

## The first species of *Roquettea* from Maranhão, Brazil (Opiliones: Cosmetidae: Discosomaticinae)

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**ABSTRACT.** *Roquettea decioi* **sp. nov.** is described from Carolina, in the Brazilian state of Maranhão. It is the seventh species in *Roquettea* Mello-Leitão, 1931 and the eighth species of Opiliones recorded from the state. *Roquettea decioi* **sp. nov.** may be characterized by ocularium low, with median depression, pedipalpal tibia without pseudo-finger forming chela and massive divergent protuberances on scutal area III.

**KEY WORDS.** Amazonia; Arachnida; Grassatores; harvestmen; Laniatores; Neotropics.

The harvestman fauna of the North Brazilian transition Amazonic Forest/Cerrado is poorly known. ROEWER (1928) described five species of Cosmetidae from “Nord-Brasilien: Sierra da Cinta”, which KURY (2003) interpreted as being the mountain ridge Serra da Cinta, located in the state of Maranhão. All records from this locality need confirmation. After that, only two species of Stygnidae have been recorded from Maranhão (PINTO-DA-ROCHA 1997, PINTO-DA-ROCHA & CARVALHO 2009).

There has been a recent surge of activity in the taxonomy of *Roquettea*, which was monotypic and neglected for 80 years. Five new species with bizarre-shaped scutal armature and/or unique ocularium have been described from northern Brazil (FERREIRA & KURY 2010, KURY & FERREIRA 2012).

A few specimens of Cosmetidae from Carolina, almost in the boundary of Maranhão with Tocantins were recently made available for study. They have been collected in Maranhão, the transitional Amazonic Forest/Cerrado region, by ichthyologist Décio F. Moraes Jr from the Museu Nacional, Rio de Janeiro (MNRJ), and one of them is a representative of a new species of *Roquettea* Mello-Leitão, 1931, which is described below, being the eighth species of Opiliones recorded from the state and the first record of *Roquettea* from the state.

### MATERIAL AND METHODS

Descriptions of colors use the standard names of the 267 Color Centroids of the NBS/ISCC Color System (<http://people.csail.mit.edu/jaffer/Color/Dictionaries#nbs-iscc>) as described in KURY & ORRICO (2006). All measurements are in millimeters. Measurements of the appendages were taken only from the femur and tibia, which are the long and variable podomeres. Other podomeres are uniformly short in the family. Description standards follow FERREIRA & KURY (2010).

Abbreviations used: (CL) carapace length, (CW) carapace width, (AL) abdominal scutum length, (AW) abdominal scutum

width, (Tr) trochanter, (Fe) femur, (Pa) patella, (Ti) tibia, (Mt) metatarsus, (Ta) tarsus.

Tarsal formula: numbers of tarsomeres are presented in order from tarsus I to IV, when an individual count is given, the order is from left to right side (figures in parentheses denote number of tarsomeres only in the distitarsus I-II).

### TAXONOMY

#### *Roquettea* Mello-Leitão, 1931

*Roquettea* Mello-Leitão, 1931: 117; Kury, 2003: 89 (catalogue); Ferreira & Kury, 2010: 699 (detailed diagnosis, revision, see this for exhaustive literature); Kury & Ferreira, 2012: 36 (key to species).

*Tetracyphus* Sørensen, 1932: 312. Synonymy established by Mello-Leitão, 1933: 105.

Included species. *Roquettea carajas* Kury & Ferreira, 2012, *Roquettea decioi* **sp. nov.**, *Roquettea jalapensis* Ferreira & Kury, 2010, *Roquettea peba* Kury & Ferreira, 2012, *Roquettea scrotalis* Ferreira & Kury, 2010, *Roquettea singularis* Mello-Leitão, 1931 (type species), *Roquettea taurina* Ferreira & Kury, 2010.

#### *Roquettea decioi* **sp. nov.**

Figs 1-7

Type data. Male holotype (MNRJ 7785), BRAZIL, Maranhão: Carolina (Parque da Pedra Caída, in humid canyon amidst the Cerrado, ca. -7.03, -47.47, 170 m).

Diagnosis. Distinguished from *R. singularis* and *R. scrotalis* by having two pairs of protuberances (Fig. 3) on areas I and III (instead of a single column topped with globoid apophyses). Distinguished from *R. peba* and *R. taurina* by having ocularium low, with median depression (Figs 2 and 3) (instead of heavily built and horn-like projected). Distinguished from *R. jalapensis*



Figures 1-4. *Roquettea decioi* sp. nov., male holotype (MNRJ 7785), habitus: (1) dorsal view; (2) frontal view; (3) lateral view; (4) ventral view. Scale bars: 1 mm.

by cheliceral bulla armed posteriorly with several small acuminate teeth (Fig. 7) (instead of a few large blunt apophyses); by having a pair of mounds on scutal area I (instead of unarmed) and by having huge, erect, very thick protuberances on area III (instead of normal spines leaned backwards). Most similar to *R. carajas* in the dentition of the cheliceral bulla (Fig. 7) and the presence of two pairs of non-spiniform scutal protuberances on areas I and III, anterior low, posterior high (Figs 2 and 3). Distinguished from *R. carajas* by 1) protuberances of area I more defined as two mounds (instead of sprawled); 2) protuberances of area III even more massive, fused at base and clearly divergent (instead of not fused, parallel); 3) white dots of scutum not forming X between protuberances (instead of with clear X-pattern); 4) pedipalpal tibia (Fig. 5) with minimal ectal-apical expansion (instead of pseudo-finger expansion opposed to tarsus, forming a rudimentary chela).

Description, male holotype. Measurements. CL: 1.47, CW: 2.98, AL: 3.95, AW: 4.20. Main appendage measurements in Table I. **Dorsum.** Dorsal scutum pyriform in dorsal view (type beta sensu KURY *et al.* 2007, Fig. 1), scutal grooves almost entirely effaced, leaving areas barely recognizable. Cheliceral sockets small and shallow (Figs 1 and 2). Ocularium small and depressed

Table I. Appendage measurements of male holotype of *Roquettea decioi* sp. nov.

Appendage	Femur	Tibia
Pedipalpus	1.5	1.8
Leg I	6.3	3.5
Leg II	14.2	9.7
Leg III	9.9	5.6
Leg IV	14.1	9.8

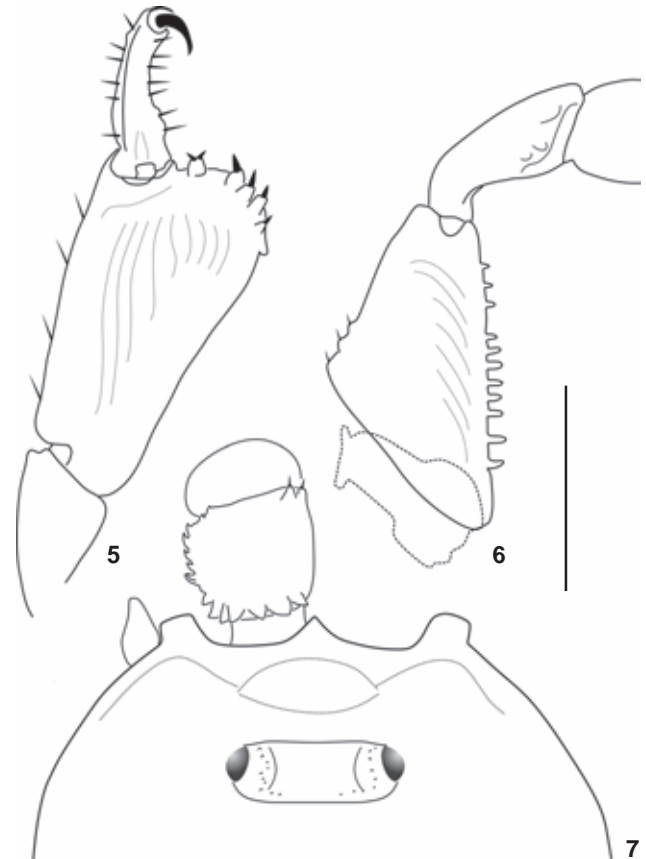
(Figs 2 and 3). Outline of scutum in lateral view not bulged. Scutal area I armed with pair of convex protuberances roughly concolorous with background, but with darker base, area III armed with pair of extremely swollen and very high paramedian blunt conical processes fused at base and divergent, darker than background (Figs 1-3), elsewhere unarmed, with overall very fine granulation. **Venter** (Fig. 4). Coxae I-III transverse, parallel to each other, small. Coxa III connected to II and IV by tubercular bridges. Coxa IV greatly elongate. Coxae I to IV, stigmatic area and genital operculum finely granular. Genital operculum subtriangular rounded. Free sternites with transverse row of granules. Stigmatic area Y-shaped, strongly concave posteriorly, stigmata large and partially hidden by fold of tegument. **Chelicera**. Hand not swollen. Basichelicerite short, with well-marked bulla. Antero-mesal corner of bulla with two setiferous tubercles. Posterior and ectal margins of bulla (Fig. 7) fringed with many small acuminate teeth. **Pedipalpus**. Usual cosmetid type. Femur compressed, strongly convex dorsally in lateral view, dorsal edge armed with three setiferous tubercles atop the most convex part, ventral edge armed with row of 11 small blunt teeth (Fig. 6). Tibia with moderate ectal-apical expansion fringed by five setiferous tubercles (Fig. 5). Tarsus slightly procurved and tapered, very elongate and slender, with ventro-distal and ventro-ectal rows of setiferous tubercles (Fig. 5). **Legs**. Trochanter I with strong anterior and posterior apophyses, visible dorsally beside scutum. Legs I-IV elongate, all segment unarmed, femora straight. Tarsal process on posterior tarsi well-developed, claws III-IV clearly pectinate. Tarsal formula: 8(3) – 8(3)/15(3) – 16(3)/9 – 9/11 – 11. **Color** (in alcohol). Body background Deep Reddish Orange (36), with numerous rounded Pinkish White (9) spots arranged in U on scutum, darker Deep Reddish Brown (41) mottling, especially around protuberance of area I, and all of protuberances of area III. Appendages Strong Reddish Orange (35), with dense darker reticle. Venter Deep Reddish Orange (36), with muck darker Deep Reddish Brown (41) mottling. Free sternites Deep Reddish Brown (41). Tibiae and metatarsi I-IV with numerous light rings, less clear on leg I. **Genitalia**. Penis lost during the clearing process.

**Etymology.** The specific epithet, *decioi*, honors my friend Décio Ferreira de Moraes Júnior, who found the holotype. Despite being an ichthyologist, Décio constantly keeps an eye out for arachnids.

## DISCUSSION

Even with the scarcity of specimens in collections (KURY & FERREIRA 2012), the described diversity of *Roquettea* is steadily increasing (from only one species known up to 2010 to seven species currently recognized). This may also be a result of their conspicuous habitus, which causes them stand out from species in other groups, and makes them easier to spot than other cosmetids.

I have given considerable thought as to whether or not to describe this species after the loss of the penis. The descrip-



Figures 5-7. *Roquettea decioi* sp. nov., male holotype (MNRJ 7785): (5) left pedipalpus, tibia-tarsus, ventral view; (6) same, femur-patella, mesal view; (7) left chelicera and carapace, dorsal view. Scale bars: 1 mm.

tion of new species without a characterization of this structure is below the current standards for Opiliones, mainly because characters of the male genitalia are important for establishing relationships. Despite these considerations, I have decided to describe the new species for the following reasons: first, all other species of *Roquettea* are adequately known and have already been reviewed and compared; second, the bizarre dorsal structures of males are so striking that recognition of any species is easy; third, and most importantly, the fauna of Opiliones of the state of Maranhão is so scarcely known that any addition to it is important. In the future, if more specimens of *R. decioi* are collected, I am confident that *R. decioi* can be identified with confidence and information about the penis structure can be easily added.

All species of *Roquettea* are distributed along a north-south ribbon more or less coinciding with the Tocantins River watershed (Fig. 8, Table II). All species but *R. carajas* occur below 500 m elevation. Three of the species (*R. singularis*, *R. decioi* and *R. taurina*) occur on the Tocantins River banks in three different

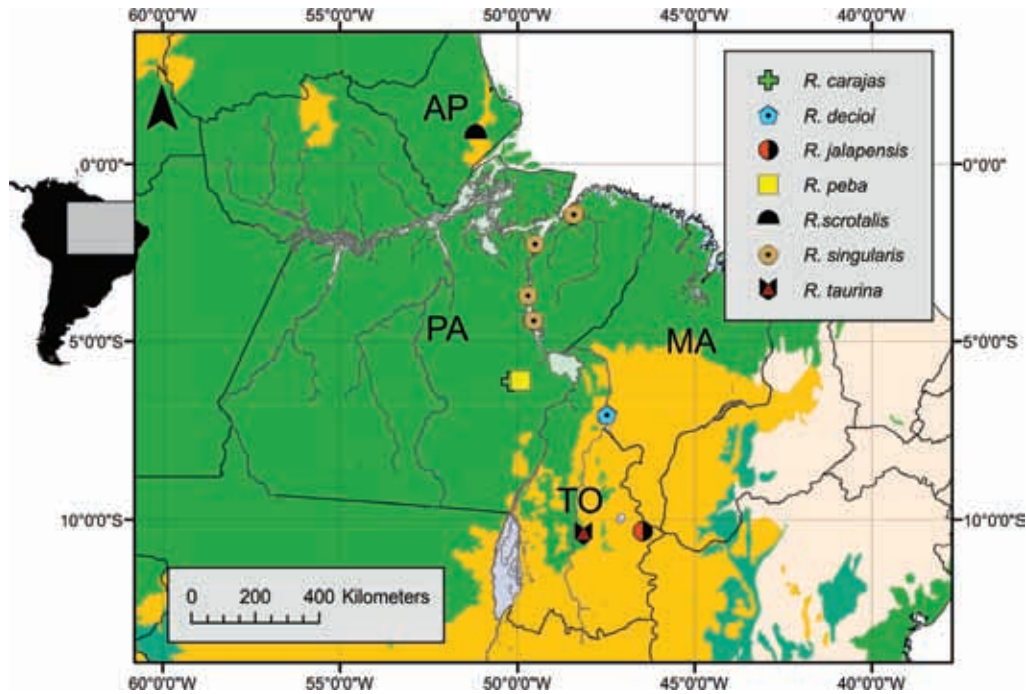


Figure 8. Northern-northeastern Brazil, showing the distribution of the seven species of *Roquettea*. Black outlines are Brazilian states. (AP) Amapá, (MA) Maranhão, (PA) Pará, (TO) Tocantins. Colored backgrounds are WWF biomes, from left: broadleaf forest, cerrado and caatinga.

Table II. Recorded distribution of species of *Roquettea*.

Species	Locality	Latitude	Longitude	Altitude	WWF Eco-region
<i>R. carajas</i>	Carajás	-6.1000	-50.1800	700	Xingu-Tocantins-Araguaia moist forests (NT0180)
<i>R. decioi</i>	Carolina	-7.0300	-47.4700	170	Transition: Mato Grosso seasonal forests (NT0140)/Cerrado (NT0704)
<i>R. jalapensis</i>	Jalapão	-10.3342	-46.4710	472	Cerrado (NT0704)
<i>R. peba</i>	Parauapeba	-6.0673	-49.9095	160	Mato Grosso seasonal forests (NT0140)
<i>R. scrotalis</i>	Ferreira Gomes	0.8600	-51.1800	7	Transition: Uatuma-Trombetas moist forests (NT0173)/Guyanan savanna (NT0707)
<i>R. singularis</i>	Cametá	-2.2500	-49.5000	150	Tocantins/Pindaré moist forests (NT0170)
<i>R. singularis</i>	Tucuruí	-3.7000	-49.7000	42	Tocantins/Pindaré moist forests (NT0170)
<i>R. singularis</i>	Ananindeua	-1.3656	-48.3722	20	Tocantins/Pindaré moist forests (NT0170)
<i>R. singularis</i>	Belém	-1.4300	-48.4600	40	Tocantins/Pindaré moist forests (NT0170)
<i>R. singularis</i>	Utinga	-1.4166	-48.4105	37	Tocantins/Pindaré moist forests (NT0170)
<i>R. singularis</i>	I. Tocantins	-4.4167	-49.5333	70	Tocantins/Pindaré moist forests (NT0170)
<i>R. taurina</i>	Taquaruçu	-10.3942	-48.1323	431	Mato Grosso seasonal forests (NT0140)

Brazilian states. *Roquettea* species occur in moist broadleaf forests (*R. singularis*, *R. carajas* and *R. peba*), but also in the contact borders of forest and cerrado (*R. decioi*, *R. taurina*) or even well within the cerrado (*R. jalapensis*). In the latter cases they were found only in humid riparian forests amidst the dry cerrado. As the same humid forest present in Pará extends into the northern half of the state of Maranhão, *Roquettea* is expected to be found there as well.

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