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Rhaucoides Roewer, 1912, an Andean genus with fused tarsomeres: revision with a new generic synonymy and two new species (Opiliones: Cosmetidae: Metergininae)

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Abstract. *Rhaucoides* Roewer, 1912 is herein revisited and re-diagnosed based on somatic and genital morphology, including the differences of both expanded and unexpanded glans complex shown for the first time in Cosmetidae. The genus is characterized mainly by abdominal ornamentation, coloration and by having the two basalmost tarsomeres of leg I fused. The genus *Cumbalia* Roewer, 1963 is newly considered a junior synonym of *Rhaucoides*. The species *Cumbalia octomaculata* Roewer, 1963, *Rhaucoides festae* Roewer 1925 and *Rhaucoides sulfureus* Mello-Leitão 1939 are considered junior subjective synonyms of *Rhaucoides riveti* Roewer, 1919. *Erginus devillei* Simon 1879 (currently in *Metarhaucus*) is transferred to *Rhaucoides,* resulting in *Rhaucoides devillei* (Simon 1879), comb. nov. *Rhaucoides atahualpa* sp. nov. and *Rhaucoides nasa* sp. nov. are described from Ecuador and Colombia, respectively. Comments about the genital and tarsal morphology in Cosmetidae are provided. A map with the known distribution of the genus, in the Andes of southern Colombia and northern Ecuador, is given. Finally, emended diagnoses are provided for the genera *Rhauculus* Roewer, 1927 and *Reimoserius* Roewer 1947. After the type species of *Metarhaucus* Pickard-Cambridge, 1905 was transferred to *Rhaucus* Simon, 1879, a few species remained without formal generic allocation. All of those are herein combined either with *Rhaucoides* (1 species), *Rhauculus* (5 species) or *Reimoserius* (1 species).

Keywords: Arachnida, Grassatores, Neotropics, morphology, sexual and male dimorphism.

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http://zoobank.org/References/7CF69BBB-7B20-4867-A6EA-CDA7B548F700

Harvestmen (Opiliones Sundevall, 1833) constitute the fourth most diverse group of Arachnida Lamarck, 1801 (after Araneae, Acariformes and Parasitiformes) (Harvey 2002; Beaulieu et al. 2011; Zhang 2013). Amidst this order, the superfamily Gonyleptoidea Sundevall, 1833 is one of the most varied groups, comprising 14 families and 2044 species. Within the Gonyleptoidea, the family Cosmetidae Koch, 1839 is the second most diverse with 125 genera and 730 species (Kury 2013, 2018; Kury et al. 2021).

The Cosmetidae are found mainly in the Neotropical region, being distributed from USA to Argentina (Kury 2003), and exhibiting a high species richness in the Andean region of Colombia, Ecuador and Venezuela (e.g., Roewer 1912, 1925; González-Sponga 1992; Medrano & Kury 2016, 2017; García & Kury 2017; García & Ahumada-C. 2018; Medrano et al. 2019a, b, 2020).

The system of classification of Opiliones popularized by Roewer (1912, 1923) was widely criticized in literature for using artificial and problematic characters (e.g., García & Kury 2017). Also, the associated name formation system, initiated by Pickard-Cambridge (1905), consisted in adding random prefixes and suffixes (which do not carry any meaning and would be thus interchangeable) to preexisting, more euphonic, names created by previous authors, like Koch or Simon (e.g., *Cynorta* C.L. Koch, 1839 or *Rhaucus* Simon, 1879). Roewer (e.g., 1912, 1915, 1928) maximized this assembly-line system, resulting in examples of repetitiveness: *Cynorta* was used as root in 27 genera names, *Vonones* Simon, 1879 was used in 16, *Libitia* Simon, 1879 was used in ten and *Rhaucus* was used in nine (Table 1). Authors like Mello-Leitão or the Goodnights also contributed to promote that pattern with examples like *Platycynorta* Mello-Leitão, 1933 or *Disvonones* Goodnight & Goodnight, 1944. In the present work, we are dealing with some genera closely related not just in taxonomy but also in etymology, thus such names sometimes could be easily mistaken for each other, as in *Rhaucus* and its derivatives: *Rhauculus* Roewer, 1927, *Pararhauculus* Mello-Leitão, 1939, *Rhauculanus* Roewer, 1928, *Metarhaucus* Pickard-Cambridge, 1905 and *Rhaucoides* Roewer, 1912.

The genus *Rhaucoides* was created as monotypic with the description of *Rhaucoides ornatus* Roewer, 1912, based on the mesotergal armature (areas I–II with low tubercles and III–IV with strong spines), males with hypertelic chelicerae, legs III–IV thicker than I–II and armed with stronger dentition, and five tarsomeres in leg I with basitarsomeres clearly incrassate in males. The genus has a short historical taxonomic background with two major events after its proposition: (1) the description of three species by Roewer (1919, 1925, 1947) and (2) the synonymy of *Pararhauculus sulfureus* Mello-Leitão, 1939 with *Rhaucoides festae* Roewer 1925 by Kury (2003), which made invalid the monotypic *Pararhauculus* Mello-Leitão 1939. Therefore, *Rhaucoides* is currently formed by four nominal species, known exclusively from the Andes of Ecuador: *R. ornatus* (type species); *R. riveti* Roewer, 1919; *R. festae* and *R. marmoratus* Roewer, 1947 (Kury 2003; Kury et al. 2021).

Based on examined material from collections of South America and expeditions by members of our laboratory, we review the current taxonomy of *Rhaucoides*, proposing an emended diagnosis, one new generic synonymy, three new specific synonymies, one new transfer and the description of two new species from Colombia and Ecuador. Additionally, we discuss the taxonomy of the genera *Rhauculus* and

Table 1.—Common names of cosmetid genera and their subsequent combinations by addition of prefixes and suffixes.

Prefix	Root	Suffix	Genus Author, year
Meta-	*Cynorta* Koch, 1839		*Metacynorta* Pickard-Cambridge, 1904
Eu-			*Eucynorta* Roewer, 1912
Eu-		-ella	*Eucynortella* Roewer, 1912
Eu-		-oides	*Eucynortoides* Roewer, 1912
		-ula	*Cynortula* Roewer, 1912
		-ella	*Cynortella* Roewer 1912
Meta-		-oides	*Metacynortoides* Roewer, 1912
		-oides	*Cynortoides* Roewer, 1912
Eu-		-ula	*Eucynortula* Roewer, 1912
Neo-			*Neocynorta* Roewer, 1915
		-ellina	*Cynortellina* Roewer 1915
Neo-		-oides	*Neocynortoides* Roewer, 1916
		-ellana	*Cynortellana* Roewer 1923
		-ellula	*Cynortellula* Roewer 1925
Pygo-			*Pygocynorta* Roewer, 1925
		-oplus	*Cynortoplus* Roewer 1925
Platy-			*Platycynorta* Mello-Leitão, 1933
Sphalero-			*Sphalerocynorta* Mello-Leitão, 1933
Para-			*Paracynorta* Goodnight & Goodnight, 1942
Cali-			*Calicynorta* Goodnight & Goodnight 1943
		-esta	*Cynortesta* Roewer 1947
		-etta	*Cynortetta* Roewer, 1947
		-operna	*Cynortoperna* Roewer 1947
		-opyga	*Cynortopyga* Roewer, 1947
		-osoma	*Cynortosoma* Roewer, 1947
Denti-			*Denticynorta* Roewer, 1947
Syn-			*Syncynorta* Roewer, 1947
	Erginus Simon, 1879	-oides	*Erginoides* Pickard-Cambridge, 1904
Meta-			*Meterginus* Pickard-Cambridge, 1905
		-ulus	*Erginulus* Roewer, 1912
Eu-			*Euerginus* Roewer, 1912
Meta-		-ulus	*Meterginulus* Roewer, 1912
Meta-		-oides	*Meterginoides* Roewer, 1912
Pro-			*Proerginus* Roewer, 1917
		-perna	*Erginiperna* Roewer, 1947
Eu-	*Libitia* Simon, 1879		*Eulibitia* Roewer, 1912
		-oides	*Libitioides* Roewer, 1912
Meta-			*Metalibitia* Roewer, 1912
Para-			*Paralibitia* Roewer, 1912
		-ola	*Libitiola* Roewer, 1925
Acantho-			*Acantholibitia* Mello-Leitão, 1928
Brachy-			*Brachylibitia* Mello-Leitão, 1941
		-ella	*Libitiella* Roewer, 1947
		-osoma	*Libitiosoma* Roewer, 1947
Prae-			*Praelibitia* Roewer, 1956
Meta-	*Rhaucus* Simon, 1879		*Metarhaucus* Pickard-Cambridge, 1905
Neo-			*Neorhaucus* Pickard-Cambridge, 1905
Para-			*Pararhaucus* Pickard-Cambridge, 1905
		-oides	*Rhaucoides* Roewer, 1912
		-ulanus	*Rhauculanus* Roewer, 1927
		-ulus	*Rhauculus* Roewer, 1927
Para-		-ulus	*Pararhauculus* Roewer, 1933
Para-		-ulus	*Pararhauculus* Mello-Leitão, 1939
Mega-			*Megarhaucus* Mello-Leitão, 1941
Meta-	*Vonones* Simon, 1879		*Metavonones* Pickard-Cambridge, 1904
Para-			*Paravonones* Pickard-Cambridge, 1904
Holo-			*Holovonones* Roewer, 1912
		-oides	*Vononoides* Roewer, 1912
Hetero-			*Heterovonones* Roewer, 1912
		-ella	*Vononella* Roewer, 1925
Ke-			*Kevonones* Chamberlin, 1925
		-ana	*Vononana* Roewer, 1928
Meta-		-oides	*Metavononoides* Roewer, 1928
Bi-			*Bivonones* Goodnight & Goodnight, 1942
Dis-			*Disvonones* Goodnight & Goodnight, 1944
Teca-			*Tecavonones* Goodnight & Goodnight, 1944
		-esta	*Vononesta* Roewer, 1947
		-ula	*Vononula* Roewer, 1947
Oligo-			*Oligovonones* Caporiacco, 1951
		-issus	*Vononissus* Roewer, 1956

Reimoserius Roewer 1947, proposing emended diagnoses for both genera and new rearrangements that include six new transferences from *Metarhaucus* to those genera. Finally, a brief discussion is made about the expanded/unexpanded glans complex in the Opiliones with non-muscular penis (infraorder Grassatores).

METHODS

The specimens were photographed using a Sony Cybershot DSC-V1 camera and the multiple resultant images at different focal planes were integrated with Combine ZP Suite software (Hadley 2015). The final images were then edited in Adobe Photoshop CC 2014 software. Drawings of the species were made using Inkscape 0.91 software. Color descriptions use the standard names of the 267 Color Centroids of the NBS/IBCC Color System (online at http://people.csail.mit.edu/jaffer/Color/Dictionaries#nbs-iscc) as described in Kury & Orrico (2006). Genitalia were examined under optical microscopy after clearing with lactophenol and glycerol and staining with Acid Fuchsin. Expansion of movable parts was carried out by submerging the piece in lactophenol and heating with a lamp. Scanning Electron Microscopy (SEM) was carried out with a JEOL JSM-6390LV at the Center for SEM at the Museu Nacional/UFRJ with accelerating voltage of 10 kV after conventional dissection (Acosta et al. 2007), ultrasonic cleaning, ordinary dehydration water to ethanol, mounting on double-face tape and sputter-coating with gold-palladium.

Geographic coordinates have been transcribed verbatim from the labels and may be in different formats; when there was no indication of coordinates, these were interpolated between square brackets to indicate that they are estimates, using Google Maps and GeoNames. The first-order administrative divisions (provinces and departments) are in italics. The distribution maps were made with QGIS 3.12.3 Bucureşti (QGisDevelopment Team, 2020). Colored shapes make reference to WWF Terrestrial Ecoregions of the World (Olson et al. 2001).

The logonymy (*sensu* Dubois 2000) used here for the genera and species is not exhaustive: only the protonyms and aponyms are used while the chresonyms are left out (these can be found in Kury 2003). Figures are numbered in the order with which they appear in the text, except for some figures which are called "out of their turn" in the diagnoses.

The morphological terminology follows: Kury & Medrano (2016, 2018) for dorsal scutum shape and for white blots patterns on the dorsal scutum of Cosmetidae, respectively; Medrano & Kury (2018) for terminology of cosmetid glans; Kury & Villarreal (2015) for chaetotaxy and Kury (2016) for microsetae of male genitalia. Tarsal formula: numbers of tarsomeres in tarsus I to IV, when an individual count is given, order is from left to right side (figures in parentheses denote number of tarsomeres only in the distitarsi I–II).

Morphological abbreviations used are: AL = abdominal scutum length, AW = abdominal scutum width, CL = carapace length, CW = carapace width, DS = Dorsal Scutum, Fe = femur, ChB = cheliceral bulla, MS = macrosetae of penis, ms = microsetae of penis, Mt = metatarsus, Pa = patella, Ta = tarsus, Ti = tibia, TL = Total length, Tr = trochanter, VP = ventral plate. All measurements are in mm unless otherwise noted.

Abbreviations of the repositories cited are: ICN (Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá, Colombia), MNRJ (Museu Nacional, Universidade Federal de Rio de Janeiro, Rio de Janeiro, Brazil), QCAZ (Museo de Zoología Sección Invertebrados, Pontificia Universidad Católica del Ecuador, Quito, Ecuador). Material marked with an asterisk (*) was lost in National Museum fire (2.ix.2018).

RESULTS

Family Cosmetidae Koch, 1839

Subfamily Meterginininae Medrano, Kury & Mendes, 2021

Genus *Rhaucoides* Roewer, 1912

Erginus Simon 1879: 200. Junior homonym of *Erginus* Jeffreys, 1877 (Mollusca); replaced by next oldest synonym *Rhaucoides*. Type species: *Erginus devillei* Simon, 1879 by subsequent designation of Pickard-Cambridge (1904).

Rhaucoides Roewer 1912: 25. Type species: *Rhaucoides ornatus* Roewer, 1912, by original designation.

Pararhauculus Mello-Leitão 1939: 170 [junior homonym of *Pararhauculus* Roewer, 1933 (Opiliones); junior subjective synonym of *Rhaucoides* Roewer, 1912 by Kury (2003). type species: *Pararhauculus sulfureus* Mello-Leitão, 1939, by original designation.

Cumbalia Roewer 1963: 51. Type species: *Cumbalia octomaculata* Roewer, 1963, by original designation. **Syn. nov.**

Diagnosis.—Median cosmetids (DS 5 mm long approx.) with short and straight femora IV (Figs. 1–2). Dorsal scutum shape α type with attenuate constrictions (Fig. 3A) similar to *Rhaucus* and *Libitia*; contrasting with *Ambatoiella* Mello-Leitão, 1943 and *Eulibitia* Roewer, 1912 that have well marked constrictions). White blots pattern occupying the lateral margins of carapace varying from headless arborescent chevron to complete arborescent chevron (Figs. 4B–E), in some species with a backbone formed by irregular blots (Fig. 8A) and areas with lateral spots (Figs. 14A–F), called "parabolic series of polygons" by Medrano & Kury (2016). Mesotergum armature: area I with small acuminate tubercles; area II with small or large paramedian acuminate tubercles; area III with paramedian conical tubercles, larger than those of other areas; area IV with small contiguous acuminate tubercles (Figs. 4A,E, 8A,C). Leg I with fused basitarsomeres in males, almost twice the size of the other segments (Fig. 2). Coxa IV without *clavi inguines* (Fig. 8A; contrasting with *Rhaucus*, some *Eulibitia* or *Taito* Kury & Barros, 2014) neither distal nor multicapitate apophysis (contrasting with *Rhaucus*, *Taito* and *Platygyndes* Roewer, 1943). Femora and tibiae III and IV with two rows or tubercles, larger than those present on the dorsal and lateral sides (Figs. 4J–L).Ventral plate of penis with a ventro-basal protuberance (Figs. 5B, 12A–B, 15F–H). A single MS-A (two in *Rhaucus*). Hypertelic chelicera with cheliceral hand reniform in major males (Figs. 1B,D; similar to *Rhaucus*, *Rhauculus*, *Meterginus* Pickard-Cambridge, 1905, and contrasting with *Cynorta*, *Paecilaema*, *Taito*, *Eulibitia*, *Ambatoiella*, *Metalibitia* Roewer, 1912 or *Flirtea* Koch, 1839), minor form males with smaller and not

incrassate cheliceral hand (Figs. 1A,F) similar to females). Penis stylus with small caruncle and a well-developed ventral peak formed by barbels (Figs. 12C, 18C–E).

Remarks.—*Pararhauculus* Mello-Leitão, 1939 is a junior homonym of *Pararhauculus* Roewer, 1933, recently revalidated from the synonymy with *Paecilaema* Koch, 1839 by Kury & Medrano (2018). The homonymy was first noted by Soares & Soares (1946).

Included species.—*Rhaucoides atahualpa* sp. nov., *R. marmoratus* Roewer, 1947, *R. nasa* sp. nov., *R. ornatus* Roewer, 1912, *R. riveti* Roewer, 1919, *R. devillei* (Simon 1879), comb. nov. and *R. virescens* (Mello-Leitão, 1942).

Key to males of *Rhaucoides* species

Note: The species *R. marmoratus* was not included in the key because of the lack of fresh material.

1. Femur IV length more than 8 mm ..... *R. nasa* sp. nov.
   Femur IV length less than 8 mm 2
2. Spots of DS irregularly distributed over scutal areas I–III, sometimes present on lateral margins of abdomen 3
   Spots of DS restricted to lateral margins of areas I–IV, absent on lateral margins of abdomen 4
3. Areas I–II with a pair of paramedian tubercles; spots of DS whitish yellow (Fig. 8A); retroventral row of spines on Fe IV as tall as Fe thickness (Fig. 4K) ..... *R. atahualpa* sp. nov.
   Areas I–II with a transversal row of four tubercles (Figs. 19A, 20A); spots of DS greenish yellow (Fig. 19E); retroventral row of spines on Fe IV shorter than Fe thickness (Fig. 20O) ..... *R. virescens*
4. Tubercles of area III remarkably slanted backwards (Fig. 10D); spots in areas II–IV elongated forming an almost continuous U-shape in abdomen (Figs. 11C–D) ..... *R. ornatus*
   Tubercles of area III slightly slanted backwards or erected (Fig. 16D); spots in areas II–IV as separated dots, sometimes forming a fragmented U-shape in abdomen (Figs. 17B–D) 5
5. Paramedian tubercles of area II larger than those of area I, tilted laterally out (Fig. 16C); spots present in the longitudinal axis on carapace and areas I–IV (Figs. 17A–D) ..... *R. devillei*
   Paramedian tubercles of area II as large as those of area I, erected (Figs. 13C–D); spots absent in the longitudinal axis on carapace and areas I–IV (Figs. 14B–F) ..... *R. riveti*

Rhaucoides atahualpa sp. nov.
ZooBank LSID: http://zoobank.org/NomenclaturalActs/FE39A9CD-FBEE-455C-B360-B82F812FE967 (Figs. 1A,B, 2B, 3-5, 22)

Type material.—*Holotype male*. ECUADOR: *Carchi*: Chamizo, Parque de Arrayanes, 00.55084°N, 077.78737° W, Expedition Ecuador II, Ponto 5, 2796 m, 10 February 2014, A.B. Kury and A.P.L. Giupponi (QCAZI 260755).

Paratypes: ECUADOR: *Carchi*: 1 ♂, 1 ♀, same data as holotype (QCAZI 260756); 4 ♂, 1 ♀, same data as holotype (MNRJ 60368); 9 ♂, 15 ♀, same data as holotype (MNRJ 8500*); *Napo*: 23 ♂, 18 ♀, 2 juveniles, Baeza Vieja, caminho do mirante, 0.472442°S, 77.89869°W, 2029 m, 20 June 2018, A. Giupponi, A. Kury and M. Medrano (MNRJ 09491*).

Etymology.—*Atahualpa* was the last emperor of the Inca Empire that stretched on the Andean Mountains of southwest Colombia to northwest Argentina and Chile. Noun in apposition.

Diagnosis.—DS with white/yellowish irregular isolated spots dispersed over areas I–IV, and lateral and posterior margins, sometimes fusing with the large spots on lateral margins of carapace (Figs. 3, 4A–E) (in *R. riveti* the spots are more rounded, beginning on lateral margins of carapace, continuing in an interrupted alignment across lateral borders of areas I–IV, and smaller at posterior border of scutum; in *R. ornatus* the irregular large blots are on lateral and posterior borders of carapace, and some smaller irregular blots are in the middle of areas I–II). Area I with a pair of medium-sized tubercles (Fig. 4E) (in *R. ornatus*, *R. devillei* and *R. riveti* two low rounded tubercles). Area II with a pair of low rounded tubercles (Figs. 3C–D, 4A) (as in *R. ornatus* and *R. riveti*; in *R. devillei* medium-sized conical tubercles).

Description.—Male holotype (QCAZI 260755) Measurements: CL=1.9, CW=3.1, AL=2.8, AW=4.2, ChB=0.6, Legs (Tr/Fe/Pa/Ti/Mt/Ta/**TL**) = I (0.7/2.9/1.0/1.9/2.5/2.8/**11.8**); II (1.0/6.2/1.3/4.5/5.9/4.7/**23.6**); III (0.8/4.5/1.1/3.1/4.6/2.7/**16.8**); IV (1.2/5.6/1.4/3.7/6.7/3.1/**21.7**). Female paratype (QCAZI 260756): CL=2.0, CW=2.9, AL=3.5, AW=4.7, ChB=0.5, Legs (Tr/Fe/Pa/Ti/Mt/Ta/**TL**): I (0.6/2.9/0.9/2.0/2.6/2.0/**11.0**); II (0.8/6.5/1.4/4.2/5.9/4.3/**23.1**); III (1.0/4.7/1.4/2.6/4.7/2.6/**17.0**); IV (1.2/6.2/1.5/3.8/6.6/2.9/**22.2**).

Dorsum (Figs. 3, 4A–E): DS α type, smooth, with irregular isolated white/yellowish spots dispersed over lateral margins of carapace and areas I–IV (in some cases the spots are larger and reach the lateral borders of abdominal scutum (Fig. 4A,C)), with shallow cheliceral sockets and rounded lateral projections. Ocularium low, without median depression, and with disperse granules. Mesotergum well delimited and divided into four areas: area I with a pair of medium-sized tubercles; areas II and IV with a pair of small-sized paramedian tubercles; area III with a pair of paramedian, large acuminate tubercles. Posterior border of DS substraight, with a row of granules. Free tergites I–III with a row of granules.

Venter (Fig. 4E): Stigmatic area with a few sparse granules. Stigmata large, oval and transverse. Coxa I with one row of 10 tubercles of same size and with an anterior smooth space; coxae II and III longer than coxa I and with some granules; coxa IV strongly backward, granulate. Genital operculum granulate.

Pedipalps (Figs. 4H, I): Trochanter with one ventro-apical tubercle; femur compressed, dorsally with a row of aligned triangular setiferous tubercles of different sizes, ventrally with a row of setiferous tubercles (the six basalmost smaller than the others); disto-mesal portion of femur smooth, without

Figure 1.—Living specimens of *Rhaucoides* from Napo (Ecuador): A–B. *R. atahualpa* sp. nov. from Baeza, minor and major males, respectively. C–D. *R. devillei* from Baeza, female and major male, respectively. E. *R. ornatus*, female from Reserva Ecológica Antisana. F. *R. virescens*, minor male from Reserva Ecológica Antisana. Photos by Adriano Kury and Miguel Medrano.

tubercles. Patella distally depressed, with one ventrodistal tubercle on ectal side. Tibia depressed, spoon-shaped, dorsally with some granules and ventrally smooth, with some spiniferous tubercles at the distal portion of both ectal and mesal sides. Tarsus long, conical, with some dorsal granules and ventrally with two lateral rows of thickened setae.

Chelicera (Figs. 4F, G): Chelicera swollen. Basichelicerite rectangular, with scattered granules, one group of tubercles of different sizes on the proximal border, four large tubercles on the ectal face, being two proximal and two subdistal, and one medium-sized tubercle between them. Cheliceral hand with setiferous tubercles on distal region. Fixed finger dentate. Movable finger with one large trapezoidal, sub-basal tooth and with the inner surface at distal portion dentate.

Legs (Figs. 3, 4J–P): Legs steadily thicker from leg II to IV. Coxa I–IV with some granules, coxae IV without *clavi inguines* and with three posterolateral tubercles. Tr II with one retrolateral tubercle; Fe II armed distally with a retroventral row of seven tubercles; Pa II ventrally with one medial spine; Ti-Ta II smooth. Fe III with one retroventral row of 10 tubercles and one prolateral row of tubercles increasing in size distally; Ti III with one retroventral row of 11 tubercles; Ta III smooth. Tr IV distally with one retrolateral spine; Fe IV with one proventral and one retrolateral row of low tubercles, and one retroventral row of high tubercles; Pa IV with one retroventral and one proventral row of tubercles; Ti IV with one retroventral row of 13 high tubercles and one proventral row of low tubercles; Ta IV smooth. Tarsi I–II with one smooth claw; tarsi III–IV with two subparallel smooth claws and tarsal process. Tarsal formula: 6(3)-6(3)/?-16(3)/9-?/10-10.

Color (in ethanol, Fig. 3): Carapace, chelicerae, coxae IV and free tergites Dark Orange Yellow (72), mottled in Dark Brown (59). Spots in carapace and abdomen Pale Yellow Green (121). Pedipalpi as well as trochanters and femora of legs Moderate Yellow (87). Legs distal articles Dark Brown (59).

Male genitalia (Fig. 5): VP of penis subrectangular with concave distal border; VP with two lateral, elongated, patches of type 4 microsetae, separated by a wide longitudinal space (Fig. 5C). VP with two pairs of apical MS C curved and laterally inserted; two pairs MS D, the most distal (D1) large and curved following the same lateral row as MS C, and the other (D2) minute, inserted dorso-laterally on the middle third of VP (Fig. 5A,B); one pair of MS A long and straight,

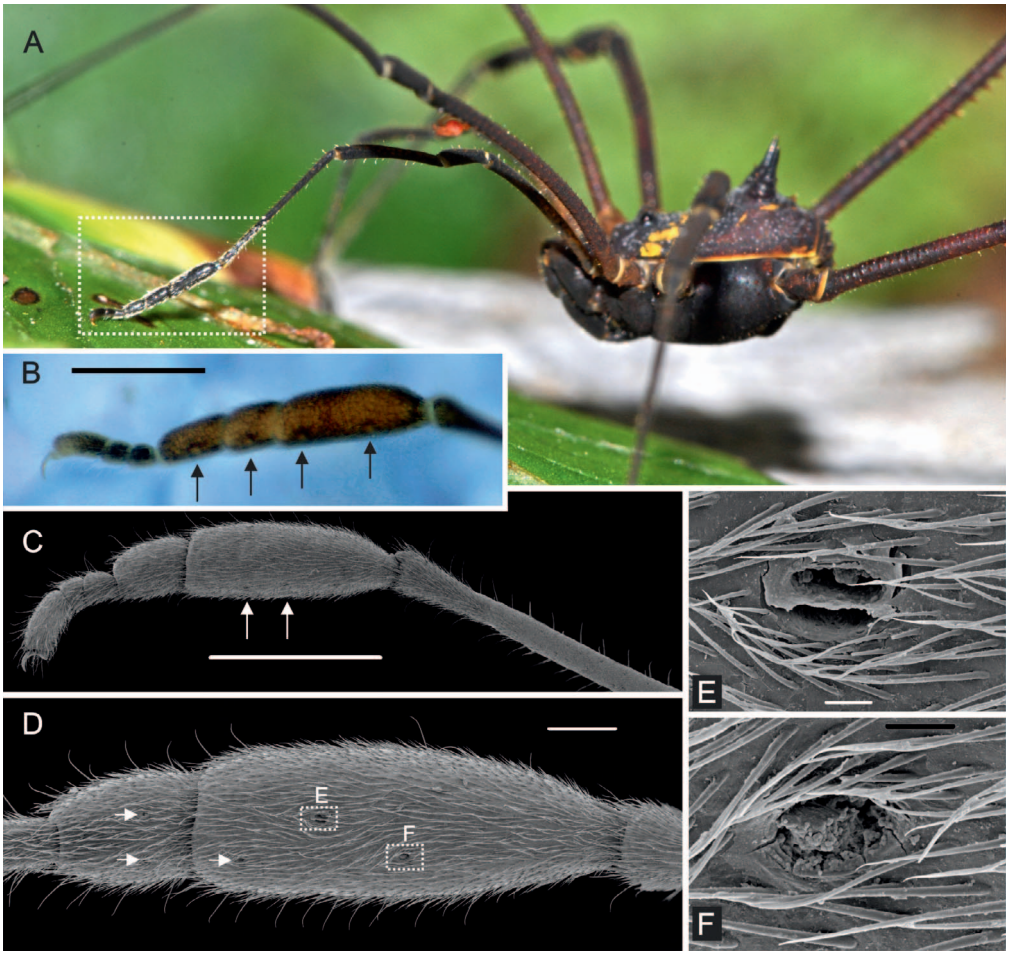

Figure 2.—*Rhaucoides* males: A. Living specimen of *R. devillei* from Reserva Antisana (Napo, Ecuador), focus in leg I. B. Detail of tarsomeres I of *R. atahualpa* (MNRJ 8500), showing gland pores (arrows). C–F. *R. riveti* (ICN-Ao-1066): C. Tarsomeres of leg I. D. Detail of fused basitarsomeres I–III with gland pores. E–F. Detail of gland pores. Scale bars: B–C = 1 mm; D = 200 μm; E–F = 20 μm.

inserted laterally near to D2 (Fig. 5A,C); two pairs of minute MS E on the ventral face; one pair of minute MS B inserted laterally at the base of the VP (Fig. 5B). Glans mostly smooth, with finger-like slender dorsal process, stylus with small wattle (= caruncle) with profuse barbels (Figs. 5A, B).

Female: Similar to male, but differs by having anterior part of carapace narrower and coda divergent, tubercles of legs III–IV smaller, chelicerae not hyperthelic and basitarsomeres of leg I not enlarged.

Distribution and habitat.—ECUADOR: Carchi and Napo, between 2029 and 2796 m a.s.l., in the Northwestern Andean montane forests and Eastern cordillera real montane forests ecoregions (Fig. 22).

Rhaucoides marmoratus Roewer, 1947
(Figs. 6, 22)

Rhaucoides marmoratus Roewer, 1947: 10, pl. 2, fig 12.

Type material.—*Holotype male*. ECUADOR: *Chimborazo*: Alausi. [2.201461°S, 78.838007°W] (SMF RII 1478/184a, examined by photograph).

Paratype. ECUADOR: *Chimborazo*: 1 ♀, collected with holotype (SMF RII 1478/184b, examined by photograph).

Remarks.—We consider this species as a member of *Rhaucoides* based in its external morphology (Fig. 6). It is not possible for us to establish whether it is one of the species previously described by Roewer or Mello-Leitão, thus, we prefer to maintain it as a separate species until new material from the type locality is available. *Rhaucoides marmoratus* may be differentiated from the new species *R. nasa* sp. nov. and *R. atahualpa* sp. nov. by the armature of area II and free tergites, the length of Fe IV and pattern of spots on dorsal scutum. Tarsal formula: 5/17-18/9/10 (Roewer 1947).

Rhaucoides nasa sp. nov.
ZooBank LSID: http://zoobank.org/NomenclaturalActs/A4D32D74-BE63-4AA7-9280-6DDD23DD6F80
(Figs. 7–9, 22)

Type material.—*Holotype male*. COLOMBIA: *Cauca*: Belalcázar, La Termal INDERENA [2.824672°N, 76.073961°W], 2830 m, 30 October 1980, I. de Arevalo (ICN-Ao-107*).

Paratypes. COLOMBIA: *Cauca*: 1 ♂, 2 ♀, same data as holotype (ICN-Ao-107.1*).

Etymology.—The *nasa* (= people of the water) are a Native American people who live in Cauca Department (southwest-

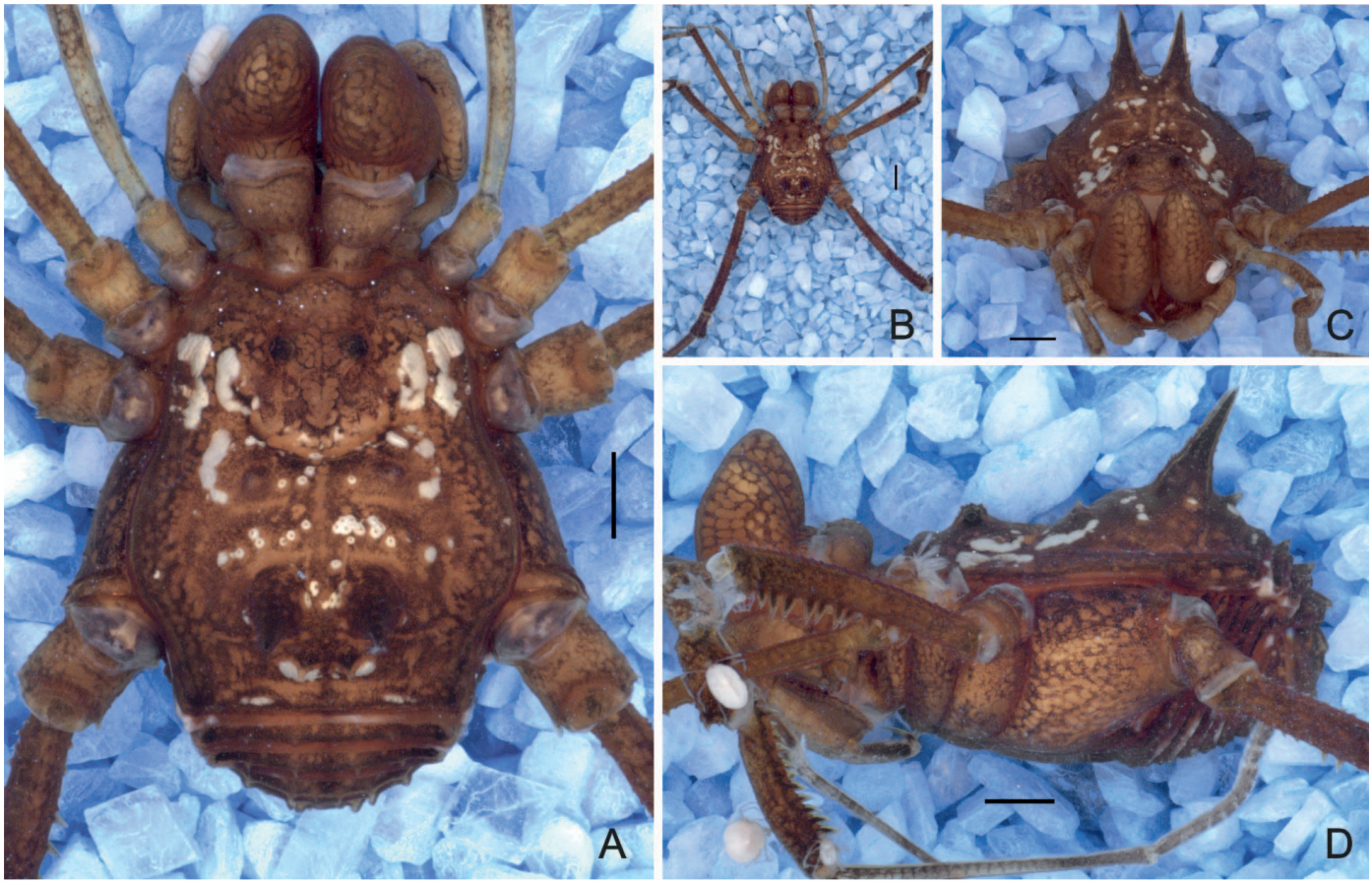

Figure 3.—*Rhaucoides atahualpa* sp. nov. (QCAZI 260755), male holotype: A. Dorsal view. B. Dorsal view. C. Frontal view. D. Lateral view. Scale bars: 1 mm.

ern highlands of Colombia), where the species was collected. Noun in apposition.

Diagnosis.—DS with white/yellowish polygonal blots beginning at ozopores level, delimiting the lateral borders of areas I and II, and with a stripe in the posterior border of scutum (Figs. 15A–B), area I with an irregular spot (as well as in the posterior part of the carapace). Lateral margins of carapace with blots as "ears of chevron". Areas I, II and IV with a pair of acuminated granules (Fig. 7D). Area III tubercles slightly backwards projected (Fig 7D). Differs from the other members of the genus by having relatively long legs (femur IV length almost twice the DS length, Fig. 7B).

Description.—Male holotype (ICN-Ao-107.1) Measurements: CL=2.0, CW=3.2, AL=3.1, AW=4.1, ChB=0.6, FeL IV=8.4, TiL IV=4.7.

Dorsum (Figs. 7, 8A–C): DS α type, smooth, with white/yellowish spots forming just the lateral part of the arborescent chevron over lateral margins of carapace and areas I–II, with shallow cheliceral sockets and rounded lateral projections. Ocularium low, without median depression, and with some granules. Mesotergum delimited and divided into four areas: areas I and II with a pair of small-sized tubercles; area IV with a pair of medium-sized paramedian tubercles; area III with a pair of paramedian, large acuminate tubercles. Posterior border of DS substraight, with a row of granules. Free tergites I–III with a row of granules.

Venter (Fig. 8C): Stigmatic area with a few sparse granules. Stigmata large, oval and transverse. Coxa I with a row of tubercles of same size and with an anterior smooth space; coxa IV strongly backward, granulate.

Pedipalps (Figs. 7C, 8F,G): Trochanter with one ventro-apical tubercle; femur compressed, dorsally with a row of aligned setiferous tubercles of different sizes, ventrally with a row of irregular setiferous tubercles (the four basalmost smaller than the others); disto-mesal portion of femur smooth, without tubercles. Patella distally depressed. Tibia depressed, spoon-shaped, dorsally with some granules and ventrally smooth, with spiniferous tubercles of both ectal and mesal borders. Tarsus long, conical, with some dorsal granules and ventrally with two lateral rows of thickened setae.

Chelicera (Figs. 7C, 8D,E): Chelicera swollen. Basichelicerite rectangular, with scattered granules, one group of tubercles of different sizes on the proximal border, four large tubercles on the ectal face, being one proximal, one medial and two subdistal. Cheliceral hand with setiferous tubercles on distal region. Fixed finger dentate. Movable finger with one large trapezoidal, sub-basal tooth; surface of distal region dentate, with a triangular medium-sized tooth at the middle.

Legs (Figs. 7, 8H–N): Legs steadily thicker from leg I to IV. Coxa I–IV with some scattered granules, coxae IV without *clavi inguines* and with three posterolateral tubercles. Legs III and IV granulate, Fe-Ti armed ventrally with two rows of tubercles,

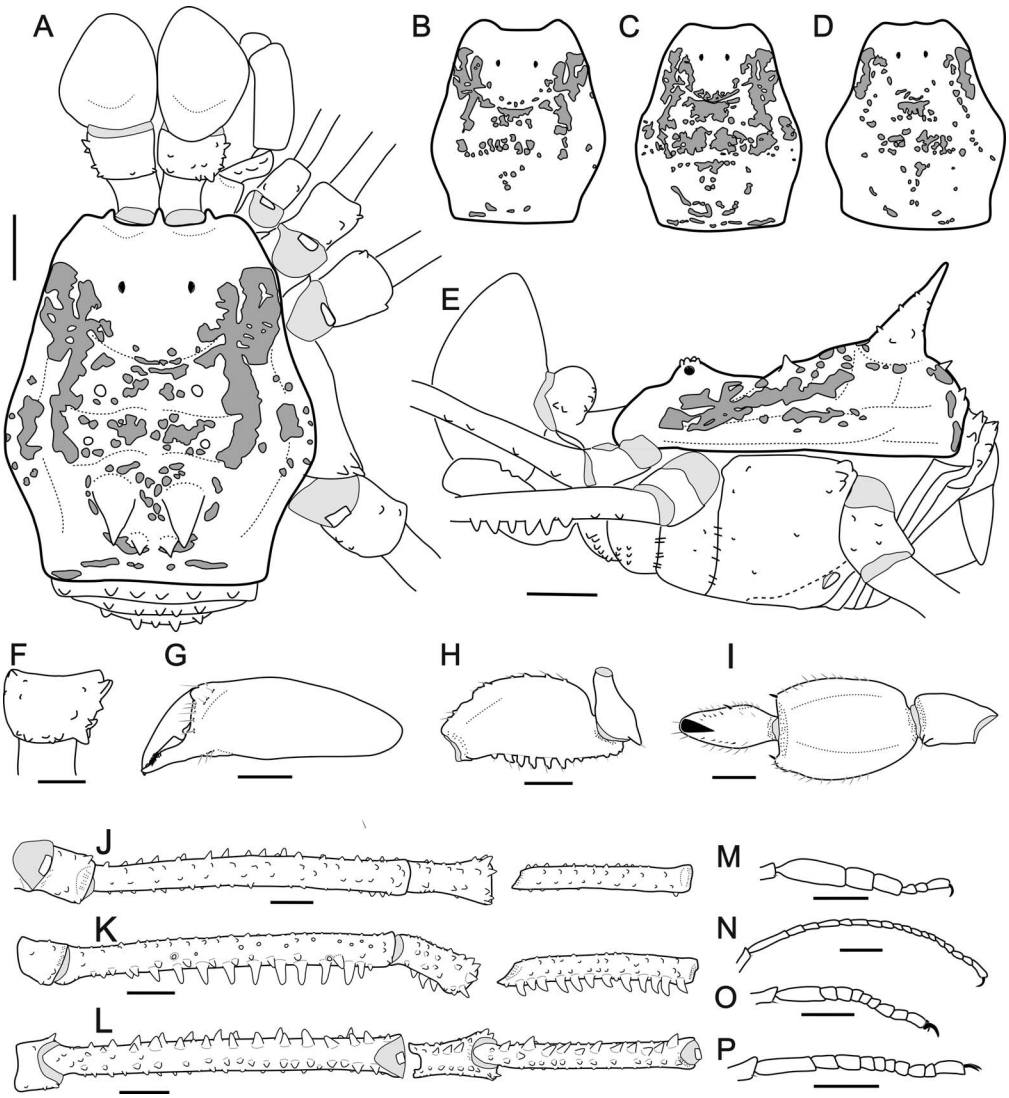

Figure 4.—*Rhaucoides atahualpa* sp. nov., schematic (MNRJ 8500): A. Major male, dorsal view. B–D. Variations of spots pattern: B. male. C–D. female. E–P. Major male: E. Lateral view. F. Right basichelicerite, dorsal view. G. Right cheliceral hand, dorsal view. H. Right femur of pedipalpus, prolateral view. I. Right patella, tibia and tarsus of pedipalpus, ventral view. J–L. Left trochanter, femur, patella and tibia of leg IV, in dorsal, retrolateral and ventral view. M–P. Tarsomeres of legs I to IV. Scale bars: 1 mm.

being the retrolateral row more developed than the prolateral and the penultimate tubercle of that row on Ti bifid. Patellae IV with some tubercles on distal margin. Tarsi I–II with one smooth claw; tarsi III–IV with two subparallel smooth claws and tarsal process. Tarsal formula: ?-6(3)/?-23(3)/?-11/?-12.

Color (in ethanol, Fig. 7): Carapace, chelicerae, coxae IV and free tergites Strong Yellowish Brown (74), Deep Yellowish Brown (75). Spots in carapace and abdomen Pale Greenish Yellow (104). Pedipalpi as well as trochanters and femora of legs Strong Yellow (84).

Male genitalia (Fig. 9): VP of penis subrectangular with concave distal border. VP with two pairs of apical MS C curved and laterally inserted; two pairs MS D, the most distal (D1) large and curved following the same lateral row as MS C, and the other (D2) minute, inserted dorso-laterally on the middle third of VP; one pair of MS A long and straight, inserted laterally near to D2; two pairs of minute MS E on the ventral face; one pair of minute MS B inserted laterally at the base of the VP. Glans mostly smooth, with fin-like dorsal process, stylus with small wattle with profuse barbels.

Female: Similar to male, but differs by having anterior part of carapace narrower and coda divergent, tubercles of legs III–IV smaller, chelicerae not hyperthelic and basitarsomeres of leg I not enlarged.

Distribution and habitat.—COLOMBIA: Cauca, at 2830 m a.s.l., in the Magdalena Valley montane forests ecoregion (Fig. 22).

Rhaucoides ornatus Roewer, 1912
(Figs. 10–12, 22)

Rhaucoides ornatus Roewer 1912: 25, pl. 1, fig. 2.

Type material.—*Syntypes*. 1 ♂, 1 ♀, ECUADOR: *Chimborazo*: Chimborazo [1.468575°S, 78.783528°W] (SMF RI 475, examined by photograph).

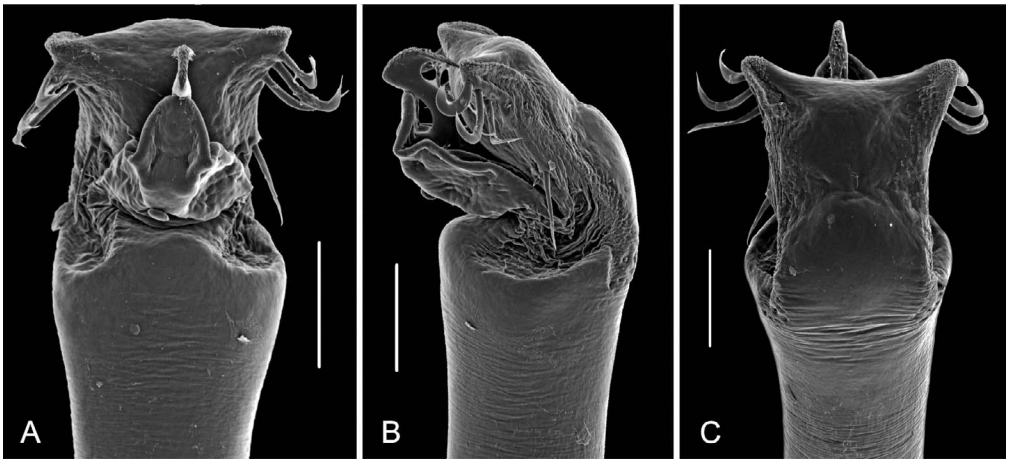

Figure 5.—*Rhaucoides atahualpa* sp. nov. (MNRJ 8500), male paratype, penis distal part: A. Dorsal view. B. Ventral view. C. Lateral view. Scale bars: 100 μm.

Other examined material.—ECUADOR: *Carchi*: 1 ♀, Chamizo, Parque de Arrayanes, 0.55084°N, 77.78737°W, 2796 m, 10 February 2014, A. Kury, A. Giupponi (MNRJ 2788*); 1 ♂, *Cotopaxi*, Illiniza sur [0.665547°S, 78,715602°W], 3400 m, 21 January 1989, E. Ayali (QCAZI AK 0376*). *Pichincha*: 1 ♂, Pasochoa [0.420008°S, 78.511624°W], 7 January 1996, P. Castillo (QCAZI AK 90*); 1 ♂, 2 ♀, Mount Pichincha [0.198187°S, 78.654989°W], 3100 m, 31 January 1988, A. Rodríguez (QCAZI AK 0334*); 1 ♂, Quito, Pifo, 0.227222°S, 78.344444°W, 2591 m, 17 November 2011, E. Reinoso (QCAZI AK 0335*); 1 ♂, 1 ♀, Nayón, 0.156944°S, 78.439167°W, 2800 m, 12 October 2013, D. Coral (QCAZI AK 0337*); 2 ♂, Parque Metropolitano, 0.180833°S, 78.467222°W, 2933 m, 10 November 2013, D. Valencia

Figure 6.—*Rhaucoides marmoratus* Roewer, male holotype (SMF 1478/184): A. Dorsal view. B. Ventral view. C. Lateral view. D. Original label. Photographs courtesy of Ricardo Pinto-da-Rocha.

Figure 7.—*Rhaucoides nasa* sp. nov. (ICN-Ao-107), male holotype: A. Dorsal view, B. Dorsal view, C. Frontal view. D. Lateral view. Scale bars: 1 mm.

(QCAZI AK 0338*); 1 ♂, Colinas del Valle, 0.250000°S, 78.566667°W, 2811 m, 7 November 2013, D. Valencia (QCAZI AK 0340*); 1 ♂, Quito, 0.183889°S, 78.507500°W, 2975 m, 5 November 2013, B. Rojas (QCAZI AK 0342*); 1 ♂, Tambillo, El Murco, 0.435206°S, 78.552873°W, 2756 m, 24 November 2011, G. López (QCAZI AK 0343*); 1 ♂, Quito, 0.223°S, 0.7851271°W, 2810 m, 20 November 2011, A.B. Carrillo (QCAZI AK 0344*); 1 ♀, Quito, 0.176664°S, 78.470206°W, 2883 m, 13 November 2011, F. Torres (QCAZI AK 0345*); 1 ♀, same data as QCAZI AK 0344 (QCAZI AK 0346*); 1 ♀, Ilaló, 0.266667°S, 78.400000°W, 2762 m, 11 November 2012, F. Quedal (QCAZI AK 0352*); 4 ♂, 6 ♀, road Quito-Latacunga, páramo Vn. Rumiñahui [páramo in Rumiñahui volcano], cruce cordillera, bajo rocas [0.630339°S, 78.533781°W], 29 April 1982, A. Roig (MACN AK 021*); 4 ♀, Páramo del Cotopaxi, pampa de limpios, base cerro [0.680793°S, 78.548298°W], 9 February 1983, A. Roig (MACN AK 110*); 11 ♂, 12 ♀, 7 juveniles, 15 km E de Pifo, under rocks, grassland [0.227294°S, 78.259464°W], 3 May 1982, A. Roig (MACN AK 112*); 3 ♂, 3 ♀, 18 km E de Pifo [0.210493°S, 78.270665°W], 30. July 1978, A. Roig (MACN AK 113*); 1 ♀, 5 juveniles, 10 km E de Pifo [0.251871°S, 78.272383°W], 3467 m, 30 July 1978, A. Roig (MACN AK 118*); 1 ♂, Uyumbicho, Pasochoa [0.431277°S, 78.515822°W], 3777 m, 16 November 2011, E. Torres (MNRJ 8572*). 1 ♂, *Napo*, La Virgen, próximo Cosanga, rodovia E45, 0.623513°S, 77.840043°W, 2250 m, 22 June 2018, A. Giupponi, A. Kury, M. Medrano (MNRJ 9507*); 1 ♂, *Santo Domingo de los Tsáchilas*, Guajalito, 0.231389°S, 78.802778°W, 1853 m, 9 November 2013, M. Mejía (QCAZI AK 0341*).

Diagnosis.—DS with white/yellowish irregular blots beginning at ozopores level, delimiting the lateral borders of areas I–IV and reaching the posterior border of scutum (Figs. 10A, 11A–E) (spots of carapace in *R. riveti* are smaller and more rounded, in *R. atahualpa* sp. nov. spots are dispersed over areas I–IV reaching the lateral margins of DS). Area II with a pair of granules (Fig. 11F) (in *R. devillei* medium-sized conical tubercles; in *R. riveti* and *R. atahualpa* sp. nov. low rounded tubercles). Area III tubercles backwards projected (Figs. 10D, 11F) (in the other species the tubercles are more vertically directed).

Complementary description.—Male (QCAZI AK 90) Measurements: CL=2.0, CW=3.2, AL=2.8, AW=4.2, ChB=0.53, FeL IV=5.0, TiL IV=3.4.

Dorsum (Figs. 10, 11A–F): Dorsal scutum smooth, with shallow cheliceral sockets and rounded lateral projections. Abdominal scutum widest at the level of groove II. Ocularium low without median depression and disperse granules close to eyes. Mesotergum well delimited and divided into four areas: areas I, II and IV with a pair of small-sized paramedian tubercles; area III with a pair of paramedian, large acuminate tubercles. The posterior border of scutum substraight with a row of granules. Free tergites I–III with a row of granules.

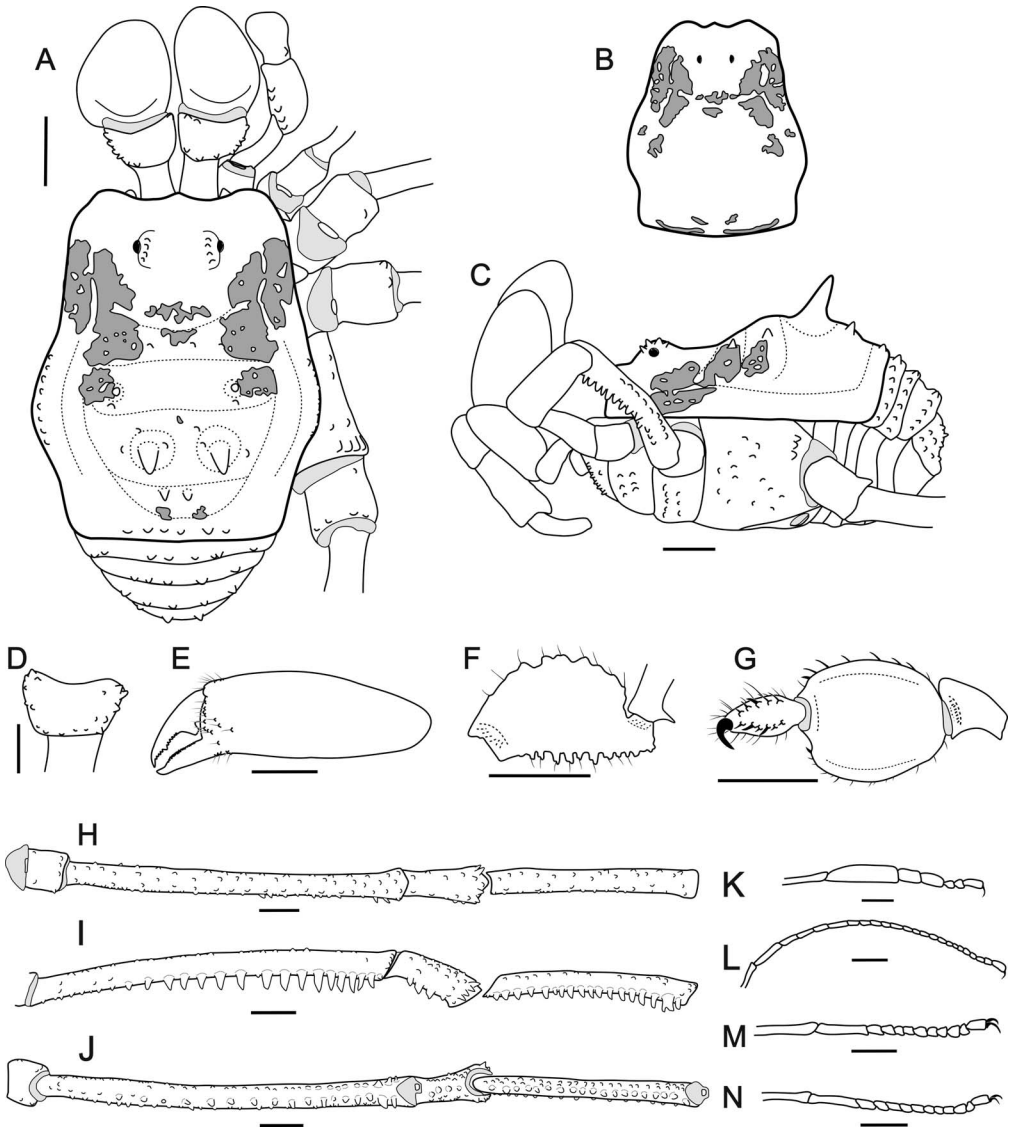

Figure 8.—*Rhaucoides nasa* sp. nov., schematic (ICN-Ao-107): A. Major male, dorsal view. B. Female depicting variations of spots pattern. C–N. Major male. C. Lateral view. D. Right basichelicerite, dorsal view. E. Right cheliceral hand, dorsal view. F. Right femur of pedipalpus, prolateral view. G. Right patella, tibia and tarsus of pedipalpus, ventral view. H–J. Left trochanter, femur, patella and tibia of leg IV, in dorsal, prolateral and ventral view. K–N. Tarsomeres of legs I to IV. Scale bars: 1 mm, except for D (0.5 mm).

Venter (Fig. 11F): Stigmatic area with a few sparse granules. Stigmata large, oval and transverse. Coxa I with two parallel rows of tubercles increasing in size distally and with an anterior smooth space; coxae II and III longer than coxa I and granulate; coxa IV strongly backward, granulate. Genital operculum granulate.

Pedipalps (Figs. 10C, 11I–J): Trochanter with one ventro-apical tubercle; femur compressed, dorsally with a row of aligned triangular setiferous tubercles of different sizes, ventrally with a row of setiferous tubercles (basalmost and distalmost smaller); disto-mesal portion of femur smooth, without tubercles. Patella distally depressed, with one distal tubercle on each side. Tibia depressed, spoon-shaped, dorsally granulate and ventrally smooth, with mesal border forming a convex keel and some spiniferous tubercles at the distal portion. Tarsus long, conical, with some dorsal granules and ventrally with two lateral rows of thickened setae.

Chelicera (Figs. 11A, F–H): Chelicera swollen. Basichelicerite rectangular, with scattered granules, one group of tubercles of different sizes on the proximal border and some tubercles in lateral borders. Cheliceral hand with setiferous tubercles on distal region. Fixed finger dentate. Movable finger with one conical, sub-basal tooth and with the inner surface at distal portion dentate.

Legs (Figs. 11A, K–Q): Coxa IV coarsely granulate without *clavi inguines* nor posterolateral apophysis. Legs III and IV armed and thicker than I and II. Patellae I–IV dorsally granulate, curved. Tarsi I–II with one smooth claw; tarsi III–IV with two subparallel smooth claws and tarsal process. Tarsal formula: 5(3)/17(3)/9/10.

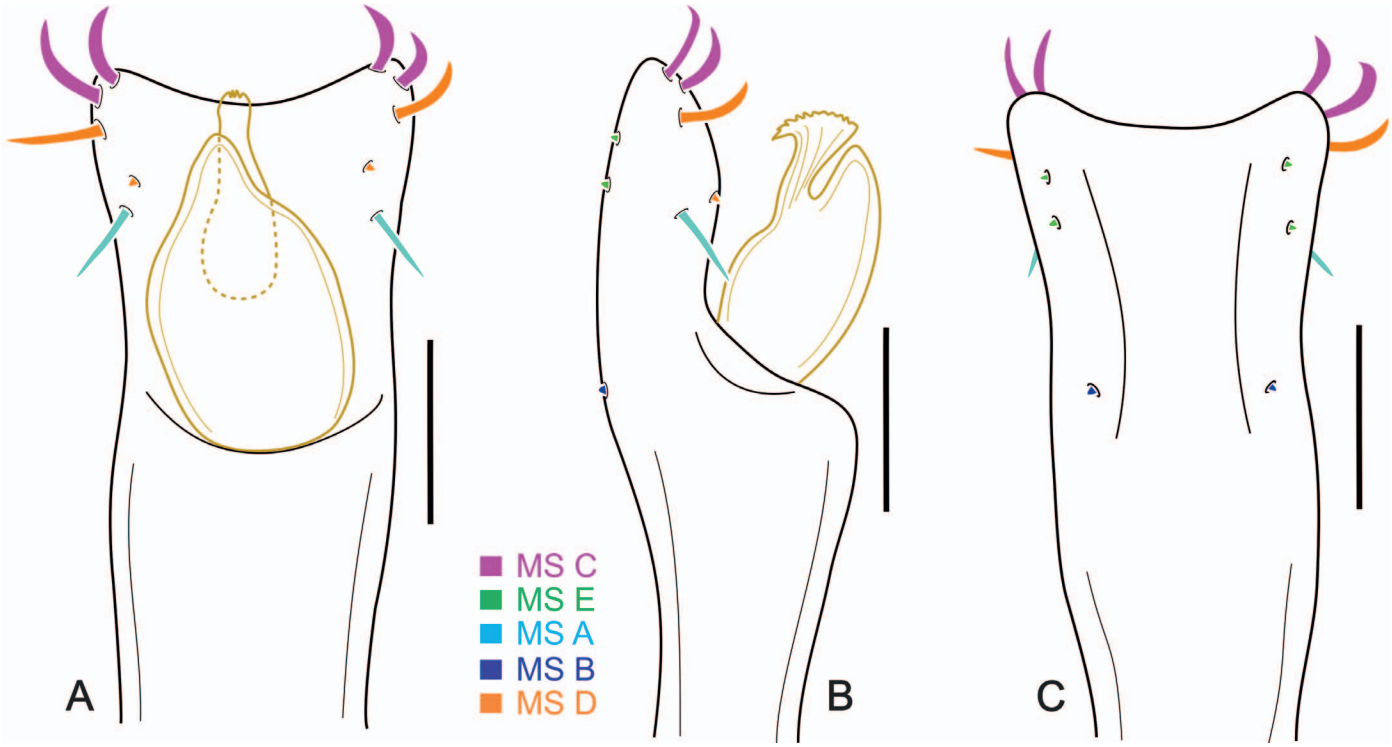

Figure 9.—*Rhaucoides nasa* sp. nov. (ICN-Ao-107), male holotype, penis distal part: A. Dorsal view. B. Lateral view. C. Ventral view. Scale bars: 100 μm.

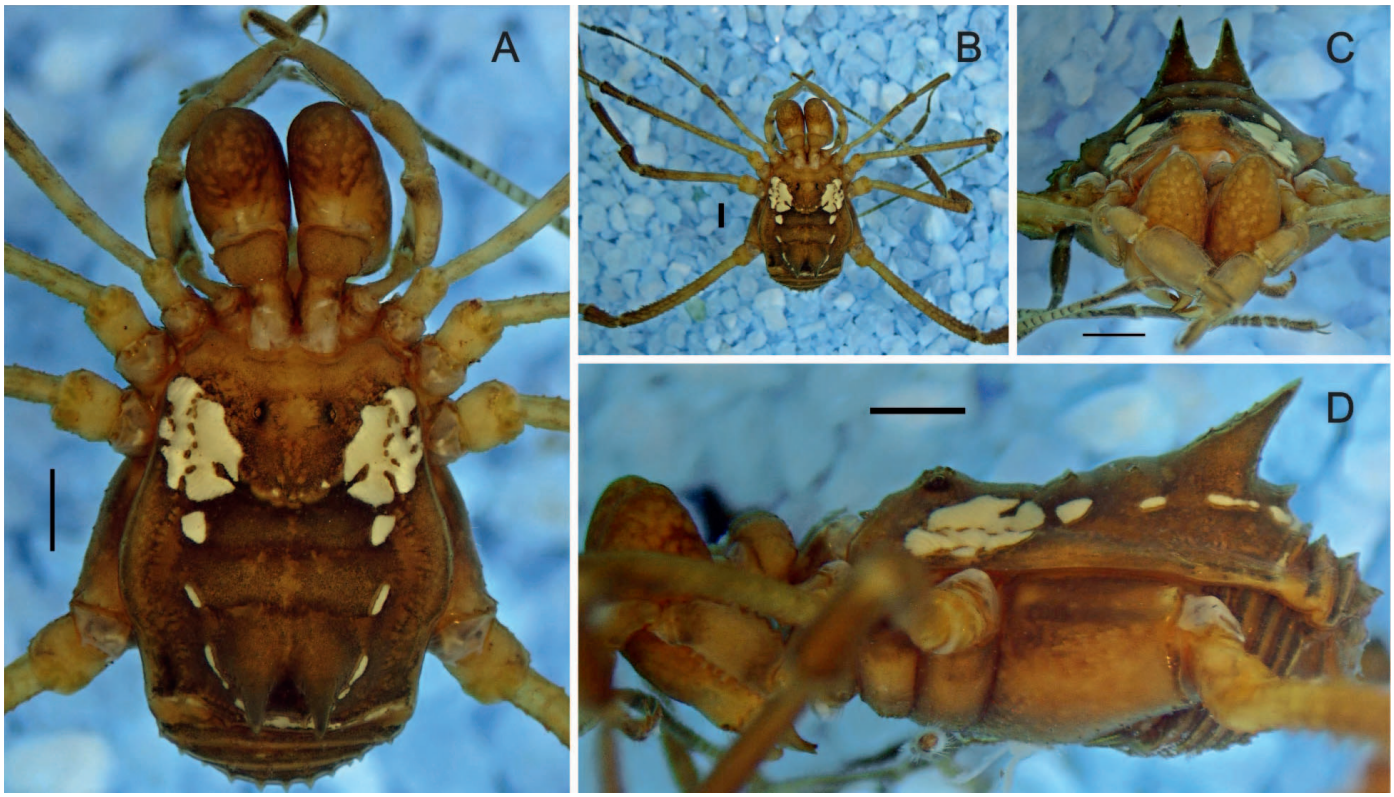

Figure 10.—*Rhaucoides ornatus* Roewer, male from Pichincha (QCAZI AK 90): A. Dorsal view. B. Dorsal view. C. Frontal view. D. Lateral view. Scale bars: 1 mm.

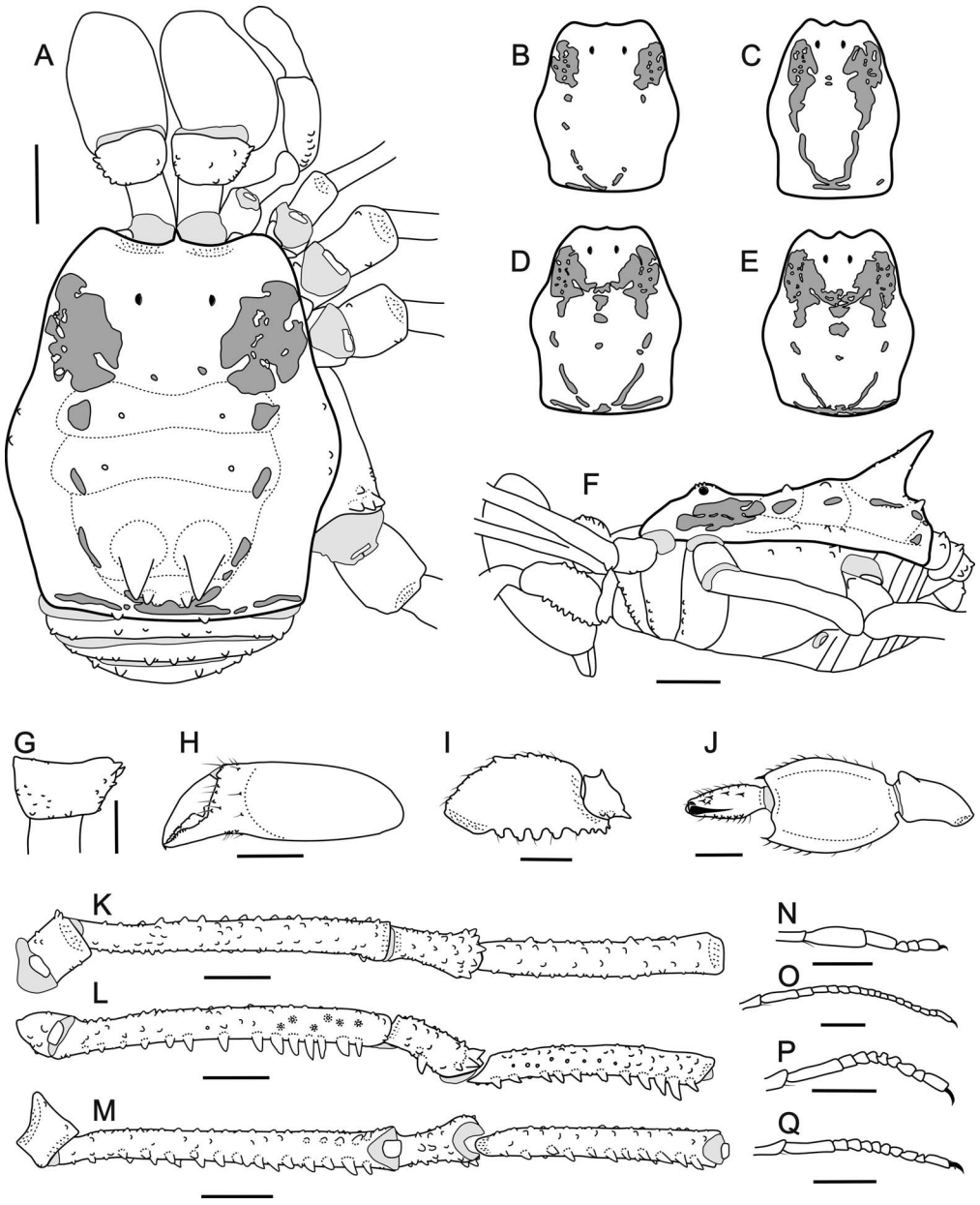

Figure 11.—*Rhaucoides ornatus* Roewer, schematic: A. Male (QCAZI AK 090), dorsal view. B–E. Variations of spots pattern: B. Male (MACN AK 112). C. Female (MACN AK 110). D. Female (QCAZI AK 334). E. Male (MACN AK 21). F–Q. Male (QCAZI AK 090): F. Lateral view. G. Right cheliceral hand, dorsal view. H. Same, right basichelicerite, dorsal view. I. Right femur of pedipalpus, prolateral view. J. Right patella, tibia and tarsus of pedipalpus, ventral view. K–M. Right trochanter, femur, patella and tibia, in dorsal, retrolateral and ventral view, respectively. N–Q. Tarsomeres of legs I to IV, respectively. Scale bars: 1 mm (A, H, G, K–Q) and 0.5 mm (F, I, J).

Color (in ethanol, Fig. 10): Carapace and chelicera Dark Yellow (88), mottled in Dark Brown (59). Spots in carapace and abdomen Pale Greenish Yellow (104): ears of the chevron not occupying the scutal groove, longitudinal spots in lateral borders of areas I–III joining to a transversal stripe in area V (posterior margin). Pedipalps as well as trochanters and femora of legs Dark Yellow (88). Legs distal articles Dark Brown (59).

Male genitalia (Fig. 12): VP of penis subrectangular with concave distal border; VP with two lateral, elongated, dense patches of type 4 microsetae, separated by a wide longitudinal space. VP with two pairs of apical MS C curved and laterally inserted; two pairs MS D, the most distal (D1) large and curved following the same lateral row as MS C, and the other (D2) minute, inserted dorso-laterally on the middle third of VP; one pair of MS A long and distally curved, inserted laterally near to D2; two pairs of minute MS E on the ventral face; one pair of minute MS B inserted laterally at the base of the VP. Glans mostly smooth, finger-like dorsal process slender, stylus with small wattle with profuse barbels.

Female: Similar to male, but differs by having anterior part of carapace narrower and coda divergent (Fig. 10C), tubercles of legs III–IV smaller, chelicerae not hyperthelic and basitarsomeres of leg I not enlarged.

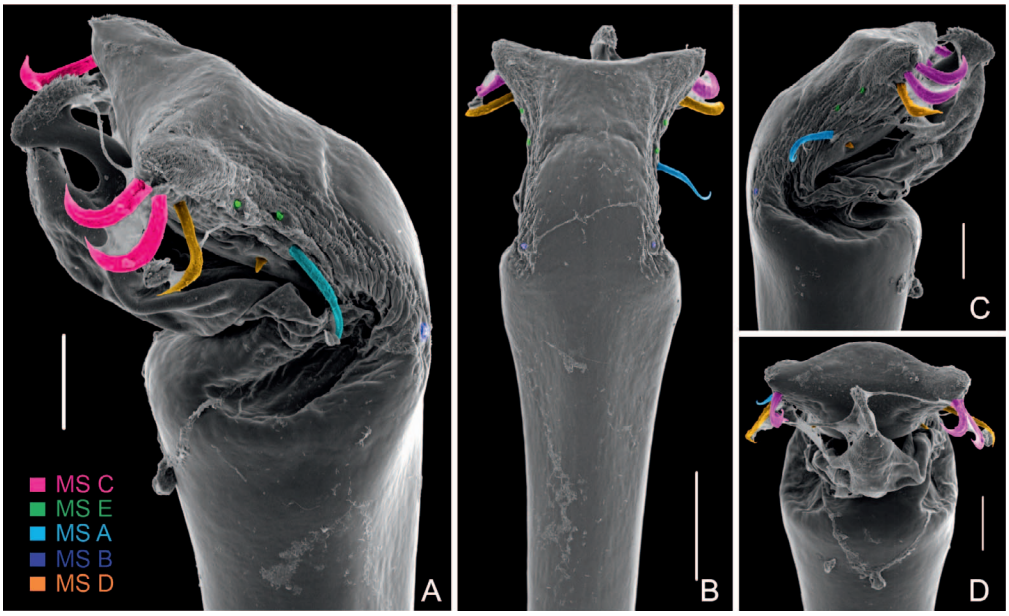

Figure 12.—*Rhaucoides ornatus* Roewer (QCAZI AK 90), penis, distal part: A. Lateral view. B. Ventral view. C. Lateral view. D. Dorsal view. Scale bars: A, C, D = 50; μm B = 100 μm.

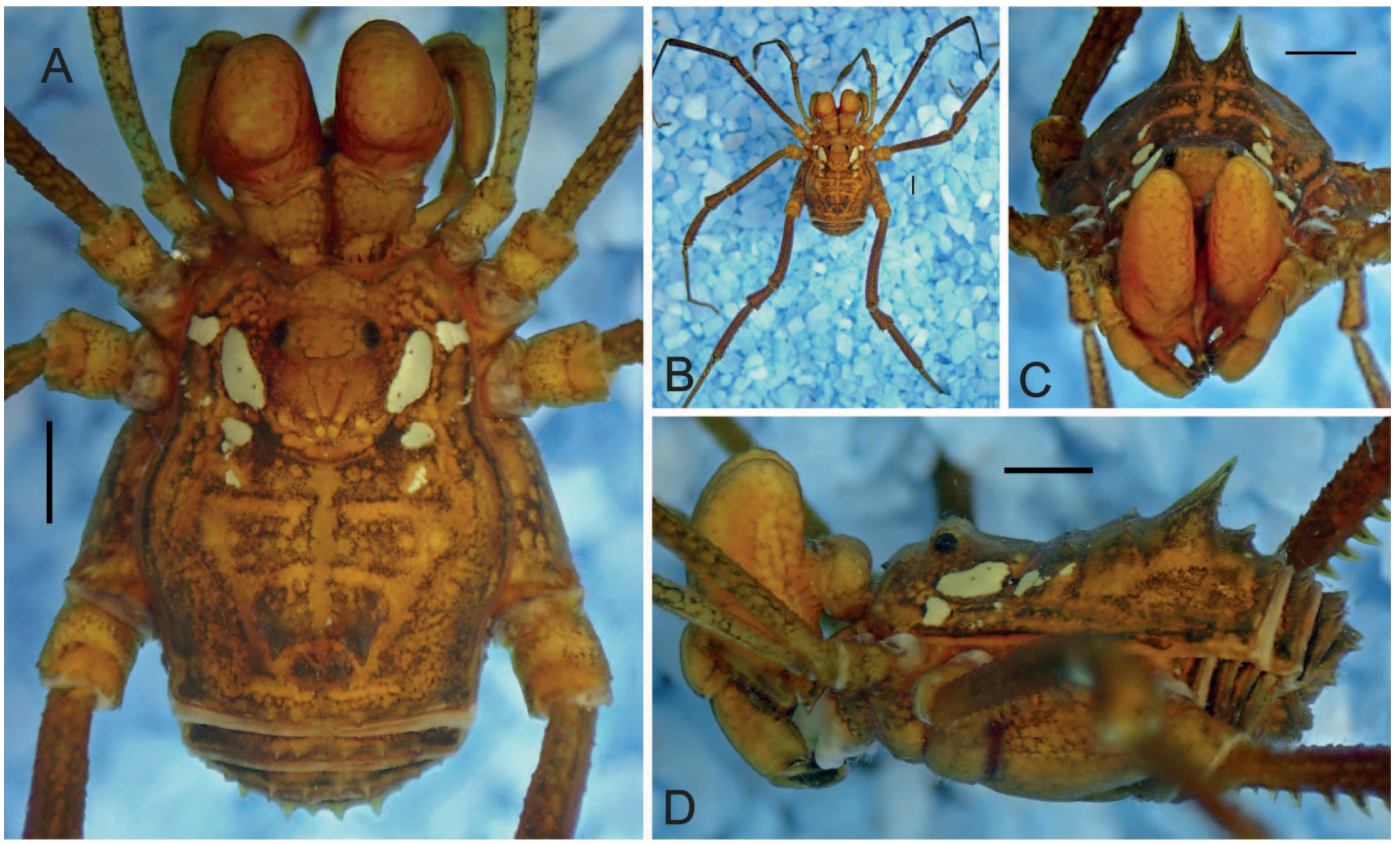

Figure 13.—*Rhaucoides riveti* Roewer (ICN-Ao-1066), male: A. Dorsal view. B. Dorsal view. C. Frontal view. D. Lateral view. Scale bars: 1 mm.

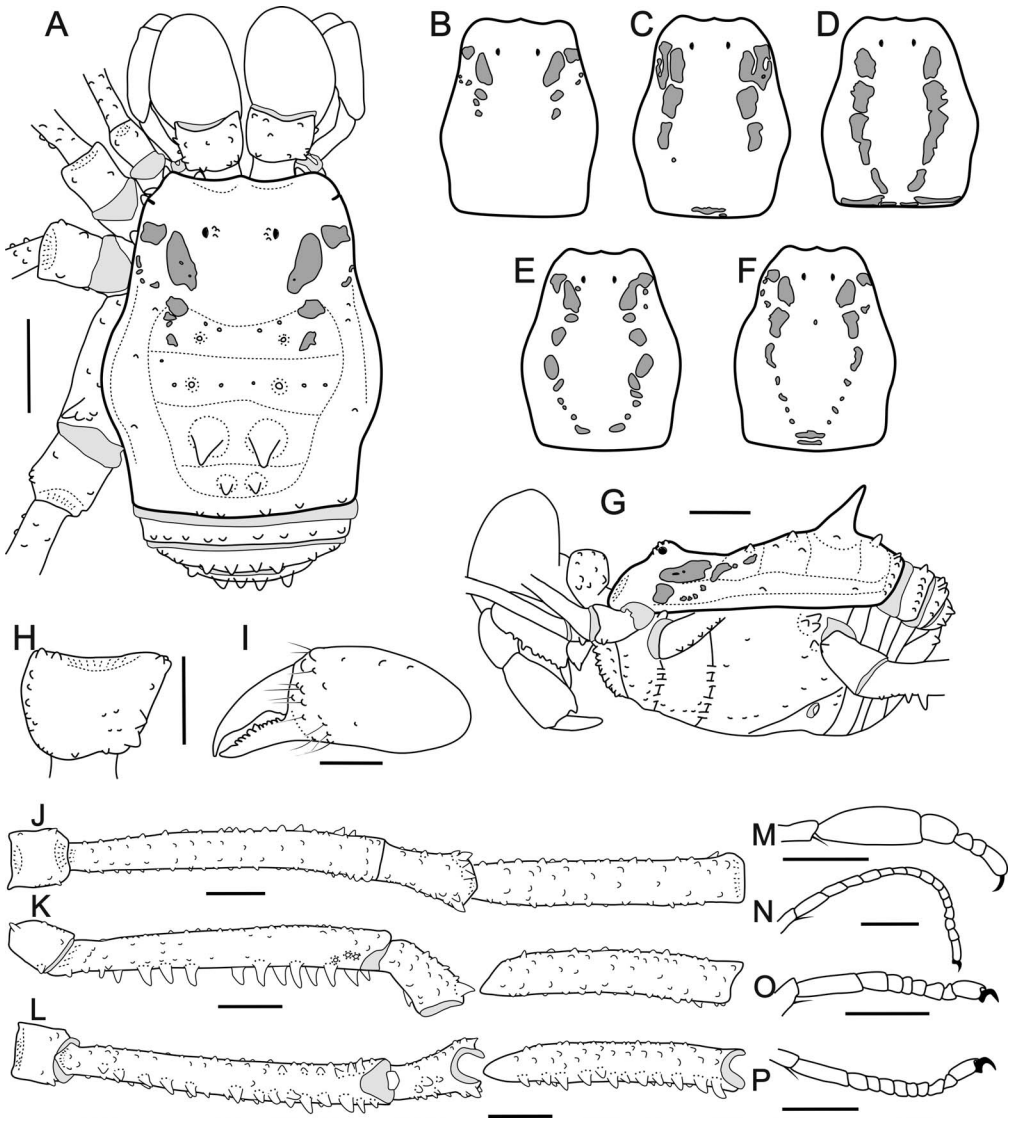

Figure 14.—*Rhaucoides riveti* Roewer, schematic. A. Male (ICN-Ao-1066), dorsal view. B–D. Variations of spots pattern: B. Male (ICN-Ao-1066). C. Male (ICN-Ao-1067). D. Male (MACN AK 016). E. Female (QCAZI AK 0351). F. Female (ICN-Ao-1066). G–P. Male (ICN-Ao-1066): G. Lateral view. H. Right cheliceral hand, dorsal view. I. Right basichelicerite, dorsal view. J–L. Right trochanter, femur, patella and tibia, in dorsal, retrolateral and ventral view. M–P. Tarsomeres of legs I to IV. Scale bars: 1 mm except for H and I = 0.5 mm.

Distribution and habitat.—ECUADOR: Carchi, Chimborazo, Napo, Pichincha and Santo Domingo de los Tsáchilas Provinces, between 1850 and 3467 m, in Northwestern Andean montane forests, Northern Andean páramo and Eastern Cordillera real montane forests ecoregions (Figs. 22).

Rhaucoides riveti Roewer, 1919
(Figs. 13–15, 22)

Rhaucoides riveti Roewer 1919: 125, pl. 13, fig. 3.

Rhaucoides riveti: Roewer 1923: 306, fig. 333.

Rhaucoides festae Roewer 1925: 3, pl. 5, fig. 1. **Syn. nov.**

Pararhauculus sulfureus Mello-Leitão 1939: 171 [junior subjective synonym of *Rhaucoides festae* Roewer, 1925 by Kury (2003: 83)]. **Syn. nov.**

Cumbalia octomaculata Roewer 1963: 51, pl. 9, fig. 13. **Syn. nov.**

Type material.—*Rhaucoides riveti*: *Holotype male*. ECUADOR: *Carchi*: Tulcán [0.822233°N, 77.734220°W], 3002 m, 1901, Rivet (MNHN, not examined)

Paratype: ECUADOR: *Carchi*: 1 ♂, same data as holotype (SMF RI, examined by photograph).

Rhaucoides festae: Syntypes. Many ♂ and ♀, ECUADOR: *Carchi*: El Pun [instead of "Insel Pun" in Roewer] (MZTU, not examined); 1 ♀ (SMF RII 115, examined by photograph).

Pararhauculus sulfureus: Holotype female. ECUADOR: *Carchi*, El Pun, 0.666667°S, 77.616667°W, 2600 m, Francisco de Campos [neither "El Puna" as in B. Soares (1945), nor Guayaquil as in original description]. (MNRJ 58167*, examined), [originally reported as ♂].

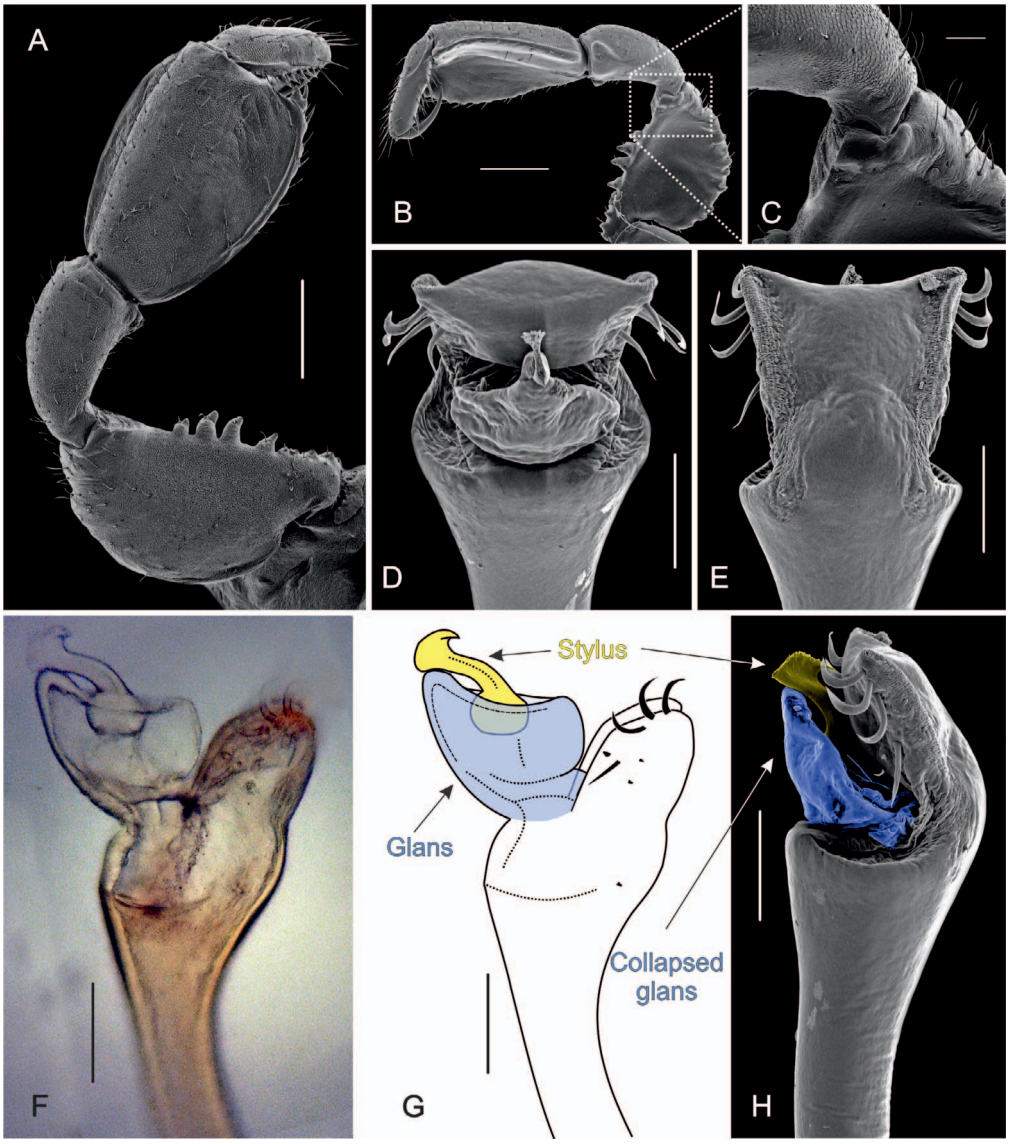

Figure 15. —*Rhaucoides riveti* Roewer (ICN-Ao-1067), male: A–C. Right pedipalpus: A. Ecto-dorsal view. B. Mesal view. C. Detail of apical portion of femur, mesal view. D. Apical portion of the penis, dorsal view. E. Same, ventral view. F. Same treated with lactophenol, optical microscopy, lateral view. G. schematic interpretation of penis expanded with lactophenol. H. SEM of penis, lateral view. Scale bars: A, B = 500 μm; C–H = 100 μm.

Cumbalia octomaculata: Holotype female. COLOMBIA, *Nariño*, Cumbal [0.901787°N, 77.785254°W], 3100 m, under stones (SMF 12729, examined by photograph).

Other examined material.—COLOMBIA: *Nariño*: 1 ♂, 1 ♀, Cumbal, via a laguna de Cumbal, 0.926583°N, 77.831744°W, 3300 m, 29 July 2012, A. García and M. Medrano (ICN-Ao-1066*); 1 ♂, 1 ♀, Sapuyes, Volcán Azufral, camino a Laguna Verde [1.091321°N, 77.715275°W], 4000 m, 30 July 2012, A. Garcia, M. Medrano and Y. Cifuentes (ICN-Ao-1067*). ECUADOR: 3 ♂, 1 ♀, 1 juvenile, *Carchi*, 10 km al sur de Tulcán [0.736888°N, 77.730374°W], 3 November 1978, A. Roig (MACN AK 016*); 1 ♂, 1 ♀, Aguas Hediondas, proximo a Tulcán [0.8101°N, 77.90392°W], 3579 m, 11 February 2014, A. Kury and A.Giupponi (MNRJ 8498*); 1 ♀, *Imbabura*, San Pablo La Rinconada [0.254428°N, 78.081701°W], 19–20 January 2002, P. Maza (QCAZI AK 0351*).

Diagnosis.—DS with white/yellowish polygonal blots beginning at ozopores level, delimiting the lateral borders of areas I–V and reaching the posterior border of scutum (Figs. 14B–F), median region of the areas without any blot (different from *R. ornatus*, *R. atahualpa* sp. nov., *R. devillei* and *R. virescens*). Lateral margins of carapace with blots as "ears of chevron". Areas I, II and IV with a pair of acuminated granules (Fig. 13D) (in *R. devillei* medium-sized conical tubercles). Area III tubercles slightly backwards projected (Fig. 13D). Differs from *R. nasa* sp. nov. by having shorter legs: femur IV as long as the dorsal scutum length (in *R. nasa* the femur IV length is almost two times the DS length).

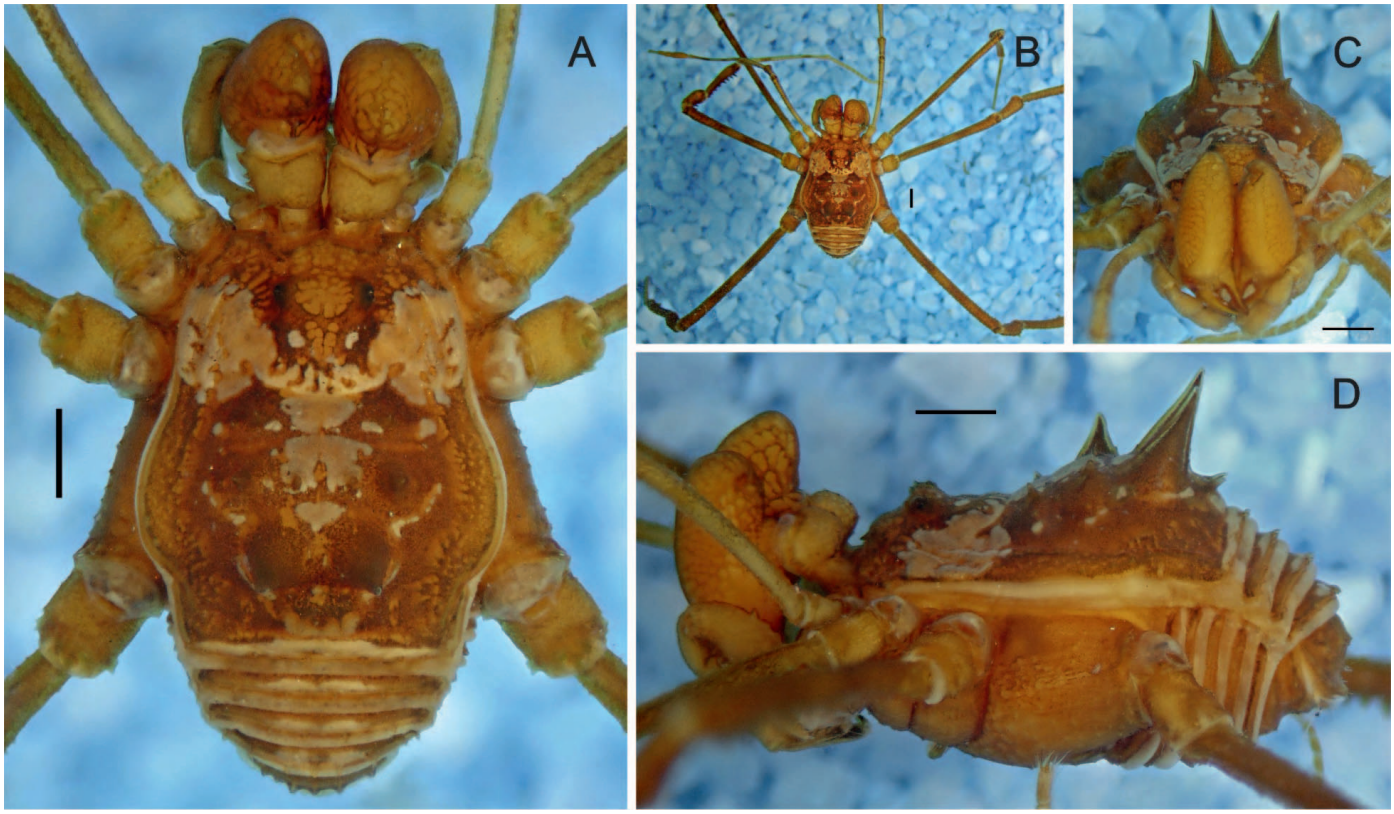

Figure 16.—*Rhaucoides devillei* (Simon) (MACN AK 83), male: A. Dorsal view, B. Dorsal view, C. Frontal view. D. Lateral view. Scale bars: 1 mm.

Complementary description.—Male (ICN-Ao-1066) Measurements: CL=1.9, CW=2.8, AL=2.7, AW=3.8, ChB=0.58, FeL IV=5.0, TiL IV=3.9.

Dorsum (Figs. 13, 14A–F): Dorsal scutum smooth, with shallow cheliceral sockets and rounded lateral projections. Abdominal scutum widest at the level of groove II. Ocularium low without median depression and disperse granules close to eyes. Mesotergum well delimited and divided into four areas: areas I, II and IV with a pair of small-sized paramedian tubercles, those of the area IV larger than those in the areas I and II; area III with a pair of paramedian, large acuminate tubercles. The posterior border of scutum substraight with a row of granules. Free tergites I–III with a row of granules.

Venter (Fig. 14G): Stigmatic area with a few sparse granules. Stigmata large, oval and transverse. Coxa I with two parallel rows of tubercles increasing in size distally and with an anterior smooth longitudinal space; coxae II and III longer than coxa I and granulate; coxa IV strongly backward, granulate. Genital operculum granulate.

Pedipalps (Figs. 15A–C): Trochanter with one ventro-apical tubercle; femur compressed, dorsally with a row of aligned triangular setiferous tubercles of different sizes slanted distally, ventrally with a row of four setiferous tubercles in medial region and four smaller in the base; disto-mesal portion of femur smooth, without tubercles. Patella distally depressed, with one distal tubercle on each side. Tibia depressed, spoon-shaped, dorsally granulate and ventrally smooth, with mesal border forming a convex keel and some spiniferous tubercles at the distal portion. Tarsus long, conical, with some dorsal granules and ventrally with two lateral rows of thickened setae.

Chelicera (Figs. 14A, G–I): Chelicera swollen. Basichelicerite sub-rectangular, with scattered granules, one group of tubercles of different sizes on the proximal border and some tubercles in lateral borders. Cheliceral hand with setiferous tubercles on distal region. Fixed finger dentate. Movable finger with one conical, sub-basal tooth and with the inner surface at distal portion serrate.

Legs (Figs. 13A, 14J–P): Coxa IV coarsely granulate without *clavi inguines* nor posterolateral apophysis. Legs III and IV armed and thicker than I and II (Fig. 13B). Patellae I–IV dorsally granulate, curved. Tarsi I–II with one smooth claw; tarsi III–IV with two subparallel smooth claws and tarsal process. Tarsal formula: 5(3)/15(3)/8/10.

Color (in ethanol, Fig. 13): Dorsal scutum and chelicera Deep Orange (51), mottled in Dark Yellowish Brown (78). Spots in carapace and abdomen Pale Greenish Yellow (104): ears of the chevron not occupying the scutal groove, longitudinal spots in lateral margins of area I (variation of spots as in Figs. 14B–F). Pedipalps as well as trochanters and femora of legs Dark Yellow (88). Legs distal articles Dark Yellowish Brown (78).

Male genitalia (Figs. 15D–H): VP of penis subrectangular with concave distal border; VP with two lateral, elongated, dense patches of type 4 microsetae, separated by a wide longitudinal space. VP with two pairs of apical MS C curved and laterally inserted; two pairs MS D, the most distal (D1) large and curved following the same lateral row as MS C, and

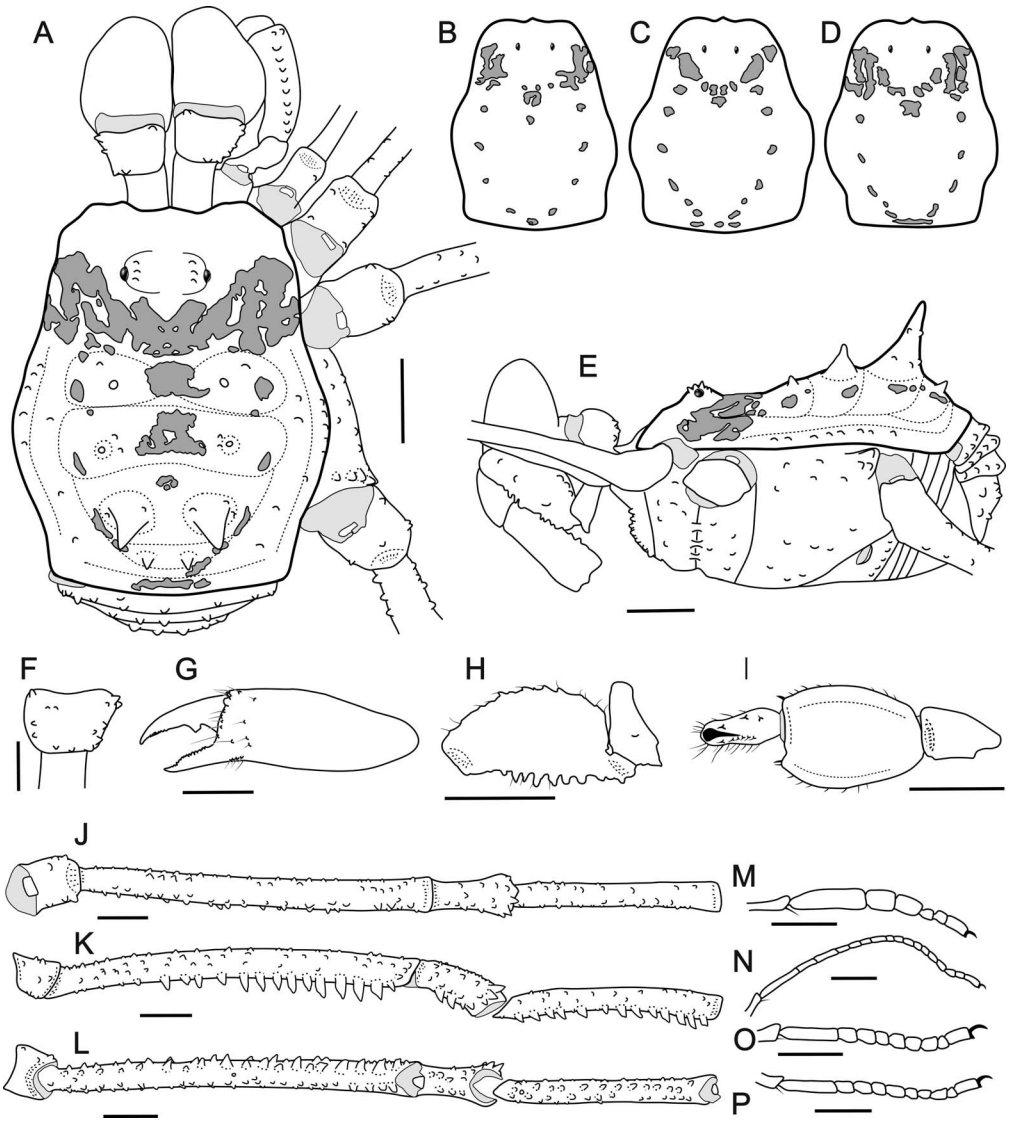

Figure 17.—*Rhaucoides devillei* (Simon), schematic: A. Male (MNRJ 19231), dorsal view. B–D. Variations of spots patern (MNRJ 8500). E–P. Male (MNRJ 19231): E. lateral view. F. Right cheliceral hand, dorsal view. G. Right basichelicerite, dorsal view. H. Right femur of pedipalpus, prolateral view. I. Right patella, tibia and tarsus of pedipalpus, ventral view. J–L. Right trochanter, femur, patella and tibia, in dorsal, retrolateral and ventral view, respectively. M–P. Tarsomeres of legs I to IV. Scale bars: 1 mm except for F = 0.5 mm.

the other (D2) minute, inserted dorso-laterally on the middle third of VP; one pair of MS A long and distally curved (although asymmetry is present in the specimen having one MS only in the left side), inserted laterally near to D2; two pairs of minute MS E on the ventral face; one pair of minute MS B inserted laterally at the base of the VP. Glans mostly smooth, finger-like dorsal process slender, stylus with small wattle with barbels apically.

Female: Similar to male, but differs by having anterior part of carapace narrower and coda divergent (Fig. 14F), tubercles of legs III–IV smaller, chelicerae not hyperthelic and basitarsomeres of leg I not enlarged.

Distribution and habitat.—South of Colombia in Nariño, high mountains of Cumbal and Sapuyes municipalities, and north of Ecuador in Carchi and Imbabura provinces, between 2600 and 4000 m, in Northwestern Andean montane forests and Northern Andean páramo ecoregions (Figs. 22).

Remarks.—Although Kury (2003) synonymized both *P. sulfureus* and *R. festae* with *R. ornatus*, here we consider the dorsal scutal pattern of spots quite similar to *R. riveti* (Figs. 14B–F). The type localities of the three species are only 40 km apart from each other in Northern Ecuador, Carchi province (Fig. 22).

Rhaucoides devillei (Simon 1879), comb. nov.
(Figs. 16–18, 22)

Erginus devillei Simon 1879: 201 (type ISNB, ♂ ♀ syntypes, lost).

Erginus devillei: Roewer 1912: 68.

Metarhaucus devillei: Roewer 1923: 342.

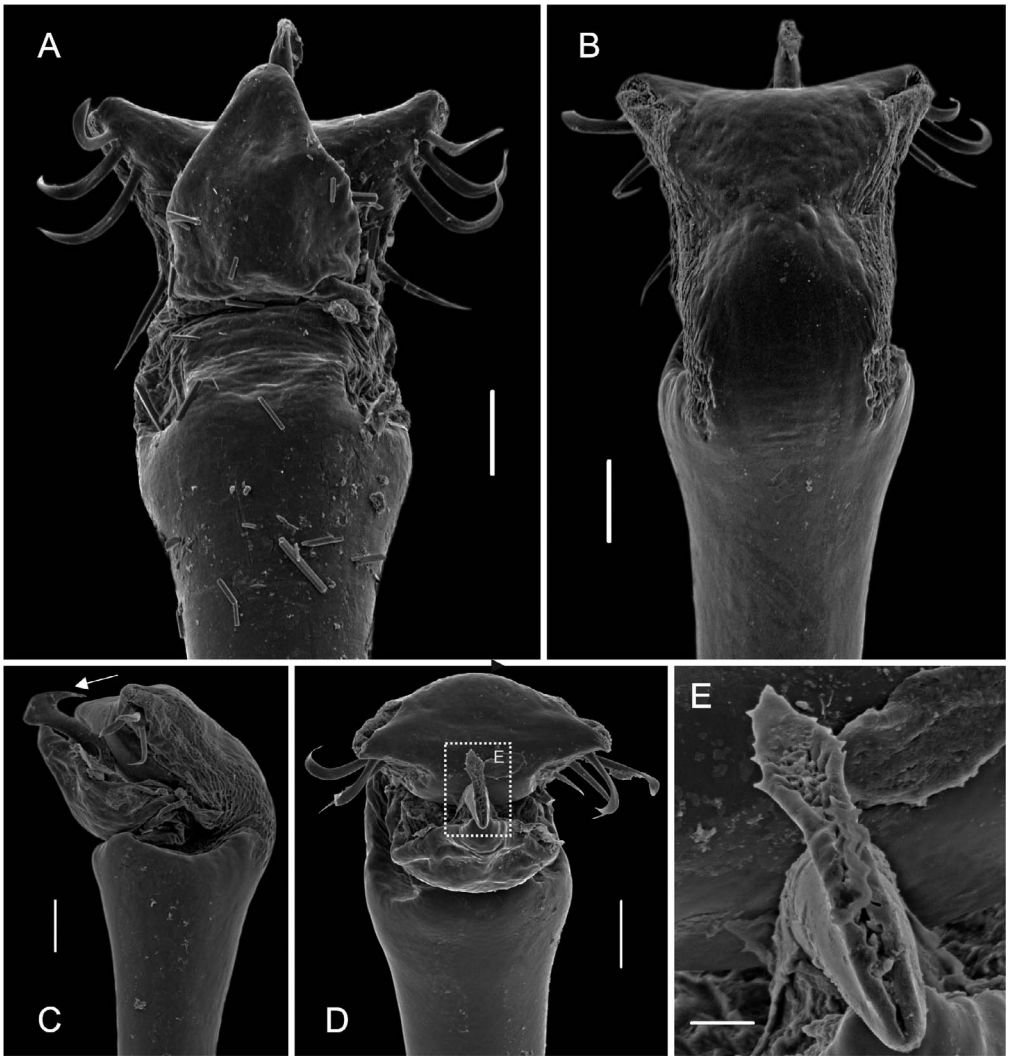

Figure 18.—*Rhaucoides devillei* (Simon) (AMNH 237), penis distal part: A. Dorsal view. B. Ventral view. C. Lateral view (arrow showing ventral peak in stylus). D. Dorso-apical view. E. Detail of stylus opening, apical view. Scale bars: A–D = 50 μm E = 10 μm.

Rhaucus (Erginus) devillei: Henriksen 1932: 352.

Erginus variatus Roewer 1912: 68, pl. 1, fig. 9. **Syn. nov.**

Metarhaucus variatus: Roewer 1923: 343, fig. 388.

Type material.— *Erginus devillei*: *Syntypes*. ♂, ♀, ECUADOR: without further locality data (ISNB, lost).

Erginus variatus: *Syntypes*. 2 ♂, 2 ♀, ECUADOR: *Tungurahua*, Baños [1.394444°S, 78.423333°W] (SMF RI 281, examined by photograph).

Other examined material.—ECUADOR: *Chimborazo*: 2 ♂, 30 km al norte de Pallatanga [1.720466°S, 78.824874°W], 24 April 1982, A. Roig (MACN AK 083*); *Napo*: 1 ♂, Cantón Quijos, Estación Biológica Yanayacu, Stream Trail, collected at night, 0.600220°S, 77.890390°W, 2177 m, 25–30 November 2009, M. Ramírez, C. Grismado, M. Izquierdo and F. Labarque (PBI Expedition) (MACN AK 087*); 1 ♂, 1 ♀, Cantón Quijos, Parroquia Cosanga, 6 km from Cosanga, Estación Biológica Yanayacu, around Biological Station [0.600220°S, 77.890390°W], 2153 m, 25–30 November 2009, M. Ramírez, C. Grismado, M. Izquierdo and F. Labarque (PBI Expedition) (MACN AK 105*); 3 ♂, 5 ♀, rodovia Baeza-Papallacta, entrada de trator na beira da rodovia E-20, próx. Chalpi, 0.36656°S, 78.08847°W, 2804 m, 19 June 2018, A. Giupponi, A. Kury and M. Medrano (MNRJ 09485*); *Pichincha*: 1 ♂, Lloa, bajo una roca con poco de humedad, 0.251514°S, 78.596150°W, 3 November 2012, C. Azul and Mizquero Cevallos (QCAZI AK 0364*); *Tungurahua*: 1 ♂, 1 ♀, Baños [1.397517°S, 78.390014°W], 1800–2100 m, June–July 1939, Clarke-Macintyre (AMNH AK 194*); 1 ♂, Baños, 2000 m April 1939, W. Clarke-Macintyre (AMNH AK 237*).

Diagnosis.—DS with white/yellowish blots as ears of chevron in carapace, joining medially by fragmented spots. Other yellow spots are present limiting the lateral borders of areas I–IV and reaching the posterior border of scutum (Figs. 1A, 17A–E). Differs from its congeners by having medial spots in areas I to III (sometimes reduced to area I). Area II with a pair of conical tubercles (Fig. 17E), smaller than those of area III, and slanted laterally. Area III with large conical tubercles slightly backwards projected (Figs. 16D, 17E).

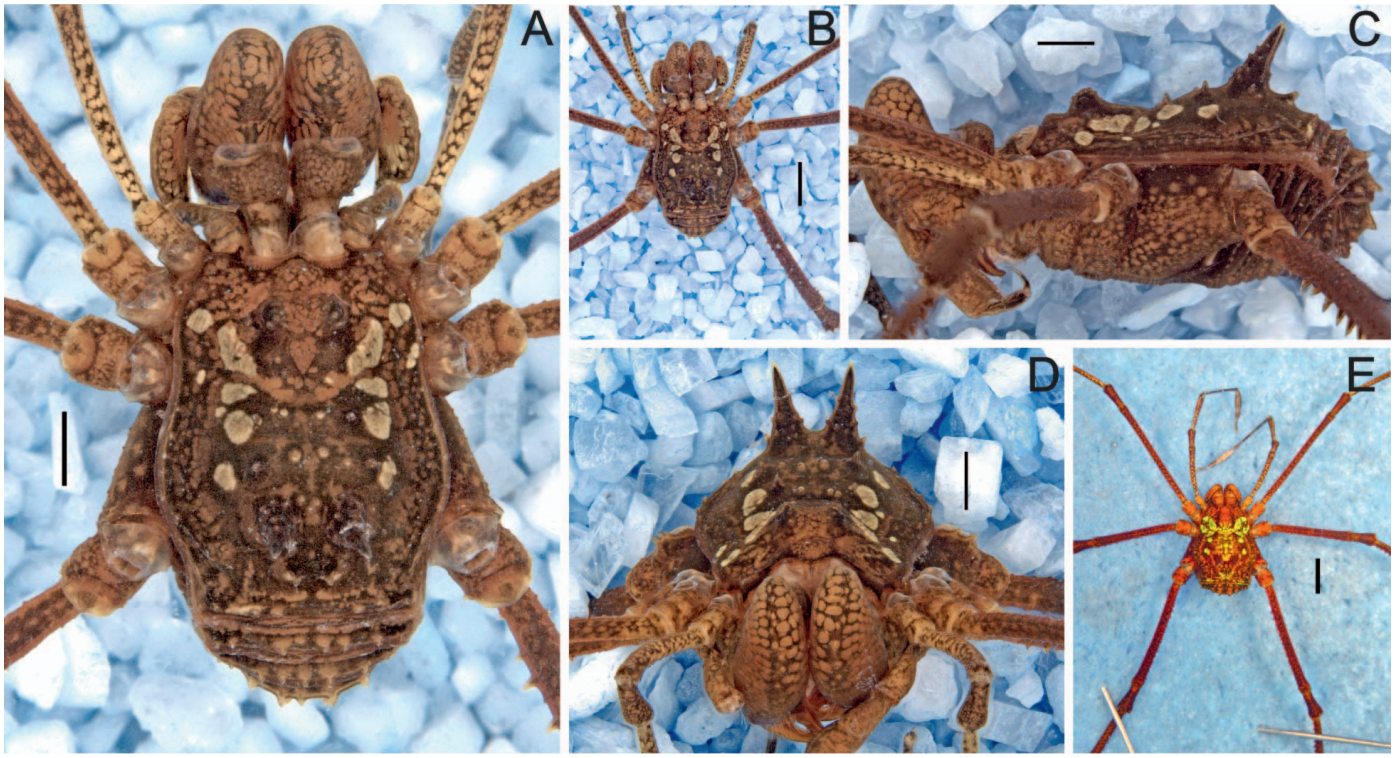

Figure 19.—*Rhaucoides virescens* (Mello-Leitão): A–D. Major male (MNRJ 58846). A. Dorsal view. B. Dorsal view. C. Lateral view. D. Frontal view. E. Minor male (MNRJ 19218), dorsal view. Scale bars: 1 mm, except for B and E = 2 mm.

Complementary description.—Male (MNRJ 19231) Measurements: CL=1.9, CW=3.1, AL=3.0, AW=4.2, ChB=0.7, FeL IV=7.0, TiL IV=4.2.

Dorsum (Figs. 16, 17A–E): Dorsal scutum mostly smooth, with shallow cheliceral sockets and rounded lateral projections. Abdominal scutum widest at the level of groove II. Ocularium low without median depression and disperse granules close to eyes. Mesotergum well delimited and divided into four areas: areas I and IV with a pair of small-sized paramedian tubercles; area II with median tubercles and area III with a pair of paramedian, large conical tubercles. The posterior border of scutum substraight. Free tergites I–III with a row of granules.

Venter (Fig. 17E): Stigmatic area with a few sparse granules. Stigmata large, oval and transverse. Coxa I with two parallel rows of tubercles increasing in size distally and with an anterior smooth space; coxae II and III longer than coxa I and granulate; coxa IV strongly backward, granulate. Genital operculum granulate.

Pedipalps (Figs. 17H–I): Trochanter with one ventro-apical tubercle; femur compressed, dorsally with a row of aligned triangular setiferous tubercles of different sizes, ventrally with a row of setiferous tubercles (basalmost and distalmost smaller); disto-mesal portion of femur smooth, without tubercles. Patella distally depressed, with one distal process on each side. Tibia depressed, spoon-shaped, dorsally granulate and ventrally smooth, with mesal border forming a convex keel and some spiniferous tubercles at the distal portion. Tarsus long, conical, with some dorsal granules and ventrally with two lateral rows of thickened setae.

Chelicera (Figs. 17F–G): Chelicera swollen. Basichelicerite subrectangular in dorsal view, with scattered granules, one group of tubercles of different sizes on the proximal border and some tubercles in lateral borders. Cheliceral hand with setiferous tubercles on distal region. Fixed finger dentate. Movable finger with one conical, sub-basal tooth and with the inner surface at distal portion dentate.

Legs (Figs. 17A, J–P): Coxa IV coarsely granulate without *clavi inguines* nor posterolateral apophysis. Legs III and IV armed and thicker than I and II. Patellae I–IV dorsally granulate, curved. Tarsi I–II with one smooth claw; tarsi III–IV with two subparallel smooth claws and tarsal process. Tarsal formula: 6(3)/17(3)/9/10.

Color (MACN AK 83 in ethanol, Fig. 16): Dorsal scutum and chelicera Brilliant Yellow (83), mottled in Strong Yellowish Brown (74). Spots in carapace and abdomen Pale Greenish Yellow (104): ears of the chevron occupying the scutal groove and going to posterior region forming an irregular "backbone" in areas I–III, longitudinal spots in lateral margins of areas I–III joining to a transversal stripe in area V (posterior margin). Pedipalps as well as trochanters and femora of legs Brilliant Yellow (83). Legs distal articles Strong Yellowish Brown (74).

Male genitalia (AMNH 237, Fig. 18): VP of penis subrectangular with concave distal border; VP with two lateral, elongated, dense patches of type 4 microsetae, separated by a wide longitudinal space. VP with two pairs of apical MS C curved and laterally inserted; two pairs MS D, the most distal (D1) large and curved following the same lateral row as MS C, and the other (D2) minute, inserted dorso-laterally on the middle third of VP; one pair of MS A

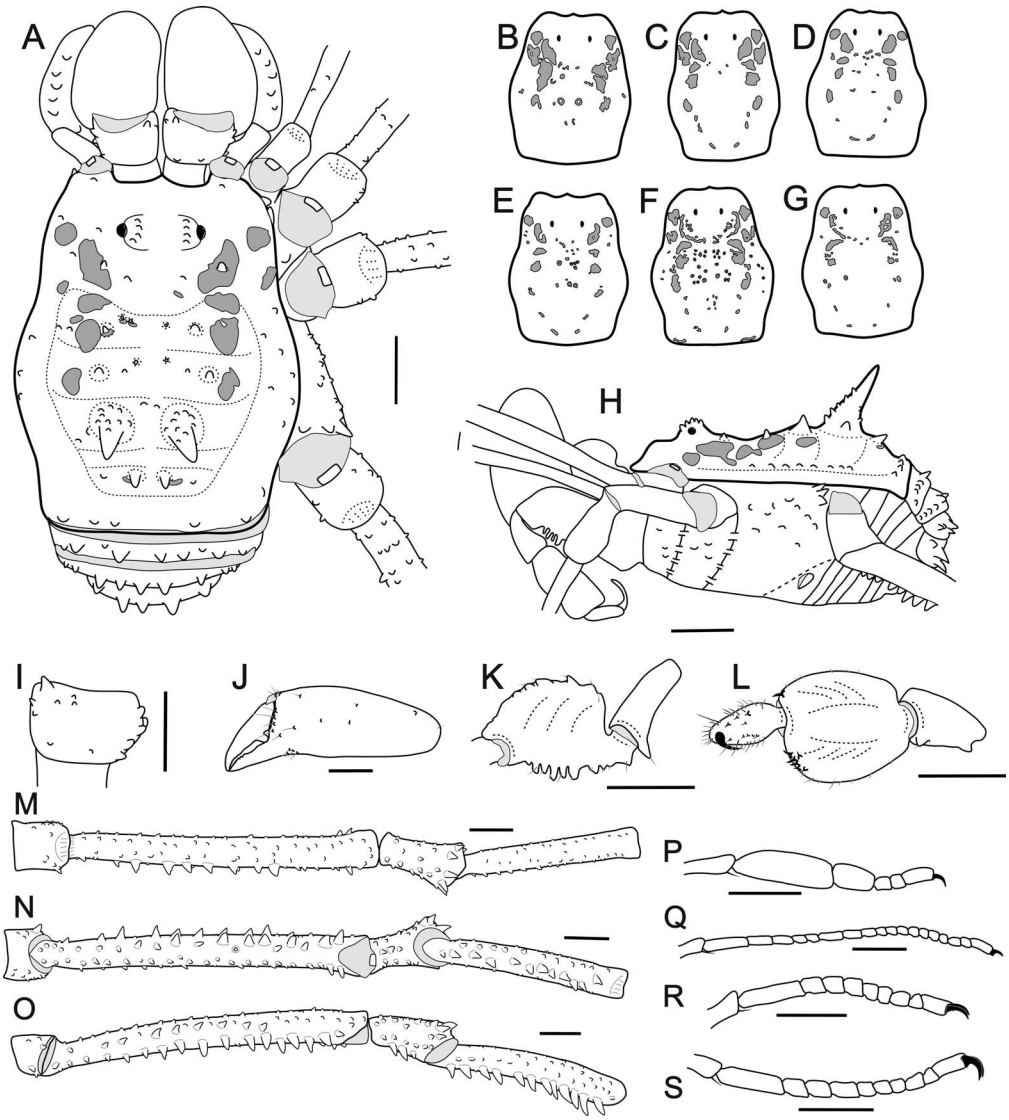

Figure 20.—*Rhaucoides virescens* (Mello-Leitão), schematic (MNRJ 58846): A. Major male, dorsal view. B–D. Variations of spots pattern: B, C, E, G. Males. D, F. Females. H–S. Major male. H. Lateral view. I. Right cheliceral hand, dorsal view. J. Right basichelicerite, dorsal view. K. Right femur of pedipalpus, prolateral view. L. Right patella, tibia and tarsus of pedipalpus, ventral view. M–O. Right trochanter, femur, patella and tibia, in dorsal, retrolateral and ventral view. P–S. Tarsomeres of legs I to IV. Scale bars: 1 mm except for H and I = 0.5 mm.

long and distally curved, inserted laterally near to D2; two pairs of minute MS E on the ventral face; one pair of minute MS B inserted laterally at the base of the VP. Glans mostly smooth, finger-like dorsal process slender, stylus with small wattle extending ventrally forming a sickle-shaped structure, with barbels.

Female: Similar to male, but differs by having anterior part of carapace narrower and coda divergent, larger (Fig. 17C), tubercles of legs III–IV smaller, chelicerae not hyperthelic and basitarsomeres of leg I not enlarged.

Distribution and habitat.—ECUADOR: Chimborazo, Tungurahua, Napo and Pichincha provinces, between 1800 and 2200 m, in Northwestern Andean montane forests, Northern Andean páramo and Eastern Cordillera real montane forests ecoregions (Fig. 22).

Doubtful records.—PERU, *Cajamarca*, Hacienda Taulis (6°50′S, 79°10′W), 2700 m (as *R. variatus*, Roewer 1956). Remark. This record is more than 400 km away from the other record points of the species, so we did not include it on the map. Some individuals of *R. devillei* have a spots pattern (Fig. 17A) similar to some *Rhauculus* spp. (Fig. 23) occurring in Peru and southern Ecuador, and Roewer may have misidentified it.

Rhaucoides virescens (Mello-Leitão, 1942)
(Figs. 19–21, 22)

Eucynorta virescens Mello-Leitão 1942: 317.
Rhaucoides virescens: Medrano et al. 2021.

Type material.—*Holotype male*. ECUADOR: *Pichincha*: Páramo near Quito [0.002929°S, 78.454581°W], 3400 m, 25 April 1942, H.E. Frizzel and O.L. Haught (MNRJ 5470*, examined).

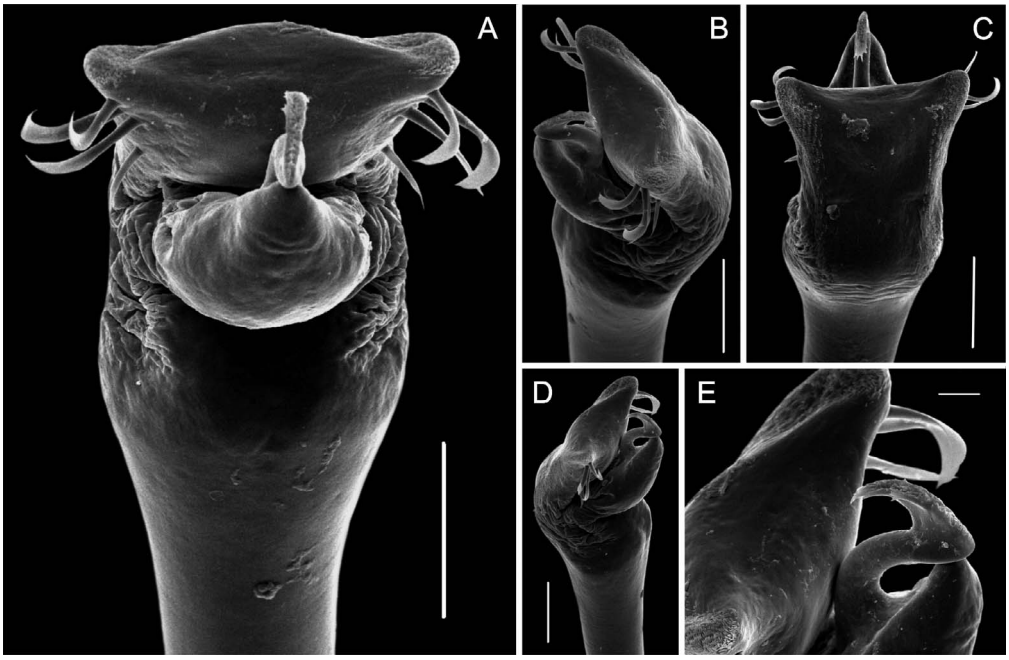

Figure 21.—*Rhaucoides virescens* (Mello-Leitão) (MNRJ 58846), penis distal part: A. Dorsal view. B. Latero-apical view. C. Ventral view. D. Lateral view. E. Detail of stylus opening, latero-apical view. Scale bars: A–D = 100 μm, E = 20 μm.

Other examined material.—ECUADOR: *Cotopaxi*: 1 ♀, Parque Nacional Cotopaxi [0.679145°S, 78.55402°W], 3600 m, 11 October 1997, T. Enriquez (QCAZI AK 140*); *Napo*: 1 ♂, 9 ♀, rodovia 28C Papallacta-Pifo, Reserva Ecológica Antisana, Río Tambo, 0.382144°S, 78.197514°W, 3644 m, 21 June 2018, A. Giupponi, A. Kury and M. Medrano (MNRJ 09500*); *Pichincha*: 49 ♀, Reserva Cayambe-Coca, Laguna de San Marcos, 0.10767°N, 77.99889°W, 3573 m, 18 March 2011, A. Chagas, A. Giupponi, A. Kury and M. Vega (MNRJ 19217*); 71 ♂, same data as previous (MNRJ 19218*); 35 ♂, 42 ♀, Reserva Ecológica Cayambe-Coca, Point 01, 0.10747°N, 77.99847°W, 3570 m, 11 July 2019, A. Chagas Jr. and A. Giupponi (MNRJ 58846).

Diagnosis.—DS with green/yellowish polygonal blots beginning at ozopores level, delimiting the lateral borders of areas I–V and may reach the posterior border of scutum (Figs. 20A–H), median region of the areas I and II with a transversal row of four yellow tubercles (Fig. 19A). Lateral margins of carapace with blots as "ears of chevron". Areas I, II and IV with a pair of acuminated granules (Fig. 19C). Area III tubercles slightly backwards projected (Fig. 19C). Differs from the other members of the genus by having a greenish hue in their spots (Fig. 19E), and sometimes a "translucent" shade in the abdomen (Fig. 1F).

Complementary description.—Male (MNRJ 58846) Measurements: CL=2.0, CW=3.3, AL=3.0, AW=4.1, ChB=0.7, FeL IV=6.9, TiL IV=4.0.

Dorsum (Figs. 19, 20A–H): Dorsal scutum mostly smooth, with shallow cheliceral sockets and rounded lateral projections. Abdominal scutum widest at the level of groove II. Ocularium low without median depression and disperse granules close to eyes. Mesotergum well delimited and divided into four areas: areas I and II with a recurved row of four low tubercles, the lateral more conspicuous. Area III with large acuminate and granulate tubercles. Area IV with a pair of small-sized paramedian tubercles more contiguous than those of the other areas. The posterior border of scutum substraight. Free tergites I–III with a row of granules.

Venter (Fig. 20C): Stigmatic area with a few sparse granules. Stigmata large, oval and transverse. Coxa I with two parallel rows of tubercles increasing in size distally and with an anterior smooth space; coxae II and III longer than coxa I and granulate; coxa IV strongly backward, granulate. Genital operculum granulate.

Pedipalps (Figs. 20K–L): Trochanter with one ventro-apical tubercle; femur compressed, dorsally with a row of aligned triangular setiferous tubercles of different sizes, ventrally with a row of 12 setiferous tubercles (basalmost and distalmost smaller); disto-mesal portion of femur smooth, without tubercles. Patella distally depressed, with one distal process on each side. Tibia depressed, spoon-shaped, dorsally granulate and ventrally smooth, with mesal border forming a convex keel and some spiniferous tubercles at the distal portion. Tarsus long, conical, with some dorsal granules and ventrally with two lateral rows of thickened setae.

Chelicera (Figs. 20F–G): Chelicera swollen. Basichelicerite subrectangular in dorsal view, with scattered granules, with a large tubercle in the distal part of the prolateral region and some other minor tubercles in lateral borders. Cheliceral hand with setiferous tubercles on distal region near the insertion of the movable finger. Fixed finger dentate distally. Movable finger with one conical, sub-basal tooth and with the inner surface at distal portion dentate.

Legs (Figs. 19A, 20M–S): Coxa IV coarsely granulate without *clavi inguines* nor posterolateral apophysis. Legs III and IV armed and thicker than I and II. Patellae I–IV dorsally granulate, curved. Tarsi I–II with one smooth claw; tarsi III–

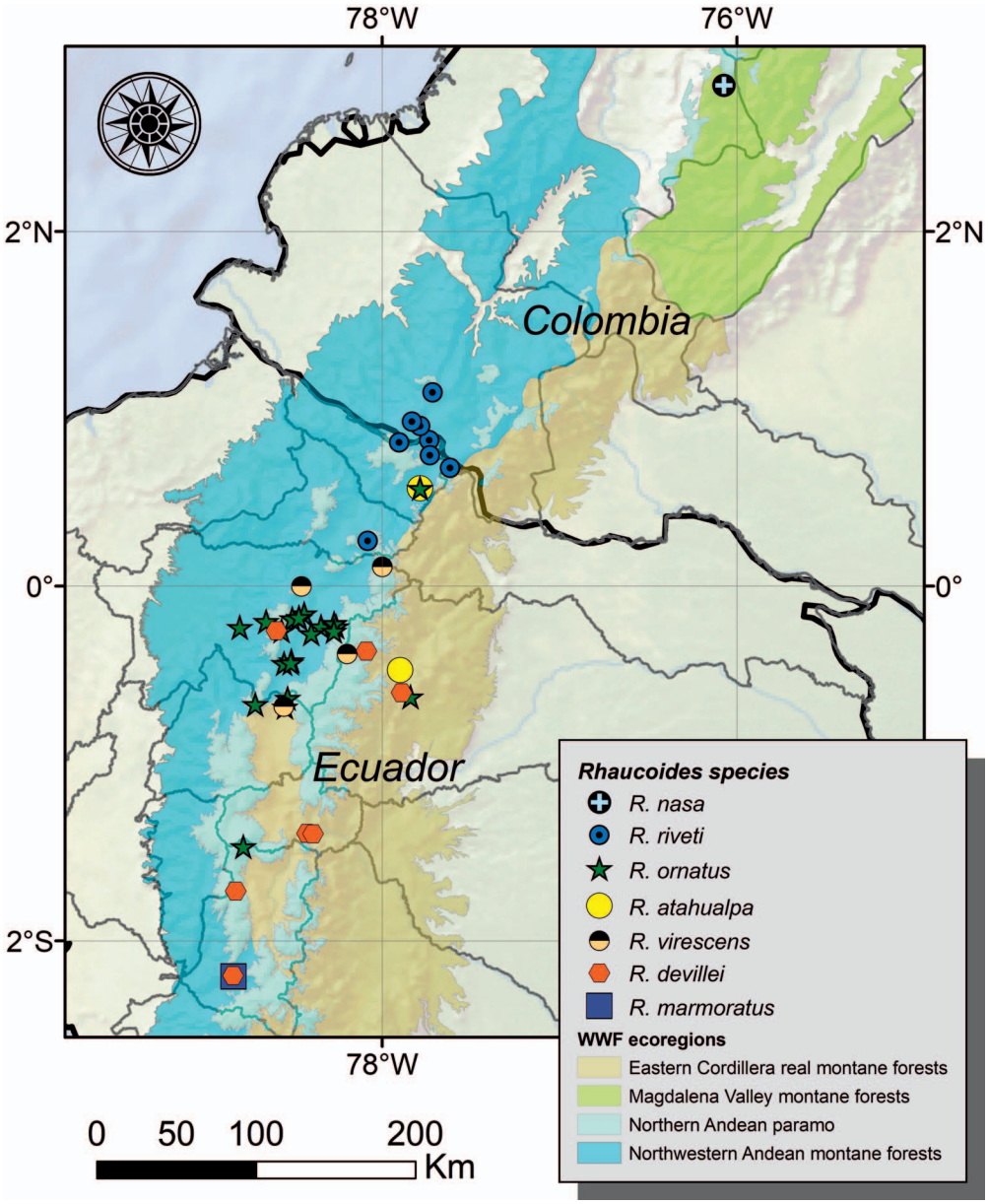

Figure 22.—Distribution of the species of *Rhaucoides* in Ecuador and Colombia.

IV with two subparallel smooth claws and tarsal process. Tarsal formula: 5(3)/18(3)/9/10.

Color (in ethanol, Fig. 19): Dorsal scutum, chelicerae and pedipalpi Moderate Orange Yellow (71), mottled in Deep Yellowish Brown (75). Spots in carapace and abdomen Pale Greenish Yellow (104): ears of the chevron not extended to the scutal groove, longitudinal spots in lateral margins of areas I–III joining to a transversal stripe in area V (sometimes absent). Pedipalps as well as trochanters and femora of legs Moderate Orange Yellow (71).

Male genitalia (Fig. 21)*:* VP of penis subrectangular with concave shallow distal border; VP with two lateral, elongated, dense patches of type 4 microsetae, separated by a wide longitudinal space. VP with two pairs of apical MS C curved and laterally inserted; two pairs MS D, the most distal (D1) large and curved following the same lateral row as MS C, and the other (D2) minute, inserted dorso-laterally on the middle third of VP; one pair of MS A long and distally curved, inserted laterally near to D2; two pairs of minute MS E on the ventral face; one pair of minute MS B inserted laterally at the base of the VP. Glans mostly smooth, finger-like dorsal process thick, stylus with small apical wattle extending ventrally forming a sickle-shaped structure, with barbels.

Female: Similar to male, but differs by having anterior part of carapace narrower and coda divergent, larger (Fig. 17C), tubercles of legs III–IV smaller, chelicerae not hyperthelic and basitarsomeres of leg I not enlarged.

Variation: Spots of dorsal scutum may vary, in living organism may be Brilliant Yellow Green (116) as in Fig. 19E and may be as diaphanous spots in abdomen as in Fig. 1F.

Distribution and habitat.—ECUADOR: Cotopaxi, Napo and Pichincha provinces, between 3570 and 3644 m, in

Northwestern Andean montane forests and Northern Andean páramo ecoregions (Fig. 22).

Genus *Rhauculus* Roewer, 1928

Rhauculus Roewer 1928: 614. Type species: *Rhauculus insignitus* Roewer, 1928, by monotypy.

Diagnosis.—Dorsal scutum shape α type with marked constrictions (Figs. 23A, F). White blots pattern almost entirely occupying the posterior part of carapace (Figs. 23A, F), with a sometimes dissociated backbone and areas of abdomen with lateral spots (Fig. 23)—not being a "parabolic series of polygons" as in *Rhaucoides*. Mesotergum armature as follows: area I and II with small tubercles; area III with paramedian erected tubercles, larger than those of other areas; area IV with small contiguous tubercles (Figs. 23B, G). Coxa IV without *clavi inguines* (Fig. 23A; contrasting with *Rhaucus*, some *Eulibitia* or *Taito*) and with distal acuminated apophysis (not multicapitate as *Rhaucus*. not unarmed as *Rhaucoides*). Hypertelic chelicera with cheliceral hand reniform in major males (Fig. 23; similar to *Rhaucus*, *Rhaucoides*, *Meterginus*, and contrasting with *Cynorta*, *Paecilaema*, *Taito*, *Eulibitia*, *Ambatoiella*, *Metalibitia* or *Flirtea*), minor form males with smaller and not incrassate cheliceral hand (similar to females; Fig. 1F). Differs from *Rhaucoides* for the shape and ornamentation of femur IV, being inflated and with strong ventral spines in medial to basal region in males of *Rhauculus* (Figs. 23D, I). Truncus of the penis enlarged dorso-distally establishing a well-formed podium. Ventral plate with two pairs of MS-C and a single pair of MS-A. Ventro-lateral regions with microsetae type T4. Stylus with reduced wattle and without barbels.

Remarks.—The type species of *Metarhaucus, M. fuscus* Pickard-Cambridge, 1905, was synonymized with *Rhaucus serripes* (Simon, 1879) by Garcia & Kury (2017), resulting in the synonym of *Metarhaucus* with *Rhaucus*, although that was not explicitly established by them and nothing was commented about the remaining species of the genus. We here propose a new diagnosis of *Rhauculus* and the inclusion of five of the remaining species of *Metarhaucus* species into it.

Some species described in four additional genera partially match our diagnosis of *Rhauculus*, although it would be advisable to study them in more detail before committing to new taxonomic combinations. These species are: *Proerginus andinus* Roewer, 1947, *Cynorta albituber* Roewer, 1952, *Flirtea andina* Roewer, 1927 and *Rhauculanus lineolatus* Roewer, 1928 (type-species of *Rhauculanus* Roewer, 1928).

Rhauculus insignitus Roewer, 1928

Rhauculus insignitus Roewer 1928: 614, fig. 44.

Type material.—*Holotype male*. ECUADOR: *Guayas*: Balzar (SMF RII 183, examined by photograph).

Rhauculus conspicuus (Roewer, 1928), comb. nov.

Metarhaucus conspicuus Roewer 1928: 591, fig. 30.

Type material.—*Syntypes*. 1 ♂, 1 ♀, ECUADOR: *Zamora-Chinchipe*: Valley of Zamora (SMF RII 162, but 133 in AQUILA (online system of SMF collection), examined by photograph).

Rhauculus lojanus (Roewer, 1912), comb. nov. (Fig. 23)

Erginus lojanus Roewer 1912: 71, pl. 1, fig. 7.
Metarhaucus lojanus: Roewer 1923: 344, fig. 390.

Type material.—*Syntypes*. ECUADOR, *Loja*, Valley of Loja, 2200 m: ♂, ♀ (ZMH, examined by photograph); 2 ♂ (SMF RI 442, examined by photograph).

Records.—ECUADOR: *Loja*: Loja (Roewer 1928).

Other material.—ECUADOR: *Loja*: 18 ♂, 18 ♀, Zamora huayco, Reserva Privada El Madrigal, 4.03977°S, 79.17515°W, 2200m, 27 March 2011, A. Chagas, A. Giupponi and A. Kury (MNRJ 19315*).

Rhauculus ohausi (Roewer, 1912), comb. nov. (Fig. 23)

Erginus ohausi Roewer 1912: 70, pl. 1, fig. 8.
Metarhaucus ohausi: Roewer 1923: 344, fig. 389.

Type material.—*Holotype? male*. ECUADOR: *Loja*: Valley of Loja, 2200 m (ZMH, examined by photograph).

Paratypes?: ECUADOR: *Loja*: ♂, ♀ collected with holotype (SMF RI, examined by photograph). [BRAZIL: *Amapá*]: 1 ♀, "Contesté Franco brésilien de la Guyane", F. Geay 1899 [doubtful locality] (MNHN Rwr 1637, unreported, examined by photograph).

Other examined material.—ECUADOR: *Loja*: 7 ♂, 28 ♀, Zamora huayco, Reserva Privada El Madrigal, 4.03977°S, 79.17515°W, 2200m, 27 March 2011, A. Chagas, A. Giupponi and A. Kury (MNRJ 19309*).

Records.—ECUADOR: *Zamora-Chinchipe*: Valley of Zamora (Roewer 1928).

Comment. —There are several species of confirmed southern Ecuadorian Opiliones incorrectly described or recorded by Roewer as being from French Guiana, which is probably an example of collective mislabeling.

Rhauculus serrifemur (Roewer, 1928), comb. nov.

Metarhaucus serrifemur Roewer 1928: 590, fig. 29.

Type material.—*Syntypes*. ECUADOR: *Loja*, Amaluza: 2 ♂, 1♀, (MNHN CS 10396, examined by photograph); (SMF RII 163, not examined).

Records.—PERU: *Piura*: Pass Abra Porculla (6.166667°S, 79.500000°W), 2000 m.

Rhauculus unicolor (Roewer, 1957), comb. nov.

Metarhaucus unicolor Roewer 1957: 89, figs. 42–44.

Type material.—*Holotype male*. PERU: *Cajamarca*: Cerro Churun, near Llama (6.516667°S, 79.133333°W), 1350 m, between Chiclayo [mispelled "Chiclago"] and Cutervo (SMF RII 11650, not examined).

Paratypes. 2 ♂, 1 ♀, collected with holotype (SMF RII 11650, not examined).

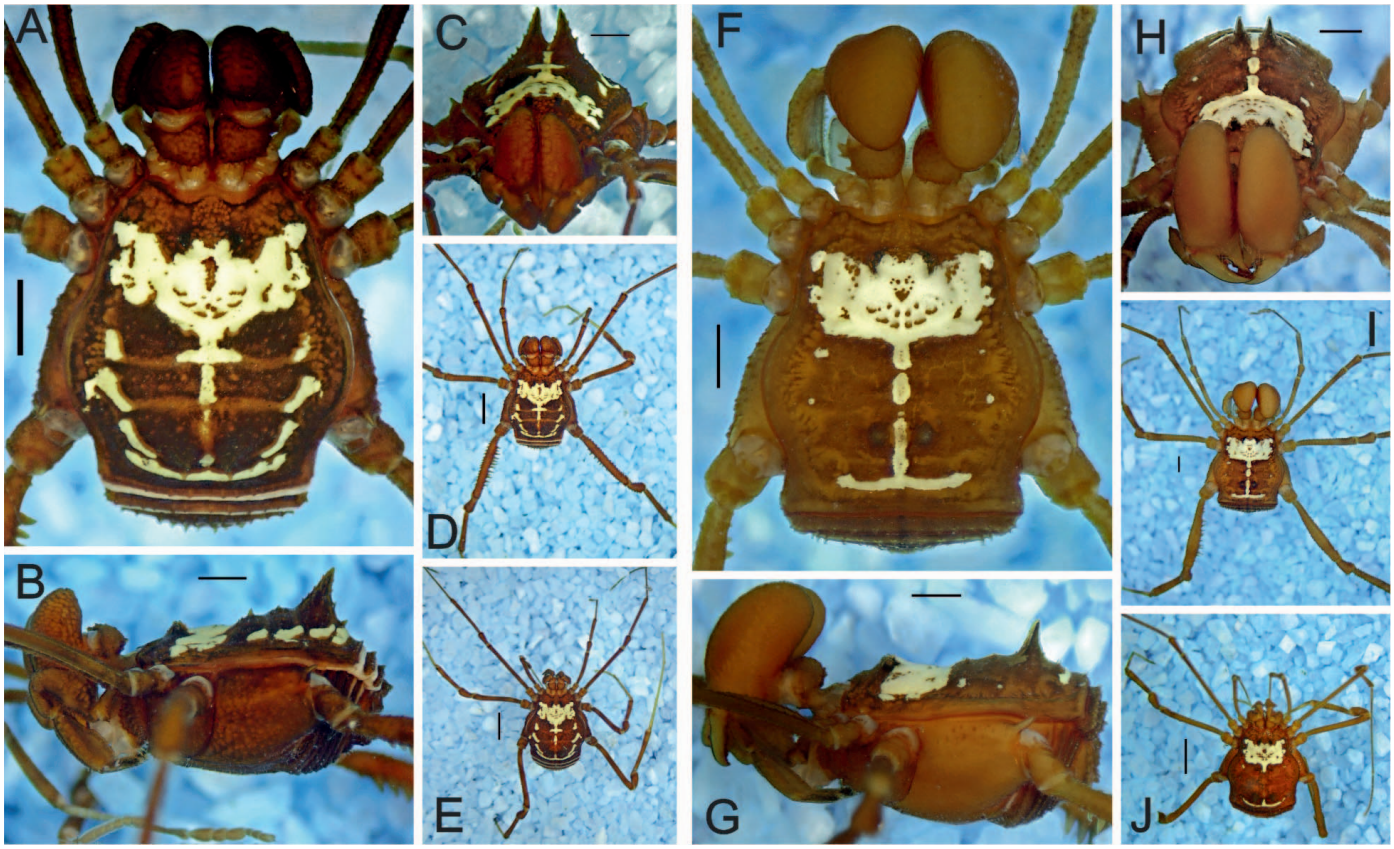

Figure 23.—*Rhauculus* spp. from Loja, Equador. A–D. *Rhauculus lojanus* (Roewer, 1912), comb. nov. (MNRJ 19315): A. Major male, dorsal. B. Same, lateral. C. Same, frontal. D. Same, dorsal. E. Female, dorsal. F–J. *Rhauculus ohausi* (Roewer, 1912), comb. nov. (MNRJ 19309): F. Major male, dorsal. G. Same, lateral. H. Same, frontal. I. Frontal view. J. Female, dorsal. Scale bars: 1 mm, except for E and J = 2 mm.

Genus *Reimoserius* Roewer, 1947

Reimoserius Roewer 1947: 27. Type species: *Reimoserius albipictus* Roewer, 1947, by original designation.

Diagnosis.—Dorsal scutum shape β type with marked constrictions. Yellowish blots as complete arborescent chevron, backbone and complex omega stripe. Area IV and posterior border (area V) with transversal yellow blots. Differs from *Rhaucus* and *Rhauculus* because the backbone is a line instead of fragmented polygons and by having omega stripe. Mesotergum armature as follows: area I and II with small acuminate tubercles; area III with paramedian tubercles tilted backwards, larger than those of other areas; area IV without remarkable armature. Coxa IV without *clavi inguines* or distal apophysis. Hypertelic chelicera with cheliceral hand swollen but not dorsally projected in major males. Femur IV substraight, roughly 1.5 as long as dorsal scutum, strongly granulated by without the remarkable rows of tubercles (especially retroventral) present in *Rhaucus* or *Rhauculus*. Patella IV with retrodistal mound armed with stouter tubercles (as in *Rhaucoides*); tibia IV without remarkable armature (contrasting with *Rhaucoides*). Tarsal counts: 6/10–12/8–9/10–12. Ventral plate of the penis subrectangular with paired macrosetae as follows: Two MS C, two MS D (proximal minute), two MS A, two MS E and one MS B. Penis stylus with wattle (larger than in *Rhaucoides*) with a serrated part and stylar barbs.

Reimoserius reimoseri (Roewer, 1933), comb. nov.

Metarhaucus reimoseri Roewer 1933: 287, fig. 11.

Type material.—*Syntypes*. 1 ♂, 3 ♀, 1 juvenile, COSTA RICA: *Cartago*: Irazú, (9.980000°N, 83.850000°W) (SMF 3006/191, examined by photograph).

Remarks.—This species is fairly similar to *R. albipictus* Roewer, 1947 (from Poas Volcano, Costa Rica), the type species and only member of the genus. There is insufficient data to propose the synonymy of *R. albipictus* and *R. reimoseri*.

DISCUSSION

The cladistic analysis performed by Medrano et al. (2021) found that the Andean genera *Rhaucoides*, *Rhaucus* and *Rhauculus* formed a clade, and *Eucynorta virescens* nested within *Rhaucoides*. These genera share morphological similarities such as the more robust and shorter legs III and IV, dimorphic kidney-shaped chelicerae, the shape of the dorsal scutum outline and similar coloration patterns (with some variations in *Rhaucus* members).

The ears of chevron (as defined in Kury & Medrano 2018) are present in all species of *Rhaucoides* but also occur in several other species without morphological similarity that are geographically distant, from Guatemala (*Meterginus basalis* Pickard-Cambridge, 1905) through the Antilles (*Cynortellana quadrimaculata* (Gervais, 1844)) to Brazil (*Paragryne quadrimaculata* Roewer, 1912). This suggests that this dorsal coloration pattern is a homoplasy. Additionally, differences in the pattern are encountered in *Rhauculus* and *Rhauculanus*, where the latter possesses ears of chevron joined medially by a wide stripe partially covering the carapace posterior to the ocularium (Fig. 23). However, the presence of the stripe joining the "ears" is not a synapomorphic character state since it also occurs in the following species: *Cynorta formosa* Goodnight & Goodnight, 1946; *Paecilaema inerme* (Banks, 1909), *Paecilaemella multimaculata* (Wood, 1869) and *Paecilaema carvalhoi* H. Soares, 1970. On the other hand, the abdominal parabolic series of polygons (Fig. 14F) are present in all species of *Rhaucoides* and some variation was detected and illustrated here, however, as far as we know that pattern of coloration, unknown in other Cosmetidae, is homologous and may be hypothesized as a primary synapomorphy for the genus.

Glans morphology.—Cosmetidae, as in other Grassatores Kury, 2002, have a non-muscular penis and the movements of the glans are due to hemolymph-pressure, a derived character state (Martens 1976, 1986). In contrast to other superfamilies of Grassatores, which have complex non-muscular penises, cosmetids, as other gonyleptoids, possess a more simplified sub-distal glans without auxiliary sclerites or vesicles. Examples of those more complex glans were depicted in their expanded and unexpanded forms in members of some families: Biantidae Thorell, 1889 (Martens 1976), Fissiphalliidae Martens, 1988 (Martens 1988), Sandokanidae Özdikmen & Kury, 2007 (Schwendinger & Martens 2002) and Samoidae Sørensen, 1886 (Colmenares & Tourinho 2016). Here, we present for the first time, the expanded condition of a cosmetid penis compared with its dehydrated version in SEM (Figs. 15F–H), the hydraulic expansion of the glans sac takes the form of a calyx that exposes the stylus in the apex of the penis, potentially facilitating sperm transfer in the lumen within the female ovipositor.

The membranous nature of the glans sac contrasts with the more rigid dorsal process. This thumb-shaped process has been considered as a diagnostic characteristic of cosmetid genitalia (Kury & Pinto-da-Rocha 2007), although it is lacking in Ferkeriinae. Moreover, variation in the shape of the glans was depicted by Medrano & Kury (2018: 1215) and some structures were even found in the apex in *Taito spaceinvaders* Kury & Barros, 2014 (Kury & Barros 2014: 21) and *Sibambea rotunda* Roewer, 1917 (Medrano et al. 2021). As those modifications occur in the most rigid section of the glans sac (the thumb-like process), it is possible that it has a function in stimulating the ovipositor sensillae during copulation [as occurs in the auxiliary structures in Eupnoi (Machado & Macías-Ordóñez 2007)], while the rest of the "calyx" may be working either as (1) a plug during insertion of the stylus or (2) stimulating the sensillae in the other lobes (which probably occurs principally by the macrosetae in the ventral plate).

Dehydrated (or at least non-everted) penises are usually illustrated in modern cosmetid descriptions, either by SEM or by optical microscopy. Nonetheless, the resultant shape in the unexpanded (collapsed) sac may be misleading in searching and proposing characters for inferring phylogenies, therefore special care is needed to avoid the proposition of artifactual characters in Grassatores.

Tarsal gland pores.—Among the multiple sensory structures in harvestmen (e.g., glands, setae, spines, trichomes), the glandular openings have received special attention and have been described in detail in several families of Opiliones (Willemart et al. 2007, 2010; Proud & Felgenhauer 2011, 2013; Dias & Willemart 2016; Gainett et al. 2020). In Laniatores, such structures have multiple functions, such as the production of sexual pheromones, contact chemoreception/mechanoreception, hygroreception, thermoreception or olfaction (Willemart et al. 2008, 2010). The laniator leg gland openings are mostly sexually dimorphic, being found in legs I, III and IV both in females and males but, in the last case, the region where they are located varies, and may appear as swellings or as small widespread pores (Willemart et al. 2007).

The swollen tarsomeres of leg I are commonly found in males of Cosmetidae [e.g., table 3 in Townsend et al. (2010); Fig. 2] and their function was investigated by Dias & Willemart (2016) in *Gryne perlata* Mello-Leitão, 1936 (Discosomaticinae). In *Rhaucoides,* the swollen tarsomeres have a particularity not seen in other cosmetid genera: the most proximal tarsomeres (basitarsomeres I–III or I–II) seems to be fused, due the lack of division between them and the presence of at least two pores on the ventral and lateral faces of each tarsomere (Figs. 2D–F). Additionally, the tarsal pores of *Rhaucoides* may be categorized as *bordered pores*, structures characterized by a shallow depression with a well-defined border, as previously described by Willemart et al. (2010) for the Andean species *Cynorta meinerti* González-Sponga, 1992 and *Litoralia junci* González-Sponga, 1992, cosmetids from the Cordillera de Mérida and Cordillera de la Costa mountain ranges in Venezuela.

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