Two remarkable new species of *Pseudocellus* Platnick, 1980 (Ricinulei: Ricinoididae) from eastern Cuba

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**Abstract**

Two new species of the American ricinulid genus *Pseudocellus* Platnick, 1980 are herein described from eastern Cuba: one from a cave in the mountains of northwestern Guantánamo Province and another from a coastal site in southeastern Santiago de Cuba Province. Both species are remarkable by their deep morphological distinction from all other Cuban described congeners, especially those from the same geographical region, e.g., the former possesses very well developed eyespots and the latter has a large retrolateral apophysis in male leg II tibia (also present but much smaller in females). As results, the Cuban ricinulid fauna is now known to comprise 12 nominal species (all congeneric and endemic to the main island), with eight of them (67%) restricted to its eastern region.

**Key words:** Arthropoda, Chelicerata, Arachnida, Ricinulei, taxonomy, new species, Cuba, Antilles.

**Introduction**

Cuba is the single insular territory of the entire Antilles where representatives of the order Ricinulei Thorell, 1876, have been found so far. Even there, these small and inconspicuous arachnids are known to occur only in the main island; despite having been both intensively and extensively searched for at Isla de Pinos and many others of the hundreds of satellite islets and cays, still their first finding there (if any) is wanting. It must be mentioned here that Judson & Hardy (2001) recorded a single protonymph of an unidentified *Cryptocellus* Westwood, 1874 from Tobago, which they claimed as the first ricinulid record from the Lesser Antilles, but this island is traditionally regarded as an offshore element of South America instead of a true Antillean territory.

In Cuba, the ricinulid diversity is currently known to include 10 nominal species, all belonging to the single genus *Pseudocellus* Platnick, 1980; see Armas (2017) for the most recent contribution. Nevertheless, such diversity is unequally distributed across the island: three described species are endemic from its western region (Pinar del Río and Artemisa Provinces), one from the central region (Sancti Spíritus Province), and six from the eastern region (Las Tunas, Granma, Holguín, Santiago de Cuba and Guantánamo Provinces). The eastern species have had an unstable taxonomic history, which will be summarized in detail as follows.
The order Ricinulei Thorell, 1876 was first recorded from Cuba and the Antilles almost at the same time by Cooke (1972) and Dumitresco & Juvara-Bals (1973), who described two species from isolate localities within a 15 km radius around Santiago de Cuba City: Cryptocellus paradoxus Cooke, 1972 and Cryptocellus cubanicus Dumitresco & Juvara-Bals, 1973. Simultaneously, Dumitresco & Juvara-Bals (1977) reaffirmed the validity of C. cubanicus (presenting the first and so far only SEM photographs of Cuban riciinulids), and Armas (1977) described a third species from a site in eastern Holguín: Cryptocellus mayari Armas, 1977.

Things started to change shortly thereafter, when the genus Pseudocellus Platnick, 1980 was described and all Cuban species were formally transferred to it by Platnick (1980). As usual, the same year Armas (1980) introduced another change of direction by synonymizing all but one eastern Cuba species; all taxa were therein listed still in Cryptocellus, maybe because Armas (1980) was unaware of Platnick’s new generic arrangement (i.e., it was not listed in the bibliographic references).

The status quo persisted unchallenged for more than two decades, until Teruel & Pérez (2003) first called attention to an interesting point: the morphological variation of the 18 populations known then from eastern Cuba was disruptive and geographically related, most likely implying multiple species instead of a single, highly variable one. Nevertheless, Teruel & Pérez (2003: 181) also stated that a taxonomic revision was not possible yet, because the composition of the available samples was inadequate, i.e., half of them represented only by a few females and/or juveniles.

Teruel & Armas (2008) described a new species based upon females from three nearby localities of northeastern Guantánamo: Pseudocellus pachysoma Teruel & Armas, 2008. Six years later, Teruel & Schramm (2014) gave its complementary description thanks to their collection of additional specimens, including the first adult males. And within a few months, Teruel (2015) added another new species from the Guantánamo Bay arid area: Pseudocellus aridus Teruel, 2015, which set back in three the number of riciinulids recognized to occur in this region of the country.

Meanwhile, additional specimens of Cuban riciinulids (including toptotypes of most taxa described from the eastern region) kept accumulating at a low but sustained pace in collections, due to the personal sampling efforts of the present author and his collaborators. This and the examination of the types housed at IES collection, finally allowed a reassessment of the taxonomic status of some putative synonyms of P. paradoxus and in a first move, Teruel (2016) resurrected both P. cubanicus and P. mayari.

The new arrangement was accepted and reaffirmed by Armas (2017), who following the same taxonomic concept described as a new species one of the populations earlier categorically regarded by himself (Armas, 1980) as P. paradoxus: the one from southern Las Tunas Province, which he named Pseudocellus undatus Armas, 2017. Therein, Armas (2017: 97–98) also divided the Cuban riciinulids into three species-groups, one of them composed by all species from the eastern region.

As part of the above-mentioned additional material of Pseudocellus, the present author identified several undescribed species, all represented by adults of both sexes. Two of them are highly remarkable by their morphological distinction from all other Cuban described congeners, and are described in this paper. The descriptions are supported by a thorough photographic complement, detailed and illustrated taxonomic comparisons and an updated distribution map of all riciinulid populations from eastern Cuba.

**Material and Methods**

Specimens were studied and measured under an AmScope SM-1T-PL LED trinocular stereomicroscope, equipped with a 20X calibrated line scale for measuring. All measurements are given in millimeters: total length of the body (= size) corresponds to the sum of the individual lengths of cucullus, carapace and abdomen (all measured along midline) and excludes pygidium. Unless otherwise noted, all characters and their states mentioned in the text refer to adults of both sexes.

Photographs were taken with two different digital cameras: Nikon Coolpix B500 (full-body views) and Nikon Coolpix S8100 (habitat and morphological close-ups, the latter by manually attaching the camera to the upper ocular tube of the same microscope). All images were processed with Adobe Photoshop CS5, only for contrast and brightness optimization, background cleanup and plate composition. Moreover, as the holotypes of P. mayari and P. paradoxus are both fragmented (some legs or their parts are detached, as well as the abdomen of the former), a digital reconstruction was needed for figure 19 herein: all loose parts of each specimen were photographed and then carefully assembled back.
Distribution maps were constructed in Mapinfo Professional ver.10, using precise coordinates either taken in situ with a portable GPS device (Datum WGS84) or extracted from 1:25 000 military-reference, cartographic maps.

The literature cited here is not an exhaustive compendium for each taxon, but a selection of those more relevant to the subject of the present paper: original descriptions, redescriptions, taxonomic revisions, and those contributing relevant information on ecology and geographical distribution.

There is considerable disagreement on how most appendage segments and whole-body cuticular structures of ricinulids can be named, with essentially each author or team following a different, usually own system (no need for a long and useless list of references here, the interested reader is encouraged to check the pertinent literature). Until a single coding system that optimizes clear homologies for the entire order is agreed by consensus, the present author keeps the one traditionally used by him (see e.g., Teruel, 2015), with two exceptions: the large projections on the internal surface of leg II tibia are referred to as "apophyses" (instead of "spurs") and their location as "prolateral" and "retrolateral" (dorsointernal and ventrointernal, respectively).

All specimens are preserved in 80% ethanol, with labels laser-printed in Spanish (transcribed into English here for text coherence), and deposited in the personal collection of the author (RTO).

**Systematics**

*Pseudocellus dissimilior* sp. n.

**TYPE DATA.** CUBA: GUANTÁNAMO PROVINCE: El Salvador Municipality: Meseta del Guaso [Guaso Plateau]: Limonar; inside cave, no more data; 1♂ holotype, 1♀ paratype (RTO).

**ETYMOLOGY.** The selected epithet is a Latin adjective that literally means "the most different". It obviously alludes to the remarkable distinction of this species from all other Cuban ricinulids.

**DIAGNOSIS.** Adult size moderately large for the genus (male 5.2 mm, female 5.4 mm). Coloration light reddish brown, essentially uniform; ocular spots whitish. Entire body and appendages covered with short to minute sedose setae. Body very robust: carapace slightly shorter than wide (length/width ratio 0.99 in male, 0.97 in female), abdomen stout-oval (length/width ratio 1.36). Appendages attenuate. Leg II slender (length/width ratio of femur 5.19 in male, 6.23 in female; of tibia 3.75 in male, 5.07 in female; of basitarsus 10.00 in male, 8.23 in female); femur cylindrical, vestigially swollen (male) or not (female); tibia moderately modified in male (vestigially swollen, internal surface conspicuously concave, armed with a weak prolateral apophysis and a retrolateral row of small denticles), slightly modified in female (not swollen, internal surface shallowly concave, armed with a pair of prolateral and retrolateral rows of minute denticles); basitarsus minutely denticulate on internal surface only. Cucullus, carapace, tergal plates and legs densely and evenly covered with fine granules. Median plate of tergites XI–XII widely trapezoidal (XI–XII much wider than long, XIII slightly wider than long), discal dome on XI only. Pygidium not notched.

**DESCRIPTION** (adult male holotype; figs. 1, 3, 5, 13, 18–19; tab. I). **Coloration** (fig. 1) reddish brown, without any discernible patterns, but slightly darker on carapace and legs II and paler on pedipalps and chelicerae. Eyespots translucent white. Cuticular granulation and denticulation much darker due to heavier sclerotization; pleural and articular membranes yellowsish. **Cucullus** (fig. 3; tab. I). Much shorter than wide (length/width ratio 0.68), markedly convex and densely covered with short to minute, curved, translucent sedose setae. Anterior margin markedly bilobed, with a deep median notch. Segument finely and evenly granulose. **Carapace** (fig. 3; tab. I). Slightly shorter than wide (length/width ratio 0.99), convex, densely covered with minute, curved, translucent sedose setae and with a deep median furrow all along. Anterior and posterior margins almost straight, lateral margins convex and convergent anteriorly. Eyespots very large, conspicuous and kidney-shaped. Segument finely and evenly granulose (even over eyespots). **Abdomen** (fig. 3; tab. I). Stout-oval (length/width ratio 1.36), densely covered with minute, curved, translucent sedose setae and with lateral margins conspicuously convex. Median plate of tergites XI–XIII trapezoidal, each with a pair of lateral furrows, with anterior margin shallowly sinuose, lateral margins subtly...
converging backwards and posterior margin shallowly bilobed; XI much wider than long (length/width ratio 0.63) and with a moderately raised dome on anterior half; XII much wider than long (length/width ratio 0.74) and flat; XIII slightly wider than long (length/width ratio 0.97) and essentially flat. Tegument finely and evenly granulose.

Pygidium (fig. 3; tab. I). Very short and wide, not notched and densely covered with minute, curved, translucent sedose setae. Tegument coriaceous.

Pedipalps (tab. I). Densely covered with minute, curved, translucent sedose setae. Tibia short, thick and markedly curved inwards; tegument very finely and evenly granulose, ventral surface with two widely spaced prolateral denticles. Tarsus long and slender; tegument smooth.

Legs (figs. 1, 5, 13; tab. I). Slender and densely covered with minute, curved, translucent sedose setae, tegument finely and evenly granulose. Leg I moderately long, internal surface of tibia with two long, parallel rows (prolateral and retrolateral) of minute denticles, distal half shallowly concave. Leg II long: femur cylindrical, round in cross-section and vestigially swollen (length/width ratio 5.19); patella short (length/width ratio 2.49) and slightly bent basally; tibia vestigially swollen (length/width ratio 3.75), internal
surface with basal half not inflate and distal two-thirds conspicuously concave, with a weak prolateral apophysis (short, obtusely triangular) and two parallel rows (prolateral and retrolateral) of minute to small, sharp denticles; basitarsus very long (length/width ratio 10.00), slightly club-shaped, weakly curved upwards and with minute, sharp denticles on prolateral surface only. Leg III moderately long, copulatory organ depicted in figure 13. Leg IV moderately long.

Fig. 3. Pseudocellus dissimilior sp. n., adult male holotype, close-up of carapace and abdomen, dorsal. Fig. 4. Pseudocellus dissimilior sp. n., adult female paratype, close-up of carapace and abdomen, dorsal.

FEMALE (paratype; figs. 2, 4, 6; tab. I). Very similar to male, with the following sexually dimorphic differences: 1) legs II slightly more slender, with internal surface of tibia lacking prolateral apophysis; 2) legs III lacking copulatory organ.

COMPARISONS. The very well developed eyespots (figs. 3–4, 19) make *P. dissimilior* sp. n. very easy to distinguish at first from all other Cuban described species, in which these structures are entirely absent.

Apart from this conspicuous character and as expected from its geographical occurrence, it clearly belongs in the first group defined by Armas (2017) to accommodate all species from eastern Cuba. It can be distinguished very easily from them all by the highly unusual combination of a very stout body with more slender appendages, as clearly seen in the following two examples:
1. The tergite XIII median plate is wider than long in *P. dissimilior* sp. n.: length/width ratio 0.97 in male, 0.96 in female. In all other eastern species, this proportion is always reversed: pooled length/width ratio 1.18–1.63 in males, 1.16–1.80 in females.

2. The male leg II femur and tibia are only vestigially swollen in *P. dissimilior* sp. n.: length/width ratio 5.19 and 3.75, respectively. In the other six species, both segments are conspicuously swollen: pooled length/width ratio 2.75–3.60 and 2.00–3.25.

**Table I.** Measurements of the types of two new species of *Pseudocellus* from eastern Cuba. Abbreviations: length (L), width (W).

| Measurements (mm) | *P. dissimilior* | *P. bifer* | *P. dissimilior* | *P. bifer* |
|------------------|-----------------|------------|-----------------|------------|
|                  | ♂ holotype      | ♂ paratype | ♂ holotype      | ♂ paratype |
| Cucullus         | 0.75 / 1.10     | 0.70 / 1.07| 0.75 / 0.95     | 0.73 / 0.95|
| Carapace         | 1.50 / 1.52     | 1.50 / 1.55| 1.45 / 1.25     | 1.35 / 1.25|
| Abdomen          | 3.00 / 2.20     | 3.20 / 2.35| 3.00 / 1.58     | 2.85 / 1.65|
| Tergite XI median plate | 0.72 / 1.15 | 0.62 / 1.27 | 0.65 / 0.80     | 0.55 / 0.85 |
| Tergite XII median plate | 0.87 / 1.17 | 0.87 / 1.22 | 0.85 / 0.70     | 0.85 / 0.70 |
| Tergite XIII median plate | 1.12 / 1.15 | 1.07 / 1.12 | 1.20 / 0.65     | 1.15 / 0.60 |
| Pedipalp         | 2.32            | 2.47       | 2.15            | 2.05       |
| Telsonemur       | 0.25 / 0.30     | 0.37 / 0.42| 0.25 / 0.15     | 0.20 / 0.25|
| Tibia            | 0.85 / 0.25     | 0.85 / 0.27| 0.75 / 0.25     | 0.75 / 0.24|
| Tarsus           | 1.22 / 0.12     | 1.25 / 0.12| 1.15 / 0.11     | 1.10 / 0.13|
| Leg II           | 7.39            | 6.88       | 7.15            | 6.34       |
| Femur            | 1.92 / 0.37     | 1.87 / 0.30| 1.80 / 0.65     | 1.75 / 0.36|
| Patella          | 0.87 / 0.35     | 0.77 / 0.27| 0.75 / 0.40     | 0.65 / 0.35|
| Tibia            | 1.50 / 0.40     | 1.37 / 0.27| 1.45 / 0.50     | 1.25 / 0.35|
| Basitarsus       | 1.50 / 0.15     | 1.40 / 0.17| 1.50 / 0.25     | 1.29 / 0.19|
| Telotarsus       | 1.60 / 0.20     | 1.47 / 0.25| 1.65 / 0.25     | 1.40 / 0.25|
| Total            | 5.25            | 5.40       | 5.20            | 4.93       |

Moreover, figure 19 herein shows a good comparison of the adult males of *P. dissimilior* sp. n. against those of all other eastern Cuban species.

**DISTRIBUTION** (fig. 18). This species is known only from the top of the Guaso Plateau (= Meseta del Guaso, about 450 m a.s.l.), in northern Guantánamo Province. The types were collected inside a cave whose name (if any) was not specified in the collection label.

**ECOLOGICAL NOTES.** The only data included in the collecting label is that both types were found inside a cave. The Guaso Plateau (fig 18) is a roughly east-to-west oriented limestone karstic massif, oval in shape (25 x 10 km), with a mean altitude of about 500 m a.s.l. and the highest summit at 862 m a.s.l. The ground is perforated by dozens of caves of various sized and elevations, some of them containing running rivers (fig 16c) and/or large bat colonies inside.

The vegetation was originally composed by a mosaic of semicaducifoliolous and evergreen forests (figs. 16a–b), but it has been severely affected by logging and largely replaced by crops (e.g., coffee, fruits, tubers and sugarcane) and pastures. The type locality (Limonar area) has exactly this same ecological conditions and lies at an altitude of 450 m a.s.l.

**REMARKS.** This species seems to be either extremely rare, or micro-localized: in an attempt to find additional specimens, the author and one skilled collaborator conducted a three-day collecting trip to the Limonar area in early April/2015, but no ricinulids were found despite intensive search that included three caves (one the large sinkhole of the Cuzco River, see fig. 16c herein). Nevertheless, it must be noted here that the ecological conditions were unfavorable due to a severe drought.
**Fig. 5.** *Pseudocellus dissimilior* sp. n., close-ups of adult male holotype: a) leg II tibia, dorsal; b) leg II tibia, ventrointernal; c) leg II tibia, ventral; d) leg II basitarsus, dorsal. **Fig. 6.** *Pseudocellus dissimilior* sp. n., close-ups of adult female paratype: a) leg II tibia, dorsal; b) leg II tibia, ventrointernal; c) leg II tibia, ventral; d) leg II basitarsus, dorsal.

*Pseudocellus bifer* sp. n.

Figures 7–12, 14–15, 17–19. Table I

*Pseudocellus paradoxus* [misidentification: specimens, records and data from Playa Verraco and possibly also from Sigua]: Teruel & Pérez, 2003: 177–181; fig. 4; tabs. I–II. Teruel & Armas, 2008: 29, 31–32; fig. 2; tab. II. Teruel & Schramm, 2014: 79; fig. 6 (top). Teruel, 2015: 149–150, 152; fig. 3.

**TYPE DATA.** CUBA: SANTIAGO DE CUBA PROVINCE: Santiago de Cuba Municipality: Baconao: Playa Verraco; under rocks semi-buried in leaf litter; 26/August/2013; R. Teruel; 1♂ holotype, 1♀ paratype (RTO).
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17/September/2002; R. Teruel, Y. Pérez, A. Fong, M. Montoya; 1♀ paratype (RTO). 29/September/2003; R. Teruel, B. Lauranzón; 2♀♀ paratypes (RTO).

ADDITIONAL MATERIAL EXAMINED (not types). CUBA: SANTIAGO DE CUBA PROVINCE: Santiago de Cuba Municipality: Baconao: Playa Verraco; under rocks semi-buried in leaf litter; 15/August/2000; R. Teruel; 1 juvenile (RTO). 17/September/2002; R. Teruel, Y. Pérez, A. Fong, M. Montoya; 2 juveniles (RTO). 10/November/2002; R. Teruel, Y. Pérez; 1 juvenile (RTO). 29/September/2003; R. Teruel, B. Lauranzón; 1 juvenile (RTO). 4/May/2006; R. Teruel; 1 juvenile (RTO). Note: specimens not designated as types because juvenile ricinulids lack most diagnostic characters and different species of Pseudocellus occur in close proximity all along the southern coast of Santiago de Cuba (R. Teruel, unpublished).

ETYMOLOGY. The selected epithet is a Latin adjective that literally means "double, bearing two". It obviously alludes to the possession of two large apophyses in male leg II tibia, which distinguishes at first this species from all other Cuban ricinulids.

Fig. 7. Pseudocellus bifer sp. n., adult male holotype, full-body views: a) dorsal; b) ventral. Scale bar in millimeters.

Fig. 8. Pseudocellus bifer sp. n., adult female paratype, full-body views: a) dorsal; b) ventral. Scale bar in millimeters.
DIAGNOSIS. Adult size moderately large for the genus (male 5.2 mm, females 4.9–5.1 mm). Coloration dark red, uniform, in male darker on carapace and legs II. Entire body and appendages covered with short to minute sedose setae. Body robust: carapace slightly longer than wide (length/width ratio 1.16 in male, 1.08 in females), abdomen elongate-oval (length/width ratio 1.90 in male, 1.73 in females). Appendages not conspicuously attenuate. Leg II long but robust (length/width ratio of femur 2.77 in male, 4.86 in females; of tibia 2.90 in male, 3.57 in females; of basitarsus 6.00 in male, 6.79 in females); femur subcylindrical, conspicuously swollen in male, only slightly in females; tibia highly modified in male (conspicuously swollen, internal surface very concave, armed with two very large, vertically aligned apophyses (prolateral and retrolateral), moderately modified in female (slightly swollen, internal surface moderately concave, armed with the same pair of apophyses as in male, but much smaller); basitarsus denticulate all over. Cucullus, carapace, tergal plates and legs densely and finely granulose, with slightly larger granules scattered. Median plate of tergites XI-XII narrowly trapezoidal to rectangular (XI slightly wider than long, XII longer than wide, XIII much longer than wide), without conspicuous discal dome. Pygidium not notched.

DESCRIPTION (adult male holotype; figs. 7, 9, 11, 14, 15a, 18–19; tab. I). Coloration (fig. 7) dark, deep red, without any discernible patterns, but darker on carapace and legs II and paler on chelicerae. Cuticular granulation and denticulation much darker due to heavier sclerotization; pleural and articular membranes yellowish.
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Fig. 11. *Pseudocellus bifer* sp. n., close-ups of adult male holotype: a) leg II tibia, dorsal; b) leg II tibia, ventrointernal; c) leg II tibia, ventral; d) leg II basitarsus, dorsal. Fig. 12. *Pseudocellus bifer* sp. n., close-ups of adult female paratype: a) leg II tibia, dorsal; b) leg II tibia, ventrointernal; c) leg II tibia, ventral; d) leg II basitarsus, dorsal.

**Cucullus** (fig. 9; tab. I). Much shorter than wide (length/width ratio 0.79), markedly convex and densely covered with short to minute, curved, translucent sedose setae. Anterior margin weakly bilobed, with a shallow median notch. Tegument densely and finely granulose, with slightly larger granules scattered.

**Carapace** (fig. 9, 15a; tab. I). Slightly longer than wide (length/width ratio 1.16), convex, densely covered with minute, curved, translucent sedose setae and with a shallow median furrow along anterior two-thirds. Anterior margin almost straight, lateral margins essentially straight and convergent anteriorly, posterior margin convex. Eyespots absent. Tegument densely and finely granulose, with slightly larger granules scattered.

**Abdomen** (fig. 9, 15a; tab. I). Elongate-oval (length/width ratio 1.90), densely covered with minute, curved, translucent sedose setae and with lateral margins shallowly convex. Median plate of tergites XI–XIII narrowly trapezoidal to rectangular, each with a pair of lateral furrows, with anterior, lateral and posterior
margins almost straight; XI slightly wider than long (length/width ratio 0.81), almost flat; XII longer than wide (length/width ratio 1.21), almost flat; XIII much longer than wide (length/width ratio 1.85), almost flat. Tegument densely and finely granulose, with slightly larger granules scattered.

**Pygidium** (fig. 9; tab. I). Very short and wide, not notched and densely covered with minute, curved, translucent sedose setae. Tegument coriaceous.

**Pedipalps** (tab. I). Densely covered with minute, curved, translucent sedose setae. Tibia moderately long, thick and shallowly curved inwards; tegument very finely and evenly granulose, ventral surface without denticles. Tarsus long and slender; tegument smooth.

**Legs** (figs. 7, 11, 14, 15a; tab. I). Slender and densely covered with minute, curved, translucent sedose setae, tegument densely and finely granulose, with slightly larger granules scattered. Leg I moderately long, internal surface of tibia with two long, parallel rows (prolateral and retrolateral) of minute denticles, distal half very concave. Leg II long but robust: femur subcylindrical, subquadrate in cross-section and conspicuously swollen (length/width ratio 2.77); patella very short (length/width ratio 1.87) and strongly bent basally; tibia conspicuously swollen (length/width ratio 2.90), internal surface with basal half inflate and distal two-thirds very concave, with two vertically aligned, very large apophyses (prolateral stronger than retrolateral, both densely covered by coarse granules), followed by irregularly aligned, small, sharp denticles (i.e., this tibial surface forms an elongate cavity where the basitarsus fits when folded, see figure 15a herein); basitarsus long (length/width ratio 6.00), club-shaped, sinuose and with variously-sized denticles all over (larger on prolateral surface). Leg III moderately long, copulatory organ depicted in figures 14. Leg IV moderately long.

![Fig. 13. Pseudocellus dissimilior sp. n., close-ups of adult male holotype: a) leg III copulatory organ, prolateral; b) leg III copulatory organ, dorsal; c) leg III copulatory organ, retrolateral.](image)

![Fig. 14. Pseudocellus bifer sp. n., close-ups of adult male holotype: a) leg III copulatory organ, prolateral; b) leg III copulatory organ, dorsal; c) leg III copulatory organ, retrolateral.](image)

**FEMALE** (paratype; figs. 8, 10, 12, 15b; tab. I). Very similar to male, with the following sexually dimorphic differences: 1) legs II much more slender, with the two apophyses small; 2) legs III lacking copulatory organ.

**VARIATION.** The four adult female paratypes are all very similar in size, i.e., the maximum body length difference amongst them is smaller than 0.3 mm. This is roughly the same size difference between them and the male holotype, thus, all five adults are assumed to represent a single size-class.

Apart from this, the adult females do not exhibit any substantial differences in relative size, shape and cuticular sculpture of the body and appendages.
Fig. 15. *Pseudocellus bifer* sp. n., adults photographed alive, full-body dorsal view: a) male holotype; b) female paratype.
Juvenile instars have a pale orange to yellow coloration. The subadult male (tritonymph) already possesses leg II tibia with both prolateral and retrolateral apophyses strong, but much smaller than the adult. Nevertheless, the unmodified leg III (i.e., with the copulatory organ not developed) and the coloration described above both attest to their immaturity.

COMPARISONS. As expected from its geographical occurrence, *P. bifer sp. n.* clearly belongs in the first group defined by Armas (2017) to accommodate all species from eastern Cuba. The unprecedented possession of a large retrolateral apophysis in male leg II tibia (fig. 7b, 11b–c), makes the new species very easy to recognize from them, which all have it vestigial to entirely absent. Moreover, figure 19 herein shows a good habitus comparison of the adult male of *P. bifer sp. n.* against those of all other eastern Cuban species.
The same conspicuous character is valid to distinguish *P. bifer sp. n.* also from the four other species described from western and central Cuba. All of them have the male leg II tibia plain unarmed, i.e., entirely lacking any apophyses.

**DISTRIBUTION** (fig. 18). This species is confirmed to occur in a single coastal locality of southeastern Santiago de Cuba Province, but there is a potential second record nearby (see below, in Remarks section).

**ECOLOGICAL NOTES.** This species lives under variously sized (usually large) rocks, semi-buried in the leaf litter of the coastal dry forest on karstic terrain, at the base of limestone cliffs, at a distance of 20–600 m away from the seashore (fig. 17). It is constant but uncommon in the samplings, i.e., individuals are found every time regardless the humidity condition (e.g., dry or rainy season), but in reduced numbers only (three or less). Juveniles are always present, but adults appear only sporadically; specimens of all instars are usually found hanging to the underside of the rocks or hidden inside crevices of the same surface. The holotype male and paratype female from the same date were both found in close proximity under the same rock, as were the two juveniles from September 17, 2002.

The vegetation is largely a xeric scrub (fig. 17a), which in the ravines and less-exposed slopes turns into a microphyllous semicaducifolious forest (fig. 17b). It is still relatively well preserved, but it has been cleared by logging and partially replaced by crops (e.g., citrus, tubers and bananas) and pastures in some areas, mainly around villages and beach facilities.

**REMARKS.** A photograph of the holotype of *P. bifer sp. n.* still alive, was published by Teruel & Schramm (2014: fig. 6 top) misidentified as *P. paradoxus*. Moreover, the record of this species from Sigua by Teruel & Armas (2008: 32), most likely belongs to *P. bifer sp. n.* instead, because the site is only 7 km east of Playa Verraco (fig. 18) and has the same ecological conditions. Unfortunately, such identity cannot be confirmed because the voucher specimens are now missing from IES collection.
General Remarks

With the present addition, the Cuban ricinulid fauna reaches 12 nominal species, all of which are national endemics. Eight of them (67%) occur only in the eastern region of the archipelago, in Camagüey (first record), Las Tunas, Granma, Holguín, Santiago de Cuba and Guantánamo Provinces. Nevertheless, this diversity is still underestimated, i.e., at least one new species from the central region (southern Cienfuegos and Sancti Spíritus Provinces) remains undescribed.

On the other hand, some taxonomic problems remain. For example, *P. undatus* cannot be regarded as satisfactorily described because of the following reasons. First, the original description (Armas, 2017) entirely omitted data crucial for its accurate distinction, such as full-body images and measurements of body segments (length and width of cucullus, carapace, abdomen and median plates of tergites XI–XIII). And second, the taxonomic definition of *P. paradoxus* given therein and thus, all species comparisons derived from it, were not based on the holotype (but on alleged topotypes instead) and actually do not match it, as revealed here by its present examination (see fig. 19 herein).

![Fig. 19. Photographic comparison of adult males of all *Pseudocellus* species from eastern Cuba, full-body dorsal view. Species ordered alphabetically. Specimens resized to same body length to make shape of body and appendages directly comparable (anterior margin of carapace and posterior margin of abdomen carefully aligned as benchmarks, cucullus and pygidium excluded because their individual position varies due to differences in hinge of the former and projection of the latter).](image)

The present author is currently revising all undetermined populations from the eastern Provinces (fig. 18), in order to clarify their taxonomic identity. These results will be published elsewhere, including the redescriptions of *P. cubanicus*, *P. mayari* and *P. paradoxus* (based upon the already available holotypes and/or topotypes), as well as authenticate new locality records for all species.
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