Belgian Journal of Entomology 67: 1–27 (2018) ISSN: 2295-0214
www.srbe-kbve.be

urn:lsid:zoobank.org:pub:6D151CCF-7DCB-4C97-A220-AC464CD484AB

Belgian Journal of Entomology

New Species, Combinations, and Records of Jumping Spiders in the Galápagos Islands (Araneae: Salticidae)

G.B. EDWARDS[1] & L. BAERT[2]

[1] Curator Emeritus: Arachnida & Myriapoda, Florida State Collection of Arthropods, FDACS, Division of Plant Industry, P. O. Box 147100, Gainesville, FL 32614-7100 USA
(e-mail: GB.Edwards@freshfromflorida.com – corresponding author)
[2] O.D. Taxonomy and Phylogeny, Royal Belgian Institute of Natural Sciences, Vautierstraat 29, B-1000 Brussels, Belgium (e-mail: Leon.Baert@naturalsciences.be)

Published: Brussels, March 14, 2018

Citation: EDWARDS G.B. & BAERT L., 2018. - New Species, Combinations, and Records of Jumping Spiders in the Galápagos Islands (Araneae: Salticidae). *Belgian Journal of Entomology*, 67: 1–27.

ISSN: 1374-5514 (Print Edition)
ISSN: 2295-0214 (Online Edition)

The Belgian Journal of Entomology is published by the Royal Belgian Society of Entomology, a non-profit association established on April 9, 1855.

Head office: Vautier street 29, B-1000 Brussels.

The publications of the Society are partly sponsored by the University Foundation of Belgium.

In compliance with Article 8.6 of the ICZN, printed versions of all papers are deposited in the following libraries:

- Royal Library of Belgium, Boulevard de l'Empereur 4, B-1000 Brussels.
- Library of the Royal Belgian Institute of Natural Sciences, Vautier street 29, B-1000 Brussels.
- American Museum of Natural History Library, Central Park West at 79th street, New York, NY 10024-5192, USA.
- Central library of the Museum national d'Histoire naturelle, rue Geoffroy Saint-Hilaire 38, F-75005 Paris, France.
- Library of the Muséum d'Histoire naturelle de Genève, route de Malagnou 1, CH-1208 Genève, Suisse.
- Zoological Record, Thomson Reuters, Publication Processing, 1500 Spring Garden Street, Fourth Floor, Philadelphia PA 19130, USA.

Front cover: *Balmaceda abba* sp. nov. Holotype female

New Species, Combinations, and Records of Jumping Spiders in the Galápagos Islands (Araneae: Salticidae)

G. B. EDWARDS[1] & L. BAERT[2]

[1] Curator Emeritus: Arachnida & Myriapoda, Florida State Collection of Arthropods, FDACS, Division of Plant Industry, P. O. Box 147100, Gainesville, FL 32614-7100 USA (e-mail: GB.Edwards@freshfromflorida.com – corresponding author)
[2] O.D. Taxonomy and Phylogeny, Royal Belgian Institute of Natural Sciences, Vautierstraat 29, B-1000 Brussels, Belgium (e-mail: Leon.Baert@naturalsciences.be)

Abstract

Five NEW SPECIES of Salticidae: *Balmaceda abba*, *Messua avicennia, Sitticus pintanus*, *Sitticus trisetosus,* and *Titanattus cordia,* are described as apparent additional Galápagos endemics. Both *Sitticus* belong to a species group formerly known as the genus *Tomis* F. O. P.-Cambridge, 1901, and are the fifth and sixth species from this group known from the Galápagos Islands, whereas only three other species in the group have been described (two from mainland South America, one from a Peruvian island). It seems to be the only salticid genus that has speciated within the Galápagos Islands. *Sitticus trisetosus* is unusual in that it appears to have partially regained a plesiomorphic character lost in most members of the family. Four NEW COMBINATIONS are made: *Philaeus pacificus* Banks, 1902, is transferred to *Cerionesta* Simon, 1901, becoming *Cerionesta pacifica* (Banks, 1902); the Mexican species *Marpissa minor* F. O. Pickard-Cambridge, 1901, and *Phanias distans* Banks, 1924, are transferred to *Balmaceda* Peckham & Peckham, 1894, becoming *Balmaceda minor* (F. O. Pickard-Cambridge, 1901) and *Balmaceda distans* (Banks, 1924); *Balmaceda minor* is redescribed and compared to *B. abba*, and the female of *B. distans* is described for the first time; and *Euophrys vestita* Taczanowski, 1878, is transferred to *Nycerella* Galiano, 1981, becoming *Nycerella vestita* (Taczanowski, 1878). The number of jumping spider species known from the Galápagos Islands is increased from 16 to 20 identified species.

Keywords: island speciation, endemic species

Introduction

The spiders occurring in the Galápagos Islands have been well studied and documented (BAERT, 2013b), yet knowledge of the species remains incomplete. For example, some species were described only from one sex, and rectifying our lack of knowledge of these species is an ongoing process (*e.g.,* BAERT, 2013a). As exploration of various islands and habitats progresses, new species and records continue to be discovered. The purpose of this paper is to update such knowledge for Galápagos Salticidae.

Until now, 16 identified species of jumping spiders have been reported from the Galápagos Islands (BAERT, 2013b), although GALIANO & BAERT (1990) reported another species in the subfamily Dendryphantinae [now subtribe Dendryphantina] that was not identified. Three of these 16 species are known pantropical synanthropes. Of the remaining 13 species, three also occur on mainland South America, nine apparently are endemic species, and one was of

questionable origin. The latter species previously was referred to as *Balmaceda estebanensis* Simon, 1903 (GALIANO & BAERT, 1990). This name is a *nomen nudum* representing a species that supposedly was known from Venezuela (SIMON, 1903: 848; World Spider Catalog, 2016); it was mentioned but never described. This species is described as new, and is found to be very close to, but different in several respects from, the Mexican species *Marpissa minor* F. O. Pickard-Cambridge, 1901, which is redescribed and re-illustrated herein for comparison. As both species actually do belong in *Balmaceda*, the transfer of *M. minor* is made.

We have discovered that another species, *Phanias distans* Banks, 1924, described from the male, is misplaced. The species is a marpissine, not belonging to the dendryphantine genus *Phanias*. It is also transferred to *Balmaceda,* and the female is formally described for the first time. This species has curious autapomorphies that suggest the possibility that it is an endemic genus and species, a status previously known only for *Darwinneon crypticus* Cutler, 1971, but this question cannot be resolved here with certainty, and is presently under study (MADDISON *et al.*, in prep.).

Of the nine previously known species of endemic salticids, only one genus (*Sitticus* Simon, 1901) is represented by more than one species. Four species of Galapagoan *Sitticus* were previously known (GALIANO & BAERT, 1990; BAERT, 2011), all representing a species group formerly considered a separate genus, *Tomis* F. O. P.-Cambridge, 1901. This species group has two additional continental species and another species known from a Peruvian island, Isla Mazorca (GALIANO, 1991). Thus, *Sitticus* is the only known salticid genus demonstrating the classic Darwinnean speciation in the Galápagos. Two more Galapagoan *Sitticus* species are described herein, a small one from the island of Pinta, and the largest of the six species, from Espagñola. The latter species is noteworthy in that it seems to have partially regained a normally plesiomorphic macrosetal character that, with very few exceptions (e.g., some genera of Euophryini), is generally lost in the family Salticidae.

In addition, a new species in the *limbata* group of the genus *Messua* Peckham & Peckham, 1896, and a new species placed in the genus *Titanattus* Peckham & Peckham, 1885, are described. A new combination is created for *Philaeus pacificus* Banks, 1902, as *Philaeus* Thorell, 1869, represents a group of Old World species and does not occur in the New World. Another new combination is created for *Euophrys vestita* Taczanowski, 1878, as this species is not a euophryine salticid, but rather belongs to the recently described subfamily Freyinae (EDWARDS, 2015). With the subsequent decompression of salticid classification (MADDISON, 2015), this taxon became subtribe Freyina. This brings the number of presumed endemic species to 14, and the total number to 20 salticid species in the Galápagos Islands (Table 1).

Methods

Specimens reported here mostly resulted from expeditions to the Galápagos Islands by staff of the Royal Belgian Institute of Natural Sciences (RBINS), and all specimens are deposited in the museum of that institution except as indicated (including some samples on loan to L. Baert collected by expeditions from the Texas Memorial Museum). Additional specimens were loaned by the American Museum of Natural History (AMNH), New York.

General abbreviations: **AER** = anterior eye row, **AP** = accessory pocket; **BL** = body length, **CL** = carapace length, **CD** = copulatory duct; **CDH** = copulatory duct head; **CO** = copulatory opening; **CP** = coupling pocket; **CW** = carapace width, **E** = embolus; **EB** = embolus base; **F** = femur, **FD** = fertilization duct; **G** = gland, **I,II,III,IV** = legs from anterior to posterior, **M** = metatarsus, **MS** = macrosetae; **P** = patella, **PER** = posterior eye row, **RTA** = retrolateral tibial apophysis of palp, **S** = spermophore; **Sp** = spermatheca; **TA** = terminal apophysis, **Tb** = tibia, **Ts** = tarsus, **VTA** = ventral tibial apophysis of palp. Width of AER and PER is given in

descriptions. Surfaces of appendages are indicated by **d** = dorsal, **p** = prolateral, **r** = retrolateral, **v** = ventral; p or r after a number indicate which of a ventral pair of macrosetae is present (if only one is present; e.g., v 1p indicates only prolateroventral macroseta present, whereas v 2 would indicate that both prolateroventral and retrolateroventral macrosetae are present). For sex indication in the Records sections, **M** = male, **F** = female, **p** = penultimate instar, and **j** = younger juvenile instar.

Traditionally leg macrosetae are indicated beginning at the distal end of each segment but beginning with the leg segments closest to the body, creating an awkward back and forth reading. To facilitate macrosetae observations, reading from the distal end of segments is maintained, but leg segments are listed from distal to proximal, opposite the traditional order, therefore for most macrosetae they would be read from the set of right legs (I-IV) in ventral view. Note that in species with distal dorsoprolateral (**dp**) and/or dorsoretrolateral (**dr**) femoral macrosetae, the distal-most of the dorsal row is between these latter macrosetae when both are present. Also, none of the dorsal or subdorsal macrosetae is evident in ventral view, so the specimen must be turned over in order to observe the dorsal femora for their presence.

All measurements are in mm. Ranges for paratypes are given for some measurements (in parentheses). Taxonomic categories follow MADDISON (2015). Photographs were taken by GBE except as noted. The following characters are considered standard for all Salticidae and will not be reported in individual species descriptions unless deviations from the norm are present: all eyes surrounded by rings of black pigment, all leg femora with a dorsal row of three macrosetae (likely also true, at least in a plesiomorphic state, for palpal femora). In addition, a cheliceral tooth formula of two promarginal teeth and one simple retromarginal tooth will be assumed unless otherwise noted, or stated if this is not a normal condition for a particular genus.

Considerable change to jumping spider classification has occurred in the past two years (BUSTAMANTE *et al.*, 2015; EDWARDS, 2015; RUIZ & MADDISON, 2015; MADDISON, 2015), which is applied to the taxa reported herein.

Taxonomy

Family SALTICIDAE
Subfamily SALTICINAE
Clade Amycoida
Tribe Sitticini

Sitticus pintanus sp. nov.

urn:lsid:zoobank.org:act:C04B9BA3-407E-4C9B-9184-EC3B7DC2A692

Figs 1, 3 (A-B)

ETYMOLOGY: The species is named after the island of its occurrence.

TYPES: Holotype male from Isla Pinta: Cabo Ibbetson, sea cliff spraying, 16.III.1992, coll. S. Peck and J. Cook. Paratype male with same data. Only specimens known.

DIAGNOSIS: *S. pintanus* is easily distinguished from other members of its species group except *S. trisetosus* sp. nov. by the prolateral origin of the embolus. From the latter species it can be distinguished by its much smaller size and lack of abdominal spots, and by its slightly less clockwise embolus position with the spermophore turned outward near the embolus base. The origin of the embolus of other species in the group is either proximal or on the retrolateral side. The RTA also is more strongly ventrally curved than other related species.

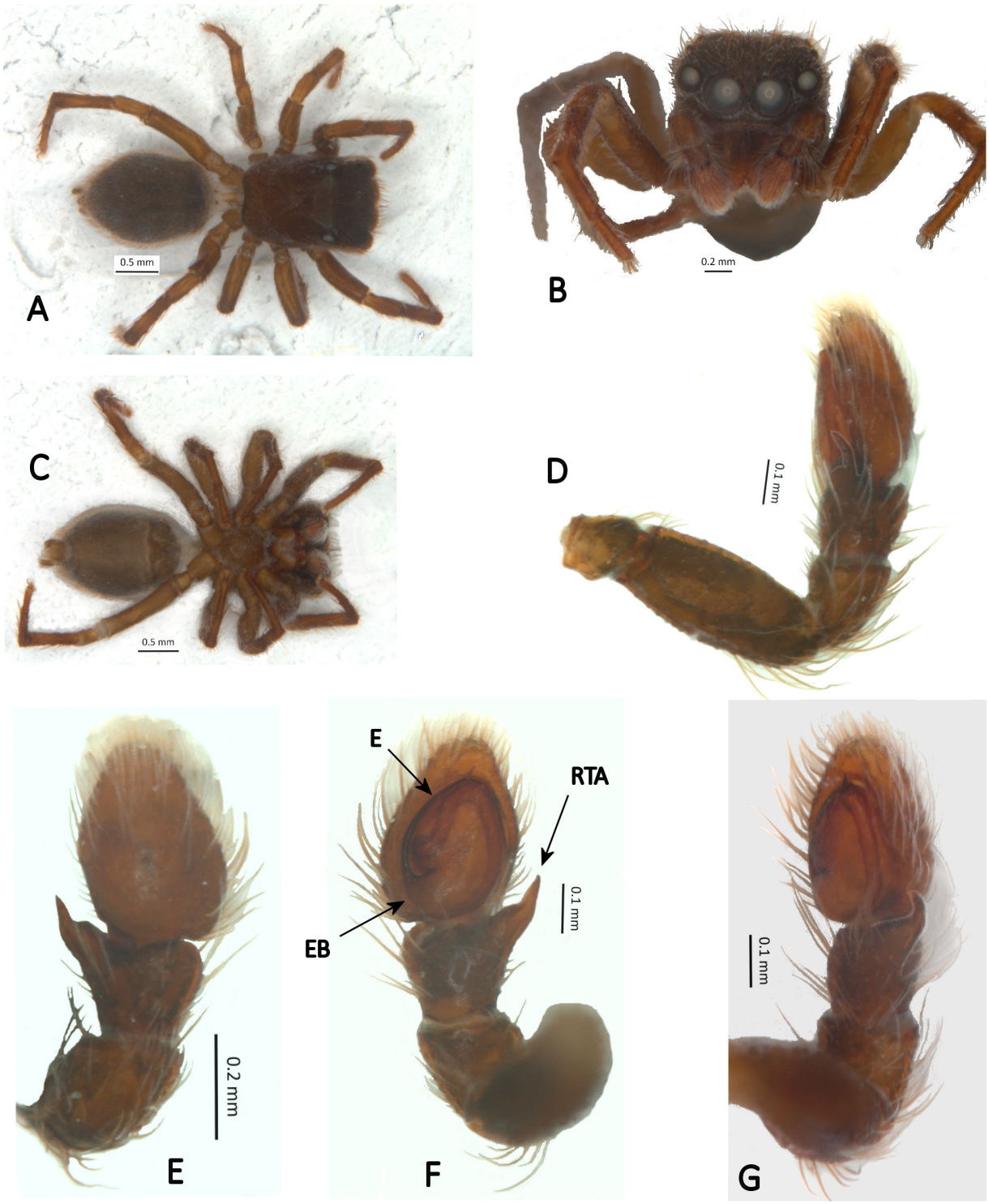

Fig. 1. *Sitticus pintanus* sp. nov. Male holotype: A. dorsal, B. face, C. ventral, D. palp retrolateral, E. palp dorsoretrolateral, F. palp ventral, G. palp ventroretrolateral.

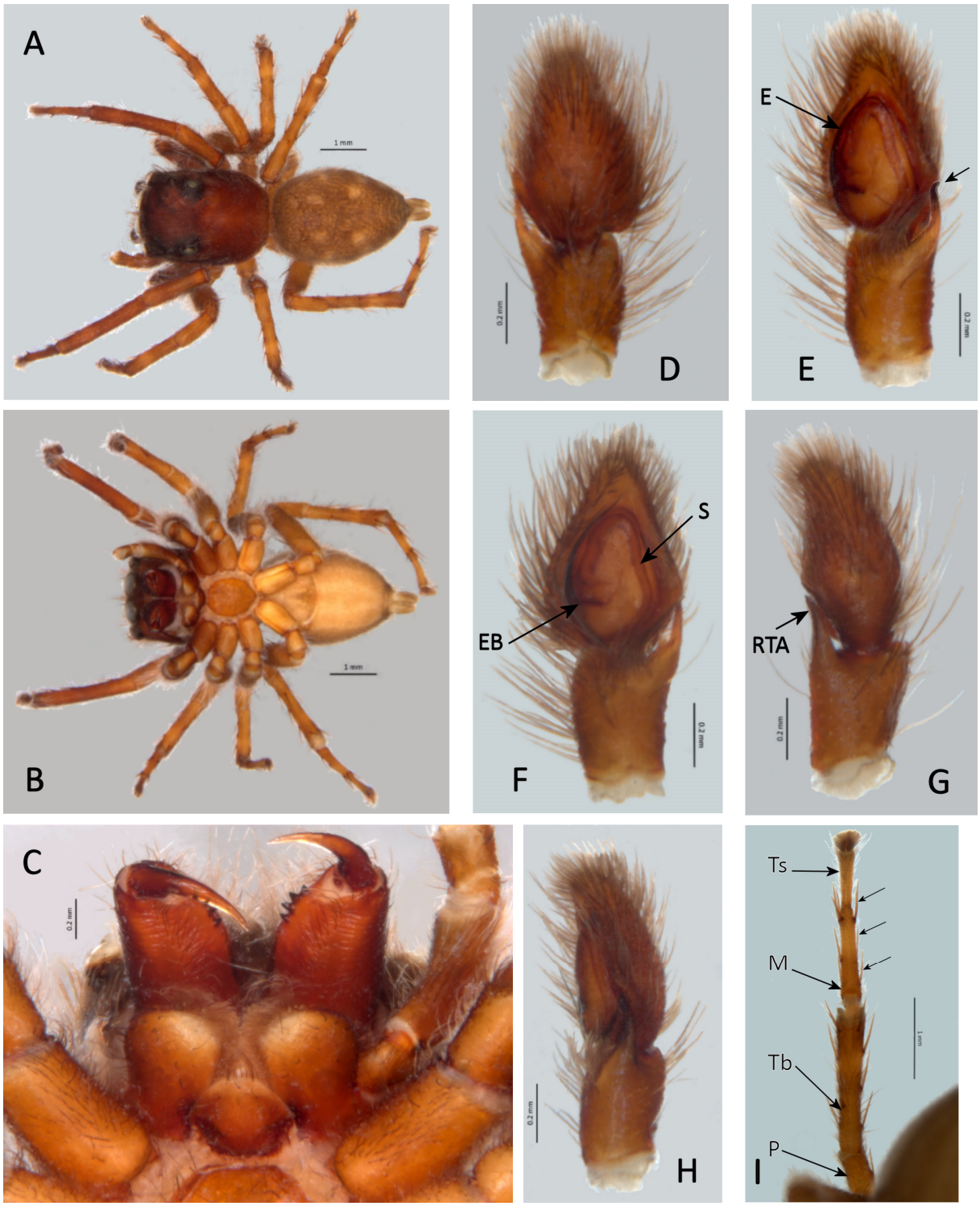

Fig. 2. *Sitticus trisetosus* sp. nov. Male holotype: A. dorsal, B. ventral, C. anterior venter showing cheliceral teeth; D. palp dorsal, E. palp retroventral (arrow at distal hook), F. palp ventral, G. palp retrodorsal, H. palp retrolateral, I. ventral fourth metatarsus showing three sets (right arrows) of lateral macrosetae.

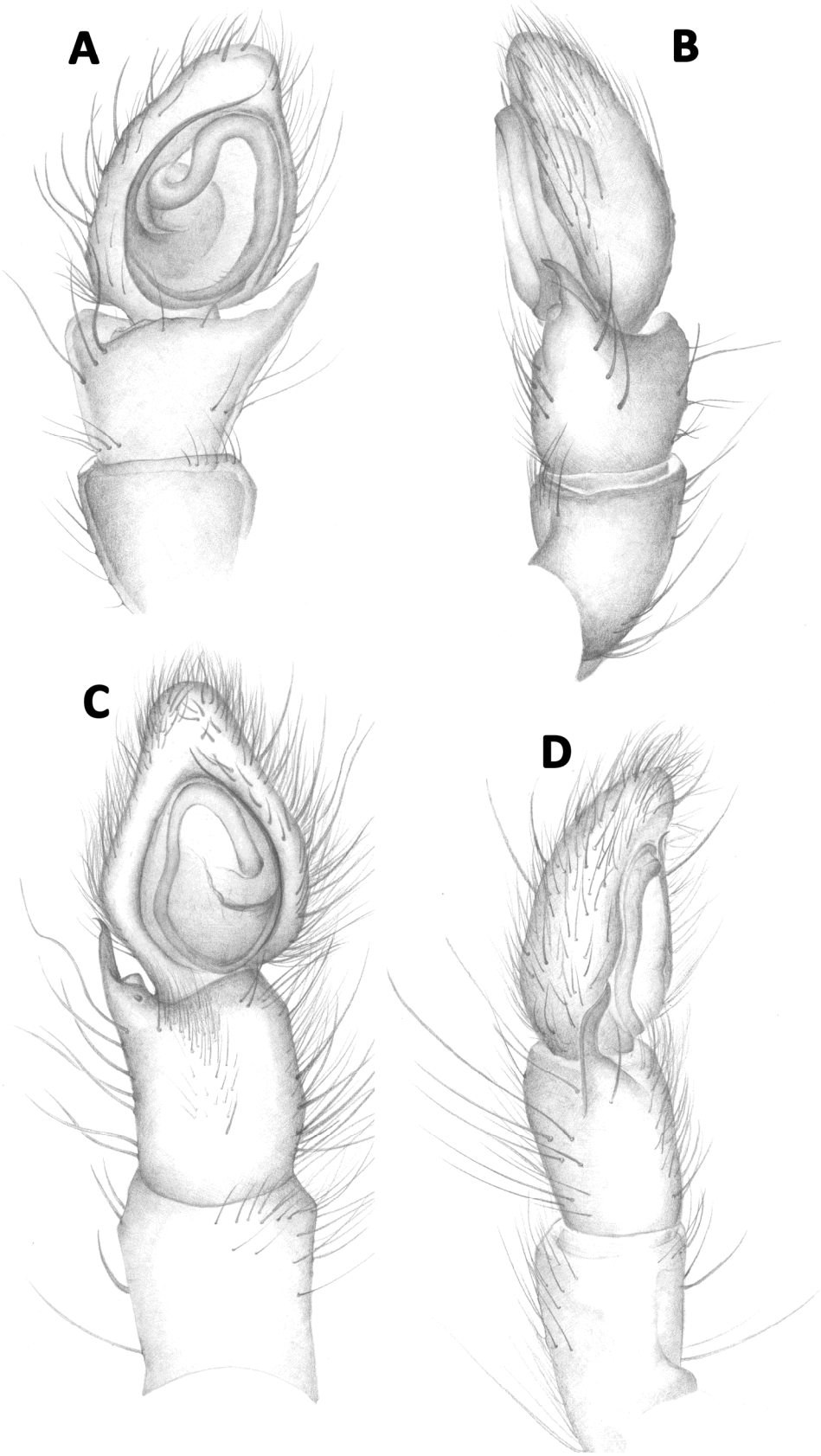

Fig. 3. *Sitticus pintanus* sp. nov. Male: A. right palp ventral, B. right palp retrolateral. *Sitticus trisetosus* sp. nov. Male: C. left palp ventral. D. left palp retrolateral (Julien Caudron).

DESCRIPTION: Male holotype (paratype in parentheses): BL 3.07 (3.17), CL 1.58 (1.62), CW 1.12 (1.11), AER 1.07 (1.05), PER 0.99 (0.95). Chelicerae with four promarginal teeth fused basally, zero retromarginal teeth. Body entirely brown, varying only by shades. Carapace and abdomen dark brown, with median third of venter of abdomen medium grayish brown; legs medium brown except lateral sides of femora and distal ends of other segments dark brown; the inner edges of the endites and distal end of the labium are light brown; palps dark brown except dorsum of the cymbium is covered with white setae. Leg macrosetae: I-II M p 1-1, v 2-2, Tb p 1-1-1, v 2-2-1r, P p 1; III M p 1-1, v 2-2, r 1-1, Tb p 1-1-1, v 2-0-0, r 1-1-1, P p 1, r 1; IV M p 1-1, v 2-2, r 1-1, Tb p 1-1-1, v 2-0-1p, r 1-1-1, P p 1, r 1.
Female unknown.

***Sitticus trisetosus* sp. nov.**

urn:lsid:zoobank.org:act:160C6FFD-0CC7-4CC0-90B2-3D6F763858E2

Figs 2, 3 (C-D)

ETYMOLOGY: The species is named for the unusual character of having three sets of lateral macrosetae on the fourth metatarsus.

TYPES: Holotype male from Isla Española, Pto. Suarez, blow-hole beach in rocks near high tide line, 21.I.1977. Only specimen known.

DIAGNOSIS: *S. trisetosus* is easily distinguished from other members of its species group except *S. pintanus* by the prolateral origin of the embolus. From the latter species it can be distinguished by its much larger size and sets of abdominal spots, and by its slightly more clockwise embolus position with the spermophore turned inward near the embolus base. The RTA tip has a short lateral hook.

DESCRIPTION: Male holotype: BL 5.92, CL 2.91, CW 2.07, AER 1.86, PER 1.61. Chelicerae with four promarginal teeth contiguous basally, zero retromarginal teeth. Body and legs mostly medium brown, distal leg segments with subdistal lighter brown rings. Abdomen with two pair of prominent pale dorsal spots surrounded anteriorly and laterally by five pair of faint pale spots; chelicerae, endites and labium darker brown, with the inner edges of the endites and adjacent edge of the labium pale; palps medium brown without white setae. Leg formula I-IV-II-III, leg macrosetae: I M v 2-2, Tb p 1-0-1, v 2-2(offset)-0, F dp 2-0-0; II like I except Tb v 2-1r-0; III M p 2-1, v 2-1p, r 2-1, Tb p 1-1-1, v 2-0-0, r 1-1-0, P p 1, r 1, F dp 2-0-0; IV M p 2-1-1, v 2-0-0, r 1-1-1, Tb p 1-1-1, v 2-0-1p, r 1-1-1, P p 1, r 1, F dp 1-0-0, dr 1-0-0.

Female unknown.

NOTES: Tibia I has the second pair of ventral macrosetae offset so that the retrolateral one is more proximal. The fourth metatarsus apparently has regained (or retained) some elements of the plesiomorphic condition of three sets of macrosetae. Possibly this is correlated with the fact that the legs are longer and more slender than is typical for a species of *Sitticus*.

Clade Amycoida
Tribe Thiodinini

***Titanattus cordia* sp. nov.**

urn:lsid:zoobank.org:act:FDBD3DFA-AF6C-4826-8F95-696F82689300

Figs 4-5

ETYMOLOGY: A noun in apposition after the genus name of a dominant plant in the habitat where this species occurs.

TYPES: Holotype male from Islote Gardner, near Isla Española, elevation 30 m, in lichens in *Bursera* sp. forest, 13.II.1977, coll. W. G. Reeder (TMM #57512). Paratype female, paratype male, same data as holotype (W.G. Reeder, TMM #57508). Paratype female, same data as

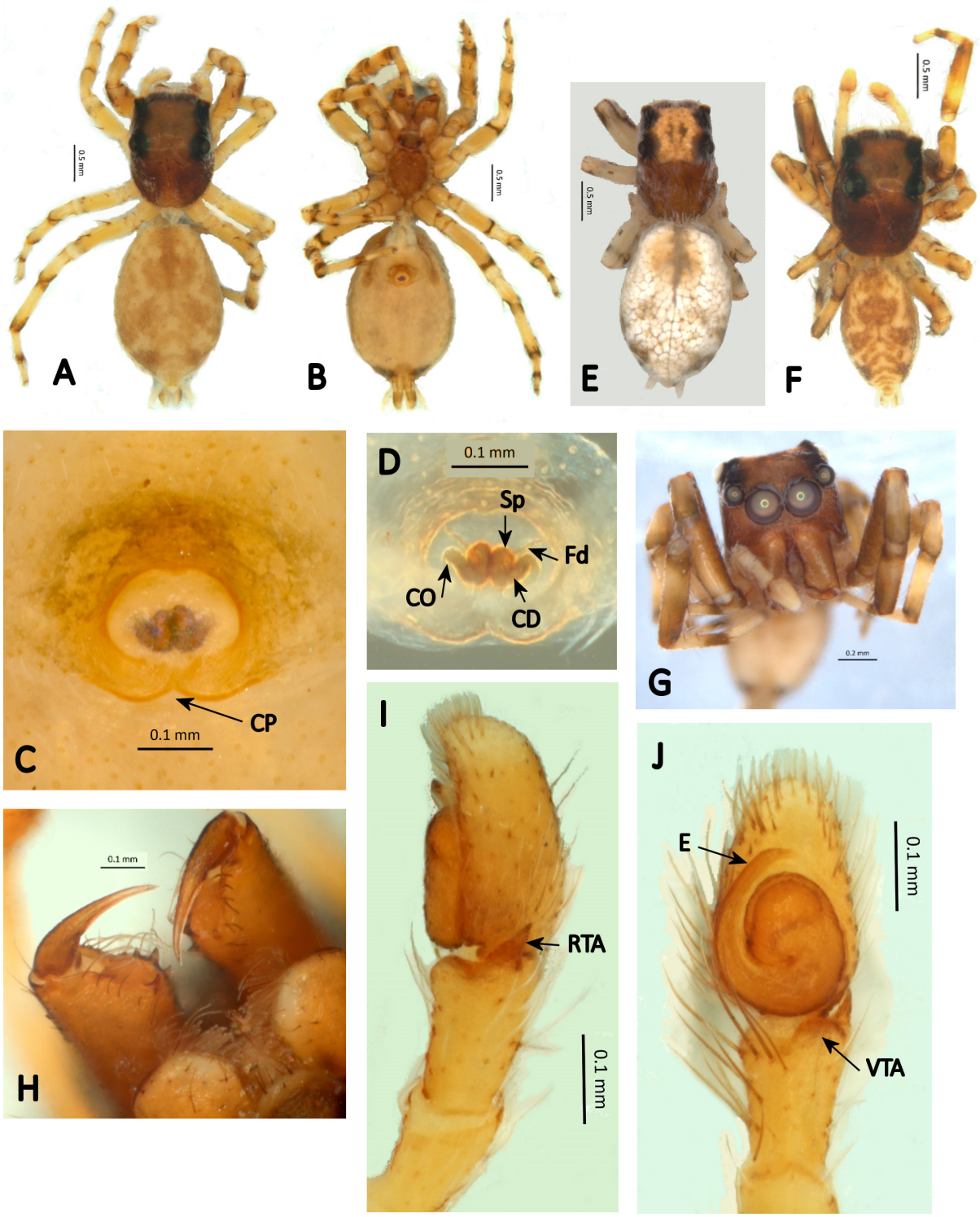

Fig. 4. *Titanattus cordia* sp. nov. Female paratype: A. dorsal, B. ventral, C. epigyne ventral, D. epigyne dorsal cleared. E. Different female with prominent surface guanine deposits. Male holotype: F. dorsal, G. face, H. chelicerae ventral, I. palp retrolateral, J. palp ventral.

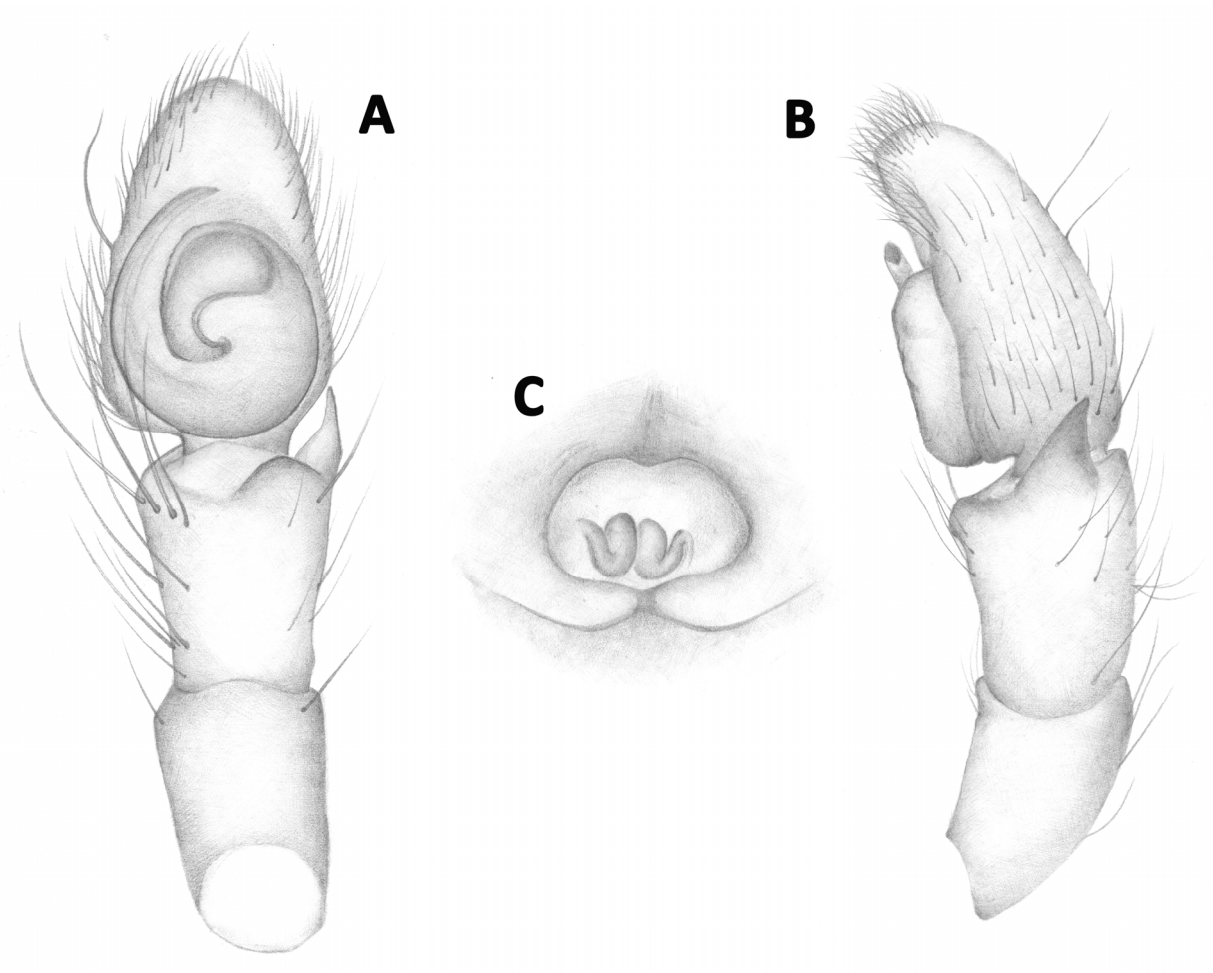

Fig. 5. *Titanattus cordia* sp. nov. Male: A. palp ventral. B. palp retrolateral. Female: C. epigyne ventral (Julien Caudron).

holotype except taken in litter of large *Opuntia* sp., *Bursera-Croton-Cordia* community (W. G. Reeder, TMM #57599). Paratype male, Isla Isabela, east slope of Volcan Alcedo, elevation 380 m, 23.V.1980, (W.G. Reeder, TMM #57575). Paratype male, Isla San Cristobal, Punta Bassa, 23-24.III.2009 (L. Baert, B.09/027). Paratype female, Isla Santiago, 5 km SE Bahia Bucanero, 520 m, on rotted guayavillo trunk in guayavillo parkland with *Sclerodendrum, Bursera, Pisonia,* 21.IV.1975 (W.G. Reeder, TMM 59614).

RECORDS: 2 females, Isla Santa Cruz, northern transect, Granillo rojo, 500 m alt., 1-30.IV.1992 (S. Peck, P92/83).

DIAGNOSIS: Matching very well with other species of *Titanattus* in general appearance, size, and genital structure (particularly the short, broad VTA on the retrolateral half of the ventral distal edge of the tibia, the presence of patellar leg macrosetae, and a heart-shaped sternum lacking keels). Like *T. acanjuba* Bustamante & Ruiz, 2017, it has extensive guanine deposits under the integument, and lacks PLEs on tubercles; see BUSTAMANTE & RUIZ, 2017), whereas most of the species in the genus have PLEs on tubercles. Differs also by having epigynal ducts and spermathecae centered in large shallow atrium rather than along anterior edge, and by having three promarginal teeth similar to some species of the related genus *Thiodina* Simon, 1900.

DESCRIPTION: Male holotype (paratype in parentheses): BL 2.92 (2.83), CL 1.47 (1.36), CW 1.01 (1.02), AER 0.93, PER 0.96. Chelicerae with three promarginal teeth, one retromarginal

tooth. Inner margins of chelicerae concave about mid-length. Sternum heart-shaped, no keels. Carapace and sides of femora I dark brown, dorsal eye field lighter brown, the color extending as a narrow stripe down median thoracic slope. Abdomen cream colored with complex symmetrical dorsal pattern of interconnected brown spots, with narrow brown chevrons medially in posterior half. Spinnerets white except posterior laterals brown. Legs cream colored with brown marks distolaterally (and proximally on tibiae) on all segments except tarsi, palps cream colored with pale yellow cymbia. Leg macrosetae: I M v 2-2, Tb v 1p-2-2; II M v 2-2, Tb p 1-0-0, v 0-1r-0; III M p 2-0, v 1-0, r 1-0, Tb p 1-0-0, v 1p-0-0, P p 1; IV M p 2-0, v 1-0, r 1-0, Tb p 1-0-0, v 2-0-1p, r 0-1-0, P p 1.

Female alloparatype (other paratypes in parentheses): BL 3.36 (3.15-3.62), CL 1.40 (1.32-1.55), CW 1.00 (0.91-1.03), AER 0.88, PER 0.94. Generally similar to male, carapace and legs not as dark, median thoracic stripe more conspicuous. Venter of abdomen dark cream colored, with three faint gray stripes, and two short brown stripes anterolaterally crossing booklung covers. Leg macrosetae like male.

NOTES: The female specimen from Isla Isabela has a less developed color pattern and other minor differences from the Islote Gardner specimens, particularly the presence of integumental guanine deposits, as does the male from Isla San Cristobal. However, we do not think this is indicative of a different species; in fact, one of the females from Islote Gardner where the most specimens were taken also has similar guanine deposits.

Clade Marpissoida
Tribe Dendryphantini
Subtribe Dendryphantina

***Cerionesta pacifica* (Banks, 1902) comb. nov.**
urn:lsid:zoobank.org:act:4D799513-5319-4CF5-9FF5-0B3662689411
Figs 6-8

Philaeus pacificus BANKS, 1902: 67 (Description male & female).

RECORDS: Isla Pinzon, 5 km W of Playa Escondida central crater, 280 m, arid forest, 19.VI.1991, 1 male (J. Heraty, H91/101). Isla Santa Cruz, above Baranco at CDRS, 40 m, malaise trap, 1-30.VI.1991, 1 female (S. Peck).

DIAGNOSIS: The enlarged, forward-projecting chelicerae of some ("major") males with a robust retromarginal tooth on a prominent ventral bulge, and the shapes of various palpal structures (curled retrolateral embolus with expanded disk-like embolus base, peripheral tegular duct with a ventral origin, and long sinuate RTA), distinguish the male from any other Galapagoan species. There are other small ("minor") males in which the cheliceral development is not obvious, but other characters, such as palpal structure, will distinguish them. Intermediate males have the chelicerae slightly diverging (as if they only have the basal part of the chelicerae that occurs in major males, in which the distal ends of the chelicerae converge and become parallel).

The palpal femur has a dorsal row of macrosetae exceeding three in number (usually four), which is also true of *Messua avicennia* sp. nov. (usually eight), although the palpal macrosetae of *C. pacifica* are somewhat more elongate than in *M. avicennia*. This is unusual in salticids, which normally have an *x-x-x* pattern of macrosetae on the appendage segments (see RAMÍREZ, 2014).

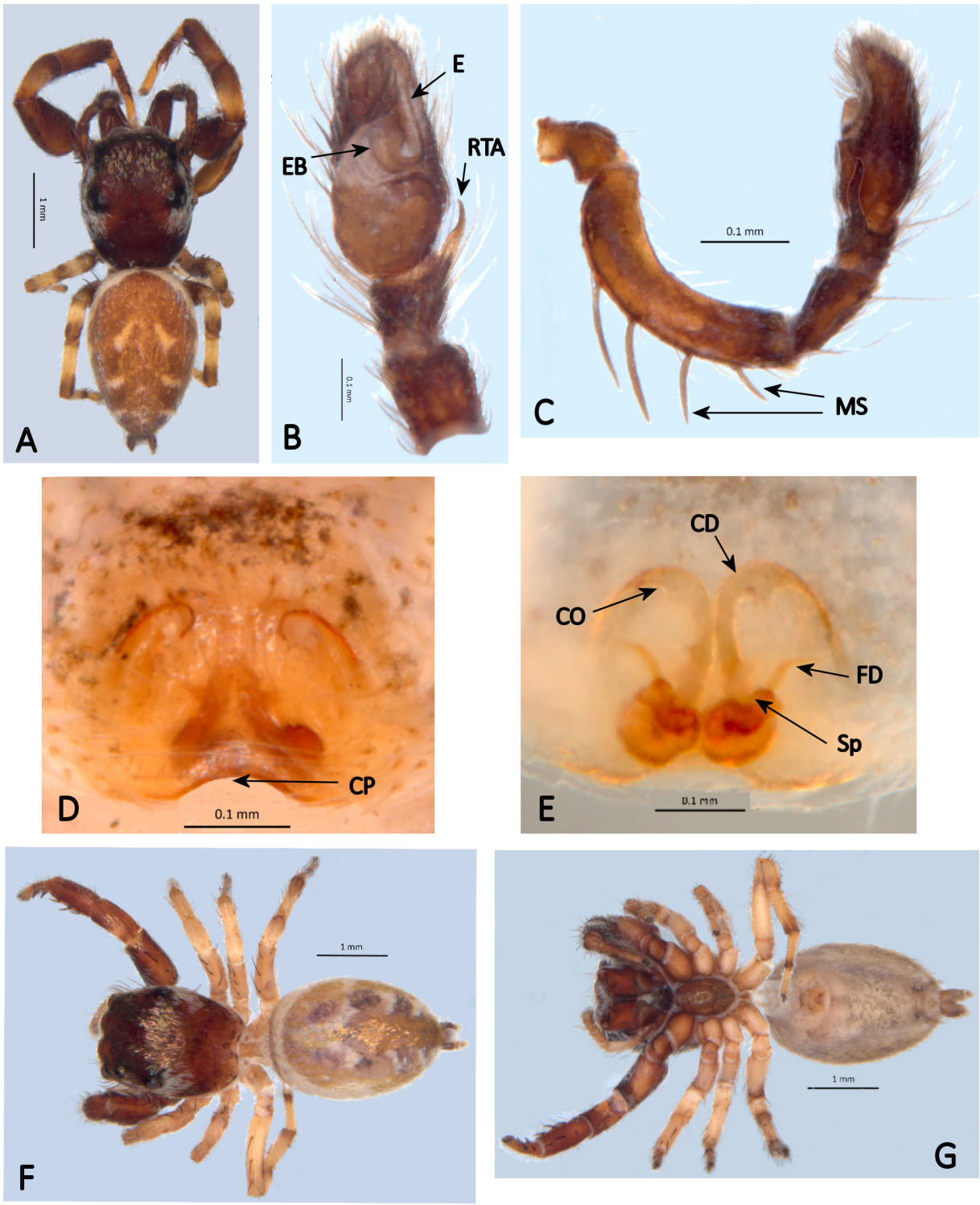

Fig. 6. *Cerionesta pacifica* comb. nov. Male: A. dorsal, B. palp ventral, C. palp retrolateral. Female: D. epigyne ventral, E. epigyne dorsal cleared, F. dorsal, G. ventral.

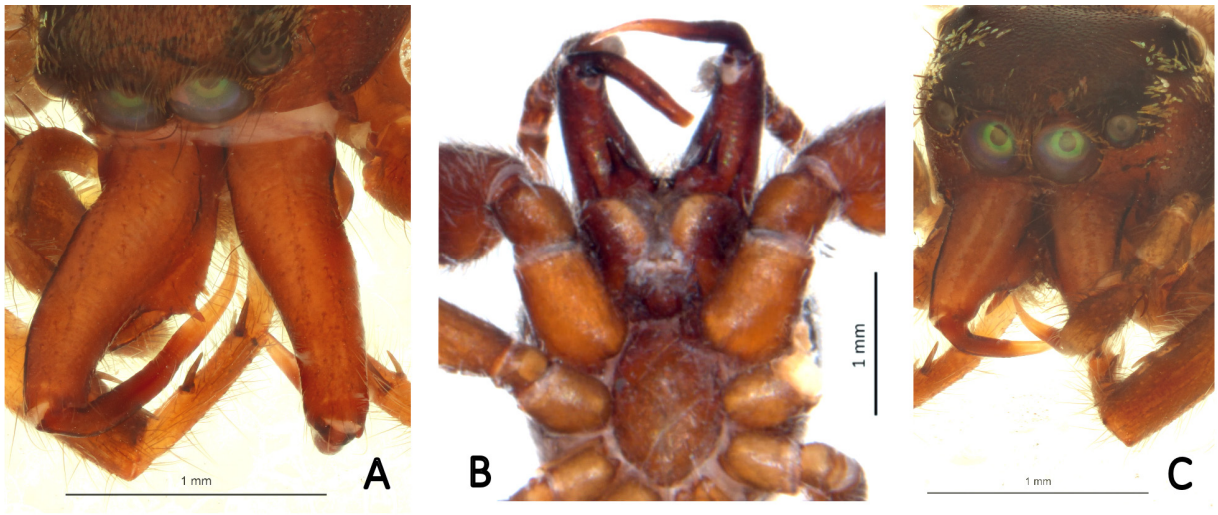

Fig. 7. *Cerionesta pacifica* comb. nov. A. major male face, B. major-intermediate male ventral chelicerae, C. minor male face (Photo credit: A, C : Camille Locatelli).

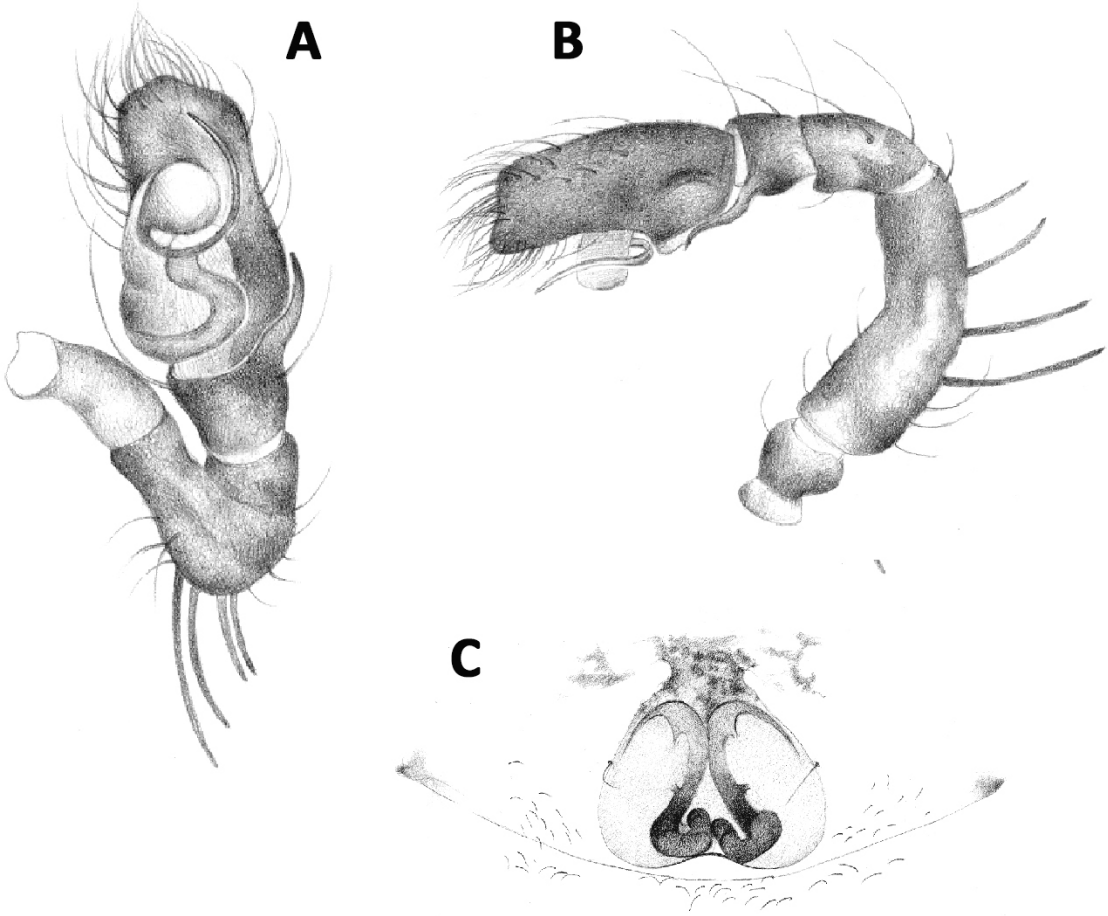

Fig. 8. *Cerionesta pacifica* comb. nov. Male: A. palp ventral. B. palp retrolateral. Female: C. epigyne ventral (Marylise Leclercq).

Like the male palpal structures, the female epigynal structures (posterior spermathecae, sinuate copulatory openings, medial copulatory ducts bent outward with the rims extending at an acute angle from the copulatory openings) are distinctive. This is similar to the typical dendryphantine epigynal structure that was described by MADDISON (1996), but the details are consistent with *Cerionesta* (Peckham & Peckham, 1893). Also see *Messua avicennia* diagnosis.

NOTES: *Philaeus* Thorell, 1869, is an Old World genus belonging to the large clade Saltafresia, which is not closely related to the Dendryphantini (part of the larger clade Marpissoida) to which this species belongs (MADDISON, 2015).

According to RUIZ (2010; pers. comm. 2016), this species either belongs in *Cerionesta* or a related undescribed genus, due to its embolus shape and position, and apparently in having the tegulum basal division turned 90 degrees clockwise. Rather than describe another monotypic genus, we place it in the previously monotypic genus *Cerionesta*, as it seems to be related to the type species, *C. luteola* Peckham & Peckham, 1893.

The ventral projection of the chelicerae can also be seen in some species of the unrelated genus *Myrmarachne* Macleay, 1839 (*e.g.*, YAMASAKI & AHMAD, 2013), and may be an adaptation to strengthen elongated male chelicerae. Other possibilities are that along with allometric size advantage (see FABER, 1984) this modification serves as additional armature for male-male encounters, or perhaps is involved in subduing a specific prey type that males prefer due to their otherwise unwieldy elongate chelicerae (see JACKSON & WILLEY, 1994).

***Messua avicennia* sp. nov.**

urn:lsid:zoobank.org:act:20187444-480E-4564-8275-85EB4CFE50EF

Figs 9-10

ETYMOLOGY: A noun in apposition after the genus name of the dominant plant in a habitat where this species occurs.

TYPES: Holotype male from Isla Floreana: 1991, coll. L. Baert, K. Desender, J.P. Maelfait, I.G.: 27.720 (B.91/633); female paratype, same data as male; female paratype, Isla Floreana, Punta Cormorant, 22.II.1988, coll. L. Baert, K. Desender, J.P. Maelfait, I.G.: 27.318 (B.88/334); male paratype, Isla Santa Cruz, Charles Darwin Research Station, elevation 0-1 m, mangrove litter, 12.II.1982, coll. L. Baert (B.82/010). One male and five female paratypes, Isla Rábida, elevation 3-10 m, sweep *Avicennia*, margin of lagoon, dry sand, 28.IX.1975, coll. W.G. Reeder (TMM #57506).

DIAGNOSIS: Males are easily distinguished from other Galapagoan salticids by the strongly divergent, forward projecting chelicerae. They may be distinguished from *Cerionesta pacifica* in that the chelicerae of major males of the latter species are distally parallel rather than divergent, and the palpal structure is much different, with the embolus originating dorsally in *M. avicennia*, but retrolaterally in *C. pacifica*. As in other species of the *limbata* species group (RUIZ, 2010), there is a long row of macrosetae on the dorsum of the palpal femora (usually eight). Females have a typical curved 'X' form (RUIZ, 2010) to the structure of the epigyne, similar to *C. pacifica*, but the ducts of *M. avicennia* are not advanced as far anteriorly nor are the atrial rims as acutely bent laterally as in that species. In addition, *M. avicennia* has a more robust body shape than *C. pacifica*.

Males are distinguished from other *Messua* species by having the embolus more elongate, directed more ventrally, and the embolus base is hidden on the dorsal side of the bulb. It is expected that female epigynal copulatory ducts would match the embolus and be longer than in related species, but the genus needs to be revised to confirm this correlation.

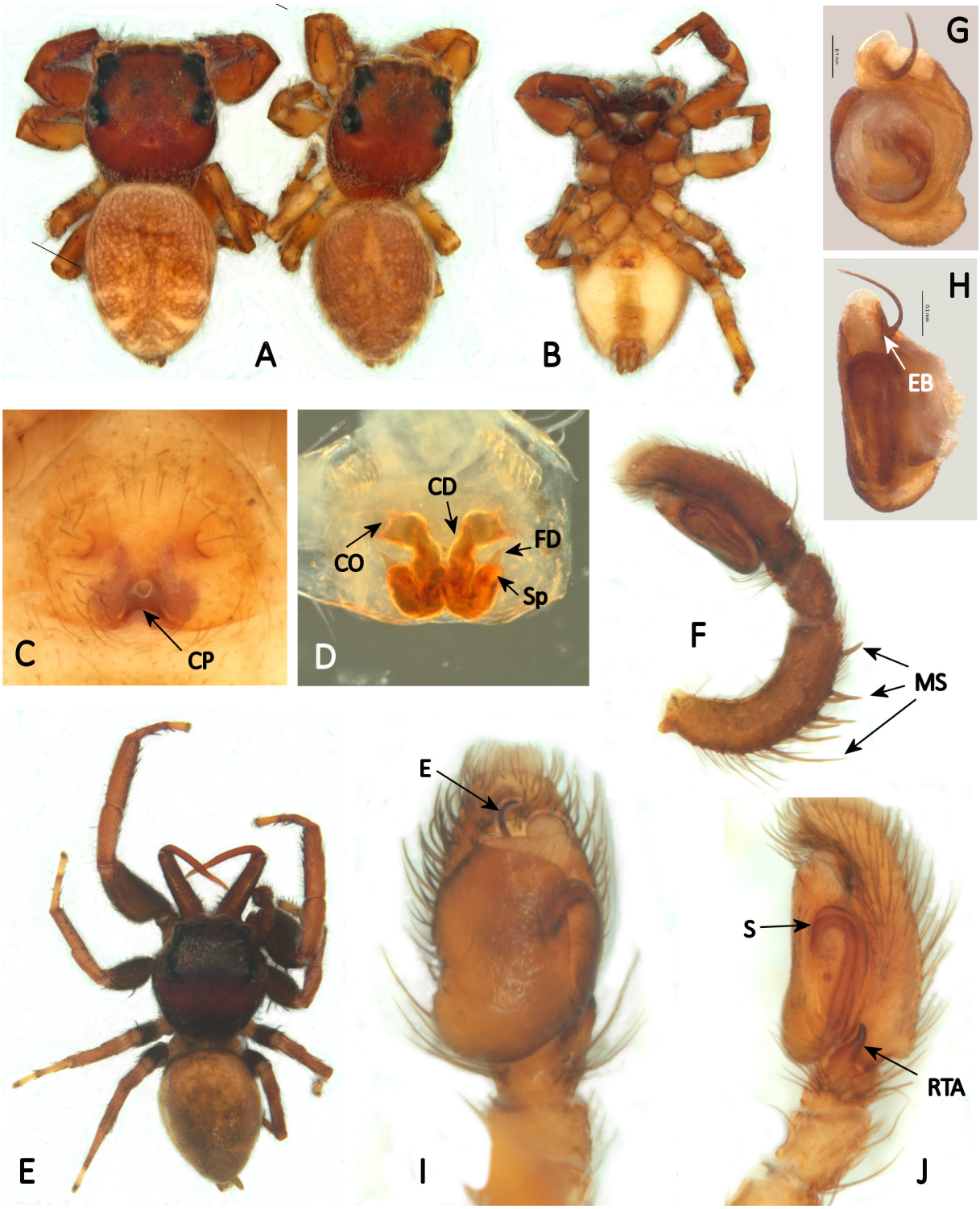

Fig. 9. *Messua avicennia* sp. nov. Female paratypes: A. dorsal, showing extremes of variation, B. ventral, C. epigyne ventral, D. epigyne dorsal cleared. Male holotype: E. dorsal, F. palp retrolateral, showing femoral macrosetae (MS, arrows). Male paratype: G. bulb dorsal, H. bulb retrolateral, slightly dorsal, I. palp ventral, J. palp retrolateral.

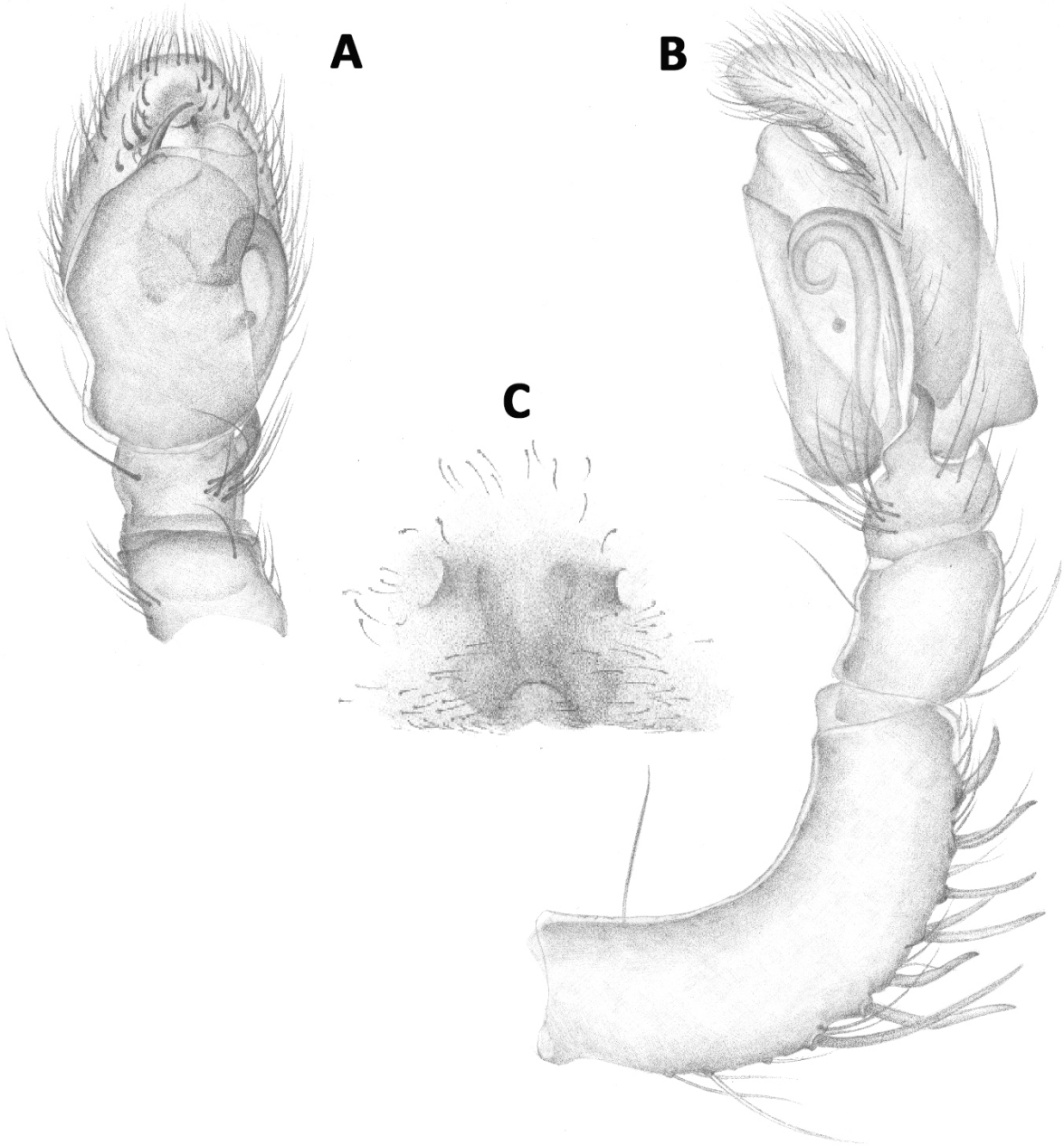

Fig. 10. *Messua avicennia* sp. nov. Male: A. palp ventral, B. palp retrolateral. Female: C. epigyne (Julien Caudron).

DESCRIPTION: Male holotype (paratypes in parentheses): BL 4.85 (3.99-4.11), CL 2.38 (1.95-2.22), CW 2.16 (1.67-1.88), AER 1.51, PER 1.78. Carapace, sternum, palps, and all leg femora dark brown, most of remainder of spider medium brown, except all metatarsi distally darker, and all tarsi yellow. Faint indications of dorsal pattern similar to some females may exist on the abdomen, and abdominal venter yellowish cream with brown median stripe as in female. Leg macrosetae: I M v 2-2, Tb v 2-2-2(r offset proximally), P p 1, F dp 2-0-0; II M p 0-1, v 2-2, Tb p 0-1-0, v 2-1r-1r, P p 1, F dp 2-0-0, dr 1-0-0; III M p 2-1, v 2-0, r 2-1, Tb p 0-1-1, v 2-0-0, r 0-1-1, P p 1, r-1, F dp 2-0-0, dr 1-0-0; IV M p 2-1, v 2-0, r 2-0, Tb p 0-0-1, v 2-0-1p, r 0-1-1, P p 1, F dp 1-0-0.

Female alloparatype (second female paratype in parentheses): BL 3.72 (3.55), CL 1.78 (1.67), CW 1.53 (1.42), AER 1.26, PER 1.44. Similar to male overall, but cephalothorax and appendages more or less medium brown, not as dark as male. Dorsal abdomen with variable pattern, sometimes with three sets of yellowish spots in posterior half, first two pair transversely linear in shape (all of which may be reduced or absent). Leg macrosetae similar to male.

NOTES: This was the undetermined dendryphantine reported by GALIANO & BAERT (1990). It apparently is mostly a coastal species, and commonly has been taken sweeping mangrove (*Avicennia* sp.) and from mangrove litter. However, it has also been reported in other habitats up to 700m (GALIANO & BAERT, 1990).

Comparison of specimens from Hawaii, Arizona, and Texas that are identified as *Messua felix* (F. O. Pickard-Cambridge, 1901) or *M. cf. felix* show the embolus of males of these specimens to be a distal concave curved shape more typical for this group of *Messua*, unlike the dorsally-extended embolus of *M. avicennia*. Although *M. felix* (or a closely related species) is thought to be introduced to Hawaii, it is not the species that occurs in the Galápagos Islands, which supports the hypothesis that *M. avicennia* is an endemic Galapagoan species.

Subtribe Marpissina

Balmaceda minor (F. O. Pickard-Cambridge, 1901) comb. nov.

urn:lsid:zoobank.org:act:FEF35EF8-EEED-4C20-AF4E-6EB996E205E9

Fig. 11 (A-F)

Marpissa minor F. O. P.-CAMBRIDGE, 1901: 250, pl. 22, f. 5-6 (Description male & female).
Marpissa minor, KRAUS, 1955: 77, f. 221-222 (male, removed from S of *M. californica*).

DIAGNOSIS: Color pattern essentially the same as *B. abba* sp. nov., but with a proportionately longer carapace, an epigynal copulatory opening and copulatory duct head that are proportionately half as wide, and a much larger body size.

DESCRIPTION: Holotype male: BL = 7.43, CL = 3.40, CW = 2.34, AER = 1.80, PER = 1.78. Chelicerae with two promarginal teeth and one bicuspid retromarginal tooth. Carapace dark brown laterally, dorsal eye field medium brown, median thoracic slope broadly yellow brown. Dorsal abdomen cream colored medially with slightly darker median cardiac mark anteriorly, broad light brown stripes laterally containing, along the inner edge, two pair of larger dark brown marks beginning at mid-point of length, followed by two pair of very small dark brown spots near posterior end, similar to some other slender species of *Balmaceda*; also there is a very narrow anterior brown band that extends about ¾ the length of the abdomen as a very narrow line. Entire venter dark cream colored except legs I light orange brown and chelicerae dark orange brown. Spinnerets cream colored except lateral brown line on anterior laterals. Leg macrosetae: I M v 2-2, Tb 2-1p-2-2, F dp 1-1-0, p 1-0-0; II like I except Tb 2-2-2; III M v 2-0, p 2-0, r 2-0, Tb v 2-0-0, p 0-1-0, r 0-1-0, F dp 1-1-0, dr 1-0-0, p 1-0-0; IV M v 2-0, Tb 2-0, F dp 1-0-0, dr 1-0-0.

Paratype female: BL = 9.16, CL = 4.12, CW = 2.86, AER = 2.07, PER = 2.01. Very similar to male, except larger, and dark areas more pronounced, especially dark marks on abdomen; the anterior part of the abdomen is damaged, but presumably that part is similar to the male, as it is in other respects. Leg macrosetae identical to male.

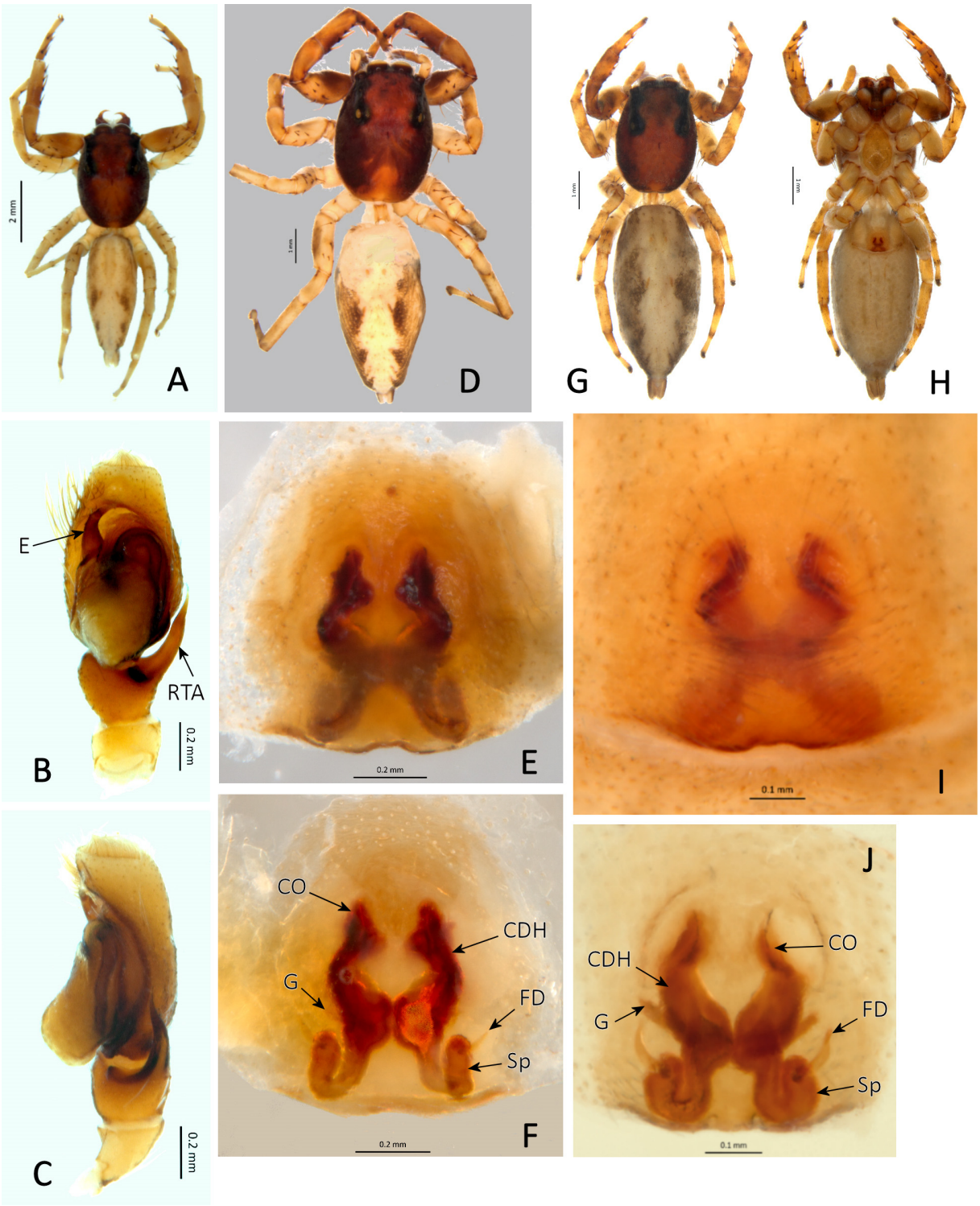

Fig. 11. *Balmaceda minor* comb. nov. Holotype male A-C, B-C right palp mirror imaged: A. dorsal, B. palp ventral, C. palp retrolateral. Paratype female D-F: D. dorsal, E. epigyne ventral cleared, F. epigyne dorsal cleared. *Balmaceda abba* sp. nov. Holotype female G-I: G. dorsal, H. ventral, I. epigyne ventral, J. paratype female: epigyne dorsal cleared.

NOTES: This species has a complex history that will be explained further in an ongoing study of *Balmaceda* (Ruiz & Edwards, in prep.). Suffice to say at this point that it has been erroneously transferred to other genera, erroneously synonymized with other species, and had other species erroneously synonymized with it. It is only known to occur in Mexico.

Eight species of *Balmaceda* are presently listed by the World Spider Catalog (2016). Only two previously were known from both sexes. The six other listed species are poorly known and presently under study (RUIZ & EDWARDS, in prep.). As is typical of the two previously known paired species of *Balmaceda*, males and females of *B. minor* are very similar in appearance (see EDWARDS, 2006; RUBIO *et al.*, 2016). We include here illustrations of the types of *B. minor*, confirming this intersexual similarity. Although not a Galapagoan species, the redescription is included here for comparison with the closely related endemic species described below.

***Balmaceda abba* sp. nov.**

urn:lsid:zoobank.org:act:40A05CC9-388A-4135-913D-C27F63AC3F8E

Figs 11(G-J), 12

Balmaceda estebanensis, GALIANO & BAERT, 1990; misidentification.

ETYMOLOGY: Named in honor of the Swedish pop group ABBA, the group name of which was an acronym, to be considered a noun in apposition.

TYPES: Holotype female from Isla Santa Cruz: Sierra Negra, 20.II.1986 (L. Baert, K. Desender, J.P. Maelfait; I.G.: 27.047); female paratype from Isla Isabela: Volcan Alcedo, 800 m, camp by water tank, 29.XI.2012 (W. Dekoninck 12/135); female paratype from Isla San Cristobal, Punta Bassa, 23-24.III.2009 (L. Baert, B.09/027).

RECORDS: Isla Fernandina: Punta Espinosa, 24.III.1988, 2j (L. Baert, K. Desender, J.P. Maelfait; I.G.: 27.318(473)); Isla Isabela: Volcan Wolf, 125 m, 21.III.1988, 1 pM (L. Baert, K. Desender, J.P. Maelfait; I.G.: 27.318(448)); Volcan Wolf, 23.III.1988, 2j (L. Baert, K. Desender, J.P. Maelfait; I.G.: 27.318(469)).

DIAGNOSIS: Very similar to *B. minor*, but the carapace is proportionately shorter, the epigynal copulatory openings and copulatory duct heads are proportionately twice as wide, the leg macrosetae are distinctive, it is significantly smaller, and the combined geographic range is not convincing (*B. minor* is only known from Mexico).

Compared to other Galapagoan species, adults are either larger than other species, or more elongate than the other large species. Most similar to *Menemerus bivittatus*, but body more slender, less flattened, and with a contrasting striped abdominal color pattern that includes spots.

DESCRIPTION: BL = 7.60 (6.72), CL = 3.07 (2.66), CW = 2.18 (1.88), AER =1.59 (1.49), PER = 1.59 (1.51). General appearance identical to *B. minor*, except lateral areas (including spots) on dorsal abdomen in shades of gray. Leg macrosetae: I M v 2-2, Tb 2-1p-2-2, F dp 1-1-0, p 1-0-0; II like I except Tb 2-2-2 (see Notes); III M v 2-0 (1r), p 1-0, r 1-0, Tb v 2-0-0, p 0-1-0, r 0-1-0, F dp 1-1-0, dr 1-0-0, p 1-0-0; IV M v 2-0, p 1-0, Tb 2-0-0, F dr 1-0-0.

Male unknown.

NOTES: The ventral macrosetae of the second metatarsi are unusual in that the distal pair and the two other retrolateral macrosetae are all much smaller than the other macrosetae. However, they are not very short as occurs in *B. distans* and *Metacyrba* species.

Other than the three type females, the remaining specimens are all juvenile, including a penultimate male. Based on the shape of the female copulatory openings and duct heads, it can be predicted that the male embolus will be broader than that of the male of *B. minor*.

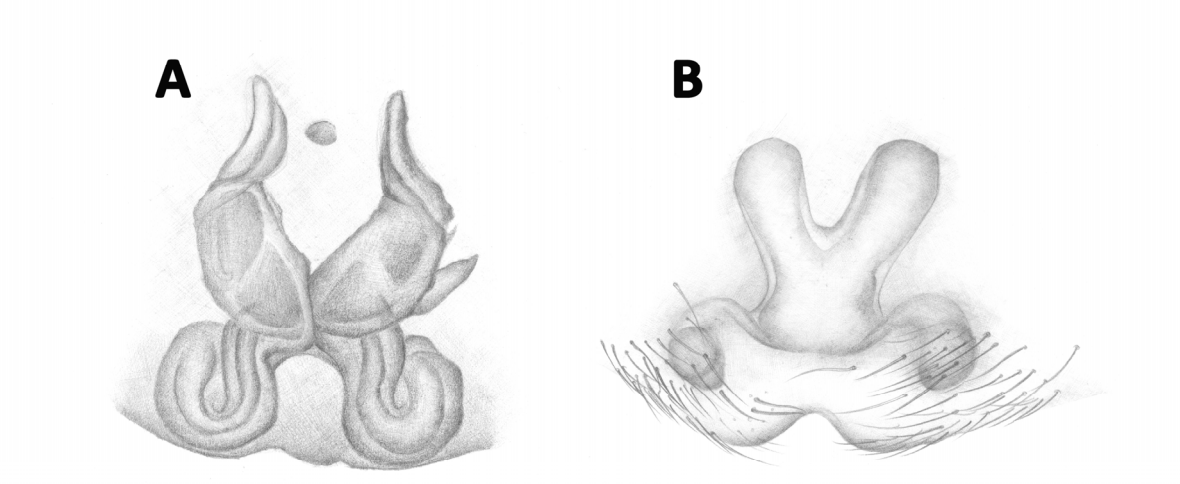

Fig. 12. *Balmaceda abba* sp. nov. Female: A. epigyne ventral. *Balmaceda distans* comb. nov. Female: B. epigyne ventral (Julien Caudron).

Balmaceda distans **(Banks, 1924) comb. nov.**

urn:lsid:zoobank.org:act:74DDA8DF-7B04-44B6-BC38-1C19FAF3DA16

Fig. 13

Phanias distans Banks, 1924

RECORDS: Isla Santiago: Ravine directly east of Cerro Cowan, eroded cave in west wall, depth 5 m, 18.IV.1975, 1 female (W.G. Reeder, I.G.: 32091); highland (260 m), transition wood, 8.IV.1982, 1 female (L. Baert, J.P. Maelfait).

DIAGNOSIS: The relatively large size will quickly separate this species from any other Galapagoan salticid except for *B. abba* and the three introduced synanthropic species: *Hasarius adansoni* (Audouin, 1827), *Menemerus bivittatus* (DeGeer, 1831), and *Plexippus paykulli* (Audouin, 1827). From the synanthropes it can be readily distinguished by the genital structures and leg I macrosetae pattern. From *B. abba* it can be distinguished by the latter being more elongate, less flattened, and with a striped color pattern on the abdomen, and by the genitalia. Genitalia in the male similar to other *Balmaceda*, but RTA forked at the tip and lacking ventral basal prong. Females similar to other *Balmaceda* in overall genital structure and abdominal pattern, but with a distinctive anterior broad T-shaped atrium and distinctive black spermathecae posterolaterally. Carapace more parallel-sided and slighter higher than is typical for the genus.

FEMALE DESCRIPTION: BL = 7.96, CL = 3.39, CW = 2.57, AER = 2.42, PER = 2.32 (Cerro Cowan specimen). Chelicerae with two promarginal teeth and one monocuspid (atypical for genus) retromarginal tooth. Carapace, chelicerae, endites, and labium reddish brown, sternum and legs yellowish brown, carapace atypically monochromatic for the genus. Abdomen gray with a faint pattern consisting of a pair of narrow broken pale submedial stripes, some short pale oblique side bands, and a few narrow chevrons posteriorly where the entire median area is pale; venter light gray with darker gray laterally. The second female is gravid with the abdomen more than half as wide as long. Legs with typical marpissine macrosetation, with subdistal prolateral macroseta on anterior tibiae moved to a ventral position, resulting in four ventral macrosetae on proventral side, and three on retroventral side. Leg macrosetae: I M v 2-2, Tb v 2-1p-2-2 (retrolaterals unusually small, similar to those of *Metacyrba*), F dp 1-1-0, p 1-0-0; II M v 2-2, Tb v 2-2-2, F dp 2-1-0; III M v 2-0, p 2-0, r 2-0, Tb v 2-0-1p, F dp 2-1-0, dr 1-0-0; IV M v 2-0, Tb 2-0-1p, F dp 1-0-0, dr 1-0-0.

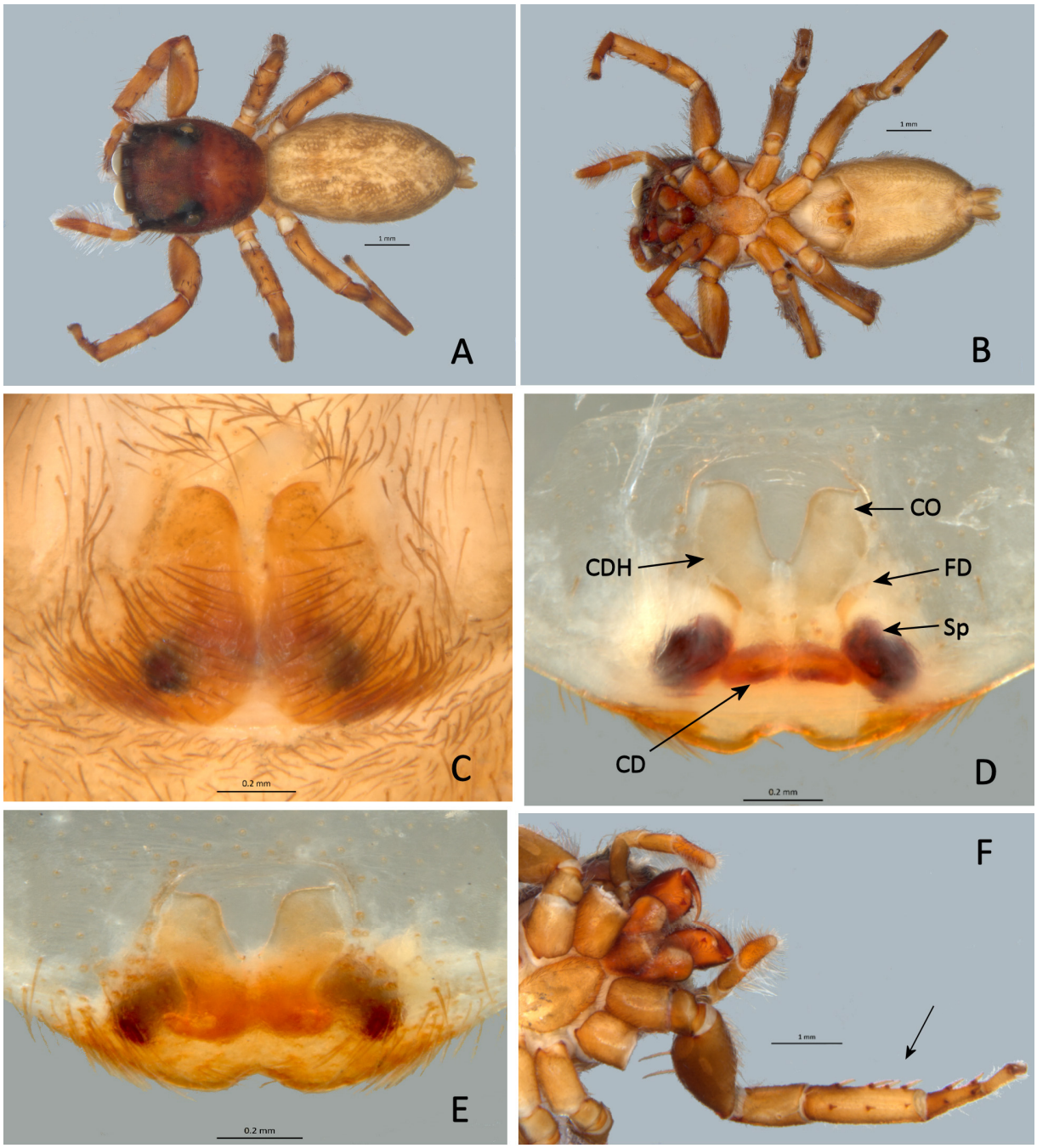

Fig. 13. *Balmaceda distans* comb. nov. Female [A-C Cerro Cowan specimen (legs I missing), D-F highland specimen (left leg I present)]. A. dorsal, B. ventral, C. epigyne ventral, D. epigyne dorsal cleared, E. epigyne ventral cleared, F. anterior venter, showing leg I macrosetae (arrow) and cheliceral teeth.

NOTES: The male holotype could not be found, but the original description and illustrations seem sufficient to place the species in *Balmaceda*. The apparent restricted distribution of the male and females to Santiago and Baltra islands, just north of Isla Santa Cruz, along with both belonging to *Balmaceda*, is evidence that they belong together.

The shift of the prolateral femoral macroseta next to the dorsoprolateral macroseta (F dp 2-1-0 vs F dp 1-1-0, p 1-0-0) is similar to what occurs in some dendryphantines (e.g., EDWARDS, 2004). Along with the somewhat dendryphantine-like carapace, it is not hard to understand why BANKS (1924) originally placed this species in a dendryphantine genus. Also, the monocuspid retromarginal cheliceral tooth is atypical for the genus and probably

plesiomorphic, possibly indicating, along with the other atypical apparently plesiomorphic characters, that this is the basal species in the genus.

Clade Saltafresia
Tribe Aelurillini
Subtribe Freyina

***Nycerella vestita* (Taczanowski, 1878) comb. nov.**
urn:lsid:zoobank.org:act:858FA64D-34AB-49B5-8123-31BF2B330277
Figs 14, 15

Euophrys vestita TACZANOWSKI, 1878: 293 (Description male & female).

RECORDS: Isla Santa Cruz: Tortuga Bay, 16.VI-25.VII.1991, 1 male (S. Abedrabbo). Isla Española: Punta Suárez, 4-7.VI.1998, 1 male (X. Salazar), same location, el. 10 m, litter of bushes in seabird rookery, 10.VI.1985, 2 females (S. & J. Peck, AMNH); Isla Pinzón: Playa Escondida, 19-27.VI.1991, 1 male (L. Baert); Unknown locality: 1991, 1 male. All male specimens were taken from pitfall traps.

DIAGNOSIS: Generally similar to other *Nycerella* species in size, carapace shape, and palp and epigynal conformation, but the palpal bulb differs by having an extension from the embolus base that projects as a large retrolateral lobe, unlike what occurs in other freyines, but possibly homologous with the freyine terminal apophysis. The only other somewhat similar freyine genus, with a much larger projection, is *Tullgrenella* Mello-Leitão, 1941, but the other palpal characters of *N. vestita* are similar to *Nycerella*. The RTA is slender and curved slightly inward, unlike the robust, strongly laterally curved RTAs of most other species in the genus. The relatively slender RTA is most similar to *N. delecta* (Peckham & Peckham 1896), which has a much longer embolus lacking a basal lobe. The female epigyne is very similar to typical *Nycerella* (see GALIANO, 1982; EDWARDS, 2015), with submedial spherical spermathecae and very short narrow anteriorly-directed copulatory ducts opening at the anterior end of short narrow atria. The color pattern is simpler than other *Nycerella* species, lacking the assortment of colorful spots and transverse bands usually present. However, the conspicuous white lateral marginal bands and median thoracic stripe are present as in typical *Nycerella* (GALIANO, 1982; EDWARDS, 2015).

NOTES: Possibly this species represents an undescribed genus due to its unusual embolus base projection, simplified color pattern, and apparent ground dwelling habits, therefore its placement is considered tentative, although its morphology suggests it is more closely related to *Nycerella* than to any other known freyine genus. Since there exists an apparent group of close relatives, we again hesitate to erect a monotypic genus. Other than the distinctive features described above, the species seems to be similar to other *Nycerella* species, which normally occur on low vegetation (EDWARDS, 2015).

The type specimens of *N. vestita* were taken from Peru (TACZANOWSKI, 1878), so this is one of the species shared with continental South America. Since most species of *Nycerella* have an Andean or Central American distribution, the distribution of other *Nycerella* seems compatible with the type locality of *N. vestita*. As noted by MADDISON (2015), salticids often have geographic distributions that reflect their phylogenetic relationships.

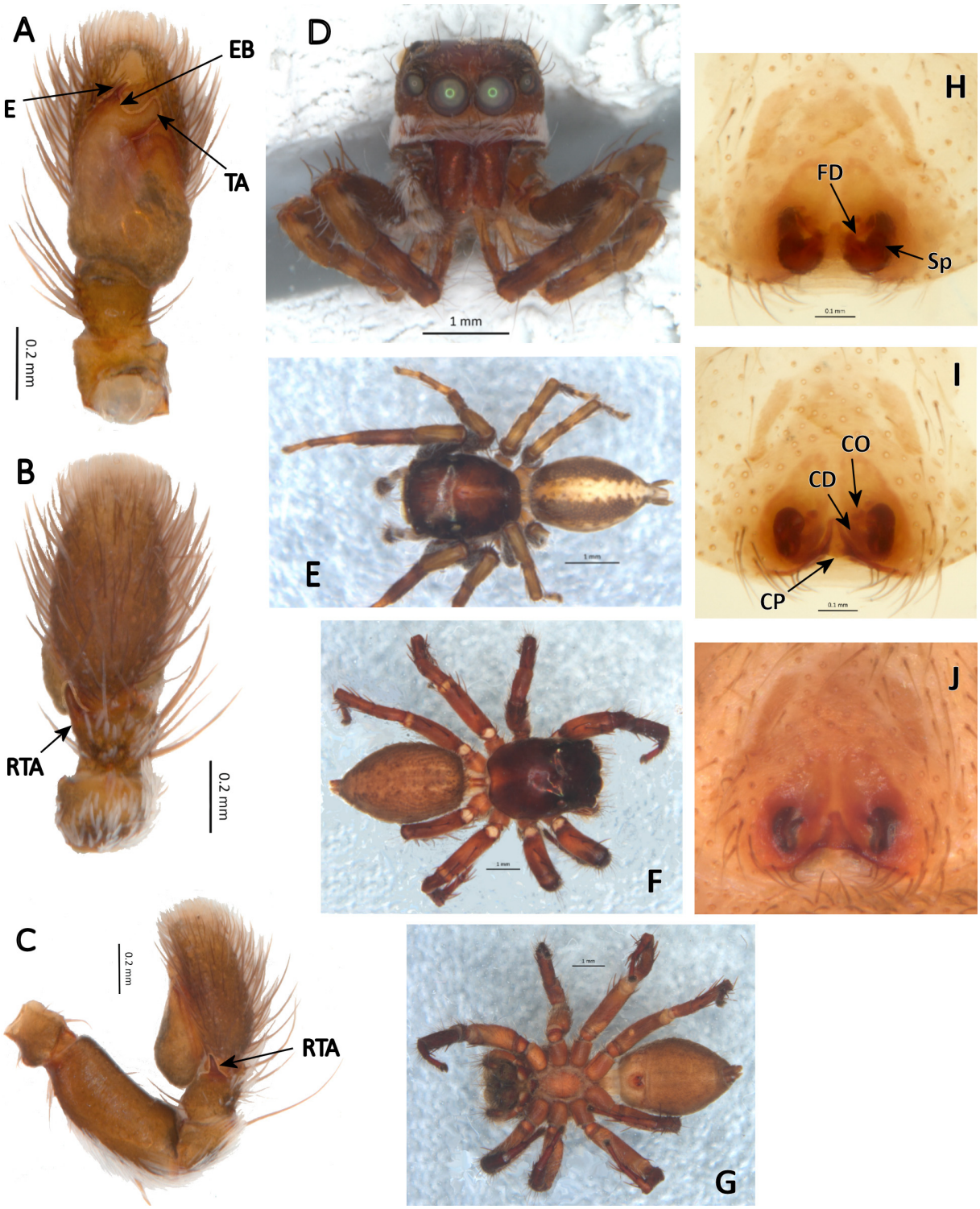

Fig. 14. *Nycerella vestita* comb. nov. Male: A. palp ventral, B. palp dorsal, C. palp retrolateral, D. face, E. dorsal. Female: F. dorsal, G. ventral, H. epigyne dorsal cleared, I. epigyne ventral cleared, J. epigyne ventral.

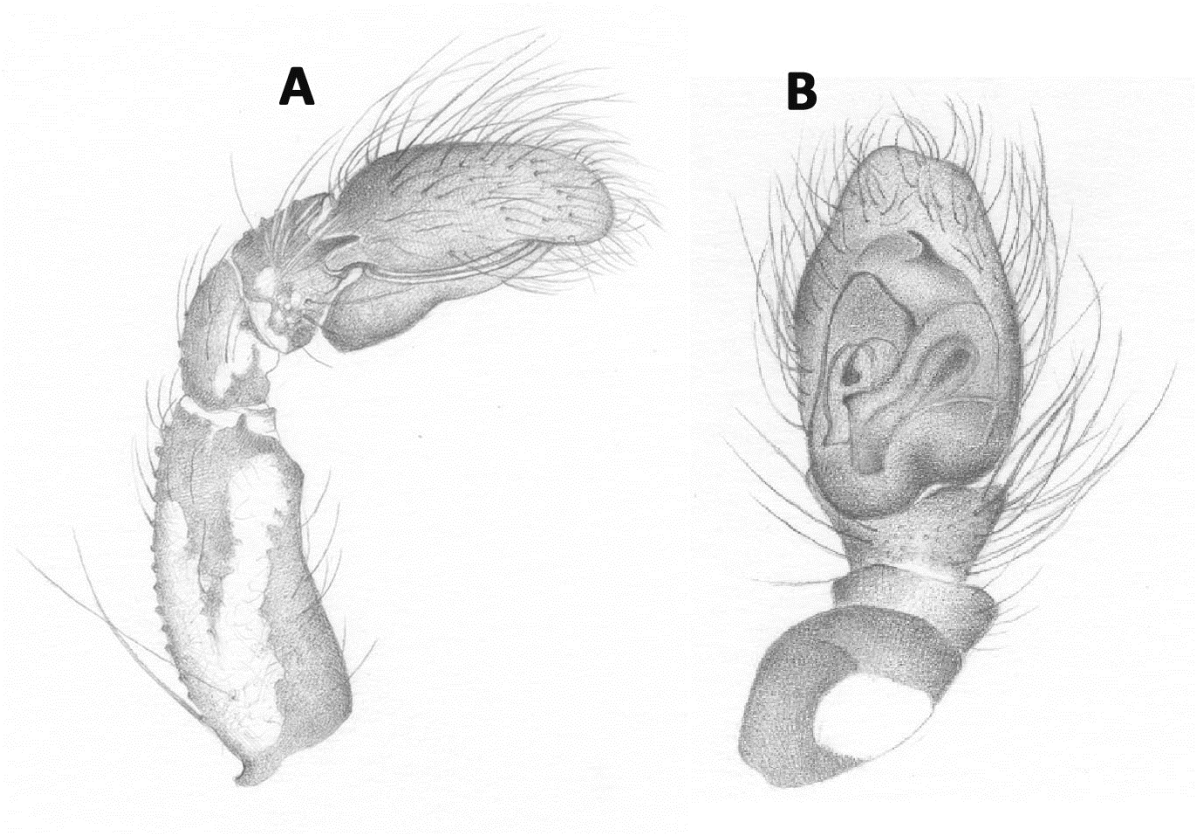

Fig. 15. *Nycerella vestita* comb. nov. Male: A. left palp retrolateral, B. left palp ventral (Marylise Leclercq).

Table 1. List of Galápagos Salticidae with island distributions.

Species	**Distribution**	**Islands Reported**
Balmaceda abba sp. nov.	endemic	Fernandina, Isabela, San Cristóbal, Santa Cruz
Balmaceda distans (Banks, 1924) comb. nov.	endemic	Baltra, Santiago
Cerionesta pacifica (Banks, 1902) comb. nov.	endemic	Española, San Cristóbal
Darwinneon crypticus Cutler, 1971	endemic	Española, Fernandina, Floreana, Genovesa, Isabela, Pinta, Pinzón, San Cristóbal, Santa Cruz, Santa Fé, Santiago, Seymour Norte
Frigga crocuta (Taczanowski, 1879)	continental	Baltra, Fernandina, Floreana, Isabela, Pinzón, San Cristóbal, Santa Cruz, Santiago
Habronattus encantadas Griswold, 1987	endemic	Darwin
Hasarius adansoni (Audouin, 1827)	pantropical	Isabela, Santa Cruz
Helvetia insularis (Banks, 1902)	continental	Fernandina
Menemerus bivittatus (Dufour, 1831)	pantropical	Isabela, San Cristóbal, Santa Cruz
Messua avicennia sp. nov.	endemic	Floreana, Isabela, Pinta, Santa Cruz
Metacyrba insularis (Banks, 1902)	endemic	Daphne, Española, Fernandina, Floreana, Isabela, Pinzón, Santa Cruz, Santiago
Nycerella vestita (Taczanowski, 1878) comb. nov.	continental	Isabela, Pinzón, Santa Cruz, Santiago
Plexippus paykulli (Audouin, 1827)	pantropical	Baltra, Santa Cruz
Sitticus phaleratus Galiano & Baert, 1990	endemic	San Cristóbal, Santa Cruz, Santa Fé, Santiago
Sitticus pintanus sp. nov.	endemic	Pinta
Sitticus tenebricus Galiano & Baert, 1990	endemic	Isabela, Santa Cruz
Sitticus trisetosus sp. nov.	endemic	Isabela
Sitticus uber Galiano & Baert, 1990	endemic	Isabela, Santa Cruz
Sitticus vanvolsemorum Baert, 2011	endemic	Española
Titanattus cordia sp. nov.	endemic	Gardner (near Española), Isabela, San Cristóbal, Santiago

Acknowledgments

Our thanks to Gustavo R. S. Ruiz and Wayne P. Maddison, who graciously advised on aspects of dendryphantine and thiodinine taxonomy, and who gave pre-submission reviews. Abel A. Bustamante also advised on thiodinine taxonomy. Gustavo Ruiz examined and sent sketches of the genitalia of the male and female types of *Euophrys vestita,* which helped establish placement of this species. Lou Sorkin (AMNH) loaned additional Galápagos specimens. Thanks also to Camille Locatelli for providing some photographs (Fig. 5A & C), and to Marylise Leclercq (Figs 4, 7(G-I) and 9) and Julien Caudron (Figs 1-3), for the drawn illustrations.

Literature Cited

BAERT L., 2011. - Descriptions of *Sitticus vanvolsemorum* sp. nov. and the male of *Sitticus tenebricus* Galiano & Baert, 1990 from the Galápagos Islands (Araneae: Salticidae). *Bulletin de la Société royale belge d'Entomologie*, 147: 63–67.

BAERT L., 2013a. - Description of several unknown Galápagos male and female spiders. *Bulletin de la Société royale belge d'Entomologie,* 149: 64–73.

BAERT L., 2013b. - Summary of our present knowledge of the spider communities of the Galápagos archipelago. First analysis of the spider communities of the islands Santa Cruz and Isabela. *Belgian Journal of Zoology*, 143 (Supplement): 159–185.

BANKS N., 1902. - Papers from the Hopkins Stanford Galapagos Expedition; 1898-1899. VII. Entomological Results (6). Arachnida. With field notes by Robert E. Snodgrass. *Proceedings of the Washington Academy of Science*, 4: 49–86.

BANKS N., 1924. - Arachnida of the Williams Galapagos Expedition. *Zoologica*, 5: 93–99.

BUSTAMANTE A.A., MADDISON W.P. & RUIZ G.R.S., 2015. - The jumping spider genus *Thiodina* Simon, 1900 reinterpreted, and revalidation of *Colonus* F.O.P-Cambridge, 1901 and *Nilakantha* Peckham & Peckham, 1901 (Araneae: Salticidae: Amycoida). *Zootaxa*, 4012(1): 181–190. doi: http://dx.doi.org/10.11646/zootaxa.4012.1.10

BUSTAMANTE A.A. & RUIZ G.R.S., 2017. – Systematics of Thiodinini (Araneae: Salticidae: Salticinae), with description of a new genus and twelve new species. *Zootaxa*, 4362(3): 301-347. doi:10.11646/zootaxa.4362.3.1

EDWARDS G.B., 2004. - Revision of the jumping spiders of the genus *Phidippus* (Araneae: Salticidae). *Occasional Papers of the Florida State Collection of Arthropods*, 11, viii + 156 pp, 350 figs., 61 color cover fig.

EDWARDS G.B., 2006. - A review of described *Metacyrba*, the status of *Parkella*, and notes on *Platycryptus* and *Balmaceda*, with a comparison of the genera (Araneae: Salticidae: Marpissinae). *Insecta Mundi,* 19(4): 193–226.

EDWARDS G.B., 2015. - Freyinae, a major new subfamily of Neotropical jumping spiders (Araneae: Salticidae). *Zootaxa*, 4036(1): 1–87. doi:10.11646/zootaxa.4036.1.1

FABER D.B., 1984. - Sexual differences in body proportions of *Zygoballus rufipes* Peckham and Peckham (Araneae, Salticidae): An effect of cheliceral and leg allometry. *Journal of Arachnology*, 11: 385–391.

GALIANO M.E., 1982. - Revision del genero *Nycerella* (Araneae, Salticidae). *Physis Buenos Aires* (Sección C), 41: 53–63.

GALIANO M.E., 1991. - Las especies de *Sitticus* Simon del grupo *palpalis* (Araneae, Salticidae). *Acta Zoologica Lilloana*, 40: 59–68.

GALIANO M.E, & BAERT, L., 1990. Distribution of the Galápagoan salticid species with the description of three new *Sitticus* species (Araneae, Salticidae). *Bulletin de l'Institut royal des Sciences naturelles de Belgique*, 60: 123-132.

JACKSON R.R. & WILLEY M.B., 1994. - The comparative study of the predatory behaviour of *Myrmarachne*, ant-like jumping spiders (Araneae: Salticidae). *Zoological Journal of the Linnean Society*, 110: 77–102.

KRAUS, O., 1955. - Spinnen aus El Salvador (Arachnoidea, Araneae). *Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft*, 493: 1–112.

MADDISON W.P., 1996. - *Pelegrina* Franganillo and other jumping spiders formerly placed in the genus *Metaphidippus* (Araneae: Salticidae). *Bulletin of the Museum of Comparative Zoology*, 154: 215–368.

MADDISON W.P., 2015. - A phylogenetic classification of jumping spiders (Araneae: Salticidae). *Journal of Arachnology*, 43(3): 231–292. doi:10.1636/arac-43-03-231-292

PECKHAM G.W. & PECKHAM E.G., 1893. - On the spiders of the family Attidae of the island of Saint-Vincent. *Proceedings of the Zoological Society of London*, 1893: 692–704.

PICKARD-CAMBRIDGE, F.O., 1901. - Arachnida - Araneida and Opiliones. *In*: *Biologia Centrali-Americana*, 2. Zoology. London, 610 pp text & 44 Plates.

RAMÍREZ M.J., 2014. - The morphology and phylogeny of dionychan spiders (Araneae: Araneomorphae). *Bulletin of the American Museum of Natural History*, 390: 1–374. doi:10.1206/821.1

RUBIO G.D., BAIGORRIA J.E. & EDWARDS G.B., 2016. - First description of the female of *Balmaceda nigrosecta* Mello-Leitão (Salticidae: Salticinae: Dendryphantini: Marpissina). *ZooKeys*, 563: 11–19. doi:10.3897/zookeys.563.6705

RUIZ G.R.S., 2010. - Análise cladística de Dendryphantinae (Araneae: Salticidae). Ph.D. thesis, Universidade de São Paulo, 166 pp.

RUIZ G.R.S. & MADDISON W.P., 2015. - The new Andean jumping spider genus *Urupuyu* and its placement within a revised classification of the Amycoida (Araneae: Salticidae). *Zootaxa*, 4040(3): 251–279. doi:10.11646/zootaxa.4040.3.1

SIMON E., 1900. - Descriptions d'arachnides nouveaux de la famille des Attidae. *Annales de la Société entomologique de Belgique,* 44: 381–407.

SIMON E., 1901. - *Histoire naturelle des araignées*. Paris 2: 381–668.

SIMON E., 1903. - *Histoire naturelle des araignées*. Paris 2: 669–1080.

TACZANOWSKI L., 1878. - Les Aranéides du Pérou. Famille des Attides. *Bulletin de la Société Impériale des Naturalistes de Moscou*, 53: 278–374.

YAMASAKI T. & AHMAD A.H., 2013. - Taxonomic study of the genus *Myrmarachne* (Araneae: Salticidae) in Borneo. *Zootaxa*, 3710(6): 501–556. doi:10.11646/zootaxa.3710.6.1

World Spider Catalog, 2015. - World Spider Catalog. Natural History Museum Bern, online at http://World Spider Catalog.nmbe.ch, version 16.5, last accessed on 8 September 2016.