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CLARIFICATION OF THE COLOMBIAN HARVESTMAN GENUS *CARMENIA*, WITH A REVIEW OF THE NEW WORLD GAGRELLINAE (OPILIONES: GAGRELLIDAE)

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ABSTRACT

The placement of *Carmenia* Roewer in the Gagrellinae (Gagrellidae) is verified. The genus and its single species are redescribed and illustrated. The similarity of *Carmenia bunifrons* Roewer to Sclerosomatinae and Gagrellinae from eastern Asia is noted. The New World genera of Gagrellinae and the South American species formerly placed in the Leiobuninae (Gagrellidae) are biefly discussed. The North American genus *Trachyrhinus* Weed is transferred to the Gagrellinae.

RESUMEN

Se verifica la inclusión de *Carmenia* Roewer dentro de los Gagrellinae (Gagrellidae), y se redescribe la única especies en dicho género. *Carmenia bunifrons* Roewer muestra similaridades con algunos Sclerosomatinae y Gagrellinae asiáticos. Los géneros de Gagrellinae del Nuevo Mundo, y las especies sudaméricanas previamente referidas a los Leiobuninae (Gagrellidae) son tratados brevemente. El género norteaméricano *Trachyrhinus* Weed es transferido a los Gagrellinae.

When Roewer (1915) described the harvestman genus *Carmenia* he stated that the leg femora lacked pseudosegments and that it was a member of the subfamily "Liobuninae." As no new material has been collected and apparently no one reexamined the holotype, *Carmenia* remained in the "Liobuninae" or Leiobuninae until Staręga (1972) transferred it to the Gagrellinae. His action was apparently based on geographical reasons though, as he was unaware of the leg femora nodules. However, my examination of the holotype reveals well developed femora nodes or pseudoarticulary nodules which places *Carmenia* in the Gagrellinae.

Apparently, the subfamily Leiobuninae is absent from South America. The single species described as a member of *Leiobunum* C. L. Koch from South America (Peru) was transferred to the Gagrellinae genus *Geaya* Roewer by Goodnight and Goodnight (1943). The transference of *Leiobunum monticola* Chamberlin to *Geaya* was apparently overlooked by Soares and Soares (1947) and Ringuelet (1959), as they continued to list it as a *Leiobunum* species.

Thrasychirus Simon (from Chile and Argentina) and *Thrasychiroides* Soares and Soares (from Brasil) were both described in the Leiobuninae. Šilhavý (1970) placed *Thrasychirus* in an entirely different family, the Neopilionidae. Although Šilhavý did not mention *Thrasychiroides*, it appears he considered it should also belong to the Neopilionidae (see Šilhavý 1970, Fig. 14 and bibliography).

The New World Gagrellinae were revised by Roewer (1953). The work of Roewer, and the characters used in the classification of Gagrellinae were reviewed and revised by Ringuelet (1954). Of the 24 New World Gagrellinae genera listed by Roewer (1953), 2 (and possibly a third) were synonymized with established genera by Ringuelet (1954). *Psammogeaya* Mello-Leitão (from Uruguay) was listed as a probable synonym of *Holcobunus* Roewer (from Brasil, Bolivia, Chile, Colombia, Honduras, and México), and *Krusella* Roewer (Venezuela) was newly synonymized with *Krusa* Goodnight and Goodnight (Brasil, Colombia, México, and Peru). *Corderobunus* Mello-Leitão (Brasil) was newly synonymized with *Parageaya* Mello-Leitão (Brasil, Argentina). The *Parageaya* sp. from México listed by Roewer (1953) and Ringuelet (1954) was excluded from *Parageaya* by Capocasale (1976), but species from Cuba and Uruguay were added. Unfortunately, Capocasale did not establish a genus for the Mexican species. At least 2 undescribed species from caves in México are congeneric with the Mexican "*Parageaya*" *albifrons* Goodnight and Goodnight (unpubl. data).

Since Roewer's revision (1953), only 5 New World Gagrellinae genera have been described. Ringuelet (1954) described *Simplicibunus* from Argentina, but it was placed in synonymy of *Holmbergiana* Mello-Leitão (also from Argentina) by Capocasale (1967). Roewer (1959) described *Azucarella* and *Caluga* from Peru. Soares (1970) described *Amazonensia* and *Paruleptes* from Brasil.

Cokendolpher (1981) revised the genus *Trachyrhinus* Weed (México and USA) and noted the presence of leg femora nodules but chose not to place the genus in a subfamily. It is now known that the smooth palpal claw is not a useful character to separate subfamilies, and therefore the genus *Trachyrhinus* is clearly a member of the Gagrellinae.

Methods

The morphological terminology and description format follow that of Cokendolpher (1981). The methods for obtaining anatomical measurements also are those used by Cokendolpher (1981). The ovipositor and seminal receptacles were removed from the body; they were first dehydrated in absolute ethyl alcohol and then examined in 100% clove oil. All illustrations were prepared with the aid of a camera lucida.

Genus *Carmenia* Roewer

Carmenia Roewer 1915: 140; 1923: 881, 924; 1957: 346; Redikorzev 1931: 31; Kästner 1937: 392; Mello-Leitão 1938: 320; Soares and Soares 1947: 84; Ringuelet 1957: 15; 1959: 212; 1961: 158.

Carmenis (sic). Staręga 1972: 61.

Type Species: *Carmenia bunifrons* Roewer by monotypy.

Diagnosis: With the characters of the Zaleptini (Gagrellinae): abdomen unarmed and femora II with nodules. The combination of short leg femora and lack of nodules on legs I, III, and IV will serve to separate *Carmenia* from most genera of Gagrellinae. *Carmenia* differs noticeably from those genera which lack nodules on legs I, III, and IV (see table 1) by (1) forward pointing, paired horns on the ocular tubercle and (2) the anterior edge of the cephalothorax extending over the supracheliceral lamellae and scent gland pores.

Relationships: The presence of pseudoarticulary nodules on femora II and lack of corona analis justify placement of *Carmenia* in the Gagrellinae, but the form of the forward pointing cephalothorax which hides the supracheliceral lamellae and scent gland pores suggests affinities to Sclerosomatinae (unknown in the New World). The scent gland pores tend to be also hidden in some Asian Gagrellinae (e.g., *Paraumbogrella huzitai* Suzuki, *Systenocentrus japonicus* Hirst, and several *Gagrellula* spp., Tsurusaki pers. commun.) but are visible from above in most New World Gagrellinae. The form of the ocular tubercle also suggests affinities with the Old World taxa. The forward pointing paired horns of the ocular tubercle appear similar to those on several species of Gagrellinae (Zaleptini) known only from India and southeastern Asia (e.g., *Bakerinulus luzonicus* Roewer, *Euzaleptus* spp., and *Hypsibunus fuscus* (With), see Roewer 1955, Fig. 210, 225, 229, 230, 243). However, these species differ from *Carmenia* in the lengths and nodule counts of the leg femora. As noted by Martens (1973), the characters of the "Sclerosomatidae" and "Leiobunidae" (including Gagrellinae) exist as a continuous transition in eastern Asian taxa. The fact that *Carmenia* shares so many important chacters with eastern Asian species is surprising!

Description: Medium sized harvestmen with anterior portion of cephalothorax extended as a forward pointing hump which is covered with numerous pointed tubercles (Fig. 1); scent gland pores on lateral margins behind dorsal spines of coxae I, small and hidden from above. Supracheliceral lamellae smooth, small and hidden from above. Coxae II endites moderately bent forming angle of about 20° to the genital operculum lip. Palps with distomesal margins of patellae and tibiae extended (Fig. 3), claw toothed. Chelicerae with spur ventrally on basal segment. Legs short,

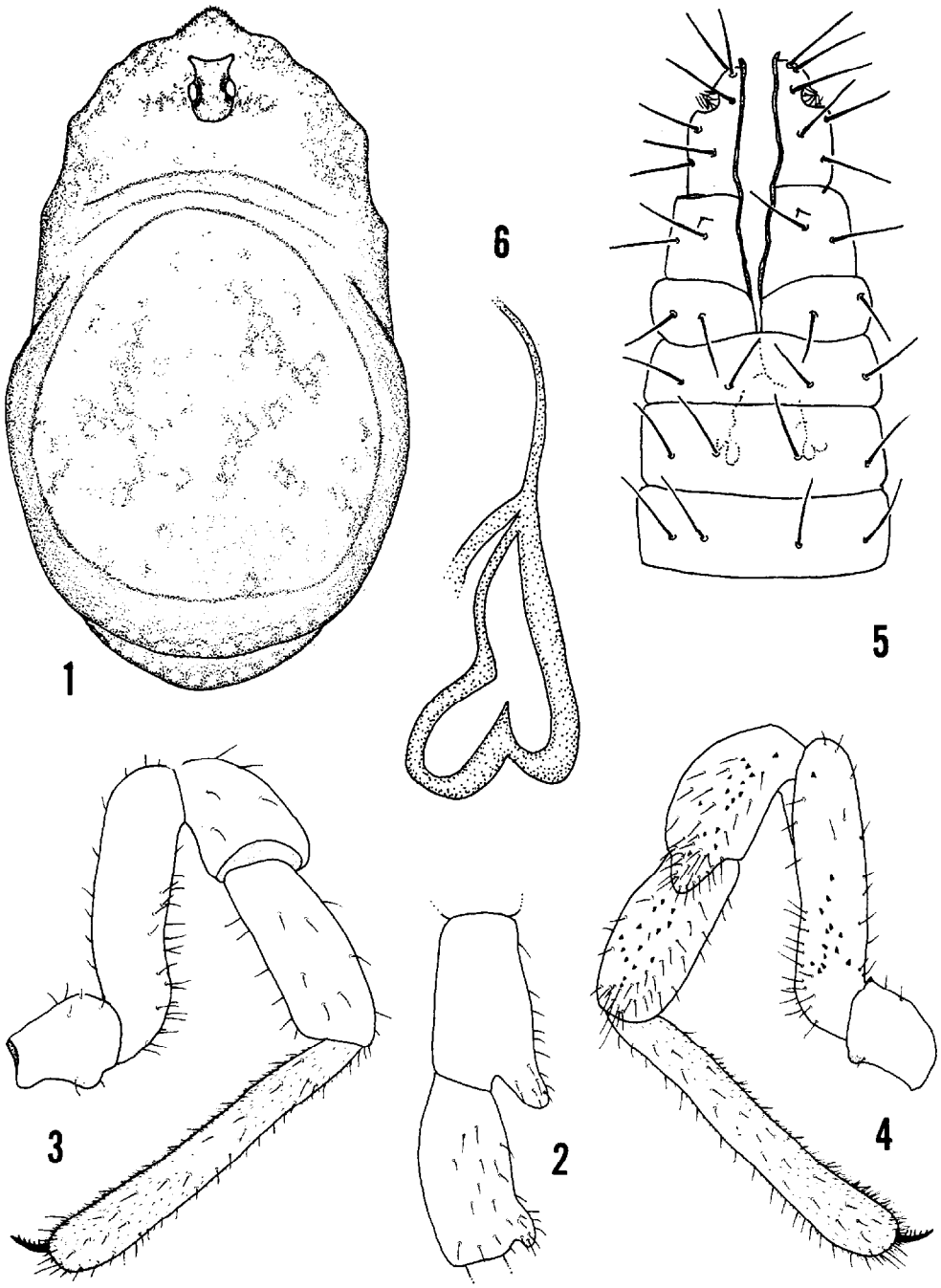

Fig. 1-6. *Carmenia bunifrons*, female holotype. (1) Dorsal aspect. (2) Apophyses of palpal patella and tibia, dorsal aspect. (3) Palp, lateral aspect. (4) Palp, medial aspect. (5) Ovipositor. (6) Seminal receptacle.

TABLE 1. GENERA OF GAGRELLINAE WITH LEG FEMORA I, III, AND IV LACKING NODULES; FEMORA I AND III EQUAL TO OR SHORTER THAN BODY LENGTH; AND ABDOMEN LACKING MEDIAN TUBERCLE (BASED ON DATA FROM ROEWER 1953 AND 1955; RINGUELET 1954; AND COKENDOLPHER 1981).

Genus/Distribution	No. femora II nodules	Palpal claw	Femora II vs. body length	Ocular tubercle
Carmenia Roewer Colombia	1	toothed	FII < B	forward pointing paired horns
Ceratobunellus Roewer Eastern Asia	1	toothed	FII > B	2 pair equal sized horns
Holmbergiana Mello-Leitão Argentina	2	toothed	FII $\overline{>}$ B	smooth or toothed
Krusa Goodnight & Goodnight México & South America	1	toothed	FII > B	smooth or toothed
Microzaleptus Roewer Eastern Asia	1	toothed	FII < B	smooth or toothed
Orissula Roewer India	3	toothed	FII > B	2 pair unequal sized horns
Pectenobunus Roewer Argentina, Brasil, Paraguay	0-2	toothed	FII > B	toothed
Tetraceratobunus Roewer India	2	toothed	FII > B	2 pair equal sized horns
Trachyrhinus Weed México, USA	1-2	smooth	FII $\overline{>}$ B	toothed

all femora shorter than body width; femora II each with single pseudoarticulary nodule other femora lacking nodules; all tibiae lacking pseudosegments.

Carmenia bunifrons Roewer
Fig. 1-6

Carmenia bunifrons Roewer 1915: 140, 141, Fig. 80; 1923: 924, Fig. 1067; 1957: 346; Redikorzev 1931: 31; Mello-Leitão 1938: 320; Soares and Soares 1947: 84.

TYPE DATA: Female holotype from Peña del Carmen, Colombia (pre-1914 collection by Herrn Kaufmann Gerlach), in Senckenberg Natur-Museum, Frankfurt, West Germany (cat. no. RI/4/1163). The specific local-

ity given by Roewer (1915), "Peña di Carmen" can not be identified for certain. Presumably, the locality was a hill near a town or village called Carmen or El Carmen. The U.S. Board on Geographic Names (1964) lists no locality for Peña del Carmen, but 2 different localities in Departamento de Antioquia are listed as "Alto del Carmen" (6°03'N-75°32'W and 6°17'N-75°24'W). This region does not seem unreasonable as most of the other species described by Roewer (1915) from Colombia came from localities along the Cordillera Central. If Peña del Carmen is not the same locality as one of the localities called Alto del Carmen, it could be at or near any one of the 53 localities listed as "Carmen" or "El Carmen" in Colombia (U.S. Board on Geographic Names, 1964).

DESCRIPTION: *Male*: unknown.

Female: Body light rusty yellow with leathery corneous texture. Total length 4.26 mm, greatest width 2.55 mm, maximum height 2.13 mm. Ocular tubercle rusty brown with dark brown rings around eyes and white to yellowish-white slightly raised tubercles; anteriorly 2 rounded tubercles (horns) projecting anterolaterally; ocular tubercle length (not including horns) 0.40 mm, width 0.31 mm, height (not including horns) 0.20 mm, distance from anterior edge of cephalothorax 0.32 mm. Abdominal dorsum with some rusty brown mottlings and 2 indistinct medial longitudinal splotches. Entire dorsum with many subsurface opalescent spots overlain by small pits; pitting and fine granules appear at lower magnifications to be coarsely granulate; last 2 abdominal tergites and anal operculum coarsely granulate medially. Venter and coxae with scattered reddish-brown splotches, most noticeable on abdomen behind trochanter IV and ventrolateral portions of coxae IV. Sternites with subsurface opalescent spots, medial portions coarsely granulate. Coxae finely granulate with subsurface opalescent spots; covered with setae and indistinct rows (clusters) of tri-pointed denticles on anterior and posterior margins, extreme lateral margins coarsely granulate. Distolateral margins of coxae without large tubercles or spurs; short rounded spurs dorsally on I, II, and III. Genital operculum finely granulate with subsurface opalescent spots, covered only with setae; length 1.00 mm, width at base 1.25 mm, width at neck 0.63 mm.

Palps (Fig. 2-4) with few scattered tubercles on mesal surfaces of femora, patellae, and tibiae medially (Fig. 4). Palpal segment lengths (mm): femora 0.56, patellae 0.38, tibiae 0.44, tarsi 0.82, patellar apophyses 0.19, tibial apophyses 0.06. Femora, patellae, and tibiae rusty brown; scattered pale yellow spots on distodorsal portions of patellae and tibiae and more noticeable spots on ventromesal margins of patellae and tibiae; tarsi pale yellow; claws with 5 teeth.

Legs pale rusty yellow, bases of all femora and tarsi creamy yellow; medial portions of femora and tibiae of legs I, III, and IV dark rusty red; small creamy colored spots on distal ends of femora and tibiae and ventral surfaces of patellae. Legs round in cross section, essentially smooth except for setae; claws smooth and untoothed. Femora II each with single pseudoarticulary nodule at point slightly less than 1/2 segment length: 3 pale rings which are slightly swollen on lateral and ventrolateral margins on femora IV and single indistinct ring at basal 1/4 of each femora II. Femora I-IV lengths (respectively, mm): 1.31, 2.41, 1.40, 2.00; tibiae I-IV lengths (respectively, mm): 1.10, 2.23, 1.06, 1.64.

Ovipositor 13 segmented, including 3 segmented furca (Fig. 5); weakly sclerotized. Apical sensilla collapsed (due to preservation ?); second furca segment with single slit sensillum (23-25μm length) per side. Setation of furca as Fig. 5, segments 4-10 each with 4 setae per side, segments 11-13 bare. Seminal receptacles with 2 basal lobes (Fig. 6).

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