

THIRD SPECIES OF GUASINIIDAE (OPILIONES, LANIATORES) WITH COMMENTS ON FAMILIAL RELATIONSHIPS

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ABSTRACT. *Guasinia persephone*, a new species of the family Guasiniidae, is described from the soil of an inundation forest in Brazilian Amazonia. This family was hitherto only known from two species from Venezuela. Male genitalia of the new species are described in detail. A close relationship of Guasiniidae with Zalmoxidae and Fissiphalliidae is proposed on basis of genital morphology. This is the third species of blind Laniatores from Brazil and the first from leaf mold, one is from termite nests and the other is from a cave.

Keywords: Guasiniidae, Neotropics, Opiliones, anophthalmy, Brazil, Amazonia, Arachnida

The family Guasiniidae (correct spelling for a family name based on the generic name *Guasinia* González-Sponga 1997, see Kury & Pinto-da-Rocha 2002) is the most recently discovered family of Laniatores (González-Sponga 1997). The other recently described families are Fissiphalliidae Martens 1988 and Agoristenidae Šilhavý 1973 from the Neotropics and Pentanychidae Briggs 1971 from the Nearctic. González-Sponga (1997) provided descriptions of two monotypic genera of Guasiniidae, with only very schematic drawings of the penis of both species and related them to the Oriental family Oncopodidae Thorell 1876.

Guasiniidae, together with Fissiphalliidae and Ogoveidae, both with three described species, are the least diverse families among Opiliones. According to Roewer's system, which dominated the past 90 years of Opiliones systematics, guasiniids should be included in the "wastebasket" family Phalangodidae Simon 1879. However, as distinct from members of the Fissiphalliidae, which are externally very similar to zalmoxids, Guasiniidae were described on well-delimited external characters. It can be reasonably expected to find Fissiphalliidae described among the Phalangodidae of Roewer, however it is highly improbable that a guasiniid has been described previously in Phalangodidae or another family due to the striking structure of the pedipalps, as well as the minuscule body

size and the strictly defined microhabitat. The recognition of the Guasiniidae (González-Sponga 1997) was a welcome departure from the conservative approach by the same author (González-Sponga 1987), who preferred to keep the polyphyletic family Phalangodidae, discarding the use of Minuidae and Zalmoxidae.

The discovery by Dr. Joachim Adis (Max-Planck Institute, Plön, Germany) of new material from upper soil layers near Manaus (Central Amazonia) is here described as a new species. This minute opilionid expands the distribution range (recorded only from Venezuela) of the family Guasiniidae much southwards and offers the opportunity to illustrate and discuss the male genitalia and attempt to relate this family to other laniatorid families.

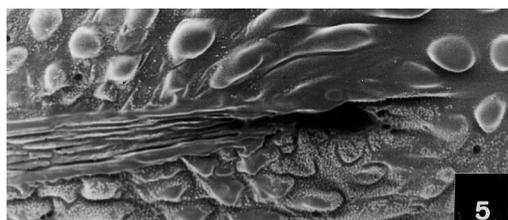
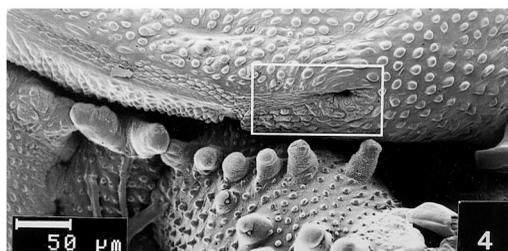
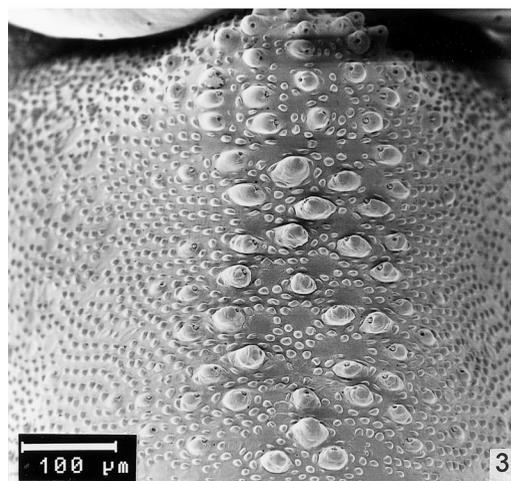
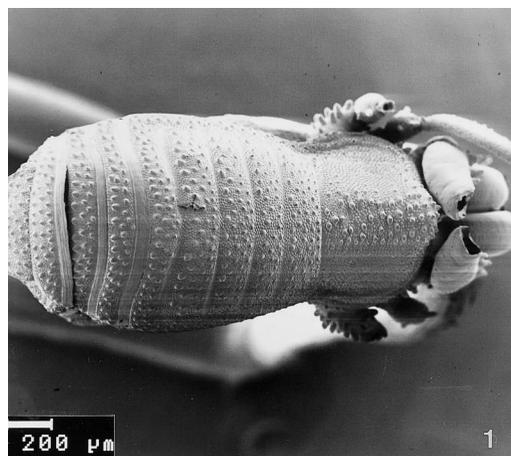
The material studied is deposited in the Instituto Nacional de Pesquisas da Amazônia (INPA, C. Magalhães); Museu de Zoologia da Universidade de São Paulo (MZSP, R. Pinto-da-Rocha), Museu Nacional do Rio de Janeiro (MNRJ, A.B. Kury) and Senckenberg Museum (SMFD, M. Grasshoff).

SYSTEMATICS

Family Guasiniidae González-Sponga 1997

Genus *Guasinia* González-Sponga 1997
Guasinia González-Sponga 1997: 53.

Type species.—*Guasinia delgadoi* González-Sponga 1997, by original designation.



Figures 1–5.—*Guasinia persephone* new species, male: 1, Habitus, dorsal view; 2, Same, lateral view; 3, Carapace, dorsal view; 4, Right ozopore and dorsal surface of coxa II; 5, Detail of ozopore, scale 4 times larger than Fig. 4.

Emended diagnosis.—Stridulatory apparatus on mesal surface of cheliceral hand. Tarsal counts 3–4(2)/4–8(2–4)/5/5–6 (see remarks). *Guaiquinimia* González-Sponga 1997 differs from *Guasinia* by the very stout smooth and spined basichelicerite with backwards projection, and 13 segments on tarsus II.

Remarks.—As currently understood, there is little reason to separate both guasiniid genera, but a synonymy would be premature at this stage.

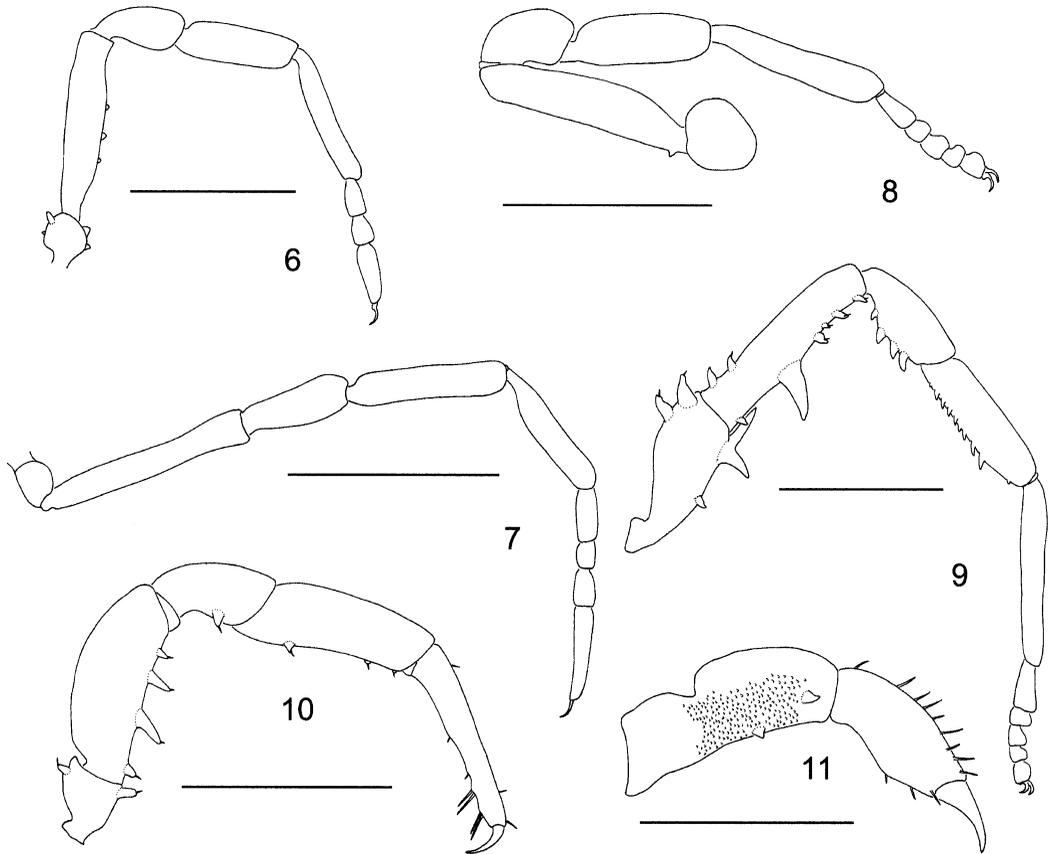
Guasinia persephone new species

Figs. 1–15

Type material.—All material collected by Joachim Adis from Igapó Taramã Mirim, Ma-

naus, State of Amazonas, Brazil (03°02'S, 60°17'W). Holotype male, date 26 July 1983, (INPA). Paratypes: 23 February 1982, 1 ♀ (INPA); 1 ♂ (MNRJ); 1 ♀ (INPA); 29 September 1982, 2 ♀ (INPA); 1 ♀ (SMFD); 25 March 1983, 1 ♂ (SMFD); 28 March 1983, 1 ♀ (MZSP); 1 ♂ (MNRJ); 25 April 1983, 2 ♂, 3 ♀ (MNRJ); 2 ♀ (INPA); 2 ♀ (SMFD); 1 ♂ (MZSP); 26 May 1983, 2 ♂, 2 ♀ (INPA); 27 June 1983, 3 ♀ (INPA); 1 ♂ (MZSP); 24 July 1983, 1 ♀ (INPA); 26 July 1983, 1 ♀ (INPA); 2 ♂, 1 ♀ (MZSP); 3 ♀ (MNRJ); 24 August 1983, 2 ♂, 3 ♀ (MZSP); 1 ♀ (MNRJ); 2 ♀ (SMFD); 2 ♀ (INPA).

Etymology.—The species name is treated as a noun in apposition to Persephone, a



Figures 6–11.—*Guasinia persephone* new species, male: 6, Leg I; 7, Leg II; 8, Leg III; 9, Leg IV; 10, Pedipalp; 11, Chelicera. Scale bars = 0.5 mm.

Greek goddess who was kidnapped by the god Hades (not Adis) and had to live with him in the underground realm all her life.

Diagnosis.—Differs from *G. delgadoi* by the male metatarsus II undivided and armature of leg IV with large tubercles (Fig. 9). Carapace without posterior convexity. Tarsal counts 3(2), 4(2), 5, 5. Segmentation of tarsi I–II and IV is lower than *G. delgadoi* that possesses 4(2), 8(4) on legs I–II and 6 on leg IV (see remarks). Transverse grooves of carapace I–V well defined (Fig. 1), differing from the other species of the family.

Description.—Measurements (holotype, in mm): Dorsal scute length 1.3; cephalothorax length 0.5; mesotergum width 0.8; cephalothorax width 0.65. *Dorsum* (Figs. 1–2): Outline of scute attenuate hourglass-shaped. All scutal grooves transverse and well marked. Scutal areas I–V and free tergites I–III densely covered with large granules. Carapace densely

covered with minute granules, and a stripe of coarse granules in the middle region (from anterior margin to groove I). Eye mound ill-defined (Fig. 3); eyes completely lacking. Only one transversal slit-like ozopore in lateral position (Figs. 4, 5).

Chelicera (Fig. 11): Cheliceral hand with stridulatory apparatus formed by numerous granules on mesal surface and two larger mesal teeth. Hand not inflated, similar in both sexes.

Pedipalp (Fig. 10): Coxa and trochanter with mesal field of numerous granules. Trochanter with one ventral and one basal setiferous tubercles. Femur with curved prolateral subapical tubercle, ventral row of four tubercles. Patella with mesal subdistal tooth. Tibia with three small setae on each side. Tarsus with small setae, plus longer distal setae. Claws short.

Legs (Figs. 6–9): Legs I–IV finely granu-

lated. Coxae I–IV with stout tubercles. Trochanter I with two ventral and two dorsal tubercles; femur III with one short dorsal subapical tubercle; trochanter IV with two ventral (apical much larger, bifid, forming a straight angle) and two large dorsal (posterior longer) tubercles; femur IV with two short dorsal sub basal, one short ventral sub basal, one longer than femur diameter on ventro-median followed by four short tubercles; patella IV with four ventral tubercles increasing in size; tibia IV with nine ventral tubercles increasing in size and one ventral subapical tubercle. Metatarsus II undivided. Tarsal segmentation: 3(2), 4(2), 5, 5.

Male genitalia (Figs. 12–15): Ventral plate modified as apical portion of truncus separated from the shaft by a constriction; lateral margins of ventral plate twisted around the main axis of truncus and are fused to each other, resulting in a funnel-shaped calyx; ventral plate with two groups of setae; basal group formed by 3 + 3 large foliaceous-spatulate setae with rounded apex; distal group is formed by 2 + 2 small cylindrical acuminate setae; distal portion of truncus proximal to ventral plate depressed forming a cavity where glans structures are inserted; accessories of glans well developed as a membranous sac projected into two paired lobes (titillators); conductors and other parastyli absent, stylus free.

Female: Measurements (INPA, 29. September 1982, in mm): Dorsal scute length 1.2; cephalothorax length 0.5; mesotergum width 0.8; cephalothorax width 0.65. Similar to male except as follows: cephalothorax less tuberculate. Legs with fewer and shorter tubercles; legs I–III granulate; trochanter IV with 2 single branched tubercles on ventral and dorsal; femur IV with 1 sub-basal, 1 median and 1 subapical short tubercles; patella IV with 1 ventroapical tubercle. Tarsal segmentation: 4(2), 4(2), 5, 5.

Habitat.—All of the material was obtained from inside the soil, similar to the species described by González-Sponga (1997), who found guasiniids inside bark under litter. The type locality, Tarumã-Mirim, is an inundation-forest of black-water, also called igapó. The type-locality is on the lower course of the Tarumã-Mirim river near the mouth of Rio Negro, 20 km upstream from Manaus, in Central Amazonia. The soil A-horizon is 10–15 cm

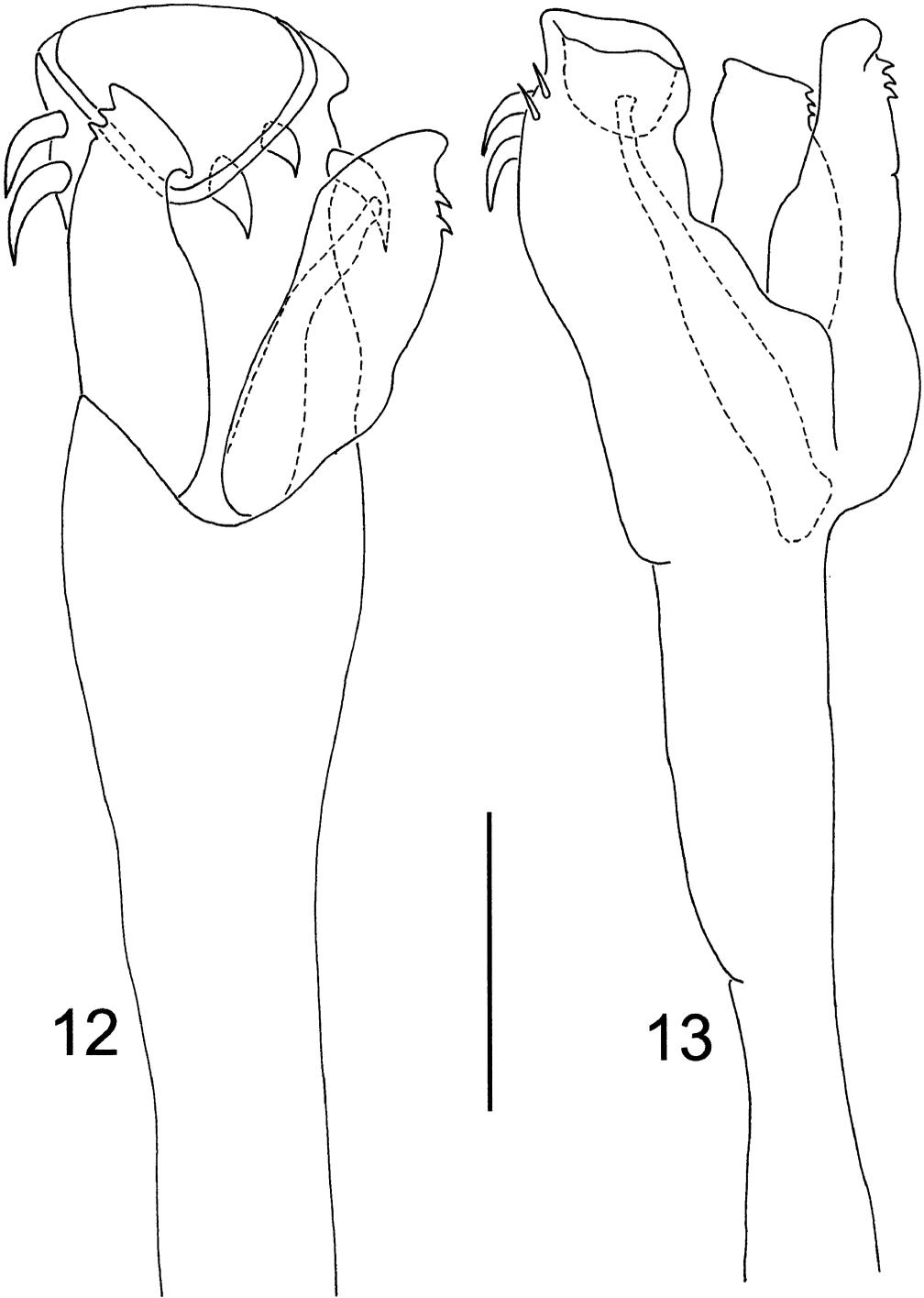
deep (humus layer = matting of humus with fine humus). The humus stratum is slightly developed (covering 5%), seedlings of abundant trees occur in large numbers, shrubs are absent, there are 1300–2000 trees/ha, totaling 47 species. The tree roots spread as far as 8 m on the forest floor. Annual precipitation ranges between 1000–2500 mm (lowest monthly precipitation 0–60 mm). Rainy months January–April; dry months July–September temperature between 24.3–27.4°C. The igapó is annually flooded for 5–6 months. The water level fluctuations are between 5.5–14 m, mean 10 m (see Adis 1981).

Remarks.—The tarsal counts of leg II of the two Venezuelan species provided by González-Sponga (1997) are not compatible with his own drawings. González-Sponga (1997) stated that *G. delgadoi* had 7(3) segments (González-Sponga 1997: 55) and that *Guaiquinimia longipes* had 10–12(4) segments (González-Sponga 1997: 58), although the drawings (his figs. 6 & 13) clearly show 8(4) and 13(3), respectively. Male genitalia of the new species appear at first to be incompatible with González-Sponga's drawings, which lack the large basal setae of the ventral plate. Our own observation is that even if those setae are very large, they are flattened and applied against the truncus, so their presence is easily overlooked using an optical microscope, reconciling penial morphology of *G. persephone* with both Venezuelan species.

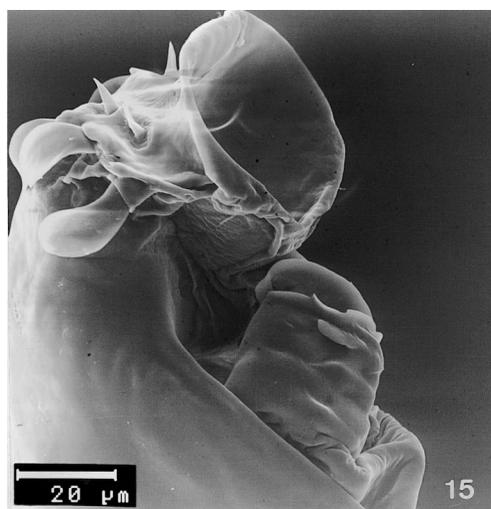
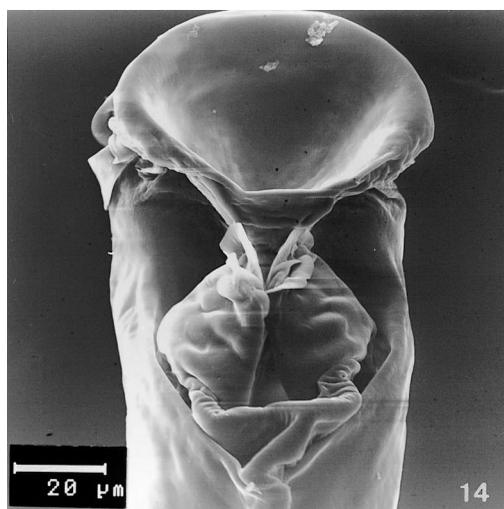
DISCUSSION

This is the third anophthalmic Brazilian species of Opiliones. The first totally blind Brazilian opilionid to be described was *Caecobunus termitarum* Roewer 1927 (originally in Phalangodidae, but family uncertain, see Kury 2003), described from termite nests in Rio de Janeiro state. The second was the cave-dweller *Giupponia chagasi* Pérez & Kury 2002 from Bahia state (Pérez & Kury 2002). The other two species of Guasiniidae described by González-Sponga (1997), *Guasinia delgadoi* and *Guaiquinimia longipes* are also eyeless.

The presence of well-developed accessory of glans (Figs. 12–15) forming a solid unfoldable bifid plate articulated with the truncus relates Guasiniidae with the Zalmoxidae, Fissiphalliidae and Icalectidae (Kury & Pérez 2002). The short pedipalpal claw, tarsus twice



Figures 12–13.—*Guasinia persephone* new species, penis: 12, Dorsal; 13, Lateral. Scale bar = 0.1 mm.



Figures 14–15.—*Guasinia persephone* new species, Distal portion of penis: 14, Dorsal view; 15, Lateral view.

as long as tibia and tarsus with reduced ventral setae seem to be autapomorphies of the family (Fig. 10). González-Sponga (1997) noticed the similarity of the pedipalps of Onco podidae and Guasiniidae. But on closer examination, Onco podidae have a very different somatic and genital morphology, possessing a huge glans that folds against the truncus and many somatic autapomorphies (see Martens 1986; Schwendinger 1992). In the absence of other putative synapomorphies to unit both families, this similarity between the structures of their pedipalps can be only homoplasious. The calyx formed by the ventral plate also occurs in some Caribbean species that are currently in the Stygnommatidae (Abel Pérez, pers. comm. 2002).

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