

ARTÍCULO:

A new family of Laniatores from northwestern South America (Arachnida, Opiliones)

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A NEW FAMILY OF LANIATORES FROM NORTHWESTERN SOUTH AMERICA (ARACHNIDA, OPILIONES)

Adriano B. Kury & Abel Pérez G.

Abstract

The new family Icaleptidae is described, based on the new genera *Icaleptes* and *Zalmopsylla*. Each of the new genera is based on a single species, *Icaleptes malkini* n. sp., from northern Colombia and *Zalmopsylla platnicki* n. sp. from Ecuador. This is the first record of the order Opiliones for the Cesar Department in Colombia. The new family is characterized by genitalic features and by the ventral insertion of legs IV, which gives the animal a flea-like habitus. The closest related families are Zalmoxidae and Fissiphalliidae. Genitalic structures of Zalmoxidae and related families are discussed.

Key Words: Icaleptidae fam. nova, Zalmoxidae, Fissiphalliidae.

Taxonomy:

Icaleptidae **new family**
Icaleptes **new genus**
Icaleptes malkini **new species**
Zalmopsylla **new genus**
Zalmopsylla platnicki **new species**

Una nueva familia de Laniatores del Noroeste de Suramérica (Arachnida, Opiliones)

Resumen

Se describe la nueva familia Icaleptidae, basada en los nuevos géneros *Icaleptes* y *Zalmopsylla*. Cada uno de los nuevos géneros están basados en una única especie, *Icaleptes malkini* n. sp., del Norte de Colombia y *Zalmopsylla platnicki* n. sp. de Ecuador. Este es el primer registro del orden Opiliones para el Departamento César en Colombia. La nueva familia es caracterizada a través de las estructuras genitales y por la inserción ventral de la pata IV, que da al animal aspecto de pulga. Las familias más próximamente relacionadas son Zalmoxidae y Fissiphalliidae. La estructura genital de Zalmoxidae y otras familias próximas es discutida.

Palabras clave: Icaleptidae fam. nova, Zalmoxidae, Fissiphalliidae.

Taxonomía:

Icaleptidae **nueva familia**
Icaleptes **nuevo género**
Icaleptes malkini **nueva especie**
Zalmopsylla **nuevo género**
Zalmopsylla platnicki **nueva especie**

Introduction

The family limits of Laniatores are starting to gain some stability with hypotheses of homology for genitalic features. The question is: is stability a target? Maybe shifting concepts reflect an active and dynamic field of research. Anyway, there have been recent changes on the number and composition of accepted families even for the largest and most conspicuous members of the suborder – e. g., Cranidae Roewer, 1913 and Manaosbiidae Roewer, 1943 (see Kury, 1994 and 1997, respectively), due to rearrangement of genera previously thought to belong in traditional families. When the micro-Opiliones inhabiting the leaf litter are studied, the result is a multitude of new species belonging to new genera and even new families. In South America, the families Fissiphalliidae (Colombia) and Guasiniidae (Venezuela) have been recently described (respectively Martens, 1988 and González-Sponga, 1997), not to mention dozens of genera and species of Zalmoxidae Sørensen, 1886 (described in the Phalangodidae Simon, 1879 by González-Sponga, 1987; see Kury in press).

In this paper, we report the discovery of two new species of small laniatorids from Sierra Nevada de Santa Marta (Northern Colombia) sifted from rotten banana leaves and San Francisco de Las Pampas (Cotopaxi, Ecuador) also from leaf litter. The two new species, each the type of a new genus, show an unique ventral insertion of leg IV, and unique genital morphology. Although fitting in the current

definition of the Zalmoxoidea (Kury, 1993: unpublished), they represent an undescribed structural plan and lack the synapomorphies for the Zalmoxidae. Therefore, those genera are included in a new family. By the Roewerian systematics, they would be members of the meaningless, polyphyletic Phalangodidae Phalangodinae.

All measurements are in mm. Material is deposited in the American Museum of Natural History, New York (AMNH) and Museu Nacional / Universidade Federal do Rio de Janeiro (MNRJ).

Systematic accounts

Icaleptidae new family

TYPE GENUS: *Icaleptes* new genus.

INCLUDED GENERA: *Icaleptes* new genus and *Zalmopsylla* new genus.

DISTRIBUTION: Ecuador and Colombia, see Fig. 22.

DIAGNOSIS: Zalmoxoidea with strong sexually dimorphic leg IV, male coxa IV ventrally inserted which causes leg IV to be positioned under the body as in a flea. In females, the leg is laterally inserted as in most Laniatores. Trochanter IV of male with inner distal or sub-distal apophysis. Eye mound well developed, unarmed, frontal border of eye mound arising directly from frontal margin of carapace forming a straight profile like a wall, perpendicular to the main axis of body. Frontal hump of carapace absent. Femur IV of male with row of pro lateral spines. Scutum unarmed, free tergites and sternites unarmed or with transverse row of small tubercles. Mesotergal areas unarmed, either well marked or not-defined. Pedipalpal segments short and stout with short and delicate spines. No sexual dimorphism in chelicerae. Tarsal counts: 3-4(2)/6-7(3)/5/6. Coxa IV with ventral inner spiniform apophysis surmounting the stigmata. The superficial flea-like appearance of males of Icaleptidae does not indicate a mammal phoretic life-style and is related to sexual dimorphism instead.

Genitalia: Capsula externa well developed, articulated to truncus as a jackknife. Capsula interna simple, with small parastylar collar formed by two lobes (unknown in *Zalmopsylla*). Lamina ventralis not covering laterally capsula externa, armed with three pairs of powerful spatulate setae and longitudinal ventrodorsal rows of small acuminate setae.

Icaleptes new genus

TYPE SPECIES: *Icaleptes malkini* new species.

DISTRIBUTION: Colombia, see map in Fig. 22.

ETYMOLOGY: Genus name stems from Ica, a Chibchan people who inhabited the slopes of Sierra Nevada de Santa Marta + *leptes*, a truncation of the generic name *Gonyleptes*, the first laniatorid to be described.

DIAGNOSIS: Icaleptidae with immense flat eye mound, occupying most of carapace width but with limits not defined. All scutal grooves wanting. Free tergites and dorsal anal opercle smooth. Cheliceral bulla barely convex, ill-defined, basichelicerite stout. Gnathapophysis of coxa III well developed. Coxa IV of male large, *in situ* occupying middle third of scutal length. Femur IV of male with only a few distal pro lateral spines. Tarsal counts 4(2)/7(3)/5/6. Ventral plate of penis with three pairs of powerful spatulate setae – two pairs subdistal ventrolateral + one pair subapical biramous Capsula externa articulated to truncus as a jackknife, formed by a powerful sclerite with two strong sinuous left and right branches widely separated. Stylus mounted on a hard involving structure – the parastylar collar – projected into two lobes. See also Table I.

Icaleptes malkini new species

Figs. 1-10, 22.

TYPE MATERIAL: Male holotype AMNH and a male paratype (AMNH), Colombia, Departamento Cesar, southeastern slope of Sierra Nevada de Santa Marta, San Sebastian de Rábago, 10°34'N 73°36'W, 2000 m, sifted from rotten banana leaves ground debris. 1-6.iv.1968 Borys Malkin leg.

ETYMOLOGY: Species name honors the ethnozoologist Borys Malkin, who with his collectings contributed immensely to the knowledge of small Opiliones.

DIAGNOSIS: The same as for the genus.

DISTRIBUTION: Known only from the type locality. This is the first record of the order Opiliones for the Cesar Department in Colombia, see map in Fig. 22.

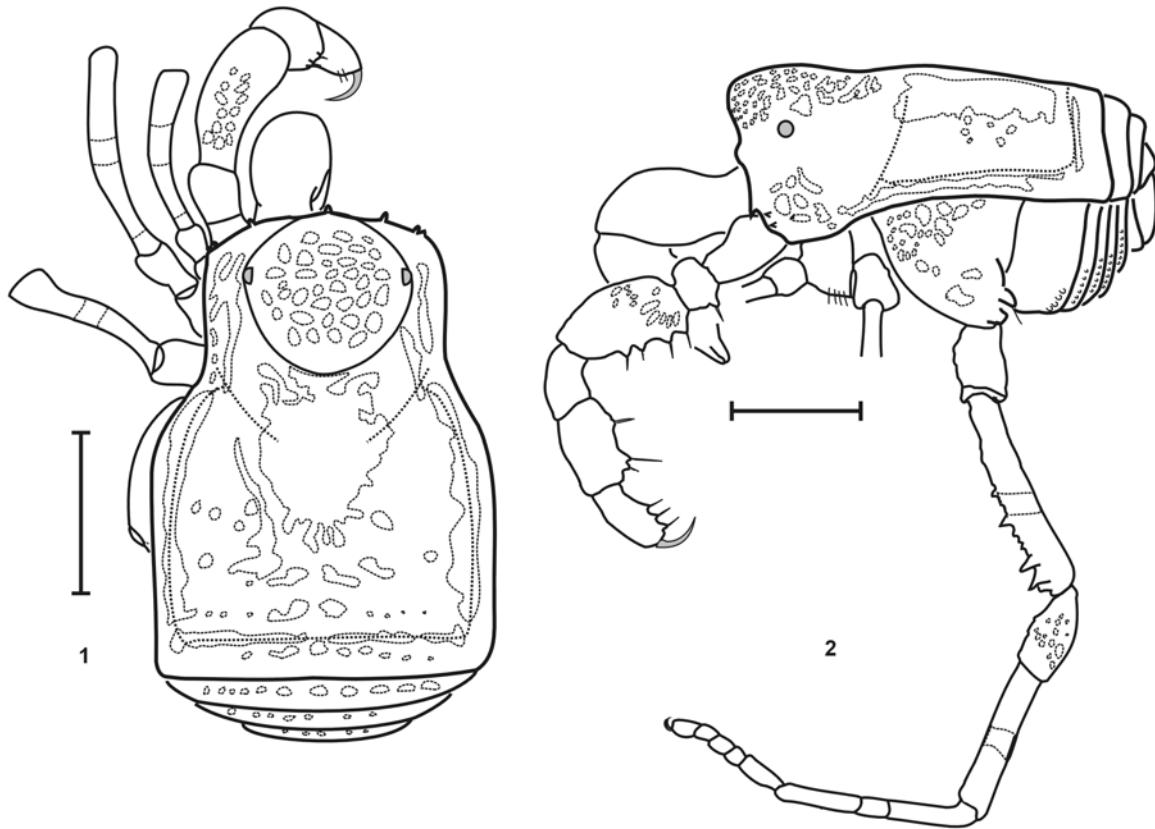
DESCRIPTION:

Male holotype measurements. Carapace 1.08 long, 1.50 wide, abdominal scute 1.81 long, 2.11 wide. Leg measurements in Table I.

Dorsum (Figs. 1-3, 6). – Scutum outline bottle-like (Fig. 1): carapace subsquare, abdominal scutum subrectangular, without constrictions at lateral margin. Frontal margin of carapace with two lateral dentiform apophyses. No frontal hump. Eye mound very wide and flat (Figs. 1-2), ill-defined, so that eyes appear sessile. Scutum smooth, entirely unarmed, without any groove (Fig. 1) besides scutal groove, this interrupted in the middle. Free tergites smooth and unarmed (Figs. 1, 2 and 6). Dorsal anal opercle unarmed.

Venter (Fig. 7). – Free sternites I-V each with a transverse row of minute setiferous tubercles. Ventral anal opercle smooth.

Chelicerae and pedipalps. – Cheliceral bulla very wide and low, basichelicerite long (1.0 mm), stout and unarmed (Fig. 2). Cheliceral hand smooth, unarmed, as long as basichelicerite. Pedipalpus armed with short setiferous tubercles bearing delicate spines, dorsal surface of segments smooth. Pedipalpal trochanter with two ventral setiferous tubercles (Fig. 2). Femur with two ventrobasal setiferous tubercles plus two ventrome-



Figs. 1-2. *Icaleptes malkini* new species [Icaleptidae], male holotype (AMNH) from Colombia: 1. Habitus, dorsal view; 2. Same, lateral view. Scale bars = 1 mm.

Table I
Icaleptes malkini new species
Measurements of legs of male holotype.

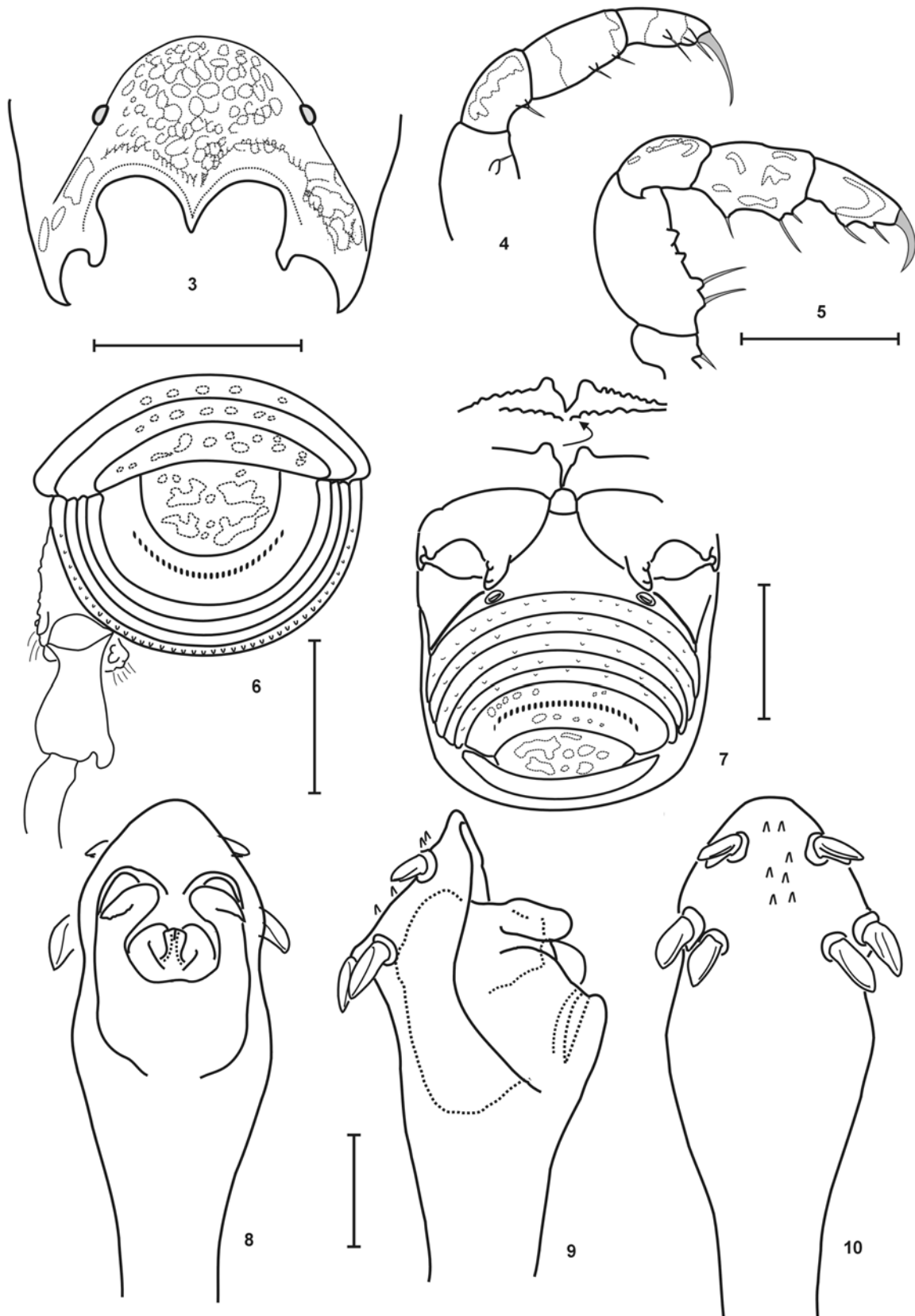
	Leg I	Leg II	Leg III	Leg IV
Trochanter	0.19	0.29	0.16	0.46
Femur	0.73	1.12	0.79	1.6
Patella	0.39	0.58	0.46	0.56
Tibia	0.62	1.04	0.81	1.16
Metatarsus	0.94	1.25	0.97	1.29
Tasus	0.56	1.19	0.81	1.23

dial teeth (Fig. 5) and with one mesal subdistal setiferous tubercle (Fig. 4). Pedipalpal tibia with three ectal (IIi) and three mesal (iii) setiferous tubercles (Figs. 4-5). Pedipalpal tarsus with three mesal (iII) + two ectal (II) setiferous tubercles.

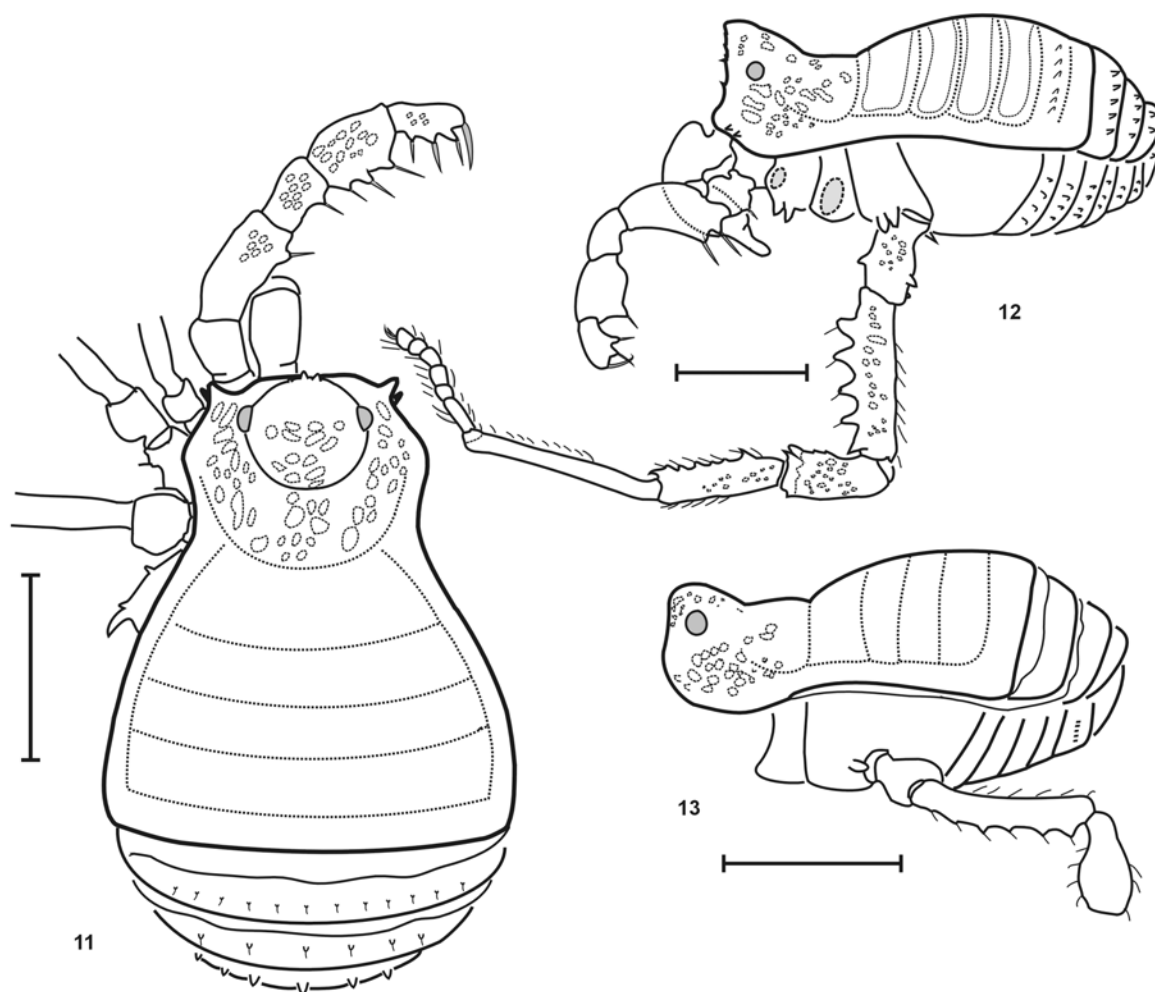
Legs. – Coxa IV of male large, in situ occupying middle third of scutal length, with one short apical prolateral apophysis. Coxa IV with apical retrolateral cluster of granules and with two apical prolateral teeth close to the stigmata. Trochanter IV with subdistal retrolateral blunt apophysis. Femur IV sub-straight, with a few short spines on distal third. Patella IV with small denticles, tibia to tarsus IV unarmed. Tarsi III-IV without tarsal process, tarsal claws unpectinate. Tarsal counts 4(2)/7(3)/5/6.

Color (in alcohol). – Background of body and appendages dark yellow covered with black reticulations denser on the two lateral thirds of mesotergum, areas IV-V and free tergites I-III. Legs with sparse dark brown reticulations, femora I-III with clearly marked dark rings. Stigmatic area and free sternites dark brown. Reticulations of eye mound forming cells like a bee hive.

Genitalia (Figs. 8-10). – Distal part of truncus penis sharply oblique forming a ventral plate, although not articulated. Ventral plate starting as a constriction of the truncus, followed by a clear dorsal bent and slightly narrower towards the rounded apex. Distal border of ventral plate convex, without any cleft. Ventral plate bearing two kinds of setae: 1) three pairs of powerful spatulate setae – two pairs subdistal ventrolateral + one pair subapical biramous and 2) three to four small spiniform setae forming two longitudinal ventrodorsal rows. Capsula externa articulated to truncus as a jack-knife, formed by a powerful sclerite with two strong sinuous left and right branches widely separated. Apex of each branch recurved forming a horn. Capsula interna formed by a stylus mounted on a hard involving structure – the parastylar collar – projected into two lobes.



Figs. 3-10. *Icaletes malkini* new species, male holotype (AMNH). **3.** Carapace, frontal view; **4.** Left pedipalp, mesal view; **5.** Right pedipalp, ectal view. **6.** Free tergites, free sternites, coxa and trochanter IV, posterior view. **7.** Coxa IV, stigmatic area and free sternites, ventral view. **8-10.** Penis, distal part. **8.** Dorsal view; **9.** Lateral view; **10.** Ventral view. Scale bar: 3-7 = 1 mm; 8-10 = 0.1 mm.



Figs. 11-13. *Zalmopsylla platnicki* new species [Icaleptidae], male holotype (AMNH) from Ecuador: **11.** Habitus, dorsal view; **12.** Same, lateral view. Female paratype (AMNH). **13.** Habitus, lateral view. Scale bars = 1 mm.

***Zalmopsylla* new genus**

TYPE SPECIES: *Zalmopsylla platnicki* new species.

DISTRIBUTION: Ecuador, see map in Fig. 22.

ETYMOLOGY: From the preexisting generic name *Zalmoxis* + Greek *psyllos* = flea.

DIAGNOSIS: Icaleptidae with conic eye mound taking half of carapace width. Scutal grooves well marked, defining four mesotergal areas. Coxa IV small, in situ inserted at area I. Cheliceral bulla well defined, basiche-licerite very small. Gnathapophysis of coxa III absent. Free tergites I-III with a transverse row of small spines each and dorsal anal opercle with scattered setiferous tubercles. Tarsal counts 3(2)/6 (3)/5/6. Ventral plate with subapical constriction and expanded in two apical left and right lobes and a pointed median apex. Ventral plate with three pairs of powerful spatulate setae – three pairs ventral/ventrolateral located basally on ventral plate. Capsula externa articulated to truncus as a jack-knife, with bulbous base, projected into a powerful

sclerite with two left and right expanded branches running close along each other. See also Table II.

***Zalmopsylla platnicki* new species**

Figs. 11-21, 22.

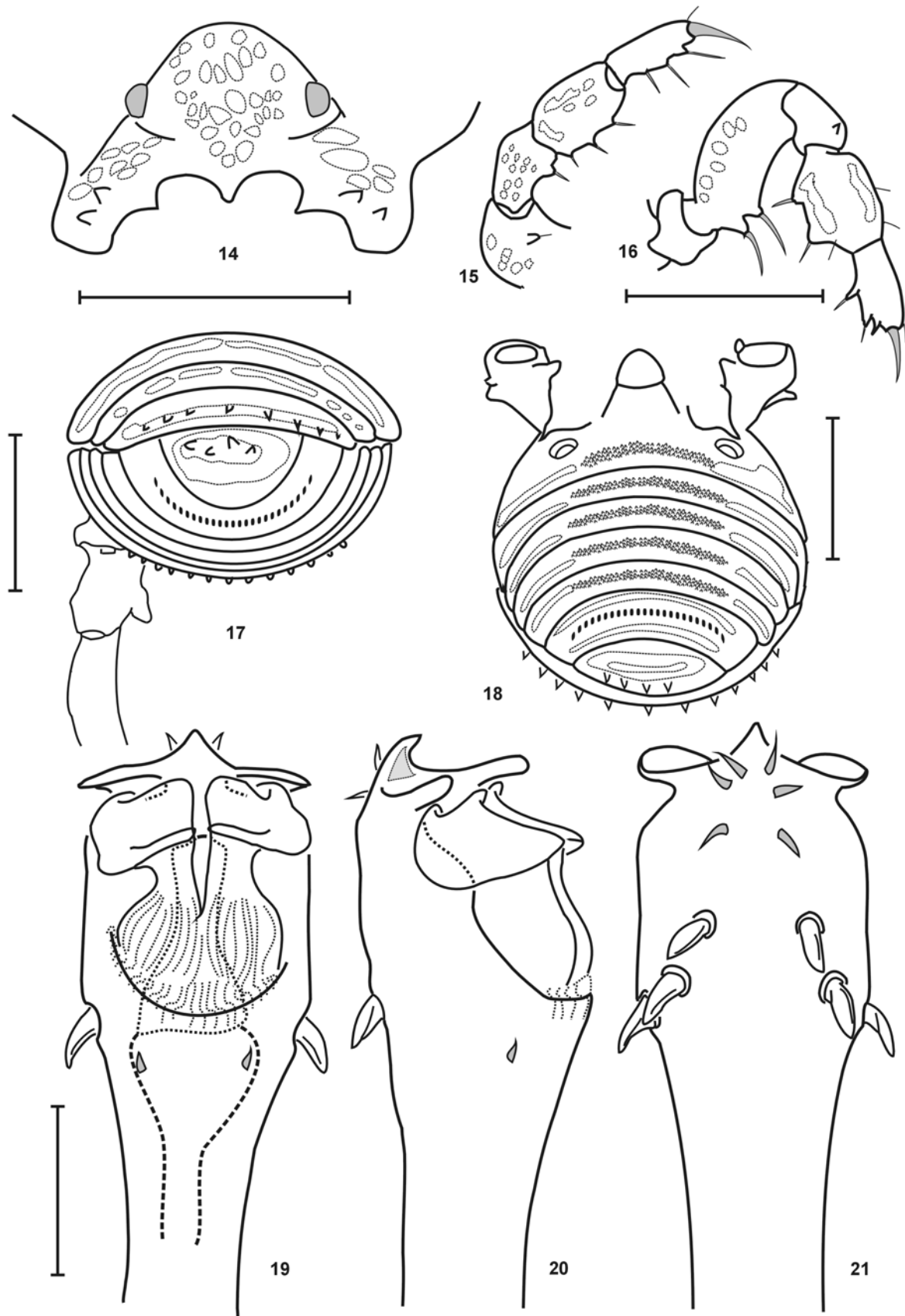
TYPE MATERIAL: Male holotype (AMNH), two female paratypes (AMNH), two female paratypes (MNRJ) Ecuador, Cotopaxi Province: NW of San Francisco de las Pampas at La Otonga, 6300 ft (= 1900 m), litter near small stream 16-17.v.1993 Lee Herman col.

ETYMOLOGY: Species name honors the distinguished American arachnologist Norman Platnick.

DIAGNOSIS: The same as for the genus.

DISTRIBUTION: Known only from the type locality see map in Fig. 22.

DESCRIPTION: Male holotype measurements. Carapace 1.25 long, 1.55 wide, abdominal scute 1.81 long, 2.64 wide. Leg measurements in Table II.



Figs. 14-21. *Zalmopsylla platnicki* new species [Icaleptidae], male holotype (AMNH) from Ecuador: **14.** Carapace, frontal view; **15.** Left pedipalp, mesal view; **16.** Right pedipalp, ectal view. **17.** Free tergites, free sternites, coxa and trochanter IV, posterior view. **18.** Coxa IV, stigmatic area and free sternites, ventral view. **19-21:** Penis, distal part. **19.** Dorsal view; **20.** Lateral view; **21.** Ventral view. Scale bar: 14-18 = 1 mm; 19-21 = 0.1 mm.

Fig. 22. Northwestern South America, showing distribution of both species of Icaleptidae. *Icaleptes malkini* new species (—) in Colombia and *Zalmopsylla platnicki* new species (●) in Ecuador. Thick lines are frontiers of countries and dotted lines are province boundaries.



Table II
***Zalmopsylla platnicki* new species.**
Measurements of legs of male holotype and female paratype (in parentheses).

	Leg I	Leg II	Leg III	Leg IV
Trochanter	0.23 (0.19)	0.23 (0.16)	0.31 (0.21)	0.29 (0.25)
Femur	0.75 (0.62)	0.85 (0.83)	0.77 (0.56)	1.14 (0.81)
Patella	0.39 (0.25)	0.60 (0.42)	0.37 (0.33)	0.69 (0.41)
Tibia	0.44 (0.37)	0.81 (0.66)	0.58 (0.56)	0.85 (0.63)
Metatarsus	0.79 (0.60)	1.16 (0.81)	0.96 (0.73)	1.25 (1.60)
Tasus	0.50 (0.46)	0.87 (0.83)	0.76 (0.62)	0.91 (0.73)

Dorsum (Figs. 11-12, 14, 17). – Scutum outline asymmetrical hourglass shaped: carapace in dorsal view convex at mid-length. Abdominal scutum campaniform, widest posteriorly. Frontal margin of carapace sinuous. Carapace without frontal hump, with two pair of latero-frontal teeth (Fig. 14). Eye mound pointed, conical with frontal granules and arising straight from frontal border of carapace. Scutum smooth, entirely unarmed. Scutal grooves well marked, defining four mesotergal areas. Free tergites with a transverse row of setiferous tubercles increasing from I to III. Dorsal anal opercle with a few pointed tubercles.

Venter (Fig. 7). – Free sternites I-V each with a median cluster of small granules forming a stripe. Ventral anal opercle smooth.

Chelicerae and pedipalps. – Basicheicerite short and unarmed, cheliceral bulla well marked (Fig. 12), Cheli-

ceral hand smooth, unarmed, a little longer than basicheicerite, fingers unarmed. Pedipalpus armed with short setiferous tubercles bearing delicate spines, dorsal surface of segments smooth. Pedipalpal trochanter with ventral setiferous tubercle (Fig. 12). Femur with two ventrobasal setiferous tubercle (Fig. 16) and with one mesal subdistal setiferous tubercle (Fig. 15). Pedipalpal patella with one mesal subdistal setiferous tubercle (Fig. 15) and a dorsal subdistal tooth (Fig. 16). Pedipalpal tibia with two ectal and two mesal setiferous tubercles (Figs. 15-16). Pedipalpal tarsus with three setiferous tubercles on each side.

Legs. – Coxa IV small, in situ surpassing scute only in length of area I, with two blunt dorsoapical apophyses. Stronger ventroapical pointed apophysis close to stigmata. Trochanter IV of male with median retrolateral blunt apophysis. Femur IV substraight, armed with

Table III
Diagnostic features of both genera of Icaleptidae

<i>Icaleptes</i>	<i>Zalmopsylla</i>
apical border of ventral plate convex, rounded.	apical border of ventral plate with narrow point and two wide lateral projections.
large spatulate spines of ventral plate: two pair basal, one pair subapical.	large spatulate spines of ventral plate: three pairs basal.
lateral branches of articulated sclerite covering the glans well separated, with small apical lobes.	lateral branches of articulated sclerite covering the glans very close together, with well developed apical lobes.
capsula interna with bilobed parastylar collar.	capsula interna unknown.
body outline with lateral borders straight and parallel.	body outline with lateral borders convex and divergent.
eye mound very wide and flat.	eye mound narrow and high.
scutal areas undefined.	scutal areas well marked by transverse grooves.
cheliceral bulla undefined.	cheliceral bulla clearly marked.
femur and tibia IV of male with small spines.	femur and tibia IV of male with robust spines.
tarsal counts 4(2)/7(3)/5/6.	tarsal counts 3(2)/6 (3)/5/6.

a row of five strong prolateral spines. Patella and tibia IV armed with small pointed prolateral tubercles. Tarsi III-IV without tarsal process. Tarsal claws unpectinate. Tarsal counts 3(2)/6(3)/5/6.

Color (in alcohol). – Body and appendages dark yellow with dark brown reticulations very faint in chelicerae and pedipalps. Areas and free tergites dark brown with transverse light bands at the grooves and articulations. Venter dark yellow with lateral third of sternites dark brown. Granule clusters of sternites pale yellow.

Genitalia (Figs 19-21). – Distal part of truncus penis forming a non-articulated ventral plate, a little wider than the shaft. Ventral plate with subapical constriction and expanded in two apical left and right lobes and a pointed median apex. Ventral plate bearing two kinds of setae: 1) three pairs of powerful spatulate setae – three pairs ventral/ventrolateral located basally on ventral plate and 2) three small spiniform setae forming two longitudinal ventrodorsal rows. Truncus with a pair of dorsal spiniform setae basal to ventral plate. Capsula externa articulated to truncus as a jackknife, with bulbous base, projected into a powerful sclerite with two left and right expanded branches running close along each other. Capsula interna completely concealed by the branches of titillator, impossible to examine without destroying the penis.

Discussion

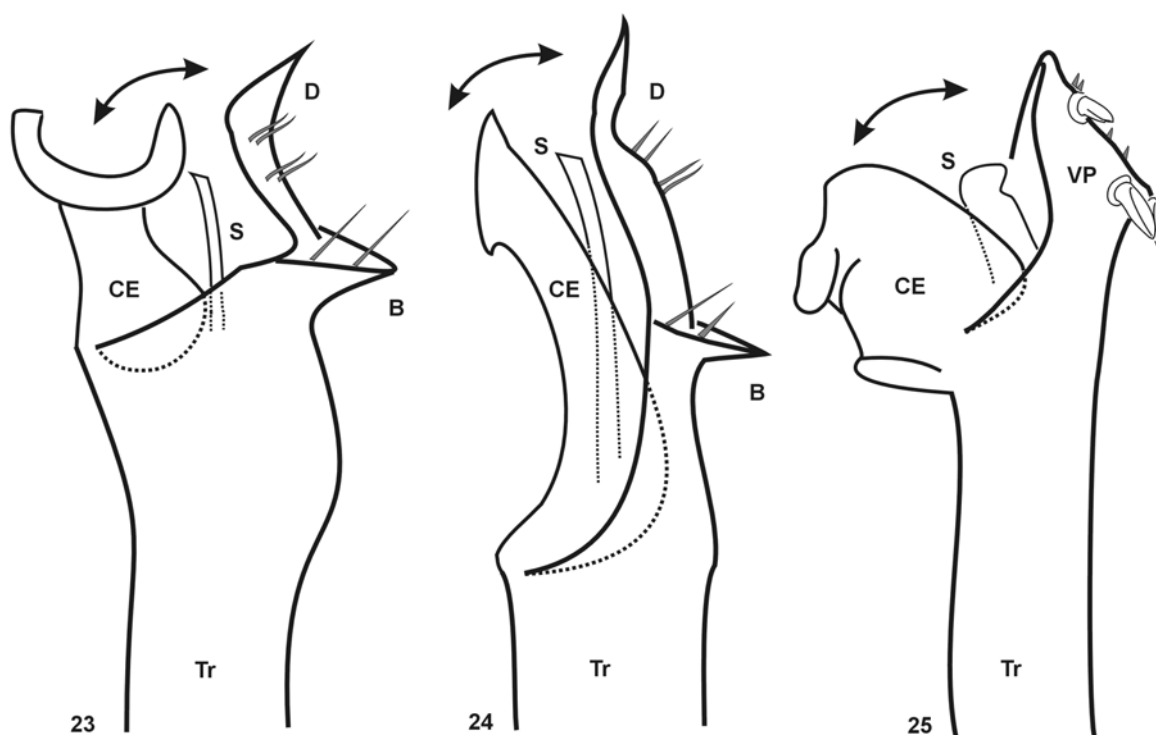
The monotypic genera of Icaleptidae. Much has been said about the undesirable trend of Roewerian systematics of creating countless monotypic genera in Opilioines. We surely hesitated before adding two more to this long list. The two factors that guided our decision have been 1) the clear morphological gap between them, in spite of having a recognizable synapomorphic structural plan and 2) the wide geographical distance between the

two type localities. Being small animals found only by extracting leaf litter, it is easy to predict that many undiscovered species await discovery either in nature or on museum shelves, labeled as “Phalangodidae”. Table III highlights the diagnostic features of both genera.

Familiar affinities. Among Grassatores, Icaleptidae is most closely related to Zalmoxidae and Fissiphalliidae by the putative synapomorphic structure of the capsula externa not introvertable, folding against the truncus as a jackknife, exposing the stylus when opened (Figs 23-25). Zalmoxidae + Fissiphalliidae form a smaller clade defined by the tagmosis of the ventral plate into a basal keeled girdle and a distal spade-shaped plate with two pairs of setae. A possible autapomorphy of Fissiphalliidae is the extremely deep and elongate structure of the jackknife system. The species of Fissiphalliidae share with some Zalmoxidae the V-shaped scutal grooves. Genital morphology is unknown for most Zalmoxidae, but in those known the capsula externa is strongly developed and convoluted. It is possible that keeping Fissiphalliidae as a distinct family renders Zalmoxidae paraphyletic.

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Figs 23-25. Schematic lateral views of the penis of the families closest to Icaleptidae. **23.** Zalmoxidae. **24.** Fissiphalliidae. **25.** Icaleptidae. Arrows show the direction of movement of the capsula externa (CE). **B** = basal tagma of ventral plate, **VP** = ventral plate, **D** = distal tagma of ventral plate, **S** = stylus, **Tr** = truncus penis.

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