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Taxonomy/Taxinomie

Redescription of *Paradiscocyrtus neglectus* Mello-Leitão, 1927 (Opiliones: Gonyleptidae), with the designation of a neotype and two synonymies



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ARTICLE INFO

Article history:

Received 26 September 2017

Accepted after revision 18 January 2018

Available online 17 February 2018

Keywords:

Arachnida

Laniatores

Pachylinae

Neotropics

Itatiaia

ABSTRACT

Paradiscocyrtus neglectus Mello-Leitão, 1927 is here redescribed and for the first time illustrated. A neotype is proposed to clarify the taxonomic status of this species and to differentiate it from the other two species of *Paradiscocyrtus* and related genera (e.g., *Discocyrtus*). Two junior synonyms of this species, currently allocated in *Discocyrtus* Holmberg, 1876 are here detected. This harvestman is endemic from areas above 2000 meters of altitude, occurring in the Campos Rupestres montane savannas terrestrial eco-region in the states of Minas Gerais and Rio de Janeiro, Brazil. This species is characterized by the powerful retrodorsal apophysis of the coxa IV, the unique armature of dorsal scutum, trochanter IV, and femur IV.

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1. Introduction

The genus *Paradiscocyrtus* Mello-Leitão, 1927 is currently composed of three valid species, occurring in the central, northeastern and southeastern regions of Brazil [1]. According to its original diagnosis, the criterion for separating *Paradiscocyrtus* from the species of *Discocyrtus* Holmberg, 1878 was the existence of a pair of tubercles present in area II of the dorsal scutum (absent in *Discocyrtus*) and such understanding remains unchanged since the last published diagnosis (decades ago) for the genus, present in Soares & Soares [2]. Its type species (by monotypy), *Paradiscocyrtus neglectus* Mello-Leitão, 1927 [3], was published with a short description containing only four lines, with neither illustrations nor information on the type material, which has not been seen by any other author. The other two species of the genus, both described by Roewer – *Paradiscocyrtus cerayanus* Roewer, 1929 and

Paradiscocyrtus trochanteralis Roewer, 1929 – have an illustration of habitus dorsal of holotype and a satisfactory description. These species were inserted in *Paradiscocyrtus* for presenting the configuration of the dorsal scutum established by Mello-Leitão, but until today, there is no evidence in the literature that this genus forms a clade. In the present work, *P. neglectus* (Fig. 1) is recognized, redescribed, and for the first time illustrated. A neotype is proposed here to clarify the taxonomic status of this species and to differentiate it from other two species of *Paradiscocyrtus* and related genera (e.g., *Discocyrtus*). Lastly, two specific junior synonyms of *P. neglectus*, currently allocated in *Discocyrtus* are here detected.

2. Material and methods

The descriptions of colors use the standard names followed by the centroid code (in parentheses) of the 267 Color Centroids of the NBS/IBCC Color System [4] as described in Kury & Orrico [5]. The formula for the tarsomeres count, in which the distitarsi of legs I and II are

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<https://doi.org/10.1016/j.crvi.2018.01.005>

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indicated between parentheses, was created by Roewer [6]. The formula for megaspines of pedipalpus in which I = large spine and i = small spine is used here following the format established by Kury [7]; here, the same formula is used to discriminate the sizes of the spines on the different surfaces of Femur IV. The terminology for scutum outline follows Kury & Medrano [8]. The terminology for the chaetotaxy of the penis ventral plate follows Kury & Villarreal [9] for the macrosetae and Kury [10] for the microsetae. The term mesotergum [11] refers to the roughly subrectangular region of the dorsal scutum formed by areas I to IV and circumscribed anteriorly by the carapace, laterally by the lateral margins and posteriorly by the area V (posterior margin of the scutum). The biogeographical units used here are from the WWF Terrestrial Ecoregions of the World (names starting with “NT” [12]). They are indicated on the map by colored background areas (Fig. 4).

The diagnosis given here is comparative among *P. neglectus* and the two other species of this genus, *Paradiscocyrtus ceryanus* Roewer, 1929 and *Paradiscocyrtus trochanteralis* Roewer, 1929.

Scanning Electron Microscopy was carried out with a JEOL JSM-6390LV at the Center for Scanning Electron Microscopy of Museu Nacional/UFRJ. All measurements are in mm.

Abbreviation of the repository cited is MNRJ (Museu Nacional, Rio de Janeiro). The abbreviation of the relevant Brazilian states are:

- MG = Minas Gerais;
- RJ = Rio de Janeiro.

Other abbreviations used are:

- AS = abdominal scutum;
- CL = carapace length;
- CW = carapace width
- AL = abdominal scutum length;
- AW = abdominal scutum width (body);
- Tr = trochanter;
- Fe = femur;
- Pa = patella;
- Ti = tibia;
- Mt = metatarsus;
- Ta = tarsus (appendages);
- VP = ventral plate;
- A1–A3 = basal macrosetae of VP;
- B = ventro-basal macrosetae of VP;
- C1–C3 = distal macrosetae of VP;
- D1 = dorso-lateral subdistal small seta of VP * E1–E2 = ventro-distal macrosetae of VP (penis).

Tarsal formula: numbers of tarsomeres in tarsus I to IV (Table 2); when an individual count is given, the order is from the left to right side (the figures in parentheses denote the number of tarsomeres only in the distitarsi I–II).

3. Systematic accounts

Paradiscocyrtus neglectus Mello-Leitão, 1927.

(Figs. 1–3).

Paradiscocyrtus neglectus Mello-Leitão, 1927: 3; Roewer, 1929: 247; Mello-Leitão, 1932: 206; Soares & Soares, 1954: 286; 1970: 340; Kury, 2003: 185.

Discocyrtus alticola Mello-Leitão, 1935b: 6, fig. 3; 1935d: 101; B. Soares, 1945: 371; Soares & Soares, 1954: 246; 1970: 340; Kury, 2003: 160. **SYN. N.**

Discocyrtus perfidus Mello-Leitão, 1932: 181, fig. 103; B. Soares, 1945: 374; Soares & Soares, 1954: 254; Kury, 2003: 165. **SYN. N.**

Type data. *Paradiscocyrtus neglectus*: (repository unknown, lost), BRAZIL, “Itatiaia”, without further locality data. *Discocyrtus alticola*: (MNRJ 18198, lost), BRAZIL, “Itatiaia”, without further locality data. *Discocyrtus perfidus*: 2 ♂ syntypes (MNRJ 1419, examined) BRAZIL, RJ, “Niterói”. Locality probably mistaken (see below).

Paradiscocyrtus neglectus: 1 ♂ neotype, proposed herein (MNRJ 5578) BRAZIL, MG, Itamonte, Parque Nacional de Itatiaia, Vale dos Lírios, –22.3616°, –44.7066°, 2400 m, 04.ii.1997, Kury, A. B., Pinto-da-Rocha, R. & Mestre, L. leg.

Other material examined. 1 ♂ 2 ♀ (MNRJ 0031) BRAZIL, RJ, Resende, 2140–2240 m, 28.xi.1971, Jim, J. leg.; 1 ♂ (MNRJ 5591) BRAZIL, MG, Itamonte, Parque Nacional de Itatiaia, Vale dos Lírios, –22.3616°, –44.7066°, 2400 m, 04.ii.1997, Kury, A. B., Pinto-da-Rocha, R. & Mestre, L. leg.; 1 ♂ (MNRJ 5601) BRAZIL, MG, Itamonte, Parque Nacional de Itatiaia, Brejo da Lapa, –22.3625°, –44.735°, 2200 m, 05–06.ii.1997, Kury, A. B., Pinto-da-Rocha, R. & Mestre, L. leg.

Etymology. Latin adjective *neglectus* (ignored, rejected).

Diagnosis. Pair of spines on ocularium independent, without inclination (fused at the base and inclined frontwards in *P. ceryanus* and *P. trochanteralis*) (Fig. 2A–B, E). Paramedian armature of area III with phalanx-shaped spines (tubercles dome-shaped in *P. ceryanus* and *P. trochanteralis*) (Fig. 2A, D–E). Area III posterior central groove invading space of area IV (grooves parallel to each other in *P. ceryanus* and *P. trochanteralis*) (Fig. 2A). Area IV posterior central groove invading the space of area V (area V anterior central groove invading the space of area IV in *P. ceryanus*, parallel to each other in *P. trochanteralis*) (Fig. 2A). Cx IV retrolateral apophysis well developed, with the same length of the prodorsal (stunted branch in *P. ceryanus* and *P. trochanteralis*) (Fig. 2A). Tr IV medial prolateral apophysis conspicuous (absent from *P. ceryanus* and *P. trochanteralis*) (Fig. 2A). Fe IV medial dorsal with two well-developed spines (absent from *P. ceryanus* and *P. trochanteralis*) (Fig. 2A, F–G, I).

Distribution. BRAZIL: MG, Itamonte. RJ, Itatiaia.

Redescription. Male neotype (MNRJ 5578). Measurements. CW 3.6, CL 2.9, AW 7.7, AL 3.4. Leg measurements in Table 1, tarsal counts in Table 2.

Dorsum: Dorsal scutum gamma form, wider than long, with lateral margins of the abdominal scutum strongly convex, widest at area II and highest at area III (Fig. 2A, E). AS posterior margin sinuous. Carapace with few tubercles on the posterior region, with two pairs of paramedian higher tubercles (Fig. 2A, E). Cheliceral sockets shallow, with a small apophysis between them (Fig. 2A). Ocularium elliptical, high (ca. 3.5 × the diameter of the eyes), almost perpendicular to the dorsal scutum, placed in the middle of the carapace, armed with a pair of parallel high spines

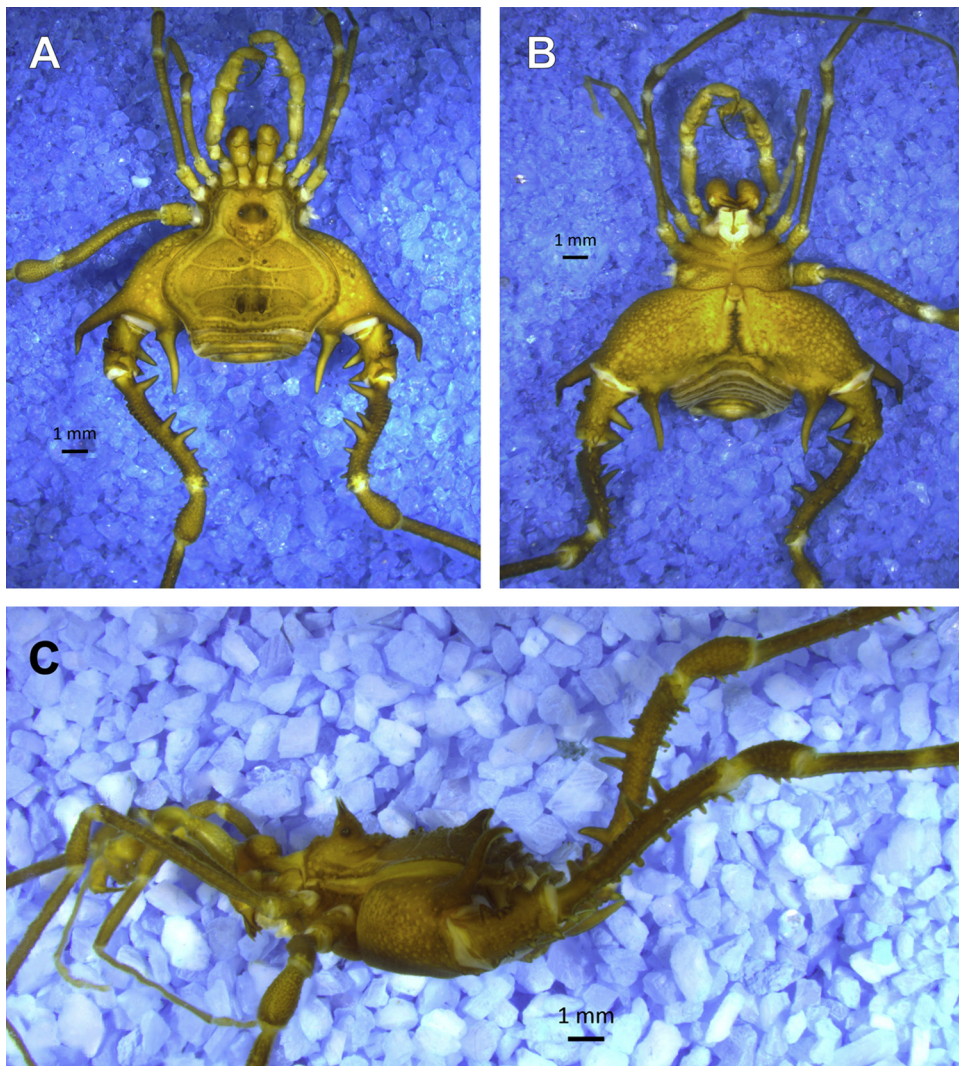


Fig. 1. *Paradiscocyrtus neglectus* Mello-Leitão, 1927, ♂ neotype (MNRJ 5578) specimen in alcohol: A. Habitus, dorsal view. B. Habitus, ventral view. C. Habitus, lateral view. Scale bars = 1 mm.

(ca. $2 \times$ the diameter of the eyes) fused at the baseline and inclined frontwards (Fig. 2A–B, E). Mesotergum divided into four clearly defined areas (Fig. 2A). Area I divided into left and right halves by the median groove (Fig. 2A). Area II anterior lateral groove slightly invading the space of the area I and posterior lateral groove strongly invading the space of area III (Fig. 2A). Area III posterior central groove strongly invading the space of area IV (Fig. 2A). AS lateral borders with two rows of ordinary tubercles from area I frontwards (Fig. 2A). All areas with many tubercles. Area I with pair of paramedian tubercles higher than the others (Fig. 2A, C, E). Area III with a pair of paramedian higher armature phalanx-shaped slightly curved backwards (Fig. 2A, D–E). Posterior border of dorsal scutum and free tergites with a horizontal row of ordinary tubercles (Fig. 2 A, E).

Venter: Cx I–III parallel to each other; each with ventral transverse rows of 8–12 setiferous tubercles (Cx I anterior row with higher and sharper tubercles). Cx II retroventral

distal with a row of six acuminated tubercles. Cx III retroventral distal with a row of ten acuminated tubercles. Cx IV much larger than the others, directed obliquely. Stigmatic area Y-shaped, clearly sunken relative to distal part of coxa IV. Intercostal bridges well-marked. Stigmata clearly visible. Free sternites and anal operculum with one transverse row of tubercles each.

Chelicera: Basichelicerite elongate, bulla well-marked, with marginal setiferous tubercles – two ectal, two posterior, one mesal; hand not swollen.

Pedipalpus: Tr with a geminated ventral setiferous tubercle. Fe with a prolateral apical setiferous tubercle and one ventral basal setiferous tubercle. Pa unarmed. Ti with two rows of setiferous tubercles; four (lili) ventro-mesal and ventro-ectal. Ta with two rows of setiferous tubercles; three (lilii) ventro-mesal and four (lilii) ventro-ectal.

Legs: Tr I–III each with several ventral tubercles. Fe I–II straight. Fe and Ti I–II with all faces containing rows of small tubercles. Leg III substraight. Fe III and Ti III with all

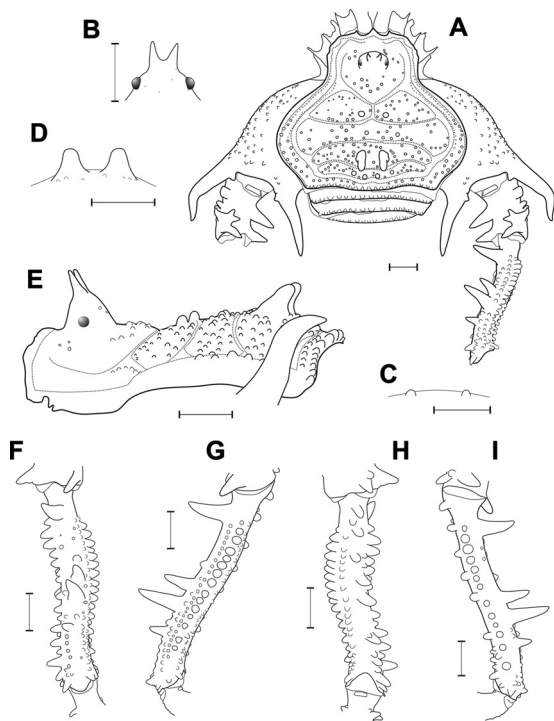


Fig. 2. *Paradiscocyrtus neglectus* Mello-Leitão, 1927, ♂ neotype (MNRJ 5578): A. Habitus, dorsal view. B. Ocularium, frontal view. C. Armature of scutal area I, dorso-anterior view. D. Armature of scutal area III, dorso-anterior view. E. Habitus, lateral view. F. Right femur IV, dorsal view. G. Same, prolateral view. H. Same, ventral view. I. Same, retrolateral view. Scale bars = 1 mm.

faces containing rows of small tubercles. Fe III with medial–distal proventral and retroventral row of acuminated tubercles. Ti III medial–distal retroventral row of acuminated tubercles. Cx IV ending distally at areas III–IV of dorsal scutum (Fig. 2A). Cx IV with a long prolateral apophysis (slightly curved to retrolateral) and a long retroventral apophysis (slightly curved to prolateral), both with a small secondary branch (Fig. 2A). Cx IV prodorsal, prolateral, proventral and ventral with rows of acuminated tubercles (Fig. 2A). Tr IV apophysis proximal prolateral forming a small hook curved to dorsal (Fig. 2A). Tr IV medial prolateral with two tubercles geminated (Fig. 2A). Tr IV apophysis medial–distal prodorsal forming a hook curved to anterior (Fig. 2A). Tr IV distal prodorsal conical, curved to posterior (Fig. 2A). Tr IV apophysis proximal retrolateral conical (Fig. 2A); distal retrolateral also conical (Fig. 2A, F, H–I). Tr IV retroventral distal with two acuminated tubercles (Fig. 2H). Fe IV substraight, prolateral convex and medial–distal oriented to dorsal (Fig. 2A, F–I). Fe IV proximal with a conical spine (I) and medial–distal with three conical spines (ili) (Fig. 2A, F–G, I). Fe IV prolateral with a row of tubercles, growing the size to medial and decreasing to distal portion (Fig. 2A, F–H). Fe IV proventral with a row of small spines (Fig. 2G–H). Fe IV with a row of spines, curved to retroventral on medial–distal portion (Fig. 2H–I) Fe IV retrolateral with a row of tubercles, decreasing the size to medial and growing to distal portion (Fig. 2F, H–I). Pa IV proventral with four

spines; retroventral with three spines; retrolateral with two spines. Ti IV prodorsal, prolateral, proventral, retrodorsal, retrolateral and retroventral with row of acuminated tubercles. Mt IV proventral and retroventral distal with spur.

Penis: VP divided into two regions: distal part trapezoidal, proximal part elliptical (Fig. 3A, C). Ventral surface of VP entirely covered with microsetae of the type 1 (Fig. 3B–C). All macrosetae inserted on lateral of VP: A1–A3, cylindrical, thick, acuminate, forming a triangle on basal third of VP, where A2 more dorso–distal than the other two (Fig. 3A–B); B1 inserted ventrally, proximal to A2 (Fig. 3B–C); C1–C3 with the same shape of macrosetae A, forming a tight row on the distal part of VP (Fig. 3A–C); D1 small, closer to C3 than to A1 (Fig. 3A–B); E1–E2 inserted on distal lateral border of VP, E1 between C1 and C2, E2 proximal to C3 (Fig. 3B). Glans sac short, arising from the middle bulge on the podium, not extended as a dorsal process (Fig. 3A–B). Stylus and the axis of its ventral process fused basally (forming long pedestal) at an acute angle (V-shaped) (Fig. 3A–B, D). Stylus substraight, without clearly defined head, armed with a few small subdistal spines (Fig. 3B, D). Ventral process of stylus shorter than it, *in situ* reaching the distal border of VP (Fig. 3B). Apex of the ventral process of the stylus with a medial–distal curve of 90°, forming a shell-shaped flabellum with edges bordered with many spines (Fig. 3B–D).

Color (*in alcohol*) (Fig. 1). Dorsal scutum background and its borders Moderate Olive Brown (95). Eye mound and paramedian spines of area III Dark Yellowish Brown (78). Articular membranes White (263). Chelicera, scutal grooves, Tr III–IV and Cx IV Strong Greenish Yellow (99). Pp, Tr I–III and Cx IV retrodorsal apophysis Brilliant Yellow Green (116). Fe–Ta I–IV and Cx IV prodorsal apophysis Grayish Brown (61).

Female (MNRJ 0031): CW 3.0, CL 2.2; AW 5.1, AL 3.3. Side of the abdominal scutum edges less concave than AS of male. Cx IV with acuminate prodorsal apophysis. Fe IV thinner and less curved when compared to male. It lacks armature on Fe IV, Tr IV and Ti IV.

Minor morph of males (MNRJ 1412): CW 3.1, CL 2.1; AW 5.6, AL 3.0. Dorsal scutum with armature smaller in size when compared to *major* morph. Cx IV with prolateral and retrolateral apophysis less developed when compared to *major* morph. Fe IV thinner and with armature smaller in size when compared to *major* morph.

Remarks. *Paradiscocyrtus neglectus* has a minimalistic description, but some elements allowed its recognition. Both the pattern of armature of dorsal scutum and the curved apophyses of Cx IV indicate the male specimen MNRJ 5578 as a co-specific of this species. The locality of Itamonte/MG corroborates this extrapolation, since the region belongs to the area of the “Parque Nacional de Itatiaia” (instituted ten years after its description) and the type locality was pointed as “Itatiaia”. *Discocyrtus alticola* is known only by the original description of the male holotype (MNRJ 18198) from “Itatiaia”, which is now lost. No further material has been reported of this species. Roger Arlé’s drawing ([13] Fig. 3) shows the structures typical of *P. neglectus*, such as the format of the apophyses of Cx IV

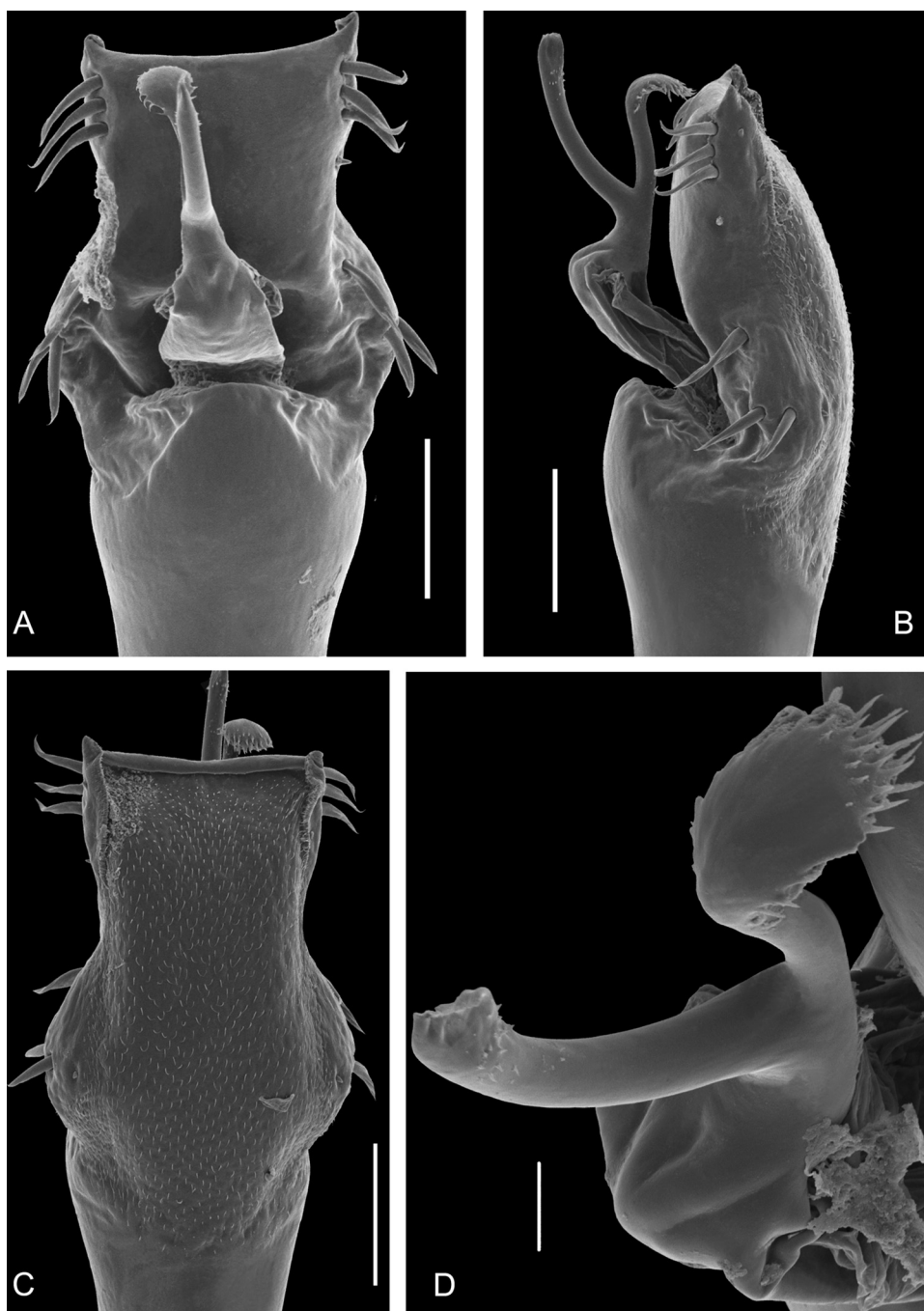


Fig. 3. *Paradiscocyrtus neglectus* Mello-Leitão, 1927, (MNRJ 5591): ♂ genitalia, distal part. A. dorsal view. B. lateral view. C. ventral view. D. stylus, dorso-lateral view, showing ventral process and flabellum. Scale bars: 100 µm (A–C), 20 µm (D).

and Tr IV and the pattern of the spines on the dorsal scutum. The armature of Fe IV has only one medial dorsal spine when compared to the three in the neotype here proposed, but such a configuration falls in the variation recognized in other specimens of this species among the material examined at the present time. Therefore, I consider this species to be a junior synonym of *P. neglectus*. *Discocyrtus perfidus* is known only by the male syntypes (MNRJ 1419) from “Niterói”, Rio de Janeiro

(Fig. 4). This locality belongs to the Serra do Mar coastal forests terrestrial eco-region, which has a very different faunal composition than that found in the Campos Rupestres montane savannas and their border areas. The examination of this material makes it clear that the armature of Fe IV, the format of the apophyses of Cx IV and Tr IV, the pattern of the spines on the dorsal scutum and ocularium is identical to those in the neotype of *P. neglectus*, but the armatures themselves are thinner in

Table 1

Leg measurements of *Paradiscocyrtus neglectus* Mello-Leitão, 1927, male neotype (MNRJ 5578).

	Tr	Fe	Pa	Ti	Mt	Ta	G	Total
Pp	0.93	1.85	1.30	1.57	–	1.37	1.61	8.63
Leg I	0.73	2.27	1.26	2.57	3.63	1.72	–	12.18
Leg II	1.09	5.18	1.70	4.36	6.09	3.45	–	21.87
Leg III	1.12	4.95	1.93	3.52	4.81	2.27	–	18.63
Leg IV	2.22	5.14	2.34	5.36	7.54	3.00	–	25.58

Table 2

Right tarsal (disitarsal) counts of *Paradiscocyrtus neglectus* Mello-Leitão, 1927, male neotype and other material examined.

	♂ (neotype)	♂ (n = 8)	♀ (n = 2)
Leg I	6 (3)	6 (3)	6 (3)
Leg II	12 (3)	10–12 (3)	10 (3)
Leg III	7	7	7
Leg IV	7	7	7

comparison to it, indicating they are *minor* morphs of *P. neglectus*. Therefore, I consider this species to be a synonym of *P. neglectus* and the record from Niterói as doubtful.

4. Discussion

Among the species of Pachylinae, *P. neglectus* is one of the most in need of clarification of taxonomic status and differentiation from the other species because of:

- an extremely brief description;

- a lack of any illustration;
- the absence of type material.

The specimen(s) on which Mello-Leitão based his description was neither indicated to be in any institution, nor numbered, or referred to in his private collection, and furthermore was never reported as having been seen by any other author. It already does not appear as early as in the list of Opiliones of MNRJ [14].

Mello-Leitão [3] proposed, along with *Paradiscocyrtus*, more than ten new genera in the same paper. All of them received the same type of treatment in their descriptions, being such work a source of taxonomic misunderstandings (nine of those genera are junior synonyms [1]). In the case presented here, this contributed to the description of two junior synonyms by the same author of *P. neglectus*, both attributed to *Discocyrtus* [13] [15]. This reflects the use of Roewer's system, in which the armature of area II was not perceived as such in both synonyms (in the case of *D. perfidus*, this would be impossible, since it is a *minor* morph).

This species has its distribution restricted to areas higher than 2000 meters of altitude in the NT 0703 (Campos Rupestres montane savannas) and its border is adjacent to the NT 0150 (Parana/Parnaíba interior forests) (Fig. 4).

In the last two years, species were removed from *Discocyrtus* by [16] and [17], using the shape of the male genitalia (and other characters of the armature of dorsal scutum and Fe IV) as support. The male genitalia of *P. neglectus* are very similar to those found in the type species of *Discocyrtus*, but the pattern of the armature either of the dorsal scutum or of the leg IV indicates that this species deserves to remain outside the heterogeneous assembly where it is today.

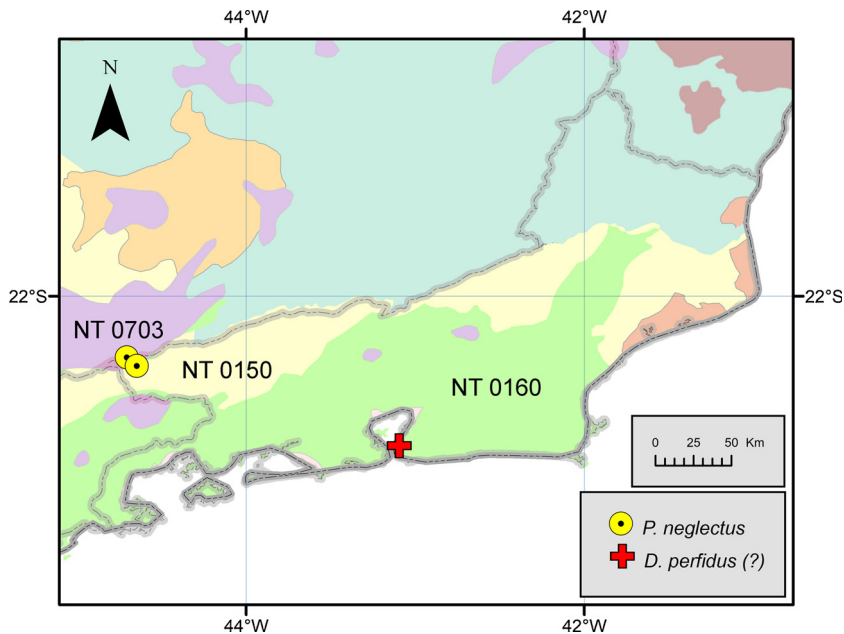


Fig. 4. Rio de Janeiro state, southeast Brazil, showing distribution of *Paradiscocyrtus neglectus* Mello-Leitão, 1927. Shaded areas on the background are WWF terrestrial ecoregions: NT 0150 (Parana/Parnaíba interior forests, in beige), NT 0160 (Serra do Mar coastal forests, in light green) and NT 0703 (Campos Rupestres montane savannas, in light purple). The red cross indicates the probably wrong locality attributed to the syntypes of *Discocyrtus perfidus*.

Disclosure of interest

The author declares that he has no competing interest.

Acknowledgements

This study has been supported by scholarship grant #134421/2016-7 from the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq). The SEM micrographs were taken in the Center for Scanning Electron Microscopy of Museu Nacional/UFRJ (financed by PETROBRAS), with the kind assistance of Beatriz Cordeiro. I am deeply grateful to Adriano Kury for both the revision and the criticisms made on the initial version of the manuscript.

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