



Article

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Notes on the systematics of the Triaenonychinae from Madagascar with description of a new species of *Acumontia* Loman (Opiliones: Laniatores)

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Abstract

Acumontia succinea sp. nov. is described from the Parc national de la Montagne d'Ambre, in the former Antsiranana Province, Madagascar. Detailed illustrations from all views of the male genitalia of a species of *Acumontia* are provided for the first time. Complementary illustrations are provided of the types of the five valid species of *Acumontia* described by Pocock in the beginning of the 20th century, two of which had never been illustrated before.

Key words: Afrotropical, Arachnida, Insidiatores, Taxonomy

Introduction

Triaenonychidae Sørensen, 1886 includes small to medium-sized Laniatores, which legs III–IV bear single claws with at least one pair of lateral prongs. It is the third most diverse family of Laniatores, with approximately 480 species described so far (Kury 2007).

In Madagascar, the triaenonychids constitute the dominant opilionofauna (Lawrence 1959, Staręga 1992). Ten genera of Triaenonychidae, distributed between two tribes of Triaenonychinae, are recognized in the island: the Triaenobunini *Ankaratrix* Lawrence, 1959, and the Triaenonychini *Acumontia* Loman, 1898, *Antongila* Roewer, 1931, *Decarynella* Fage, 1945, *Flavonuncia* Lawrence, 1959, *Hovanuncia* Lawrence, 1959, *Ivohibeia* Lawrence, 1959, *Millomontia* Lawrence, 1959, *Millotonyx* Lawrence, 1959 and *Paulianyx* Lawrence, 1959. These genera are currently defined by a combination of a few characters of external morphology such as tarsal formulae, and armatures of mesotergal areas and ocularium, without the inclusion of any character from male genitalia. Almost all genera are monotypic or have only two species, except for *Acumontia* which possesses 21 of the 32 valid species of Malagasy triaenonychids. *Acumontia* had been the only triaenonychid genus reported also from outside the island, but their South African species were later transferred to *Lizamontia* Kury, 2004, which is endemic of South Africa (Kury 2004). We had the opportunity to study material collected by an expedition of the Smithsonian National Museum of Natural History, Washington D.C. (USNM) to the north of Madagascar. In this material we detected a new species of Triaenonychini which we describe under *Acumontia* and discuss its generic allocation. We examined type material of the five valid species of *Acumontia* described by Pocock in the beginning of the 20th century and deposited in the Natural History Museum, London (BMNH). Illustrations of these types are provided.

Systematic History of Malagasy Triaenonychini

Loman (1898) described *Acumontia* as a monotypic genus, and its only species, *A. armata* Loman. The genus was then diagnosed based on the shape of the dorsal scutum, presence of marginal teeth on the carapace, armatures of mesotergal areas and ocularium, shape of sternum, armature of pedipalp. Pocock (1902) provided a key for the genera of Triaenonychidae (= Triaenonychinae = Triaenonychini), where *Acumontia* was separated from other triaenonychid genera by the high ocularium. He also described two other species of *Acumontia*, *A. rostrata* Pocock

(Fig. 5) (with two subspecies) and *A. majori* Pocock (Fig. 3), providing a key for the species of the genus. Later Pocock (1903) discovered that the metatarsal notch of leg I occurred in males, not in females as he had thought before, and accordingly changed some of his identifications, elevated *A. rostrata cowani* Pocock, 1902 (Fig. 1) to species level and described two additional species of *Acumontia*. In this work he broadly sketched the male genitalia of *A. rostrata*, which became the only illustration of the genitalia of an *Acumontia* in the literature to date.

Roewer (1915), in a work dealing with the Triaenonychidae, rearranged the structure of the family. He described the new monotypic Malagasy genera *Tanalaius* and *Spinimontia*, each for a new species, and also *Triaenomontia* (for two new species) and *Triacumontia* (to allocate *A. rostrata*, *A. echinata* Pocock, 1903 (Fig. 2), *A. cowani* and five new species). He also described two new species of *Acumontia*. Later, Roewer (1931; 1949) added a new species for *Triacumontia*, and the two new monotypic genera *Antongila* and *Bezavonia* for the new species *Antongila spinigera* Roewer and *Bezavonia remyi* Roewer. Fage (1945) described *Decarynella* for the new cavernicolous species *D. gracilipes* Fage. Lawrence (1931) added two South African new species to *Acumontia* and modified the structure of Malagasy Triaenonychini, making some synonymies (*Triaenomontia* = *Triacumontia*, *Bezavonia* = *Acumontia*), and described six new genera and 15 species. Lawrence (1931, 1959) illustrated the male genitalia for 12 species of Triaenonychini, however, he did not change the Roewerian way of delimiting the genera, strongly based on meristic characters such as tarsal counts. Staręga (1992) synonymized *Tanalaius*, *Triacumontia* and *Spinimontia* with *Acumontia*, and also some species in his catalogue, but did not provide explanations. He also made the synonym of *Flavonuncia* with *Hovanuncia* in the abstract, but kept the genera apart in the corpus of his work (Staręga 1992: 271; 285). Kury (2004) described the new genus *Lizamontia* for the two South African species of *Acumontia* plus a new species.

Methods

The given distributions for the species follow the Global Ecoregions adopted by the World Wild Fund for Nature (Olson & Dinerstein, 2002). Descriptions of colors use the standard names of the 267 Color Centroids of the NBS/IBCC Color System (<http://people.csail.mit.edu/jaffer/Color/Dictionaries#nbs-isc>) as described in Kury and Orrico (2006). Specimens were prepared for SEM with triple ultrasonication in water and detergent, without critical point preparation (air dried), gold coated and examined with a JEOL JSM-6390LV at the Center for Scanning Electron Microscopy of Museu Nacional/Universidade Federal do Rio de Janeiro. The software package CombineZ, version CombineZP (Hadley 2012) was used to create composite images with extended depth of field, through combination of several images taken at different focal planes. The original photographs were taken with a Sony Cybershot DSC-V1 on an Olympus dissecting microscope. The types of Pocock were imaged in the Sackler Biodiversity Imaging Laboratory of the British Museum of Natural History (BMNH) through their image capture system. All measurements are given in mm.

Systematic Accounts

Acumontia Loman, 1898

Acumontia Loman 1898: 528; Pocock 1902: 409 (key to species); Pocock 1903: 443; Roewer 1915: 115 (key); Roewer 1923: 609 (key); Staręga 1992: 279 [type species: *Acumontia armata* Loman, by monotypy].

Tanalaius Roewer 1915: 113; Roewer 1923: 609; Roewer 1931: 156 [junior subjective synonym of *Acumontia* Loman, 1898 by Staręga (1992); type species: *Tanalaius alluaudi* Roewer, by monotypy; currently under synonymy of *Acumontia pococki* Roewer].

Spinimontia Roewer, 1915: 137; Roewer 1923: 618 [junior subjective synonym of *Acumontia* Loman, 1898 by Staręga (1992); type species: *Spinimontia lomani* Roewer, by monotypy].

Triacumontia Roewer 1915: 122; Roewer 1923: 612; Roewer 1931: 156 (key); Lawrence 1959: 34 [junior subjective synonym of *Acumontia* Loman, by Staręga (1992); type species: not designated].

Triaenomontia Roewer 1915: 133; Roewer 1923: 617 [junior subjective synonym of *Triacumontia* Roewer by Lawrence (1959); type species: not designated].

Bezavonia Roewer 1949: 289 [junior subjective synonym of *Acumontia* Loman by Lawrence (1959); type species: *Bezavonia remyi* Roewer, by original designation].

Included species. *Acumontia alluaudi* (Roewer, 1915), *Acumontia armata* Loman, 1898, *Acumontia capitata* (Lawrence, 1959), *Acumontia cowani* Pocock, 1902, *Acumontia echinata* Pocock, 1903, *Acumontia flavispina* (Lawrence, 1959), *Acumontia hispida* (Roewer, 1915), *Acumontia horrida* (Roewer, 1915), *Acumontia hystrix* (Lawrence, 1959), *Acumontia longipes* Lawrence, 1959, *Acumontia majori* Pocock, 1902, *Acumontia milloti* (Lawrence, 1959), *Acumontia nigra* (Lawrence, 1959), *Acumontia pococki* Roewer, 1915, *Acumontia remyi* (Roewer, 1949), *Acumontia roberti* Pocock, 1903, *Acumontia roeweri* Starega, 1992 (valid replacement name for *Triacumontia pococki* Roewer, 1915), *Acumontia rostrata* Pocock, 1902, *Acumontia soerenseni* (Roewer, 1915), *Acumontia spinifrons* (Roewer, 1915), *Acumontia succinea* **sp. nov.**, *Acumontia venator* (Roewer, 1931).

Diagnosis. Differs from *Flavonuncia* and *Hovanuncia* by the presence of spines on the abdominal scutum. Differs from *Decarynella* and *Paulianyx* by spines of area III being always larger than spines of dorsum of the femur of pedipalp. Differs from *Millomontia* and *Millotonyx* by the presence of spines or tubercles on free tergites instead of round granules. Differs from *Ivohibeia* by the absence of a long dorsal spine on base of femora II–IV.

Notes. Currently, there are not any diagnostic features which distinguish *Antongila* from *Acumontia*. The genus is monotypic and the description was probably based in a female (Lawrence 1959: 45). According to Lawrence (1959), *Antongila spinigera* is close to *Acumontia flavispina*.

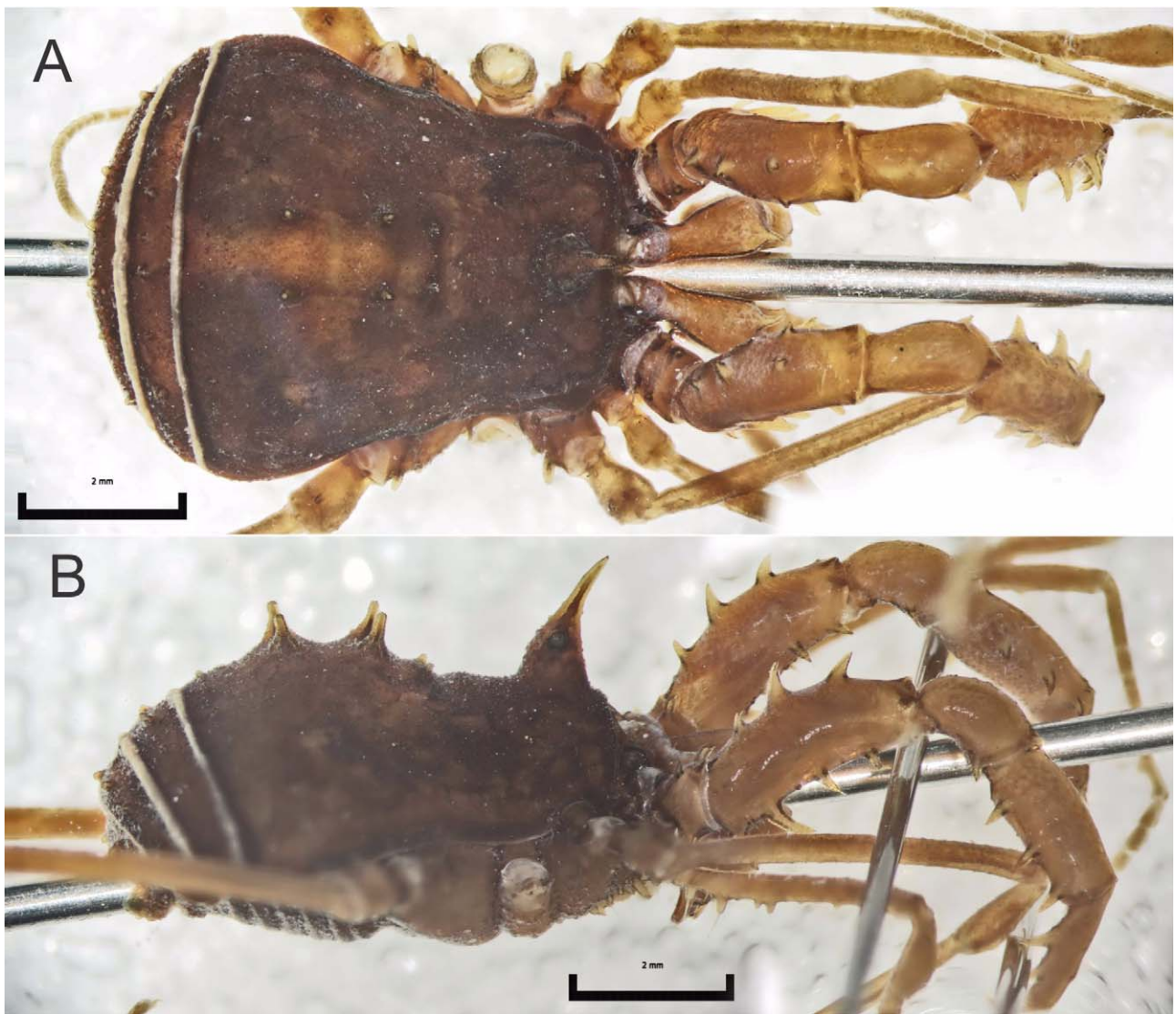


FIGURE 1. *Acumontia cowani* Pocock, 1903, habitus of male syntype (BMNH): A, dorsal view; B, lateral view. Scale bars = 2 mm.

Acumontia cowani Pocock, 1902

(Figs. 1A–B, 13)

Acumontia rostrata cowani Pocock 1902: 407.

Acumontia cowani: Pocock 1903: 442; Staręga 1992: 280.

Triacumontia cowani: Roewer 1915: 125; Roewer 1923: 613; Lawrence 1959: 36.

Type data. 1 ♂ 2 ♀ syntypes (BMNH, examined), from MADAGASCAR, [FIANARANTSOA], Betsileo.

Records. MADAGASCAR, [TOAMASINA], Moramanga, km 57 road to Anosibe (Lawrence 1959).

Notes. Pocock (1902) mentioned the type series of this (sub)species as consisting in “an adult and two subadult females”. Later, Pocock (1903: 441) stated that “the specimens described as *A. rostrata* subsp. *Cowani* [sic.] are males and females of a form which must be regarded as a valid species.” Roewer (1915; 1923) limited himself to repeat this information without seeing the types. He also included it in the newly created genus *Triacumontia*, later sunken by Staręga (1992) into *Acumontia*. Lawrence (1959) reported additional material from Toamasina. This species has never been illustrated.

Diagnosis. Differs from *A. hispida*, *A. horrida*, *A. nigra*, *A. roeweri*, *A. soerenseni*, *A. spinifrons* and *A. venator* by having the apophysis of ocularium unbranched. Differs from *A. alluaudi*, *A. echinata*, *A. longipes*, *A. milloti*, *A. nigra*, *A. rostrata* and *A. spinifrons* by having the two pairs of spines of areas II–III much smaller than the armature of ocularium. Differs from *A. pococki* by having the spines of areas II–III equally sized. Differs from *A. armata*, *A. capitata*, *A. flavispina*, *A. hystrix*, *A. majori*, *A. remyi*, *A. succinea* **sp. nov.**, *A. venator* by the presence of two tubercles on dorsum of the trochanter of pedipalps. Differs from *A. armata*, *A. echinata*, *A. majori*, *A. nigra*, *A. roberti*, *A. roeweri*, *A. rostrata*, *A. soerenseni*, *A. spinifrons* and *A. venator* by the two ventro-basal apophyses of femur of pedipalps spiniform, not blunt. Differs from *A. alluaudi*, *A. flavispina*, *A. hispida*, *A. horrida* and *A. succinea* **sp. nov.** by having five tarsomeres in tarsus I of male.

Acumontia echinata Pocock, 1903

(Figs. 2A–B, 13)

Acumontia rostrata (part, ♀ only): Pocock 1902: 407, fig. 82B.

Acumontia echinata Pocock 1903: 441; Staręga 1992: 280.

Triacumontia echinata: Roewer 1915: 124, fig. 33; Roewer 1923: 613; Lawrence 1959: 44.

Type data. ♂ holotype, (originally reported as ♀ syntype of *A. rostrata*), (BMNH, examined), from MADAGASCAR, [FIANARANTSOA], Ambohimombo.

Notes. Pocock (1902) firstly mistook this species for females of *A. rostrata* and even illustrated one specimen as a female of that species. Later, Pocock (1903) interpreted the “females” as males and females of an undescribed species, which he then described as *A. echinata*. Roewer (1915; 1923) simply repeated Pocock’s figures, not having seen any material, and included this species in *Triacumontia*.

Diagnosis. Differs from *A. pococki* and *A. rostrata* by the tubercles of anterior margin of carapace much smaller than cheliceral sockets. Differs from *A. hispida*, *A. horrida*, *A. nigra*, *A. roeweri*, *A. soerenseni*, *A. spinifrons* and *A. venator* by having the apophysis of ocularium unbranched. Differs from *A. cowani* by the size of spines of areas II–III comparable to the armature of ocularium (and not much smaller). Differs from *A. majori* and *A. roberti* by spines of areas II–III subequal (from area III not much longer and stouter than of area II), and widely separated at the base. Differs from *A. armata*, *A. capitata*, *A. flavispina*, *A. hystrix*, *A. majori*, *A. remyi*, *A. succinea* **sp. nov.**, *A. venator* by the presence of two tubercles on dorsum of the trochanter of pedipalps. Differs from *A. alluaudi*, *A. capitata*, *A. cowani*, *A. flavispina*, *A. hispida*, *A. horrida*, *A. hystrix*, *A. longipes*, *A. milloti*, *A. remyi* and *A. succinea* **sp. nov.** by the shape of the two ventro-basal apophyses of the femur of pedipalps blunt instead of spiniform. Differs from *A. alluaudi*, *A. flavispina*, *A. hispida*, *A. horrida* and *A. succinea* **sp. nov.** by having five tarsomeres in tarsus I of male.

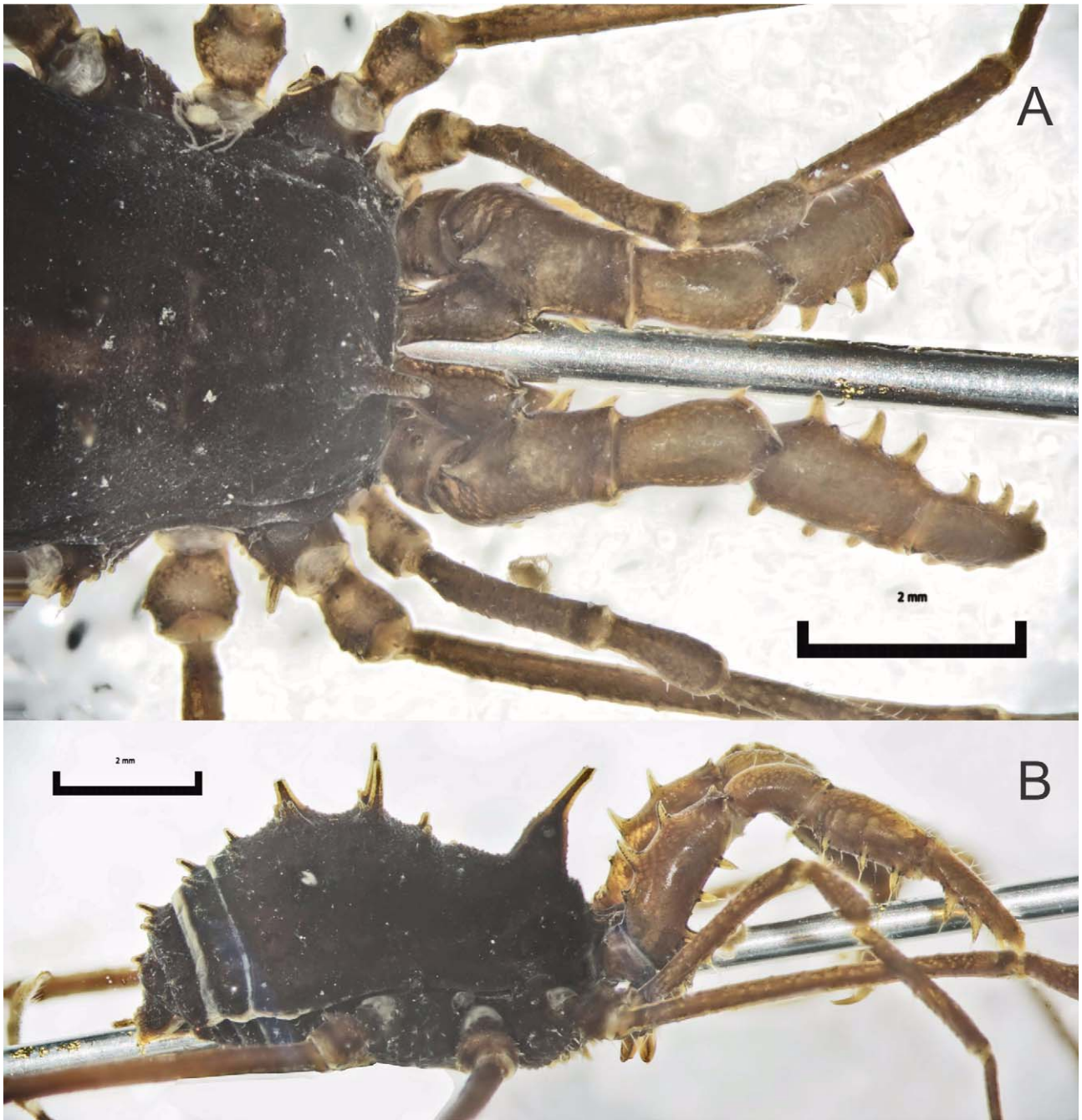


FIGURE 2. *Acumontia echinata* Pocock, 1903, male syntype (BMNH): A, Basichelicerite, trochanter and femur of pedipalps, carapace and areas I–II; B, habitus, lateral view. Scale bars = 2 mm.

***Acumontia majori* Pocock, 1902**

(Figs. 3A–B, 13)

Acumontia majori Pocock 1902: 407, figs. 83A–A2 (part, ♂ only); Roewer 1915: 117, fig. 29; Roewer 1923: 610, fig. 765; Lawrence 1959: 60; Staręga 1992: 280.
Acumontia Majori [sic.]: Pocock 1903: 443.

Type data. ♂ lectotype, (BMNH, examined), from MADAGASCAR, [FIANARANTSOA], Ambohitombo.

Notes. Pocock (1902) described this species based on 2 specimens, which he deemed with doubt to be a male (smaller specimen, “probably not quite adult”) and a female (larger one, with metatarsal notch). He provided

illustrations of the lateral habitus and metatarsal notch of this larger specimen. Later, Pocock (1903) noticed that his initial sex determination was inverted and that those were representative of two species: “but the example described as the male is the female, and vice versa. Moreover, the evidence supplied by other species does not justify the opinion that the very considerable structural differences between these two are merely attributable to sex. External sexual characters in the genus *Acumontia* and other genera of Triaenonychidae are usually slight as compared with what obtains in some of the Mecostethous Opiliones. Hence I feel compelled to regard the two specimens in question as representatives of distinct species.” He chose the (true) male as lectotype of *A. majori*, while the female became the holotype of *A. roberti*. Roewer (1915; 1923) limited himself to repeat the main illustration of Pocock, without seeing the types. Lawrence (1959) and Starega (1992) have not seen the types either and only repeated the original information. No further specimen has been reported.



FIGURE 3. *Acumontia majori* Pocock, 1902, habitus of male holotype (BMNH): A, dorsal view; B, lateral view. Scale bars = 2 mm.

Diagnosis. Differs from *A. pococki* and *A. rostrata* by the tubercles of anterior margin of carapace much smaller than cheliceral sockets. Differs from *A. hispida*, *A. horrida*, *A. nigra*, *A. roeweri*, *A. soerenseni*, *A. spinifrons* and *A. venator* by having the apophysis of ocularium unbranched. Differs from *A. armata*, *A. echinata* and *A. pococki* by the spines of area III contiguous at base. Differs from *A. alluaudi*, *A. capitata*, *A. cowani*, *A.*

flavispina, *A. hispida*, *A. horrida*, *A. hystrix*, *A. longipes*, *A. milloti*, *A. remyi* and *A. succinea* **sp. nov.** by the shape of the two ventro-basal apophyses of the femur of pedipalps blunt instead of spiniform. Differs from *A. alluaudi*, *A. flavispina*, *A. hispida*, *A. horrida* and *A. succinea* **sp. nov.** by having five tarsomeres in tarsus I of male. Very similar to *A. roberti*, differing by the trochanter of pedipalp dorsally unarmed, and by the small tubercles on the anterior margin of carapace.

***Acumontia roberti* Pocock, 1903**

(Figs. 4A–B, 13, 14)

Acumontia majori Pocock 1902a: 407, figs. 83A–A2 (part, ♀ only).

Acumontia Roberti [sic.]: Pocock 1903: 443.

Acumontia roberti: Roewer 1915b: 121; Roewer 1923: 612; Lawrence 1959: 61; Starega 1992: 281.



FIGURE 4. *Acumontia roberti* Pocock, 1903, habitus of male holotype (BMNH): A, dorsal view; B, lateral view. Scale bars = 2 mm.

Type data. ♀ holotype (originally a syntype of *A. majori*), BMNH, from MADAGASCAR, [FIANARANTSOA], Ambohimombo.

Records. MADAGASCAR, [ANTANANARIVO], Mt Ankaratra, Manjakatempo forest, 2000 m; [FIANARANTSOA], Ambohimombo; Nosiarivo; Farafangana, Karianga (Lawrence 1959).

Notes. Pocock (1902) initially mistook a female of this species by a male and included it as a syntype of *A. majori*. Later, Pocock (1903) realized it was a female of an yet undescribed species, calling it *A. roberti*. Roewer only cited the species without seeing any material of it. Lawrence cited both males and females, but limited himself to note variation on tarsal count of females and did not comment about males. This species has never been illustrated before.

Diagnosis—Differs from *A. pococki* and *A. rostrata* by the tubercles of anterior margin of carapace much smaller than cheliceral sockets. Differs from *A. hispida*, *A. horrida*, *A. nigra*, *A. roeweri*, *A. soerensemi*, *A. spinifrons* and *A. venator* by having the apophysis of ocularium unbranched. Differs from *A. armata*, *A. echinata* and *A. pococki* by the spines of area III contiguous at base. Differs from *A. alluaudi*, *A. capitata*, *A. cowani*, *A. flavispina*, *A. hispida*, *A. horrida*, *A. hystrix*, *A. longipes*, *A. milloti*, *A. remyi* and *A. succinea* **sp. nov.** by the shape of the two ventro-basal apophyses of the femur of pedipalps blunt instead of spiniform. Differs from *A. alluaudi*, *A. flavispina*, *A. hispida*, *A. horrida* and *A. succinea* **sp. nov.** by having five tarsomeres in tarsus I of male. Very similar to *A. majori*, differing by having the trochanter of pedipalp dorsally armed with two spines, and by the tubercles on each corner of the anterior margin of carapace.



FIGURE 5. *Acumontia rostrata* Pocock, 1902, habitus of male syntype (BMNH): A, dorsal view; B, lateral view. Scale bars = 2 mm.

Acumontia rostrata Pocock, 1902

(Figs. 5A–B, 13)

Acumontia rostrata Pocock 1902: 405, fig. 82A (part, ♂ only); Pocock 1903: 441, pl. 11, figs. 2–2a (penis); Starega 1992: 281. *Triacumontia rostrata*: Roewer 1915: 123, fig. 32; Roewer 1923: 613, fig. 768; Lawrence 1959: 44.

Type data. ♂ holotype, (BMNH, examined), from MADAGASCAR, [FIANARANTSOA], Ambohimombo, Tanala district.

Notes. Pocock (1902) originally described and illustrated males and females (with metatarsal notch!) of this species. The females resulted to be males of *A. echinata*, while the males were conserved in *A. rostrata* (Pocock 1903). Pocock (1903) also mentioned that the males did not have a metatarsal notch and provided a [too] schematic illustration of the penis. Roewer (1915; 1923) transferred this species to *Triacumontia* and repeated Pocock's illustration of the male lateral habitus. Lawrence (1959) did not bring any new information, while Starega (1992) brought it back to *Acumontia*.

Diagnosis. Differs from *A. alluaudi*, *A. armata*, *A. capitata*, *A. cowani*, *A. echinata*, *A. flavispina* and *A. majori* by spines of anterior margin with size similar to the processes of cheliceral sockets. Differs from *A. soerenseni* by two spines on lateral side of anterior margin instead of one. Differs from *A. cowani* by having the two pairs of spines of areas II–III with size comparable to the armature of ocularium. Differs from *A. majori* and *A. roberti* by the spines of area III widely separated at base and divergent from each other. Differs from *A. pococki* and *A. roeweri* by the large spines on free tergites. Differs from *A. nigra*, *A. spinifrons* and *A. venator* by median pair of spines on free tergite I. Differs from *A. alluaudi*, *A. capitata*, *A. cowani*, *A. flavispina*, *A. hispida*, *A. horrida*, *A. hystrix*, *A. longipes*, *A. milloti*, *A. remyi* and *A. succinea* **sp. nov.** by the shape of the two ventro-basal apophyses of the femur of pedipalps blunt instead of spiniform. Differs from *A. alluaudi*, *A. flavispina*, *A. hispida*, *A. horrida* and *A. succinea* **sp. nov.** by having five tarsomeres in tarsus I of male. Very similar to *A. roberti*, differing by the trochanter of pedipalp dorsally unarmed, and by the small tubercles on the anterior margin of carapace.

Acumontia succinea **sp. nov.**

(Figs. 6–12)

Type data. USNM Male (♂) Holotype, 4 ♂ and 5 ♀ paratypes. MADAGASCAR, Antsiranana, P.N. Mt. D'Ambre, Montagne d'Ambre, 1100m, 12.32S 49.10E, 23–28.XI.1993, Coddington, J., Scharff, N., Larcher, S., Griswold, C., Andriamasimanana, R. *col.* (CG.24.LUN.0); 5 ♂ 6 ♀ paratypes, same data, (SL.25.LUN.); 2 ♀ paratypes, same data, (CG.27.LUN.); 3 ♂ 2 ♀ paratypes, same data. (SL.27.LUN.); 4 ♂ 3 ♀ paratypes, same data, (CG.26.LDN2.); 1 ♀ paratype, same data. (SL.26.BED.); 4 ♂ 3 ♀ paratypes, same data, (RA.26.LDN.); 9 ♂ 6 ♀ paratypes, same data. (NS.27.GEN.); 1 juv. paratype, same data, (CG.27.NEW2). MNRJ 07581, 4 ♂ 5 ♀ paratypes, same data, (SL.26.LUN2.).

Distribution. Known only from the type locality in WWF Ecoregion AT0118 (Madagascar subhumid forests), WWF 01-type formation (Tropical & Subtropical Moist Broadleaf Forests). Most Malagasy Triaenonychini are endemic to one of the two WWF 01-type formations that run roughly in a North-South direction making 2 long stripes in the Eastern half of the island (See Figs. 12–14). Only one species (*Decarynella gracilipes*) occurs in the 02-type formation (Tropical & Subtropical Dry Broadleaf Forests). No species is known from the two 13-type formations (Deserts & Xeric Shrublands). Lawrence (1959: 60) recorded two females of *Acumontia lomani* (= *A. armata*) from Montagne d'Ambre. However, as this species is distributed in Central-eastern and Southern Madagascar, except for those two females, probably it is a misidentification. Those two females could be *A. succinea* **sp. nov.** The remaining old record from Montagne d'Ambre is from *Hovanuncia monticola* Lawrence, 1959, quite different from the species of *Acumontia* (see Discussion).

Etymology. Species name is a Latin adjective meaning “from amber”, in reference to the locality where the types were collected, the Parc national de la Montagne d'Ambre.

Diagnosis. Differs from other species of *Acumontia* (except for *A. hispida*, *A. horrida* and *A. remyi*) by having four and three tarsomeres on leg I on males and females respectively. Differs from *A. hispida* and *A. horrida* by the apophysis of ocularium unbranched. Similar to *Acumontia majori*, *A. longipes*, *A. remyi*, and *A. roberti* but differing by the number of tarsomeres on leg I. Additionally, differs from *A. majori* and *A. roberti* by having the spines of area III less inclined backwards, tubercles of free tergites high and thin, and trochanter of pedipalp with one pointed tubercle on the dorsum. From *A. longipes* by the leg II about three times the body (instead of five times), and by the size of tubercles of area II in relation to the ones of area III (much smaller). From *A. remyi* for the absence of pairs of spines on free tergites I–III.

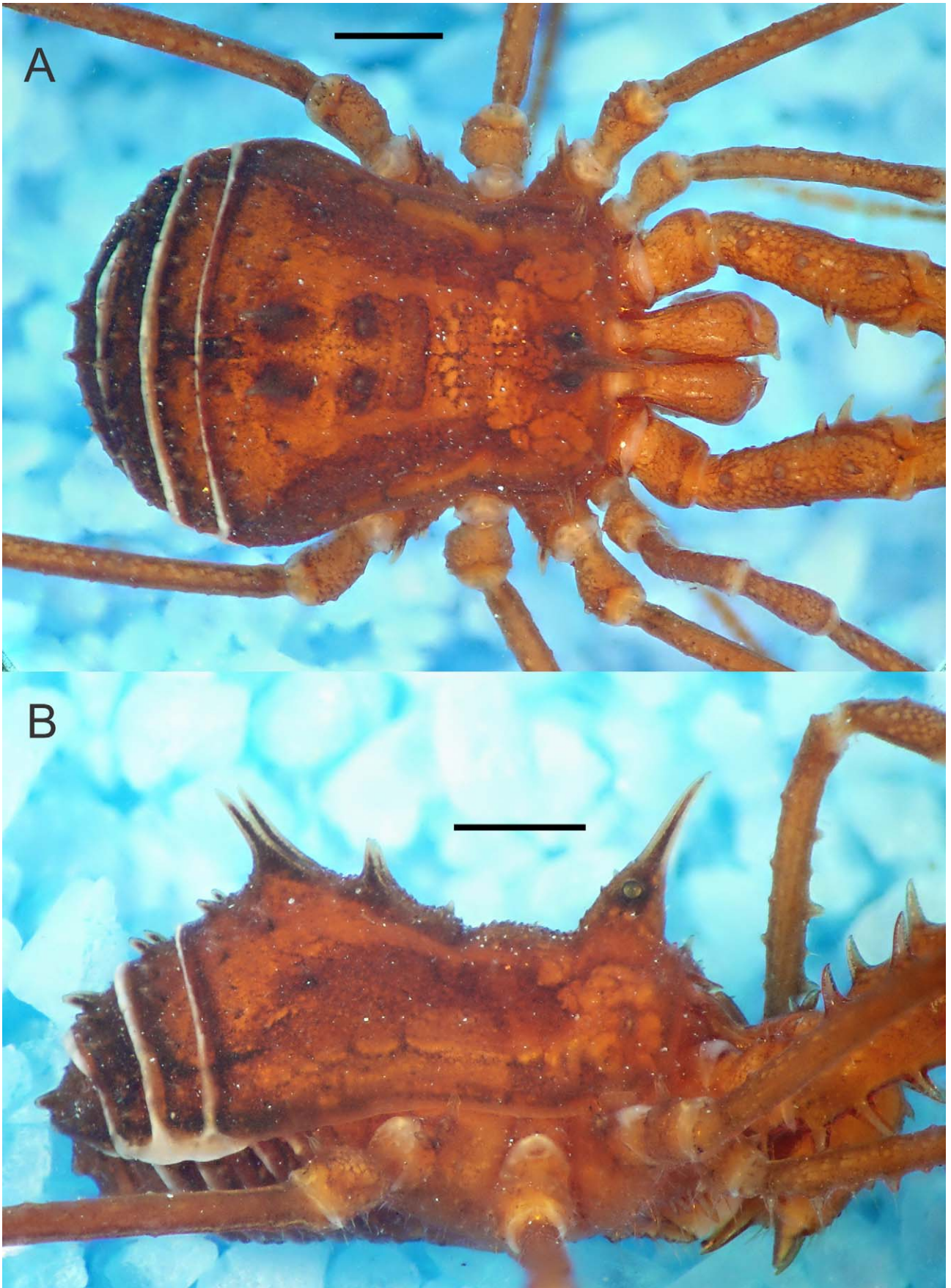


FIGURE 6. *Acumontia succinea* sp. nov., habitus of male holotype (USNM): A, dorsal view; B, lateral view. Scale bars = 1 mm.

Description of male holotype. Measurements: Carapace: length 1.8 maximum width 2.8; Abdominal scutum length 3.2, maximum width 3.7; Appendages measurements as in Table 1.

TABLE 1. Appendage measurements of male holotype of *Acumontia succinea* **sp. nov.**

	Trochanter	Femur	Patella	Tibia	Metatarsus	Tarsus	Claw
Pedipalp	0.6	2.3	1.3	1.5	-	1.5	0.5
Leg I	0.7	2.6	0.8	1.8	2.3	1.2	-
Leg II	0.7	4.0	1.0	3.6	4.4	3.4	-
Leg III	0.6	2.6	1.0	2.1	3.4	1.6	-
Leg IV	0.7	4.0	1.3	3.1	5.2	2.0	-

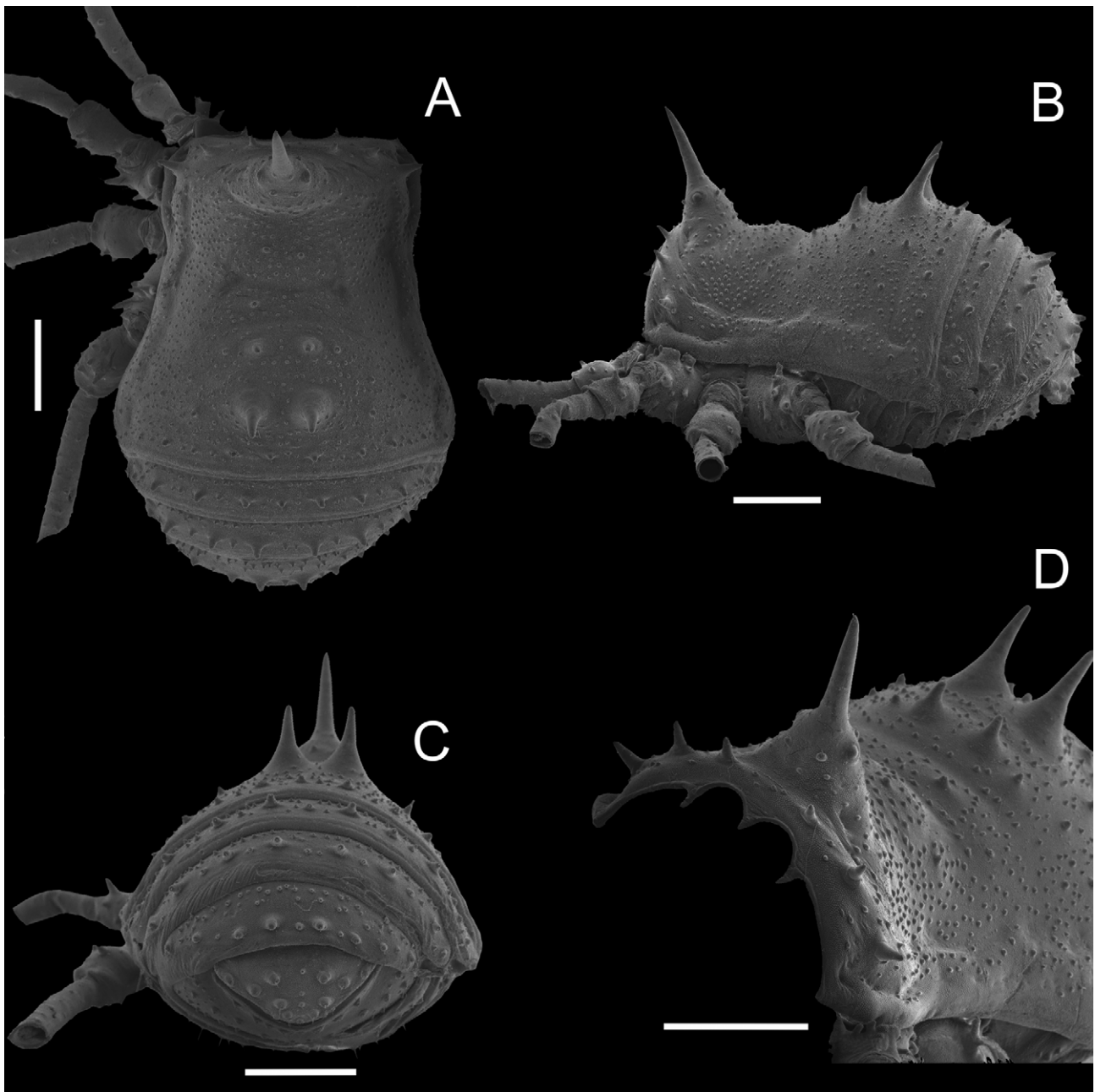


FIGURE 7. *Acumontia succinea* **sp. nov.**, male paratype (USNM): A–B, habitus, dorsal and lateral views, respectively; C, posterior view; D, dorsum, oblique view. Scale bars = 1 mm.

Dorsal scutum and free tergites: Scutum outline asymmetrical hourglass-shaped, typical of the family (Figs 6A, 7A). Tegument with microsculpture, with scaly aspect in some parts (lateral area, anterior and posterior margins of scutum), covered by pustules (Fig. 7). Anterior margin of carapace with a row of six setiferous tubercles, the outermost two larger than the four internal (Figs. 6A, 7A, B, D). Ocularium elevated, conical, bearing an apical, long, spiniform apophysis (Figs 6, 7). Eyes located high, far from base of ocularium (Figs 6B, 7B, D). Carapace and areas marked only by inconspicuous faint grooves (Fig. 7D). Area I with a pair of paramedian tubercles larger than the common granules (pustules) that cover the body, area II with a pair of larger paramedian tubercles similarly sized to the tubercles of the anterior margin of carapace, with two small acuminate tubercles lateral to them, area III with pair of spines twice as large the tubercles of area II, but smaller than the apophysis of the ocularium, slightly bent backwards (Figs. 6, 7). One transverse row of setiferous tubercles in posterior margin and free tergites I–III, larger in free tergites II and III (Figs. 6, 7A–C). Dorsal anal operculum with rounded tubercles (Fig. 7C).

Chelicerae (Figs. 6A, 8A, B): Not sexually dimorphic, with an apical setiferous spiniform tubercle on basal segment.

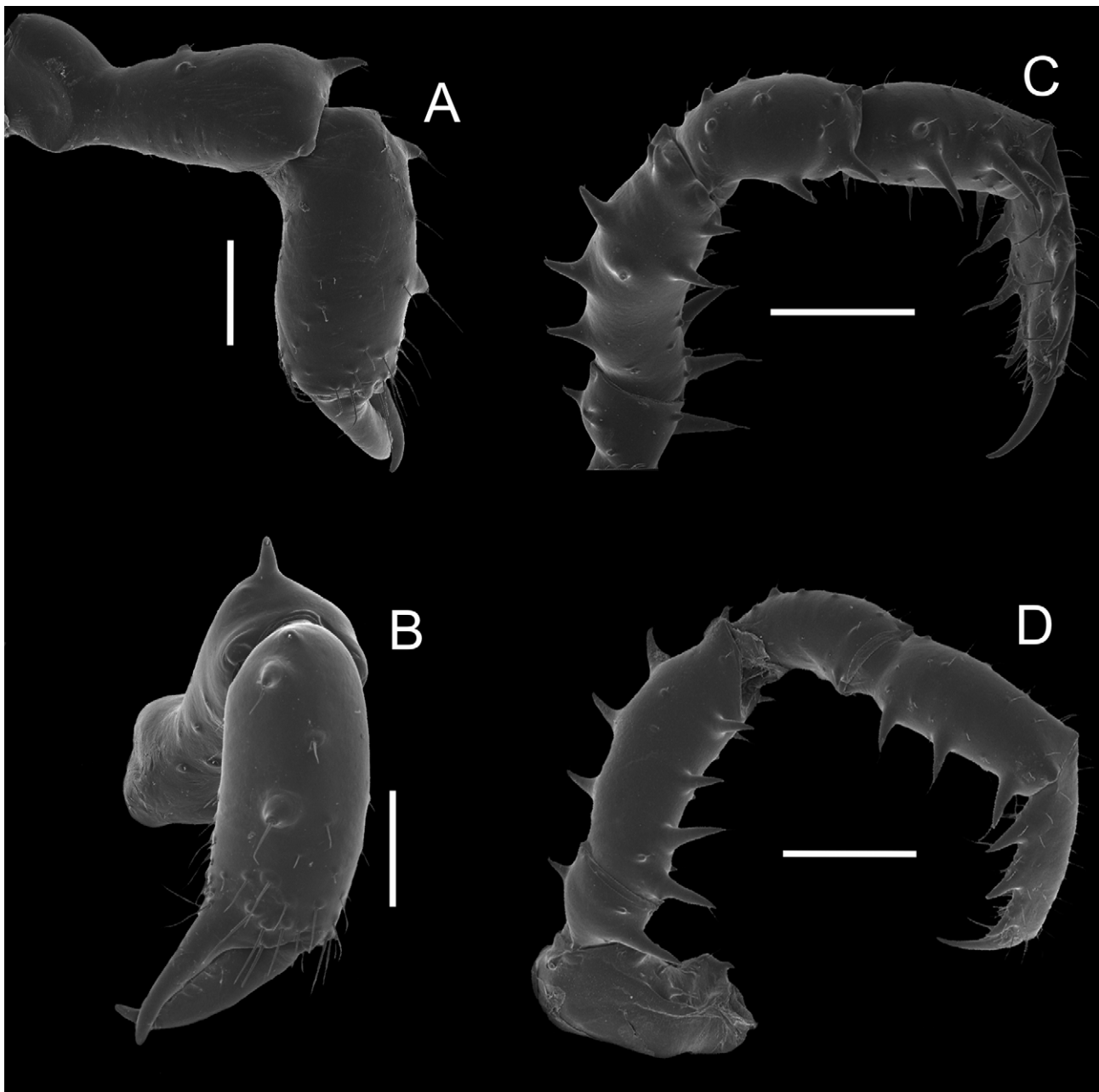


FIGURE 8. *Acumontia succinea* sp. nov., male paratype (USNM): A, right chelicera, ectal view, B, left chelicera frontal view; C, left pedipalp, mesal view; D, right pedipalp, ectal view. Scale bars, A–B = 0.5 mm, C–D = 1 mm.

Pedipalps (Figs 8C, D): Trochanter with one ventral high setiferous acuminate tubercle and a dorsal setiferous acuminate tubercle. Femur robust, bearing a ventral row of four high setiferous tubercles, the two basal divergent and larger than the two distal; dorsal row of four high setiferous tubercles; two mesal subdistal setiferous tubercles. Patella with two mesal subdistal setiferous tubercles. Tibia with three mesal and three ectal setiferous tubercles. Tarsus with four mesal and four ectal setiferous tubercles. All tubercles of pedipalps bear subdistal setae, not apical.

Legs: All legs covered with small setiferous tubercles. Coxa I with tegument covered with small pustules (Figs. 9A–C), armed ventrally with an anterior row of setiferous stout tubercles, the two most external fused together; other tubercles smaller and bearing apical setae (Figs. 9A, B). Femur I covered by small setiferous tubercles, with three ventral basal larger setiferous tubercles (Fig. 10A). Metatarsus I with calcaneus notched and much shorter than astragalus (Figs. 10A–C). Coxa II with dorsal apophyses and stout retrolateral setiferous tubercles (Fig. 7B). Coxa IV with three dorsal setiferous tubercles, one apical large, and two prolateral (Figs 7A, B). Trochanter IV with one distal dorsal apophysis and some tubercles (Fig. 7A). Tarsal counts of legs I–IV: 4(2)/11(3)/4/4 (paratype used for SEM); 4/4(2), 11/13(2), 4/4, 4/4 (holotype).

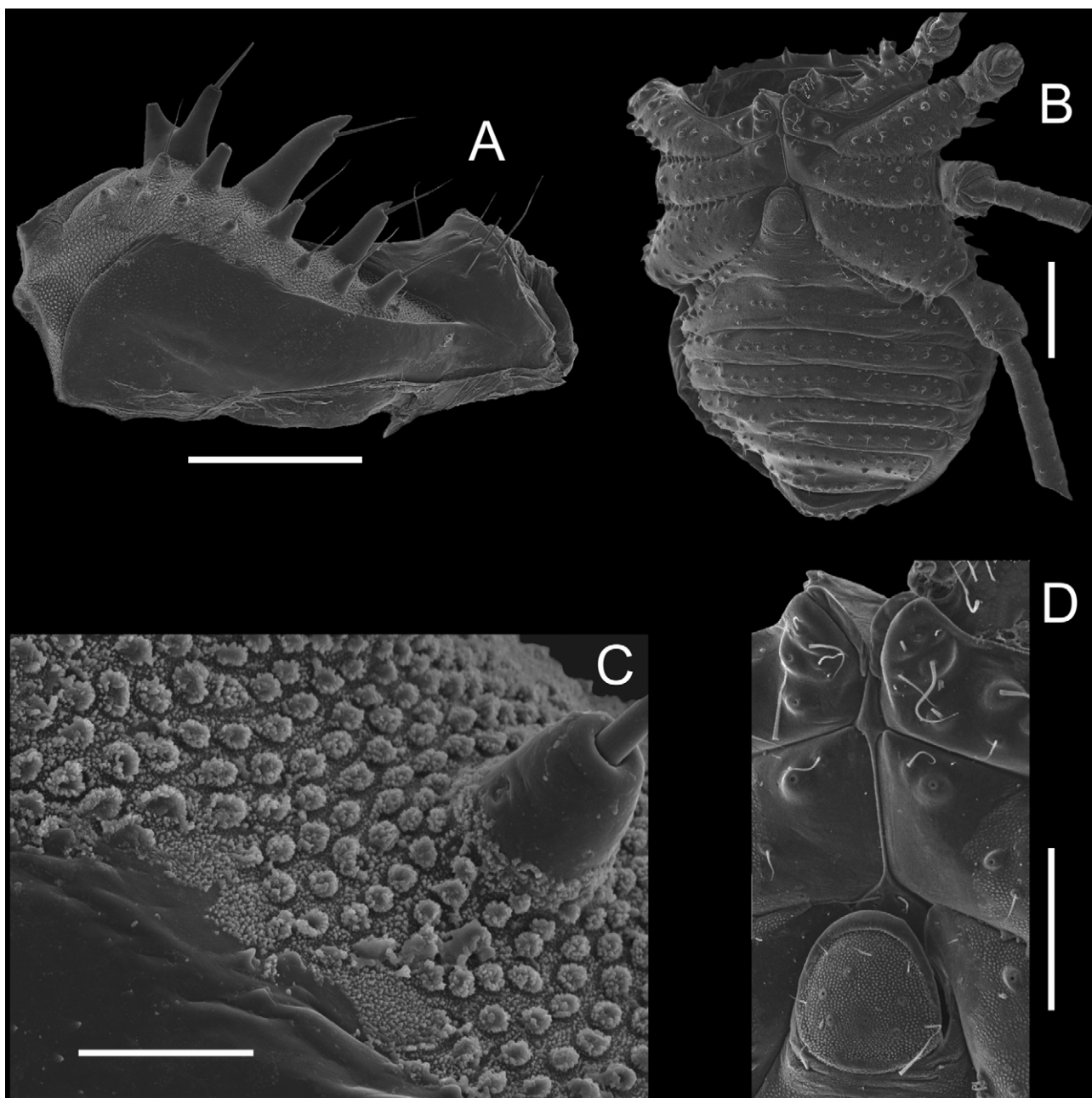


FIGURE 9. *Acumontia succinea* sp. nov., male paratype (USNM): A, right coxa I, ventral view; B, habitus, ventral view; C, detail of coxa I in ventral view; D, detail of sternum and genital opercle. Scale bars, A, D = 0.5 mm, B = 1 mm, C = 0.05 mm.

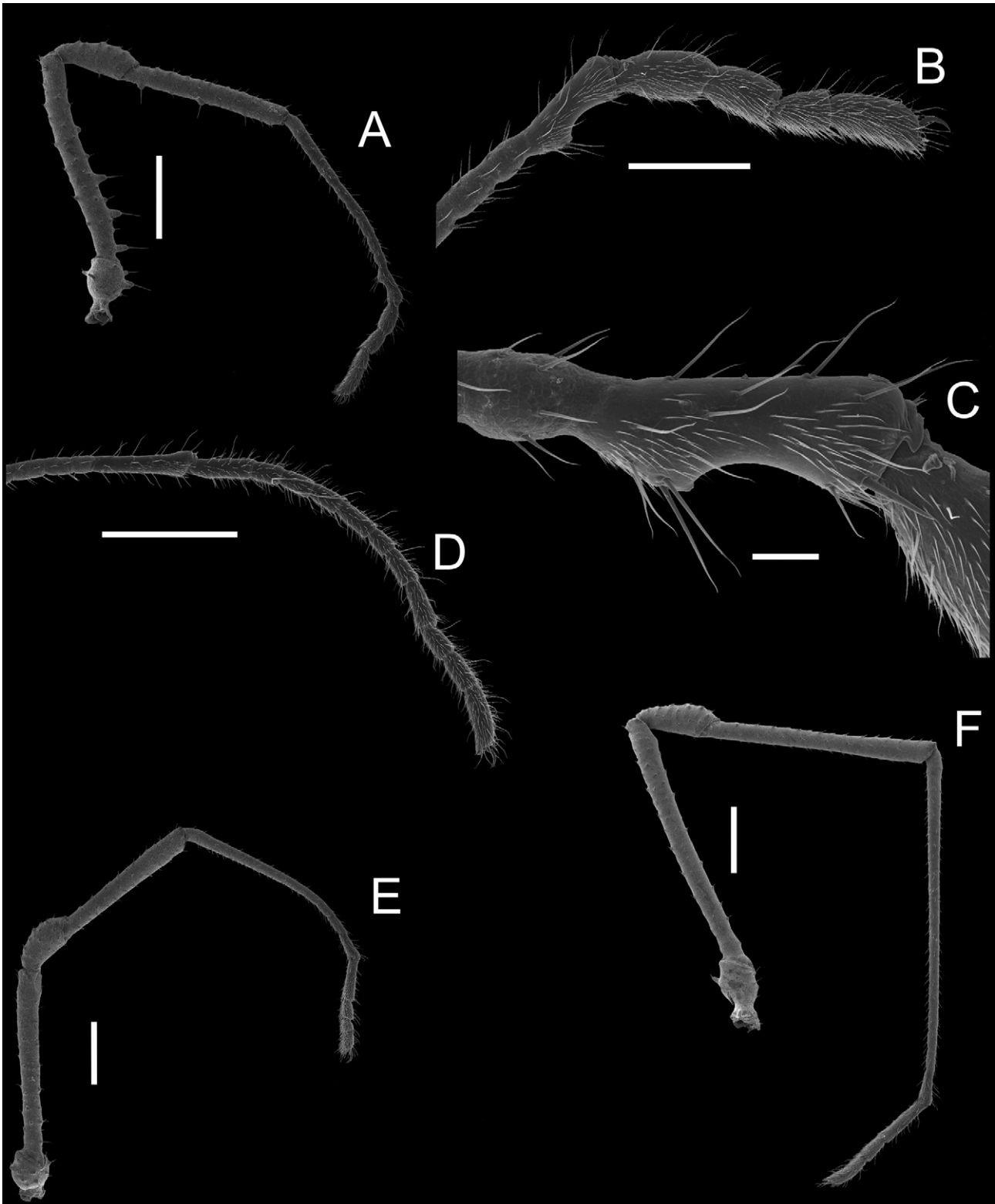


FIGURE 10. *Acumontia succinea* sp. nov., male paratype (USNM): A–C, right leg I, A, trochanter, femur, patella, tibia, metatarsus, tarsus; B, tarsus in detail; C, ventral notch of calcaneus; D, calcaneus and tarsus of right leg II; E, trochanter, femur, patella, tibia, metatarsus, tarsus of right leg III; F, trochanter, femur, patella, tibia, metatarsus, tarsus of right leg IV. Scale bars, A, D–F = 1 mm, B = 0.5 mm, C = 0.1 mm.

Color (in alcohol) (Fig. 6). Body and appendages Brownish Orange (54), legs, chelicerae and pedipalps loosely and small honeycomb-reticulated in Dark Brown (59). Patches of Dark Brown (59) on the following: anterior rim of carapace; on and around the ocularium spreading in wide honeycomb-pattern; mid portion of scutal areas,

including the main paired spines; a pair of elongate tongues running from posterior edges of carapace along laterals of mesotergum down to posterior corners of abdominal scutum. Posterior half of free tergite I and all free tergites II–III Dark Brown (59).

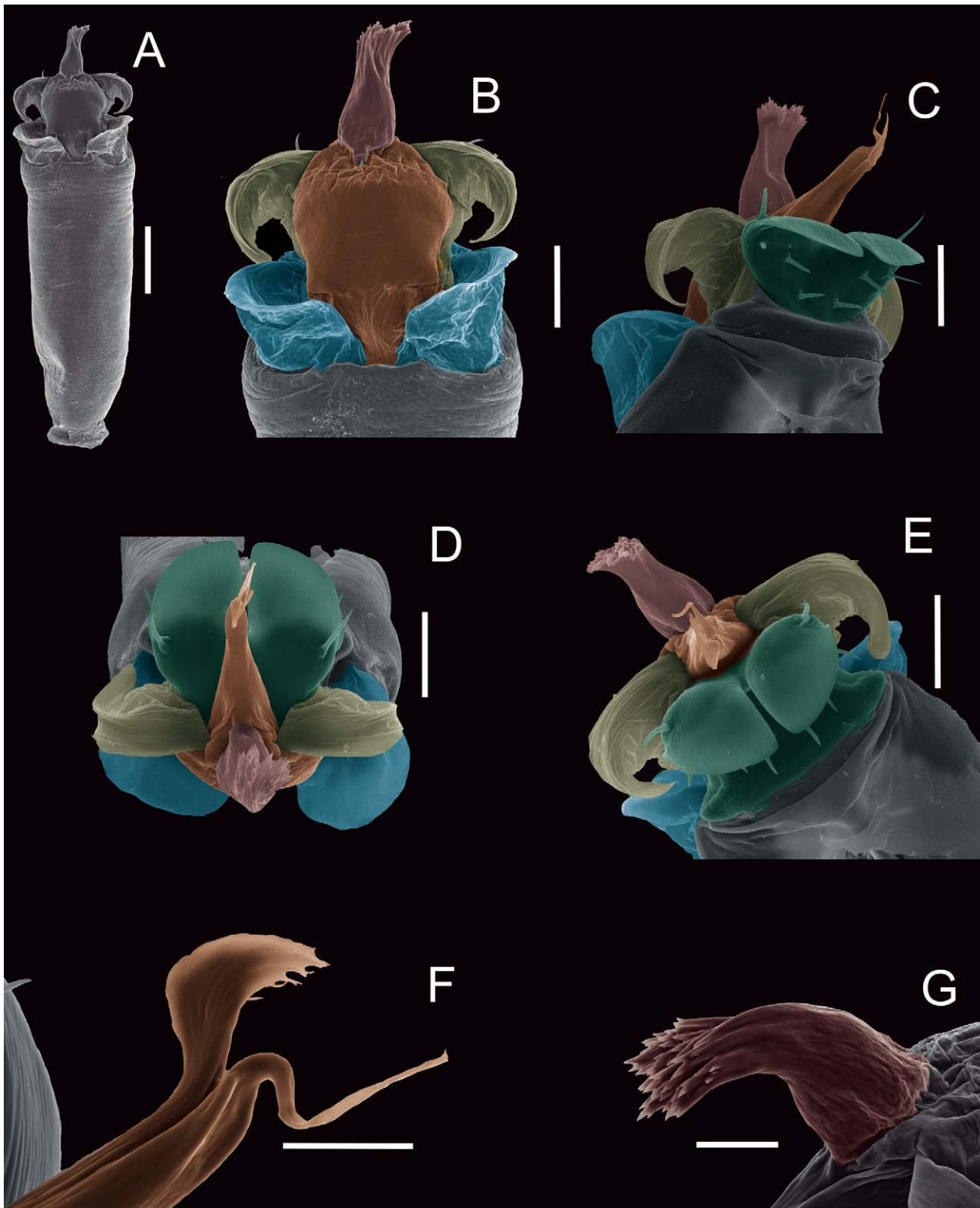


FIGURE 11. *Acumontia succinea* sp. nov., penis of male paratype (USNM): A, truncus and glans, dorsal view; B–E, distal part, B, dorsal view, C, ventrolateral view, D, apical view, E, ventral view, F, stylus and ventral process, lateral view, G, dorsal process, lateral view. Scale bars, A = 0.2 mm, B–E = 0.1 mm, F–G = 0.05 mm.

Genitalia: Ventral setiferous plate deeply cleft, dividing the plate into two halves, three pairs of ventral and one pair of dorso-marginal straight setae (Figs. 11C–E). Dorso-lateral plates ear-shaped, reaching half the complex of glans (Figs. 11A–C, E). Complex of stylus long, stylus thin and sinuous, with a ventral foliaceus (Fig. 11F) and a dorsal multi-pointed process (Fig. 11G). Complex of glans with a pair of lateral winglets (Figs. 11A–E).

Variation: Middle pair of tubercles of area II with lateral rounded tubercles (not spiniform like in the holotype). Sometimes two of the three dorsal tubercles in coxa IV are fused. Tarsal counts of legs I–IV in males 4(2)/10–12(3)/4/4.

Measurements: Males (n=5), carapace length 1.6–1.8, maximum width 2.8–3.3; abdominal scutum length 3.2–3.7, maximum width 3.6–4.7; Femur I 2.3–2.8, II 3.7–4.5, III 2.4–3.2, IV 3.6–4.2. Females (n=5), carapace length 1.6–1.8, maximum width 2.7–2.8; abdominal scutum length 2.4–4.1, maximum width 3.8–4.1; Femur I 2.1–2.6, II 3.4–4.0, III 2.5–3.2, IV 3.2–3.8.

Female. Identical to males in relation to the dorsal scutum armature. They lack the ventral notch on metatarsi I, body smaller and legs I and II with lower tarsal counts than males: 3(2)/8–10(3)/4/4.

Juvenile. Carapace length 1.8, maximal width 2.6; abdominal scutum length 3.2, maximal width 3.6; Femur I 1.9, II 3.1, III 1.9, IV 3.0.

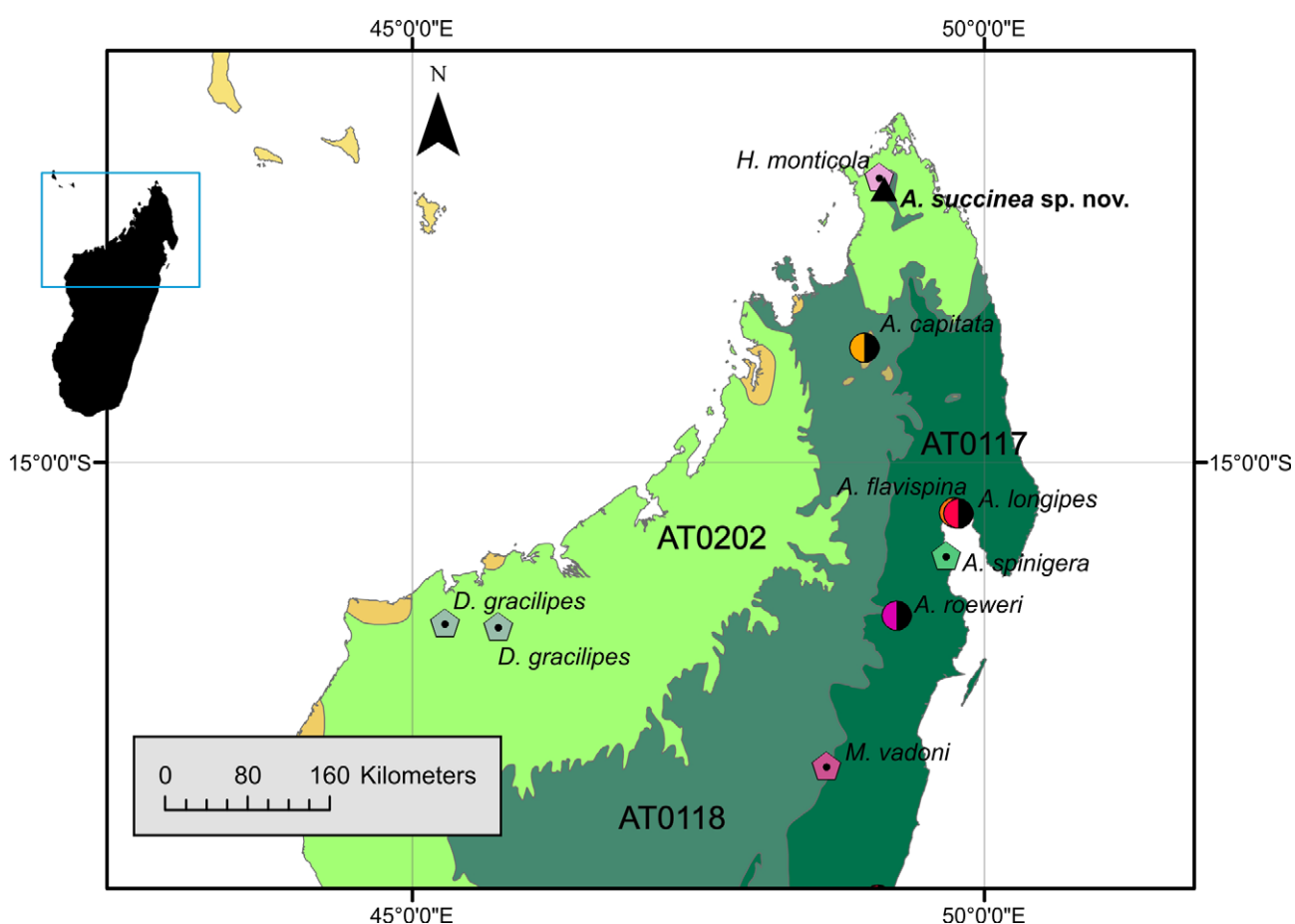


FIGURE 12. Northern Madagascar, showing distribution of the Triaenonychini in the WWF Terrestrial Ecoregions (AT = Afrotropical). Circles = *Acumontia* species; pentagons = minor genera; triangle = *Acumontia succinea* sp. nov.

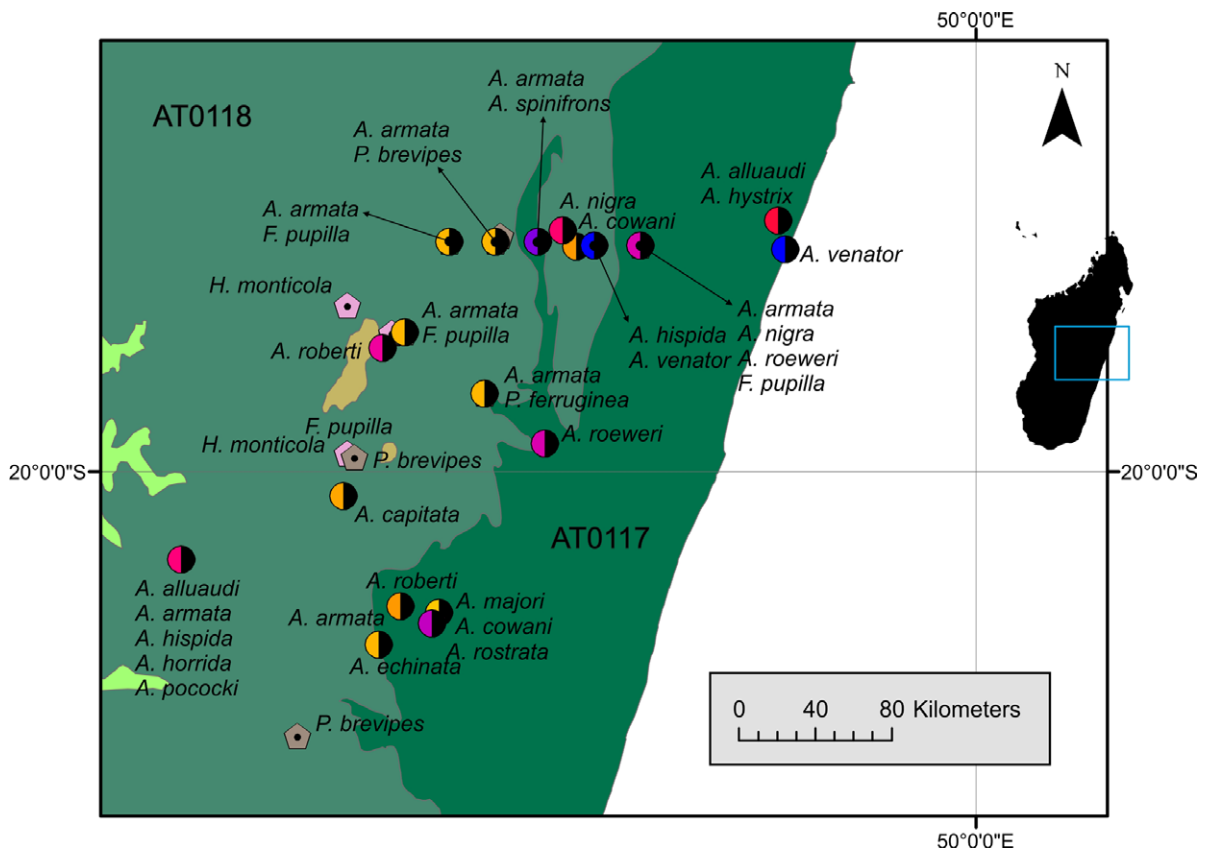


FIGURE 13. Central-eastern Madagascar, showing distribution of the Triaenonychini in the WWF Terrestrial Ecoregions (AT = Afrotropical). Circles = *Acumontia* species; pentagons = minor genera.

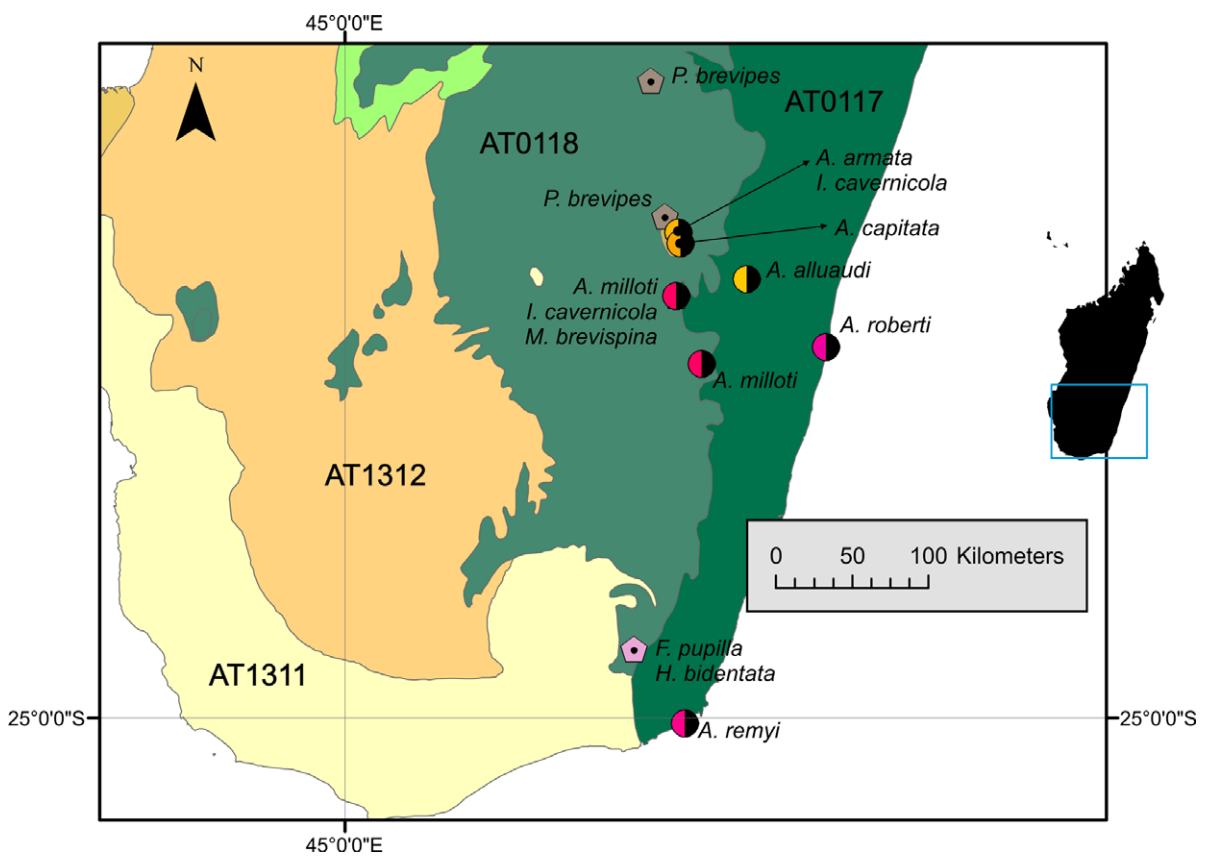


FIGURE 14. Southern Madagascar, showing distribution of the Triaenonychini in the WWF Terrestrial Ecoregions (AT = Afrotropical). Circles = *Acumontia* species; pentagons = minor genera. There are no members of the tribe in the xeric formations (prefix 13) in the southwest.

Discussion

The delimitation of genera of Triaenonychini of Madagascar needs to be investigated. The synonymies proposed by Staręga are accepted here because the diagnostic characters used by Lawrence overlap, especially when more specimens are studied, and there are no genitalic characters to support the external morphological separation. Currently five from the nine Malagasy triaenonychini genera are monotypic, two of them based solely on females (*Antongila* and *Ivohibeia*). In contrast, *Acumontia* retains 21 from the 32 species of the group. The genera *Flavonuncia* and *Hovanuncia* are quite different from other genera by, among other features, the absence of spines on the mesotergal areas and shape and armature of ocularium. But some other genera are based on morphological features that also occur in species allocated in *Acumontia*—leg I with more than five tarsomeres (*Millomontia*, *Millotonix*, *Acumontia flavispina* and *A. hystrix*), bases of spines of area III swollen and granulous (*Ivohibeia* and *Acumontia capitata*), small spines on mesotergal areas (*Paulianyx*, *Acumontia armata* and *A. capitata*). Those and other features (e.g., structure of armature of pedipalp) are probably useful to define natural groups. However, a detailed revision with a cladistic analysis is needed.

Acumontia succinea sp. nov. is here tentatively allocated in this genus because of its overall similarities with the morphology of *A. armata* (type species of the genus), and some other species like *A. majori*, *A. longipes* and *A. remyi*, as the armature of ocularium and dorsal scutum. Following the Roewerian system adopted by Lawrence (1931; 1959), the species would fall in *Paulianyx*, due to the males bearing four tarsomeres in leg I and females three. But besides being an artificial system, Lawrence (1959) reported the occurrence of five articles in one of the legs in some specimens of *P. brevipes* and *P. ferruginea*, which can also be seen in the drawing (Lawrence 1959: 25, fig. 5d). Moreover, *Acumontia* is the oldest genus, has priority over all the other morphologically similar genera (*Millomontia*, *Millotonyx*, *Paulianyx*, *Ivohibeia*, *Antongila*), and therefore is more stable nomenclaturally.

The Malagasy species of Triaenonychini seem to form a natural group (Mendes 2009): they share the strong pair of spines on area III, the notch on calcaneus of leg I, and a dorsal multi-pointed process in the complex of stylus. They also seem to be more closely related to the Triaenobunini and Adaeini (e.g., *Larifuga* Loman, 1898, *Adaeum* Karsch, 1880, *Triaenobunus* Sørensen, 1886) than to other Triaenonychini (e.g., *Triaenonyx* Sørensen, 1886, *Nuncia* Loman, 1902, *Equitius* Simon, 1880, *Ceratomontia* Roewer, 1915), sharing the presence of pustules all over the dorsal scutum, median spine continuous to the ocularium and the pair of lateral winglets in the complex of the glans.

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