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## The genus *Spinopilar* Mello-Leitão, 1940, with notes on the status of the family Tricommatidae (Arachnida, Opiliones)

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Tricommatinae Roewer, 1912 is removed from the Phalangodidae and is given familial rank. *Padangcola* Roewer, 1963, described in Tricommatinae, is newly referred to the Sarasinicinae. *Spinopilar apiacaensis* new species is described from Espírito Santo, Southeastern Brazil. *Saladonus friburguensis* H. Soares, 1946, is newly referred to *Spinopilar*, Mello-Leitão, 1940, and a key is given to the three species of this genus.

Key words: Neotropics, phylogeny, Sarasinicinae, Phalangodidae, Cranainae, Prostyginae.

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### INTRODUCTION

In the Roewerian concept, the Phalangodidae were the Gonyleptoidea (i. e., non Triaenonychiidae and non Oncopodidae) Laniatores without frontal spines (which characterize the Assamiidae) and without "pseudonychium" (which characterizes the Cosmetidae and Gonyleptidae). This exception group has been divided into many subfamilies, and with the years, it has become exceedingly large. Some authors started to identify natural groups and remove them from Phalangodidae – Mello-Leitão (1938) sorted out the Biantidae and Podoctidae; Martens (1988) described the Fissiphalliidae (which by the Roewerian system should be also a Phalangodidae) and Starega (1989) resurrected the Zalmoxidae of Soerensen and isolated an African family, hitherto not named.

The Tricommatinae were defined by Roewer (1912), as Phalangodidae without scopula, with five scutal areas and with distitarsus three-seg-

mented. None of these states is synapomorphic for Tricommatidae. This highly artificial division was evident in the geographic distribution of the subfamily given by him (Roewer, 1935), which included five genera of the Tricommatinae in the European Laniatores. These presumed European Tricommatinae were later removed to the Travunioidea (Martens 1972). There is but one monotypic genus from the Oriental Region, *Padangcola* Roewer, 1963, said by him "to have the habitus of a Sarasinicinae, but because of the five scutal areas should be referred to the Tricommatinae". *Padangcola* does not share any evident synapomorphy with the rest of the Tricommatinae, which are exclusively South-American, ranging from Argentina to Venezuela, and should be ranked instead in the Sarasinicinae.

Ringuelet (1959) judging insufficient the single character of distitarsal segmentation used to separate Tricommatinae (3-segmented distitarsus I) from Phalangodinae (2-segmented distitarsus I), collapsed both subfamilies. This was not

followed by subsequent authors (e.g. Soares & Soares 1985). Rambla (1978) cited the Tricommatinae as a radical example of the splitting results of the Roewerian approach.

The Tricommatinae were always considered to be part of the Phalangodidae, and even when they were elevated to familial status (Henriksen 1932), this was only a matter of nomenclature, since the Phalangodoidea = Tricommatidae + Phalangodidae of Henriksen represent the same phylogenetic hypothesis as the Phalangodidae = Tricommatinae + Phalangodinae of Roewer.

Abbreviations of the Institutions cited are: Museu de Zoologia da Universidade de São Paulo (MZUSP), Zoologisk Museum Copenhagen (ZMUC). Abbreviations of Brazilian states cited are Rio de Janeiro (RJ) and Espírito Santo (ES).

All measurements are in mm.

#### Family Tricommatidae Roewer, 1912

Tricommatinae Roewer, 1912:157; 1923:121; 1927:536; 1935: 45; Mello-Leitão, 1938: 137; 1949: 7; Soares & Soares, 1985: 5; Rambla, 1978: 305.

Tricommatinas: Mello-Leitão, 1932:39.

Tricommatidae: Henriksen, 1932:250.

Olythoidea Soerensen in manusc.; Henriksen, 1932: 250.

#### Diagnosis

Gonyleptoidea with body outline mostly rectangular; eye mound situated in mid-length of cephalothorax, armed with a high median spine (unarmed in early derivative genera); dorsal scute divided in five areas by four parallel grooves, area I undivided (divided by a median groove in *Tricommatulus*), all areas and free tergites unarmed; second cheliceral segment not swollen, alike in both sexes; pedipalpal femur without seriated dorsal or ventral spines, with or without meso-distal spine; pedipalpal patella unarmed; maxillary lobe of coxa II reduced; coxa IV visible beyond the dorsal scute only by its apical portion; tarsus I with 4-5 segments, II with 6 or more, III with 4-6 segments, IV with 5-6 segments; distitarsus I three-segmented; in some genera sexual dimorphism in trochanter IV, armed with apophyses in male, unarmed in female; penis with apical portion of truncus inflated and bearing many setae, ventral plate trapezoidal, small, armed with a row of 3 setae in each side, glans bifid, with basal inflatable vesicular sac, ventral

process fan-like and stylus cylindrical, sub-straight.

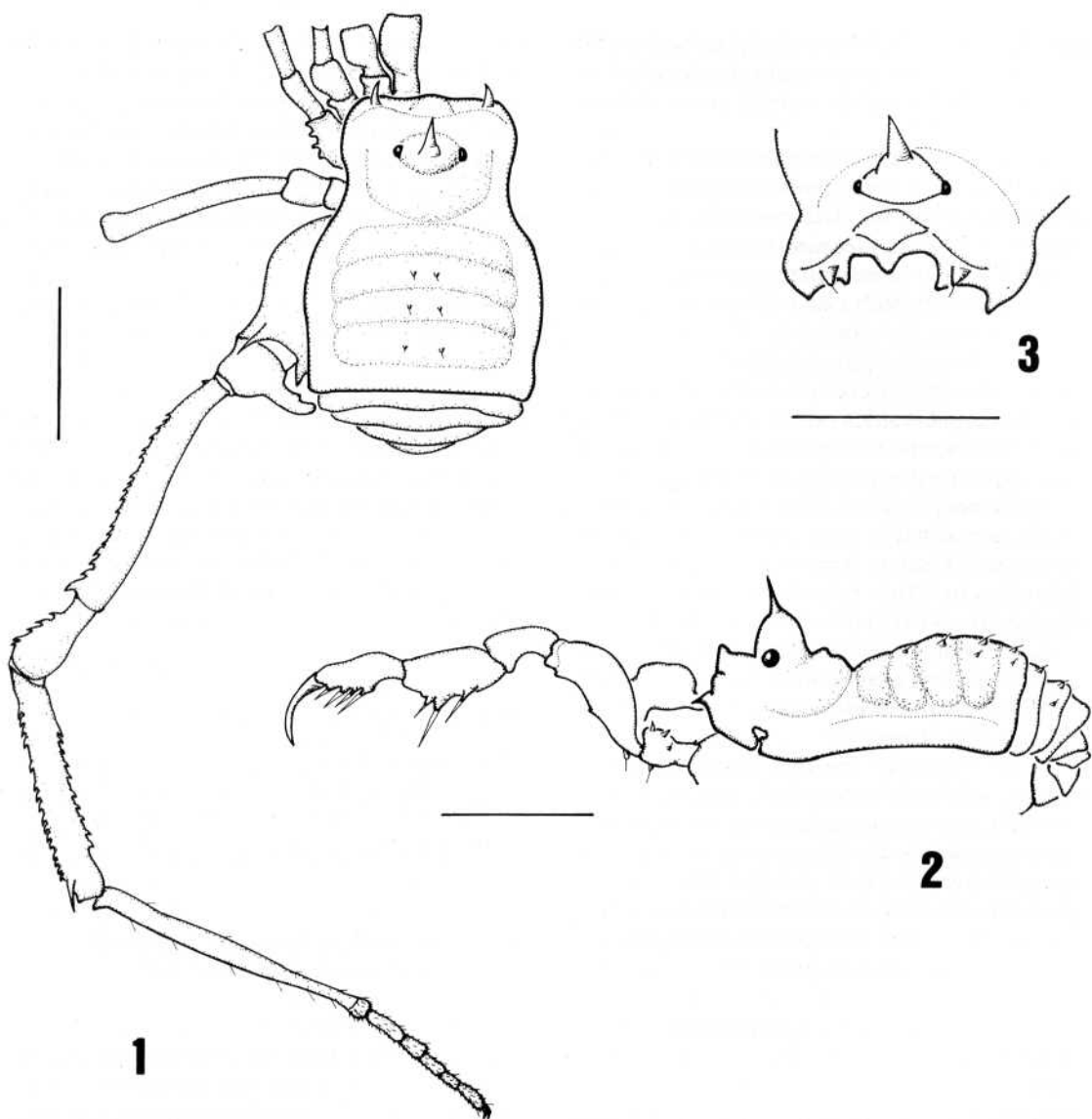
#### Discussion

All the similarities between Tricommatidae and the other Phalangodidae are symplesiomorphies, and on the other hand, the Tricommatidae share some advanced conditions with other families, which are here interpreted as synapomorphies. A set of ten characters was used to evaluate the monophyly of Tricommatidae and its relationship with closer families. The sister group to the analyzed families is unknown. The Neotropical family Agoristenidae was chosen as outgroup for the present analysis because of the following derived characters in relation to the ground plan of Gonyleptoidea: A) Distitarsus I three-segmented; B) Maxillary lobe of coxa II reduced. These characters are shared by the ingroup + Agoristenidae + some taxa presently classified in the Old World family Assamiidae. The monophyly of Tricommatidae + Gonyleptidae sensu lato + Stygnidae + Cosmetidae is supported by C) Ventral plate of penis well defined; D) Stylus barely movable, without accessory structures, free subdistally in truncus.

A phylogenetic analysis of the four families cited above was performed - using ten morphological characters - with PAUP 2.4.1 (Swofford 1985), and subsequent manual optimization. All multistate characters were treated as unordered to avoid biasing the conclusions by a priori interpretations on the direction of transformation series. The result were three equally most parsimonious trees, with length 19 and consistency index 0.842. The strict consensus tree of the three cladograms is shown in Fig. 6, and the character states are listed in Table 2.

The presence of a discrete apical sclerite in truncus penis (forming the distal half of the ventral plate) relates Tricommatidae (or at least part) with the Stygnidae, Cosmetidae and Gonyleptidae (this a paraphyletic group), but this structure has been further modified, and appears as the multistate character 5. The homologue of the proximal half of ventral plate of these families is a globose oblique continuation of truncus in Tricommatidae, absent in Stygnidae (it is however marked 5a in the cladogram). In the other fami-





Figs. 1-3. *Spinopilar apiacaensis* new species, male holotype. - 1. Habitus, dorsal view. - 2. Habitus, lateral view. - 3. Eye mound, frontal view. - Scale bars = 1 mm.

***Spinopilar friburguensis* (H. Soares, 1946) new combination**

*Saladonus friburguensis* H. Soares, 1946: 389, figs 5-7.

**Diagnosis**

Frontal hump armed with a median spine; stigmata clearly visible. Tarsal segmentation in both sexes 5-7-6-6. Areas III-V, lateral margins, free

tergites and coxa IV densely granulose (as in *S. armatus*; smooth in *S. apiacaensis*).

**Discussion**

Using a typological approach, H. Soares (1946) included her *S. friburguensis* in *Saladonus* Roewer, a monotypic genus created for *S. singularis* from the Argentinean Chaco. The similarities

between both species are all symplesiomorphic. Presumable synapomorphies which allow to refer *S. friburguensis* to *Spinopilar* are: the unarmed pedipalpal femur, stout, bifid and recurved trochanteral apophysis and 5-segmented tarsus I.

#### Distribution

Nova Friburgo, RJ, Brazil.

#### *Spinopilar apiacaensis* new species

Figs. 1-5.

Material examined: Fazenda Santa Maria, Apicá, ES, Brazil, 20/07/1991 leg. A. Kury/R. Baptista by leaf litter sifting: Male holotype, 2 male 1 female paratypes (MZUSP 13.742); 1 male paratype (ZMUC).

#### Diagnosis

It is the only species of the genus with stigmata concealed and unarmed frontal hump. Tarsal segmentation of leg II sexually dimorphic, 7 or 8 in male, and only 6 in female (no dimorphism in *S. friburguensis*, judging for the scarce available data; only the male of *S. armatus* is known).

#### Description

##### Male

**Measurements.** Cephalothorax 0.84 long, 1.13 wide; abdominal scute 1.12 long, 1.52 wide.

**Dorsum** (Figs. 1-3). Cephalothorax and abdominal scute rectangular, the former narrower with rounded frontal corners. Frontal margin of scute provided on each side with a large spine projecting frontwards, none in the middle, but frontal hump high and projecting upwards. Eye mound high, armed with erect median spine. Mesotergum divided in 4 completely distinct areas, area I entire, not divided by a median longitudinal groove. Transverse grooves parallel. Scute smooth, all areas and free tergites unarmed, except for a pair of pointed tubercles in each areas II-IV. Anal opercle densely tuberculate.

**Venter.** Coxa I with a row of tubercles, coxae II-III with serrate borders, all coxae densely granular. Maxillary lobe of coxa II vestigial. Stigmatic area with a small apophysis in each posterior corner; stigmata hidden under a fold of tegument.

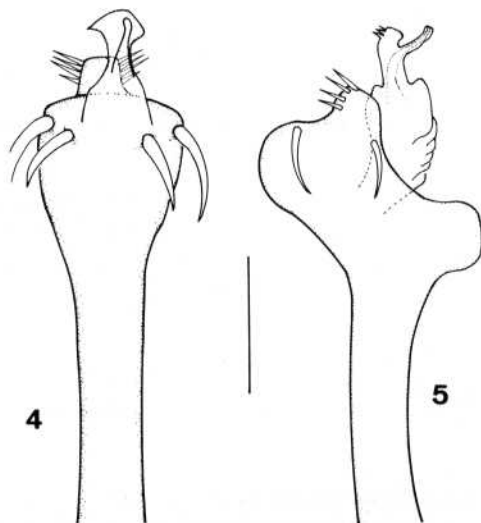
**Pedipalps** (Fig. 2). Trochanter with a few dorsal tubercles and a ventro-basal granule, femur

with a ventro-basal setiferous tubercle, otherwise smooth and unarmed. Patella unarmed. Tibia with three ectal and four mesal spines; tarsus with four ectal and three mesal spines. Measurements: Tr 0.35, Fe 0.91, Pa 0.45, Ti 0.67, Ta 0.70.

**Legs** (Fig 1). Femur I with a ventral row of setiferous tubercles. Femora I-IV substraight. Coxa IV widely surpassing abdominal scute, armed with one sharp apical outer spine, and a spiniform inner apophysis; trochanter IV armed with a stout bifurcated meso-distal apophysis. Femur IV with three ventral rows of denticles growing larger apically and two ventro-apical spines, patella with a row of lateral denticles; tibia with a mesal and an ectal row of denticles, and a stouter ecto-distal spine. Ratio calcaneus/astragalus of metatarsi I-IV: 0.29/0.26/0.24/0.12. Ratio of tarsal counts in the four males: 5/7-8/6/6, in two males one of the distitarsi is four-segmented (tarsi eight-segmented). Measurements of podomeres, see Table 1.

Table 1. *Spinopilar apiacaensis* new species. Measurements of podomeres (in mm).

	Tr	Fe	Pa	Ti	Mt	Ta	Total
Leg I	0.17	0.92	0.54	0.75	1.16	0.58	4.12
Leg II	0.29	1.33	0.46	1.38	1.63	1.52	6.61
Leg III	0.29	1.12	0.50	0.96	1.20	1.00	5.07
Leg IV	0.50	1.50	0.67	1.49	1.92	0.91	6.99



Figs. 4-5. *Spinopilar apiacaensis* new species, male holotype. - 4. Distal part of penis, dorsal view. - 5. Same, lateral view.

**Colour.** Body and appendages uniform mahogany brown.

**Genitalia** (Figs. 4-5). Truncus penis long, slender, cylindrical, with apex bulbous, bearing two pairs of stout setae, ventral plate well isolated as a lamina parva, trapezoidal, bearing four pairs of distal setae (iIII). Glans with lamellar ventral process; stylus long, smooth, subsigmoid.

#### Female

Differs from male in absence of trochanteral apophysis, smooth leg IV, very small outer apophysis of coxa IV. Differs also in body outline: abdominal scute rectangular in male, trapezoidal in female, growing wider posteriorly. Ratio cal-

caneus/astragalus of metatarsi I-IV: 0.36/0.28/-0.28/0.10. Tarsal counts: 5/6/6/6.

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Table 2. Ten morphological characters used in the analysis of the families of Gonyleptoidea. Zero represents the plesiomorphic state, 1 the apomorphic condition in binary characters, a-c different apomorphic conditions in multistate characters.

- 1) Tarsal process (Roewerian "pseudonychium"): 0 absent, 1 present.
- 2) Dorsal process of glans penis: 0 absent, 1 present.
- 3) Stylus: 0 long and slender, 1 short and thick.
- 4) Coxa IV in dorsal view: 0 hidden under scute, 1 widely surpassing scute.
- 5) Ventral plate: 0 undefined, a present as lamina parva, b present as a piriform lamina magna, c present as a rectangular lamina magna.
- 6) Coxa IV of male: 0 weakly armed, 1 armed with robust bifid dorsoapical apophysis.
- 7) Second cheliceral segment: 0 swollen in male, 1 equally weak in both sexes.
- 8) Eye mound: 0 unarmed or with paired armature, a with a median spine, b with a median groove, c absent.
- 9) Pedipalpal femur: 0 cylindrical, normally built, a spoon-like, b extremely elongate.
- 10) Scutal area I: 0 divided by a median groove, a undivided, b invaded by the projection of area II.

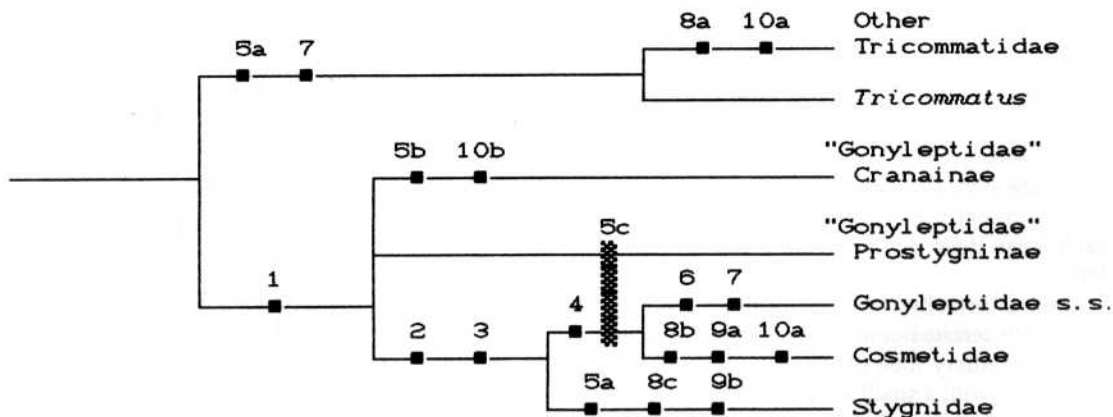


Fig. 6. Cladogram depicting the present hypothesis of sister group relationships among 7 terminal taxa of Gonyleptoidea. The data used in the analysis consisted of 10 morphological characters summarized in Table 2. This is the strict consensus tree of three equally most parsimonious cladograms with length 19 and consistency index 0.842. Black squares represent synapomorphies; the hatched area in 5c represents a convergence. The Gonyleptidae are regarded as at least two distinct families.



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