36240); same locality, 10.v.2012, 1♀ (PUCRS 36138); same data, 1♂ 2♀ (PUCRS 36129); same locality, 20.i.2012, 1♂ (PUCRS 34616); same data, 2♂ 3♀ (PUCRS 34610); same data, 2♂ 4♀ (PUCRS 34603); same data, 3♂ (PUCRS 34584); same data, 7♂ 1♀ (PUCRS 34582); same data, 11♂ 5♀ (PUCRS 34542); same data, 2♂ 1♀ (PUCRS 34538). **PARAGUAY**: **Alto Paraguay**; Puerto Casado [22.286010, 57.941824], Cranwel, J.A. and Giai, A., vii.1944, 1♀ 1 immature (MACN-Ar 1643). **ARGENTINA: Tucumán**: Horco Molle [26.793008, 65.317438], Galiano, M.E. x.1963, 2♀ (MACN-Ar 41657). **Santa Fe**: Vera: Estancia Las Gamas, 16,5 km by air W de Vera (29.44134, 60.38455), Ramírez, M., Grismado, C., Piacentini, L. and González Márquez, M., 20–24.iii.2014, hand collecting, 1♂ (MACN-Ar 32215); same locality and collectors, around the houses (29.42363, 60.38105), hand collecting, 1♂ (MACN-Ar 41975); same data 1♂ (MACN-Ar 41658); same locality, date and collectors, Chacoan humid forest, hand collecting, 1♂ (MACN-Ar 32215); Las Colonias: Tambo, 15 Km N of Esperanza, near to Salado river [31.3137012, 60.930366], Sarquis, J.A., 4.xi.2011, pitfall trap, 2 days active, 7♂ 4♀ (MACN-Ar 35265); same data, 1♂ (MACN-Ar 35213); same locality and collector, 1♂ (MACN-Ar 35266); same data, 8.xii.2011, 1♂ (MACN-Ar 35274); same data, 1♀ (MACN-Ar 35276); same locality and collectors, 20.vii.2011, 4♂ (MACN-Ar 35279); same data, 1♀ (MACN-Ar 35272). **Córdoba**: Alta Gracia (31.655452, 64.431918), Botero Trujillo, R. & Izquierdo, M., 22.i.2016, 1♂ (MACN-Ar 35792); same data, 1♀ (MACN-Ar 35792); Calamuchita [32.273838, 64.626038], Viana, iii.1953, 1♂ (MACN-Ar 41659); Cruz del Eje, El Tropezón (30.636676, 64.879609), Castellarini, F., 01.ii.2013, pirfall trap, 1♂ (MACN-Ar 41660); same data (30.640316, 64.858404), 1♀ (MACN-Ar 41661); same data, 6♂ (MACN-Ar 41663); same data (30.645217, 64.870217), 3♂ (MACN-Ar 41662); Cruz del Eje, Tuclame (30.743055, 65.248499), Castellarini, F., 01.ii.2011, pirfall, 3♂ 2♀ (MACN-Ar 41665); same data (30.726749, 65.262802), 1♂ 1 immature (MACN-Ar 41666); same data, 3♂ (MACN-Ar 41664); Media Naranja (30.639717, 64.875800), Castellarini, F., 01.ii.2012, pirfall trap, 1♂ (MACN-Ar 41667). **Corrientes**: San Roque, in the way to Colonia Pando [28.522597, 58.660742], López-Carrión, N., 2.xi.2019, hand collecting, 1♀ (MACN-Ar 41983). **Entre Ríos**: Departamento Colón, Parque Nacional El Palmar (31.866538, 58.208497) elev. 21m, Ramírez, M. and MACN-Ar team, 07.viii.2011, near to historic site La Calera del Palmar, sand beach on the Río Uruguay, night collecting. 1♂ (MACN-Ar 31122). **Buenos Aires:** Atucha (33.971180, 59.200038), Ramírez, M., 08.ix.1989, 1♀ (MACN-Ar 41668); same data, 1♂ (MACN-Ar 41669); Bella Vista

[34.563363, 58.691436], ii.1979, 1♀ (MACN-Ar 41670); Campana, Reserva Natural Otamendi, Río Luján railroad station (34.277352, 58.888052) alt. 5m, Ramírez, M., Grismado, C., Piacentini, L., Soto, E., Gonzáles Márquez, M.E., Guala, M., Andia Navarro, J.M., López, N., Ortega Insaurralde, I., Zermoglio, P., 09.ix.2010, in grassland and wetlands, 1♂ (MACN-Ar 28814); same locality (34.278722, 58.887833) alt. 6m, Grismado, C., Damer, L., López, N., Trivero, S., Grismado, A., 03–17.ii.2007, on grassland of "pelo de chancho" (*Distichlis sp*.), pitfall trap, 1♂ (MACN-Ar 12124); same locality, Grismado, C. and Grismado, A., 18.ii–06.iii.2007, 1♂ (MACN-Ar 12208); same data 1♂ (MACN-Ar 12208); same locality, Sendero Guardianes de la Barranca [34.230759, 58.894898], Grismado, C., Damer, L., López, N., Trivero, S. and Grismado, A., 3.ii.2007, 1♂ (MACN-Ar 12124); same locality (34.278017, 58.890346), Ramírez, M. and MACN-Ar team, 9.ix.2011, hand collecting, 1♂ (MACN-Ar 28814); San Fernando: Delta del Paraná, 3ra sección, Río Barca Grande y Arroyo Barquita [34.435679, 58.537776], Zapata, L. and Grismado, C., 24–26.i.2012, 1♂ 1♀ 1 immature (MACN-Ar 31197); Luján: Open Door [34.494851, 59.068501], Piacentini, L., 1.i.2005, hand collecting, 2♂ 3♀ (MACN-Ar 41946); San Pedro: Parque Histórico Natural Vuelta de Obligado [33.598256, 59.809827], López-Carrión, N. and Olejnik, N., 10.i.2009, hand collecting during day, 1♀ (MACN-Ar 36908); same data, hand collecting in camalotes, 1♂ 1♀ (MACN-Ar 36901); same locality and collectors, at the foot of the slope, 11.x.2009, hand collecting during day, 1♂ (MACN-Ar 36910). **Catamarca**: El Rodeo [28.208697, 65.876588], 16–23.i.1977, 1♂ (MACN-Ar 41671). **Ciudad Autónoma de Buenos Aires:** Reserva Ecológica Costanera Sur (34.604583, 58.350083), Turienzo, P., 13.x.2008, forest of *Tessaria integrifolia*; pitfall trap, 1♂ (MACN-Ar 38980); same locality and date, Mamani, A., pitfall trap, 1♂ (MACN-Ar 38980); Reserva Ecológica Costanera Sur, Laguna de los Macáes (34.606027, 58.348611), Mamani, Turienzo and Zapata, 19.i.2009, pitfall trap, 1♂ (MACN-Ar 39015); same data 1♂ (MACN-Ar 39015). **URUGUAY**: **San José**: Balneario Kiyú [34.696922, 56.755091], Laborda, A., 14.xii.2012, hand collecting, 1♂ (FCE-Ar 3901). **Maldonado**: Cerro Pan de Azucar (-34.810291, -55.259097), Ramírez, M., 25.i.2014, 1♂ (MACN-Ar 31191); Piriápolis (34.864363, 55.271627), Ramírez, M., 15.i–14.ii.2014, 1♂ (MACN-Ar 31392); same data, 1♀ (MACN-Ar 31391). **Río Negro**: Esteros de Farrapos, near to San Javier [32.686886, 58.124233], Laborda, A., 12.iii.2018, in blanqueal, 5♂ 11♀ (FCE-Ar 10131). **Salto**: Horacio Quiroga [31.272783, 57.922255], Vazquez, V., 05.vii.1996, at a trunk of Ceibo (*Erythrina crista-galli*), 1♀ (FCE-Ar 982). **Canelones**: INIA, Las Brujas [34.663019, 56.336322], Simó y col., 22.iii.2005, pitfall trap, 1♀ (FCE-Ar 3317); same data, 1♀ (FCE-Ar 3336); same locality and collectors, 12.i.2005, in pitfall trap in artificial grassland, 1♂ (FCE-Ar 2089); same locality and collectors, 07.x.2004, 1♂ (FCE-Ar 1074); same data, 1♀ (FCE-Ar 1078); same locality and collectors, 22.iii.2005, in pitfall trap, 1♂ 1 immature (FCE-Ar 3265); same locality and collectors, 07.x.2004, 1♂ (FCE-Ar 2787); same locality and collectors, 09.xi.2004, 1♀ (FCE-Ar 1506); same locality and collectors, 27.xii.2004, 1♀ (FCE-Ar 1776); same locality and collectors, 12.i.2005, 2♂ 1 immature (FCE-Ar 2076); same data, 1♀ (FCE-Ar 2096); same locality and collectors, 23.x.2004, in pitfall trap on *Eucalyptus* forest, 1♀ (FCE-Ar 1360); same locality and collectors, 23.x.2004, in pitfall trap on *Eucalyptus* forest, 2♂ 1 immature (FCE-Ar 1191); same locality and collectors, 21.ix.2004, in pitfall trap in artificial grassland, 2♂ 2♀ (FCE-Ar 2788); same data, 1♂ (FCE-Ar 2786); same locality and collectors, 07.iii.2005, in pitfall trap in artificial grassland, 1♀ (FCE-Ar 2670); Marindia [34.777636, 55.815147], Costa, F., 08.x.1998, pitfall trap, 1♂ (FCE-Ar 2735); same data, 1♂ (FCE-Ar 2733); same data, 1♀ (FCE-Ar 2714); same locality and collectors, viii.2014, hand collecting, 1♂ 1♀ (FCE-Ar 5926); same locality and collectors, pitfall trap, 1♀(FCE-Ar 2734). **Montevideo**: Melilla [34.731994, 56.322544], Hagopián, D., i–ii.2018, in pool filter, 9♂ 6♀ (FCE-Ar 10132); Paso de la arena [34.820255, 56.318936], Simó, M., Pérez-Miles, F. and Viera, C., iii.1996, 1♂ (FCE-Ar 7946). **Treinta y Tres**: Quebrada de los Cuervos [32.923577, 54.458077], Sección Entomología, ii.1990, 3♂ (FCE-Ar 4706). **Paysandú**: Río Queguay, Rincón de Pérez, Estancia Loma del Queguay [32.102322, 57.446752], Laborda, A., 18.iii.2010, in grassland, hand collecting, 1♀ (FCE-Ar 4823). **Río Negro**: Ruta 24, km 85, Estancia "Las Cadenas" [32.529027, 58.038194], Hagopián, D., 13.iii.2018, in Blanqueal zone, 1♂ (FCE-Ar 10133).

3.2.3. *Abaycosa paraguensis* (Gertsch & Wallace, 1937) new comb.

http://www.wsc.nmbe.ch/lsid/urn:lsid:nmbe.ch:spidersp:018480

Figs. 3–5; 7; 9; 10

Arctosa paraguensis Gertsch & Wallace, 1937: 4, fig. 10. Male holotype from Taquarapa, Alto Paraná, Paraguay (AMNH), examined through a photo.

Orinocosa paraguensis: Roewer, 1955: 281.

Alopecosa rosea Mello-Leitão, 1945: 247. fig. 30. Male holotype from Solari, Corrientes, Argentina (MLP 16460), examined. **Syn. n.**

Synonymy. After comparing the type of *Alopecosa rosea* with several specimens of *Abaycosa paraguensis* collected together on pitfall traps in Rocha (Uruguay), we did not find morphological differences in the male genital features of both species.

Diagnosis. *Abaycosa paraguensis* resembles *A. nanica* in the colouration pattern and the presence of only one distal macrosetae on the tip of the male cymbium. Males can be recognized by the ventrally pointed basal branch of median apophysis (Figs. 3G, H; 7B) and females by the copulatory openings separated (Figs. 3D; 9B).

Description. Male (FCE-Ar 7903)**.** Dorsal shield of prosoma dark brown with a light brown median band, wide in the cephalic area narrowing posteriorly. Sternum, labium, and endites dark brown. Chelicerae dark brown, covered with brown bristles. Opisthosoma light brown with two dark brown lateral bands, a brown lanceolate mark in the cardiac area with a dark brown outline and a pattern of light and dark spots posterior to the cardiac mark. Venter brownish yellow with two middle dark lines; spinnerets brownish yellow. Legs, femora almost entirely dark brown, the other segments brownish yellow with dark spots (Figs. 4C; 5E, F). Leg formula IV > I > II > III. Cymbium with only one distal macrosetae and flat setae on the tip (Fig. 7G). Bulb with a median apophysis wide and bifid, the basal projection short and straight, the distal projection is longer, curved and ventrally projected (Figs. 3G, H; 7B). Sierwald conductor long and triangular (Fig. 7D). Embolus curved and slender, almost perpendicular to the longitudinal axis of the bulb, resting on the

Figure 4. Live specimens. *Abaycosa nanica* (Mello-Leitão). A: male, B: female with eggsac. *Abaycosa paraguensis* (Gertsch & Wallace). C: male, D: female.

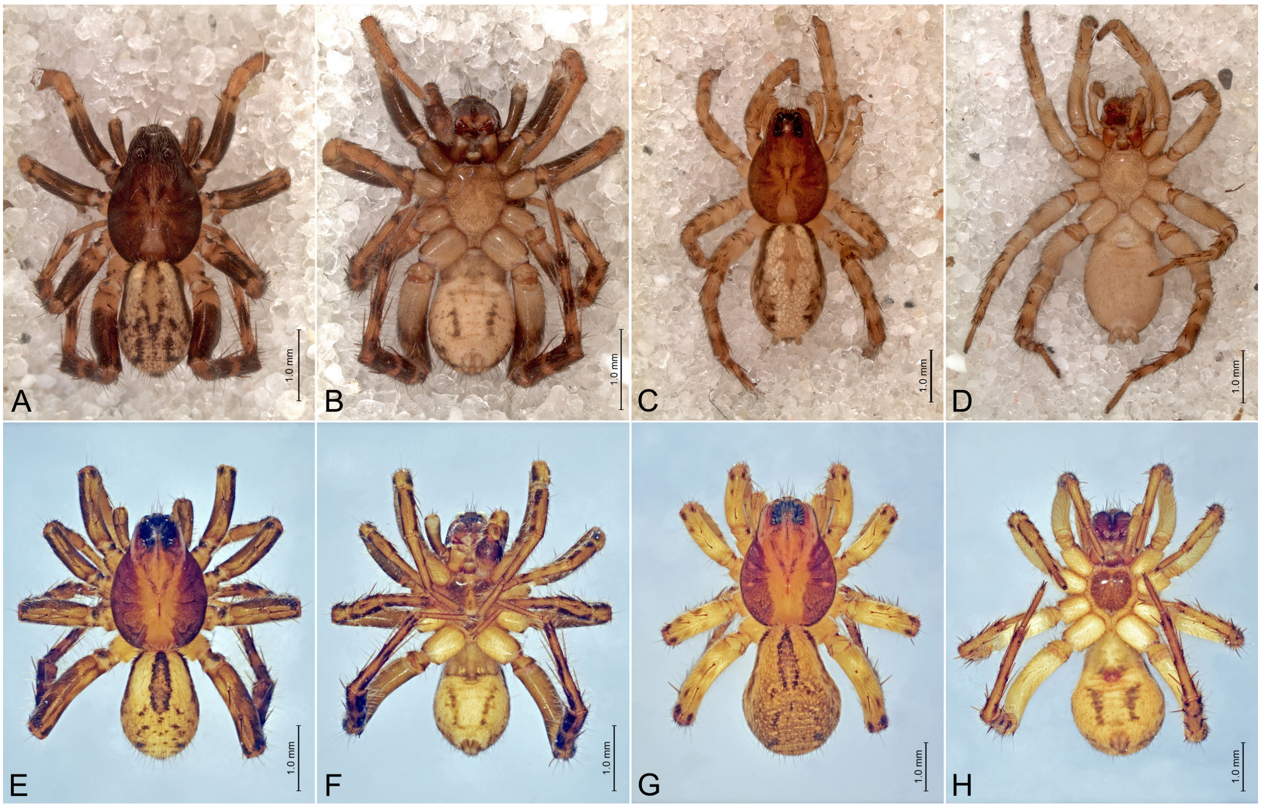

Figure 5. Habitus. A–D: *Abaycosa nanica* (Mello-Leitão). E–H *Abaycosa paraguensis* (Gertsch & Wallace). A, E male dorsal view. B,F male ventral view. C, G female dorsal view. D, H female ventral view.

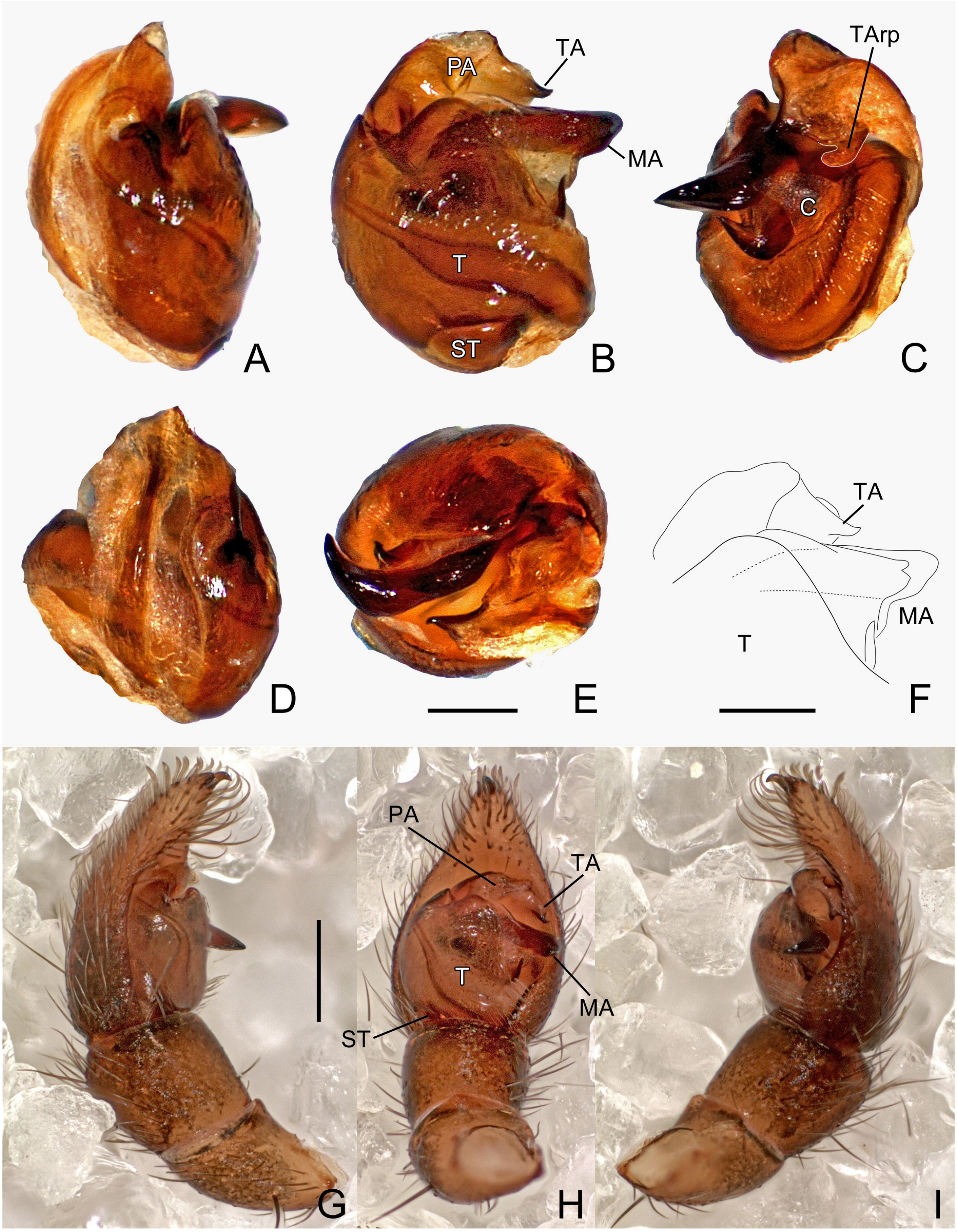

Figure 6. *Abaycosa nanica* (Mello-Leitão), male genitalia, A–F bulb (MACN-Ar 41946), A prolateral; B ventral; C retrolateral; D dorsal; E apical; F detail of the TA and MA disposition; G–I pedipalp, G prolateral; H ventral; I retrolateral. Abbreviations: C Sierwald conductor, MA median apophysis, PA palea, ST sub tegulum, T tegulum, TA terminal apophysis, TArp retrolateral projection of the terminal apophysis. Scale bars, A–F 0.10 mm, G–I 0.20 mm.

posterior projection of the MA. Terminal apophysis elongated, projected posteriorly and pointed at the tip (Fig. 7F). — Spination pattern: femur **I p** 0-0-d1, **d** 1-1-1, **II p** 0-0-d1, **d** 1-1-1, **III p** 0-1-1, **d** 1-1-1ap, **r** 0-1-1, **IV p** 0-0-d1, **d** 1-1-1, **r** 0-0-d1; patella **III p** 1, **r** 1, **IV p** 1, **r** 1; tibia **I p** 0-1, **v** 2-2-2ap, **II p** d1-1, **v** r1-r1-2ap, **III p** 1-1, **d** 1, **r** 1-1, **v** p1-p1-2ap, **IV p** 1-1, **d** 1, **r** 1-1, **v** p1-2-2ap; metatarsus **I p** 0-0-1ap, **r** 0-0-1ap, **v** 2-2-2, **II p** 0-1-1ap, **r** 0-0-2ap, **v** 2-2-2ap, **III p** 1-1-1ap, **r** 1-1-2ap, **v** 2-2-2ap, **IV p** 1-1-1ap, **r** 1-1-2ap, **v** 2-2-2ap.

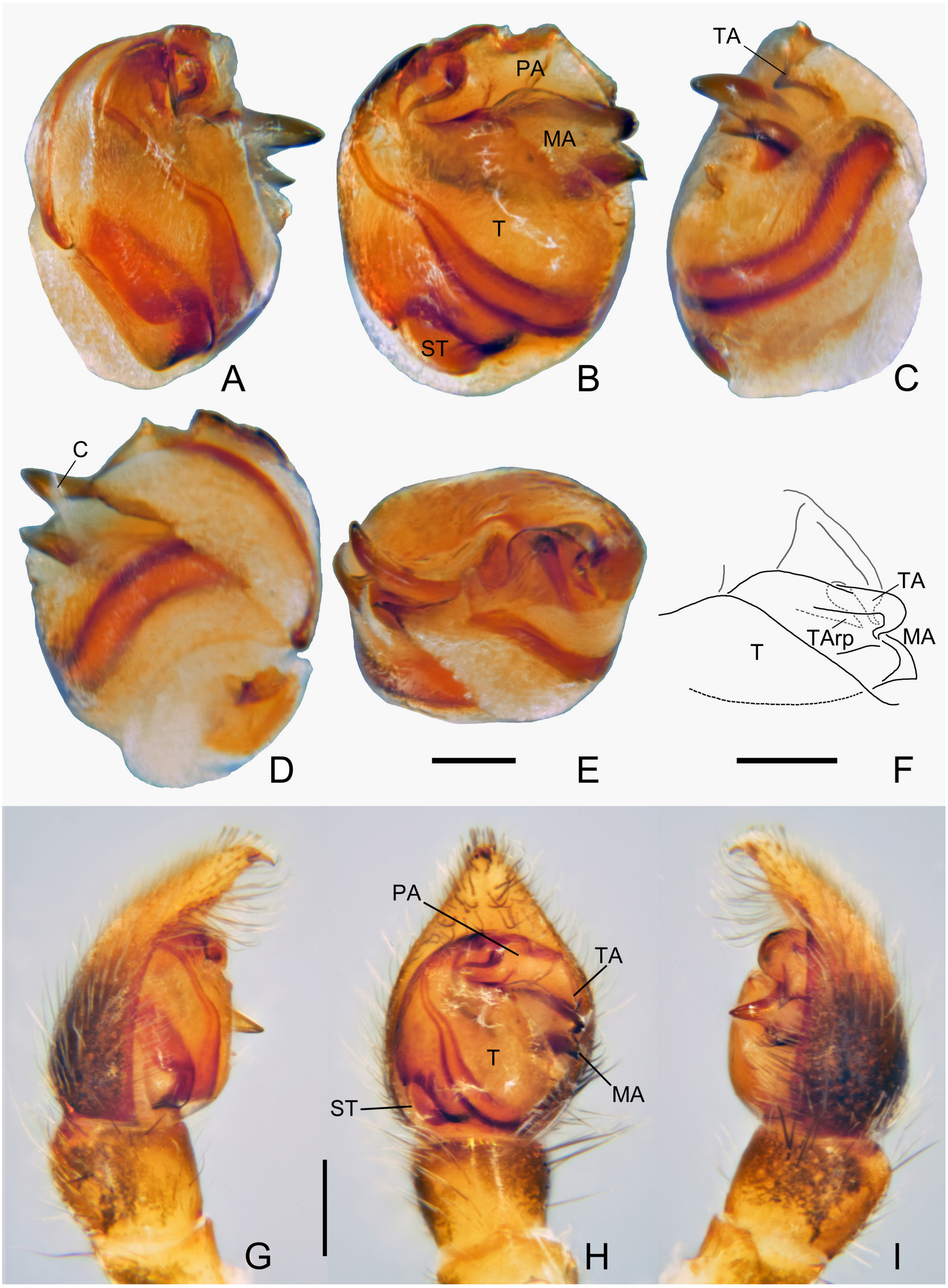

Figure 7. *Abaycosa paraguensis* (Gertsch & Wallace), male genitalia (FCE-Ar 7903), A–F bulb, A prolateral; B ventral; C retrolateral; D dorsal; E apical; F detail of the TA and MA disposition; G–I pedipalp, G prolateral; H ventral; I retrolateral. Abbreviations: C Sierwald conductor, MA median apophysis, PA palea, ST sub tegulum, T tegulum, TA terminal apophysis, TArp retrolateral projection of the terminal apophysis. Scale bars, A–F 0.10 mm, G–I 0.20 mm.

Female (FCE-Ar 2744)**.** Colouration as in male, except by the legs, lighter, brownish yellow with dark spots (Figs. 4D; 5G, H). Leg formula IV>I>II>III. Epigyne: square flat plate, densely covered by setae (Figs. 3B; 9A). Copulatory openings situated on the posterior margin of the epyginal plate. In the dorsal view the heads of spermathecae are elongated, with a short stalk; vulval chambers rounded, smaller than the spermathecae and projected ventrally (Figs. 3D; 9B). — Spination pattern: femur **I p** 0-0-d1, **d** 1-1-1, **II p** 0-0-d1, **d** 1-1-1, **III p** 0-1-1, **d** 1-1-

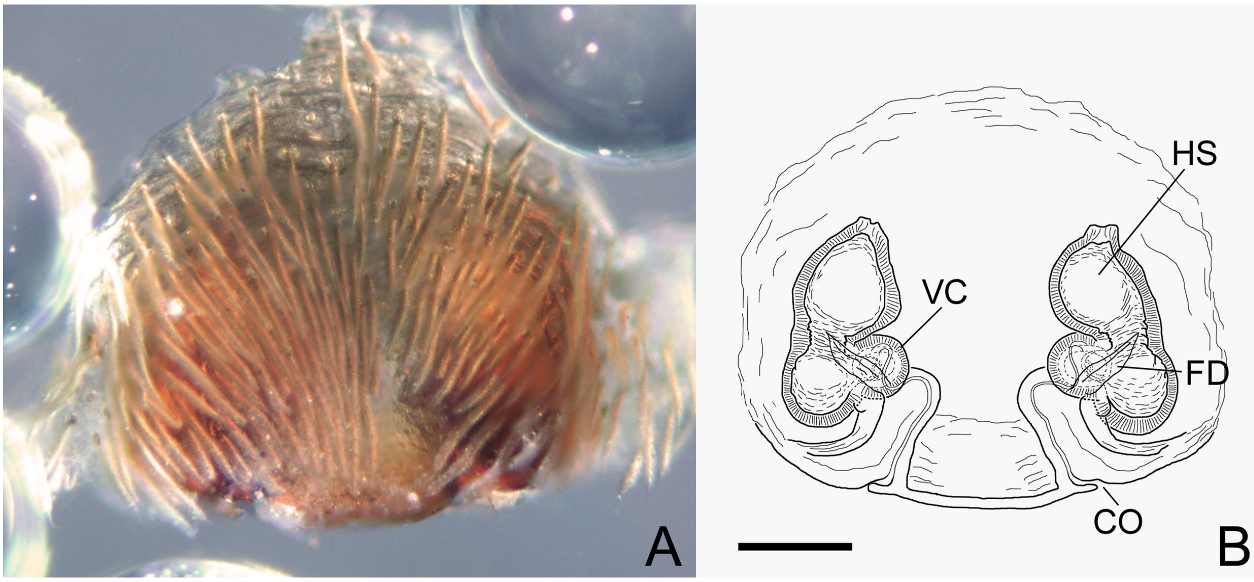

Figure 8. *Abaycosa nanica* (Mello-Leitão), female genitalia (MACN-Ar 35265). A epigyne ventral view, B vulva dorsal view. Abbreviations: CO copulatory opening, FD fertilization ducts, HS head of spermatheca, VC, vulval chamber. Scale bar, 0.10 mm.

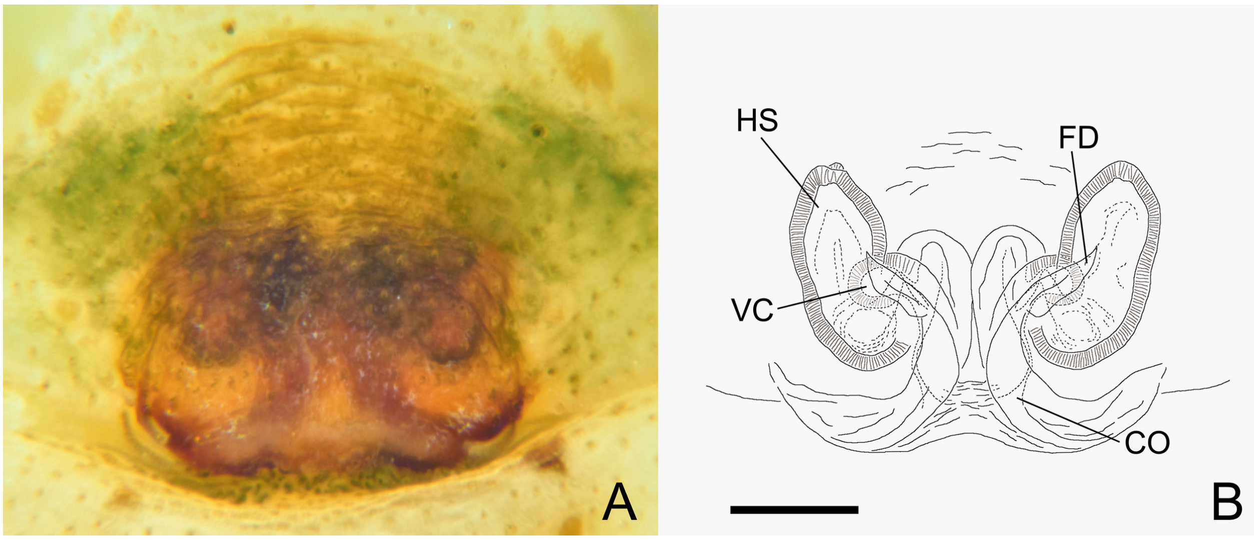

Figure 9. *Abaycosa paraguensis* (Gertsch & Wallace), female genitalia (FCE-Ar 2744), A epigyne ventral view, B vulva dorsal view. Abbreviations: CO copulatory opening, FD fertilization ducts, HS head of spermatheca, VC, vulval chamber. Scale bar, 0.10 mm.

1ap, **r** 0-1-1, **IV p** 0-0-d1, **d** 1-1-1, **r** 0-0-d1; patella **III p** 1, **r** 1, **IV p** 1, **r** 1; tibia **I p** d1-1, **v** 2-2-p1ap, **II p** d1-1, **v** r1-r1-2ap, **III p** 1-1, **d** 1, **r** 1-1, **v** p1-p1-2ap, **IV p** 1-1, **d** 1, **r** 1-1, **v** p1-2-2ap; metatarsus **I p** 0-0-1ap, **r** 0-0-1ap, **v** 2-2-2, **II p** 1-1-1ap, **r** 0-0-2ap, **v** 2-2-2ap, **III p** 1-1-1ap, **r** 1-1-2ap, **v** 2-2-2ap, **IV p** 1-1-1ap, **r** 1-1-2ap, **v** 2-2-2ap.

Measurements. Male, FCE-Ar 7903 (Female, FCE-Ar 2744): TL 3.75 (5.05), CL 2.05 (2.60), CW 1.45 (1.95), CH 0.75 (0.95), AL 1.85 (2.60). Eyes: AME 0.07 (0.10), ALE 0.06 (0.08), PME 0.17 (0.20), PLE 0.16 (0.18). Row of eyes: AER 0.38 (0.45), PME 0.53 (0.73), PLE 0.60 (0.75). Sternum (length/width) 1.08/0.80 (1.25/1.10). Labium (length/width) 0.23/0.25 (0.30/0.38). Legs: length of segments (femur + patella/tibia + metatarsus + tarsus =total length): **I** 1.20 + 1.58 + 0.95 + 0.65 = 4.38, **II** 1.13 + 1.28 + 0.88 + 0.60 = 3.88, **III** 1.10 + 1.08 + 0.98 + 0.58 = 3.73, **IV** 1.50 + 1.70 + 1.53 + 0.78 = 5.50 (**I** 1.38 + 1.75 + 1.05 + 0.65 = 4.83, **II** 1.33 + 1.58 + 1.00 + 0.63 = 4.53, **III** 1.30 + 1.50 + 1.08 + 0.63 = 4.51, **IV** 1.85 + 2.30 + 1.95 + 0.88 = 6.98).

Variation. Male (Female) (range, mean±s.d.): TL 3.72–4.50, 4.16±0.28; CL 1.98–2.25, 2.12±0.10; CW 1.40–1.70, 1.53±0.10; n = 10 (TL 4.79–5.84, 5.31±0.33; CL 2.28–2.60, 2.48±0.10; CW 1.72–2.00, 1.85±0.08; n = 10).

Other material examined. URUGUAY: **Colonia**: Establecimiento "El Relincho" [34.330277, 57.770994], Seguí, R., 08.iii.2001, in pitfall trap in grazed grassland, 2♂ 2♀ (FCE-Ar 10727). **Salto**: Estancia "Los Venados", potrero "El Perado" [31.736477, 56.731483], Laborda, A. 12.ii.2010, in pitfall trap 1♀ (FCE-Ar 10723). **Montevideo**: Melilla [34.731994, 56.322544], Hagopián, D., i-iii.2019, in pool filter, 1♂ 3♀ (FCE-Ar 10725). **Rocha**: Cabo Polonio [34.400000,

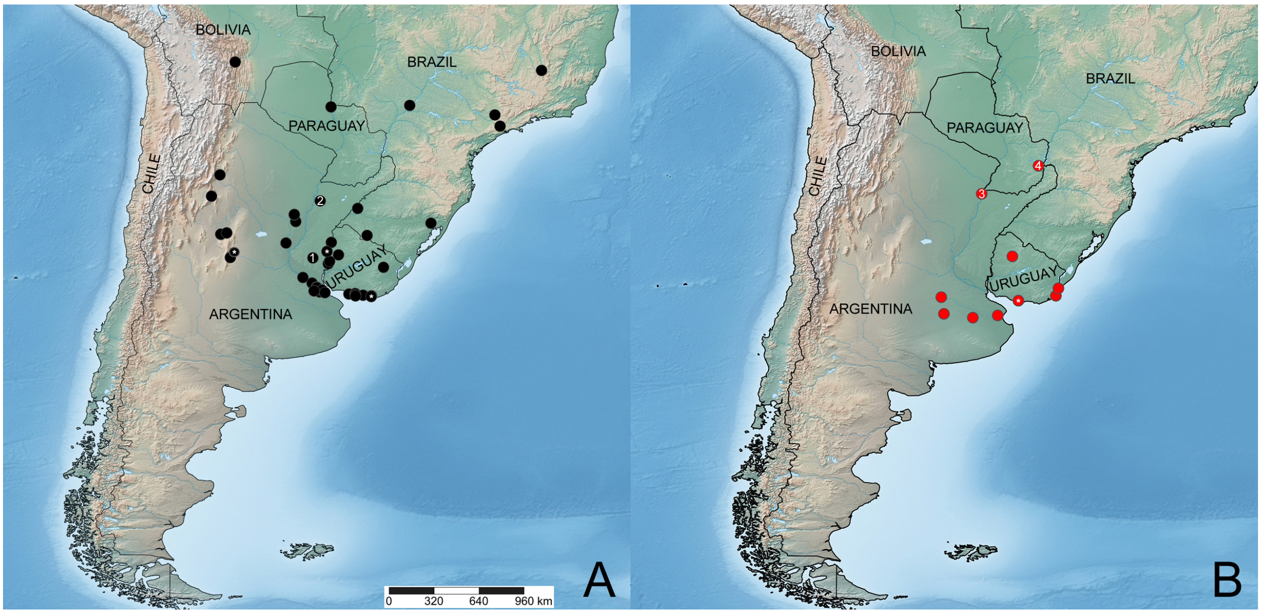

Figure 10. Distribution records of *Abaycosa* species. A *Abaycosa nanica* (Mello-Leitão). B *Abaycosa paraguensis* (Gertsch & Wallace). Numbers in the circle denote type localities: 1 *Pardosa flammula*; 2 *Pardosa nanica*; 3 *Alopecosa rosea*; 4 *Arctosa paraguensis*. Asterisk indicates the locality from which the individuals were sequenced.

53.783300], Achaval, F., 19.i–07.ii.2005, 2♀ (FCE-Ar 2804); same locality, 19.xii.2003–18.iii.2004, 1♂ (FCE-Ar 10724); Potrero Grande [33.896419, 53.614044], Toscano-Gadea, C., 03.iii.2001, 2♀ (FCE-Ar 2744); same data, 2♂ (FCE-Ar 8643); same data, 4♂ (FCE-Ar 10726); same data, 1♂ 1♀ (FCE-Ar 2761); same data, 1♂ (FCE-Ar 2764); same data, 1♂ (FCE-Ar 2780); same data, under a trunk, 1♂ (FCE-Ar 7903); same locality and collectors, 21.i.2001, 2♂ (FCE-Ar 2749); same data, 1♂ (FCE-Ar 2751); same locality and collectors, 23.xi.2000, 1♂ (FCE 2756); same data 1♂ 1♀ (FCE-Ar 7905); same data, 4♂ (FCE-Ar 7906); same locality and collectors, 04.iv.2001, 1♀ (FCE-Ar 2760); same data, 1♀ (FCE-Ar 2777); same data, 1♀ (FCE-Ar 2766); same locality and collector, 21.x.2001, 1♂ 3♀ (FCE-Ar 2779). **ARGENTINA**: **Buenos Aires**: Carlos Casares [35.622561, 61.365219], i.1979, 1♂ (MACN-Ar 41672); El Trigo [35.881666, 59.406944], Galiano, M.E., i.1962, 1♀ 1 immature (MACN-Ar 5371); Libres del Sur [35.730808, 57.720983], Gallardo, i.1958, 1♂ (MACN-Ar 42116); Vedia [34.498055, 61.542222], Frem, A.G., 23.viii.1914, 1♂ (MACN-Ar 42117).

Distribution. Known for southeastern Paraguay, northeast Argentina and south of Uruguay (Fig. 10B).

Natural history. This species was found in rural areas, natural grasslands, and in sandy environments near the coast. A one-year sampling performed with pitfall traps in southern Uruguay (information based on collection data) indicated a presence of adults from October through April (spring and summer).

4. Discussion

All the sequenced individuals of *Abaycosa* were recovered as a monophyletic group and both species groups were also monophyletic (Fig. 1). That allows us to propose the new genus *Abaycosa* within Allocosinae as sister of a clade composed by *Allocosa funerea*, *Allocosa senex* and *Gnatholycosa spinipalpis* (Piacentini and Ramírez (2019), through the inclusion of *A. nanica* as *P. flammula*). This phylogenetic placement of *Abaycosa* is in agreement with the morphological characters proposed as diagnostic to the subfamily by Dondale (1986), which are: the beak like terminal apophysis, median apophysis with two pointed retrolateral apophysis (the basal of which functions as a conductor) and median septum and atrium absent. The diagnostic characteristics of the new genus are the tibia of male palp as long as wide, the patch of flat setae on the dorsal tip of the cymbium, the ventral position of the vulval chamber, and the short and stout stalk of the spermathecae. The presence, number, and types of cymbium macrosetae are interesting characters to explore, since in other Lycosidae these structures are involved in several behaviors. During courtship, males use palps for acoustic communication, making percussion striking and scraping the tip of the palps against the substratum, and stridulation via specialized structures on the tibio-cymbial joint (Rovner 1967, 1975). Also in a sexual context, the males can detect females pheromones by chemoreceptive setae distributed primarily on the distal segments of the pedipalps (Tietjen and Rovner 1982). Palpal macrosetae of males and females of *Allocosa senex,* and probably in *A. marindia* and *A. alticeps*, are used to dig their burrows and present several unique modifications (Aisenberg et al. 2010; Foelix et al. 2017). In Allocosinae, as in most of lycosids, the morphological variation is scarce, and structures like macrosetae or relative position of female genital parts, are features to take into account to distinguish different clades. Another characteristic potentially informative is the retrolateral projection of the distal part of the bulb present in *Abaycosa*. This structure was illustrated, but without comments in *Allocosa funerea* (Dondale and Redner 1983) and seems to be promising since it could be a new synapomorphy for the subfamily or could be used to distinguish different clades within the subfamily. In this study we also expand the geographic distribution range known for both species, which shows a wide distribution of the genus in the central area of South America. Both species inhabit open environments such as natural grasslands or grazing meadows in rural areas. *Abaycosa paraguensis* can also be found in sandy environments near the coast and *A. nanica* in halomorphic soil savannas. This variety of environments have also been reported for North American species of Allocosinae (Dondale and Redner 1983), such as *Allocosa funerea*, so this could be the determinants of a convergent somatic morphology into the subfamily. In the same way, the environment could explain the morphological differences between *Abaycosa* and other South American species of the subfamily, such as *Allocosa senex*, which presents a divergent morphology related to a specialization to live in sandy substrates, such as elongated spinnerets, long and thin pedipalps with specialized macrosetae, large chelicerae, and a high prosoma (Aisenberg et al. 2010; Foelix et al. 2017; Simó et al. 2017; Albín et al. 2018). The present study contributes to establishing a phylogenetic framework of the subfamily, necessary to study how some interesting behavior traits evolve in species of the subfamily such as *A. senex* and *A. marindia* (Bidegaray-Batista et al. 2017), which shows a reversal in the typical sex roles and size dimorphism of spiders (Aisenberg et al. 2007; Aisenberg and Costa 2008; Aisenberg 2014). Future studies will focus on expanding this phylogenetic framework, including more taxa of Allocosinae from South America and the North American species of the genus *Allocosa*, in order to determine the diversity of genera and species within the subfamily and their relationships to each other.

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Supplementary material 1

Table S1

Authors: Laborda Á, Bidegaray-Batista L, Simó M, Brescovit A, Beloso C, Piacentini L (2022)
Data type: .docx
Explanation note: List of GenBank or BOLDSYSTEM reference numbers of terminals extracted from Piacentini and Ramirez 2019 used in the phylogenetic analysis.

Link: https://doi.org/10.3897/asp.80.e76339.suppl1