



***Marayniocus martensi*, a new genus and a new species of Peruvian harvestmen (Arachnida: Opiliones: Gonyleptidae)**

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Abstract

A new genus and a new species of Gonyleptidae (Pachylinae) from the Peruvian Andes, *Marayniocus martensi*, are described. The generic distinction is primarily based on the male genitalia, especially the ventral process of the stylus, which is fan-shaped and bears an acute ventral apophysis; such a structure has no parallel among other Andean pachylines. Exomorphological and genital differences between *Marayniocus* **gen. n.** and the Andean genera *Acrographinotus*, *Junicus*, *Punagraphinotus*, *Palcapachylus*, *Tarmapachylus* and *Pichitus* are discussed. The new species has been collected in high altitude grasslands south of the Chanchamayo basin, on the eastern Andean slopes of central Peru.

Key words: Peru, Andes, Neotropics, Pachylinae, taxonomy, genus diagnosis

Resumen

***Marayniocus martensi*, nuevo género y nueva especie de opilión peruano (Arachnida: Opiliones: Gonyleptidae)**

Se describe *Marayniocus martensi*, nuevo género y nueva especie de Gonyleptidae (Pachylinae) peruano. La identidad genérica se basa fundamentalmente en la morfología genital masculina, en especial el proceso ventral del stylus, en forma de abanico y provisto de una apófisis ventral aguda; dicha morfología no tiene paralelo entre los demás Pachylinae andinos. Se discuten las diferencias exomorfológicas y genitales entre *Marayniocus* **gen. n.** y los géneros andinos *Acrographinotus*, *Junicus*, *Punagraphinotus*, *Palcapachylus*, *Tarmapachylus* y *Pichitus*. La nueva especie ha sido colectada en pastizales de altura al sur de la cuenca del Chanchamayo, en la vertiente andina oriental, Perú central.

Introduction

The present knowledge of the Peruvian opiliofauna is largely based on the numerous contributions published by the German arachnologist Carl-Friedrich Roewer between 1912 and 1963. Harvestmen described by this author alone constitute almost 70% of the around 170 species hitherto recorded from that country. Whereas this count is four times higher than that of its poorly sampled neighboring country, Bolivia, it still represents probably a small fraction of the actual opilionid diversity in Peru. It is obvious that further collecting in little explored areas promises a dramatic increase in the number of species, but not only new samples allow the discovery of new taxa: The re-examination of old collections is also a source of unexpected findings. The Roewer collection (deposited in the Senckenberg Museum Frankfurt, SMF) has proved its usefulness in that regard. It contains specimens that were misidentified (and so published) by that author, who overlooked that he examined undescribed taxa. As an example, the Peruvian gonyleptid *Acrographinotus mitmaj* Acosta, 2002 was described from specimens mistakenly determined as *Acrographinotus erectispina* Roewer, 1929 by Roewer (1963) (see Acosta 2002). In the present paper, some material misidentified by Roewer (1959) as *Acrographinotus luteipalpis* Roewer, 1957 (currently in the synonymy of *Junicus gerhardi* Goodnight & Goodnight, 1947; see Kury 2003) are shown to represent not only a new species, but also an hitherto unknown genus, here described as *Marayniocus martensi* **gen. n. sp. n.**

Generally speaking, two main geographical sectors can be recognized for the Peruvian opiliofauna (Acosta 2005): The large Amazonas basin, dominated by cosmetids, cranaiids and stygnids, and the Andean realm, where Gonyleptidae Pachylinae and Metasarcinae are the prevalent taxa. On the east-facing Andean and sub-Andean slopes, i.e. where the mountains meet the lowlands, dense cloud and rainforests develop from the humid air masses originating over the Amazonia. Though collectively referred to as "montaña", the area encompasses at least two definite belts of the Yungas Biogeographic Province: The more basal "selva alta", and the "ceja de montaña" at higher altitudes (Hueck & Seibert 1972, Cabrera & Willink 1973). Almost 70 harvestmen species are known from localities referable to these montane forests; thus this ecoregion alone contains around 40% of the whole opiliological diversity recorded in Peru, surpassing even the Amazonian lowlands in species richness (Acosta 2005). It is remarkable that this percentage is reached with the contribution of just a few sites on the eastern slopes, e.g. the Urubamba valley (most species described by Chamberlin 1916), the Tingo Maria area and the Chanchamayo basin. Because many genera in the area are monotypic, and endemism appears to be remarkable for the Andean harvestmen (Acosta 2005), most taxa are known from one or very few close localities. Nine out of 21 genera of Andean Pachylinae hitherto recorded in Peru occur in the Chanchamayo area alone. Above 3000 m (i.e. beyond the timberline) high altitude grasslands develop, not only in the main central-south plateau or "altiplano", but also on top of some independent mountain chains. Grasslands closer to the montane

rainforests are accordingly more humid than those further westwards, a fact also reflected in the higher opiloid richness of "eastern Puna" sites (Acosta 2005). *Marayniocus gen. n.* is likely to be referred to the latter biogeographic subunit.

The Chanchamayo area, especially the road descending from Tarma (3050 m) to San Ramón-La Merced (750 m), is indeed the best known east-facing Andean profile, thanks to its vicinity to the capital Lima and to the many samples obtained in the 1950s by the zoologist Wolfgang Weyrauch. Labels of Weyrauch's material have an additional value, since they normally contain detailed and reliable habitat information. Most of these specimens, now held in SMF, enabled Roewer to describe a meaningful number of new genera and species from the area (Acosta 1996). Some duplicates were retained by Weyrauch in his personal collection, with uncertain repository until recently (Acosta 1996). A part of Weyrauch's collection is now known to be stored in the Fundación Miguel Lillo (San Miguel de Tucumán, Argentina).

Material and methods

Taxonomic methods follow outlines proposed by Acosta *et al.* (in press), especially regarding terminology of armature (calling an acute cuticular projection either "spine", if articulated in a socket, or "apophysis" when emerging from the tegument without a limit), topological terms used for appendages (prolateral, retrolateral), and notation of the tarsal formula. The species description refers to all specimens rather than to a single one. Due to remarkable dimorphism and in order to avoid repetitive statements, exomorphological characters are arranged in three paragraphs: Features referable to both ♂ and ♀; dimorphic features of ♂; the same for ♀. All measurements are in mm. Total body length is provided with the posterior apophysis included. Prosoma (carapace) length was measured from the front margin to the angle anterior to the two halves of area I. Since the ocular mound rises with no limit from the carapace, its height was taken from the inferior border of the eye up to the apophysis tip, its width between the external borders of the eyes.

Abbreviation of morphological term: VPS: Ventral process of the stylus (penis).

Abbreviations of collections: CDA: Cátedra de Diversidad Animal I, Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de Córdoba; FML: Fundación Miguel Lillo, San Miguel de Tucumán, Argentina; SMF: Senckenberg Museum, Frankfurt (RII: Collection Roewer II).

Taxonomy

Marayniocus gen. n.

Acrographinotus: Roewer 1959: 74 (in part).

Type species: *Marayniocus martensi sp. n.*, here designated. Genus currently monotypic.

Etymology: The generic name is derived from the Peruvian locality where the genus was collected (Hacienda Maraynioc, Departamento Junín); grammatical gender masculine.

Distribution: Central Peru, eastern Andean slopes, near the Chanchamayo valley, in high altitude grasslands of “eastern Puna”.

Diagnosis: Medium-sized Gonyleptidae (Pachylinae), of robust habitus. Ocular mound with unpaired armature (median acute apophysis). Scutum unarmed and smooth, except for a pair of aligned paramedian granules in areas I–IV; area V and lateral areas with a row of granules. Free tergites I–II unarmed, with granulation similar to that of area V; free tergite III with a strong median apophysis (in ♂ larger than in ♀) and a row of smaller apophyses on each side. Dorsal anal plate unarmed, with a few granules. Pedipalpal femur unarmed (i.e. without prolateral subapical spine); tibia slightly dilated. Leg IV of ♂♂ with large apophyses on coxa, trochanter, femur, patella and tibia, the latter with a strong retroventral apophysis; leg IV in the ♀ with a spiny appearance due to numerous small, acute apophyses on femur, patella and tibia. Tarsal formula 6:8–9:7:7. Penis: subproximal portion of glans dilated; VPS fan-shaped, with dorsal concavity and an acute ventral projection.

Comparisons: *Marayniocus* **gen. n.** shares with *Acrographinotus* Holmgren, 1916 the “Roewerian” features: Tarsal formula 6:n:7:7, unpaired armature of ocular mound, scutum “unarmed” (at least, in the Roewerian sense!), and armature of free tergite III. This combination of character states is quite frequent among Andean pachylines of Peru: An identical characterization corresponds to the genus *Junicus* Goodnight & Goodnight, 1947, and, except for the tarsal formula, also to *Punagraphinotus* Soares & Bauab, 1972 (5:n:6:6 tarsomers). The habitus of *Acrographinotus* intuitively allows a separation, considering the less developed coxal apophyses of the latter, and especially its more diagonal (and sideways) articulation of the ♂ trochanter IV (Acosta 2001). In addition, no *Acrographinotus* species has a strong retroventral apophysis on tibia IV. In turn, the only named species of *Junicus* bears a distinct apophysis in an equivalent position on tibia IV (Goodnight & Goodnight 1947; Mello-Leitão 1949; Roewer 1957; Soares & Bauab 1972), what undoubtedly led Roewer (1959) to confuse this material with *Acrographinotus luteipalpis*. The new genus shows some exomorphological similarities with the central Peruvian genera *Palcapachylus* Roewer, 1952 and *Tarmapachylus* Roewer, 1956, both with species in the neighboring Tarma valley, upper Chanchamayo basin. These genera were described as bearing small tubercles in scutal areas III–IV (Roewer 1952, 1956), which recall the paramedian granules of *Marayniocus* **gen. n.** The tarsal formula is also identical and the femoral armature of ♂♂ of the two known *Palcapachylus* species depicts a pattern similar to that of the new genus. However, both *Palcapachylus* and *Tarmapachylus* lack any kind of armature on free tergite III.

As stressed previously (Acosta 2001, 2002), the most reliable features defining genera of Andean pachylines refer to the male genitalia, in particular the differently shaped VPS.

In that character *Marayniocus* **gen. n.** shows the sharpest distinction, its flabelliform process being so far unique. In *Acrographinotus* the VPS consists of a slightly dilated portion, covered with an apical laminar expansion, and bearing a long ventral projection (the whole described as having the shape of a “combed ibis head”, see Acosta 2001). The VPS of *Punagraphinotus* resembles that of *Acrographinotus*, bearing a kind of ventral projection but without a “comb” (Soares & Soares 1979). *Junicus* has a VPS strongly dilated, almond-shaped and dorsally oriented (also illustrated in Acosta 2001). The genital morphology of most remaining Andean pachyline genera has not been published yet, but all were examined by me. Penes of *Palcapachylus*, *Tarmapachylus* and *Biconisoma* Roewer, 1936, all closely related to each other, are roughly similar to that of *Junicus* and thereby clearly different to *Marayniocus* **gen. n.** In contrast, *Pichitus* Roewer, 1959, with a quite distinct external morphology, especially regarding the armature of femur IV in the ♂, as well as the curious and complex armature of the dorsal anal plate (see Roewer 1959), shows a surprising genital similarity with the “*Acrographinotus* pattern”: The VPS of *Pichitus* bears an acute downward-pointing projection, but instead of having a membranous comb, the tip has lateral umbrella-shaped expansions. At the present state of knowledge it is very difficult to assess the actual affinities of *Marayniocus* **gen. n.**, but the acute ventral projection of the flabelliform process might prove to be homologous to equivalent structures in *Acrographinotus*, *Punagraphinotus* and *Pichitus*. Other Andean pachyline genera (e.g. *Polyacanthoprocta* Mello-Leitão, 1927 and *Punrunata* Roewer, 1952) appear to be much more distant (Acosta, unpubl. data).

***Marayniocus martensi* sp. n.**

Figs 1–10

Acrographinotus luteipalpis: Roewer 1959: 74, misidentification, in part (only some material from Hacienda Maraynioc belongs to *Marayniocus martensi* **sp. n.**, the rest is referred to *Junicus gerhardi*, see below).

Type series: ♂ holotype, 1 ♂ and 1 ♀ paratypes (SMF) [ex RII 12767/134]; 1 ♂, 2 ♀ paratypes (FML 00053) and 1 ♂ paratype (CDA 000.803) [both ex Coll. Weyrauch, brittle and badly preserved]: Central Peru, Hacienda Maraynioc (3500 m), east slope of the Andes, basin of the río Chanchamayo, east of Tarma, under stones in grassland, 10.x.1956 (W. Weyrauch coll.). The label of RII 12767/134 only states “Perú, Río Chanchamayo” (Weyrauch’s label not retained) but full details (as in Roewer 1959) are given in the RII card catalog. After separating the types of *M. martensi* **sp. n.**, the vial RII 12767/134 now contains one unidentified ♀ (probably belonging to *Acrographinotus*).

Type locality: Hacienda Maraynioc (3500 m, circa 11°20’S 75°24’W), Department Junín, Province Tarma, Peru. This locality is situated in the upper basin of the río Aynamayo, which flows into the río Chanchamayo near San Ramón. The valley of the río

Tarma, also a subsidiary of the Chanchamayo, is located a few kilometers west of Hacienda Maraynioc, but is separated by a mountain range with altitudes higher than 4000 m.

Etymology: I am pleased to dedicate this new species to Prof. Dr Jochen Martens, as an acknowledgement of his many and meaningful contributions to the systematics of harvestmen, and especially for his kind *Gastfreundlichkeit* (hospitality), which enabled me to have a pleasant and fruitful time in his laboratory in the early 90s, during a research stay in Germany supported by the DAAD (Deutscher Akademischer Austauschdienst).

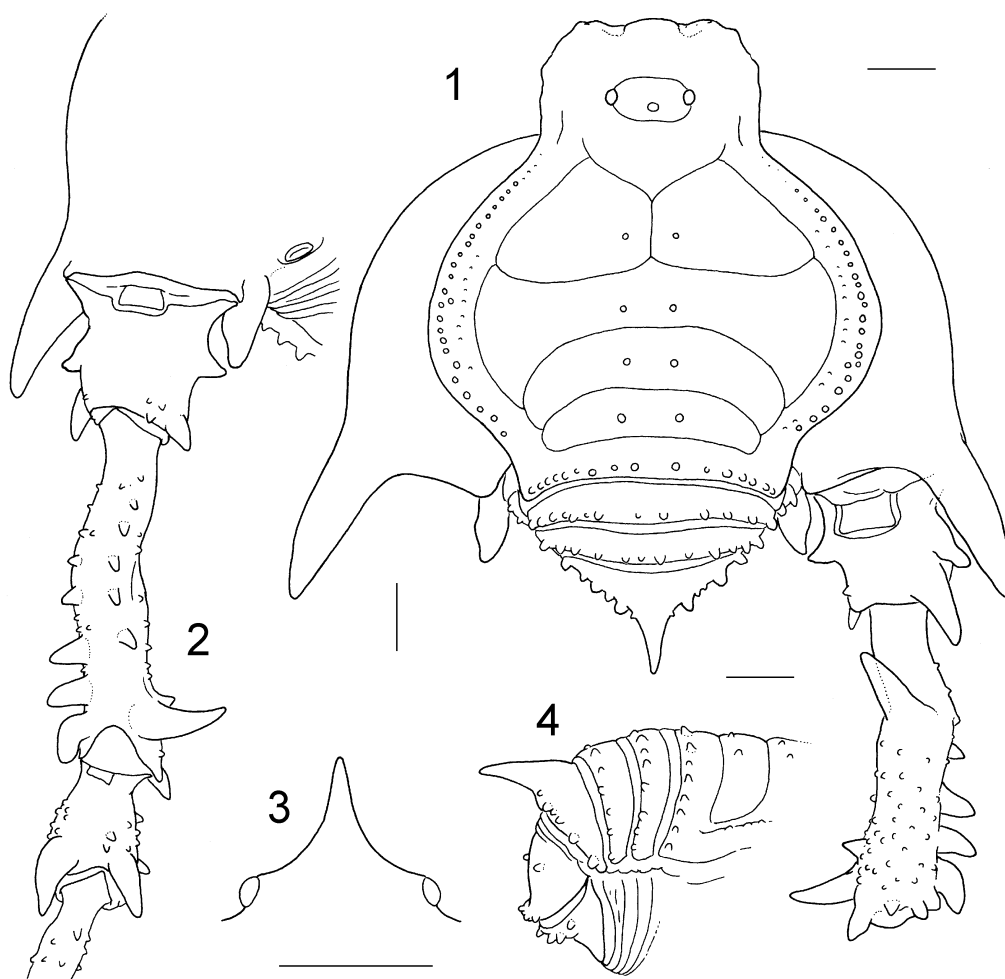
Description: Measurements. Dorsal scutum length: ♂♂ 6.0–6.7 (n=4), ♀♀ 5.9–6.0 (n=3). Detailed measurements of ♂ holotype and ♀ paratype: Table 1.

TABLE 1: Measurements (in mm) of the holotype and a ♀ paratype of *Marayniocus martensi* gen. n. sp. n.

| | ♂ holotype | ♀ paratype (SMF) |
|--|------------|------------------|
| Total body length (posterior apophysis included) | 9.3 | 7.5 |
| Scutum, length / maximal width | 6.4 / 6.2 | 6.0 / 5.6 |
| Prosoma, length / width | 2.4 / 3.1 | 2.3 / 2.9 |
| Leg I, total length / femur length | 11.9 / 2.9 | 10.5 / 2.6 |
| Leg II, total length / femur length | 19.0 / 4.8 | 16.3 / 4.1 |
| Leg III, total length / femur length | 16.3 / 4.3 | 14.5 / 3.7 |
| Leg IV, total length | 24.2 | 18.3 |
| Trochanter IV length | 1.7 | 1.4 |
| Femur IV length | 5.7 | 4.6 |
| Patella IV length | 2.6 | 2.1 |
| Tibia IV length | 5.5 | 3.7 |
| Metatarsus IV length | 6.2 | 4.7 |
| Tarsus IV length | 2.4 | 1.9 |
| Pedipalp, total length / femur length | 8.8 / 2.3 | 8.6 / 2.3 |
| Cheliceral hand, length / width | 2.2 / 0.8 | 2.1 / 0.7 |
| Ocular mound, width / height | 1.3 / 1.0 | 1.2 / 0.9 |

Color: General color yellowish-straw. Prosoma with faint pigment reticulation, this extending even fainter to lateral scutal borders, area V and free tergites; most of scutum very pale. Chelicerae and pedipalps with tenuous pigment reticulation. Legs I–III and leg IV of ♀ of the general color. Leg IV of ♂: Coxa similarly colored as scutum in its basal 2/3 (approximately at level of origin of apophyses); distal third, including apophyses, becoming abruptly darker (with definite transverse limit between the two tones); trochanter as dark as distal part of coxa, especially on dorsolateral apophyses; femur, patella and tibia slightly lighter, and in contrast to coxa and trochanter, ventral apophyses

lighter (dorsal apophysis of femur of same coloration as rest of the article); metatarsus and tarsus of the general color. Ventral surface of body like light portion of coxa IV, except for darker borders of coxa-trochanter articulation and sternites.



FIGURES 1–4. *Marayniocus martensi* gen. n. sp. n., ♂ holotype (SMF). 1 Dorsal scutum, free tergites, coxae IV, right trochanter and femur IV, dorsal view. 2 Right coxa, trochanter, femur and patella IV, ventral view. 3 Ocular mound, posterior view. 4 Posterior part of body showing apophysis on free tergite III, lateral view. Scale bars: 1 mm.

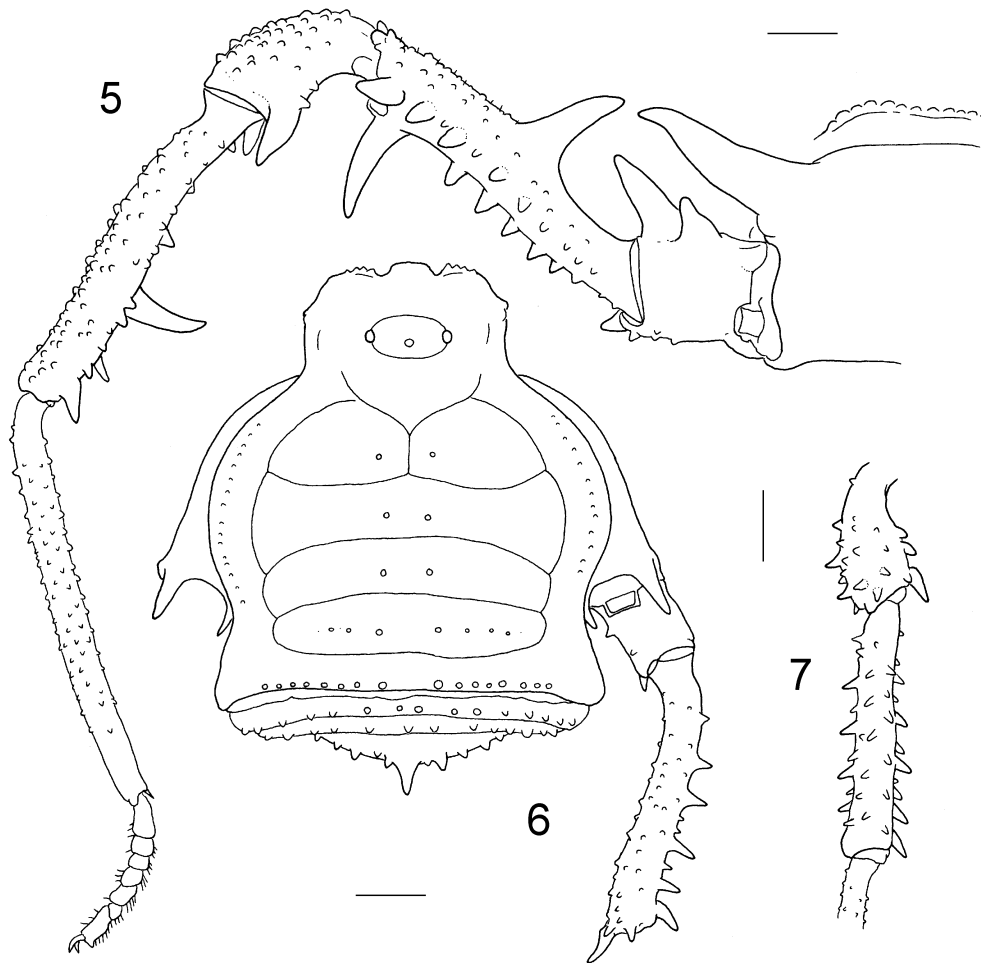
Exomorphology. Prosoma and scutum sparsely set with tiny granules. Ocular mound with a tall apophysis (Fig. 3). Scutum (Figs 1, 6): Areas I–IV with a pair of paramedian granules, these minute in area I, increasing in size towards area IV. Lateral areas of scutum with a row of blunt granules and a fine, more mesal granulation. Area V and free tergites I–II (Figs 1, 6) with a row of spaced grains, these smaller and rounded in area V, becoming more conical posteriorly in the ♂. Free tergite III with a row of small apophyses and a large median apophysis, this larger in the ♂ (Figs 1, 4) than in the ♀ (Fig. 6). Dorsal anal plate with two central grains, and with several small granules on the border; ventral anal plate

with a row of granules along the edge (median ones largest). Shape and development of chelicerae and pedipalps as usual in the subfamily; pedipalp femur without medial subapical spine; tibia in dorsal view slightly more dilated than more basal articles (more pronounced in the ♀). Legs I–III unarmed, tibia III with 2–3 acute retroapical granules. Number of tarsomeres: 6:8–9:7:7 (holotype with 6:9/8:7:7).

Leg IV of ♂. Coxa very dilated, its surface smooth, bearing a strong prolateral apophysis, diagonal and slightly inclined upwards (Figs 1, 5); retrolateral apophysis quite large, opposed to an apophysis on the following article (Fig. 2). Trochanter with two large prodorsal apophyses, the proximal smaller, the distal pointing more upwards and posteriad (Figs 1, 5); an acute retrolateral apophysis in the basal half (opposed to retrolateral apophysis of coxa); retroventral apical apophysis of similar size, accompanied by a conical tubercle situated more ventrally. Femur with a strong dorsal apophysis in the middle third (Fig. 5), its position determining a mild break in the article's axis (Fig. 1); basal part of femur more slender and smooth than portion posterior to apophysis, the latter dorsally with granulose surface; proventral row with a large leaf-shaped apical apophysis followed by 2–3 acute apophyses (Fig. 2); this row continued anteriorly by acute grains from level of the large dorsal apophysis; retroventral subapical apophysis large, spur-like and diagonally inclined ventrad (Figs 1–2, 5), on its base bearing an acute tubercle; after a gap, continued anteriorly into a retroventral row of apophyses of decreasing size, almost reaching base of femur; apex with three rudimentary dorsal apophyses. Patella dorsally covered with large, rounded granules (Fig. 5); a large leaf-shaped ventral proapical apophysis, an acute ventral retroapical one, and a small prolateral apophysis (Fig. 2). Tibia straight in dorsal view, slightly S-shaped in lateral view (Fig. 5); dorsal surface with granulation similar to that on patella; a large, spur-like retroventral apophysis situated between middle and distal thirds of article; noticeable retro and proapical apophyses.

Leg IV of ♀. Coxa (Fig. 6) with acute prolateral apophysis; small retrolateral apophysis less conspicuous because of proximity to sternites. Trochanter only with a small retroventral apophysis and a rudimentary retrolateral apophysis. Femur, patella and tibia of more spiny appearance than in ♂ (Figs 6–7). Femur with granular dorsal surface and a proventral row of acute apophyses, these decreasing in size proximally; retroapical apophysis well-developed (Fig. 6). Patella and tibia with acute apophyses on all surfaces (Fig. 7), proapical one on patella enlarged.

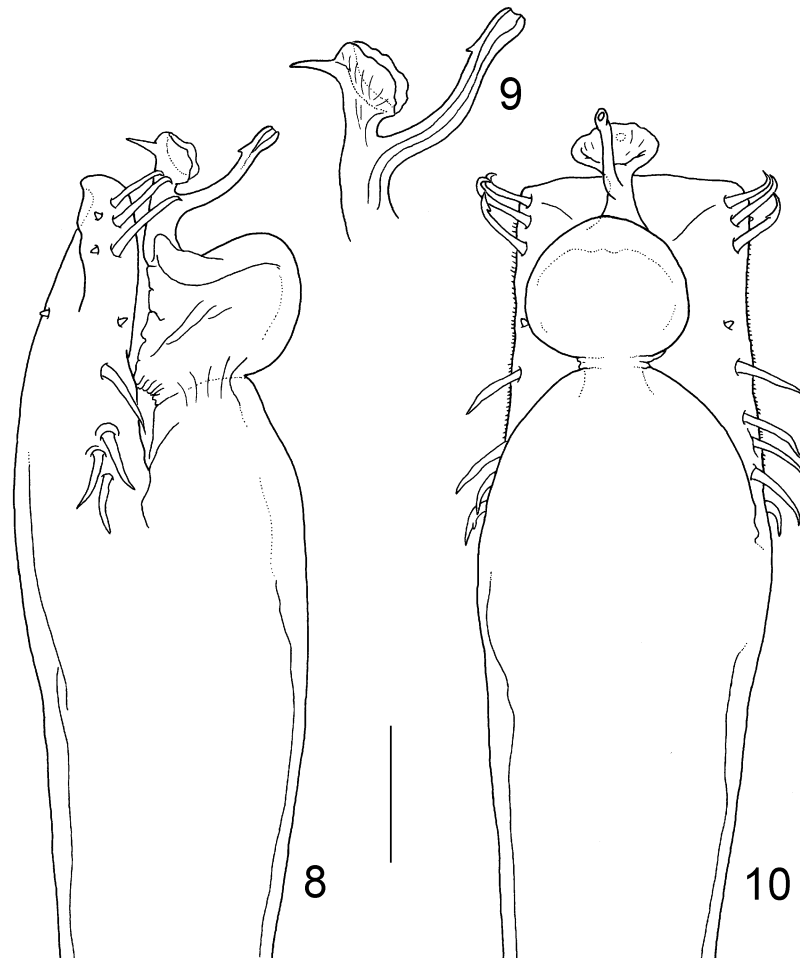
Genitalia. Penis. Trunk simple, cylindrical. Ventral plate subrectangular, distal and lateral borders straight (Fig. 10); marginal spine-shaped setae in two groups on each side: 3 apical setae with upwards-curved tips, and 4–5 thick and tortuous, longitudinally arranged basal setae; small rudimentary setae between these two groups and ventrally of the apical group (Fig. 8). Glans arising from an expansion of the trunk, its subproximal portion strongly dilated, subspherical in dorsal view (Fig. 10); VPS expanded in the form of a concave fan resembling a clam valve (Fig. 10); ventral surface of the “fan” subterminally bearing an acute projection pointing downwards (Figs 8–9).



FIGURES 5–7. *Marayniocus martensi* **gen. n. sp. n.** 5 ♂ holotype (SMF), right leg IV (coxa to tarsus), prolatral view. 6–7 ♀ paratype (SMF). 6 Dorsal scutum, free tergites, coxae IV, right trochanter and femur IV, dorsal view. 7 Right patella and tibia IV, prolatral view. Scale bars: 1 mm.

***Junicus gerhardi* Goodnight & Goodnight, 1947**

Material examined (referred to as *Acrographinotus luteipalpis* by Roewer 1959): FML 143 (2 ♂♂, 2 ♀♀, ex Coll. Weyrauch), SMF RII 12766/133 (1 ♂, 2 ♀♀): Central Peru, Hacienda Maraynioc (3500 m), east slope of the Andes, basin of río Chanchamayo, east of Tarma, under stones in grassland, 10.x.1956 (W. Weyrauch coll.). The label of RII 12766/133 just states “Peru, Tarma”; full data, as in Roewer (1959), are included in the RII card catalog.



FIGURES 8–10. *Marayniocus martensi* **gen. n. sp. n.**, ♂ paratype (SMF), apical end of penis. 8 Lateral view. 9 Detail of stylus, with flabelliform ventral process, lateral view. 10 Dorsal view. Scale: 0.1 mm.

Note: *Junicus gerhardi* is the valid name of the species I formerly (Acosta 2001) referred to as *Sokkupia olivacea* Mello-Leitão, 1949. While determining *A. luteipalpis* to be a junior synonym of *S. olivacea*, Soares & Soares (1979) also proposed the generic synonymy *Acrographinotus* = *Sokkupia* Mello-Leitão, 1949, so that *olivacea* was then transferred to *Acrographinotus*. Acosta (2001) demonstrated that *S. olivacea* belongs to an independent genus, thus revalidating *Sokkupia*. Finally, Kury (2003) rescued Goodnight & Goodnight's (1947) generic and specific names *Junicus* and *J. gerhardi* (originally placed in Phalangodidae Tricommatinae, transferred to Pachylinae by Kury 2003), stating that they are the valid names for the corresponding taxa (*S. olivacea* and *A. luteipalpis* being accordingly placed in the synonymy of *J. gerhardi*). Despite those intricate nomenclatural changes, *Marayniocus martensi* **gen. n. sp. n.** is clearly different from the actual species it was confused with.

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