

## On the Identity of the Enigmatic *Leptocnema* (Arachnida, Opiliones, Gonyleptidae)

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With 9 figures

**Abstract.** Through the restudy of type material of *Leptocnema sulphurea* (PERTY, 1833), the monotypic genus *Leptocnema* KOCH, 1839 is removed from the Mitobatinae to the Progonyleptoidellinae. The species is fully described and illustrated, including male genital morphology.

**Key words:** Opiliones, Gonyleptidae, Mitobatinae, Progonyleptoidellinae, *Leptocnema*; Neotropics, Brazil.

### Introduction

Many unrelated Gonyleptidae have been included in the Mitobatinae SIMON, 1879 due only to their superficial similarity to one another. A closer study of some genera currently placed in this subfamily will be leading to an exodus of presumed mitobatines to other subfamilies (KURY, in prep.). The long-legged members of Bourguiyinae MELLO-LEITÃO, 1923, Caelopyginae SOERENSEN, 1884, and Progonyleptoidellinae SOARES & SOARES, 1985 show a superficial “mitobatine facies”, although the structure of leg IV of the Mitobatinae is considered an unique evolutionary novelty (KURY, in prep.).

The enigmatic *Leptocnema sulphurea*, described by PERTY, and for long held without contest as a mitobatine, is really a close relative of the Gonyleptinae-like subfamilies, as discussed below. A redescription of this species is presented below, based on the few specimens available. All measurements are in mm.

#### Abbreviations used:

NHMW = Naturhistorisches Museum Wien

ZMB = Zoologisches Museum Berlin

#### *Leptocnema* KOCH, 1839

*Goniosoma* (part) PERTY, 1833: 202; GERVAIS, 1844: 108.

*Leptocnemus* KOCH, 1839a: 92 (non DEJEAN, 1834); ROEWER, 1913: 297; MELLO-LEITÃO, 1926: 34; SOARES & SOARES, 1949: 232.

*Leptocnema* KOCH, 1839b: 19; ROEWER, 1923: 514; 1931: 106; MELLO-LEITÃO, 1932: 411, 1935: 108. *Asarcus* (part) SIMON, 1879: 236.

Derivatio nominis. From Greek *leptós* = slender + *cneme* = leg.

Type species. *Goniosoma sulphureum* PERTY, 1833; by monotypy.

Diagnosis. Progonyleptoidellinae with eye mound low, elevated in two hemispherical mounds with a median depression; all scutal areas unarmed; lateral margins of scute each with a stout tooth; free tergites II and III each armed with a median spine; coxa IV of male armed with a heavy dorso-apical apophysis and a slender spiniform ventro-apical apophysis, trochanter IV with a dorso-basal apophysis; femur IV of male long, straight,

with two rows of teeth; low tarsal subdivision; posterior claws unpectinate; ventral plate of penis with an U-shaped cleft, setae of distal group short and straight; ventral process of glans truncated, vestigial.

***Leptocnema sulphurea*** (PERTY, 1833) (Figs. 1–9)

*Goniosoma sulphureum* PERTY, 1833: 202; GERVAIS, 1844: 108.

*Leptocnemus sulphureus*: KOCH, 1839a: 92, fig. 578; ROEWER, 1913: 297, fig. 119; MELLO-LEITÃO, 1923: 167; SOARES & SOARES, 1949: 232.

*Asarcus sulphureus*: SIMON, 1879: 236.

*Leptocnema sulphurea*: KOCH, 1839b: 19; ROEWER, 1923: 514, fig. 643; MELLO-LEITÃO, 1932: 411, fig. 277.

Derivatio nominis. From Latin *sulphureus* = sulfur yellow.

Material examined. "BRAZIL": 1 ex. (ZMB 942), leg. LANGSDORFF, ex. coll. siccata C. L. KOCH; 1 male (NHMW 3.113); 1 ex. (NHMW 3.112), formerly dry.

Distribution. Brazil, without more precise locality; presumably Atlantic forest of southeastern Brazil (where all closely related groups are found).

**Description**

Male measurements: based on NHMW 3.113, in parentheses measurements of ZMB 942. Cephalothorax 2.53 (2.23) wide, 1.30 (1.50) long; abdominal scute 3.90 (3.74) wide, 1.94 (1.69) long.

Dorsum (Figs. 1–3). Body pyriform, somewhat depressed, widest at area II. Anterior margin of cephalothorax with shallow cheliceral sockets, a median elevation armed with

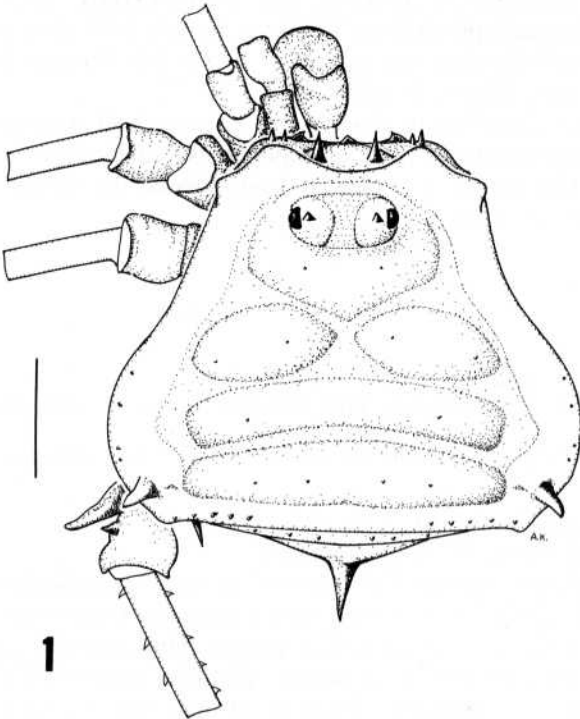
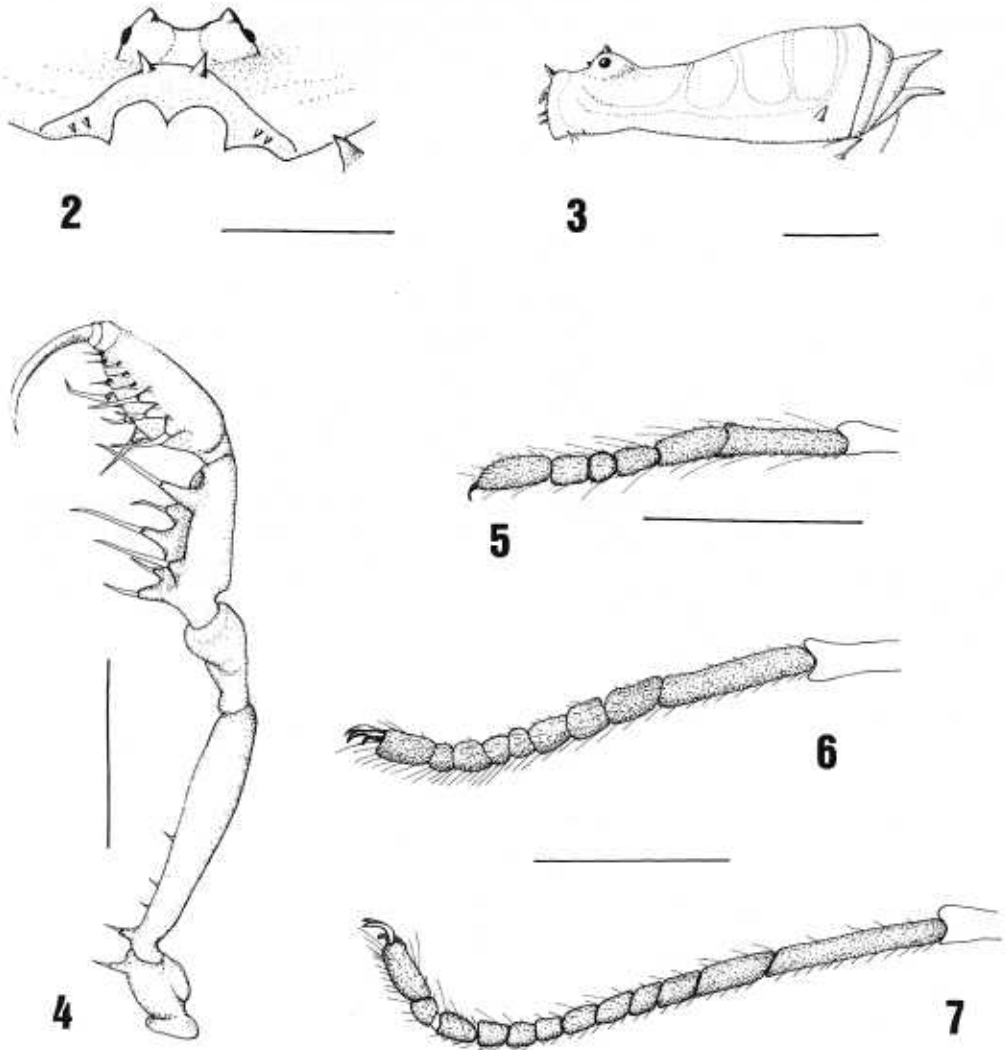


Fig. 1. *Leptocnema sulphurea* (PERTY, 1833), ZMB 942, habitus, dorsal view. (Scale bar = 1 mm).

a pair of acute spines, and two smaller spines on each corner. Eye mound (Fig. 2) very low, with two hemispheric elevations for the eyes, armed with a pair of tubercles. Mesotergum limited by grooves I and IV and divided in three areas by grooves II–III; groove I deeper and pointed backwards, others almost straight. Area I divided in two halves by a median longitudinal line. All areas, free tergite I and anal opercle unarmed; free tergites II and III each armed with a robust median spine. Lateral margin bearing a pointed apophysis at area III. Areas I–III with a transverse row of minute granules each. Posterior margin of scute with a row of small granules interrupted in the middle.



Figs. 2–7. *Leptocnema sulphurea* (PERTY, 1833). — 2 ZMB 942, dorsal scute, frontal view; 3 same, body, lateral view; 4 left pedipalpus, lateral view; 5 NHMW 3.113, right tarsus I; 6 ZMB 942, right tarsus III; 7 same, right tarsus IV. (Scale bars = 1 mm).

Venter. Ventral anal opercle and free sternites smooth. Stigmatic area finely granular, with a transverse groove uniting the stigmata. These elevated, well visible. All coxae provided with setiferous tubercles, much stouter at coxae I and IV.

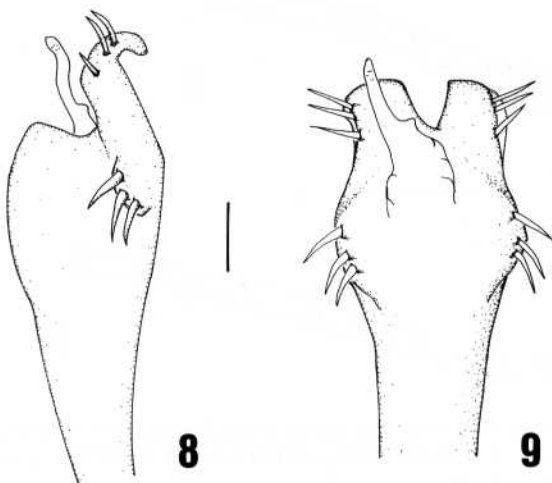
Pedipalpus (Fig. 4). Trochanter with a ventral setiferous tubercle; femur slender with a ventro-basal setiferous tubercle and a ventral row of three setae, mesodistally unarmed; patella widened distally, unarmed; tibia somewhat flattened ventrally, armed with very long spines, two ectal (II) and four mesal (Iili); tarsus fusiform, armed with three ectal (II) and four mesal (Iili) spines and two ventro-distal rows of prominent setae.

Legs. Coxa IV broader than the others, but not surpassing the dorsal scute in dorsal view; armed with two apical apophyses (Fig. 1): one dorsal, robust; one ventral spine-like. Trochanter IV armed with a dorsal small apophysis; femur IV straight, armed with two rows of small teeth. Tarsal segmentation: 6–15–12–13 (ZMB 942: ?–10–9–12). Ratio calcaneus/astragalus of metatarsi I–IV: 0.7–?–0.4–0.2 (ZMB 942: 0.7–0.5–0.5–0.3). Tarsus I of male (Fig. 5) not swollen. Tarsi III–IV (Figs. 6–7) bearing no scopulae, with a tarsal process, double claws unpectinate. Measurements of podomeres in Table 1.

Table 1  
Appendage measurements of *Leptochnema sulphurea* (ZMB 942).

	Tr	Fe	Pa	Ti	Mt	Ta	Total
Pedipalpus	0.40	1.41	0.48	0.84	—	1.54	4.67
Leg I	0.46	2.89	0.74	1.85	2.91	?	—
Leg II	0.58	7.74	1.29	5.83	7.48	4.54	27.46
Leg III	0.60	5.31	1.20	2.96	4.84	2.51	17.42
Leg IV	0.84	6.70	1.22	4.07	7.35	2.87	23.05

Colour. Strongly effaced by the long preservation in alcohol. Body pale greenish-yellow; a pair of very small hardly visible dark green dots in each area I–III and in the cephalothorax behind eye mound. Spines of lateral areas and of free tergites dark-brown. Legs dark-yellow, with all patellae and apex of femora darker. Venter pale-yellow; with dark spots in free sternites and ventral anal opercle.



Figs. 8–9. *Leptochnema sulphurea* (PERTY, 1833), NHMW 3.113 – 8 distal part of penis, lateral view; 9 same, dorsal view. (Scale bar = 0.1 mm).

Genitalia (Figs. 8–9). Ventral plate with basal lobes twisted and projected dorsally and distal part recurved; distal border provided with an U-shaped cleft. Two groups of subequal setae; three distal, straight, and three basal, stouter. Ventral branch of glans very short, vestigial; stylus sinuous and smooth.

## Discussion

PERTY (1833) described many species of *Goniosoma* from Brazil, among them *G. sulphureum*. Later, the heterogeneous assemblage of *Goniosoma* was divided, and some species were transferred to different genera and subfamilies. KOCH (1839a: 92) erected for PERTY's species *G. sulphureum* the new genus *Leptocnemus* and in the same year (1839b: 19) changed the name to *Leptocnema* without any comment. SIMON (1879: 236) included *G. sulphureum* in *Asarcus* (in his new subfamily Mitobatinae), based only on superficial similarity, without examining any material of the species. ROEWER (1913: 297) kept the species in the Mitobatinae and conserved KOCH's generic name. His opinion was followed by all subsequent authors, and so far, the subfamilial inclusion of *L. sulphurea* as a mitobatine has not been questioned.

The type status of the material hitherto cited for *L. sulphurea* is uncertain. PERTY's material is supposed to be in the Munich Museum. KOCH (1839a: 94) mentions two individuals – one in Munich, one in Vienna. ROEWER (1923: 514) mentions three individuals – two females, one of them not examined by him, and without locality, the other (“Typ?”) in Vienna, examined by him. He also cites a male in the Zoological Museum of Berlin (ZMB). The material of *G. sulphureum* in Vienna is represented by two pinned and damaged specimens, one (NHMW 3.112) half eaten by dermestid beetles and carrying an ambiguous label “*Goniosoma sulphureum?* Perty, Bras.”, the other one, a male (NHMW 3.113), better preserved, but mouldy, without any meaningful label. Sexual dimorphism is inconspicuous in this group. The sex of ZMB 942 and NHMW 3.112 is uncertain (due to their poor condition, the extraction of genitalia was not attempted).

ROEWER considered ZMB 942 to be a male, but I cannot see anything to support this affirmation, although he cites as sexual dimorphism the unarmed coxa IV in the female and the length of femur IV, which is incorrect, since all individuals examined show comparable armature and leg IV. The two apophyses of coxa IV provide no evidence that ZMB 942 is a male, because in most Caelopyginae and allies both sexes bear them. The very weak spination of femur IV suggests a female, although in some species of Caelopyginae even the males are weakly armed. Some Caelopyginae and most Progonyleptoidellinae do not show well marked sexual dimorphism concerning to armature of legs. The male NHMW 3.113, said by ROEWER to be a female, resembles closely ZMB 942 in all aspects of leg armature and proportion calcaneus/astragalus of all metatarsi.

## Relationships

As synapomorphic evidence placing *Leptocnema* in the assemblage Gonyleptinae + Caelopyginae + Hernandariinae + Progonyleptoidellinae, may be cited 1) distal border of ventral plate of penis U-shaped cleft; 2) basal lobes of ventral plate well detached and twisted in relation to its plane. The median depressed eye mound and the armed lateral

margin of scute are derived traits which speak for a relationship with the Caelopyginae, in spite of the conservation of the ancestral condition of unpectinate posterior claws. On the other hand, the hidden coxae IV, pedipalp structure and armature of tergites are evidences of a progonyleptoidelline affinity, in spite of the primitive tarsal segmentation. The assignation of *Leptochnema* to the Progonyleptoidellinae is the most cautious step in the present state of knowledge.

## Conclusion

Evidence discussed above indicates that *Leptochnema sulphurea* is more closely related to the Progonyleptoidellinae than to any other group, although some derived similarity with the Caelopyginae.

At the same time, only symplesiomorphies were found not corroborating a hypothesis of *Leptochnema* and mitobatines as forming a monophyletic group. In view of the results obtained, this monotypic genus should be transferred from the Mitobatinae to the Progonyleptoidellinae.

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