On the genus *Neoscotolemon* (Opiliones: Laniatores: Samooidea *incertae sedis*) with the description of one new species[§]

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[§]*Contribution dedicated to the Cuban zoologist, and renowned arachnologist, Dr. Luis F. de Armas*, on the occasion of his 80th anniversary.

> *"Y ¿cómo quiere que en algunas líneas diga todo lo bueno y nuevo que pudiera yo decir de aquel enamorado de la belleza, que la quería en las letras como en las cosas de la vida, y no escribió jamás sino sobre verdades de su corazón (...)". José Martí, national hero and apostle of Cuban independence, referring to his teacher Rafael María de Mendive.*

Abstract

The genus *Neoscotolemon* Roewer, 1912, is herein reviewed and re-diagnosed for the first time using modern taxonomic standards. *Neoscotolemon* is removed from Grassatores *incertae sedis* and transferred to the superfamily Samooidea *incertae sedis*, **transl. nov.** The genera *Citranus* Goodnight & Goodnight, 1942, *Rula* Goodnight & Goodnight, 1942, and *Vlachiolus* Šilhavý, 1979, are considered **new subjective synonyms** of *Neoscotolemon* Roewer, 1912. *Neoscotolemon pictipes* (Banks, 1908) is redescribed and fully illustrated, including, for the first time, the external and genital morphology of males. *Neoscotolemon armasi* **spec. nov.** is described from Isla de la Juventud, Cuba. Five additional species are transferred to *Neoscotolemon*, including some that were newly ranked from subspecies to species: *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945) **comb. nov., stat. rest.**, *N. cotilla* (Goodnight & Goodnight, 1945) **comb. nov., nom. rest., stat. rest.**, *N. spinifer* (Packard, 1888) **comb. rest.**, *N. tancahensis* (Goodnight & Goodnight, 1951) **comb. nov., stat. prom.**, and *N. vojtechi* (Šilhavý, 1979) **comb. nov.** Finally, upon reexamination of *Neoscotolemon lutzi* Goodnight & Goodnight, 1942, the male genital morphology, herein illustrated for the first time, indicates that this species is not related to *Neoscotolemon* and is therefore transferred to *Metapellobunus* and combined as *Metapellobunus lutzi* (Goodnight & Goodnight, 1942) **comb. nov.** A map is provided showing the known distribution of *Neoscotolemon* in the southeastern USA, Cuba, Mexico, and Belize with doubtful and unconfirmed records in Jamaica and Cayman Islands. *Neoscotolemon* is characterized by multiple somatic and genitalic traits. Atop the hourglass-shaped scutum magnum, there is a widely-separated pair of eyes with a large spiniform apophysis placed between them. The pedipalps are robust, and in major males they are elongated and thickened. In major and minor males, the rectangular metatarsus III is enlarged, covered

with modified trichomes, and possesses aggregated pores distally. The penis has a ventral plate ending in a deep *calyx*, armed with two bilateral rows of macrosetae, and a short pointed stylus that is basally fused to two laminar conductors. Although the family allocation remains uncertain, the re-diagnosis of *Neoscotolemon*, together with the re-description of the type species, makes this an easily recognizable genus, among Samooidea, that now contains seven species.

Key words. Arachnida, Harvestmen, genitalia, taxonomy, sexual dimorphism

Introduction

The harvestmen (Opiliones) fauna of the Antilles is diverse, and the richness of endemic species (*e.g.*, Cokendolpher & Camilo-Rivera 1989, Armas *et al*. 2017, Kury 2003, Kury *et al.* in press) presumably reflects the complex geological and biogeographic history of the region studied in other arachnid groups (Chamberland *et al.* 2018, Shapiro *et al.* 2022, Cala-Riquelme *et al.* 2022). Micro-opiliones that inhabit leaf-litter and other cryptic microhabitats are particularly diverse. For example, there is a remarkable radiation of *Neoscotolemon* Roewer, 1912, in Cuba, with dozens of undescribed species (Pérez-González 2023), but efforts to describe this remarkable fauna have been largely impeded. The taxonomic impediment that exists can be attributed to three major gaps of knowledge:

1.- The female holotype of *Scotolemon pictipes* Banks, 1908, the type species of the genus *Neoscotolemon*, was described with insufficient details and few illustrations. The species has never been described using a modern taxonomic approach.

2.- The male morphology, including key morphological traits of the genitalia, remains unknown, making it difficult to delimit the species and associate it with possible congeners.

3.- The diagnosis of the genus is further complicated by a misplaced species. In addition to *N. pictipes*, the genus *Neoscotolemon* currently contains one other species, *Neoscotolemon lutzi* Goodnight & Goodnight, 1942, which is also poorly characterized taxonomically. Despite the limited data available in the original species descriptions, there are strong morphological differences between *N. pictipes* and *N. lutzi*.

The present contribution aims to solve these taxonomic impediments and provide a foundation upon which the uncharted diversity of *Neoscotolemon* can be described and documented in future works.

Taxonomic background. The taxonomic history of *Neoscotolemon* began when Roewer (1912a) established a largely influential, non-natural and typologic systematic scheme for Phalangodinae. The Roewerian system for Phalangodinae was based on two somatic characteristics. First, he divided the subfamily according to five different types of *ocularia* defined by the relative position on the carapace and the armature. Second, the groups were divided according to four different patterns of tarsomere numbers on legs I and II. Following this scheme, the phalangodines with an oval *ocularium*, located far from the frontal margin of the carapace, and armed with an apical spiniform apophysis were divided by Roewer into two different groups. The first group comprised the monotypic genera *Metaconomma* (type species *M. femorale* Pickard-Cambridge, 1905) and *Hoplobunus* (type species *H. barretti* Banks, 1900) were diagnosed by having three tarsomeres on basitarsus I (*i.e.*, more than four tarsomeres in total). The second group, diagnosed by having two tarsomeres on basitarsus I (*i.e.*, four tarsomeres in total), was composed of the species *Phalangodes spinifera* Packard, 1888, and *Scotolemon pictipes* Banks, 1908. Roewer (1912a) united these latter two species in a new genus, *Neoscotolemon*, without designating a type species and without examining the type specimens or any other relevant materials.

The genus was expanded to briefly include three species when *Neoscotolemon lutzi* Goodnight & Goodnight, 1942, was described from Dominica, an island in the Lesser Antilles. Goodnight & Goodnight (1942a) pointed out that *N. lutzi* is related to *N. pictipes*, but that *N. lutzi* has an *ocularium* with a straight (rather than curved) spiniform apophysis and five (rather than four) tarsomeres on legs III and IV. Later that year, Goodnight & Goodnight (1942b) examined Packard's type specimen of *Phalangodes spinifera*, and concluded that this species does not belong to the genus *Neoscotolemon* or to the subfamily Phalangodinae; therefore, they transferred the species to a new genus *Rula* Goodnight & Goodnight, 1942, in the subfamily Stygnommatinae. Also in this work, after examining Banks' holotype of *Scotolemon pictipes*, Goodnight & Goodnight (1942b) proposed the subsequent designation of this binomen as the type species of the genus *Neoscotolemon* and kept *N. pictipes* within Phalangodinae. They also clarified that the type specimen had five tarsomeres, and not four as Banks had originally stated. Thus, the main difference between *N. pictipes* and *N. lutzi*, stated in Goodnight & Goodnight (1942a), was reduced to a spiniform apophysis on the *ocularium* that was either curved or straight.

The description of *Neoscotolemon caheni* Rambla, 1980 from Napo, continental Ecuador, increased the number of species in the genus to three once again. However, Rambla was emphatic in criticizing the Roewerian system when she stated that "some [of] Roewer's genera, have not been correctly delineated" and therefore "the use of Roewer's genus *Neoscotolemon*, does not imply acceptance, but only recognition of it, until generic revision be completed" (Rambla 1980: 2). Because of her doubts about the genus *Neoscotolemon*, Rambla (1980) proposed other potential relationships, based on the morphology of the *ocularium*, between *N. caheni* and members of *Stygnomma* and *Pachylicus*.

In the *Annotated catalogue of the Laniatores of the New World*, Kury (2003) confirmed the distrust of Rambla (1980) and removed *Neoscotolemon caheni* from *Neoscotolemon* considering this species as a junior subjective synonym of *Exlineia rhinoceros* Mello-Leitão, 1945, Zalmoxidae (currently *Phalangodella rhinoceros*, Zalmoxoidea *incertae sedis*, Kury & Pérez-González 2015). In addition to restricting *Neoscotolemon* to two species, *N. pictipes* and *N. lutzi*, Kury (2003) removed the genus from Phalangodidae, and instead treated it as Grassatores *incertae sedis*. This has been the *status quo* (Kury *et al.* 2023) until the present work.

Materials and methods

Specimen repositories and collections acronyms. The specimens examined for this work were borrowed from the following zoological collections: Arachnida & Myriapoda collection of American Museum of Natural History (AMNH), New York, United States of America; Zoological Collection of the Instituto de Ecología y Sistemática (CZACC), La Habana, Cuba; National Collection of Arachnology of the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" (MACN-Ar), Buenos Aires, Argentina; Invertebrate Zoology Collection of the Museum of Comparative Zoology (MCZ), Harvard University, Cambridge, United States of America; National Museum of Natural History, Smithsonian (USNM), Washington DC, United States of America; Colección Nacional de Arácnidos (CNAN) of the Universidad Nacional Autónoma de México (UNAM), Ciudad de México, México.

Specimen preparations and description. Specimens were examined using a Leica M205A stereomicroscope, and different focal plane pictures were taken with a Leica DF295 digital camera (MACN) and Keyence VHX-6000 digital microscope (MCZ). Illustrations

were performed on a Wild Heerbrugg M5 and a Leica M165C stereoscopic microscope, both equipped with a *camera lucida*. The drawings included in this publication were made in two different times. In 1993, APG made the drawings of the holotypes of *Rula bolivari* Goodnight & Goodnight, 1945; *Rula cotilla* Goodnight & Goodnight, 1945; *Phalangodes spinifera* Packard, 1888; and *Stygnomma spinifera tancahensis* Goodnight & Goodnight, 1951; and *Vlachiolus vojtechi* Šilhavý, 1979. All other drawings were created more recently. Due to the huge lapse of time, different optical equipment, and taxonomic experience, differences in styles and accuracy can be detected among the drawings.

Male genitalia were prepared using glycerin as a clearing agent, following Acosta *et al.* (2007), and were drawn using a *camera lucida* attached to an Olympus BH3 microscope. To expand male genitalia, they were placed in hot lactic acid, followed by distilled water (Schwendinger & Martens 2002). Specimens for scanning electron microscopy (SEM) were dissected and the body, appendages, and genitalia were dehydrated via 80%–90%–96%–100% ethanol series and affixed to aluminum stubs with conductive adhesive copper tape. Mounted samples were sputter-coated with 10 nm of gold and examined and photographed using a Philips XL30 TMP New Look scanning electron microscope and a Zeiss GeminiSEM 360 microscope at the MACN.

Morphological nomenclature follows Pérez-González & Kury (2007), Kury & Medrano (2016), Wolff *et al.* (2016), and Gnaspini & Rodrigues (2011). Some new conventions were adopted here to describe the morphology of the male genital organ (penis) of *Neoscotolemon*. The macrosetae of the penis in *Neoscotolemon* are symmetrical bilaterally and were coded from dorsal to ventral as: basal row (B) pairs: B1, B2, B3, and B4 (left and right), and the apical row (A) pairs: A1, A2, and A3 (left and right) (*e.g.*, Fig. 5F–G). The

two thin laminar projections on the dorsal part of the *calyx* are herein called "wings" (*e.g.*, Fig. 5F, J), and the dorsomedial cleft of the *pars distalis* is herein called "neckline" (*e.g.*, Fig. 5B, F).

The major/minor male dimorphism nomenclature follows Buzatto & Machado (2014), and herein is used as a putative condition because it was not quantitatively tested. Measurements are given in millimeters (mm). Descriptions of colors follow Kury and Orrico (2006) using the standard names of the 267 Color Centroids of the NBS/IBCC Color System (http://people.csail.mit.edu/jaffer/Color/Dictionaries#nbs-iscc). Drawings were vectorized, and plates were prepared in CorelDRAW Graphics Suite 2023 (24.3.0). The distribution map was created by SimpleMappr (Shorthouse 2010).

Abbreviations: Lat. *translatio nova* = **transl. nov.** (new transfer/assignment); Lat. *speciēs nova* = **spec. nov.**; Lat. *combīnātiō nova* = **comb. nov.** (= new combination); Lat. *combīnātiō restaurata* = **comb. rest.** (= reinstated or restored combination); Lat. *synōnymum novum* = **syn. nov.** (= new synonym); Lat. *synonymus resurrectus*/ *restitutus* = **syn. res.** / **syn. rest.** (= resurrected/restored synonym); Lat. *nomen restitūtum* = **nom. rest.** (= name revalidated or reinstated from synonymy); Lat. *status promotus* / *status demotus* / *status restitutus* = **stat. prom.** / **stat. dem.** / **stat. rest.** (= promoted status / demoted status / reinstated or restored status); Lat. *partim* = **part.** (= partly, in part).

Taxonomy

Opiliones

Laniatores

Grassatores

Samooidea *incertae sedis*

***Neoscotolemon* Roewer, 1912**

Neoscotolemon Roewer 1912a: 149; 1923: 112; 1927: 272; Walker 1928: 157; Goodnight & Goodnight 1942b: 13; Rambla 1980: 2; Kury 2003: 26. [Type species: *Scotolemon pictipes* Banks, 1908, by subsequent designation in Goodnight & Goodnight 1942b: 13]

Citranus Goodnight & Goodnight 1942b: 4. [Type species: *Citranus marquesas* Goodnight & Goodnight, 1942, by original designation. Junior subjective synonym of *Stygnomma* Roewer, 1912, by Goodnight & Goodnight 1951: 3] **Syn. nov.**

Rula Goodnight & Goodnight 1942b: 13. [Type species: *Phalangodes spinifera* Packard, 1888, by original designation. Junior subjective synonym of *Stygnomma* Roewer, 1912, by Goodnight & Goodnight 1951: 3] **Syn. nov.**

Vlachiolus Šilhavý 1979: 6; Kury 2003: 224. [Type-species: *Vlachiolus vojtechi* Šilhavý, 1979, by original designation] **Syn. nov.**

Synonymy justification. We proposed to remove the genera *Citranus* and *Rula* from synonymy with *Stygnomma; Citranus* and *Rula* are herein treated as junior synonyms of the genus *Neoscotolemon*. The type species of *Citranus*, *C. marquesas* Goodnight & Goodnight, 1942, is a junior subjective synonym of *Phalangodes spinifera* Packard, 1888, the type species of the genus *Rula*. The somatic and genital morphology of *Phalangodes spinifera* Packard, 1888, agree with the diagnosis of *Neoscotolemon* (see below). Therefore, according the principle of priority of the International Code of Zoological Nomenclature (ICZN 1999), we considered *Neoscotolemon* Roewer, 1912, as the senior name and

Citranus Goodnight & Goodnight, 1942, and *Rula* Goodnight & Goodnight, 1942, as junior subjective synonyms.

The genus *Vlachiolus* is monotypic and the type species, *V. vojtechi*, is based on only the female holotype. Therefore, the genus diagnosis lacks the male genital morphology. Nevertheless, the somatic characteristics of *V. vojtechi* fully agree with that of *Neoscotolemon* spp. females, including the pedipalp spination, basichelicerite without a well-marked *bulla*, hourglass-shaped *scutum magnum* with wide separated eyes on the carapace, *ocularium* barely defined with the inter-ocular area elevated and armed with a median strong spiniform apophysis. All those characteristics supported our decision to consider *Vlachiolus* Šilhavý, 1979, a junior subjective synonym of *Neoscotolemon* Roewer, 1912.

Placement. *Neoscotolemon* was originally described in Phalangodinae and removed to Grassatores *incertae sedis* by Kury (2003). We herein transfer it to Samooidea *incertae sedis*, **transl. nov.** The transference is based on the combination of the following characteristics: hourglass body, basichelicerite elongated and without a well-marked *bulla*, males with samooidean-type metatarsus III where the calcaneus largely invaginates the astragalus ventrally, *capsula interna* of the penis largely invaginating the truncus *pars distalis* with telescopic hydraulic expansion (*i.e.*, not articulated with the truncus as a jack-knife as in Zalmoxoidea).

Diagnosis. Members of *Neoscotolemon* Roewer, 1912, can be distinguished from all other Samooidea genera by the combination of the following morphological characteristics: hourglass-shaped scutum magnum with wide separated eyes on the carapace, *ocularium* barely defined, inter-ocular area elevated and armed with a median strong spiniform apophysis. Sexual dimorphism is strongly evident with males exhibiting

very long and strong pedipalps, with a tarsus remarkably enlarged and a characteristic metatarsus III with a flattened calcaneus ventrally invading a large portion of the astragalus. The modified calcaneus III is covered by uniformly-distributed furcate trichomes with a rounded or paintbrush-shaped tip; distally, there is a group of aggregated pores, surrounded by a dense bundle of fine acuminate trichomes. *Pars distalis* of penis with a dorsomedial neckline of variable depth and with a ventral plate ending in a deep *calyx* and armed with two rows (apical and basal) of macrosetae arranged bilaterally; *capsula externa* with *follis* invaginated, not visible in the resting condition of the penis, and *capsula interna* with a pointed stylus flanked by two laminar conductors fused only at the base.

Etymology. Combination of the Greek νέος, Lat. *neos* , *nea* [= new] and the pre-existing genus name *Scotolemon*. Grammatical gender: masculine.

Species included: *Neoscotolemon armasi* **spec. nov.**, *N. bolivari* (Goodnight & Goodnight, 1945) **comb. nov., stat. rest.**, *N. cotilla* (Goodnight & Goodnight, 1945) **comb. nov., nom. rest., stat. rest.**, *N. pictipes* (Banks, 1908), *N. spinifer* (Packard, 1888) **comb. rest.**, *N. tancahensis* (Goodnight & Goodnight, 1951) **comb. nov.**, **stat. prom.**, *N. vojtechi* (Šilhavý, 1979) **comb. nov.**

Geographical distribution: UNITED STATES OF AMERICA (Southern Florida), CUBA, CAYMAN ISLANDS, MÉXICO (Yucatán Peninsula), and BELIZE.

Unconfirmed record: JAMAICA

***Neoscotolemon pictipes* (Banks, 1908)**

Zoobank-CodeXXXXXXX

(Figs 1–6, 39)

Scotolemon pictipes Banks 1908: 38, fig. 3; 1909: 171.

Neoscotolemon pictipes: Roewer 1912a: 150; 1923: 113, fig. 113 a–b; Goodnight & Goodnight 1942a: 4; Rambla 1980: 2; Kury 2003: 26.

Type material. Holotype: f# (MCZ 26121, examined), CUBA, near Havana, C.F. Baker *leg.*

Other material examined. CUBA: 6 m# (one photo voucher and one SEM voucher), 9 f# (one photo voucher and one SEM voucher), (MACN-Ar 46949), Artemisa, San Antonio de los Baños, forest next to Ariguanabo River [22.89538°, -82.502977°], 15-Jan-2011, A. Pérez-González, A. L. Carbajal de la Fuente & L. F. de Armas *leg.* • 1 m#, 2 f#, (CZACC), Artemisa, San Antonio de los Baños, marginal forest of Ariguanabo River, 4-May-1984, L. F. Armas *leg.*

Comparative diagnosis. *Neoscotolemon pictipes* can be distinguished from the rest of the species in the genus by the coarse granulation of the mesotergal areas, free tergites, and anal operculum, which lack any notably pointed tubercles (Figs 1A–C; 2A–B, D, F; 6A–B, D–E, G–H, J–K). *Neoscotolemon pictipes* can also be easily separated from *N. armasi* **spec. nov.** by the absence of a pseudochela in the pedipalp tarsus of males (Fig. 3A–B *vs.* Fig. 8E). In *N. pictipes*, the wide *calyx* in the penis ventral plate, dorsally open and with a pair of wings (Fig. 5B, F), distinguishes it from *N. cotilla* which has a narrow and reduced calyx, without wings (Fig. 21A, F).

Redescription. Male (MACN-Ar 46949). Body measurements: Total body length 2.60, carapace length 0.96, *scutum magnum* length 2.25, maximum carapace width 1.40, maximum abdominal *scutum* width 1.94. Appendage measurements in Table 1.

Dorsum: Outline slightly hourglass-shaped with an Eta (η) shape, with a constriction slightly posterior to eye level (Figs 1A; 2A). Carapace with scattered granules, wider than long, with a rounded and marked frontal hump; anterior border slightly convex, each lateral corner with two or three small tubercles (Fig. 2A). Cheliceral sockets not marked (Fig. 2A). Eyes separated, slightly posterior to the medial region of the carapace, located at the base of a poorly defined *ocularium* with a wide base and apically armed with a long, forward-slanted spiniform apophysis; *ocularium* extends from the posterior of the carapace to just before the frontal hump (Figs 1C; 2A, D). Abdominal *scutum* in lateral view convex (Figs 1C; 2D). Sulcus I deep and well-marked, in dorsal view, curved to the posterior body region (Fig. 2A, D). Mesotergal areas coarsely granulated and not well defined (Fig. 2A). Mesotergal areas I─II with larger medial conical setiferous granules (Fig. 2A, D); mesotergal areas III–IV with two rows of larger conical setiferous granules, medial granules slightly longer than lateral granules (Fig. 2A, D). Mesotergal area V with two rows of small conical setiferous granules (Fig. 2A, D). Lateral borders with two rows of granules, the inner row consisting of setiferous granules (Fig. 2A, D). Ozopore with an oval, narrow, and elongated orifice with a descending channel that extends toward the posterior region (Fig. 2E). Free tergites granulated; with two rows of setiferous granules, granules of posterior row longer than anterior row; free tergite I–II with medial setiferous granules slightly longer and more conical than lateral granules (Fig. 2A, D, F).

Venter: Coxae I–IV with setae and small granules; coxa I with setiferous granules (Fig. 2B); anteroposterior borders of coxa III with a row of strong granules connecting with coxae II and IV, respectively (Fig. 2B–C). Free sternites with a row of setiferous granules; posterior border of the spiracular area and free sternites I–IV with a row of setiferous

granules; free sternite V and anal operculum with several conspicuous setiferous granules (Fig. 2B, D, F–G). Spiracles not concealed (Fig. 2B).

Chelicerae: Basichelicerite unarmed, with an elongated and slightly marked *bulla* (Fig. 3E–F). Cheliceral hand with sparse setae and small frontal setiferous granules (Fig. 3E–G). Movable finger with a medio-distal lamina bearing sub-square teeth; fixed finger with a proximal conical tooth (Fig. 3G).

Pedipalps: Coxa elongated (*i.e.*, remarkably longer than trochanter), proximally with one dorsomesal and one ventroectal setiferous granule (Fig. 1A–B). Trochanter rounded, with three dorsal and one mesal pointed setiferous tubercles, plus three ventral pointed setiferous tubercles (Fig. 3A–B). Femur dorsally convex; ventrally armed with a row of six small ectal setiferous pointed tubercles, with the fifth distal tubercle being longest (Fig. 3B); ventroproximally with two long spines, fused at the base; mesal surface with a medial spine followed by one setiferous pointed tubercle (Fig. 3A–B). Patella short, ventrodistally with one mesal spine and one ectal setiferous pointed tubercle (Fig. 3A–B). Tibia ventromesally with three spines, increasing in size from proximal to distal (Fig. 3A); ventroectally with one proximal spine, followed by one setiferous pointed tubercle and two spines fused at the base, the longest spine featuring an apical square-shaped projection; ventral surface with several small granules (Fig. 3B). Tarsus remarkably elongated, incrassate, and ventrally flattened (Fig. 3A–B); ventromesally with one proximal setiferous pointed tubercle, followed by a row of five spines, the second and fifth spines being the largest (Fig. 3A); ventroectally with three spines interspersed with two setiferous pointed tubercles (Fig. 3B). Claw notably short, robust, and triangular (Fig. 3A–C). Setae of spines covered with microtrichia (Fig. 3D).

Legs: Coxae II and IV with setiferous granules on dorsolateral surface (Fig. 2B, D). Femur I–IV with one retrolateral and one prolateral longitudinal row of ventral setiferous conical tubercles (Fig. 4A). Metatarsus III rectangular, swollen at calcaneus region (Figs 4A–B; 6I); calcaneus occupies the distal region of the metatarsus, ventrally with rounded trichomes and some lateral sensilla chaetica flanking the calcaneus (Fig. 4B–C, E); apical region of calcaneus with a high concentration of acuminate trichomes densely covering numerous aggregated pores (glandular function?) (Fig. 4C–D). Tarsi III–IV without scopula and modified spatulate setae (Fig. 4F). Tarsal formula: 4(2):7–8(3):5:5.

Color (specimen preserved in 80% ethanol): General body appearance dark brown; carapace and appendages light yellowish-brown and with dark brown reticulations; coloration at the chelicerae insertion level is lighter, creating a false appearance of a marked cheliceral socket (Fig. 1A); lateral margin of abdominal *scutum* with the outer line dark brown and the inner line yellowish-brown (Fig. 1A); abdominal *scutum*, mesotergal area V, and free tergites dark brown (Fig. 1A); coxae I–IV yellowish-brown and with dark brown reticulations; posterior border of stigmatic area, free sternites, and anal operculum dark brown (Fig. 1B).

Genitalia: General shape of penis tubular, with a blunt rectangular apex (Fig. 5A, C); boundary poorly defined between *pars basalis* and *pars distalis* (Fig. 5A, C). *Pars distalis* with a ventral plate ending in a deep *calyx*; *calyx* dorsally open with two thin laminar projections (wings) (Fig. 5 B, F, J); dorsally, *pars distalis* with a medial deep neckline (Fig. 5B, F). *Pars distalis* armed with two groups of macrosetae bilaterally arranged: a basal row of four pairs (B1–B4) extending from the dorsal cleft to the ventrolateral region (Fig. 5B, F), and an apical row (A1–A3) located on the ventrolateral

region of the *calyx* (Fig. 5D–E, G–H). *Capsula externa* with *follis* invaginated and not visible in resting position (Fig. 5B, F). *Capsula interna* with two laminar conductors, arrow-shaped apically (*i.e.*, medially pointed and with two lateral projections) (Fig. 5B–C, F, I); conductors flank a shorter laminar pointed stylus (Fig. 5B, D, F, J).

Female (holotype, MCZ 26171; MACN-Ar 46949). Body measurements: Total body length 2.98, carapace length 0.74, *scutum magnum* length 1.92, maximum carapace width 1.20, maximum abdominal *scutum* width 1.89. Appendage measurements in Table 1. Females resemble male in terms of the armature of the *scutum magnum*, but with granules slightly smaller (Fig. 6A–B, D–E *vs.* Fig. 6G–H). Female also differs from male by having a shorter pedipalp, with smaller spines; trochanter of pedipalp with a small dorsal tubercle; tarsus of pedipalp not elongated and enlarged, armed with four ventromesal spines and ventroectally with one setiferous tubercle between the two most distal spines; claw elongated, thin, and highly pointed (Fig. 6B, E). Metatarsus III not swollen, lacking aggregated pores and associated setae, and without the deep invagination of the astragalum by the calcaneus (Fig. 6C, F *vs.* Fig. 6I). Tarsal formula 4(2):7(3):5:5.

Distribution. The only precise locality known for this species is the marginal forest of the Ariguanabo River in San Antonio de los Baños, Artemisa, Cuba (Fig. 39).

Spurious Record: CUBA, Pinar del Río, North of Viñales, September 16, 1913, F. E. Lutz (AMNH, examined) (Goodnight & Goodnight 1942a). This specimen is a female and belongs to an undescribed species (pers. obs.).

***Neoscotolemon armasi* spec. nov.**

Zoobank-CodeXXXXXXX

(Figs 7–11, 39)

Type material. Holotype: m# (CZACC), CUBA, Isla de la Juventud, Nueva Gerona, Presa El Abra [approx. 21.855°, -82.824°], Apr-1974, L. R. Hernández *leg.*

Etymology. The species epithet is a patronym, honoring the Cuban zoologist Luis F. de Armas in recognition of his enormous and fundamental contribution to arachnology and natural history of Central America and the Caribbean.

Comparative diagnosis. *Neoscotolemon armasi* **spec. nov.** is distinguished from all other species of *Neoscotolemon* by the male pedipalp with markedly reduced spines and an enlarged tarsus ending in a pseudochela (Figs 7E; 8B–E), as well as a row of five long pointed setiferous tubercles on free tergite III (Figs 7A; 8A) and the presence of a lateral U-shaped cleft in the penis between the basal macrosetae B2 and B3 (Fig. 11B–D). *Neoscotolemon armasi* **spec. nov.** differs from *N. cotilla* by having a wide *calyx* in the penis ventral plate, which is dorsally open rather than a narrow and closed one as in *N. cotilla* (Fig. 11B *vs.* Fig. 20B), and from males of *N. spinifer* and *N. tancahensis* by lacking enlarged setiferous pointed tubercles in the lateral regions of free tergite III (Figs 7A; 8A *vs.* Figs 22A; 23A; 24A; 29A; 30A; 31A).

Description. m# (holotype, CZACC). Body measurements: Total body length 2.87, carapace length 0.93, *scutum magnum* length 2.21, maximum carapace width 1.34, maximum abdominal *scutum* width 1.89. Appendage measurements in Table 2.

Dorsum: Outline slightly hourglass-shaped with an Eta (η) shape, with a constriction posterior to eye level (Figs 7A; 8A). Carapace granulated, wider than long; frontal hump

not well marked; anterior border slightly convex, each lateral corner with two conical tubercles (Figs 7A; 8A). Cheliceral sockets not marked (Figs 7A; 8A). Eyes separated, slightly posterior to the medial region of the carapace, located at the base of a poorly defined *ocularium* with a wide base and apically armed with a long, forward-slanted spiniform apophysis; *ocularium* extends from the posterior of the carapace to just before the frontal hump (Fig. 7E). Abdominal *scutum* in lateral view convex (Fig. 7E). Sulcus I deep and well-marked, in dorsal view curved to the posterior body region (Figs 7A, E; 8A). Mesotergal areas coarsely granulated and not well defined (Figs 7A, E; 8A). Mesotergal areas I─II with a medial row of small conical setiferous granules; mesotergal areas III–IV with a row of small conical setiferous granules (Figs 7E; 8A). Mesotergal area V with a posterior row of conical setiferous granules, the medial granule slightly longer (Figs 7A, E; 8A). Lateral borders with two rows of granules (Fig. 8A). Free tergites granulated; free tergites I–II with a posterior row of conical setiferous granules and a long pointed medial tubercle; free tergite III with a row of five long setiferous tubercles, medial tubercle longer than lateral ones (Figs 7A, E–F; 8A).

Venter: Coxae I–IV with setae and small granules; coxa I with setiferous granules; lateroanterior and posterior borders of coxa III with a row of strong granules connecting with coxae II and IV, respectively (Fig. 7B–C); posterior border of the spiracular area and free sternites I–V with a row of setiferous granules (Fig. 7B, D); anal operculum with setiferous tubercles (Fig. 7B, D–F). Spiracles not concealed (Fig. 7D).

Chelicerae: Basichelicerite unarmed, with an elongated and slightly marked *bulla* (Fig. 8F). Cheliceral hand with sparse setae and frontal setiferous granules (Fig. 8F–H).

Fixed finger with a large proximal conical tooth followed by a few small conical teeth (Fig. 8G–H).

Pedipalps: Coxa elongated (*i.e.*, remarkably longer than trochanter), armed with one dorsomesal and one dorsoectal protuberance (Fig. 8A); ventrally with two ectal setiferous granules (Fig. 7C). Trochanter rounded, with one dorsal pointed setiferous tubercle slanted forward (Fig. 8C); ventrally with three small mesal setiferous granules (Fig. 8B). Femur dorsally convex, ventrally with two distal small ectal setiferous tubercles, distal tubercle smaller than proximal (Fig. 8C–D); ventroproximally with two spines (Fig. 8B–D); ventromedial surface with one mesal spine fused laterally with a setiferous tubercle, followed by a distal setiferous tubercle (Fig. 8B, D). Patella short, ventrodistally with one mesal spine (Fig. 8B). Tibia ventromesally with three small spines, increasing in size from proximal to distal (Fig. 8B); ventroectally with one proximal spine, followed by one small setiferous tubercle and two spines fused at the base (Fig. 8C); ventral surface with small granules (Fig. 8B). Tarsus enlarged, incrassate, and ventrally flattened (Figs 7E; 8B–C); ventromesally with a row of five spines, the second and fifth spines largest (Fig. 8B); ventroectally with three spines, the most distal spine largest (Fig. 8C); inner to the most distal spine, a long sclerotized projection forms a pseudochela with the claw (Fig. 8C, E). Claw short, robust, with mesal margin straight, ectal margin proximally concave in contact with the distal projection of the tarsus, and distally with a convex projection (Fig. 8E).

Legs: Coxae II and IV with setiferous granules on dorsolateral surface (Fig. 7C). Metatarsus III swollen at calcaneus region (Figs 9A–B; 10A–C), with a rectangular shape; calcaneus extends from the third proximal region of the metatarsus (Figs 9A–B; 10B–C), ventrally with paintbrush-shaped trichomes with multifurcate tips and some sensilla

chaetica (Fig. 10E, F); apical region of the calcaneus with a high concentration of acuminate trichomes densely covering numerous aggregated pores (glandular function?) (Fig. 10D). Tarsi III–IV without scopula and modified spatulate setae. Tarsal formula: 4(2):7(3):5:5.

Color (specimen preserved in 80% ethanol): General body appearance yellowish-brown (Fig. 7); appendages light yellowish-brown; coloration lighter at the level of cheliceral insertion, creating a false appearance of a marked cheliceral socket (Fig. 7A); mesotergal areas I–III with an irregular sinusoidal brown line (Fig. 7A); mesotergal area V and free tergites dark yellowish-brown (Fig. 7A, F); coxae I–IV light yellowish-brown (Fig. 7B–C); posterior border of stigmatic area, free sternites, and anal operculum dark yellowish-brown (Fig. 7B, D).

Genitalia: General shape of penis tubular, with a blunt rectangular apex; boundary not well defined between *pars basalis* and *pars distalis* (Fig. 11A, C). *Pars distalis* with a ventral plate ending in a deep *calyx* (Fig. 11B); *calyx* dorsally opened, with two thin laminar projections (wings) (Fig. 11B, D); dorsally *pars distalis* with a medial deep neckline (Fig. 11B) and a lateral shallower U-shaped cleft between the basal macrosetae B2 and B3 (Fig. 11D). *Pars distalis* armed with two groups of macrosetae bilaterally arranged: a basal row of four pairs (B1–B4) extending from the dorsal cleft to the ventrolateral region (Fig. 11B, D), and an apical row (A1–A3) located on the ventrolateral region of the *calyx* (Fig. 11D–E). *Capsula externa* with *follis* invaginated and not visible in resting position (Fig. 11B). *Capsula interna* with two laminar conductors, arrow-shaped apically (*i.e.*, medially pointed and with two lateral projections) (Fig. 11B, D); conductors flanked a shorter laminar pointed stylus (Fig. 11B, D–E).

Female. unknown

Distribution. Known only from the type locality (Fig. 39).

***Neoscotolemon bolivari* (Goodnight & Goodnight, 1945) comb. nov., stat. rest.**

Zoobank-CodeXXXXXXX

(Figs 12–18, 39)

Rula bolivari Goodnight & Goodnight 1945: 62, figs 1–4; Armas & Alayón 1984: 16; Silva Taboada 1988: 86.

Stygnomma spinifera bolivari (part.): Goodnight and Goodnight 1951: 11, figs 19–21; 1953: 177, fig. 6; Pérez-González & Yager 2001:74.

Stygnomma spiniferum bolivari (part.): Kury 2003: 236.

Type material. Holotype: Minor m# (AMNH, examined), CUBA, Mayabeque, San José de las Lajas, Tapaste, Escalera de Jaruco; Cueva del Cura [approx. 23.033°, -82.100°], 18-Nov-43, C. Bolívar-Pieltain *leg.* **Paratypes:** 1 minor m# (photo voucher), 1 f# (photo voucher) (AMNH, examined), with the same data as holotype.

Other material examined. CUBA: 3 major m# (one photo voucher and one SEM voucher), 1 minor m#, 4 f# (MACN-Ar 46922), Mayabeque, San José de las Lajas, Tapaste, Escalera de Jaruco, Cueva de la Jaula [approx. 23.018°, -82.089°], 28-Aug-2015, Pérez-González & R. Barba-Díaz *leg.*

Comparative diagnosis. Differs from all other species of *Neoscotolemon* by the presence of frontally-oriented setiferous tubercles on the cheliceral hand (Figs 13F–H; 15E–G). Can be distinguished from *N. pictipes* by the presence of longer medial setiferous

granules on mesotergal area II and long pointed medial setiferous tubercles on mesotergal areas III–IV and free tergites (Figs 12A, C; 13A, B *vs.* Figs 1C; 2A, C). Can be separated from *N. spinifer* and *N. tancahensis* by the absence of enlarged setiferous pointed tubercles in each lateral region of free tergite III (Figs 12A; 13A *vs.* Figs 24A; 25A; 26A; 31A; 32A; 33A) and from *N. armasi* by the absence of a pseudochela in the enlarged tarsus of the pedipalp. *Neoscotolemon bolivari* can be differentiated from *N. cotilla*, the most similar species based on exomorphology, by the following characteristics: larger body size and appendages (Table 3 *vs.* Table 4), absence of the two anterolateral patches of coarse granulation on carapace, presence of two medial setiferous tubercles on mesotergal areas III–IV, and one medial pointed setiferous tubercle on mesotergal area V, besides the conspicuous medial granules on mesotergal areas of *N. cotilla* (Figs 12C; 13A–B; 14 A, C *vs.* Fig. 19A–B); the presence of conspicuous setiferous granules adjacent to the setiferous tubercles on anal operculum (Figs 13 B; 14E–F *vs.* Fig. 19C). Also, these two species can be more reliably separated by the male genital morphology because *N. bolivari* has a wider *calyx* with wings in the penis ventral plate whereas *N. cotilla* has a remarkably narrow *calyx* without wings.

Redescription. Minor male (holotype, AMNH; paratype, AMNH). Body measurements (holotype, AMNH): Total body length 3.53, carapace length 1.31, *scutum magnum* length 3.01, maximum carapace width 1.93, maximum abdominal *scutum* width 2.75. Appendage measurements in Table 3.

Dorsum: Outline slightly hourglass-shaped with an Eta (η) shape, with a constriction posterior to eyes level (Figs 12A; 13A; 14A). Carapace granulated, wider than long, with a rounded frontal hump; anterior border slightly convex, each lateral corner with three

tubercles (Figs 13A; 14A). Cheliceral sockets not marked (Fig. 14A). Eyes separated, slightly posterior to the medial region of the carapace, located at the base of a poorly defined *ocularium* with a wide base and apically armed with a long, forward-slanted spiniform apophysis; *ocularium* extends from the posterior of the carapace to just before the frontal hump (Figs 12C; 13B; 14E). Abdominal *scutum* in lateral view convex (Figs 12C; 13B; 14E). Sulcus I deep and well-marked, in dorsal view curved to the posterior body region (Figs 12A, C; 13 A–B; 14A, E). Mesotergal areas granulated and poorly defined; sulci II–V shallow and incomplete (Fig. 13A). Mesotergal areas II with two medial conical setiferous granules; mesotergal areas III–IV with a row of conical setiferous granules and two medial pointed setiferous tubercles (Figs 13A–B; 14A, E). Mesotergal area V with a posterior row of conical setiferous granules and a medial pointed setiferous tubercle (Figs 13A–B; 14A, E). Lateral borders with two rows of granules, the inner row consisting of setiferous granules (Fig. 14A). Ozopore with an oval, narrow, and elongated orifice with a descending channel extending toward the posterior region (Fig. 14E). Free tergites granulated; free tergites I–III with a posterior row of setiferous granules and one medial pointed setiferous tubercle; medial tubercle of free tergite III shorter than medial tubercles of free tergite I and II (Figs 13A–B; 14A, E).

Venter: Coxae I–IV with sparse setae (Fig. 14B); coxa I with setiferous granules; coxa II with setiferous granules on ventrolateral region; lateroanterior and posterior borders of coxa III with a row of strong granules that connect with coxae II and IV, respectively; posterior border of the spiracular area and free sternites I–V with a row of setiferous granules (Fig. 14B); free sternite V with rows of setiferous granules; anal operculum with

conspicuous setiferous granules (Figs 13B–C; 14D–F). Spiracles not concealed (Fig. 14B–C).

Chelicerae: Basichelicerite unarmed, with an elongated and slightly marked *bulla* (Figs 13F–G; 15E–F). Cheliceral hand with sparse setae and frontal pointed setiferous tubercles (Figs 13F–H; 15E–G); distally with one ectal tubercle near the movable finger (Figs 13I; 15H). Movable finger with a proximal wide tooth followed by a lamina with sub-square teeth (Figs 13I; 15H); fixed finger with one proximal tooth followed by a posterior rounded tooth, one large frontal tooth, and a row of triangular-shaped teeth (Figs 13I; 15H).

Pedipalps: Coxa elongated (*i.e.*, remarkably longer than trochanter), proximally with two dorsoectal and two small ventroectal setiferous granules (Fig. 14A–B). Trochanter rounded, with one bifid tubercle on the dorsal surface and one mesal and four ventral setiferous tubercles (Figs 13E; 14B; 15A–C). Femur dorsally convex; ventrally armed with a row of six small ectal setiferous pointed tubercles, the fifth distal tubercle longest (Figs 13E; 15B); ventroproximally with two large spines, fused at the base (Figs 13D; 15A–C); ventromesal surface with a medial spine followed by one setiferous pointed tubercle (Figs 13D; 15A). Patella short; ventrodistally with one mesal spine and one ectal setiferous pointed tubercle (Figs 13D–E; 15A–B). Tibia ventromesally with three spines, increasing in size from proximal to distal (Figs 13D; 15A); ventroectally with one proximal spine, followed by one setiferous pointed tubercle and two spines fused at the base, the longest spine featuring an apical square-shaped projection (Figs 13E; 15B). Tarsus remarkably elongated, incrassate, and ventrally flattened; ventromesally with one proximal setiferous pointed tubercle, followed by a row of five spines, the second and fifth spines largest (Figs

13D; 15A, D); ventroectally with three spines interspersed with two setiferous pointed tubercles (Figs 13E; 15B). Claw long and pointed (Fig. 12C).

Legs: Coxae II and IV with setiferous granules on dorsolateral surface (Fig. 14A, E). Trochanters I–IV with setiferous granules (Figs 12B–C; 14B). Femur I–IV with sparse setiferous granules; femur I–II with one longitudinal row of ventral setiferous tubercles; femur III–IV with one prolateral and one retrolateral longitudinal row of setiferous tubercles (Fig. 12B–C). Patellae I–IV with setiferous granules (Fig. 12B–C). Tibiae I–IV with setiferous granules (Fig. 16A). Metatarsus III swollen at the calcaneus region, with a rectangular shape (Figs 16A–B; 18F); calcaneus extends from the third proximal region of the metatarsus (Figs 16B–C; 18F), ventrally with rounded trichomes and some lateral sensilla chaetica flanking the calcaneus (Fig. 16C, E); apical region of calcaneus with a high concentration of acuminate trichomes densely covering numerous aggregated pores (glandular function?) (Fig. 16C–D). Tarsi III–IV without scopula and modified spatulate setae (Fig. 16F). Tarsal formula (paratype AMNH): 4(2):10(3):5:5.

Color (specimen preserved in 80% ethanol): General appearance of body dark yellowish-brown; appendages light yellowish-brown (Fig. 12A–C); at level insertion of chelicerae the coloration is more clear and that gives a false appearance of a marked cheliceral socket (Fig. 12A). Coxae I–IV, free sternites V and anal operculum light yellowish-brown; free sternites I–IV dark yellowish-brown (Fig. 12B).

Genitalia: General shape of penis tubular, with a blunt rectangular apex; boundary between *pars basalis* and *pars distalis* not well defined (Fig. 17A, C, E, G). *Pars distalis* with a ventral plate ending in a deep *calyx* (Fig. 17B, F); *calyx* dorsally open with two thin laminar projections (wings) (Fig. 17B, F); dorsally *pars distalis* with a medial deep

neckline (Fig. 17B, F). *Pars distalis* armed with two groups of macrosetae bilaterally arranged: a basal row of four pairs (B1–B4) extending from the dorsal cleft to the ventrolateral region (Fig. 17B, D, F, H), and an apical row (A1–A3) located on the ventrolateral region of the *calyx* (Fig. 17D, H–I). *Capsula externa* with *follis* invaginated and not visible in resting position (Fig. 17B, F). *Capsula interna* with two laminar conductors, arrow-shaped apically (*i.e.*, medially pointed and with two lateral projections) (Fig. 17B, D, F, H); conductors flanked a shorter, pointed, laminar stylus (Fig. 17B, D, F, H–I).

Major male (MACN-Ar 46922). Body measurements: Total body length 3.86, carapace length 1.42, *scutum magnum* length 3.08, maximum carapace width 1.89, maximum abdominal *scutum* width 2.54. Appendage measurements in Table 3. Resembles minor male in terms of the armature of the *scutum magnum*, but sulci II-IV are complete, and the mesotergal areas are defined (Figs 14A *vs.* 13A; 18 G–H *vs.* 18D–E). Major male differs from minor male in having elongated pedipalp; tarsus of pedipalp remarkably elongated and enlarged (Fig. 18H vs. 18E); claw remarkably short, robust, and triangular (Figs 15A–B, D; 18H *vs.* Fig 18E). Metatarsus III similar to minor male (Fig. 18I). Tarsal formula: 4(2):12(3):5:5.

Female (paratype, AMNH). Body measurements: Total body length 4.04, carapace length 1.24, *scutum magnum* length 3.07, maximum carapace width 1.76, maximum abdominal *scutum* width 2.74. Appendage measurements in Table 3. Resembles both minor and major males in terms of the armature of *scutum magnum* (Fig. 18 A–B *vs.* 18D–E, G–H), but differs in the armature of the pedipalp: trochanter with a small dorsal setiferous tubercle (Fig. 18B); femur with ventroproximal spines not fused at the base; tibia with

distal ventroectal spines not fused; tarsus shorter; claw elongated and pointed (Fig. 18B). Metatarsus III not swollen, lacking aggregated pores and associated setae, and without the deep invagination of the astragalum by the calcaneus (Fig. 18C). Tarsal formula 4(2):10(3)–11(3):5:5.

Distribution. Known only from two caves, Cueva del Cura and Cueva de la Jaula in Escaleras de Jaruco, Mayabeque province, western Cuba (Fig. 39).

Natural history. Due to the elongated appendages and lighter, uniform coloration and distribution restricted to two caves in close proximity, *N. bolivari* has been included in the list of Cuban troglobite species (Pérez-González & Yager 2001).

***Neoscotolemon cotilla* (Goodnight & Goodnight, 1945) comb. nov., nom. rest., stat. rest.**

Zoobank-CodeXXXXXXX

(Figs 19–20, 39)

Rula cotilla Goodnight & Goodnight 1945: 63, Figs 5–7; Armas & Alayón 1984: 16; Silva Taboada 1988: 86.

Stygnomma spinifera bolivari [part.]: Goodnight & Goodnight 1951: 11, figs 19–21; 1953: 177.

Stygnomma spiniferum bolivari [part.]: Kury 2003: 236.

Type material. Holotype: m# (AMNH, examined), CUBA, Mayabeque, San José de las Lajas, Loma de Cotilla, Cueva de Cotilla; 6-Oct-43, coll. C. Bolívar-Pieltain *leg.* **Paratypes:** 1 m# and 1 juvenile, same data as the holotype (repository unknown).

Other material examined. None.

Comparative diagnosis. Differs from males of *N. spinifer* and *N. tancahensis* by the absence of enlarged pointed setiferous tubercles in the lateral regions of free tergite III

(Fig. 19A, B *vs.* Figs 22A; 23A; 24A; 29A; 30A; 31A). Males of *N. cotilla* can be separated from *N. pictipes* by the presence of long medial pointed setiferous tubercles on each free tergite and the anal operculum covered by similar pointed tubercles (Fig. 19A–B *vs.* Fig. 2A, D, F–G). Males of *N. cotilla* are easily distinguished from *N. armasi* by the absence of a pseudochela in the enlarged tarsus of the pedipalp (Fig. 19C–D *vs.* Fig. 8E). The most morphologically similar species, *N. bolivari*, can be diagnosed by the absence of frontal pointed setiferous tubercles on the cheliceral hand of males (Fig. 19E–G *vs.* Figs 13F–H; 15E–G) and by the absence of two medial pointed setiferous tubercles on mesotergal areas III–IV and one medial pointed setiferous tubercle on mesotergal area V (Fig. 19A–B *vs.* Figs 12C; 13A–B; 14A, C). Additionally, *N. cotilla* exhibits a smaller body size and shorter appendages (Table 3 *vs.* Table 4) than *N. bolivari*. *Neoscotolemon cotilla* has a highly differentiated male genital morphology with a remarkably narrow *calyx* and a wide and shallow dorsal neckline (Fig. 20A), and the carapace has two anterolateral patches of coarse granulation; these features separate *N. cotilla* from all other *Nesocotolemon* species.

Redescription. Male (holotype, AMNH). Body measurements: Total body length 3.54, carapace length 1.24, *scutum magnum* length 2.70, maximum carapace width 1.68, maximum abdominal *scutum* width 2.37.

Dorsum: Outline slightly hourglass-shaped with an Eta (η) shape, with a constriction posterior at eye level (Figs 19A). Carapace granulated but with two anterolateral patches of coarse granulation (Fig. 19A, B). Carapace wider than long, with a rounded and marked frontal hump; anterior border slightly convex, each lateral corner with a row of small tubercles (Fig. 19A). Cheliceral sockets not marked (Fig. 19A). Eyes separated, slightly posterior to the medial region of the carapace, located at the base of a

poorly defined *ocularium* with a wide base and apically armed with a long, forward-slanted spiniform apophysis (Fig. 19B); *ocularium* extends from the posterior of the carapace to just before the frontal hump (Fig. 19B). Abdominal *scutum* in lateral view convex (Fig. 19B). Sulcus I deep and well-marked, in dorsal view, curved to the posterior body region (Fig. 19A–B). Mesotergal areas granulated and defined; sulci II–V shallow and complete (Fig. 19A–B). Mesotergal areas I–II with small medial conical setiferous granules; mesotergal areas III–IV with a row of small conical setiferous granules, medial granules longer than lateral granules (Fig. 19A–B). Mesotergal area V with a posterior row of conical setiferous granules (Fig. 19A–B). Lateral borders with two rows of granules. Free tergites granulated; free tergites I–III with a posterior row of setiferous granules and one medial pointed setiferous tubercle; medial tubercle of free tergite II longer than medial tubercles of free tergite I and III (Figs 19A–B).

Venter: Anal operculum with setiferous granules and setiferous tubercles (Fig. 19B).

Chelicerae: Basichelicerite unarmed, with an elongated and slightly marked *bulla* (Fig. 19E–F). Cheliceral hand with sparse setae and small frontal setiferous granules (Fig. 19E–F). Movable finger with a proximal wide tooth followed by a lamina with sub-square teeth; fixed finger with rounded teeth (Fig. 19G).

Pedipalps: Trochanter rounded, with two dorsal pointed setiferous tubercles and small dorsal granules; one small mesal tubercle; and two ventral setiferous tubercles (Fig. 19C). Femur dorsally convex; ventrally armed with a row of four small ectal setiferous pointed tubercles, the third distal tubercle longest (Fig. 19D); ventroproximally with two large spines, fused at the base (Fig. 19C–D); ventromesal surface with a proximal

longitudinal row of rounded setiferous granules, one medial spine followed by one setiferous pointed tubercle (Fig. 19C). Patella short; ventrodistally with one mesal spine and one ectal setiferous pointed tubercle (Fig. 19C–D). Tibia ventromesally with three spines, increasing in size from proximal to distal (Fig. 19C); ventroectally with one proximal setiferous tubercle followed by one spine, one setiferous pointed tubercle, and two spines fused at the base, the longest spine featuring an apical square-shaped projection (Fig. 19D); ventral surface with several small granules (Fig. 19C). Tarsus remarkably elongated, incrassate, and ventrally flattened (Fig. 19C–D); ventromesally with one proximal setiferous pointed tubercle, followed by a row of five spines (Fig. 19C); ventroectally with three spines interspersed with three setiferous pointed tubercles (Fig. 19D). Claw remarkably short, robust, and triangular (Fig. 19C–D).

Legs: Femur III–IV with one prolateral and one retrolateral longitudinal row of setiferous tubercles (Fig. 19B). Metatarsus III swollen at the calcaneus region, with a rectangular shape.

Genitalia: General shape of penis tubular tapering distally to a blunt, rectangular tip; boundary not well defined between *pars basalis* and *pars distalis* (Fig. 21A, C). *Pars distalis* with a ventral plate ending in a *calyx* (Fig. 21B); dorsally, *pars distalis* with a wide and shallow dorso-medial neckline (Fig. 21B). *Pars distalis* armed with two groups of macrosetae bilaterally arranged: a basal row of four pairs (B1–B4) located from the dorsal cleft to the ventrolateral region (Fig. 21B, D), and an apical row (A1–A3) located on the ventrolateral region of the *calyx* (Fig. 21B, D). *Capsula externa* with *follis* invaginated and not visible in resting position (Fig. 21B). *Capsula interna* with two laminar conductors,

apically with two lateral projections (Fig. 21B, D); conductors flanked by a shorter, pointed, laminar stylus (Fig. 21B, D).

Female: unknown

Distribution. Known only from the type locality (Fig. 39).

Natural history. Although this species is known only from a cave, the morphological characteristics do not support the troglobiont condition as proposed for the closely related *N. bolivari* (see above). *Neoscotolemon cotilla* exhibits a darker body coloration than *N. bolivari* and other troglobionts. Based on the original species description, the male has a reddish brown venter and dorsum, some darker spots at the posterior of the dorsum, yellowish spines and tubercles on the dorsum, black eyes, yellowish legs with dark spots, yellowish-orange pedipalps with some darker spots on distal segments, and chelicerae that are concolorous with the dorsum (Goodnight & Goodnight 1945, p. 64). In contrast, *N. bolivari* exhibits a lighter, troglomorphic coloration. According to the original species description, the holotype has a yellow-orange body, black eyes, and yellow spines on the free tergites, and the uniform color of the appendages is lighter than the body Goodnight & Goodnight (1945, p. 63). Additionally, *N. cotilla* has shorter appendages than *N. bolivari*. For these reasons, we consider *N. cotilla* a troglophilic species rather than a troglobite.

***Neoscotolemon spinifer* (Packard, 1888) comb. rest.**

Zoobank-CodeXXXXXXX

(Figs 21–28, 39)

Phalangodes spinifera Packard 1888: 52, pl. 13, figs 2, 2a–c; Banks 1893: 151
Scotolemon spinifera: Banks 1901: 672.

Scotolemon spinigera: Banks 1904: 140 (misspelling).
Neoscotolemon spinifera: Roewer 1912a: 150.
Neoscotolemon spinifer: Roewer 1923: 113; Walker 1928: 157, fig. 11 (misidentification).
Rula spinifera: Goodnight & Goodnight 1942b: 13, figs 43–45; 1945: 64.
Stygnomma spinifera spinifera: Goodnight & Goodnight 1951: 9, figs 15–18; 1953: 177, fig. 4; Edgar 1966: 355 (misidentification).
Stygnomma spinifera: Rambla 1969: 391; Duffield *et al.*, 1981: 446, fig. 5; Edgar 1990: 546, fig. 19.44; Peck 1975: 308, 1992: 45 (misidentification); Acosta *et al.*, 1993: 27; Hounsome 1994: 311, 320 (misidentification?); Peck 1999: 375 (misidentification).
Stygnomma spiniferum spiniferum: Kury 2003: 236.
Citranus marquesas Goodnight & Goodnight 1942b: 4, figs 7–9 (synonymy established by Goodnight & Goodnight 1951).

Type material. *Phalangodes spinifera* Packard, 1888: **Holotype:** major m# (MCZ 39047, examined), UNITED STATES OF AMERICA, Florida, Key West or Tortugas [Packard 1888: 53 stated: "The present species [referred to *P. spinifera*] was collected by us either in Key West or Tortugas, Florida, probably the former locality."]. *Citranus marquesas* Goodnight & Goodnight, 1942: **Holotype:** f# (AMNH, examined), UNITED STATES OF AMERICA, Florida, Marquesas Key, under trash palm tree, 23-Jun-1938, George Van Hyning *leg.* **Paratype:** f# (AMNH, not examined) UNITED STATES OF AMERICA, Florida, Barracuda Key, June 13-Jun-1938, George Van Hyning *leg*.

Remark. The holotype of *Phalangodes spinifera* Packard, 1888, was originally designated, incorrectly, as a female specimen (Packard 1988: 52), and the holotype of *Citranus marquesas* Goodnight & Goodnight, 1942, was originally designated, incorrectly, as a male specimen (Goodnight & Goodnight 1942b: 4).

Other material examined. UNITED STATES OF AMERICA: 1 f# (AMNH), Florida, Key Largo, 1-Apr-1957, W.J. Gertsch & R. Forster *leg.* • 2 f# (AMNH), Florida, Miami-Dade, 7 miles west of Florida City, 31-Mar-1957, R. Forster & W.J. Gertsch *leg.* • 1 f# (AMNH), Florida, Florida Keys, Little Duck Key, 24.4°; -81.15°, Jean and Wilton Ivie

leg. • 1 juvenile (AMNH), Florida, Key Largo, 25°; -80°, 30-Jan-1959, H.A. Denmark *leg.* • 1 m# (AMNH), Florida, Miami-Dade. • 1 f# (AMNH), Florida, Miami-Dade, Homestead, 11-JUN-1930, N.W. Davis *leg.* • 2 major m# (one photo voucher) 1 f# (photo voucher) (AMNH), Florida, Miami-Dade, Homestead, fall 1930, J.B. Tower *leg.* • 1 f# (AMNH), Florida, Miami-Dade, Homestead, Rattlesnake Hannsand [?], 2-Jun-1941. • 1 major m# (AMNH), Florida, Miami-Dade, Everglades National Park, Royal Palm Hammock, hardwood hammock, malaise-FIT, 28-Jul/15-Nov-1985, S. & J. Peck *leg.* • 1 f# (AMNH), Florida, Monroe, Key Largo, Pennekamp State Park, hammock forest leaf litter Ber., 31-Aug-1985, S. & J. Peck *leg.* • 1 major m# (AMNH), Florida, Monroe, Big Pine Key, Watson's Hammock, hardwood hammock, malaise-FIT, 3-May/31-Aug-1985, S. & J. Peck *leg.* • 1 minor m# (photo voucher) (AMNH), Florida, Monroe, Big Pine Key, Watson's Hammock, hammock for malaise-FIT, 3-Jun/27-Aug-1986, S. & J. Peck, *leg.* • 1 f# (AMNH), Florida, Tamiami Trail, 1-Mar-1936. • 1 major m# (AMNH), Florida, Miami-Dade, Everglades National Park, Royal Palm State Park, 28-Dec-1940, A. F. Archer *leg.* • 1 m# (SEM voucher), 2 f# (USNM), Florida, Everglades, Rowdy Bend, 25.1747°, -80.90428°, 6-Jun-2013, CarBio Team *leg.*

Comparative diagnosis. *Neoscotolemon spinifer* differs from males of all other species of *Neoscotolemon* (except from *N. tancahensis*) by the presence of enlarged pointed setiferous tubercles on the lateral regions of free tergite III (Figs 22A; 23A; 24A). Males of *Neoscotolemon spinifer* are easily distinguished from *N. armasi* by the absence of a pseudochela in the enlarged tarsus of the pedipalp (Figs 22B–C; 23D–E; 25A–B *vs.* Fig. 8E). Additionally, *N. spinifer* can be separated from *N. pictipes* by the presence of a medial long pointed setiferous tubercle on free tergites and I–III (Figs 22A, C; 23A–B; 24A, E *vs.* Figs 29A; 30A–B; 31A, D). Another distinguished feature is that *Neoscotolemon spinifer*

has scattered granules on the dorsal surface of the pedipalp tibia (Figs 23D–E; 25B), whereas *N. pictipes* has a smooth pedipalp tibia; this characteristic is also useful for differentiating *N. spinifer* from its most morphologically similar species, *N. tancahensis*, which lacks the long, pointed medial setiferous tubercles on each free tergite exhibited by *N. spinifer* (Figs 22A, C; 23A–B; 24A, E *vs.* Figs 29A, C; 30A–B; 31A, D).

Redescription. Major male (holotype, AMNH; 1 m# AMNH; 1 m# USNM). Body measurements: Total body length 3.14, carapace length 1.00, *scutum magnum* length 2.46, maximum carapace width 1.51, maximum abdominal *scutum* width 2.20. Appendage measurements in Table 4.

Dorsum: Outline slightly hourglass-shaped with an Eta (η) shape, with a constriction posterior to eyes level (Figs 22A; 23A; 24A). Carapace granulated, wider than long; frontal hump not well marked; anterior border slightly convex, each lateral corner with three small conical tubercles (Figs 23A; 24A). Cheliceral sockets not marked (Fig. 24A). Eyes separated, slightly posterior to the medial region of the carapace and located at the base of a poorly defined *ocularium*; *ocularium* with a wide base and apically armed with a long spiniform apophysis slanted forward; *ocularium* extends from the posterior to just before the frontal hump (Figs 22C; 23B; 24E–F). Abdominal *scutum* in lateral view convex (Figs 22C, 23B, 24E). Sulcus I deep and well-marked, in dorsal view curved to the posterior body region (Figs 22A, C; 23A–B; 24A, E–F). Mesotergal areas coarsely granulated and not well defined (Figs 23A–B; 24A, E). Mesotergal areas I–II with small medial conical setiferous granules; mesotergal areas III–IV with a row of small conical setiferous granules, with medial granules slightly longer than lateral ones (Figs 23A–B; 24A, E). Mesotergal area V with a posterior row of conical setiferous granules, the medial granule slightly

longer (Figs 23A–B; 24A, E). Lateral borders with two rows of granules, the inner row consisting of setiferous granules (Fig. 24A, E). Ozopore with an oval, narrow, and elongated orifice with a descending channel extending toward the posterior region (Fig. 24E). Free tergites granulated; free tergites I–II with a posterior row of conical setiferous granules, a medial long spiniferous tubercle, and smaller lateral tubercles; medial tubercle of free tergite II longer than tubercle of free tergite I; free tergite III with a medial row of short setiferous tubercles, the medial setiferous tubercle slightly longer, and the lateral margin with long setiferous tubercles (Figs 23A–B; 24A, E).

Venter: Coxae I–IV with setae and small granules (Fig. 24B); coxa I with setiferous granules; anteroposterior borders of coxa III with a row of strong granules connecting with coxae II and IV, respectively (Fig. 24B); posterior border of the spiracular area and free sternites I–V with a row of setiferous granules (Figs 23C; 24B); anal operculum with several conspicuous setiferous granules and setiferous tubercles (Figs 23B–C; 24D–E). Spiracles not concealed (Figs 23C; 24B–C).

Chelicerae: Basichelicerite unarmed, with an elongated and slightly marked *bulla* (Figs 23F–G; 25C–D). Cheliceral hand with sparse setae and small frontal setiferous granules (Figs 23F–H; 25C–E). Movable finger with a proximal lamina with sub-square teeth, followed by a medial conical tooth and a distal lamina with sub-square teeth (Figs 23I; 25E); fixed finger with a large medial conical tooth (Figs 23I; 25E).

Pedipalps: Coxa elongated (*i.e.*, remarkably longer than trochanter), with one small dorsomesal protuberance and one small medial setiferous granule on the ventral surface (Figs 24 A–B). Trochanter rounded, with three dorsal, one mesal setiferous pointed tubercles, and two ventral setiferous conical tubercles (Figs 23D–E; 24B; 25A–B). Femur

dorsally convex; ventrally armed with a row of six small ectal setiferous pointed tubercles, the fifth distal tubercle longest (Figs 23E; 25B); ventroproximally with two large spines, fused at the base (Figs 23D–E; 25A–B); ventromesal surface with a medial spine followed by one setiferous pointed tubercle (Figs 23D; 25A). Patella short, with dorsal granules, and ventrodistally with one mesal spine and one small ectal setiferous pointed tubercle (Figs 23D–E; 25A–B). Tibia with dorsal granules; ventromesally with three spines, increasing in size from proximal to distal (Figs 23D; 25A); ventroectally with one proximal setiferous pointed tubercle, followed by one spine, one setiferous pointed tubercle, and two spines fused at the base, the longest spine featuring an apical square-shaped projection (Figs 23E; 25B); ventral surface with scattered small granules (Fig. 25A). Tarsus remarkably elongated, incrassate, and ventrally flattened (Figs 22C; 23D–E; 25A–B); ventromesally with one proximal setiferous pointed tubercle, followed by a row of five spines (Figs 23D, 25A); ventroectally with three spines interspersed with two setiferous pointed tubercles (Figs 23E, 25B). Claw remarkably short, robust, and triangular (Figs 22C; 23D–E; 25A–B).

Legs: Coxae II and IV with setiferous granules on dorsolateral surface (Fig 24A, E). Trochanters I–V with setiferous granules (Figs 22B–C; 24E). Femur I–IV with longitudinal rows of ventral conical setiferous tubercles (Fig. 22B–C). Metatarsus III swollen at calcaneus region, with a rectangular shape (Figs 26A, C; 28F); calcaneus extends from the medial region of the metatarsus (Figs 26A, C; 28F), ventrally with trichomes and some lateral sensilla chaetica (Fig. 26A, C, E); apical region of calcaneus with a high concentration of acuminate trichomes densely covering numerous aggregated pores (glandular function?) (Fig. 26A–D). Tarsi III–IV without scopula and modified spatulate setae (Fig. 26F). Tarsal formula: 4(2):8(3):5:5.

Color (specimen preserved in 80% ethanol): General body appearance yellowish-brown; appendages light yellowish-brown (Fig. 22A–C); coloration more clear at the level of cheliceral insertion, creating a false appearance of a marked cheliceral socket (Fig. 22A). Coxae I–IV, free sternites V and anal operculum light yellowish-brown; free sternites I–IV dark yellowish-brown (Fig. 22B).

Genitalia: General shape of penis tubular, with a strong distal constriction and widening apically to a blunt, rectangular tip; boundary not well defined between *pars basalis* and *pars distalis* (Fig. 27A, C, E, G). *Pars distalis* with a ventral plate ending in a *calyx* (Fig. 27B, F); *calyx* dorsally open with two thin laminar projections (wings) (Fig. 27B, F); dorsally, *pars distalis* with a medial deep neckline (Fig. 27B, F). *Pars distalis* armed with two groups of macrosetae arranged bilaterally: a basal row of four pairs (B1–B4) located from the dorsal cleft to the ventrolateral region (Fig. 27B, D, F, H), and an apical row (A1–A3) located on the ventrolateral region of the *calyx* (Fig. 27D, H–I). *Capsula externa* with *follis* invaginated and not visible in resting position (Fig. 27B, F). *Capsula interna* with two laminar conductors arrow-shaped apically (*i.e.*, medially pointed and with two lateral projections) (Fig. 27 B, D, F, H); conductors flank a shorter, pointed, laminar stylus (Fig. 27 B, D, F, H–I). When the penis is expanded and the *capsula interna* is everted it is possible to see that the conductors are basally fused between them and with the stylus, forming an integrated structure (Fig. 27B, D).

Minor male (AMNH). Body measurements: Total body length 2.40, carapace length 0.90, *scutum magnum* length 2.21, maximum carapace width 1.34, maximum abdominal *scutum* width 2.05. Appendage measurements in Table 5. Minor male differentiated from major male by the absence of lateral setiferous tubercles on free tergite

III and shorter medial setiferous tubercle; medial setiferous tubercles on free tergites I–II shorter, contrasting with the long setiferous tubercles present in major male (Fig. 28D–E *vs.* Fig. 28G–H). Additionally, minor male has a shorter pedipalp with smaller spines; trochanter of pedipalp with small setiferous tubercles, resembling female; femur of pedipalp with the mesal spine closer to the distal setiferous tubercle; tarsus not elongated and enlarged, with a proximal setiferous tubercle but with four spines, instead of the five observed in major males; claw is remarkably long, thin, and pointed, similar to that of female (Fig. 28E *vs.* Fig. 28B *vs.* Fig. 28H). Metatarsus III similar to major male (Fig. 28I). Tarsal formula 4(2):8–9(3):5:5.

Female (AMNH). Body measurements: Total body length 2.61, carapace length 0.85, *scutum magnum* length 1.28, maximum carapace width 1.32, maximum abdominal *scutum* width 2.06. Appendage measurements in Table 5. Resembles minor and major males in terms of the armature of *scutum magnum*, but differs from major male by the absence of long lateral setiferous tubercle on free tergite III (Fig. 28A–B *vs.* Fig. 28G–H); medial setiferous tubercle of free tergite I–III shorter than in major male (Fig. 28A–B); pedipalp remarkably shorter than in major male and with smaller spines; trochanter without dorsal setiferous tubercles and only one small setiferous granule; femur of pedipalp with the mesal spine and distal tubercle closer than in major male; tarsus not elongated, with four spines and without proximal setiferous tubercle; claw elongated, thin and pointed as in minor male (Fig. 28B vs. Fig. 28E, H). Female differs from minor and major males by having metatarsus III not swollen, lacking aggregated pores and associated setae, and without the deep invagination of the astragalum by the calcaneus (Fig. 28C *vs.* 28F, I). Tarsal formula 4(2):7(3)–8(3):5:5.

Geographical distribution. UNITED STATES OF AMERICA: Florida: Key West or Tortugas (Packard 1888); Biscayne Bay (Banks 1904); Everglades National Park—Royal Palm State Park, Homestead, Marquesas Key, Barracuda Key (Goodnight & Goodnight 1942b); Everglades National Park (Duffield *et al.*, 1981). **New records:** Key Largo, 7 miles west of Florida City, Little Duck Key, Key Largo—Pennekamp State Park, Big Pine Key—Watson's Hammock, Tamiami Trail (Fig. 39).

Unconfirmed records. CAYMAN ISLANDS: Little Cayman (Hounsome 1994); probably another species of *Neoscotolemon*, potentially a new species (Fig. 39).

Doubtful records. JAMAICA**:** Clarendon, Jackson Bay Cave; Saint Ann, Dairy Bull Cave and Ken Connell Hole (Peck 1992), probably a misidentification of a Jamaican Samoidae species (*Akdalima jamaicana* Šilhavý, 1979, *Reventula amabilis* Šilhavý, 1979, or another related species) (Fig. 39).

Spurious records. UNITED STATES OF AMERICA, Ohio, Clear Creek; Hocking County; Rockbridge; Sugar Creek (Walker, 1928: 157, fig. 11). There are no reliable records of *Neoscotolemon spinifer* outside peninsular Florida and adjacent keys. The record by Walker is surely a misidentification, probably of *Erebomaster acanthinus* (Crosby & Bishop 1924) (Cladonychiidae) that commonly occurs in southern Ohio (W. Shear 2010 pers. comm.).

Natural history. Duffield *et al.* (1981) stated that: "The opilionids [*N. spinifer*] were collected in Everglades National Park, Florida, in November 1977 and March 1978, from solitary retreats on the undersides of coral rocks. Also, specimens have been collected (in August 1985) in Hammock forest leaf litter." See "Other material examined" above.

***Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951) comb. nov., stat. prom.**

(Figs 29–35)

Stygnomma spinifera tancahensis Goodnight & Goodnight 1951: 13, figs 13–14; 1953: 177, fig. 5; 1977: 148, figs 12–16.
Stygnomma spiniferum tancahense: Kury & Cokendolpher 2000: 155; Kury 2003: 236.

Type material: Holotype: Major m# (AMNH, examined), MEXICO, Quintana Roo, Tancah, near the Mayan ruins of Tulum, 12-Aug-1949, C. & M. Goodnight *leg.* **Paratypes:** 1 major m# (photo voucher), 1 f# (photo voucher) (AMNH, examined), with the same data as for the holotype. • 1 f# (AMNH, examined), MEXICO, Quintana Roo, 12-Aug-1949, Goodnight *leg.* • 3 major m#, 5 minor m#, 8 f# (AMNH, examined), MEXICO, Quintana Roo, Island of Cozumel, 16-Aug-1949, C. B. Goodnight *leg.*

Other material examined: 1 major m#, 2 f# (AMNH), MEXICO, Quintana Roo, Cozumel, Chancanab [sic., should be Chankanaab], 8-Aug-1949, C. B. Goodnight *leg.* • 1 major m# (CNAN-Op000106), MEXICO, Quintana Roo, Isla Mujeres, 4-Apr-1979, J. Palacios *leg.* • 1 major m# (SEM voucher), 1 minor m#, 2 f# (USNM), MEXICO, Quintana Roo, Coastal forest outside Tulum, [20.21098°, -87.43149°], 30-Jul-2014, Team CarBio *leg.* • 2 minor m# (one photo voucher), 1 f# (AMNH), BELIZE, Glover's Reef, Southeast Cay, Southwest Cay. 25-Jul-1971, M. Goodnight *leg.* • 1 minor m#, 1 f# (AMNH), BELIZE, Glover's Reef, Southeast Cay, Southwest Cay, 25-Jul-1971, M. Goodnight *leg.*

Comparative diagnosis. *Neoscotolemon tancahensis* differs from males of all other species of *Neoscotolemon* (except *N. spinifer*) by the presence of enlarged setiferous pointed tubercles in each lateral region of free tergite III (Figs 29A; 30A; 31A). Additionally, *N. tancahensis* can be distinguished from *N. pictipes* by having, in males, the anal operculum covered by pointed setiferous tubercles (Figs 30B; 31B–D *vs.* Fig. 2B, D, F–G). *Neoscotolemon tancahensis* is easily distinguished from males of *N. armasi* by the absence of a pseudochela in the enlarged tarsus of the pedipalp (Figs 30E–F; 32A–B *vs.* Fig

8E). *Neoscotolemon tancahensis* can be differentiated from the most morphologically similar species, *N. spinifer*, by the absence of the medial long pointed setiferous tubercles on free tergites I–III as is exhibited in *N. spinifer*. Furthermore, the dorsal surface of the pedipalp tibia in *N. tancahensis* is smooth, contrary to *N. spinifer,* which is covered by scattered granules (Figs 30E–F; 32A–B *vs.* Figs 23D–E; 25A–B).

Description. Major male (holotype, AMNH; paratype AMNH; USNM). Body measurements: Total body length 3.14, carapace length 1.11, *scutum magnum* length 2.64, maximum carapace width 1.57, maximum abdominal *scutum* width 2.28. Appendage measurements in Table 5.

Dorsum: Outline slightly hourglass-shaped with an Eta (η) shape, with a constriction at eye level (Figs 29A; 30A; 31A). Carapace granulated, wider than long, with a rounded frontal hump; anterior border slightly convex, each lateral side with a row of small tubercles (Figs 30A; 31A). Cheliceral sockets not marked (Fig. 31A). Eyes separated, slightly posterior to the medial region of the carapace, located at the base of a poorly defined *ocularium* with a wide base and apically armed with a long, slightly forward-slanted spiniform apophysis; *ocularium* extends from the posterior of the carapace to just before the frontal hump (Figs 29C; 30B; 31D–E). Abdominal *scutum* in lateral view convex (Figs 29C; 30B; 31D). Sulcus I deep and well-marked, in dorsal view curved to the posterior body region (Figs 29A, C; 30A–B; 31A, D–E). Mesotergal areas coarsely granulated and not well defined. Mesotergal areas I–II with conspicuous small medial conical setiferous granules; mesotergal areas III–IV with two rows of conspicuous small conical setiferous granules, with medial granules slightly longer than lateral ones (Figs 30A–B; 31A, D). Mesotergal area V with a posterior row of small conical setiferous

granules (Figs 30A–B; 31A, D). Lateral borders with two rows of granules, the inner row consisting of setiferous granules (Fig. 31A, D). Ozopore with an oval, narrow, and elongated orifice with a descending channel extending toward the posterior region (Fig. 31D). Free tergites granulated; free tergites I–II with a posterior row of conical setiferous granules; free tergite III with a posterior row of setiferous tubercles, lateral tubercles slightly longer than medial tubercles (Figs 30A–B; 31A, D).

Venter: Coxae I–IV with sparse setae and small granules (Fig. 31B); coxae I–II with setiferous granules; anteroposterior borders of coxa III with a row of strong granules connecting with coxae II and IV, respectively (Fig. 31B); posterior border of the spiracular area and free sternites I–V with a row of setiferous granules (Figs 30B; 31B–D); anal operculum with setiferous granules and tubercles (Figs 30B; 31B–D). Spiracles not concealed (Fig. 31B).

Chelicerae: Basichelicerite unarmed, with an elongated and slightly marked *bulla* (Figs 30C–D; 32C–D). Cheliceral hand with sparse setae and small frontal setiferous granules (Figs 30C–D; 32C–E). Fixed finger with a row of rounded teeth (Fig. 32E).

Pedipalps: Coxa elongated (*i.e.*, remarkably longer than trochanter), with one small proximal dorsomesal protuberance and two ventroectal setiferous granules (Figs 31A–B). Trochanter rounded, with three dorsal and one mesal pointed setiferous tubercles; ventrally with three setiferous granules (Figs 30E–F; 31B; 32A–B). Femur dorsally convex; ventrally armed with a row of six small ectal setiferous pointed tubercles, the fifth distal tubercle longest (Figs 30F; 32B); ventroproximally armed with two large spines, fused at the base (Figs 30E–F; 32A–B); ventromesal surface with a medial spine followed by one setiferous pointed tubercle (Figs 30E; 32A). Patella short; ventrodistally with one mesal spine and one

small ectal setiferous tubercle (Figs 30E–F; 32A–B). Tibia ventromesally with three small spines, increasing in size from proximal to distal (Figs 30E; 32A); ventroectally with one proximal setiferous tubercle, followed by one spine, one setiferous pointed tubercle, and two spines fused at the base; the longest spine featuring an apical square-shaped projection (Figs 30F; 32B); ventral surface with a few small granules (Figs 30E; 32A). Tarsus remarkably elongated, incrassate, and ventrally flattened (Figs 29C; 30E–F; 32A–B); ventromesally with one proximal setiferous pointed tubercle, followed by a row of five spines, the second and fifth spines largest (Figs 30E, 32A); ventroectally with three spines interspersed with four setiferous pointed tubercles, two tubercles between the two most distal spines (Figs 30F, 32B). Claw remarkably short, robust, and triangular (Fig. 30E–F).

Legs: Coxae II and IV with setiferous granules on dorsolateral surface (Fig. 31A, E). Trochanters I–IV with setiferous granules. Femur I–IV with sparse setiferous granules; femur I–II with one longitudinal row of ventral setiferous tubercles; femur III–IV with one prolateral and one retrolateral longitudinal row of setiferous tubercles (Fig. 29B–C). Metatarsus III swollen at calcaneus region, with a rectangular shape (Fig. 33A); calcaneus extends from the medial region of the metatarsus (Fig. 33A), ventrally with trichomes and some lateral sensilla chaetica (Fig. 33A–B); apical region of calcaneus with a concentration of acuminate trichomes densely covering numerous aggregated pores (glandular function?) (Fig. 33A, C). Tarsi III–IV without scopula and modified spatulate setae (Fig. 33D). Tarsal formula: 4(2):8–9(3):5:5.

Color (specimen preserved in 80% ethanol): General body appearance yellowish-brown; appendages light yellowish-brown (Fig. 29A–C); coloration cheliceral insertion

level lighter, creating a false appearance of a marked cheliceral socket (Fig. 29A). Free sternites I–IV darker yellowish-brown (Fig. 29B).

Genitalia: General shape of penis tubular, with a distal constriction and widening apically to a blunt, rectangular tip; boundary not well defined between *pars basalis* and *pars distalis* (Fig. 34A, C). *Pars distalis* with a ventral plate ending in a deep *calyx* (Fig. 34B, E); *calyx* dorsally open with two thin laminar projections (wings) (Fig. 34B, E); dorsally, *pars distalis* with a medial shallow neckline (Fig. 34B, E). *Pars distalis* armed with two groups of macrosetae arranged bilaterally: a basal row of four pairs (B1–B4) located from the dorsal neckline to the ventrolateral region (Fig. 34B, D, E–F), and an apical row (A1–A3) located on the ventrolateral region of the *calyx* (Fig. 34D, F–G). On one side there is a fourth apical macroseta that is considered teratological (Fig. 34F). *Capsula externa* with *follis* invaginated and not visible in resting position (Fig. 34B, E). *Capsula interna* with two laminar conductors arrow-shaped apically (*i.e.*, medially pointed and with two lateral projections) (Fig. 34B, D–F); conductors flank a shorter, pointed, laminar stylus (Fig. 34B, D–E).

Minor male (AMNH). Body measurements: Total body length 2.43, carapace length 0.83, *scutum magnum* length 2.07, maximum carapace width 1.23, maximum abdominal *scutum* width 1.75. Appendage measurements in Table 5. Minor male differentiated from major male by the presence of small setiferous granules on free tergite III and anal operculum similar to that of the female, and in contrast to the long setiferous tubercles found in major male (Goodnight & Goodnight 1977, figs 12; 14; 16; herein Fig. 35D–E *vs.* Fig. 35A–B, G–H). Minor male also differs from major male in having a shorter pedipalp with small spines. Pedipalp trochanter bears small setiferous tubercles; tibia lacks

ventral tubercles; tarsus is neither elongated nor enlarged, mesal surface of tarsus with a proximal setiferous tubercle followed by four spines whereas major males possess five spines; claw remarkably longer, thin, and pointed similar to that of female (Goodnight & Goodnight 1977, figs 12, 16; herein Fig. 35E *vs.* Fig. 35A, H). Metatarsus III similar to major male (Fig. 35F). Tarsal formula 4(2):7(3):5:5.

Female (paratype, AMNH). Body measurements: Total body length 2.89, carapace length 0.85, *scutum magnum* length 2.06, maximum carapace width 1.25, maximum abdominal *scutum* width 1.95. Appendage measurements in Table 5. Resembles minor and major males in terms of the armature of *scutum magnum* but differs from major males by having setiferous granules on free tergite III and anal operculum in contrast to the long setiferous tubercles in major males (Fig. 35A–B vs. Fig. 35G–H). Female also differs from major male by having a shorter pedipalp and smaller spines, with the trochanter bearing one small dorsal setiferous granule (Fig. 35B *vs.* Fig. 35H). Tarsus of pedipalp remarkably shorter, with four ventromesal spines like minor male, but differs by the absence of a proximal mesal setiferous tubercle. Claw elongated and pointed similar to that of minor male (Fig. 35B *vs.* Fig. 35E, D). Additionally, female differs from both minor and major males by having a metatarsus III not swollen, lacking aggregated pores and associated setae, and without the deep invagination of the astragalum by the calcaneus (Fig. 35C *vs.* Fig. 35F, I). Tarsal formula 4(2):8(3):5:5.

Geographical distribution. MEXICO: Quintana Roo State—Tancah and Island of Cozumel (Goodnight & Goodnight 1951); Tancah—Cueva de la Avispa (Goodnight & Goodnight, 1977) (Fig. 39). BELIZE: Glover's Reef (Goodnight & Goodnight, 1977). **New record:** MEXICO: Quintana Roo, Isla Mujeres (Fig. 39).

Natural history. Goodnight & Goodnight (1951: 14) wrote about *N. tancahensis*: "At Tancah, these animals were found in large numbers under the fibrous material from the trunks of the coconut palms. These had fallen on the sand. It is possible that the oil of this palm may have attracted the animals. They were found within a few yards of the Caribbean." Some specimens were collected in Tancah by us (APG) under rocks, in sandy soil, in the dry forest near the beach (pers. obs.).

***Neoscotolemon vojtechi* (Šilhavý, 1979*)* comb. nov.**

Zoobank-CodeXXXXXXX

(Figs 36–37, 39)

Vlachiolus vojtechi Šilhavý 1979: 6, figs 11–13; Kury 2023: 224

Type material: Holotype: f# (MCZ 14838, examined), CUBA, Pinar del Río, Sierra de Rangel, 1500 ft [457 m.], 23–24-Aug-1936, Darlington *leg.*

Other material examined: none

Comparative diagnosis. *Neoscotolemon vojtechi* differs from all females of the other species of *Neoscotolemon*, except from *N. pictipes*, by the absence of prominent armature in the medial and/or lateral region of the free tergites (in form of an enlarged pointed granule or tubercle) (Fig. 36A, C). *Neoscotolemon vojtechi* can be distinguished from females of *N. pictipes* by the general shape and armature of the pedipalp (Fig. 37A–B *vs.* Fig. 6B, E). In *N. vojtechi*, the pedipalp is slightly shorter and stouter than in *N. pictipes*, particularly the wider tibia (Fig. 37A–B *vs.* Fig. 6B, E). Notably, the main spines on the femur and tibia differ from those to *N. pictipes* by the rounded, wider, and shorter pedestal

and by the absence of a small spiniform tubercle before the most proximal spine in the ventroectal tibia (Fig. 37A–B *vs.* Fig. 6B, E).

Remark. The female somatic morphology strongly supports the combination of this species under *Neoscotolemon*, justifying its transfer from Samoidae to Samooidea *incertae sedis* **transl. nov.**. However, females of *Neoscotolemon* are relatively homogeneous and do not exhibit many of the important differential characteristics used to confidently separate the species (*e.g.*, male genital morphology, male dimorphic pedipalp, free tergite armature); therefore, *Neoscotolemon vojtechi* remains a taxonomically deficient species. The collection and description of male specimens in the future is necessary to provide the morphological elements for a proper and reliable identification of this species.

Spurious Neoscotolemon

Grassatores *incertae sedis*

***Metapellobunus lutzi* (Goodnight & Goodnight, 1942) comb. nov.**

Zoobank-CodeXXXXXXX

(Fig. 38)

Neoscotolemon lutzi Goodnight & Goodnight 1942a: 4; Kury 2003: 26.

Type material: Holotype: m# (AMNH, not examined), DOMINICA, Laudet, 12-Jun-1911, F. E. Lutz *leg.* **Paratypes:** 1 f# and 4 juveniles (AMNH, examined), with the same data as for the holotype. • 1 m#, 1 f# (AMNH, not examined), DOMINICA, Long Ditton near Roseau, 20-Jun-1911, F. E. Lutz *leg*.

Other material examined. 1 m# (photo voucher), 1 f# (USNM), DOMINICA, Syndicate Native Trail, [15.523940°; -61.420490°], 21-Apr-2013, CarBio Team *leg.*

Justification of the new combination. *Neoscotolemon lutzi* was described by Goodnight & Goodnight (1942) and was allocated under the genus *Nesocotolemon* because of its similarity with *Neoscotolemon pictipes*, mainly the presence of an ocularium with a strong median spiniform apophysis. This species was never revisited after the original description and thus it remained in this genus for more than 80 years. The examination of the types and additional material clearly show that this species is not related with *Neoscotolemon pictipes*, and does not belong to the genus *Neoscotolemon* or to the Samooidea superfamily.

Based on morphological evidence, we propose the combination *Metapellobunus lutzi* (Goodnight & Goodnight, 1942) **comb. nov.** to better reflect the phylogenetic affinities of this species and eliminate the spurious association with *Neoscotolemon*. Males of *Metapellobunus lutzi* comb. nov. lack the sexually dimorphic characteristics of *Neoscotolemon* such as the enlarged pedipalp with remarkably enlarged tarsus and the modified metatarsus III (Fig. 38A–D). Additionally, *Metapellobunus lutzi* does not have widely separated eyes as in *Neoscotolemon*; in *Metapellobunus*, the eyes are close together and clearly associated with a rounded *ocularium* near the anterior border of the carapace (Fig. 38A–B, D). The cheliceral *bulla* also exhibits strong differences because, contrary to *Neoscotolemon*, the *bulla* is short and well marked (as is commonly observed in Zalmoxoidea) (Fig. 38B, D). Moreover, the male genital morphology discredits the inclusion of this species in *Neoscotolemon* because it does not exhibit the characteristic bauplan of this genus. In *Metapellobunus lutzi* the male genitalia lacks the apical *calyx*, dorsal neckline and laminar conductors that is exhibited by *Neoscotolemon;* instead, *Metapellobunus lutzi* exhibits a *capsula externa* modified in a well-developed *stragulum* and a ventral plate with a wide and laterally protected *lamina apicalis* (Fig. 38E). The male

genital morphology of *Metapellobunus lutzi* shows strong similarities with the male genital morphology of the Grassatores *incertae sedis*, *Metapellobunus unicolor* (Roewer, 1912a) (pers. obs.), a harvestman species described from St. Thomas, US Virgin Islands, Lesser Antilles.

Discussion

The current concept of Stygnommatidae has long been challenged by claims that its species composition does not reflect a natural group. For example, based on morphology, Pérez-González (2007) found support for a group of Stygnommatidae *sensu stricto* that was composed of all the species that share morphological and genital bauplan with the species *Stygnomma fuhrmanni* Roewer, 1912, described by Roewer (1912b) from Colombia. For those species which did not fit in Stygnommatidae *sensu stricto,* Pérez-González (2007) suggested that they should be removed from this family. In a molecular phylogeny using Sanger sequence data, Sharma & Giribet (2011) recovered Stygnommatidae as paraphyletic.

Our results are aligned with the proposal of Pérez-González (2007) after we removed *Stygnomma spiniferum* and its subspecies from Stygnommatidae, transferred them to Samooidea *incertae sedis,* and combined them under *Neoscotolemon*. The redescription of *Neoscotolemon pictipes* based on specimens of both sexes allowed us to restore the original association with *N. spinifer* proposed by Roewer (1912a) but this time supported by a series of strong morphological similarities, including key morphological characteristics of the male genitalia. This is an important achievement because *Nescotolemon spinifer* is an important taxon used in a highly referenced study about chemical compounds of defensive secretion in Opiliones (Duffield *et al.* 1981). Based on

our results, this species was rescued from a spurious systematic relationship with the genus *Stygnomma* and associated with a group of closely related species under the genus *Neoscotolemon*. Furthermore, several valid species were rescued from their synonymy, their status as species restored (or newly ranked), and they were properly redescribed. *Neoscotolemon bolivari*, *N. cotilla* and *N. tancahensis* were the species obscured under the former *Stygnomma spiniferum* concept which is not supported by the observations of our comparative study. *Neoscotolemon bolivari* and *N. cotilla* were considered by Goodnight & Goodnight (1951) as synonyms of one subspecies, *Stygnomma spiniferum bolivari*, but these species have remarkably different male genitalia and some clear differences in external morphology. Similarly, *Neoscotolemon tancahensis* exhibits clear morphological differences with *N. spinifer*, and there is a huge gap in their distributions (Yucatán *vs.* Florida Peninsula). These four species (previously treated as three subspecies of *Stygnomma spinifera*) were used as a text-book example of subspeciation by Goodnight & Goodnight (1953). The possible causes of this lumping approach, in our opinion, could be influenced by the fact that Goodnight & Goodnight at that time did not consider the male genital morphology for Opiliones taxonomy. Additionally, the collecting bias for Cuba conceals the great radiation of *Neoscotolemon* spp. across this island (Pérez-González 2023).

The Goodnight's taxonomical approach of lumping also led to the early incorporation of the phylogenetically distant, *Neoscotolemon lutzi*, into the genus. This species not only exhibits marked external morphological differences with the type species *Neoscotolemon pictipes*, including differences in the scutum magnum outline shape, *ocularium* shape and relative position on the carapace, form of the *bulla* in the basichelicerite and pedipalp spination, but also remarkable differences in the male genitalia

that support the transfer of this species to a different genus, *Metapellobunus*, and to a different superfamily, Zalmoxoidea.

The majority of confirmed records of *Neoscotolemon* species are from Cuba, with one species recorded for the USA (Florida) and one species recorded for Mexico (Yucatán) and Belize. *Neoscotolemon spinifer* has been recorded in Ohio, but this is certainly a spurious record. Besides being very far from the distributional area of any Samooidea, the provided picture in Walker (1928), even with no great detail, is enough to see that the specimen does not exhibit a general shape compatible with *Neoscotolemon.* Rather, Walker's picture looks similar to *Erebomaster acanthinus* (Crosby & Bishop, 1924) (Cladonychiidae), the probable identity of the recorded species from Ohio (W. Shear pers. com.). Steward Peck (1992) also recorded *Neoscotolemon spinifer* in three caves in Jamaica, but to us this is another spurious record for this species. No opilionologists who have collected in Jamaica have described a *Neoscotolemon* species or recorded *N. spinifer* from the island. Additionally, in 2013, one of us (APG) collected intensively in Jamaica, but *Neoscotolemon* was never observed during this field trip. Two samoid species, *Akdalima jamaicana* Šilhavý, 1979, and *Reventula amabilis* Šilhavý, 1979, were described from Jamaica, and a large number of related new species also live on the island (Pérez-González 2023), making this a common component of Jamaican opiliofauna. These Jamaican samoids exhibit an external morphology somewhat similar to *Neoscotolemon*, with hourglass scutum, *ocularium* with median spiniform apophysis, enlarged cheliceral *bulla*, and strong and long pedipalps; in fact, it is quite possible that the Peck's record of *Neoscotolemon spinifer* belongs to one of those samoid species. On the other hand, Hounsome (1994: 320) recorded *Stygnomma spinifera* from the central woodland of Little

Cayman. Given the presence of species of *Neoscotolemon* in other localities south of the main island of Cuba (*e.g.*, *N. tancahensis* from Yucatán and *N. armasi* from Isla de la Juventud, Cuba), it is possible that *Neoscotolemon* occurs in the Cayman Islands. However, due to the high degree of endemicity and small distributional range shown by *Nesocotolemon* spp., we believe the presence of *N. spinifer* south of Cuba is highly improbable, although other species of *Neoscotolemon* could occur there. Therefore, we considered the presence in Cayman Island as an unconfirmed record for *N. spinifer* until specimens from this locality could be properly examined.

Regarding the family-level assignment of *Neoscotolemon,* we opted to maintain the genus as Samooidea *incertae sedis*. Pérez-González & Kury (2007) stated that the penial *calyx* relates Samoidea to *Neoscotolemon* as well as the enlarged metatarsus III in males, but this latter characteristic also relates Samoidae to the Biantidae subfamily Stenostygninae. Undoubtedly, *Neoscotolemon* is part of Samooidea, but the internal arrangement of this superfamily is artificial (Sharma & Giribet 2011) and none of their family components (Stygnommatidae, Samoidae and Biantidae) correspond to natural groups. Therefore, without a clear association to any type species of the type genus of the three currently defined samooidean families, we prefer to keep *Neoscotolemon* as a genus with uncertain family ties until a systematic revision (in progress) defines more clearly their association.

Regardless of the uncertain allocation to a family, *Neoscotemon* is now a very recognizable genus within Samooidea. They have somatic and genital features that reliably allow species to be assigned to this genus. Among the somatic features, they have a characteristic sexually dimorphic pedipalp. Although the podomeres are strong and armed

with spines in both sexes, in males, the pedipalp is remarkably elongated compared to females. This differs from other families in which the elongated dimorphic pedipalp is remarkably thinner in males, *e.g.*, *Assamhoplites martensi* Porto, Kontos & Pérez-González, 2024 (Assamiidae), *Lomanius annae* Kury & Machado, 2018 (Podoctidae) and *Ankaratrix maloto* Porto & Pérez-González, 2020 (Triaenonychidae). In this characteristic, the pedipalps of *Neoscotolemon* seem similar to members of Stygnommatidae *sensu stricto*, but in Stygnommatidae the coxa is extremely elongated and the tarsus is remarkably shorter than the tibia (Pérez-González 2007, fig. 4.39 a) whereas in major males of *Neoscotolemon*, the coxa is moderately elongated and the tarsus is remarkably enlarged and bigger than the tibia (*e.g.*, Figs 1C; 7E). Up to now, this kind of pedipalp is unique to *Neoscotolemon* representatives. On the other hand the penis morphology is also unique among samooidean genera, with a well-developed *calyx* with dorsal wings (except in *N. cotilla*) and without a central pointed apophysis as in *Akdalima jamaicana* Šilhavý, 1979 (Samoidae), presence of dorsal neckline and two rows of macrosetae bilaterally arranged in the *pars distalis*, a glans with an invaginated *follis* that is not visible when the penis is in the resting configuration, and a *capsula interna* with two laminar conductors, fused only at the base, that flank a pointed laminar stylus (Figs 5B, F; 11B; 17B, D, F; 20B, D; 27B, D, F; 34B, D–E).

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Tables.

Table 1. Measurements (in mm) of *Neoscotolemon pictipes* (Banks, 1908). *****–Holotype, Tr–Trochanter, Fe–Femur, Pa–Patella, Ti–Tibia, Mt–Metatarsus, Ta–Tarsus, T–Total.

		Tr	Fe	Pa	Ti	Mt	Ta	**T**
	Pedipalp	0.46	1.62	0.98	1.11	-	1.54	5.70
♂	Leg I	0.36	1.11	0.48	0.70	1.18	0.77	4.61
MACN-Ar	Leg II	0.46	1.55	0.69	1.29	1.58	1.56	7.13
46949	Leg III	0.38	1.20	0.51	0.87	1.32	0.91	5.17
	Leg IV	0.50	1.53	0.71	1.24	1.83	1.05	6.85
	Pedipalp	0.29	0.97	0.52	0.69	-	0.78	3.25
♀	Leg I	0.28	0.85	0.37	0.58	0.90	0.59	3.57
MCZ	Leg II	0.34	1.31	0.56	1.08	1.29	1.43	6.02
26171*****	Leg III	0.32	0.95	0.37	0.76	1.08	0.71	4.19
	Leg IV	0.43	1.26	0.58	1.00	1.56	0.82	5.64

Table 2. Measurements (in mm) of *Neoscotolemon armasi* **spec. nov.**, holotype. Tr–Trochanter, Fe–Femur, Pa–Patella, Ti–Tibia, Mt–Metatarsus, Ta–Tarsus, T–Total.

		Tr	Fe	Pa	Ti	Mt	Ta	**T**
	Pedipalp	0.41	1.44	0.62	1.02	-	1.20	4.69
♂	Leg I	0.27	0.99	0.46	0.68	1.01	0.74	4.15
CZACC	Leg II	0.33	1.00	0.65	1.14	1.47	1.63	6.21
	Leg III	0.35	0.97	0.45	0.77	1.16	0.83	3.54
	Leg IV	0.43	1.44	0.61	1.08	1.72	1.08	6.38

Table 3. Measurements (in mm) of *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945). Tr–Trochanter, Fe–Femur, Pa–Patella, Ti–Tibia, Mt–Metatarsus, Ta–Tarsus, T–Total.

		Tr	Fe	Pa	Ti	Mt	Ta	**T**
	Pedipalp	0.59	2.30	1.08	1.59	-	2.34	7.89
major ♂	Leg I	0.49	1.77	0.79	1.25	2.06	1.22	7.57
MACN-Ar	Leg II	0.62	2.96	1.08	2.40	2.74	3.18	12.98
46922	Leg III	0.53	2.22	0.69	1.55	2.37	1.47	8.82
	Leg IV	0.63	2.62	1.01	2.11	3.22	1.99	11.58
	Pedipalp	0.59	2.07	0.96	1.48	-	1.72	6.82
	Leg I	0.54	2.07	0.81	1.50	2.46	1.49	8.87
minor ♂	Leg II	0.60	3.42	1.18	2.79	3.31	3.93	15.23
AMNH	Leg III	0.47	2.43	0.76	1.81	2.77	1.67	9.91
	Leg IV	0.75	3.17	1.03	2.48	3.68	2.37	13.46
	Pedipalp	0.49	1.76	0.91	1.38	-	1.42	5.96
	Leg I	0.47	1.96	0.79	1.31	2.11	1.31	7.95
♀	Leg II	0.55	3.12	1.12	2.43	2.86	3.25	13.31
AMNH	Leg III	0.49	2.16	0.69	1.63	2.38	1.55	8.89
	Leg IV	0.67	2.87	1.06	2.27	3.46	2.10	12.43

Table 4. Measurements (in mm) of *Neoscotolemon spinifer* (Packard, 1888). Tr–Trochanter, Fe–Femur, Pa–Patella, Ti–Tibia, Mt–Metatarsus, Ta–Tarsus, T–Total.

		Tr	Fe	Pa	Ti	Mt	Ta	**T**
	Pedipalp	0.45	1.87	0.97	1.35	-	1.56	6.20
	Leg I	0.38	1.26	0.56	0.87	1.35	0.87	5.31
major ♂	Leg II	0.45	1.86	0.84	1.62	1.87	2.12	8.76
AMNH	Leg III	0.40	1.44	0.53	1.11	1.61	1.00	6.08
	Leg IV	0.44	1.68	0.76	1.49	2.21	1.24	7.82
	Pedipalp	0.31	1.10	0.54	0.77	-	0.91	3.63
	Leg I	0.26	1.00	0.43	0.70	1.15	0.80	4.34
minor ♂	Leg II	0.36	1.69	0.69	1.35	1.49	1.96	7.54
AMNH	Leg III	0.32	1.18	0.49	0.94	1.37	0.96	5.26
	Leg IV	0.38	1.59	0.67	1.27	2.00	1.12	7.03
	Pedipalp	0.35	1.02	0.48	0.75	-	0.78	3.38
	Leg I	0.30	1.06	0.48	0.71	1.13	0.78	4.47
♀	Leg II	0.37	1.66	0.71	1.31	1.54	1.86	7.45
AMNH	Leg III	0.38	1.22	0.42	0.95	1.35	0.99	5.31
	Leg IV	0.43	1.59	0.69	1.32	2.01	1.11	7.15

Table 5. Measurements (in mm) of *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951). Tr–Trochanter, Fe–Femur, Pa–Patella, Ti–Tibia, Mt–Metatarsus, Ta–Tarsus, T–Total.

		Tr	**Fe**	**Pa**	**Ti**	**Mt**	**Ta**	**T**
	Pedipalp	0.45	1.87	0.97	1.35	-	1.56	6.20
	Leg I	0.38	1.26	0.56	0.87	1.35	0.87	5.31
major ♂	Leg II	0.45	1.86	0.84	1.62	1.87	2.12	8.76
AMNH	Leg III	0.40	1.44	0.53	1.11	1.61	1.00	6.08
	Leg IV	0.44	1.68	0.76	1.49	2.21	1.24	7.82
	Pedipalp	0.31	1.10	0.54	0.77	-	0.91	3.63
	Leg I	0.26	1.00	0.43	0.70	1.15	0.80	4.34
minor ♂	Leg II	0.36	1.69	0.69	1.35	1.49	1.96	7.54
AMNH	Leg III	0.32	1.18	0.49	0.94	1.37	0.96	5.26
	Leg IV	0.38	1.59	0.67	1.27	2.00	1.12	7.03
	Pedipalp	0.35	1.02	0.48	0.75	-	0.78	3.38
	Leg I	0.30	1.06	0.48	0.71	1.13	0.78	4.47
♀	Leg II	0.37	1.66	0.71	1.31	1.54	1.86	7.45
AMNH	Leg III	0.38	1.22	0.42	0.95	1.35	0.99	5.31
	Leg IV	0.43	1.59	0.69	1.32	2.01	1.11	7.15

FIGURES CAPTIONS

FIGURE 1. *Neoscotolemon pictipes* (Banks, 1908), male (MACN-Ar 46949), habitus: A. Dorsal view; B. Ventral view; C. Lateral view. Scale bars: 1 mm.

FIGURE 2. *Neoscotolemon pictipes* (Banks, 1908), male (MACN-Ar 46949), habitus: A. Dorsal view; B. Ventral view; C. Detail of coxa II; D. Lateral view; E. Detail of ozopore; F. Posterior view; G. Detail of granules of anal operculum. Scale bars: A–B, D, F = 500 μm; C, E, G = 100 μm.

FIGURE 3. *Neoscotolemon pictipes* (Banks, 1908), male (MACN-Ar 46949). A–D. Left pedipalp: A. Mesal view; B. Ectal view; C. Detail of claw; D. Detail of spine with microtrichia. E–G. Left chelicera: E. Mesal view; F. Ectal view; G. Frontal view. Spines in green. Scale bars: A–B, E–G = 500 μm; C = 100 μm; D = 25 μm.

FIGURE 4. *Neoscotolemon pictipes* (Banks, 1908), left leg III. A–F. Male (MACN-Ar 46949): A. Prolateral view; B. Metatarsus in prolateral view; C. Metatarsus in ventral view; D. Detail of trichomes concentrated around aggregated pores on apical surface of calcaneus; E. Detail of trichomes and sensilla chaetica on proximal surface of calcaneus; F. Lateral tarsus without scopula. G–H. Female (MACN-Ar 46949): G. Metatarsus in retrolateral view; H. Detail of ventral calcaneus. Scale bars: A = 1 mm; B–C, G = 500 μm; D = 20 μm; E = 50 μm; F, H = 100 μm.

FIGURE 5. *Neoscotolemon pictipes* (Banks, 1908), males. A–E. Penis drawings (MACN-Ar 46949): A, B. Dorsal view; C, D. Lateral view; E. Ventral view. F–J. Penis SEM (MACN-Ar 46949): F. Dorsal view; G. Lateral view; H. Ventral view; I. Tip of conductors, detail; J. Apical view. Scale bars: A, C = 500 μm; B, D–E = 100 μm; F–H, J = 50 μm; I = 10 μm. Stylus in green; conductors in red. Arrow indicates the neckline; asterisk indicates the *calyx*. Abbreviations: B1–B4, basal macrosetae; A1–A3, apical macrosetae; W, wing.

FIGURE 6. *Neoscotolemon pictipes* (Banks, 1908), sexual dimorphism. A–C. Female (holotype, MCZ 26121): A. Habitus, dorsal view; B. Habitus, lateral view; C. Left metatarsus III, prolateral view; D–F. Female (MACN-Ar 46949): D. Habitus, dorsal view; E. Habitus, lateral view; F. Left metatarsus III, prolateral view; G–I. Male (MACN-Ar 46949): G. Habitus, dorsal view; H. Habitus, lateral view; I. Left metatarsus III, prolateral view. Scale bars: A–B, D–E, G–H = 1 mm; C, F, I = 200 μm.

FIGURE 7. *Neoscotolemon armasi* **spec. nov.**, male (CZACC), habitus: A. Dorsal view; B. Ventral view; C. Ventral view with detail of coxae; D. Ventral view with detail of free sternites; E. Lateral view; F. Posterior view. Scale bars: A–B = 2 mm; C = 200 μm; D, F = 500 μm; E = 1 mm.

FIGURE 8. *Neoscotolemon armasi* **spec. nov.**, male (holotype, CZACC): A. Habitus, dorsal view; B–E. Left pedipalp: B. Mesal view; C. Ectal view; D. Femur, ventral view; E. Tarsus and claw, ventral view, with black arrow indicating the sclerotized projection. F–H. Left chelicera: F. Ectal view; G. Frontal view; H. detail of fingers. Spines in green. Scale bars: A–F = 1 mm; G = 200 μm; H = 100 μm.

FIGURE 9. *Neoscotolemon armasi* **spec. nov.**, male (holotype, CZACC), left metatarsus III: A. Prolateral view; B. Ventral view. Scale bars = 500 μm.

FIGURE 10. *Neoscotolemon armasi* **spec. nov.**, male (holotype, CZACC), left leg III: A. Prolateral view; B. Metatarsus, prolateral view; C. Metatarsus, ventral view; D. Detail of trichomes concentrated around aggregated pores on apical surface of calcaneus; E. Detail of trichomes and sensilla chaetica on proximal surface of calcaneus; F. Detail of trichomes with multifurcate tips. Scale bars: A = 300 μm; B–C = 100 μm; D, F = 10 μm; E = 20 μm.

FIGURE 11. *Neoscotolemon armasi* **spec. nov.**, male holotype (CZACC), penis drawings: A, B. Dorsal view; C, D. Lateral view; E. ventral view. Scale bars: A, C = 500 μm; B, D–E = 100 μm. Stylus in green; conductors in red; blue arrows indicate the U-shaped cleft between macrosetae B2 and B3. Abbreviations: B1–B4, basal macrosetae; A1–A3, apical macrosetae: W, wing.

FIGURE 12. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), minor male (paratype, AMNH), habitus: A. Dorsal view; B. Ventral view; C. Lateral view. Scale bars: 2 mm.

FIGURE 13. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), minor male (holotype, AMNH): A–C. Habitus: A. Dorsal view; B. Lateral view; C. Posterior view; D–E. Left pedipalp: D. Mesal view; E. Ectal view; F–I. Left chelicera: F. Mesal view; G. Ectal view; H. Frontal view; I. Detail of fingers. Spines in green. Scale bars: A–E = 2 mm; F–H = 1 mm; I = 500 μm.

FIGURE 14. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), major male (MACN-Ar 46922), habitus: A. Dorsal view; B. Ventral view; C. Detail of spiracle; D. Posterior view; E. Lateral view; F. Detail of setiferous granules of free sternite V and anal operculum. Scale bars: A–B, D, F = 500 μm; C, E, G = 100 μm.

FIGURE 15. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), major male (MACN-Ar 46922). A–D. Left pedipalp: A. Mesal view; B. Ectal view; C. Detail of trochanter; D. Detail of tarsus*;* E–H. Left chelicera: E. Mesal view; F. Ectal view; G. Frontal view; H. Detail of fingers. Spines in green. Scale bars: A–B = 1 mm, C–G = 500 μm; H = 200 μm.

FIGURE 16. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), major male (MACN-Ar 46922), left leg III: A. Retrolateral view; B. Metatarsus, retrolateral view; C. Metatarsus, ventral view; D. Detail of trichomes concentrated around aggregated pores on apical surface of calcaneus; E. Detail of trichomes and sensilla chaetica on medial surface of calcaneus; F. Tarsus without scopula, retrolateral view. Scale bars: A = 1 mm; B–C = 500 μm; D = 25 μm; E–F = 50 μm.

FIGURE 17. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), Penis drawings. A–D. minor male (holotype, AMNH): A–B. Dorsal view; C–D. Lateral view. E–I. major male (MACN-Ar 46922): E–F. Dorsal view; G–H. Lateral view; I. Ventral view. Scale bars: A, C, E, G = 500 μm; B, D, F, H–I = 100 μm. Stylus in green; conductors in red. Abbreviations: B1–B4, basal macrosetae; A1–A3, apical macrosetae; W, wing.

FIGURE 18. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), sexual dimorphism. A–C. female (paratype, AMNH): A. Habitus, dorsal view; B. Habitus, lateral view; C. Left metatarsus III, prolateral view; D–F. Minor male (paratype, AMNH): D. Habitus, dorsal view; E. Habitus, lateral view; F. Left metatarsus III, prolateral view. G–I. major male (MACN-Ar

46922): G. Habitus, dorsal view; H. Habitus, lateral view; I. Left metatarsus III, prolateral view. Scale bars: A, D, G = 1 mm; B, E, H = 2 mm; C, F, I = 500 μm.

FIGURE 19. *Neoscotolemon cotilla* (Goodnight & Goodnight, 1945), major male (holotype, AMNH): A–B. Habitus: A. Dorsal view; B. Lateral view; C–D. Left pedipalp: C. Mesal view; D. Ectal view; E–G. Left chelicera: E. Mesal view; F. Ectal view; G. Frontal view. Spines in green. Scale bars: A–B = 2 mm; C–G = 1 mm.

FIGURE 20. *Neoscotolemon cotilla* (Goodnight & Goodnight, 1945), male (holotype, AMNH), penis drawings: A–B. Dorsal view; C–D. Lateral view. Scale bars: A, C = 500 μm; B, D = 100 μm. Stylus in green; conductors in red. Abbreviations: B1–B4, basal macrosetae; A1–A2, apical macrosetae.

FIGURE 21. Living specimens of *Neoscotolemon spinifer* (Packard, 1888) in typical resting position (*i.e.*, compact configuration with legs and pedipalps folded over the the body): A. female; B. male. Asterisk marks the typical enlarged tubercles in the lateral region of free tergite III, and the arrow shows the sexually dimorphic metatarsus III that is enlarged in males. Photos courtesy of Oonagh Degenhardt.

FIGURE 22. *Neoscotolemon spinifer* (Packard, 1888), major male (AMNH), habitus: A. Dorsal view; B. Ventral view; C. Lateral view. Scale bars: 2 mm.

FIGURE 23. *Neoscotolemon spinifer* (Packard, 1888), major male (holotype, AMNH): A–C. Habitus: A. Dorsal view; B. Lateral view; C. Ventral view; D–E. Left pedipalp: D. Mesal view; E. Ectal view; F–I. Left chelicera: F. Mesal view; G. Ectal view; H. Frontal view; I. Detail of fingers. Spines in green. Scale bars: A–C = 2 mm; D–G = 1 mm; H–I = 500 μm.

FIGURE 24. *Neoscotolemon spinifer* (Packard, 1888), major male (USNM), habitus: A. Dorsal view; B. Ventral view; C. Detail of spiracle; D. Posterior view; E. Lateral view; F. Detail of *ocularium*. Scale bars: A–B, D–E = 1 mm; C = 100 μm; F = 500 μm.

FIGURE 25. *Neoscotolemon spinifer* (Packard, 1888), major male (USNM). A–B. Left pedipalp: A. Mesal view; B. Ectal view; C–D. Left chelicera: E. Mesal view; F. Ectal view; G. Frontal view. Spines in green. Scale bars: A–B = 1 mm, C–E = 500 μm.

FIGURE 26. *Neoscotolemon spinifer* (Packard, 1888), major male (USNM), A–B. Left leg III: A. Metatarsus, ventral view; B. Detail of trichomes concentrated around aggregated pores on apical surface of calcaneus, ventral view; C–F. Left leg III: C. Metatarsus, retrolateral view; D. Detail of trichomes concentrated around aggregated pores on apical surface of calcaneus; E. Detail of trichomes and sensilla chaetica on medial surface of calcaneus; F. Tarsus without scopula, retrolateral view. Scale bars: A, C = 500 μm; B, D–F = 50 μm.

FIGURE 27. *Neoscotolemon spinifer* (Packard, 1888), Penis drawings. A–D. major male (holotype, AMNH): A–B. Dorsal view; C–D. Lateral view. E–I. Major male (AMNH): E–F. Dorsal view; G–H. Lateral view; I. Ventral view. Scale bars: A, C, E, G = 500 μm; B, D, F, H–I = 100 μm. Stylus in green; conductors in red. Abbreviations: B1–B4, basal macrosetae; A1–A3, apical macrosetae; W, wing.

FIGURE 28. *Neoscotolemon spinifer* (Packard, 1888), sexual dimorphism. A–C. Female (AMNH): A. Habitus, dorsal view; B. Habitus, lateral view; C. Left metatarsus III, prolateral view; D–F. Minor male (AMNH): D. Habitus, dorsal view; E. Habitus, lateral view; F. Left metatarsus III, prolateral view; G–I. Major male (AMNH): G. Habitus, dorsal

view; H. Habitus, lateral view; I. Left metatarsus III, prolateral view. Scale bars: A, D, G = 1 mm; B, E, H = 2 mm; C, F, I = 500 μm.

FIGURE 29. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), major male (MACN-Ar), habitus: A. Dorsal view; B. Ventral view; C. Lateral view. Scale bars: 2 mm.

FIGURE 30. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), major male (holotype, AMNH): A–B. Habitus: A. Dorsal view; B. Lateral view; C–D. Left chelicera: E. Mesal view; F. Ectal view; E–F. Left pedipalp: C. Mesal view; D. Ectal view. Spines in green. Scale bars: A–B = 2 mm; C–F = 1 mm.

FIGURE 31. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), major male (USNM), habitus: A. Dorsal view; B. Ventral view; C. Posterior view; D. Lateral view; F. Detail of carapace. Scale bars: A–D = 1 mm; E = 500 μm.

FIGURE 32. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), major male (USNM). A–B. Left pedipalp: A. Mesal view; B. Ectal view; C–E. Left chelicera: C. Mesal view; D. Ectal view; E. Frontal view. Spines in green. Scale bars: A–B = 1 mm, C–D = 2500 μm; E = 500 μm.

FIGURE 33. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), major male (USNM), left leg III: A. Metatarsus, ventral view; B. Detail of trichomes and sensilla chaetica on medial surface of calcaneus; C. Detail of trichomes concentrated around aggregated pores on apical surface of calcaneus; D. Tarsus without scopula, ventral-retrolateral view. Scale bars: A = 500 μm; B, D = 50 μm; C = 25 μm.

FIGURE 34. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), major males. A–D. Penis drawings (holotype, AMNH): A, B. Dorsal view; C, D. Lateral view; E–G. Penis SEM (USNM): F. Dorsal view; G. Lateral view; H. Ventral view. Scale bars: A, C = 500 μm; B, D, F–G = 100 μm; E = 50 μm. Stylus in green; conductors in red; asterisk indicates a teratological macroseta present only on the left side between A2 and A3. Abbreviations: B1–B4, basal macrosetae; A1–A3, apical macrosetae; W, wing.

FIGURE 35. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), sexual dimorphism. A–C. Female (AMNH): A. Habitus, dorsal view; B. Habitus, lateral view; C. Left metatarsus III, prolateral view; D–F. Minor male (USNM): D. Habitus, dorsal view; E. Habitus, lateral view; F. Left metatarsus III, prolateral view; G–I. Major male (AMNH): G. Habitus, dorsal view; H. Habitus, lateral view; I. Left metatarsus III, prolateral view. Scale bars: A, D, G = 1 mm; B, E, H = 2 mm; C, F, I = 500 μm.

FIGURE 36. *Neoscotolemon vojtechi* (Šilhavý, 1979), female (holotype, MCZ 14838), habitus: A. Dorsal view; B. Ventral view; C. Lateral view. Scale bars: 1 mm.

FIGURE 37. *Neoscotolemon vojtechi* (Šilhavý, 1979), female (holotype, MCZ 14838): A. Left pedipalp, ectal view; B. Right pedipalp, mesal view; C–D. Right chelicera: C. Ectal view; D. Mesal view. Scale bars: A–B = 500 μm; C–D = 2 mm.

FIGURE 38. *Metapellobunus lutzi* (Goodnight & Goodnight, 1942), male (USNM). A–D. Habitus: A, B. Dorsal view; C. Ventral view; D. Lateral view. E. Penis, dorsal view. Stylus in green; *stragulum* in magenta. Scale bars: A = 2 mm; B–D = 1 mm; E = 500 μm.

FIGURE 39. Geographical distribution of the genus *Neoscotolemon*. *Neoscotolemon pictipes* (sky blue circle), *N. armasi* **spec. nov.** (orange star), *N. bolivari* (yellow square), *N.*

cotilla (red triangle), and *N. vojtechi* (white circle) in Cuba; *N. spinifer* (magenta hexagon) in Southern Florida, United States of America, Cayman Islands (unconfirmed record, indicated by a question mark), and Jamaica (doubtful record, indicated by a question and exclamation mark); *N. tancahensis* (green inverted triangle) in Yucatán Peninsula, México and Belize.

FIGURES

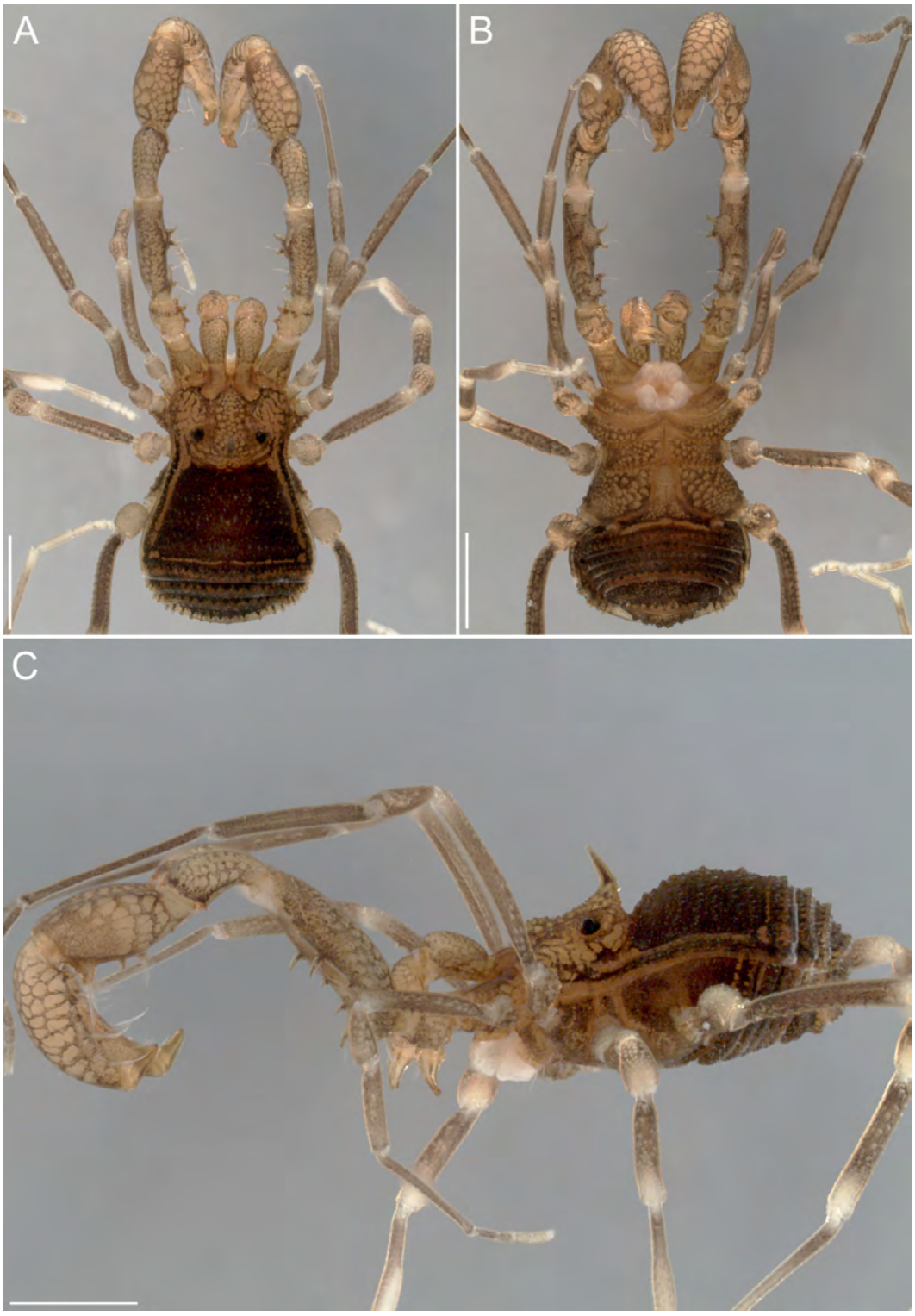

Figure 1. *Neoscotolemon pictipes* (Banks, 1908), male (MACN-Ar 46949), habitus: A. Dorsal view; B. Ventral view; C. Lateral view. Scale bars: 1 mm.

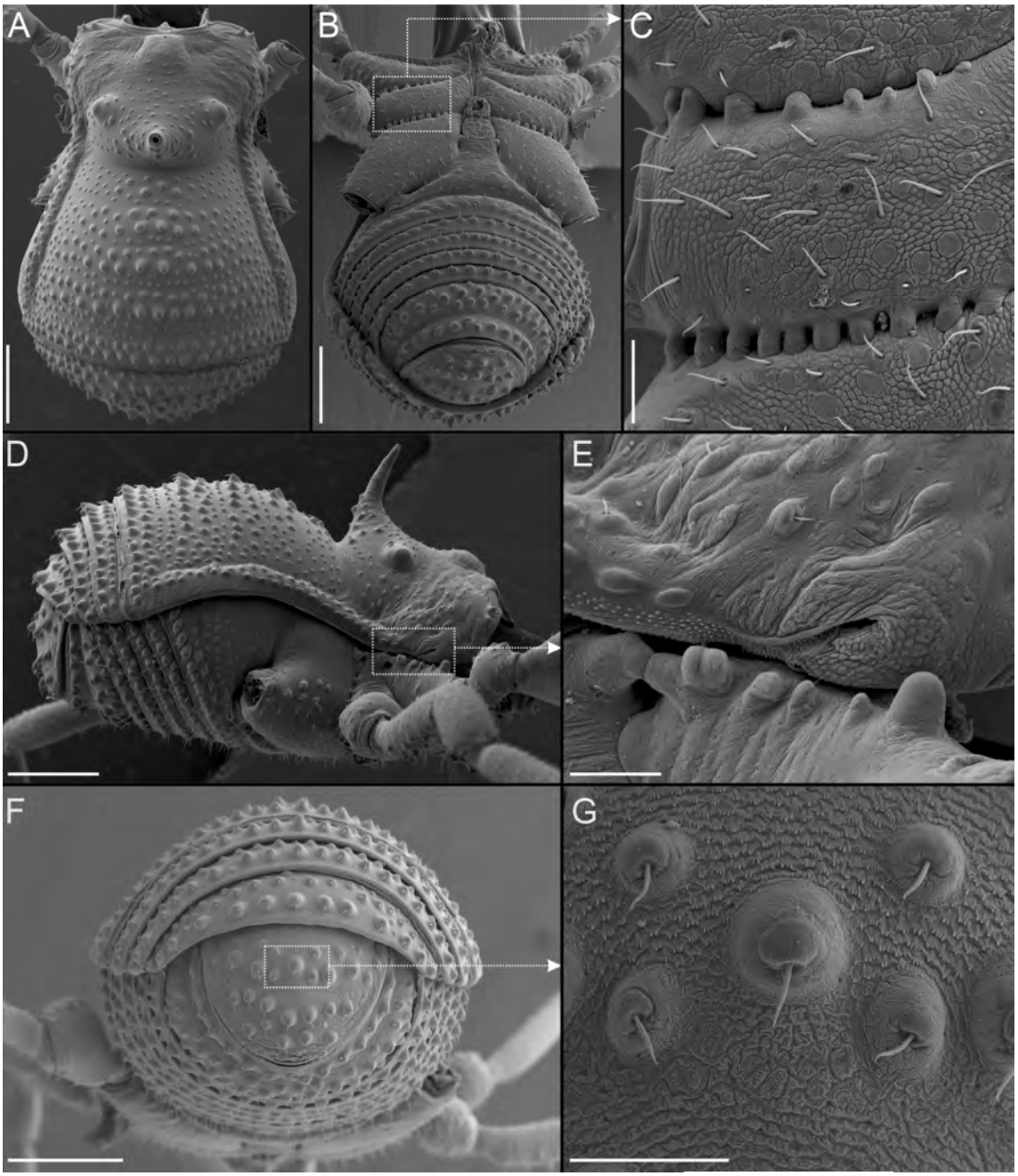

Figure 2. *Neoscotolemon pictipes* (Banks, 1908), male (MACN-Ar 46949), habitus: A. Dorsal view; B. Ventral view; C. Detail of coxa II; D. Lateral view; E. Detail of ozopore; F. Posterior view; G. Detail of granules of anal operculum. Scale bars: A–B, D, F = 500 µm; C, E, G = 100 µm.

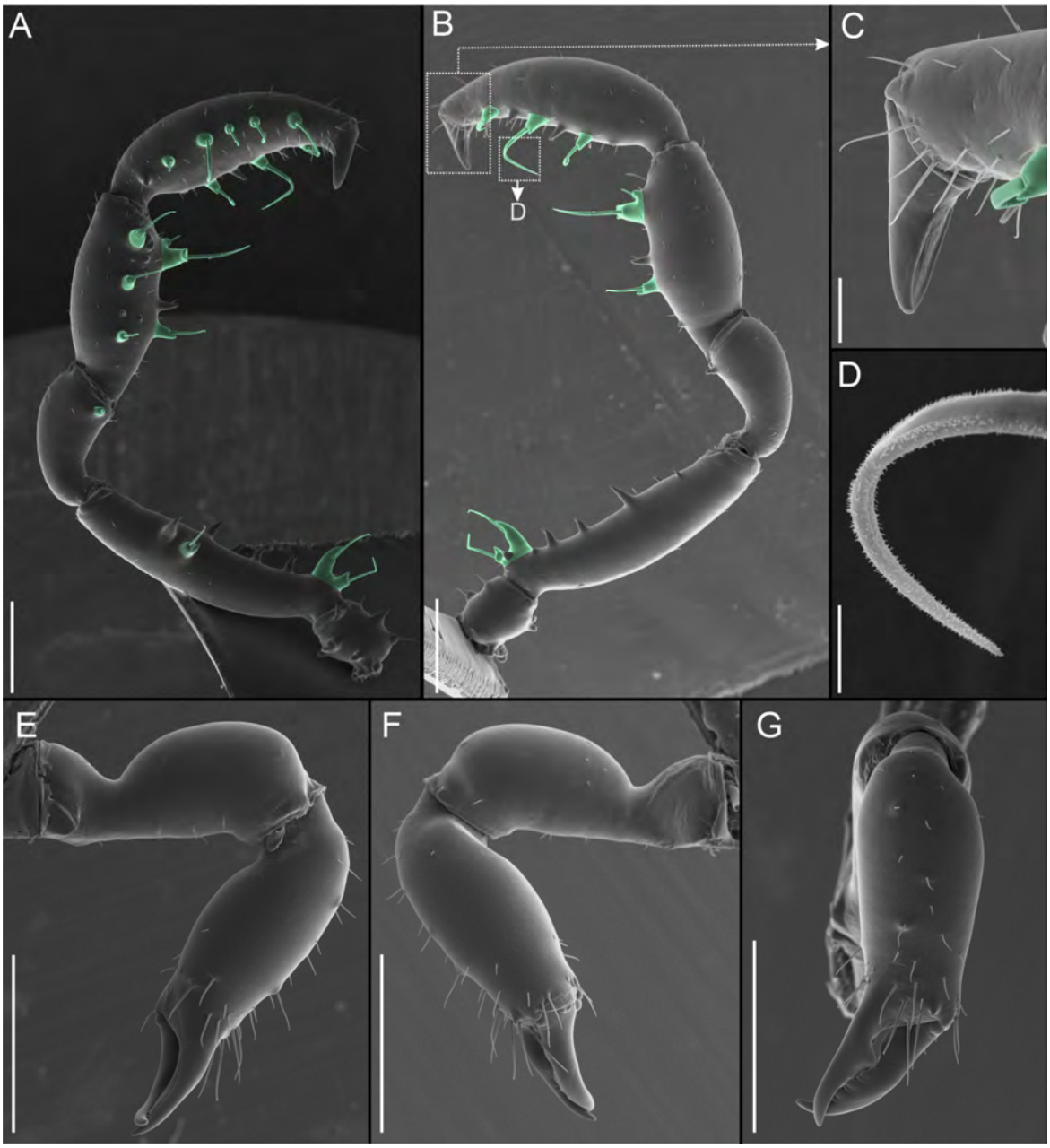

Figure 3. *Neoscotolemon pictipes* (Banks, 1908), male (MACN-Ar 46949). A–D. Left pedipalp: A. Mesal view; B. Ectal view; C. Detail of claw; D. Detail of spine with microtrichia. E–G. Left chelicera: E. Mesal view; F. Ectal view; G. Frontal view. Spines in green. Scale bars: A–B, E–G = 500 μm; C = 100 μm; D = 25 μm.

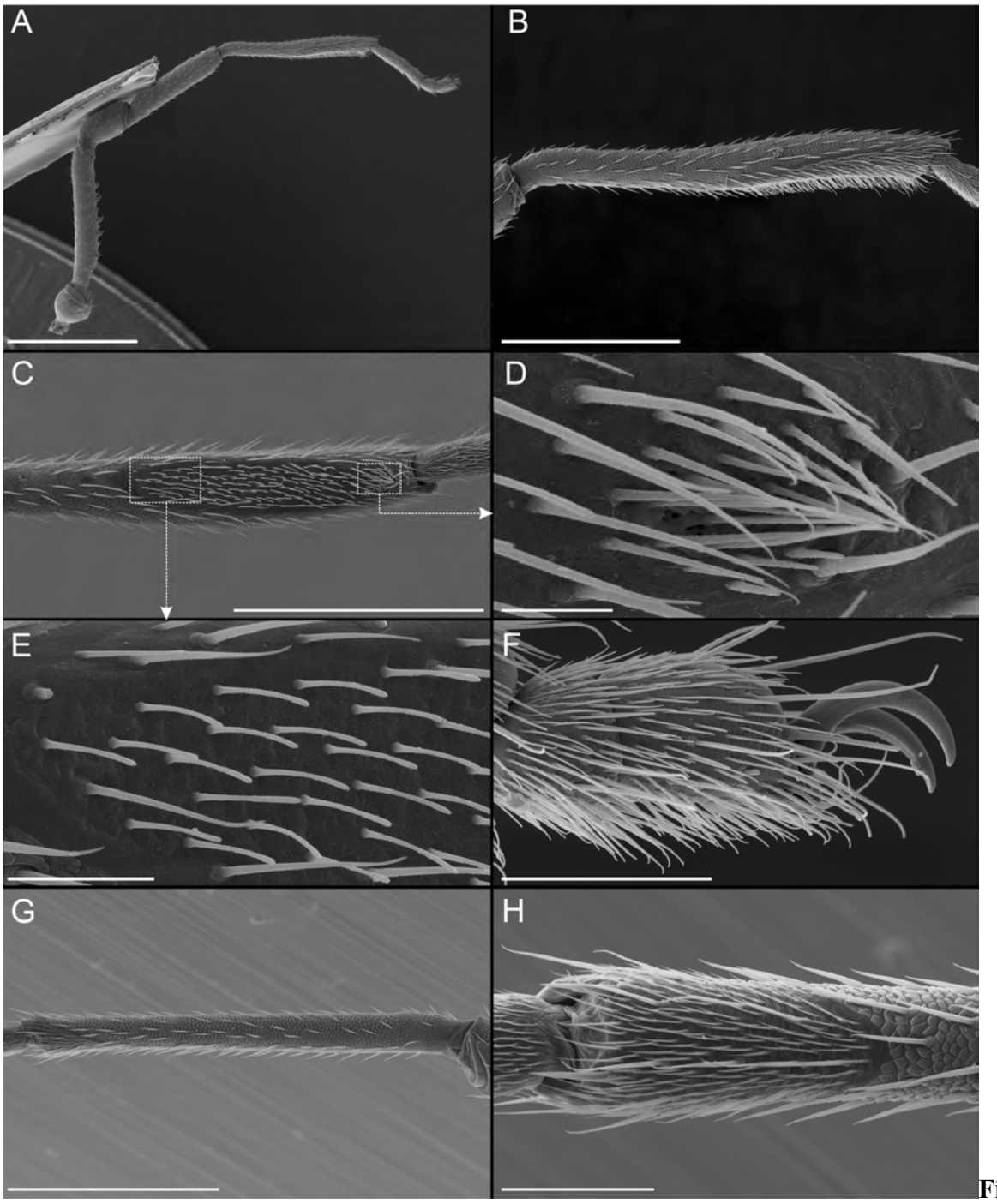

Figure 4. *Neoscotolemon pictipes* (Banks, 1908), left leg III. A–F. Male (MACN-Ar 46949): A. Prolateral view; B. Metatarsus in prolateral view; C. Metatarsus in ventral view; D. Detail of trichomes concentrated around aggregated pores on apical surface of calcaneus; E. Detail of trichomes and sensilla chaetica on proximal surface of calcaneus; F. Lateral tarsus without scopula. G–H. Female (MACN-Ar 46949): G. Metatarsus in retrolateral view; H. Detail of ventral calcaneus. Scale bars: A = 1 mm; B–C, G = 500 μm; D = 20 μm; E = 50 μm; F, H = 100 μm.

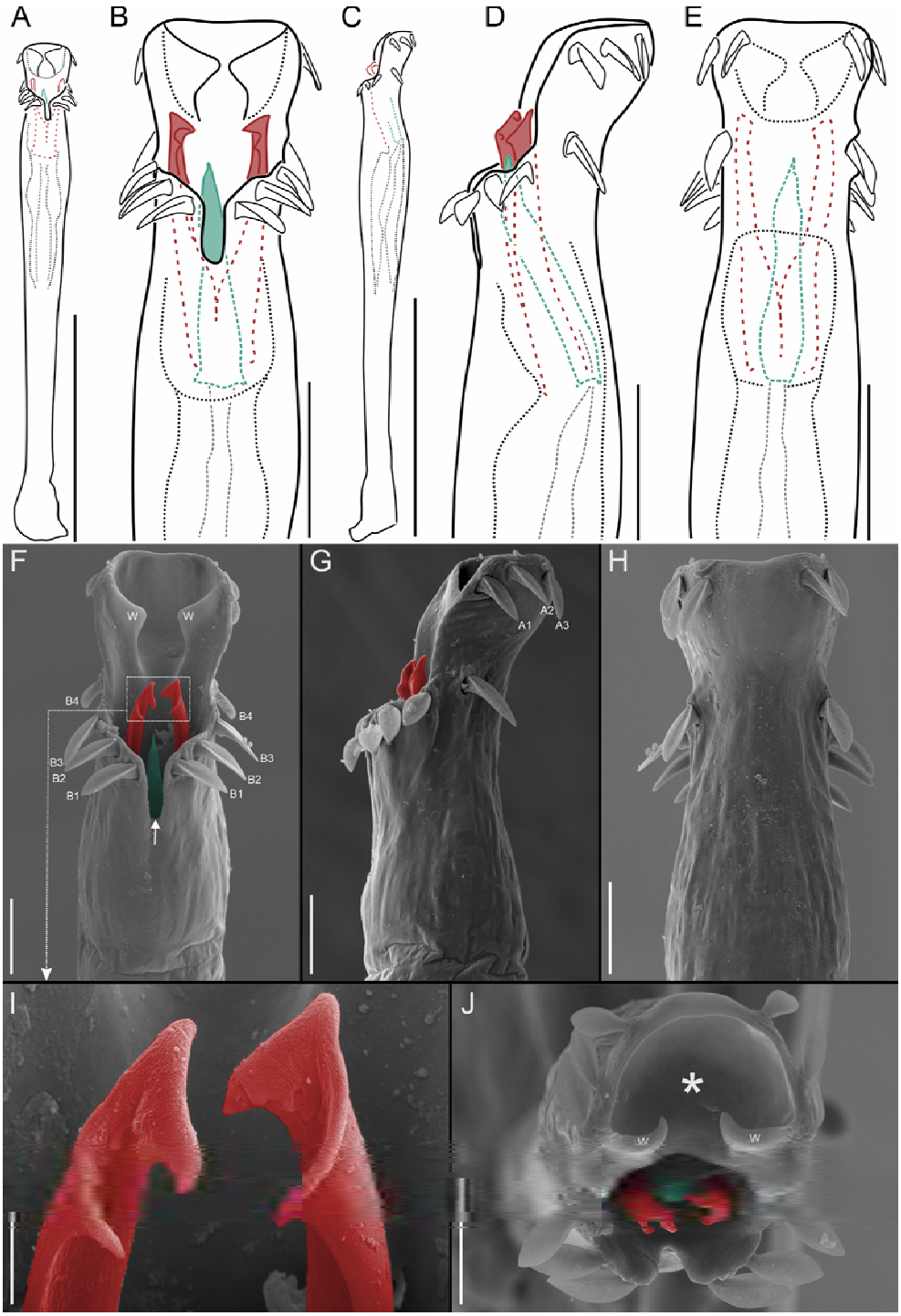

Figure 5. *Neoscotolemon pictipes* (Banks, 1908), males. A–E. Penis drawings (MACN-Ar 46949): A, B. Dorsal view; C, D. Lateral view; E. Ventral view. F–J. Penis SEM (MACN-Ar 46949): F. Dorsal view; G. Lateral view; H. Ventral view; I. Tip of conductors, detail; J. Apical view. Scale bars: A, C = 500 µm; B, D–E = 100 µm; F–H, J = 50 µm; I = 10 µm. Stylus in green; conductors in red. Arrow indicates the neckline; asterisk indicates the *calyx*. Abbreviations: B1–B4, basal macrosetae; A1–A3, apical macrosetae; W, wing.

Figure 6. *Neoscotolemon pictipes* (Banks, 1908), sexual dimorphism. A–C. Female (holotype, MCZ 26121): A. Habitus, dorsal view; B. Habitus, lateral view; C. Left metatarsus III, prolateral view; D–F. Female (MACN-Ar 46949): D. Habitus, dorsal view; E. Habitus, lateral view; F. Left metatarsus III, prolateral view; G–I. Male (MACN-Ar 46949): G. Habitus, dorsal view; H. Habitus, lateral view; I. Left metatarsus III, prolateral view. Scale bars: A–B, D–E, G–H = 1 mm; C, F, I = 200 μm.

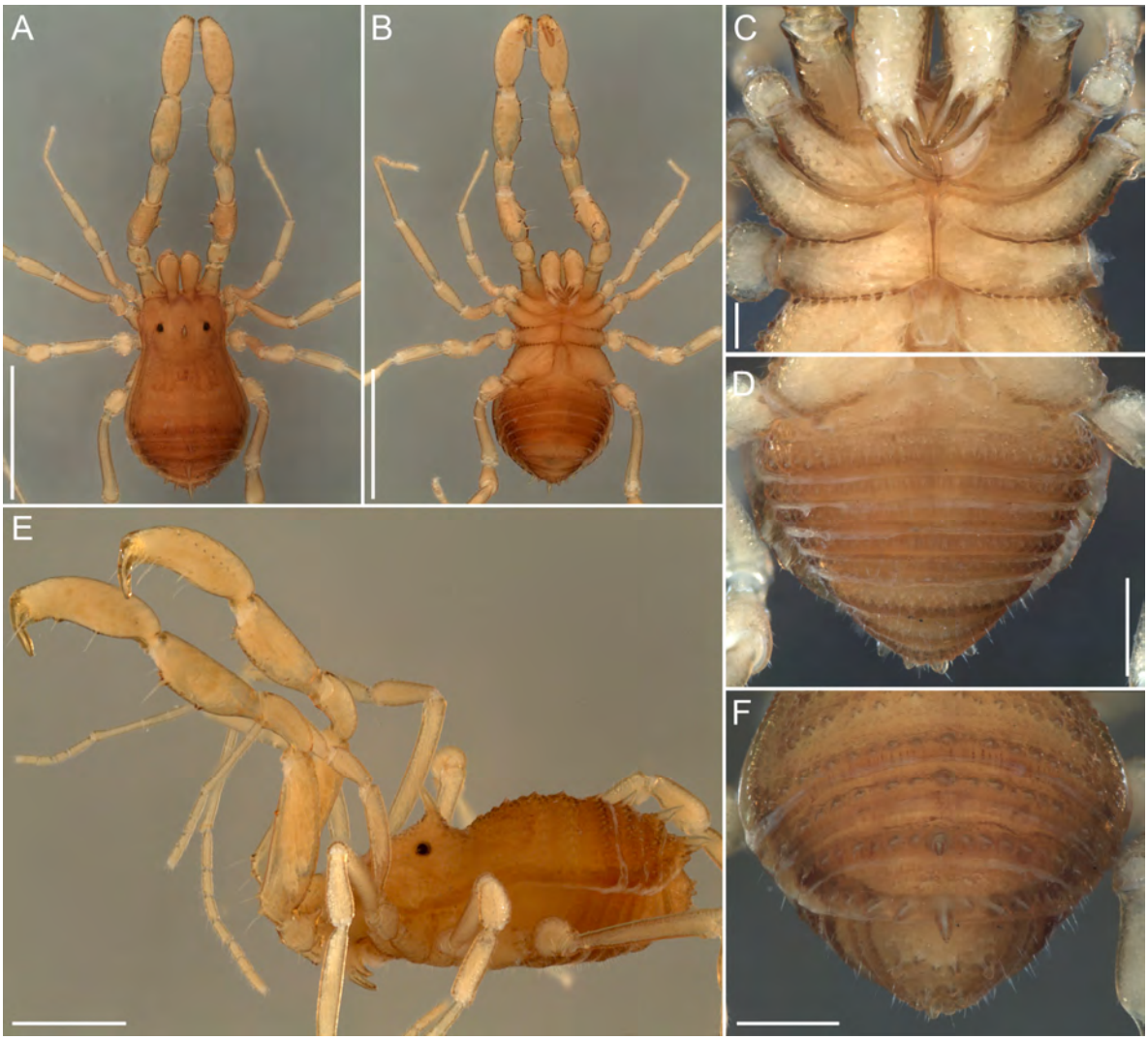

Figure 7. *Neoscotolemon armasi* **spec. nov.**, male (CZACC), habitus: A. Dorsal view; B. Ventral view; C. Ventral view with detail of coxae; D. Ventral view with detail of free sternites; E. Lateral view; F. Posterior view. Scale bars: A–B = 2 mm; C = 200 µm; D, F = 500 µm; E = 1 mm.

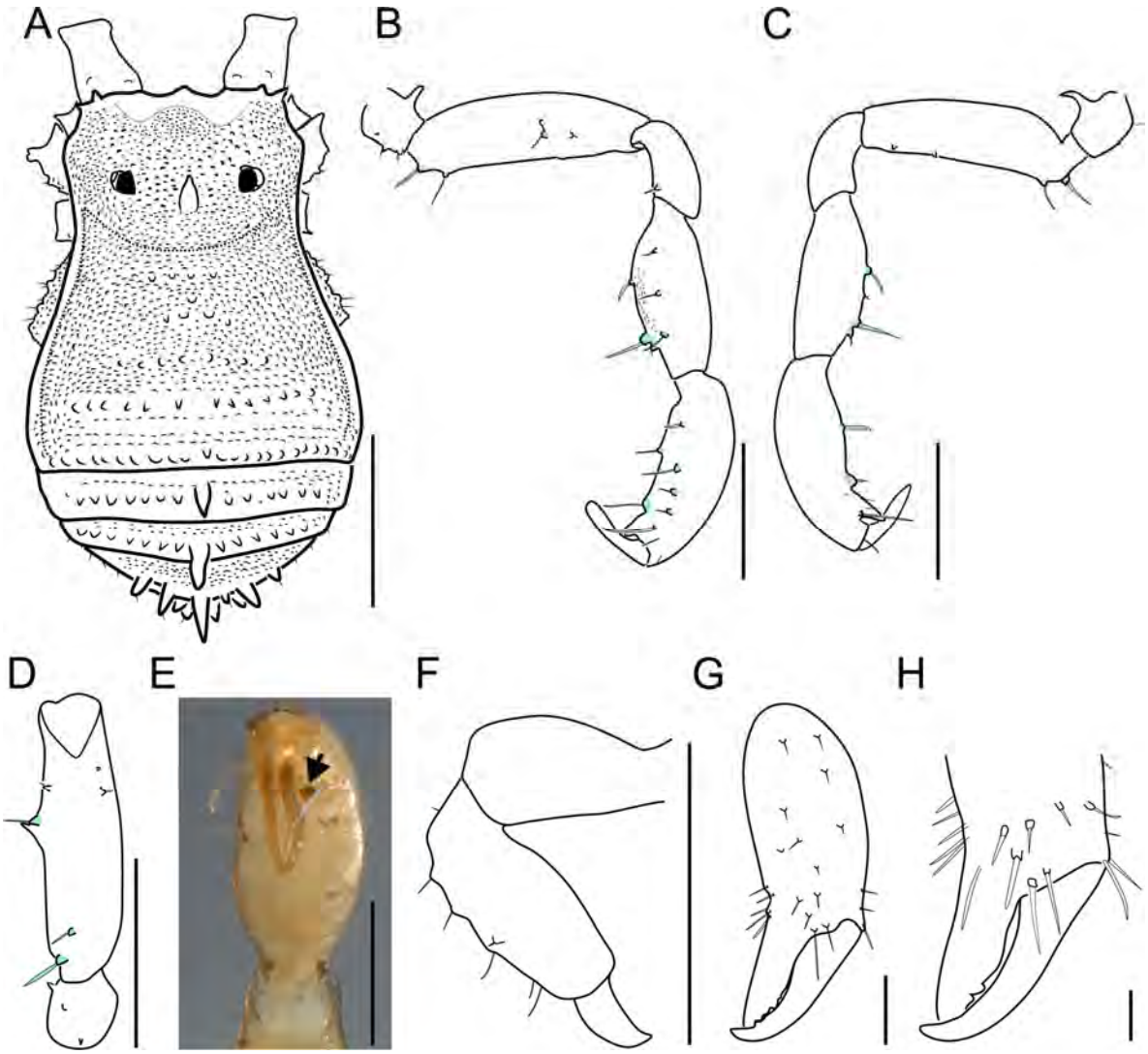

Figure 8. *Neoscotolemon armasi* **spec. nov.**, male (holotype, CZACC): A. Habitus, dorsal view; B–E. Left pedipalp: B. Mesal view; C. Ectal view; D. Femur, ventral view; E. Tarsus and claw, ventral view, with black arrow indicating the sclerotized projection. F–H. Left chelicera: F. Ectal view; G. Frontal view; H. detail of fingers. Spines in green. Scale bars: A–F = 1 mm; G = 200 μm; H = 100 μm.

Figure 9. *Neoscotolemon armasi* **spec. nov.**, male (holotype, CZACC), left metatarsus III: A. Prolateral view; B. Ventral view. Scale bars = 500 μm.

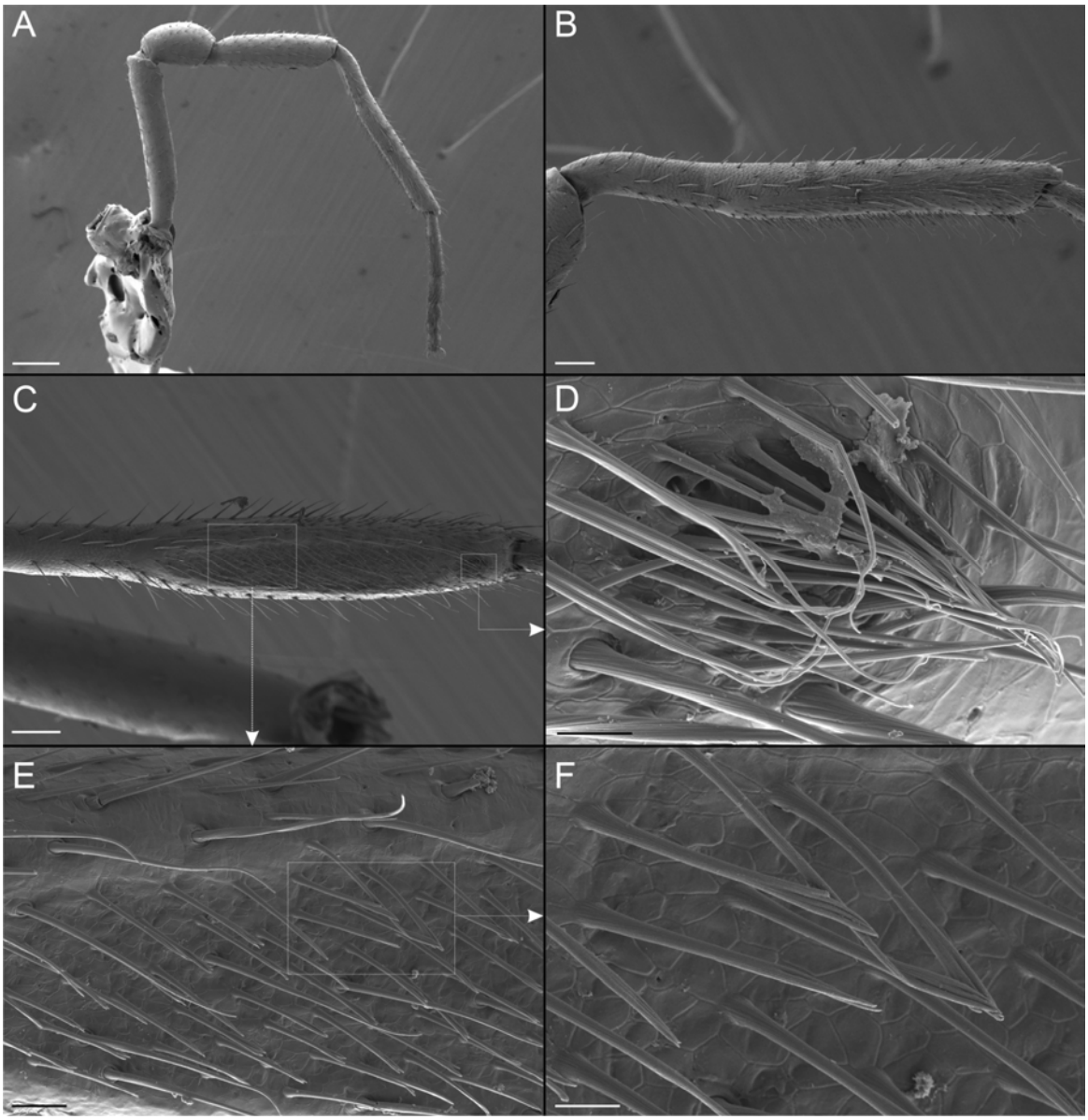

Figure 10. *Neoscotolemon armasi* **spec. nov.**, male (holotype, CZACC), left leg III: A. Prolateral view; B. Metatarsus, prolateral view; C. Metatarsus, ventral view; D. Detail of trichomes concentrated around aggregated pores on apical surface of calcaneus; E. Detail of trichomes and sensilla chaetica on proximal surface of calcaneus; F. Detail of trichomes with multifurcate tips. Scale bars: A = 300 μm; B–C = 100 μm; D, F = 10 μm; E = 20 μm.

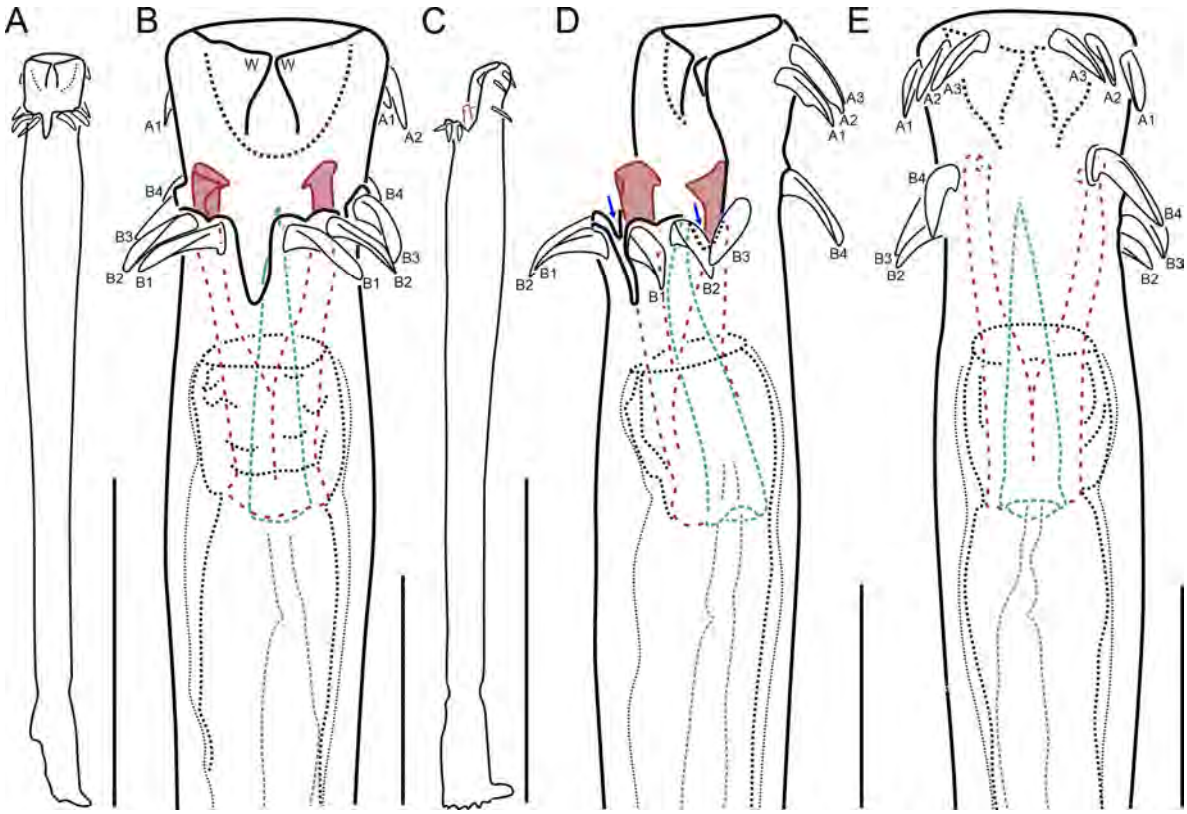

Figure 11. *Neoscotolemon armasi* **spec. nov.**, male holotype (CZACC), penis drawings: A, B. Dorsal view; C, D. Lateral view; E. ventral view. Scale bars: A, C = 500 µm; B, D–E = 100 µm. Stylus in green; conductors in red; blue arrows indicate the U-shaped cleft between macrosetae B2 and B3. Abbreviations: B1–B4, basal macrosetae; A1–A3, apical macrosetae: W, wing.

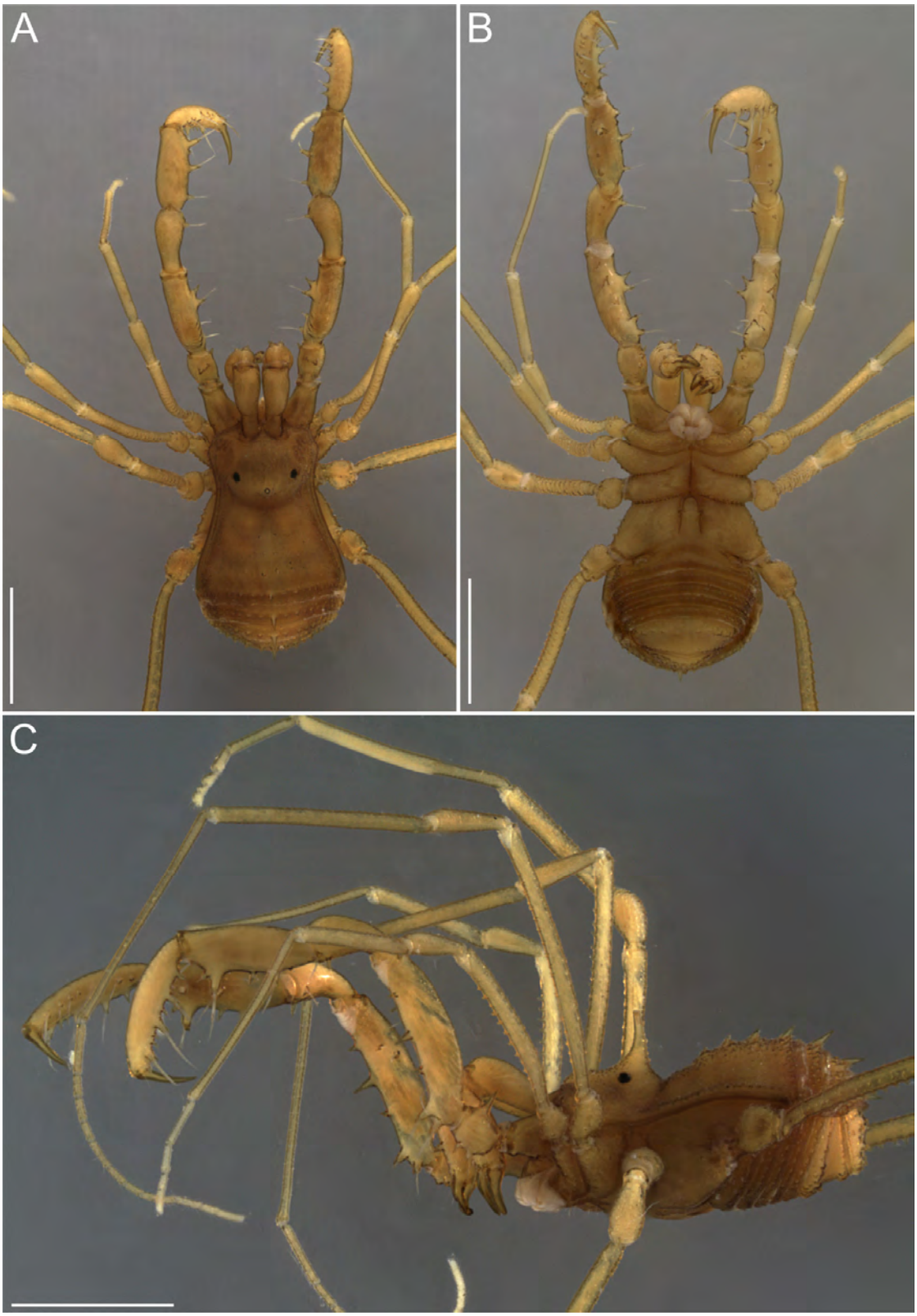

Figure 12. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), minor male (paratype, AMNH), habitus: A. Dorsal view; B. Ventral view; C. Lateral view. Scale bars: 2 mm.

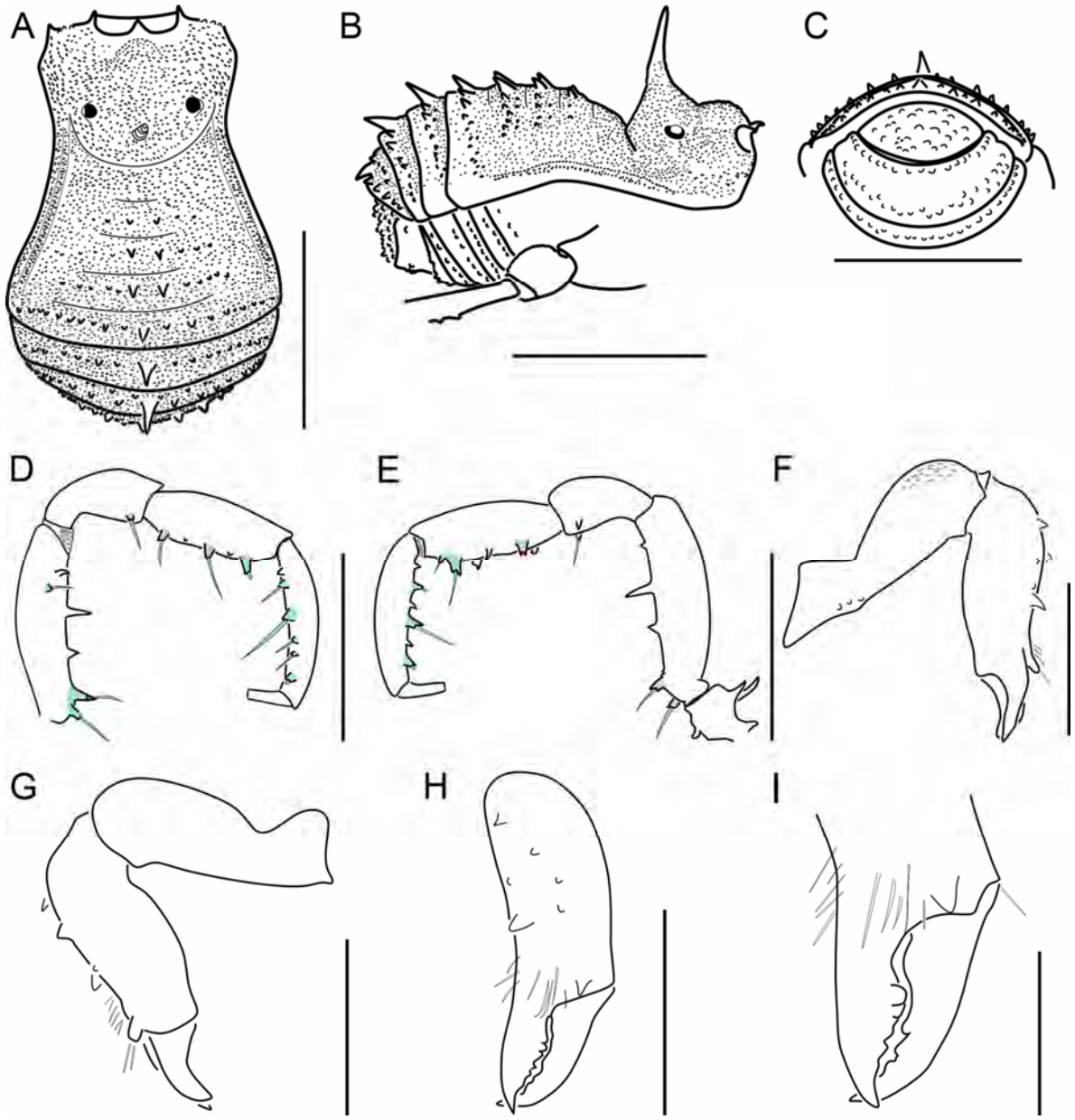

Figure 13. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), minor male (holotype, AMNH): A–C. Habitus: A. Dorsal view; B. Lateral view; C. Posterior view; D–E. Left pedipalp: D. Mesal view; E. Ectal view; F–I. Left chelicera: F. Mesal view; G. Ectal view; H. Frontal view; I. Detail of fingers. Spines in green. Scale bars: A–E = 2 mm; F–H = 1 mm; I = 500 μm.

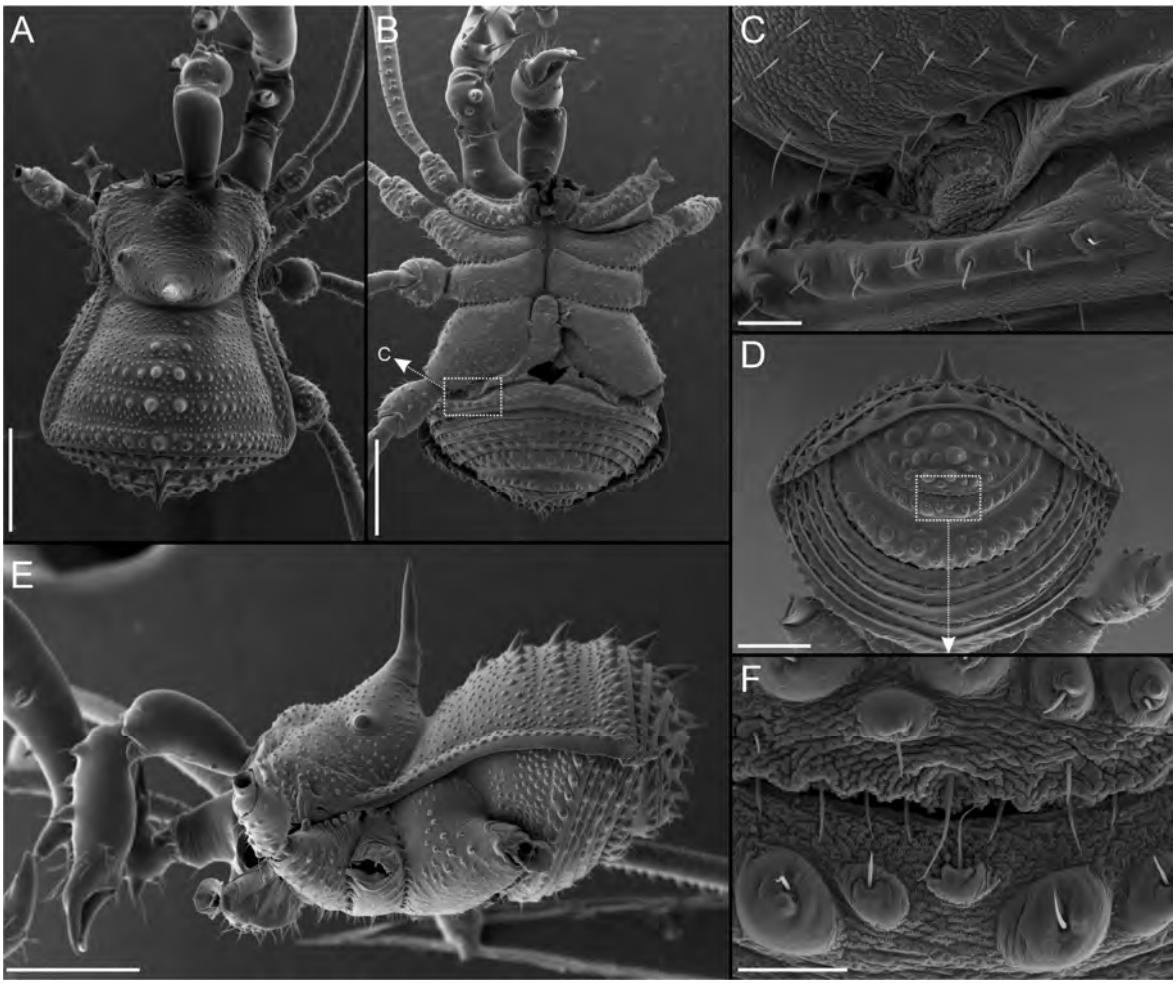

Figure 14. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), major male (MACN-Ar 46922), habitus: A. Dorsal view; B. Ventral view; C. Detail of spiracle; D. Posterior view; E. Lateral view; F. Detail of setiferous granules of free sternite V and anal operculum. Scale bars: A–B, D, F = 500 μm; C, E, G = 100 μm.

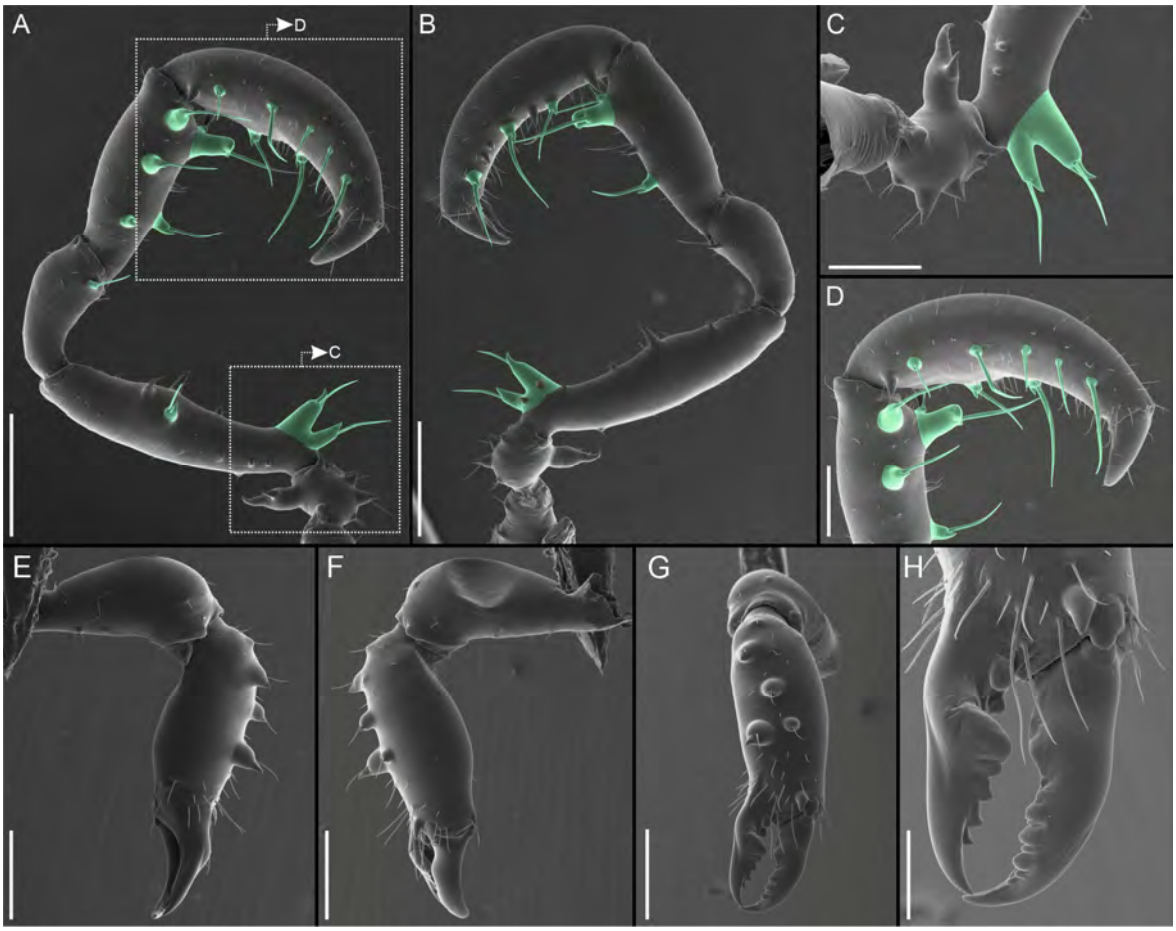

Figure 15. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), major male (MACN-Ar 46922). A–D. Left pedipalp: A. Mesal view; B. Ectal view; C. Detail of trochanter; D. Detail of tarsus*;* E–H. Left chelicera: E. Mesal view; F. Ectal view; G. Frontal view; H. Detail of fingers. Spines in green. Scale bars: A–B = 1 mm, C–G = 500 µm; H = 200 µm.

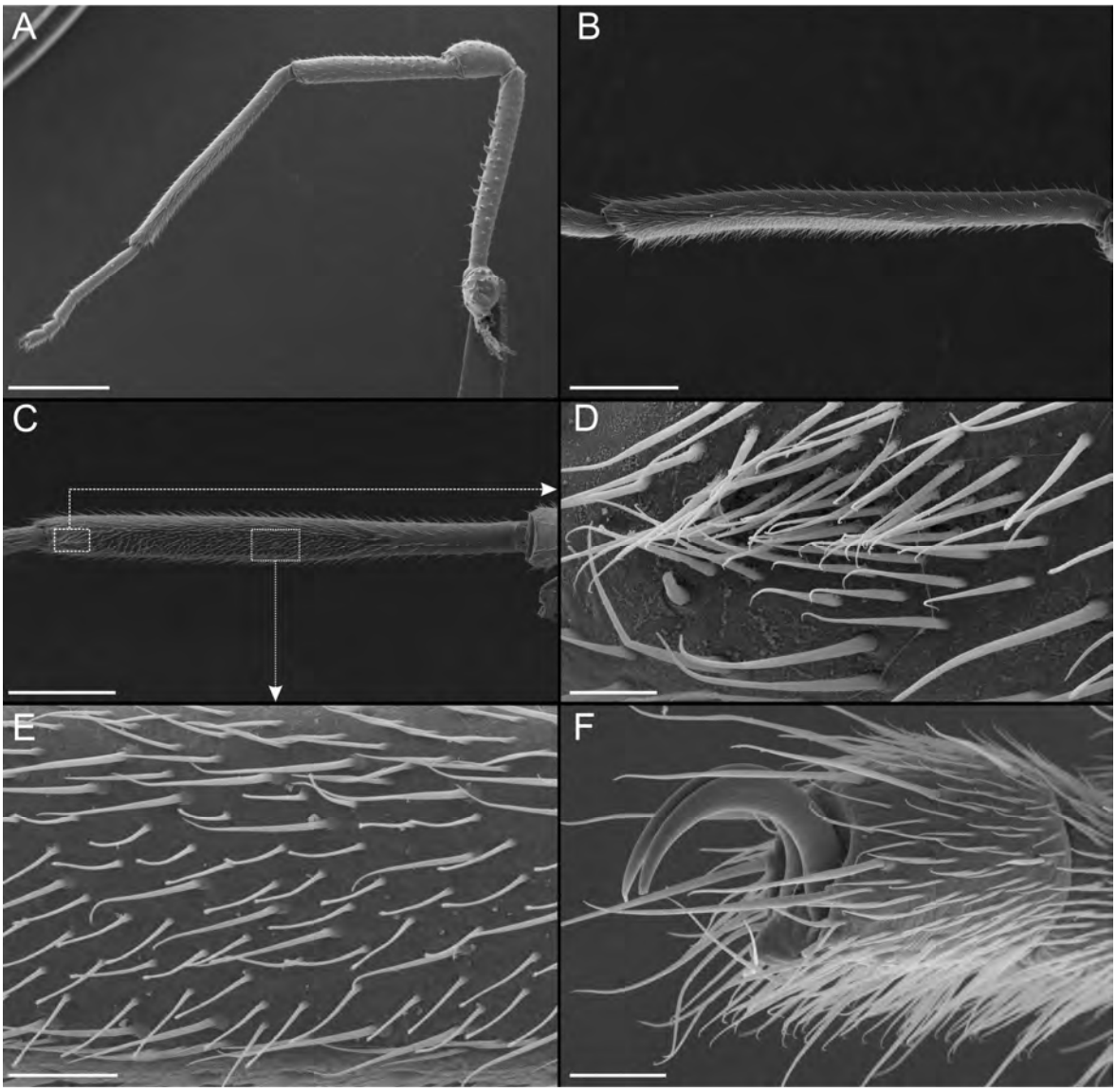

Figure 16. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), major male (MACN-Ar 46922), left leg III: A. Retrolateral view; B. Metatarsus, retrolateral view; C. Metatarsus, ventral view; D. Detail of trichomes concentrated around aggregated pores on apical surface of calcaneus; E. Detail of trichomes and sensilla chaetica on medial surface of calcaneus; F. Tarsus without scopula, retrolateral view. Scale bars: A = 1 mm; B–C = 500 μm; D = 25 μm; E–F = 50 μm.

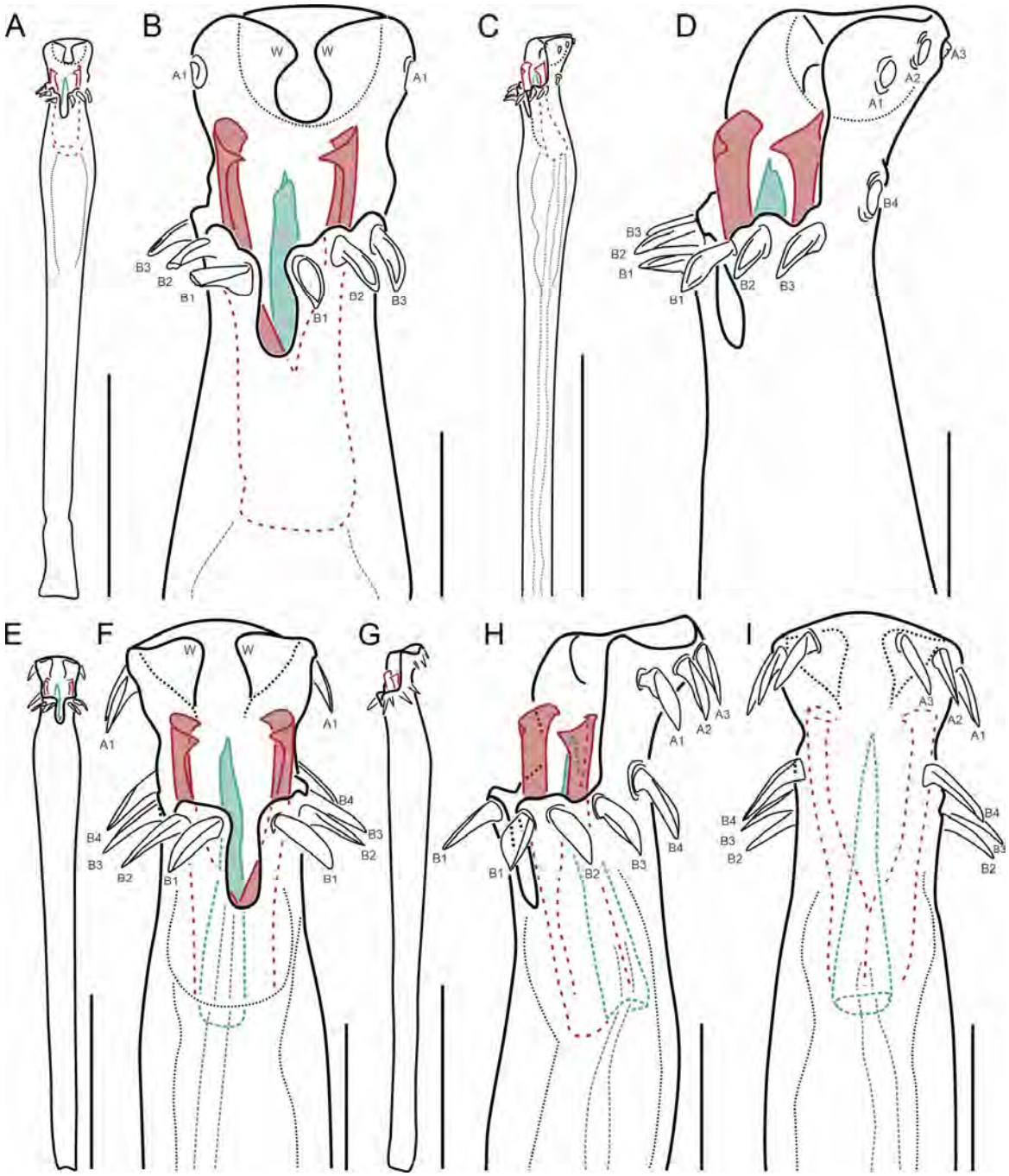

Figure 17. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), Penis drawings. A–D. minor male (holotype, AMNH): A–B. Dorsal view; C–D. Lateral view. E–I. major male (MACN-Ar 46922): E–F. Dorsal view; G–H. Lateral view; I. Ventral view. Scale bars: A, C, E, G = 500 μm; B, D, F, H–I = 100 μm. Stylus in green; conductors in red. Abbreviations: B1–B4, basal macrosetae; A1–A3, apical macrosetae; W, wing.

Figure 18. *Neoscotolemon bolivari* (Goodnight & Goodnight, 1945), sexual dimorphism. A–C. female (paratype, AMNH): A. Habitus, dorsal view; B. Habitus, lateral view; C. Left metatarsus III, prolateral view; D–F. Minor male (paratype, AMNH): D. Habitus, dorsal view; E. Habitus, lateral view; F. Left metatarsus III, prolateral view. G–I. major male (MACN-Ar 46922): G. Habitus, dorsal view; H. Habitus, lateral view; I. Left metatarsus III, prolateral view. Scale bars: A, D, G = 1 mm; B, E, H = 2 mm; C, F, I = 500 μm.

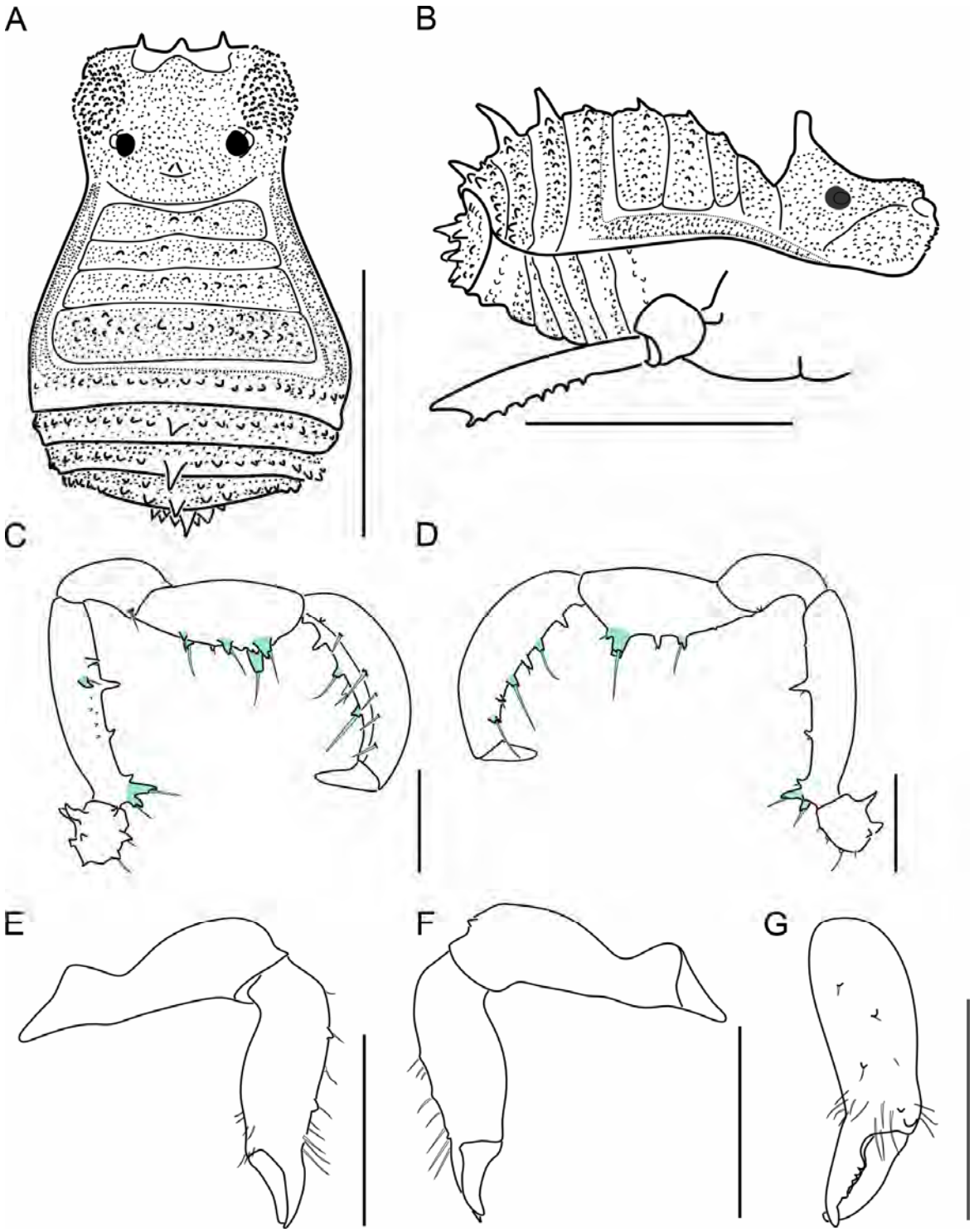

Figure 19. *Neoscotolemon cotilla* (Goodnight & Goodnight, 1945), major male (holotype, AMNH): A–B. Habitus: A. Dorsal view; B. Lateral view; C–D. Left pedipalp: C. Mesal view; D. Ectal view; E–G. Left chelicera: E. Mesal view; F. Ectal view; G. Frontal view. Spines in green. Scale bars: A–B = 2 mm; C–G = 1 mm.

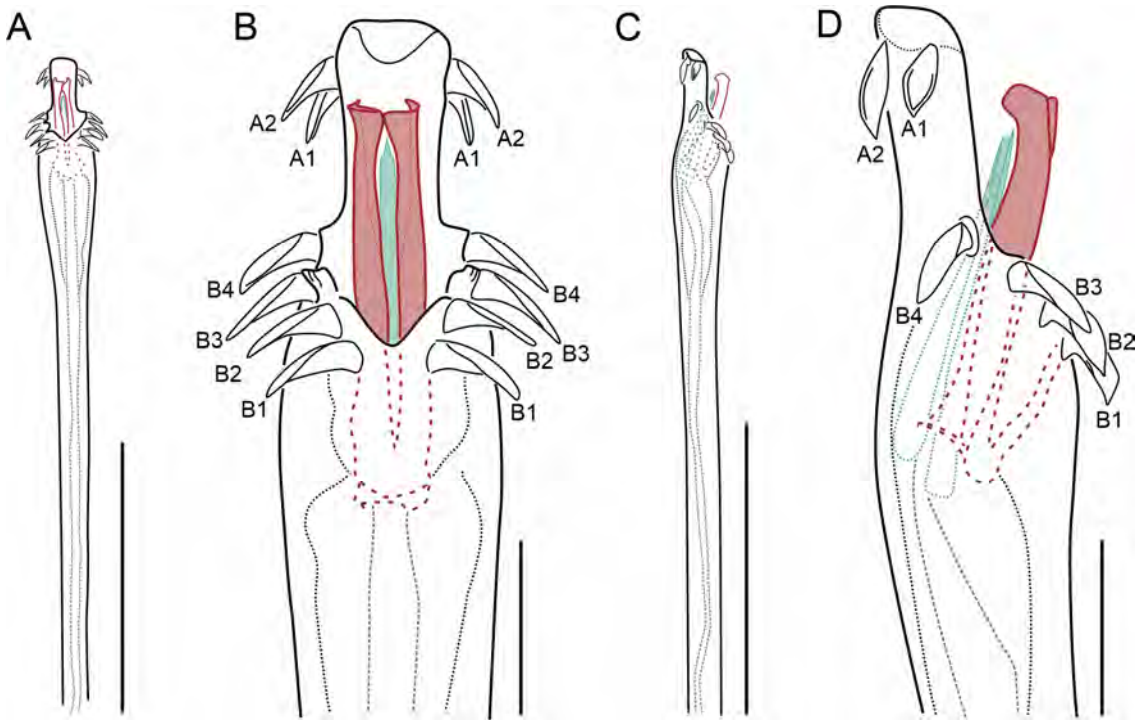

Figure 20. *Neoscotolemon cotilla* (Goodnight & Goodnight, 1945), male (holotype, AMNH), penis drawings: A–B. Dorsal view; C–D. Lateral view. Scale bars: A, C = 500 µm; B, D = 100 µm. Stylus in green; conductors in red. Abbreviations: B1–B4, basal macrosetae; A1–A2, apical macrosetae.

Figure 21. Living specimens of *Neoscotolemon spinifer* (Packard, 1888) in typical resting position (*i.e.*, compact configuration with legs and pedipalps folded over the the body): A. female; B. male. Asterisk marks the typical enlarged tubercles in the lateral region of free tergite III, and the arrow shows the sexually dimorphic metatarsus III that is enlarged in males. Photos courtesy of Oonagh Degenhardt.

Figure 22. *Neoscotolemon spinifer* (Packard, 1888), major male (AMNH), habitus: A. Dorsal view; B. Ventral view; C. Lateral view. Scale bars: 2 mm.

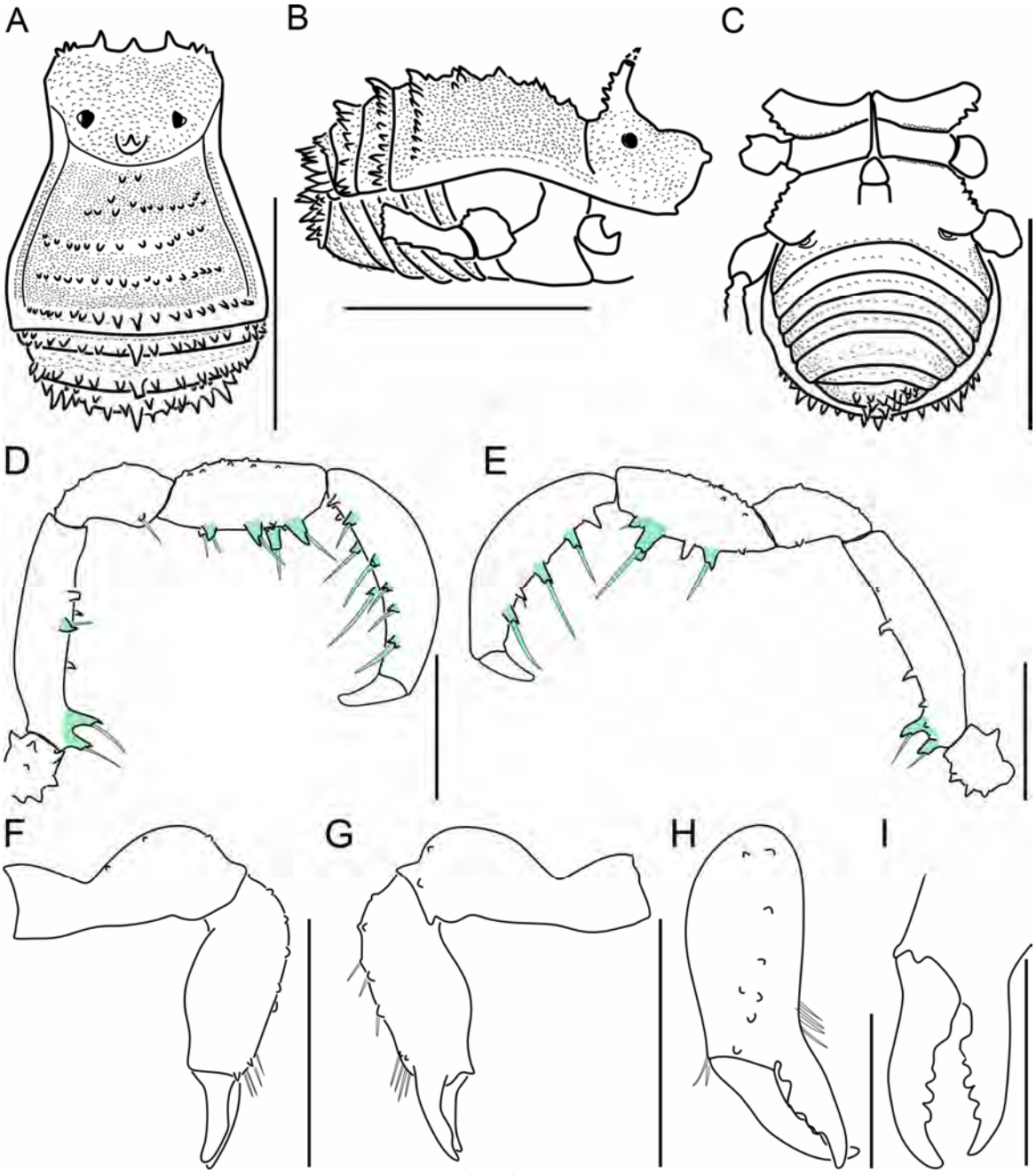

Figure 23. *Neoscotolemon spinifer* (Packard, 1888), major male (holotype, AMNH): A–C. Habitus: A. Dorsal view; B. Lateral view; C. Ventral view; D–E. Left pedipalp: D. Mesal view; E. Ectal view; F–I. Left chelicera: F. Mesal view; G. Ectal view; H. Frontal view; I. Detail of fingers. Spines in green. Scale bars: A–C = 2 mm; D–G = 1 mm; H–I = 500 μm.

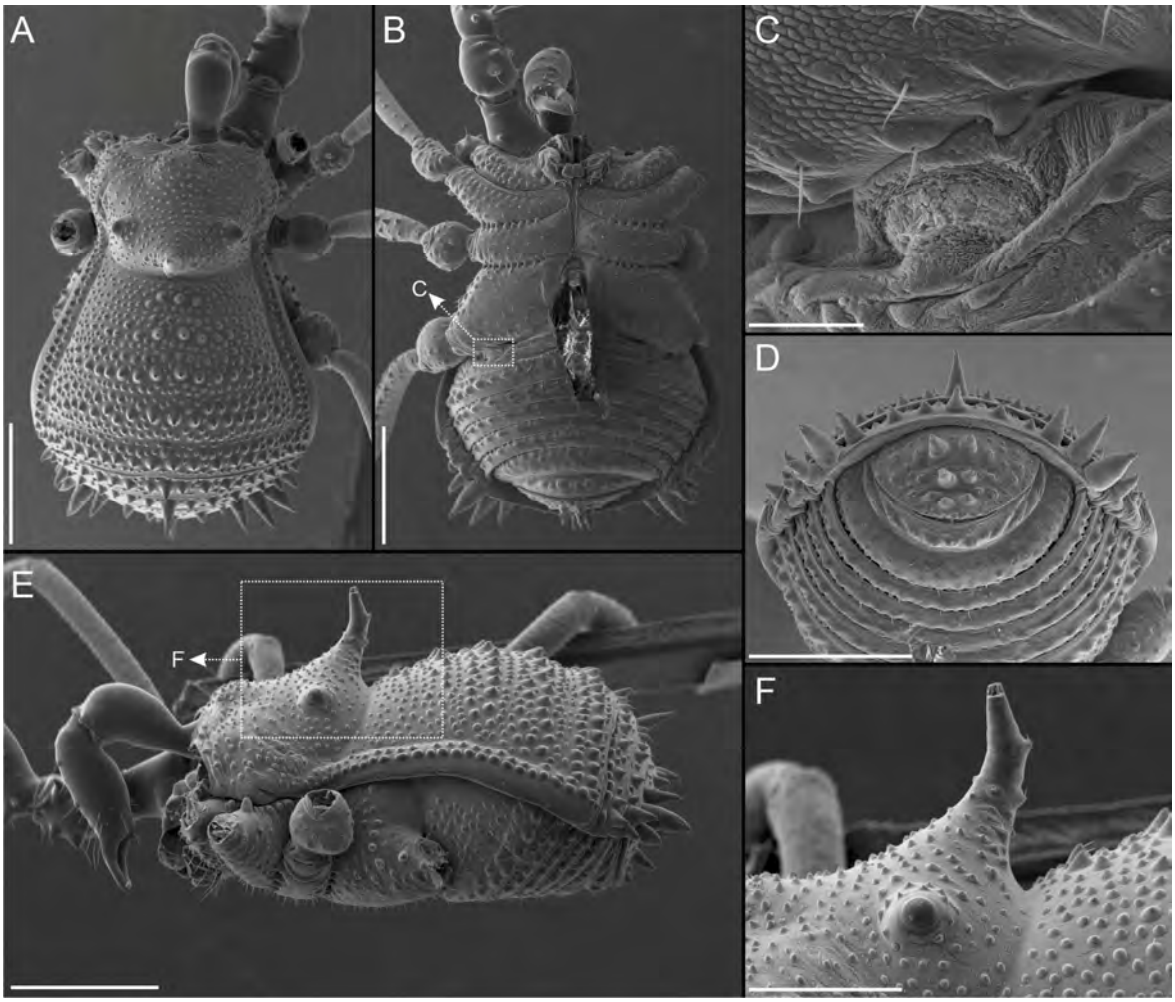

Figure 24. *Neoscotolemon spinifer* (Packard, 1888), major male (USNM), habitus: A. Dorsal view; B. Ventral view; C. Detail of spiracle; D. Posterior view; E. Lateral view; F. Detail of *ocularium*. Scale bars: A–B, D–E = 1 mm; C = 100 μm; F = 500 μm.

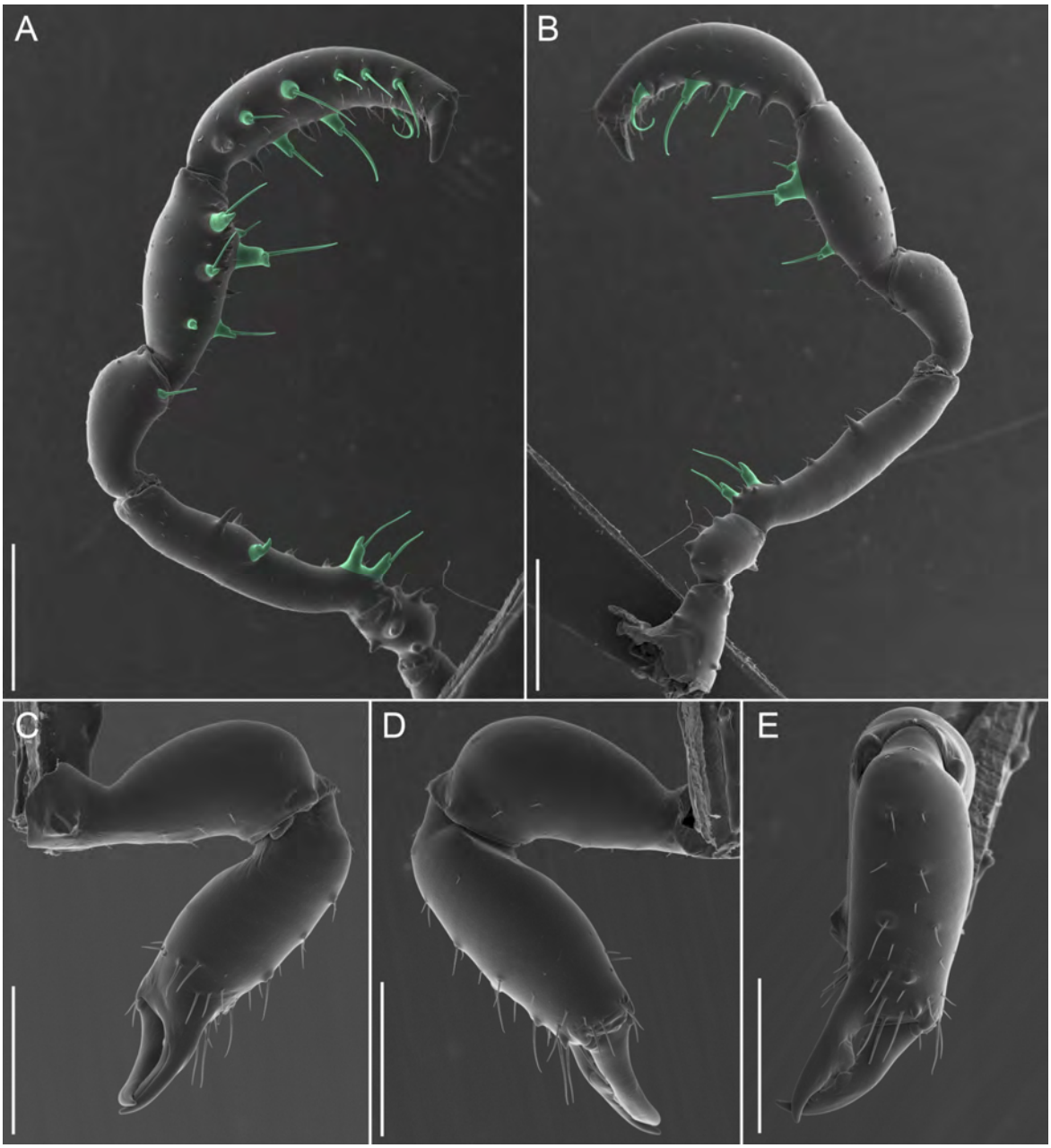

Figure 25. *Neoscotolemon spinifer* (Packard, 1888), major male (USNM). A–B. Left pedipalp: A. Mesal view; B. Ectal view; C–D. Left chelicera: E. Mesal view; F. Ectal view; G. Frontal view. Spines in green. Scale bars: A–B = 1 mm, C–E = 500 μm.

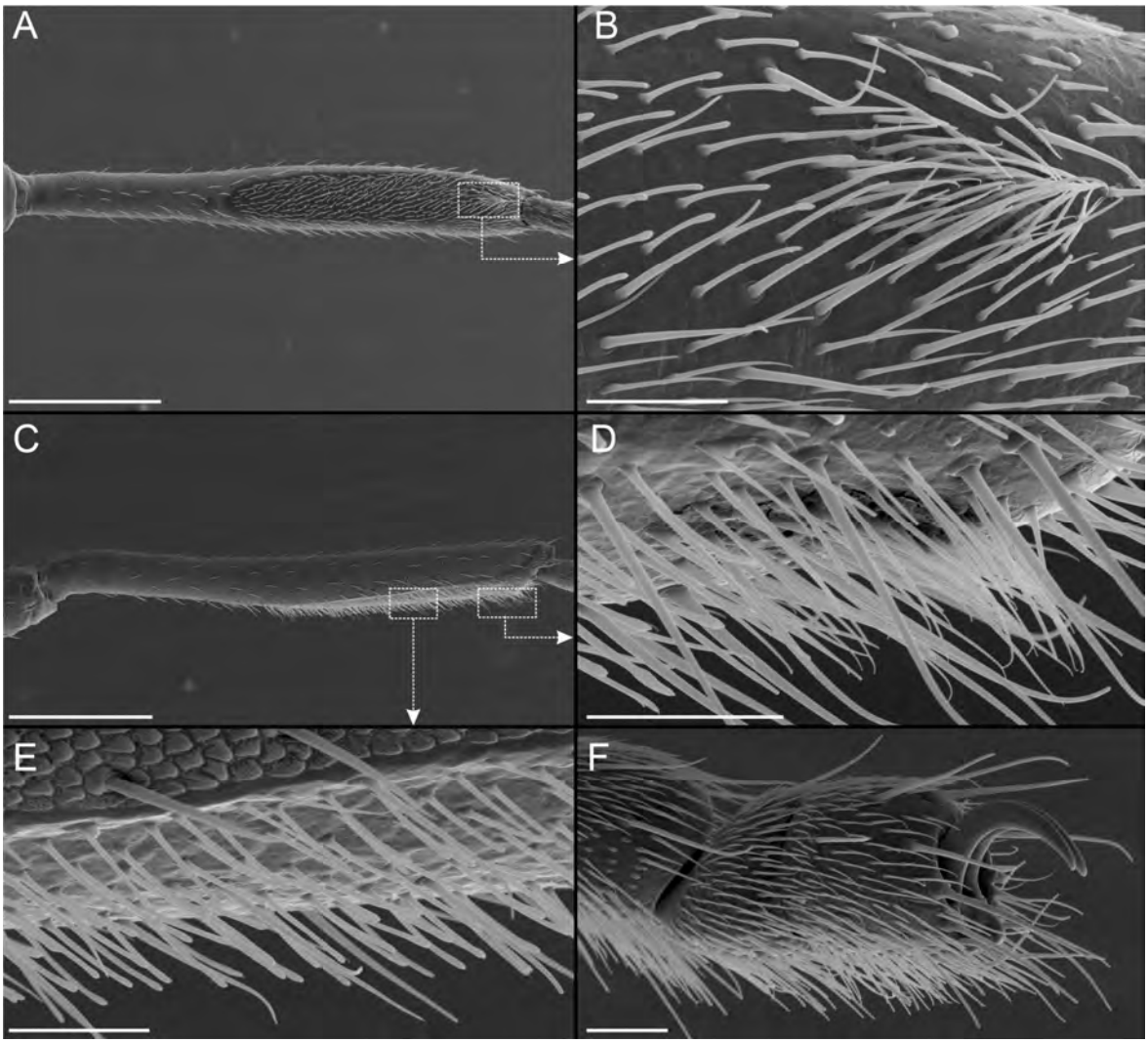

Figure 26. *Neoscotolemon spinifer* (Packard, 1888), major male (USNM), A–B. Left leg III: A. Metatarsus, ventral view; B. Detail of trichomes concentrated around aggregated pores on apical surface of calcaneus, ventral view; C–F. Left leg III: C. Metatarsus, retrolateral view; D. Detail of trichomes concentrated around aggregated pores on apical surface of calcaneus; E. Detail of trichomes and sensilla chaetica on medial surface of calcaneus; F. Tarsus without scopula, retrolateral view. Scale bars: A, C = 500 μm; B, D–F = 50 μm.

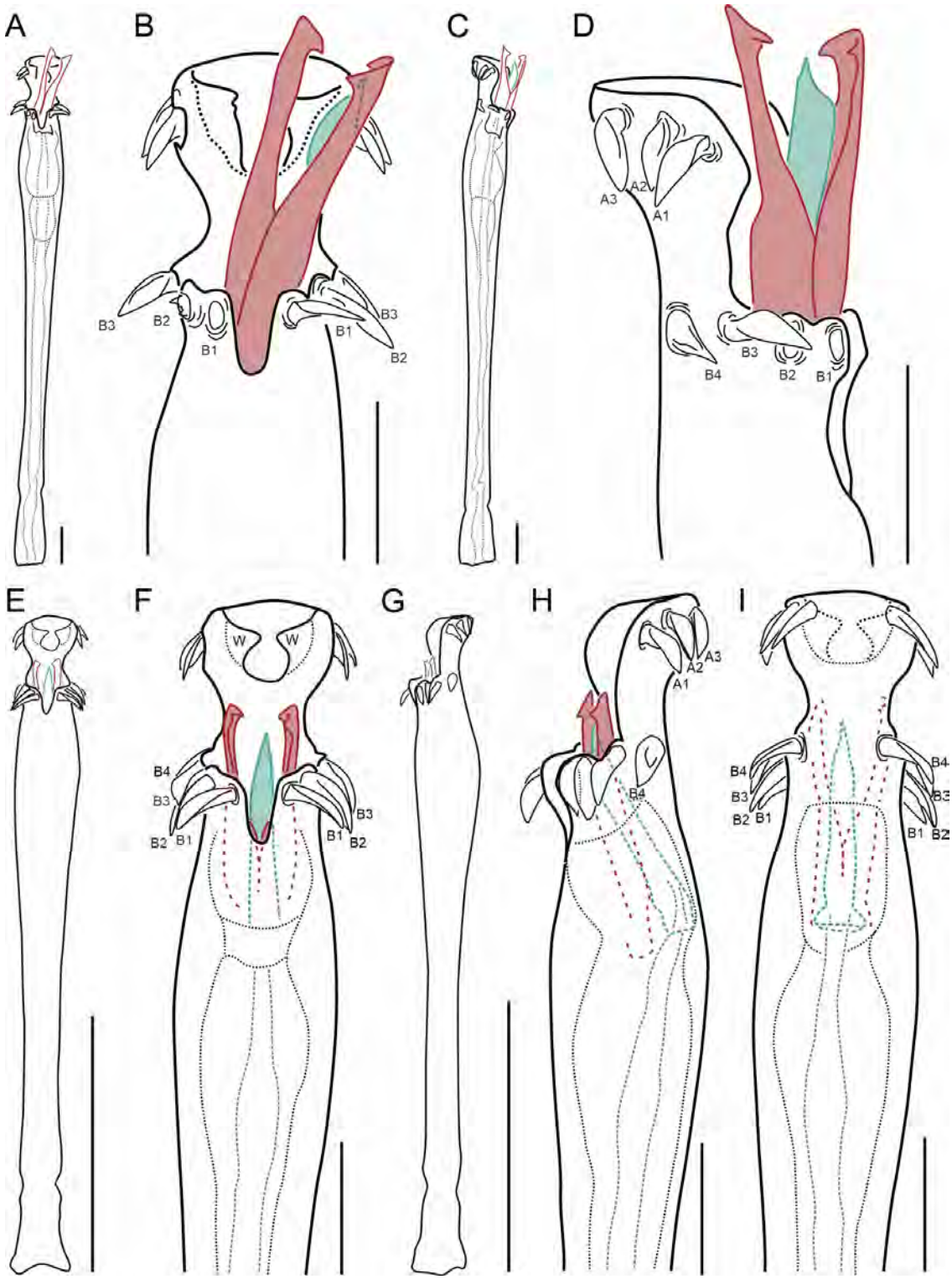

Figure 27. *Neoscotolemon spinifer* (Packard, 1888), Penis drawings. A–D. major male (holotype, AMNH): A–B. Dorsal view; C–D. Lateral view. E–I. Major male (AMNH): E–F. Dorsal view; G–H. Lateral view; I. Ventral view. Scale bars: A, C, E, G = 500 µm; B, D, F, H–I = 100 µm. Stylus in green; conductors in red. Abbreviations: B1–B4, basal macrosetae; A1–A3, apical macrosetae; W, wing.

Figure 28. *Neoscotolemon spinifer* (Packard, 1888), sexual dimorphism. A–C. Female (AMNH): A. Habitus, dorsal view; B. Habitus, lateral view; C. Left metatarsus III, prolateral view; D–F. Minor male (AMNH): D. Habitus, dorsal view; E. Habitus, lateral view; F. Left metatarsus III, prolateral view; G–I. Major male (AMNH): G. Habitus, dorsal view; H. Habitus, lateral view; I. Left metatarsus III, prolateral view. Scale bars: A, D, G = 1 mm; B, E, H = 2 mm; C, F, I = 500 μm.

Figure 29. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), major male (MACN-Ar), habitus: A. Dorsal view; B. Ventral view; C. Lateral view. Scale bars: 2 mm.

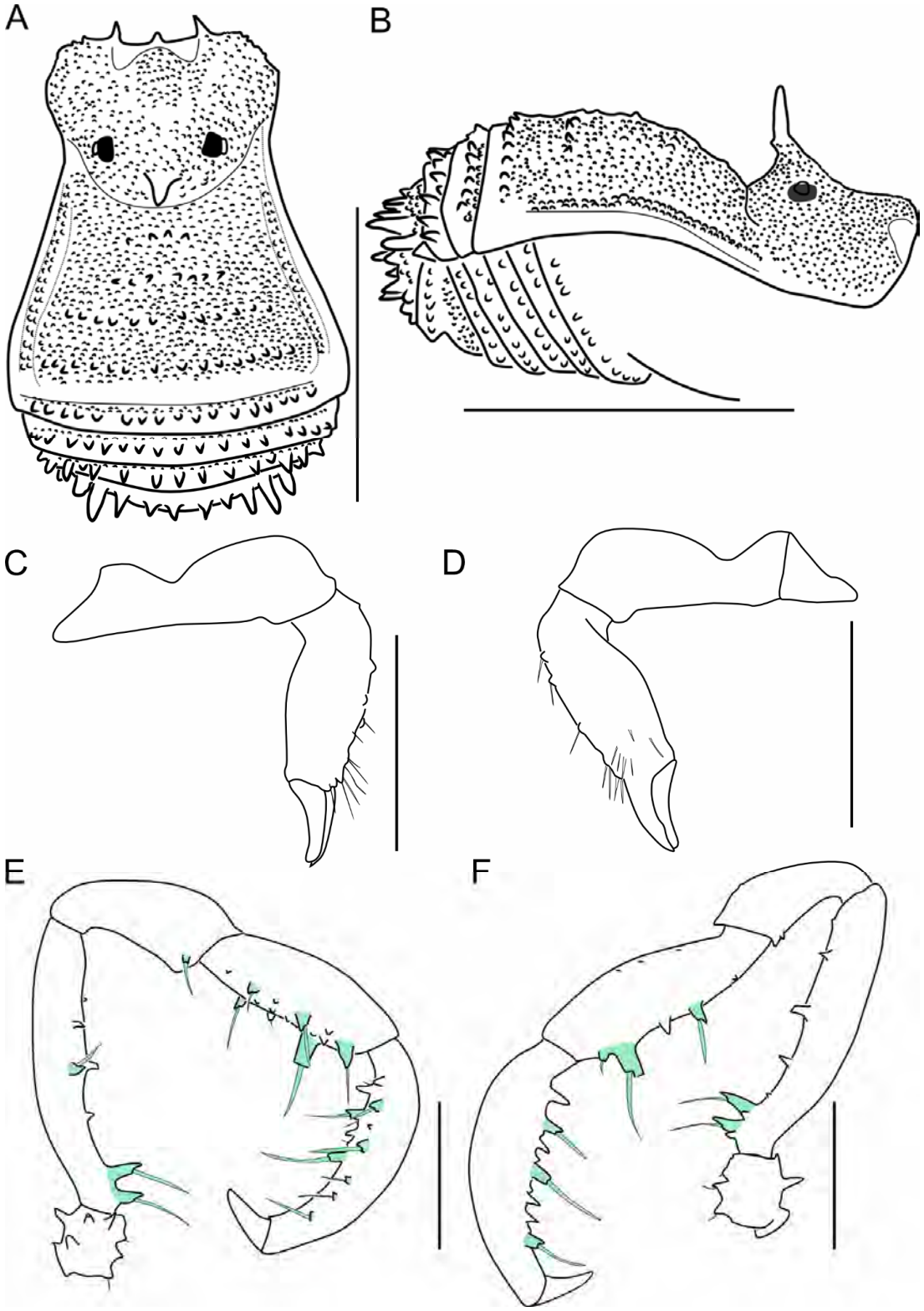

Figure 30. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), major male (holotype, AMNH): A–B. Habitus: A. Dorsal view; B. Lateral view; C–D. Left chelicera: E. Mesal view; F. Ectal view; E–F. Left pedipalp: C. Mesal view; D. Ectal view. Spines in green. Scale bars: A–B = 2 mm; C–F = 1 mm.

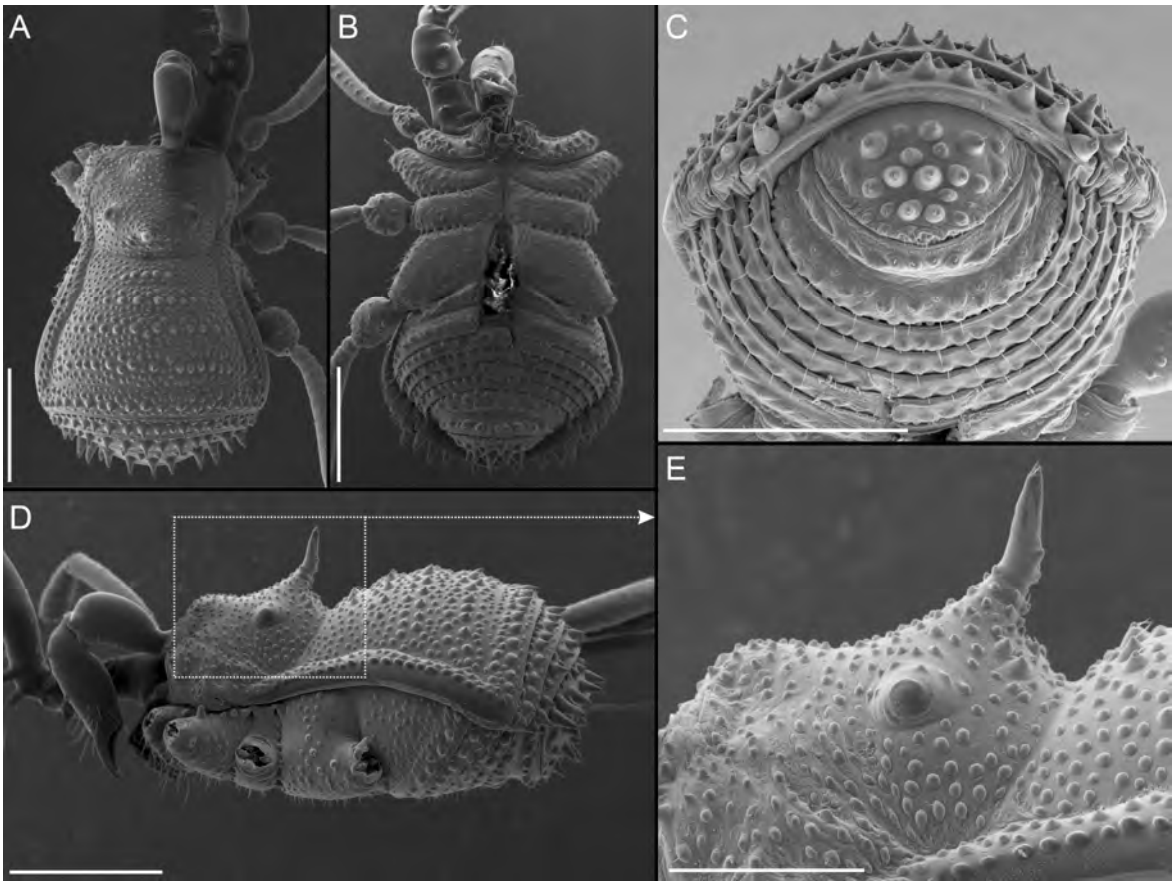

Figure 31. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), major male (USNM), habitus: A. Dorsal view; B. Ventral view; C. Posterior view; D. Lateral view; F. Detail of carapace. Scale bars: A–D = 1 mm; E = 500 μm.

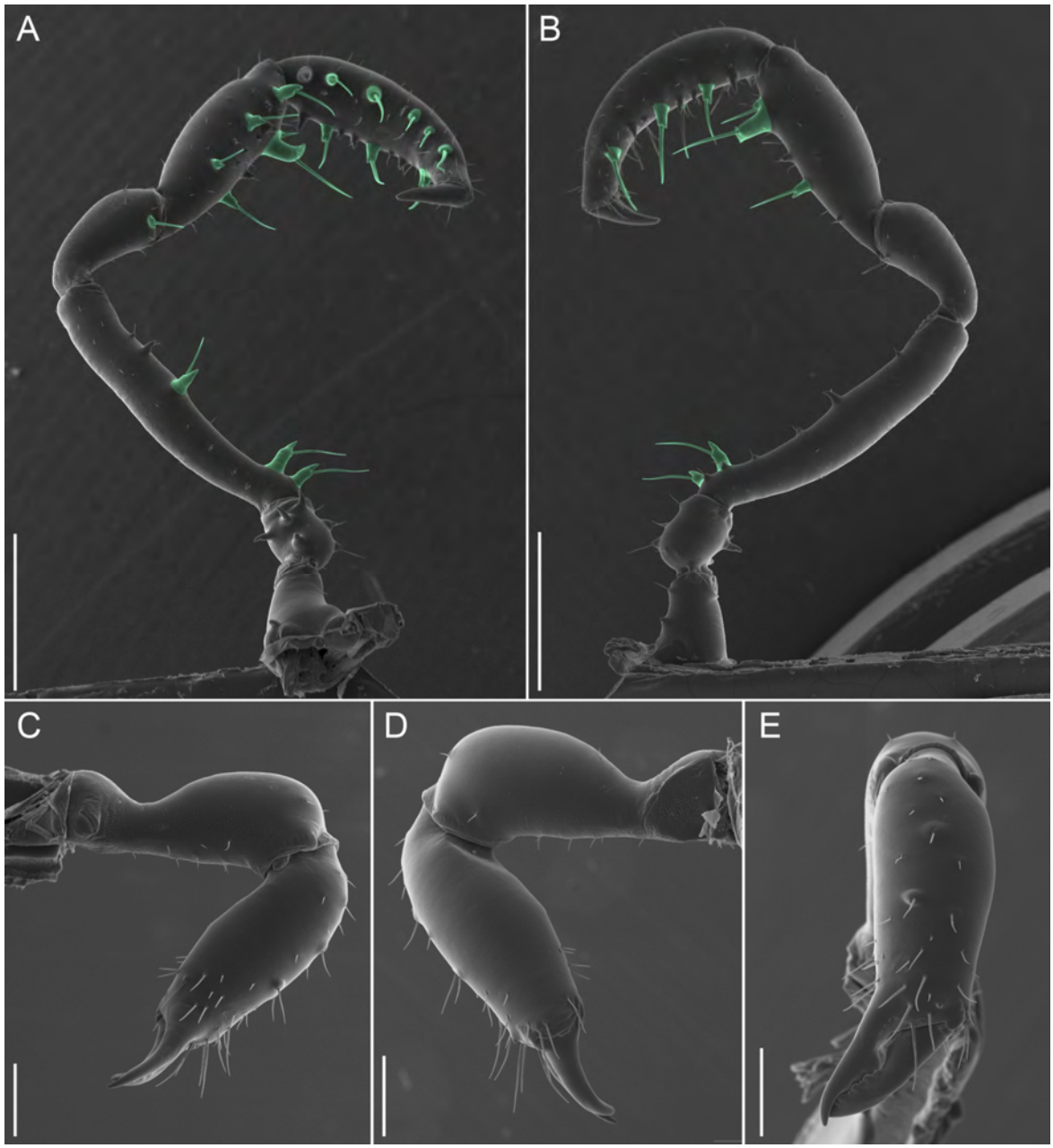

Figure 32. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), major male (USNM). A–B. Left pedipalp: A. Mesal view; B. Ectal view; C–E. Left chelicera: C. Mesal view; D. Ectal view; E. Frontal view. Spines in green. Scale bars: A–B = 1 mm, C–D = 2500 μm; E = 500 μm.

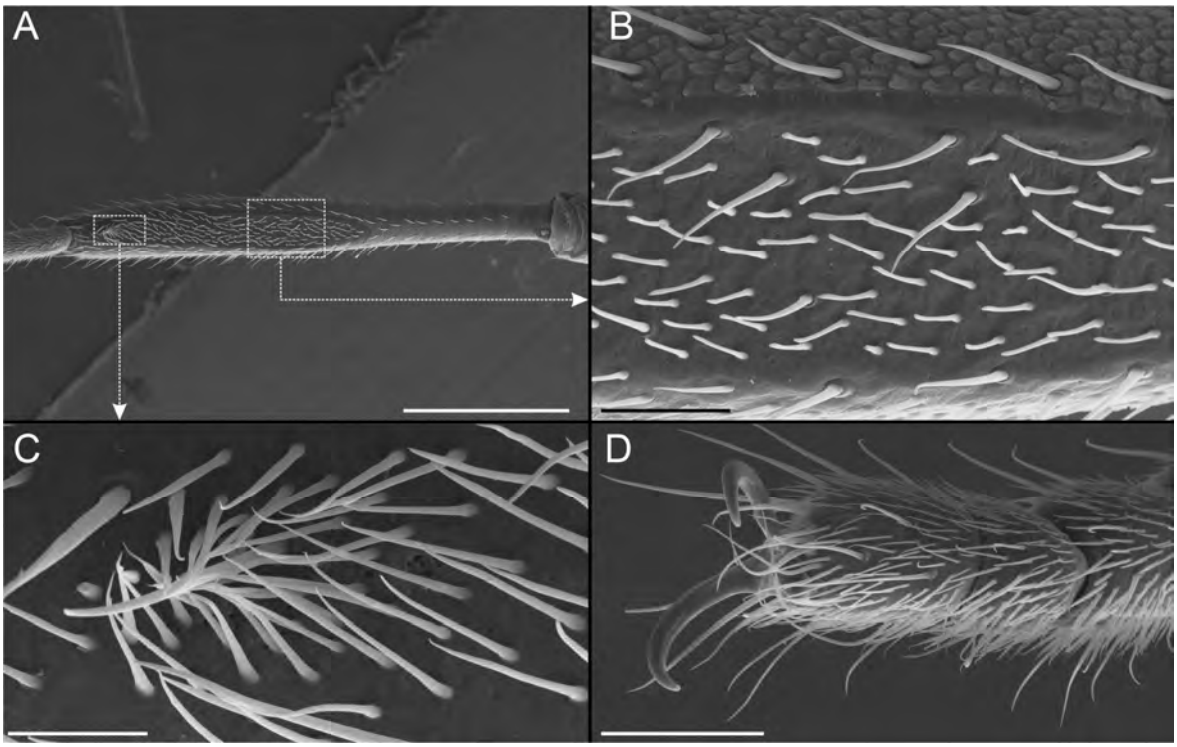

Figure 33. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), major male (USNM), left leg III: A. Metatarsus, ventral view; B. Detail of trichomes and sensilla chaetica on medial surface of calcaneus; C. Detail of trichomes concentrated around aggregated pores on apical surface of calcaneus; D. Tarsus without scopula, ventral-retrolateral view. Scale bars: A = 500 μm; B, D = 50 μm; C = 25 μm.

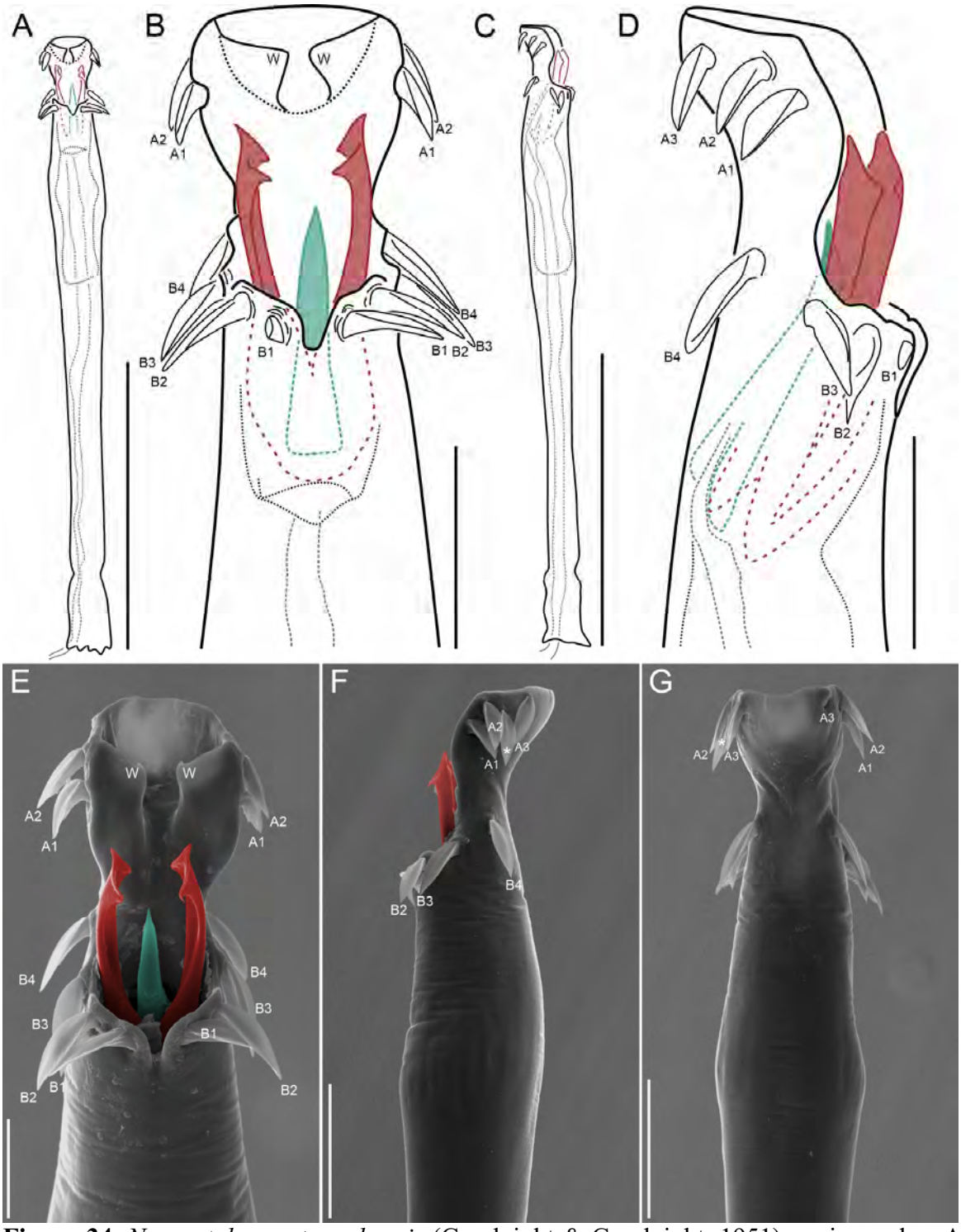

Figure 34. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), major males. A–D. Penis drawings (holotype, AMNH): A, B. Dorsal view; C, D. Lateral view; E–G. Penis SEM (USNM): F. Dorsal view; G. Lateral view; H. Ventral view. Scale bars: A, C = 500 µm; B, D, F–G = 100 µm; E = 50 µm. Stylus in green; conductors in red; asterisk indicates a teratological macroseta present only on the left side between A2 and A3. Abbreviations: B1–B4, basal macrosetae; A1–A3, apical macrosetae; W, wing.

Figure 35. *Neoscotolemon tancahensis* (Goodnight & Goodnight, 1951), sexual dimorphism. A–C. Female (AMNH): A. Habitus, dorsal view; B. Habitus, lateral view; C. Left metatarsus III, prolateral view; D–F. Minor male (USNM): D. Habitus, dorsal view; E. Habitus, lateral view; F. Left metatarsus III, prolateral view; G–I. Major male (AMNH): G. Habitus, dorsal view; H. Habitus, lateral view; I. Left metatarsus III, prolateral view. Scale bars: A, D, G = 1 mm; B, E, H = 2 mm; C, F, I = 500 μm.

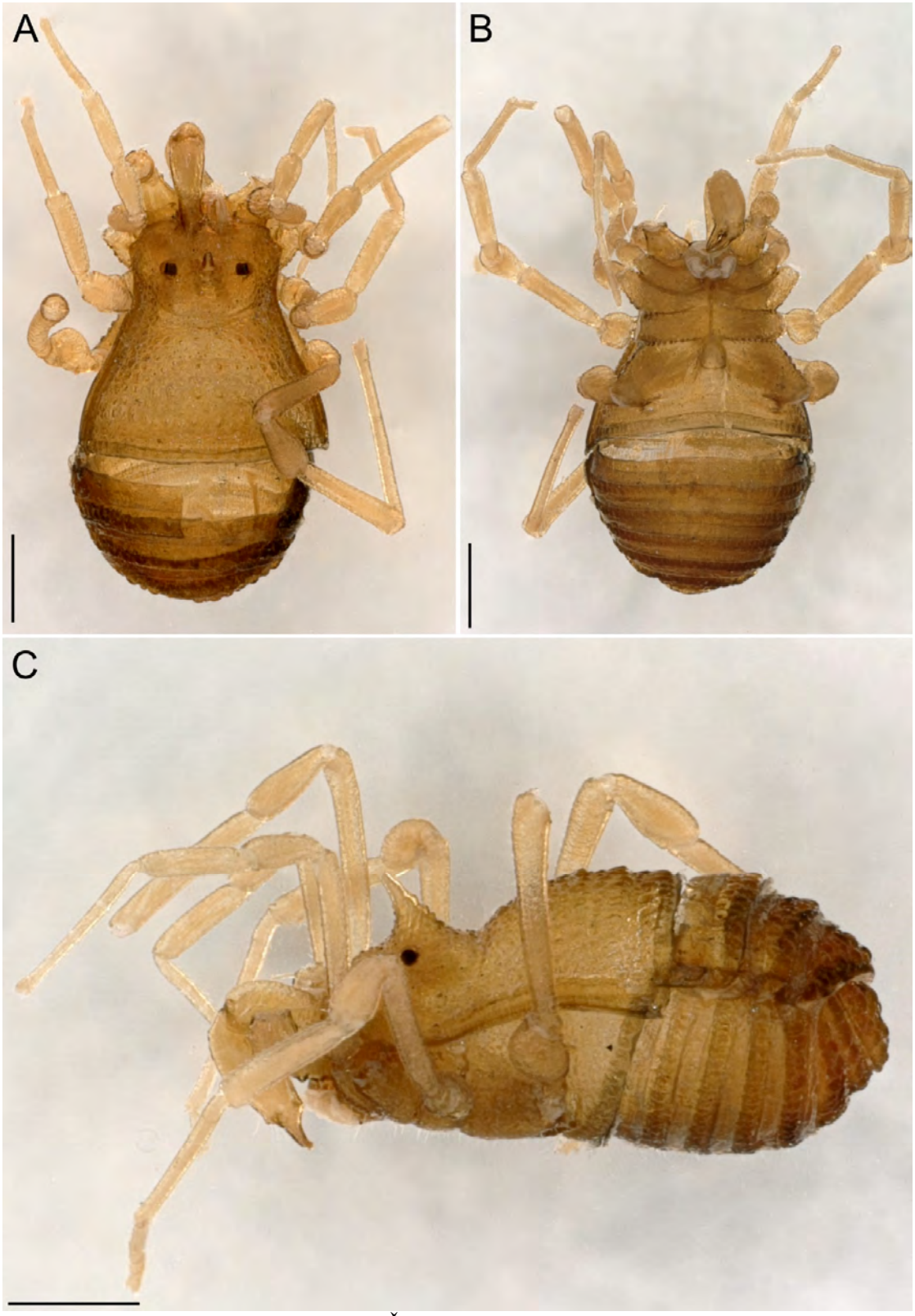

Figure 36. *Neoscotolemon vojtechi* (Šilhavý, 1979), female (holotype, MCZ 14838), habitus: A. Dorsal view; B. Ventral view; C. Lateral view. Scale bars: 1 mm.

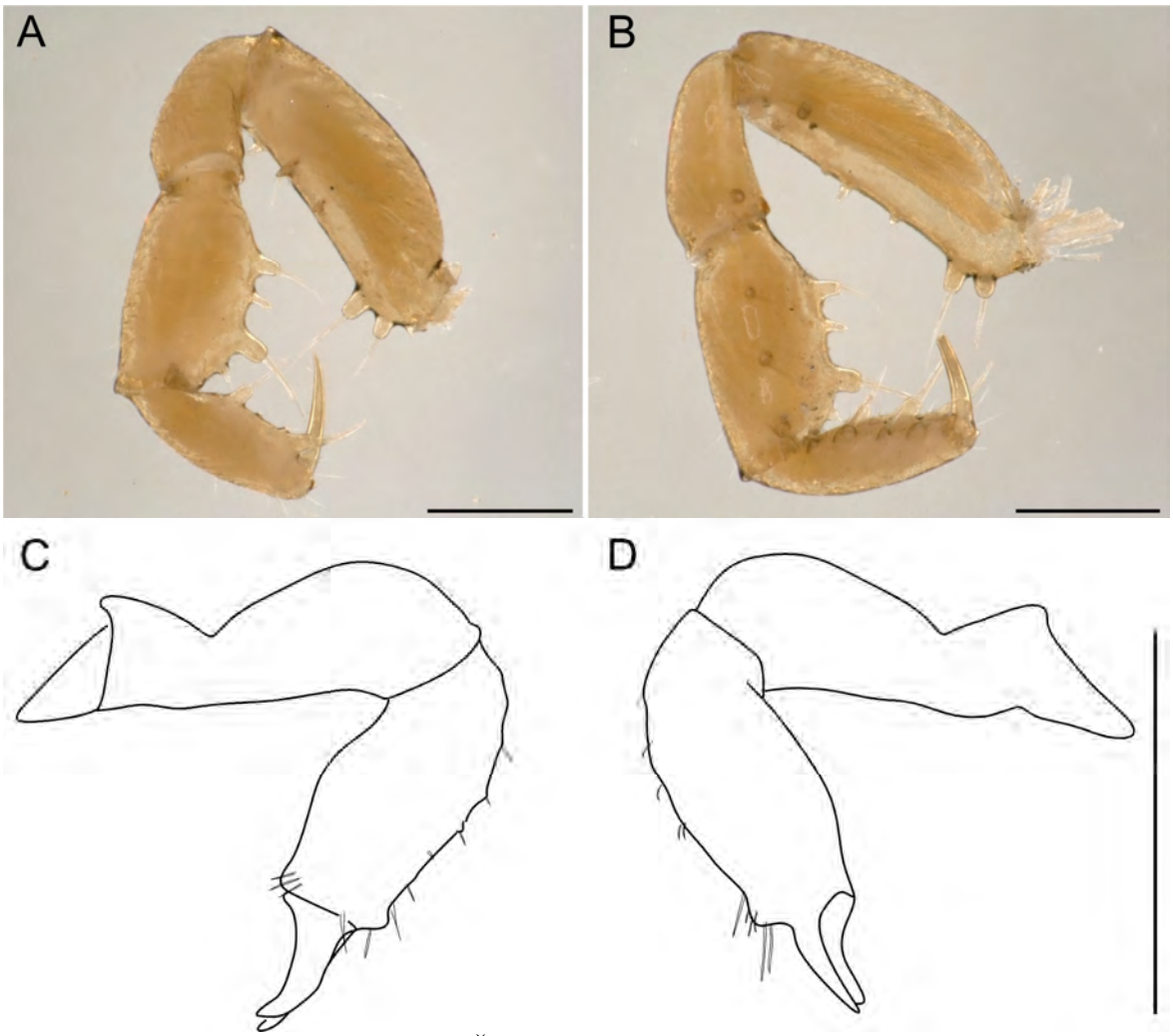

Figure 37. *Neoscotolemon vojtechi* (Šilhavý, 1979), female (holotype, MCZ 14838): A. Left pedipalp, ectal view; B. Right pedipalp, mesal view; C–D. Right chelicera: C. Ectal view; D. Mesal view. Scale bars: A–B = 500 μm; C–D = 2 mm.

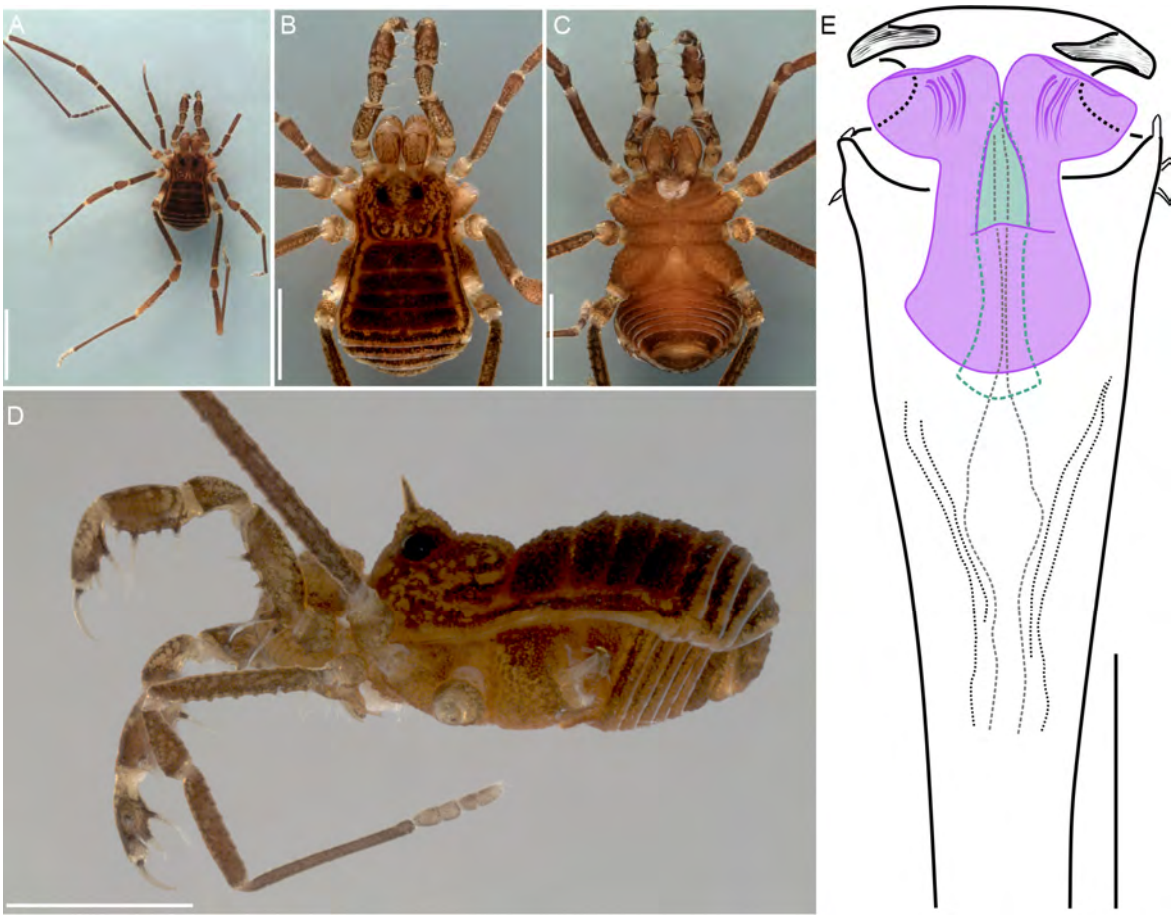

Figure 38. *Metapellobunus lutzi* (Goodnight & Goodnight, 1942), male (USNM). A–D. Habitus: A, B. Dorsal view; C. Ventral view; D. Lateral view. E. Penis, dorsal view. Stylus in green; *stragulum* in magenta. Scale bars: A = 2 mm; B–D = 1 mm; E = 500 µm.

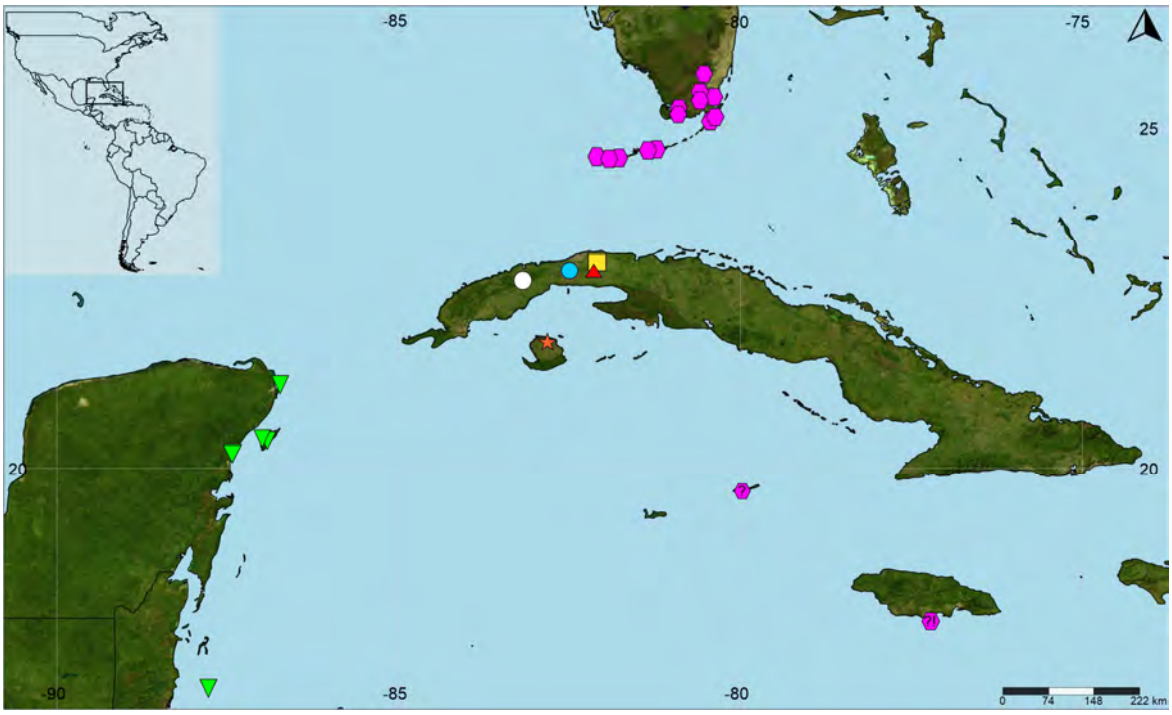

Figure 39. Geographical distribution of the genus *Neoscotolemon*. *Neoscotolemon pictipes* (sky blue circle), *N. armasi* **spec. nov.** (orange star), *N. bolivari* (yellow square), *N. cotilla* (red triangle), and *N. vojtechi* (white circle) in Cuba; *N. spinifer* (magenta hexagon) in Southern Florida, United States of America, Cayman Islands (unconfirmed record, indicated by a question mark), and Jamaica (doubtful record, indicated by a question and exclamation mark); *N. tancahensis* (green inverted triangle) in Yucatán Peninsula, México and Belize.