2012. The Journal of Arachnology 40:291–295

A new species of *Heterolacurbs* (Opiliones: Biantidae: Stenostygninae) from Puerto Rico

Aylin Alegre Barroso and **Luis F. de Armas**: División Colecciones Zoológicas y Sistemática, Instituto de Ecología y Sistemática, Apartado Postal 8029, La Habana, C.P. 11 900, Habana 19, Cuba. E-mail: aylinalegre@gmail.com

Abstract. A new species of Biantidae belonging to the genus *Heterolacurbs* Roewer 1912 is herein described. *Heterolacurbs perezassoi* new species from Puerto Rico, Greater Antilles, is the second species included in the genus, and it is clearly recognized by the pair of large spiniform apophyses on area IV that does not restrain area III of the dorsal scutum, the smooth legs, femora II–IV without dorsodistal spine, its tarsal formula, sternites with small tubercles and penis that exhibits a distinctive morphology.

Keywords: Laniatores, Samooidea, taxonomy, West Indies

The genus *Heterolacurbs* Roewer 1912 currently comprises a single species, *H. ovalis* Roewer 1912. *Heterolacurbs* can be recognized by the presence on area IV of a pair of large spiniform apophyses and free tergite III with a medial spiniform apophysis. It also may be distinguished from all other stenostygnid genera by the penial morphology, a capsula interna composed by an apically pointed stylus, lateroapically flattened and wide, flanked by two basally fused conductors, apically with laminar lobes.

Roewer (1912) originally placed *Heterolacurbs ovalis* as part of the Biantinae in the then numerous family Phalangodidae. Mello-Leitão (1938) elevated it to family status. Lawrence (1959) erected the subfamily Lacurbsinae for the western tropical African biantids, including *H. ovalis* by implication. Martens (1978) excluded *Heterolacurbs* from Biantidae, but did not reassign it to another family. Staręga (1992) restored it to Biantidae, but did not specify which subfamily. Pérez-González & Alegre (2009) established that *H. ovalis* Roewer 1912 mislabelled as from Togo, Africa is a senior synonym of *Martibianta virginsulana* Šilhavý 1973 from United States Virgin Islands (West Indies) and removed the genus *Heterolacurbs* from Lacurbsinae to the Neotropical subfamily Stenostygninae. Armas (2010) recorded the family Biantidae from Puerto Rico for the first time and cited it as a new species here described of *Heterolacurbs*, being the second known species for the genus. This new species is described herein and provides data on its intraspecific variability, habitat, natural history and distribution.

The specimens studied are lodged in the arachnological collection of the Institute of Ecology and Systematics (CZACC), Havana, Cuba. All measurements are given in millimeters and were made with a Carl Zeiss microscope equipped with an ocular micrometer. Abbreviations are as follows: (PL) prosoma length, (PW) prosoma width, (DSL) dorsal scutum length, (DSW) dorsal scutum width, (Fe) femur, (Mt) metatarsus, (Pa) patella, (Ta) tarsus, (Ti) tibia, (Tr) trochanter. Pedipalpal tibia and tarsus setal coding follows previous authors (Pinto-da-Rocha 1997; Acosta *et al.* 2007); *i.e.*,"i" indicates small setae (half the size of the longest setae), "I" indicates long setae and listed from basal to distal. The penial morphology nomenclature follows Kury & Pérez-González (2007). The method of male genitalia preparation and illustration follows Acosta *et al.* (2007). The penis was expanded by first placing it in lactic acid at room temperature, then heating (not boiling) for about two minutes, cooling for two minutes away from heat and rapidly transferring it to distilled water at room temperature. Line drawings were made with the software packages CorelDRAW 13 and Adobe Photoshop CS3 using photographs as templates. The map was produced with the computer GmapCatcher program using satellite images.

TAXONOMY

Family Biantidae Thorell 1889
Subfamily Stenostygninae Roewer 1913
Genus *Heterolacurbs* Roewer 1912

Type species.—*Heterolacurbs ovalis* Roewer 1912, by monotypy.

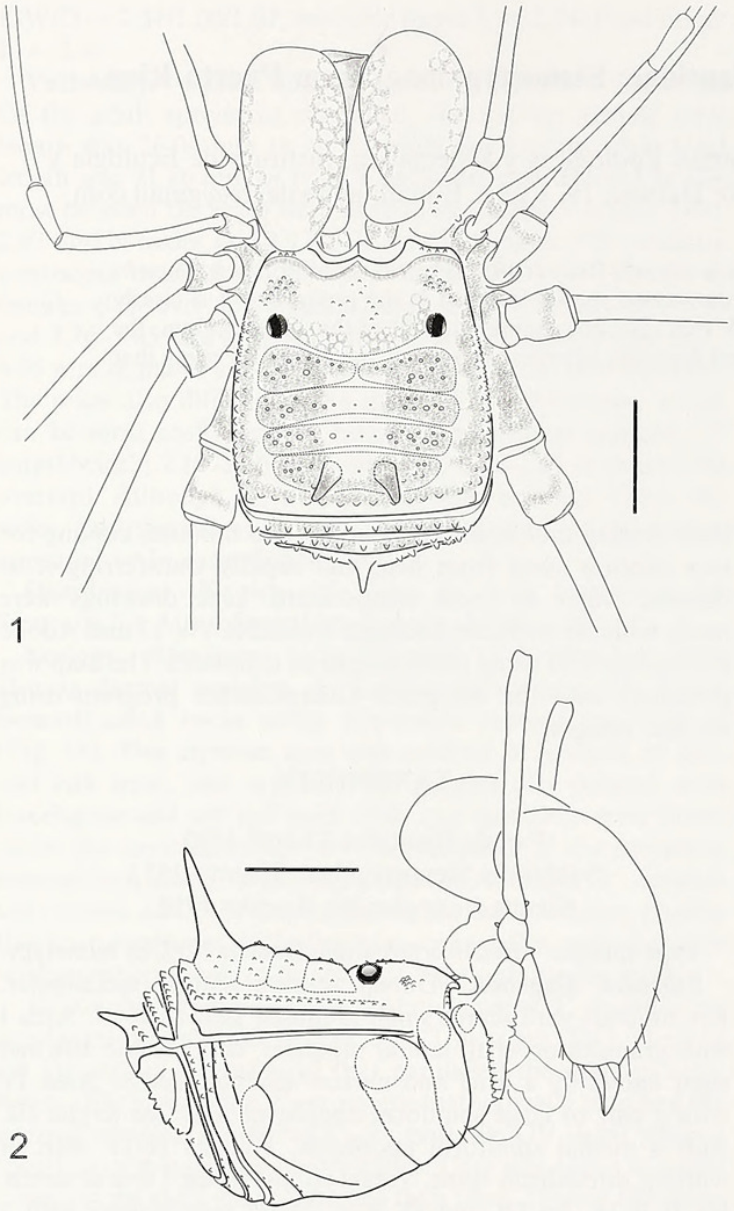
Emended diagnosis.—Dorsal scutum almost rectangular. Eye mounds with scarce small granules, near sulcus I. Area I with granules or small lateral tubercles, divided into left and right halves by a brief and narrow median groove. Area IV with a pair of large spiniform apophyses and free tergite III, with a medial spiniform apophysis. Femora II–IV with or without dorsodistal spine. Tarsal counts of leg I five or seven, leg II 9–14, leg III and IV 8–9. Penial morphology with a capsula interna composed by an apically pointed stylus, lateroapically flattened and wide, flanked by two basally fused conductors, apically with laminar lobes.

Remarks.—The penial morphology of the genus *Manahunca* points to a very close relationship with *Heterolacurbs*. Both of them present a markedly swollen pars distalis, a finger–like ventroapical process and a lateroapically flattened and wide pointed stylus. However, the apical ends of the conductors are very different between the two genera; in *Manahunca* species they are apically acute. The armature of the dorsal scutum and free tergites from both genera are also very different: the *Manahunca* species only present small tubercles.

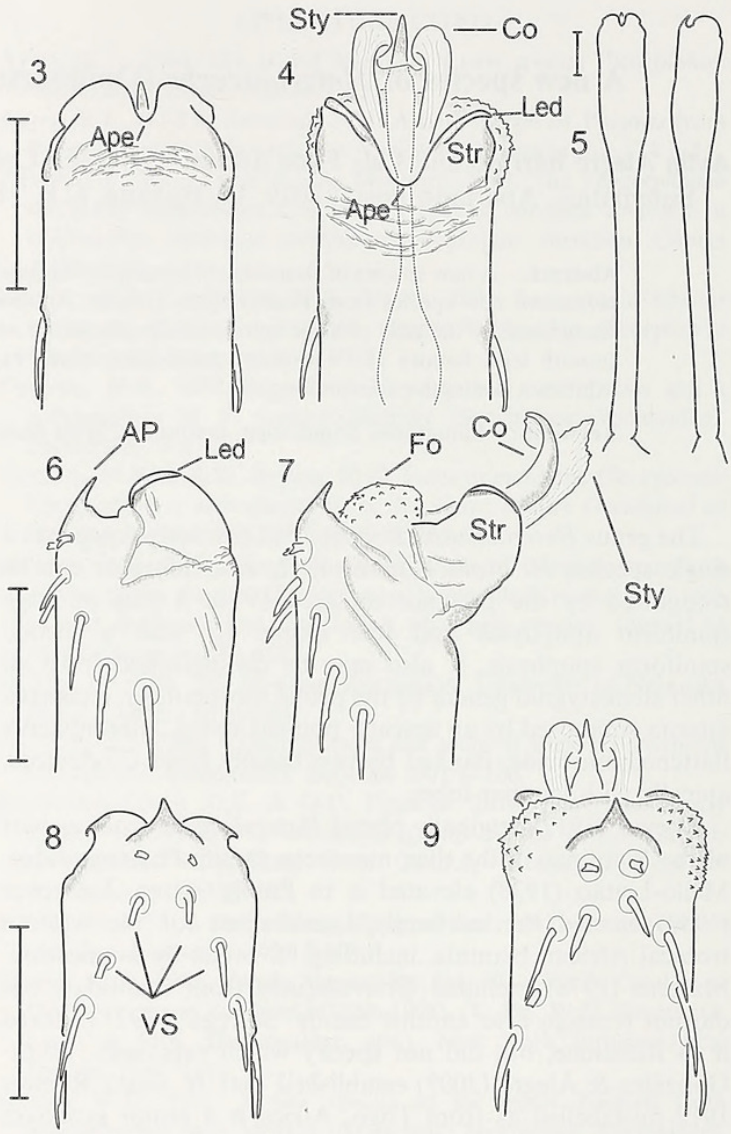
Heterolacurbs perezassoi new species
Figs. 1–10

Biantidae: Armas 2010:59, fig. 3E.
Heterolacurbs new species: Armas 2010:62.

Type material.—PUERTO RICO: holotype male, *Sierra de Guardarraya*, Barrio Los Pollos, farm at the end of road 7757, 18°00′00.8″N, 65°58′55.8″W, 170 m, 28 July 2010, L.F. Armas & A. Pérez Asso, under damp wood in yard of house (CZACC



Figures 1–2.—*Heterolacurbs perezassoi* new species, male holotype: 1. Habitus, dorsal view; 2. Habitus, lateral view. Scale = 1 mm.



Figures 3–9.—*Heterolacurbs perezassoi* new species, male holotype, distal part of penis: 3. Dorsal view; 4. Dorsal view; 5. Dorsal and lateral views, total penis; 6. Lateral view; 7. Lateral view, expanded; 8. Ventral view; 9. Ventral view, expanded. Abbreviations: Str, stragulum; Ape, aperture; Led, ledge; Co, conductors; Sty, stylus; Fo, follis; AP, apical process; VS, ventral setae. Scale = 0.1 mm.

3.3179). Paratypes: 1 male (CZACC 3.3180), 1 female (CZACC 3.3181), 1 male (CZACC 3.3182) and 1 female (CZACC 3.3183), same data as holotype.

Etymology.—The specific name honors Antonio Pérez Asso, a specialist who has worked actively with diplopods of the Antilles and has collaborated in the collection of the new species here described.

Diagnosis.—*Heterolacurbs perezassoi* new species is very close to *H. ovalis*, but is clearly distinguished from it by a pair of large spiniform apophyses on area IV, which possess a wide base, but do not restrain area III. Legs unarmed, with only scarce short sensilla, femora II–IV without dorsodistal spine, sternites with very small tubercles only, and higher tarsal formula. It also differs from *H. ovalis* in having a penis with a slightly more bulky gland, a lower ventral finger-like process, the two pairs of ventroapical setae more widely separated from each other, the most apical pair of setae reduced in size; and the stragulum with wider dorsal aperture and a thin apical ledge.

Description.—*Male holotype:* dorsal measurements: PL 0.96, PW 2.04, DSL 2.32, DSW 2.24. For measurements of appendages, see Table 1.

Dorsum (Figs. 1–2): Dorsal scutum almost rectangular. Anterior margin with shallow cheliceral sockets and 3–4 small tooth-like tubercles on each side. Prosoma finely granulated in the medial region and more heavily in the anterior region of each eye mound. Eye mounds with scarce small granules, near sulcus I. Lateral margins with two rows of tubercles, the lateral row more prominent, the tubercles increasing in size toward the posterior margin. Area I with small granules and divided into left and right halves by a brief and narrow median groove. Area II finely granulated. Area III granulated with 3–4 lateral small hair tubercles. Area IV with a pair of large spiniform apophyses, each one possessing a wide base that covers the entire length of the area, but without compressing area III. Posterior margin with a row of small hair tubercles, those on each corner larger. Free tergites I–II with a row of

Figure 10.—Distribution of the genus *Heterolacurbs*: *H. perezassoi* new species (▲); *H. ovalis* Roewer, 1912 (■).

small hair tubercles, those on each corner being more prominent, free tergite III with a medial strong spiniform apophysis. Anal operculum with small hair tubercles.

Venter: Coxae I, III and IV with an anterior row of hair tubercles, which are larger on the first coxa. Coxa II with only one small anterolateral tubercle. Free sternites with a row of very small hair tubercles, those toward each corner being a little more evident.

Chelicerae: Basichelicerite slightly granulated with bulla, hand greatly swollen (hypertelic) with scattered hairs concentrated mainly at the distal portion, chelicerae fingers with teeth, fixed finger with 16 small teeth and movable finger with one basal blunt tooth and 11–12 small distal teeth.

Pedipalps: Coxae dorsally with a proximal ectal tooth-like tubercle and three mesal small tubercles. Coxa ventrally with an ectal edge on which are 5–6 tubercles, the two most remarkable being the proximal with a tooth-like shape and the distal with one long hair. Trochanter with a small dorsal hair granule, ventrally with two hair tubercles and one ectoproximal small hair tubercle. Femur with scarce short hairs, dorsal unarmed and ventroproximal small hair tubercle. Patella enlarged in the 1/3 distal portion, dorsally with scarce small granules and a mesal ventrodistal setiferous tubercle. Tibia and tarsus with dorsal hair granules and ventrally armed with setiferous tubercles: tibia ectal: IIIIi (1 = 3 = 4 > 2 > 5); mesal: III (1 = 2 = 3), tarsus ectal: IiIii (1 > 3 > 2 = 4 = 5); mesal IiIii (1 > 3 > 2 > 4 = 5).

Legs: Smooth with scarce short hairs. Trochanter I ventrally with 2 small hair tubercles. Femora smooth. Metatarsi III–IV with two ventrodistal lateral and retrolateral spiniform projections, metatarsus III enlarged with spindle form on distal region. Tarsal claws smooth, double and lying perpendicular to the axis of the legs. Presence of dense scopula in distitarsus III and IV. Tarsal formula: 7(3): 14 (4): 9: 9.

Penis (Figs. 3–9)*:* Gland exhibiting a very wide stragulum, which articulates dorso-distally on the truncus like a jackknife and dorsally possesses a wide aperture and a distal thin ledge. When the penis is expanded, the ventral extension of the stragulum shows a spiny follis. Ventrally the truncus has a finger–like apical process and longitudinally five pairs of setae; the most apical pair is apically bifurcate and very short, the nearest pair is a little longer, and the rest of setae are longest and acuminate. The capsula interna is composed by a pointed *stylus*, dorsoventrally serrated and lateroapically flattened and wide, flanked by two basally fused conductors, with apical laminar lobes.

Coloration (in ethanol): Dorsum reddish brown with darker brown and yellowish tones. Carapace with the medial region yellowish and toward the sulcus I and lateral sides with dark brown reticules. Anterior margin with a dark brown line all over the border. Lateral and posterior margins dark brown. Areas I–IV dark brown with a lighter medial region beyond sulcus II to area IV. Surrounding zone of the mesotergal areas reddish brown. Pair of apophyses on area IV dark brown, medial apophysis on free tergite III lighter. Coxae brown with darker region at their distal portions. Trochanters yellowish with a dark brown line at the distal portion. Femora-tarsi I–III yellowish with dark brown stripes on the distal portion and lighter spots on the stripes. Femur, patella and tibia IV reddish, with the same pattern of stripes and lighter spots. Pedipalps yellowish with dorsal dark brown reticules on tibia and tarsus. Chelicerae yellowish with lateral and medial dark brown reticules; distal part of the hand and fingers reddish.

Female: similar to the male. Anterior margin with 6 tooth-like tubercles toward the each side. Pedipalp coxae dorsally with a mesal small tooth-like tubercle. Sexual dimorphism in legs III and IV; femur, patella and tibia less enlarged, metatarsus III without enlarged spindle. Coloration pattern in ethanol differs in leg IV; femur, tibia and patella not reddish, but of the same color as the other legs.

Variation: Measurement variations in Table 1. Tubercles on mesotergal areas, free tergites and free sternites variable in size and number. Dimension of medial spiniform apophysis on free tergite III varies from one to two times the segment length. Coxae of male pedipalps vary in number of dorsoproximal mesal tubercles (2–3) and ventro-ectal (3–5–6) tubercles. Tarsus of pedipalps with variable number of setiferous tubercles, ectal 4–5 setiferous tubercles, mesal 4–5 setiferous tubercles. Tarsal formula: 7:12–14:9:9.

Table 1.—*Heterolacurbs perezassoi* new species: Dorsal scutum, pedipalp and legs measurements expressed in millimeters.

♂ (holotype) CZACC 3.3179	♂ (paratype) CZACC 3.3180	♂ (paratype) CZACC 3.3182	♀ (paratype) CZACC 3.3181	♀ (paratype) CZACC 3.3183
Dorsal scutum				
DSL 2.32	2.40	2.44	2.48	2.40
DSW 2.24	2.28	2.24	2.24	2.08
PL 0.96	0.96	1.00	0.92	1.00
PW 2.04	2.08	2.04	1.84	1.80
Pedipalp				
Tr 0.43	0.45	0.43	0.38	0.38
Fe 2.20	2.10	2.13	1.95	1.88
Pa 1.25	1.25	1.20	1.23	1.18
Ti 0.80	0.78	0.80	0.75	0.78
Ta 1.53	1.55	1.55	1.43	1.45
Total 6.21	6.13	6.11	5.74	5.67
Leg I				
Tr 0.35	0.40	0.35	0.35	0.30
Fe 2.00	2.00	2.00	1.85	1.85
Pa 0.55	0.50	0.55	0.45	0.50
Ti 1.80	1.75	1.75	1.60	1.55
Mt 2.75	2.62	2.55	2.35	2.35
Ta 1.25	1.20	1.20	1.05	1.10
Total 8.70	8.47	8.40	7.65	7.65
Leg II				
Tr 0.50	0.55	0.50	0.40	0.45
Fe 4.90	4.75	4.55	4.55	4.70
Pa 0.75	0.80	0.80	0.70	0.75
Ti 4.10	4.00	3.85	3.80	3.80
Mt 5.70	5.04	5.10	4.80	4.80
Ta 3.02	3.05	2.85	2.80	2.80
Total 18.97	18.19	17.65	17.05	17.30
Leg III				
Tr 0.55	0.55	0.60	0.50	0.55
Fe 3.50	3.35	3.30	3.25	3.15
Pa 0.90	0.92	0.90	0.80	0.80
Ti 2.25	2.30	2.25	2.15	2.15
Mt 4.20	3.80	3.95	3.60	3.60
Ta 1.75	1.65	1.70	1.60	1.50
Total 13.15	12.57	12.70	11.90	11.75
Leg IV				
Tr 0.60	0.65	0.65	0.60	0.55
Fe 4.60	4.35	4.40	4.65	4.75
Pa 1.05	0.95	1.00	0.90	0.95
Ti 2.95	2.75	2.75	2.60	2.90
Mt 5.58	5.16	5.28	4.92	4.98
Ta 2.25	2.15	2.10	1.95	1.80
Total 17.03	16.01	16.18	15.62	15.93

Distribution.—Known from Puerto Rico: Sierra de Guardarraya, Barrio Los Pollos (Fig. 10).

Natural history.—The specimens were collected in the backyard of a house (170 m a.s.l.), under damp logs (see Armas 2010:59, fig. 3E), living together with species of the family Cosmetidae and other unidentified opilions, also sharing the habitat with the buthid scorpion *Tityus obtusus* (Karsch 1879), undetermined Corinnidae, *Avicularia* sp. (Theraphosidae) and the whip spider *Phrynus longipes* (Pocock 1894) (Armas 2010).

Remarks.—In *H. perezassoi* n. sp. the dorsodistal spine on femur II–IV of the legs is absent, but in *H. ovalis* it is present. This remarkable interspecific difference also occurs between the Cuban stenostygnids *Galibrotus carlotanus* Šilhavý 1973, *G. riedeli* Šilhavý 1973 and *G. matiasis* Avram 1977. This spine is present in the first species, but lacking in the last two. The absence or presence of this character in different species from the same genus seems to occur indistinctly. The length of legs I to IV in *H. ovalis* varies from 9.0, 18.0, 14.5, 18.0 mm in the holotype (Roewer 1912) to 5.0, 10.4, 7.4, 10.6 in the holotype of *Martibianta virginsulana* (Šilhavý 1973). However, among the specimens of *Heterolacurbs perezassoi* examined there is no remarkable variability in the length of the legs (see Table 1); they exhibit measurements very similar to Roewer's type.

Regarding the coloration pattern, even when both species have a lighter medial region, the new species does not exhibit lighter spots on each tubercle of the mesotergal areas and posterior margin.

Manahunca silhavyi Avram 1977 and *H. perezassoi* share similarities such as long, smooth legs; long pedipalps and pattern of coloration. However, the armature of the dorsal scutum and free tergites are very different: in *M. silhavyi*, they are unarmed and only provided with small tubercles.

Before this study, the only known records for Stenostygninae in the Antilles were from Haiti on the island of Hispaniola (2 genera and 2 species), St. Johns and St. James, United States Virgin Islands (1 genus and 1 species), and from Cuba (5 genera and 13 species). *Heterolacurbs perezassoi*, from the island of Puerto Rico constitutes a new distributional record of this subfamily. However, with the complicated geological history of the Antilles and favorable conditions for harvestmen (tropical forests, mountainous territories and high humidity), we expect to find new members of this subfamily in this area. The diversity of stenostygnid species found in Cuba shows that every island of the Greater Antilles could have experienced a high level of speciation, which is why we highly recommend more collecting of these Laniatores around the Antillean region.

ACKNOWLEDGMENTS

Thanks are given to René Barba Díaz and Abel Pérez González for their helpful comments on the manuscript. Also we are grateful to David O. Martínez for helping with the coordinates of the type locality. This work would not have been possible without the sponsorship of Víctor L. González Barahona (San Juan, Puerto Rico), who kindly financed the arachnological expedition of L.F. de Armas in Puerto Rico. Also we express our gratitude to Antonio Pérez Asso (Hacienda Paraíso, Ponce) for his valuable support during the fieldwork and his collaboration in collecting.

LITERATURE CITED

Acosta, L.E., A. Pérez-González & A.L. Tourinho. 2007. Methods and techniques of study. Pp. 489–524. *In* Harvestmen: the Biology of Opiliones. (R. Pinto-da-Rocha, G. Machado & G. Giribet, eds.). Harvard University Press, Cambridge, Massachusetts.

Armas, L.F. de. 2010. Nuevos arácnidos de Puerto Rico (Arachnida: Amblypygi, Araneae, Opiliones, Parasitiformes, Schizomida, Scorpiones). Boletín de la Sociedad Entomológica Aragonesa 47:55–64.

Kury, A.B. & A. Pérez-González. 2007. Biantidae Thorell, 1889. Pp. 176–179. *In* Harvestmen: the Biology of Opiliones. (R. Pinto-da-Rocha, G. Machado & G. Giribet, eds.). Harvard University Press, Cambridge, Massachusetts.

Lawrence, R.F. 1959. Faune de Madagascar, Arachnides-Opilions. Publications de L'Institut de Recherche Scientifique Tananarive-Tsimbazaza 9:1–121.

Martens, J. 1978. Spinnentiere, Arachnida: Weberknechte, Opiliones. Pp. 1–464. *In* Die Tierwelt Deutschlands, part 64. (K. Senglaub, H.J. Hannemann & H. Schumann, eds.). G. Fischer, Jena, Germany.

Mello-Leitão, C.F. de. 1938. Considerações sobre os Phalangodoidea Soer. com descrição de novas formas. Annaes da Academia Brasileira de Sciencias 10:135–145.

Pérez-González, A. & A. Alegre. 2009. On the enigmatic *Heterolacurbs ovalis* Roewer, 1912 (Opiliones, Laniatores, Biantidae). Zootaxa 2269:65–67.

Pinto-da-Rocha, R. 1997. Systematic review of the Neotropical family Stygnidae (Opiliones, Laniatores, Gonyleptoidea). Arquivos de Zoologia 33:163–342.

Roewer, C.F. 1912. Die Familien der Assamiden und Phalangodiden der Opiliones-Laniatores. (= Assamiden, Dampetriden, Phalangodiden, Epedaniden, Biantiden, Zalmoxiden, Samoiden, Palpipediden anderer Autoren). Archiv für Naturgeschichte, Abt. A: Original-Arbeiten 78(3):1–242.

Staręga, W. 1992. An annotated check-list of harvestmen, excluding Phalangiidae, of the Afrotropical Region (Opiliones). Annals of the Natal Museum 33:271–336.

Manuscript received 15 November 2011, revised 18 June 2012.