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Four new genera and eight new species of Aradidae (Hemiptera: Heteroptera) from Venezuela

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Abstract

Hitherto, only 24 species belonging to 13 genera of the flat bug family Aradidae have been recorded from Venezuela, including two genera and species of the subfamily Carventinae Usinger, 1950 and none of the subfamily Aneurinae Douglas & Scott, 1865. In the present paper, the following apterous carventine taxa are described and illustrated: *Rabitschaptera scudderi* gen.n. et sp.n., *Meridacoris glabroapicalis* gen.n. et sp.n., *Caraboboaptera wachteli* gen.n. et sp.n., and *Carabobocoris cerropajanus* gen.n. et sp.n. Further new Aneurinae described are *Aneurus micropygus* sp.n., *Iralunelus brachati* sp.n., *Iralunelus bolivari* sp.n., and *Iralunelus guatopoensis* sp.n. A key to the species of Carventinae and Aneurinae of Venezuela is presented.

Key words: Heteroptera, Aradidae, Carventinae, Aneurinae, apterous, new genera, new species, Venezuela.

Zusammenfassung

Von Venezuela sind bisher 24 Arten aus 13 Gattungen der Familie Aradidae (Rindenwanzen) bekannt geworden. Dies ist für ein so großes und habitatreiches Land eine bescheidene Artenzahl, was vor allem auf die wenigen Belege in den institutionellen Sammlungen und auch kaum angewendete geeignete Sammelmethoden – z. B. für aptere Taxa – zurückzuführen ist. So sind von der Unterfamilie Carventinae Usinger, 1950 bisher nur zwei Arten aus zwei Gattungen bekannt geworden. Belege der Unterfamilie Aneurinae waren bisher nicht von Venezuela bekannt. Die Bearbeitung von drei Beifang-Ausbeuten brachte vier neue Gattungen und Arten apterer Vertreter der Unterfamilie Carventinae: *Rabitschaptera scudderi* gen.n. et sp.n., *Meridacoris glabroapicalis* gen.n. et sp.n., *Caraboboaptera wachteli* gen.n. et sp.n. und *Carabobocoris cerropajanus* gen.n. et sp.n., welche nachstehend beschrieben und abgebildet werden. Weiters werden neue Belege von zwei Gattungen und vier Arten der Unterfamilie Aneurinae mitgeteilt: *Aneurus micropygus* sp.n., *Iralunelus brachati* sp.n., *Iralunelus bolivari* sp.n. und *Iralunelus guatopoensis* sp.n. Ein Bestimmungsschlüssel für die in Venezuela bisher nachgewiesenen Gattungen und Arten der Unterfamilien Carventinae und Aneurinae wird vorgelegt.

Introduction

The most recent synopsis of the Neotropical fauna of the flat bug family Aradidae was published in the Catalog of Aradidae for the Neotropical Region (Coscaron & Contreras 2012). It reported 509 species assigned to 80 genera. Later published additional records and descriptions of twelve new genera and 22 new species, all but two by the author,

raised the total number to currently 92 genera and 532 species (Heiss 2012, 2013, 2014, 2017, 2018, 2019, Contreras et al. 2018, Lopez & Costa 2018).

Although the Neotropical Region (mainland South America, Mesoamerica including Mexico) is very rich in habitats suitable for Aradidae, the flat bug fauna recorded to date is still insufficiently known and numerous new taxa can be expected, when adequate collecting methods, such as sifting leaf- or forest litter or using pan and pit traps, will be adopted.

Particularly, apterous species are living and developing in such substrates and therefore are rarely collected and underrepresented in museum collections.

To date, the known flat bug fauna of Venezuela comprises 13 genera and 24 species belonging to four subfamilies (Coscaron & Contreras 2012):

Aradinae:

Aradus compressicornis Stål, 1873

Calisiinae:

Calisius major Bergroth, 1913

Carventinae:

Aparilocoris venezuelanus Kormilev, 1983

Neproxius gypsatus (Bergroth, 1898)

Mezirinae:

Cinyphus subtruncatus Bergroth, 1898

Cinyphus terminalis Kormilev, 1968

Cinyphus venezuelanus Kormilev, 1968

Dysodius lunatus (Fabricius, 1794)

Hesus flaviventris (Burmeister, 1835)

Hesus mexicanus Kormilev, 1968

Limonocoris jolyi Kormilev, 1971

Mezira barberi Kormilev, 1964

Mezira crenulata Kormilev, 1968

Mezira neonigripennis Kormilev, 1953

Mezira sanmartini Kormilev, 1968

Mezira venezuelana Kormilev, 1971

Nannium elongatum Bergroth, 1898

Nannium parvum Bergroth, 1898

Neuroctenus amazonicus Kormilev, 1960

Neuroctenus terginus (Stål, 1860)

Notapictinus araguensis Kormilev, 1985

Notapictinus varelai Kormilev, 1975

Notapictinus venezuelanus Kormilev, 1971

Pictinus venezuelanus Kormilev, 1968

The subfamily Carventinae is only represented by two species, *Aparilocoris venezuelanus* Kormilev, 1983 and *Neproxius gypsatus* (Bergroth, 1898), of which the latter is macropterous and widespread (Guatemala, Panama, French Guyana, Brazil, Bolivia, Peru). *Aparilocoris venezuelanus* is only known from the holotype from Aragua, Rancho Grande, Bordon. Because of its small size and limited range of distribution, it can be assumed that this species is endemic. No record of the subfamily Aneurinae is known to date.

Material and methods

The material upon which this study is based is deposited in the collection of the author (CEHI) at the Tiroler Landesmuseum. As apterous aradid specimens collected from litter are usually covered by incrustation obscuring the body structures, they were cleaned and remounted for the study of the ventral side bearing arrangements of glandular tubercles essential for taxonomy.

Photos were taken with Nikon Coolpix 300 camera and processed with paint.net software. Arrows on imaged specimens indicate the position of glandular structures on male sternite VII.

When citing the text on the labels of a pin attached to the specimens / separates the lines and // different labels.

Measurements were taken with a micrometre eyepiece (40 units = 1 mm), then converted and given in millimetres.

Abbreviations used: deltg = dorsal external laterotergite (connexivum), mtg = mediotergite, vltg = ventral laterotergite, ptg = paratergite.

Taxonomy

Carventinae Usinger, 1950

Key to Carventinae genera and species recorded from Venezuela

1 Macropterous. ..... *Neoproxius gypsatus* (Bergroth, 1898)

– Apterous. 2

2 Thorax and abdomen bulbously elevated. ..... *Aparilocoris venezuelanus* Kormilev, 1983

– Thorax and abdomen not bulbously elevated. 3

3 Antennae longer, about 1.70–1.80 times as long as width of head. Head distinctly longer than wide. 4

– Antennae shorter, about 1.30–1.55 times as long as width of head. Head shorter, about as wide as long. 5

4 Male vltg VII with a pivot-like glandular protuberance. Female with a distinct hump on mtg VI (Figs. 1–5). ..... *Rabitschaptera scudderi* gen.n. et sp.n.

– Male vltg VII with an oval flat glandular structure. Female without any elevation on mtg VI (Figs. 6–9). ..... *Meridacoris glabroapicalis* gen.n. et sp.n.

5 Median thoracic ridge elongate, smooth and narrow at base, female with a small triangular elevation on tergite VII, spiracles II–III lateral and visible from above (Figs. 10–12). ..... *Caraboboaptera wachteli* gen.n. et sp.n.

– Median thoracic ridge triangular, striate and wide at base, female with a distinct hump on tergite VII, spiracles II–IV ventral (Figs. 13, 14). .... *Carabobocoris cerropajanus* gen.n. et sp.n.

Rabitschaptera gen.n.

Type species: *Rabitschaptera scudderi* sp.n.

Etymology: This new genus is dedicated to my friend Dr. Wolfgang Rabitsch, Vienna, expert heteropterologist and book author on environmental issues, appreciating his long-lasting friendship and biographical support, also recognizing his scientific oevre on systematic and faunistic matters and his continuous activities in favour of the Austrian entomologists.

Diagnosis: *Rabitschaptera* gen.n. is recognized by the following combination of characters: apterous; eyes not stalked; deltg II+III fused; spiracles II–IV ventral, V–VII

lateral and visible from above. The most striking feature is the conical pivot-like glabrous projection on the ventral side of vltg VII apex of the male. The latter character is only shared by the apterous genus *Grenadaptera* Heiss, 2019 with the species *G. ursulae* from Grenada Island of the Lesser Antilles. *Rabitschaptera* gen.n. is clearly distinguished from *Grenadaptera* by genae not produced over clypeus (vs. distinctly produced), eyes not stalked (vs. stalked), spiracles II–IV ventral, V–VII lateral (vs. II–VII lateral), median thoracic ridge longitudinally striate (vs. smooth ridge), deltg VII of male bluntly rounded (vs. triangularly produced), mtg VI of female with a median hump (vs. without elevation).

Description: Small sized, body stout; thorax and abdomen about 1.5 times longer than wide across tergite IV. Colouration yellowish brown to darker brown; antennae and legs yellow; femora and tibiae with blackish apex; surface of body glabrous.

Head longer than wide, genae as long as clypeus. Antennae about 1.70 times as long as width of head. Eyes globular, not stalked; postocular lobes without distinct tubercles; collar long, cylindrical. Rostrum arising from a slit-like atrium.

Thorax: Pro-, meso-, and metanotum consisting of transverse sclerites, separated at middle by a triangular fused ridge with a median carina, laterally striate, reaching from pronotum to mtg III. This median ridge includes also the fused mtg I+II; their fusion line is not discernible. Legs unarmed and slender, beset with small setigerous tubercles; claws with pulvilli.

Abdomen: Lateral margins slightly rounded; deltg II+III fused; tergal plate consisting of mtg III–VI raised at mtg III–IV, laterally sloping and striate; deltg VII of male roundly produced posteriorly, ventral side with a conical glandular tubercle. Spiracles II–IV ventral, V–VII lateral and visible from above.

Female basically as male, but of larger size; mtg VI with a distinct median hump.

***Rabitschaptera scudderi* sp.n.** (Figs. 1–5)

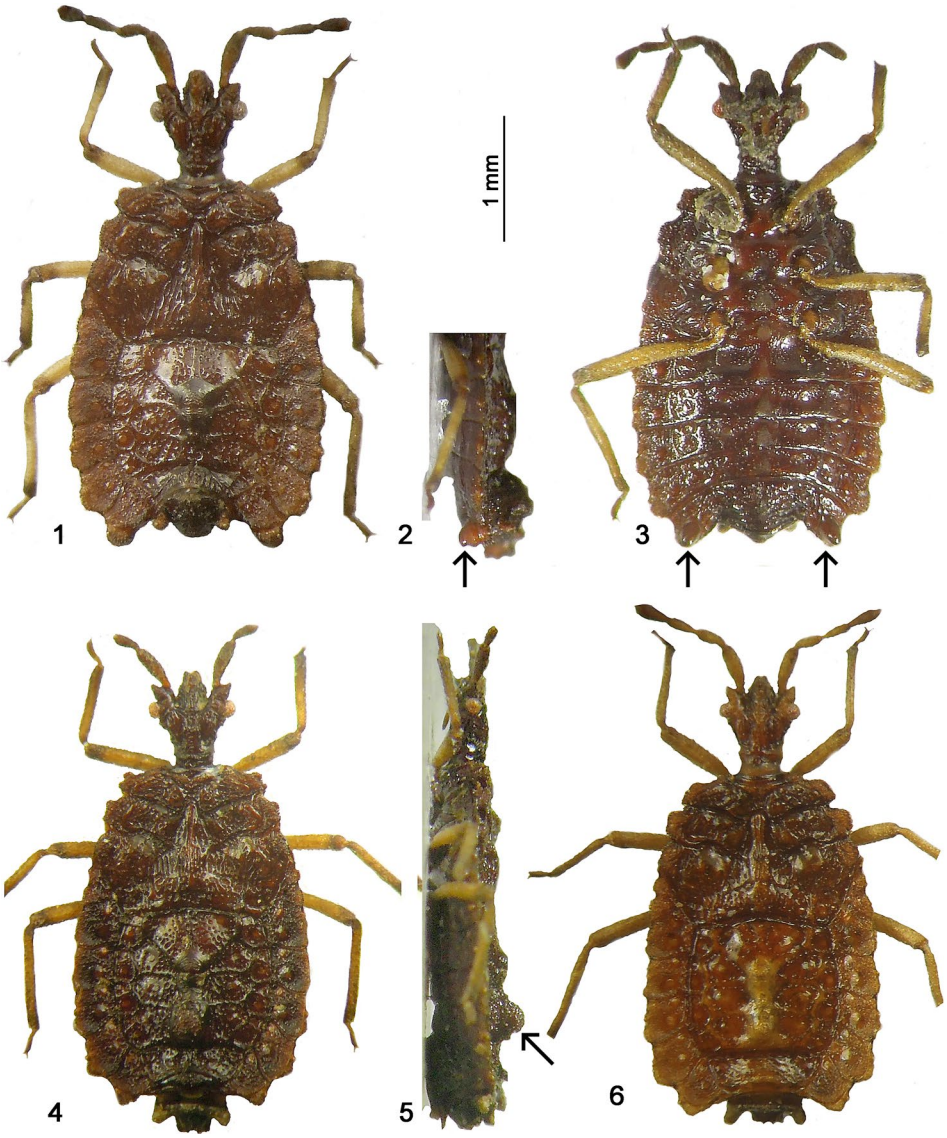
Type material: Holotype (male) labelled: Venezuela / Merida St. La / Montana 1988 / collected in Pan Trap / Alt. 2436 m // 10-13 IV 1988 / A.T. Finnamore / & C.E. Boxfield / Collectors // ex collection / G.G.E.Scudder //. Paratypes, labelled as holotype but different collecting dates: 3 males, 3–6 IV 1988; 1 female, 7–11 IV 1988; 1 female, 8–10 IV 1988; 1 female with data of holotype. They are designated and provided with type labels.

Etymology: Named after G.G.E. Scudder (Vancouver, Canada) who generously donated these specimens, recognizing his numerous and important contributions to the world fauna of Heteroptera.

Description of male: Measurements of holotype: length 4.1; width of pronotum 1.30, of mesonotum 1.80, of metanotum 1.95; width of abdomen across tergite IV, 2.35. Paratypes: length 4.10–4.30.

Head longer than wide (1.00 / 0.85); genae adhering to clypeus not produced; antenniferous lobes blunt with angular apex. Antennae 1.73 times as long as width of head; antennal segment I thickest and longest, II–IV thinner and shorter; length of segments I / II / III / IV = 0.50 / 0.30 / 0.35 / 0.33. Eyes globular and granulate, not stalked; postocular lobes with few small round tubercles, converging posteriorly to long neck.

Thorax: Pro- and mesonotum consisting of two transverse sclerites with oval callosities, separated medially by a posteriorly widening fused ridge reaching from anterior incision



Figs. 1–6: (1–5) *Rabitschaptera scudderi* gen.n. et sp.n.: holotype male, dorsal (1), lateral (2) and ventral (3), arrows indicate pivot-like glandular structures; paratype female, dorsal (4) and lateral (5), arrow indicates hump on mtg VI; (6) *Meridacoris glabroapicalis* gen.n. et sp.n., female, dorsal.

of pronotum to tergal plate. Metanotum consisting of two larger oval sclerites, depressed parts lateral of median ridge longitudinally striate, posteriorly fused to mtg I+II. Meso- and metasternum fused, surface glabrous.

Abdomen: Tergal plate with a conical elevation on mtg III–IV; surface striate, sloping toward margins; deltg II+III fused; lateral margins of deltg V–VII enlarged by dorsally reflexed rim of vltg V–VII bearing spiracles V–VII; spiracles II–IV ventral.

Genitalic structures: Pygophore conical and strongly elevated; ptg VIII small, directed upward, with spiracle VIII on its apex.

Description of female: Measurements of paratypes: length 5.10–5.25. Basic structures as of male. Tergal plate with an additional distinct hump on mtg VI; deltg VII triangularly produced.

Distribution: So far only recorded from pan traps in the mountainous area around Merida in Central Venezuela.

Meridacoris gen.n.

Type species: *Meridacoris glabroapicalis* sp.n.

Etymology: Named after the Province and City of Merida where the specimens were collected and "coris", the Greek word for true bug.

Diagnosis: Apterous, of small size; eyes not stalked; thorax wide, laterally trilobate, medially with a fused triangular ridge extending from pronotum to tergal plate; deltg II+III fused, spiracles II–IV ventral, V–VII lateral, vltg VII of male with an oval glandular structure on apical half.

Rabitschaptera gen.n., collected from the same locality as *Meridacoris* gen.n., shares most characters with this genus, but differs at first glance by larger size, rounded, not triangular deltg VII of male and the conus-like glandular tubercle on male vltg VII; the females by a large hump on mtg VI lacking in *Meridacoris* gen.n.

The most closely related genus seems to be *Acaricoris* Harris & Drake, 1944 with the type species *A. ignotus* from southern United States. Of the five species assigned to this genus and listed by Coscaron & Contreras (2012), three (*A. austeris* Drake & Kormilev, 1958, *A. barroensis* Drake & Kormilev, 1958, *A. clausus* Drake & Kormilev, 1958) were recognized to belong to *Kolpodaptera* Usinger & Matsuda, 1959 (Heiss 2018). Two species (*A. haitiensis* Kormilev, 1968, *A. lattini* Heiss, 2008) are reported from Haiti and the Dominican Republic. *Meridacoris* gen.n. differs from *Acaricoris* by different habitus with trilobate thorax (vs. laterally rounded), long head and neck (vs. shorter head and neck), and size and position of large glandular protuberance on apex of vltg VII of male (vs. small round tubercle at middle of vltg VII).

Grillo (1988) described several apterous Carventinae from Cuba, three of them sharing part of the set of characters given for *Meridacoris* gen.n., differing however in other characters: *Protokolpodaptera* by a short head and a glandular tubercle at apex of deltg VII of male; *Planocoris* by genae longer than clypeus, rounded anterolateral angles of pronotum, and apical position of glandular tubercle at deltg VII of male; *Yvacoris* (only the female holotype known) by larger size (5.48 mm) and postocular tubercles.

Description: Small sized. Colouration yellowish brown; legs and antennae yellow; surface of body glabrous.

Head longer than wide, genae as long as clypeus; antennae about 1.7 times as long as width of head; eyes globular, not stalked; postocular lobes straight without tubercles; neck as long as wide; rostrum arising from a slit-like atrium.

Thorax: Pro-, meso-, and metanotum consisting of transverse and oval sclerites lateral of the median triangular ridge reaching from pronotum to tergal plate; this posteriorly widening structure includes the fused mtg I and II, its surface is longitudinally striate; lateral margins angularly lobate. Legs unarmed and slender; claws with pulvilli.

Abdomen: Posterolateral angles of deltg II–VII progressively produced, deltg II+III fused; tergal plate moderately raised at middle, spiracles II–IV ventral, V–VII lateral and visible from above; vltg VII of male with an oval glandular structure.

Meridacoris glabroapicalis **sp.n.** (Figs. 6–9)

Type material: Holotype (male) labelled: Venezuela / Merida St. La / Montana 1988 / collected in Pan Trap / Alt. 2436 m // 8 – 10 IV 1988 / A.T. Finnamore / & C.E.Boxfield / Collectors //. Paratypes: 1 male labelled as holotype, but date 3 – 6 IV 1988, 1 male, 1 female with date 8 – 10 IV 1988. (CEHI). They are designated and provided with type labels.

Etymology: The name recalls the unique glabrous preapical glandular structure of the male.

Description of male: Measurements: Holotype: length 3.5; width of pronotum 1.30, of mesonotum 1.60, of metanotum 1.75; width of abdomen across tergite IV 1.95. Paratypes: length 3.40–3.50.

Head longer than wide (0.90 / 0.75); genae as long as clypeus; antenniferous lobes with blunt apex. Antennae 1.73 times as long as width of head; segment I longest and thickest, II–IV shorter; length of segments I / II / III / IV = 0.45 / 0.25 / 0.30 / 0.30. Eyes globular, inserted in head; postocular lobes straightly converging posteriorly, then recessed at narrower constricted neck.

Thorax: Pronotum consisting of two oblique sclerites, medially separated by a furrow which is widening anteriorly and delimited by the thin transverse collar; surface with irregular oval callosities, lateral margins raised, produced and angularly rounded. Mesonotum with basic structure as pronotum, a fused triangular median ridge widening posteriorly; surface lateral of ridge longitudinally striate. Metanotum with two oval callosities lateral of median ridge, lateral margins as of pro- and mesonotum.

Abdomen: Fused mtg I and II not discernible. Tergal plate smooth with elevated thoracic scent gland scars on mtg III and IV, laterally with usual pattern of depressions marking the segments; deltg II–III fused, anteriorly reaching metanotum; posterolateral angles of deltg V–VII increasingly produced consisting of dorsally reflexed rim of vltg V–VII bearing the spiracles; spiracles II–IV ventral.

Description of female: Measurements: Length 4.2; head length / width 0.90 / 0.78; ratio length of antennae / width of head 1.80, length of antennal segments I / II / III / IV = 0.50 / 0.30 / 0.30 / 0.30; width of pronotum 1.50, of mesonotum 1.80, of metanotum 1.95; width of abdomen across tergite IV 2.30. Larger and wider body. Colouration lighter. Tergal plate with very shallow median elevation; deltg VII triangular, shorter than ptg VIII.

Distribution: Venezuela, from pan traps in mountainous area near Merida. Assumed to be endemic.

Carabobocoris **gen.n.**

Type species: *Carabobocoris cerropajanus* sp.n.

Etymology: The genus is named after the Province Carabobo where the specimens were collected, and “coris” (Greek) for true bug.

Diagnosis: *Carabobocoris* gen.n. resembles and is related to *Caraboboaptera* gen.n. collected from the same locality and sharing the general habitus and structure of head. It

differs however at once by larger size 5.2 (vs. 4.4 in female), the elevated, striate, triangular median thoracic ridge (vs. flat, smooth, bi-rhomboid, and narrow), shorter antennae, 1.3 times as long as width of head (vs. longer, 1.50–1.59), deltg II–VII of abdomen laterally reflexed (vs. flat, not reflexed); spiracles II ventral, III–IV sublateral (vs. II–III lateral, IV sublateral), legs and antennae with longer setigerous pilosity (vs. shorter pilosity), and tergite VII of female with a distinct round hump (vs. small, oval callosity).

The striate thoracic ridge is also shared by *Rabitschaptera* gen.n., but there it is narrower and less elevated. *Carabobocoris* gen.n. further differs by a shorter head, shorter antennae (1.3 times vs. 1.7 times as long as width of head, slightly stalked eyes (vs. not stalked), and a distinct round hump on tergite VII (vs. hump on tergite VI).

This single female was surprisingly collected from the same locality as *Caraboboaptera* gen.n. and first considered as a second species of the latter. However, as the set of essential differences mentioned above is not shared by any other neotropical Aradidae, a new genus is proposed for this distinct species. Unless a male presumably congeneric specimen with characteristic glandular structure is found, the true taxonomic relationship of this new genus cannot be proved.

Description: Head about as long as wide; genae longer than clypeus; antennae about 1.3 times as long as width of head; eyes globular, slightly stalked; postocular lobes straight without tubercles; rostrum arising from a slit-like atrium.

Thorax: Pro-, meso-, and metanotum consisting of transverse and oval sclerites lateral of the median raised triangular ridge reaching from pronotum to tergal plate including meso-, metanotum, and fused mtg I+II; its surface longitudinally striate; lateral margins tuberculate and angularly lobate. Legs unarmed and slender; claws with pulvilli.

Abdomen: Posterolateral angles of deltg II–VII progressively produced, deltg II+III fused; tergal plate moderately raised at middle; spiracles II ventral, III+IV sublateral, V–VII lateral and visible from above.

***Carabobocoris cerropajanus* sp.n.** (Figs.10, 11)

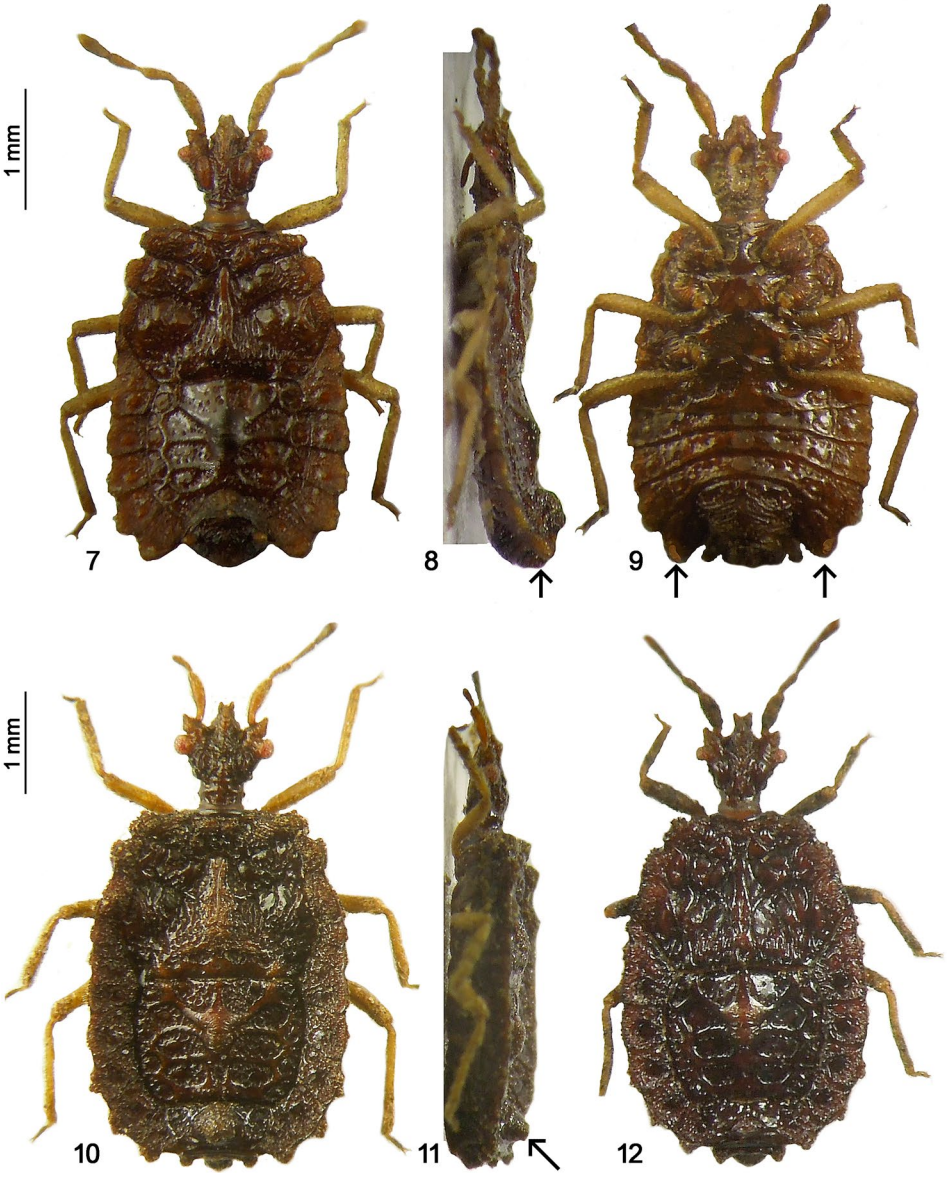
Type material: Holotype (female) labelled: Venezuela, Carabobo / Cerro de Paja Mts. / 1500 m / F.Wachtel 16.11.05 // (CEHI). It is designated and provided with type labels.

Etymology: The name refers to the mountain range Cerro de Paja in Carabobo state, where it was collected.

Description of female: Measurements: length 5.2; head length / width 1.20 / 1.15; ratio length of antennae / width of head 1.30, length of antennae 1.50; width of pronotum 2.05, of mesonotum 2.05, of metanotum 2.65; width of abdomen across tergite IV 3.00.

Head slightly longer than wide (1.20 / 1.15); genae produced over clypeus; clypeus medially raised, with a round tubercle. Antennae 1.3 times as long as width of head; I longest, II shortest; length of antennal segments I / II / III / IV = 0.55 / 0.25 / 0.35 / 0.35. Eyes slightly stalked and granulate, separated anterolaterally by a cleft from antenniferous lobes. Postocular lobes without tubercles, converging to constricted neck which is separated from head by a carina and a deep furrow. Vertex and infraocular space longitudinally striate.

Thorax: Pronotum strongly transverse, about four times as wide as long (2.05 / 0.50); anterior margin straight, with a short median ridge; disk irregularly sculptured; lateral margins raised and beset with setigerous tubercles; posterior margin bi-sinuate, medially



Figs. 7–12: (7–9) *Meridacoris glabroapicalis* gen.n. et sp.n.: holotype male, dorsal (7), paratype male, lateral (8) and ventral (9) arrows indicate oval glandular structures; (10, 11) *Carabobocoris cerropajanus* gen.n. et sp.n.: female holotype, dorsal (10) and lateral (11), arrow indicates hump on tergite VII; *Caraboboaptera wachteli* gen.n. et sp.n., paratype female, dorsal (12).

incised for the reception of the apex of median ridge. Mesonotum medially triangularly elevated, widening posteriorly, fused to metanotum and mtg I+II, highest on transverse suture metanotum-mtg I, then sloping posteriorly to tergal plate; sclerites lateral of median ridge irregularly sculptured; lateral margins raised and granulate. Metanotum lateral of median ridge depressed, with oval callosities; structure of lateral margins as of pro- and mesonotum.

Abdomen: Tergal plate medially elevated on mtg III–IV, sloping laterally; lateral margins of deltg II–VII reflexed, surface irregularly sculptured; deltg II+III fused; spiracles II ventral, III+IV sublateral but not visible from above, V–VII lateral and visible from above, placed on triangular expansions of dorsally reflexed vltg V–VII; female tergite VII with a large median hump (Fig. 11)

Distribution: Venezuela, from Cerro de Peja mountains at 1500 m a.s.l., assumed to be endemic.

Caraboboaptera gen.n.

Type species: *Caraboboaptera wachteli* sp.n.

Etymology: The genus is named after the state of Carabobo where the specimens were collected and also refers to its apterous condition.

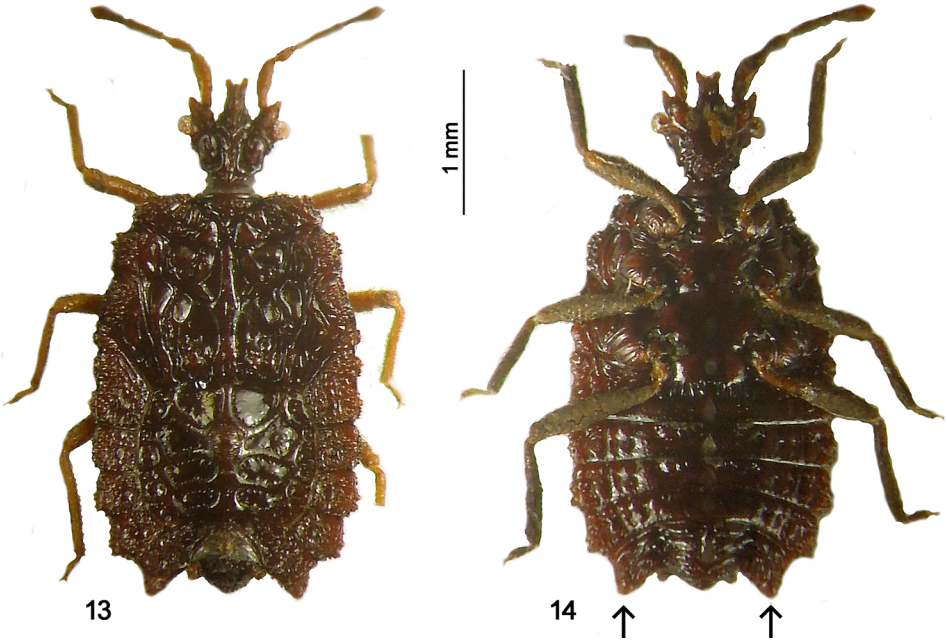
Diagnosis: Apterous, of small size; colouration of head, thorax and abdomen piceous; surface glabrous and shiny; legs and antennae yellowish brown, beset with semi-erect stiff bristles; eyes moderately stalked; thorax wide, laterally trilobate, medially with a fused rhomboid ridge extending from pronotum to tergal plate; deltg II+III fused; spiracles II+III lateral, IV ventral, V–VII lateral; vltg VII of male with an oval glandular structure on apex.

Caraboboaptera gen.n. differs from *Rabitschaptera* gen.n. by shorter antennae (1.50–1.55 times as long as width of head vs. 1.72–1.73 times), the smooth rhomboid median ridge (vs. triangular and striate), an oval glandular structure on male vltg VII (vs. conus-like tubercle), and mtg VI of tergal plate without elevation (vs. distinct hump present). From *Meridacoris* gen.n. it is distinguished by the slightly stalked eyes (vs. not stalked), the elongate shape of the smooth median thoracic ridge (vs. triangular and striate), lateral spiracles II+III (vs. ventral), and tergite VII of female with a distinct hump (vs. without hump). The structure of the median thoracic ridge resembles that of the apterous genus *Grenadaptera* Heiss, 2019 from Grenada Island, but the position of spiracle IV is ventral (vs. all spiracles lateral), the distinct hump on female tergite VII (vs. not present) and the oval glandular structure of male vltg VII (vs. pivot-like tubercle).

Description: Head as long as wide; genae longer than clypeus; antennae about 1.5 times as long as width of head; eyes globular, slightly stalked; postocular lobes straight with few tubercles; rostrum arising from a slit-like atrium.

Thorax: Pro-, meso-, and metanotum consisting of transverse and oval sclerites lateral of the median bi-rhomboid ridge reaching from pronotum to tergal plate including meso-, metanotum, and fused mtg I+II; its surface smooth and shiny; lateral margins angularly lobate. Legs unarmed and slender; claws with pulvilli.

Abdomen: Posterolateral angles of deltg II–VII progressively produced, deltg II+III fused; tergal plate moderately raised at middle, spiracles II+III lateral, IV ventral, V–VII lateral and visible from above; vltg VII of male with a small glandular tubercle at its apex.



Figs. 13–14: *Caraboboaptera wachteli* gen.n. et sp.n.: (13) holotype male, dorsal; (14) paratype male, ventral; arrows indicate apical glandular tubercles.

***Caraboboaptera wachteli* sp.n.** (Figs. 12–14)

Type material: Holotype (male) labelled: Venezuela, Carabobo / Cerro de Paja Mts. / 1500 m / F.Wachtel 16.11.05 //. Paratypes: 4 males, 2 females, labelled as holotype; 1 male: Venezuela / Carabobo Prov., Cerro de Paja 1500 m / 10°16'N, 68°14'W / 12.5.2007 V. Brachat // (CEHI). They are designated and provided with type labels.

Etymology: This interesting species is dedicated to my friend Franz Wachtel (Munich) who discovered these specimens and donated them generously for the author's collection.

Description of male: Measurements: Holotype: length 3.7; width of pronotum 1.35, of mesonotum 1.50, of metanotum 1.90; width of abdomen across IV 2.05. Paratypes: length 3.60–3.70.

Head as long as wide (0.85 / 0.85), genae produced over clypeus diverging anteriorly; clypeus medially raised with a round tubercle. Antennae about 1.5 times as long as width of head, I longest, II shortest, length of antennal segments I / II / III / IV = 0.40 / 0.25 / 0.35 / 0.30. Eyes slightly stalked and granulate, separated anterolaterally by a cleft from antenniferous lobe. Postocular lobes with a patch of small round tubercles adjacent to eyes, then subparallel and strongly converging to constricted neck which is separated from head by a transverse furrow. Vertex longitudinally striate flanked by large oval interocular callosities.

Thorax: Pronotum strongly transverse, more than three times as wide as long (1.35 / 0.40) consisting of polygonal callosities separated at middle by a groove filled by a triangular sclerite with granular surface; lateral margins raised and beset with setigerous tubercles;

anterolateral margins widely rounded; posterior margin deeply incised for the reception of the apex of median ridge. Mesonotum with two large, round and oblique smaller callosities; lateral margins as of pronotum; median smooth carinate ridge parallel-sided on mesonotum, then enlarging at metanotum, and again narrower along fused mtg I+II reaching from pronotum to tergal plate. Metanotum fused to mesonotum and mtg I+II, with four large, oval callosities, deeply depressed lateral of median ridge; structure of lateral margins as of pronotum.

Abdomen: mtg I+II fused with two round elevations laterad of median ridge, depressed along lateral margin confining deltg II+III. Tergal plate with strongly elevated dorsal scent gland scars on mtg III–V, lateral oval depressions marking the segments; deltg II+III fused, surface of deltg II–VII deeply irregularly sculptured; lateral margins beset with setigerous tubercles. Spiracles II–III lateral, IV subventral but not visible from above, V–VII lateral and visible from above, placed on the dorsally reflexed rim of vltg II-VII which is increasingly visible on deltg II–VI, forming a triangular expansion on deltg VII. Tergite VII medially strongly raised for the reception of the dorsally keel-like pygophore, ptg VIII clavate directed upward; vltg VII with apical glandular tubercle.

Description of female: Measurements: Paratype: Length 4.4 mm; head length / width 0.95 / 0.90; ratio length of antennae / width of head 1.50, length of antennal segments I / II / III / IV = 0.50 / 0.30 / 0.30 / 0.30; width of pronotum 1.50, mesonotum 2.00, metanotum 2.15; width of abdomen across tergite IV 2.50. Other paratype: length 4.40. Larger and wider body. Tergite VII at middle with a small, triangular elevation.

Distribution: Venezuela, from Cerro de Peja mountains at 1500 m a.s.l., assumed to be endemic.

Aneurinae Douglas & Scott, 1865

No member of this subfamily has been recorded so far from Venezuela (Coscaron & Contreras 2012). However, specimens from the collection of the author belonging to the genera *Aneurus* Curtis, 1825 and *Iralunelus* Štys, 1974, confirm their expected occurrence in Venezuela.

The last comprehensive study of Aneurinae from North and Central America and the West Indies was that of Picchi (1977). Based upon this publication and the key to species, the following specimens cannot be assigned to one of the described taxa and are recognized as new. They are described and illustrated herein.

Key to Aneurinae genera and species recorded from Venezuela

1 Tergite VII undivided, without a triangular paratergite VII (Figs. 16, 17, 22a). .... *Aneurus micropygus* sp.n.

– Tergite VII divided, with a triangular paratergite VII. (*Iralunelus*) 2

2 Habitus very slender, ratio total length / width of abdomen 2.86. Postocular lobes rounded, not reaching outer border of eyes (Figs. 18, 25c). ..... *Iralunelus bolivari* sp.n.

– Habitus wider, ratio total length / width of abdomen 2.22–2.33. Postocular lobes angulate, reaching or exceeding outer border of eyes. 3

3 Habitus more stout, ratio total length / width of abdomen 2.22. Antenna shorter, ratio antennal length / width of head 1.72. Postocular lobes reaching outer border of eyes.

Scutellum with a narrow median smooth callus (Figs. 19, 20, 24c). .... *Iralunelus brachati* sp.n.

– Habitus more elongate, ratio total length / width of abdomen 2.33. Antenna longer, ratio antennal length / width of head 1.90. Postocular lobes exceeding outer border of eyes. Scutellum with a wide median smooth callus (Figs. 15, 26c). .... *Iralunelus guatopoensis* sp.n.

***Aneurus micropygus* sp.n.** (Figs. 16, 17, 22)

Type material: Holotype (male) and paratype (female) labelled: El Encantado / 1400 m 15 IV 1965 / Y.Ramírez, L.Joly //; both in CEHI, ex. coll. Kormilev. They are designated and provided with type labels.

Etymology: The name refers to the very small pygophore of the male.

Notes: Both specimens were attached to the same pin and identified as "*Aneurus tenuis* Champion" by N. Kormilev in 1970, but identification is erroneous as they do not match the diagnosis and figures given by Champion (1898) and Picchi (1977). Later, *A. tenuis* was recognized as a species of *Iralunelus* and transferred to this genus, but the studied specimens belong to *Aneurus*. *Iralunelus tenuis* (Champion, 1898) is not yet recorded from Venezuela.

Fig. 15: *Iralunelus guatopoensis* sp.n., holotype male, dorsal.

Diagnosis: The new species resembles *A. championi* Kormilev, 1968 (new name for preoccupied *A. politus* Champion, 1898, nec Say, 1832) sharing the unusual structure of the pygophore. *Aneurus micropygus* sp.n. differs from *A. championi* by the following characters: spiracles I and VII lateral and visible from above, III–VI ventral (vs. II, VI–VI lateral, III–V ventral), antennal segment I shorter than III (vs. I–III of same length), and postocular lobes rounded, not reaching outer borders of eyes (vs. lobes angular, laterally exceeding outer border of eyes) (*A. championi*, see Figs. 23a, b).

Description of male: Measurements: body length 4.1; width of abdomen 1.65.

Head longer than wide (0.63 / 0.75); genae adhering to clypeus not reaching round apex. Antennal segment I thickest, II+III conical, IV missing, length of I / II / III = 0.18 / 0.26 / 0.26. Eyes sunken in head; postocular lobes rounded and not reaching outer border of eyes; infraocular callosities round and smooth.

Thorax: Pronotum strongly transverse (1.22 / 0.75), lateral margins sinuately converging anteriorly to rounded anterolateral angles; disk with four flat, oval callosities on anterior part, then transversely striate; posterior lobe smooth except posterior margin. Scutellum wider than long (0.75 / 0.55), anterolateral angles carinate, surface transversely striate.

Abdomen: deltg II+III fused on outer half, forming a contergite; surface of deltg II–VII and lateral margins smooth. Pygophore small, oval, and retracted in tergite VII, with a median carina on posterior face.

Description of female: Measurements: body length 4.6; length / width of head 0.67 / 0.60; width / length of pronotum 1.32 / 0.75; antennal segments I / II / III = 0.18 / 0.25 / 0.25; width of abdomen 1.78. As male, but larger; tergite VII widely incised posteriorly for the reception of the strongly transverse tergite VIII.

Distribution: Only recorded from the type locality in Venezuela (possibly Miranda province).

Iralunelus brachati sp.n. (Figs. 19–21, 24)

Type material: Hotype (male) labelled Venezuela / Carabobo Mun. / Bejuma 750-850 m / XI 2005 V. Brachat //. Paratypes: 2 males, 2 females, collected with holotype (CEHI). They are designated and provided with type labels.

Etymology: The new species is dedicated to my friend Volker Brachat (Gebetsried, Germany), expert of Pselaphinae (Coleoptera), who collected these and other Aradidae as by-catches and donated them for the author's collection.

Notes: The genus *Iralunelus* Štys, 1974 is represented in the Caribbean and adjacent countries by eight species (Coscaron & Contreras 2012). The key given by Picchi (1977) includes three species sharing the position of spiracles of the new species (II+VII lateral, III–VI ventral): *I. politus* (Say, 1832) from Florida, *I. leptocerus* (Hussey, 1957) from Panama and Guatemala, and *I. tenuis* (Champion, 1898) from Panama and Mexico, to which *I. brachati* sp.n. is compared here.

The taxonomy of *Iralunelus politus* was unclear until a neotype from Florida was designated by Kormilev (1968d). It was erroneously reported from Guatemala and Cuba (Picchi 1977), and French Guyana (Heiss & Moragues 2009); the latter record was based on misidentified voucher specimens. *Iralunelus politus* is reported to date only from the southern United States (Henry & Froeschner 1988).

Two species described after the review of Picchi (1977) are *I. costariquensis* Kormilev, 1982 and *I. longicornis* Kormilev, 1982 from Costa Rica. They differ at once from *I. brachati* sp.n. by larger size and longer antennae (*I. longicornis*) and the structure of head and abdomen (*I. costariquensis*).

Diagnosis: *Iralunelus brachati* sp.n. differs from *I. leptocerus* by smaller size (4.0–4.5 vs. 4.75–6.00 (Champion 1898)), shorter antennae (1.72 times vs. 2.37 times as long as width of head), and smooth lateral margins of deltg II–VII (vs. granulate). It resembles and seems related to *I. tenuis*, but differs by blunt postocular lobes reaching outer border of eyes (vs. angulate, exceeding outer border of eyes) and by a larger pygophore that is more produced posteriorly (vs. smaller, less produced).

Description of male: Measurements: length 4.05; length of antennae 0.95; width of abdomen 1.83.

Head slightly longer than wide (0.75 / 0.55); genae shorter than clypeus, reaching apex of antennal segment I. Antennae 1.72 times as long as width of head; segment I shortest and globular, II–III tapering toward base and of equal length; IV longest; length of antennal segments I / II / III / IV = 0.15 / 0.20 / 0.20 / 0.40. Eyes sunken in head; postocular lobes

Figs. 16–21: (16, 17) *Iralunelus micropygus* sp.n., holotype male, dorsal (16), paratype female, dorsal (17); (18) *Iralunelus bolivari* sp.n., holotype male, dorsal; (19–21) *Iralunelus brachati* sp.n., holotype male, dorsal (19), paratype male, ventral (20), paratype female, ventral (21).

roundly expanded laterally, not exceeding outer border of eyes. Vertex transversely striate with two round, smooth callosities on anterior part.

Thorax: Pronotum 2.5 times as wide as long, lateral margins sinuate and converging anteriorly; anterolateral angles rounded; anterior surface transversely striate, with four oval smooth callosities. Scutellum wider than long, striate, with a smooth, elongate callosity at middle; anterior and lateral margins finely carinate.

Abdomen: deltg II–VII separated by sutures, surface finely striate, lateral margins granulate. Tergite VII with a triangular paratergite VII. Spiracles II+VII lateral and visible from above, III–VI ventral. Pygophore pear-shaped, slightly produced posteriorly.

Description of female: Measurements: length 4.5; width / length of head 0.65 / 0.58; width / length of pronotum 1.38 / 0.55; length of antennal segments I / II / III / IV = 0.18 / 0.25 / 0.25 / 0.45; width of abdomen 2.10. Basically as male, but of larger size. Tergite VII deeply incised medially for the reception of paratergite VII.

Distribution: Central Venezuela, Carabobo state, Cordillera La Costa Montane Forests Ecoregion.

Iralunelus bolivari sp.n. (Figs. 18, 25)

Type material: Holotype (male, pinned) labelled: Carret. El Dorado / Sta. Elena km 125 / Bolivar 1100 m // 25 IX 1967 / l.J.Joly T. // *Aneurus* / *leptocerus* / Hussey / det. N.Kormilev 70 // (CEHI ex coll. Kormilev). This specimen is designated and provided with a type label.

Etymology: Named after Bolivar, the largest state of Venezuela where this species was found.

Diagnosis: Comparison with a male syntype of *Aneurus tenuicornis* Champion, 1898 (= *I. leptocerus* (Hussey, 1957)) proved, that the specimen from El Dorado was misidentified. The new species differs from true *I. leptocerus* by smaller size (4.00 vs. 4.75–6.00), width of head (1.95 vs. 2.37 times as wide as long), rounded postocular lobes (vs. angular); lateral margins of deltg II–VII finely granulate (vs. smooth). The habitus of *I. bolivari* sp.n. resembles *I. tenuis*, however differs from the latter and from *I. guatopoensis* sp.n. by rounded postocular lobes (vs. angulate) and by different shape and size of the posteriorly produced pygophore (vs. not produced).

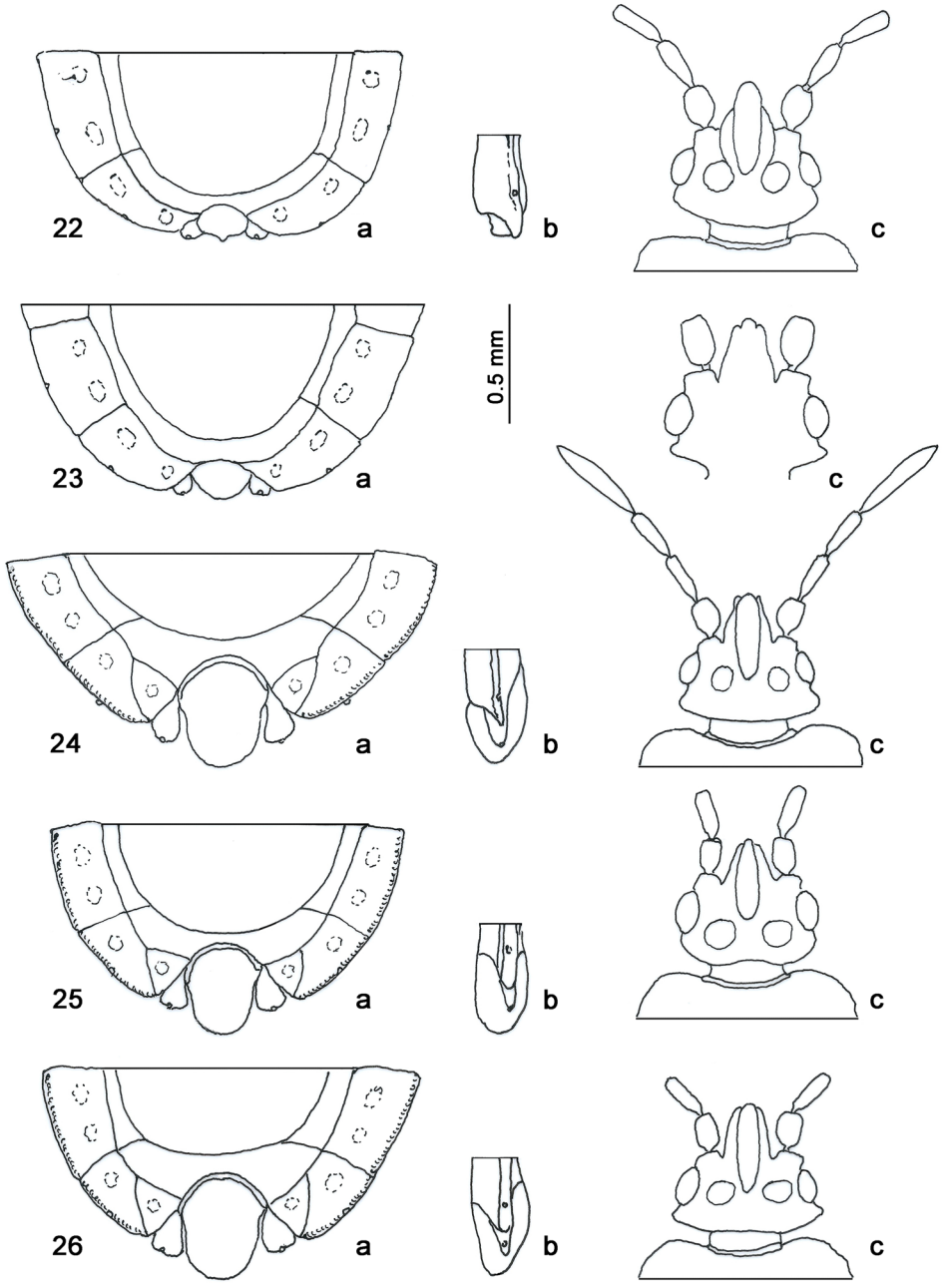
Iralunelus zipaquirensis Contreras, Neder & Coscarón, 2018 from Colombia, resembles *I. bolivari* sp.n. However, the measurements of the male holotype differ, e.g., by the following characters: Body length 4.7 mm (vs. 4.0 mm of *I. bolivari* sp.n.); stouter habitus, ratio body length / width of abdomen 2.53 (vs. more slender habitus, ratio 2.76); ratio length of antennae / width of head 1.88 (vs. 1.97); stouter pronotum, ratio width / length of pronotum 2.14 (vs. pronotum more transverse, ratio 2.50). The description (Contreras et al. 2018) indicates that *I. zipaquirensis* is a distinct species, different from all three Venezuelan taxa.

Description of male: Measurements. Length 4.00; width of abdomen 1.45; width / length of pygophore 0.27 / 0.45.

Head wider than long (0.63 / 0.58); genae shorter than clypeus; clypeus reaching apex of antennal segment I. Antennae 1.95 times as long as width of head; segment I shortest, IV longest; length of antennal segments I / II /III /IV = 0.18 / 0.23 / 0.25 / 0.48. Eyes inserted in head; postocular lobes rounded not reaching outer border of eyes.

Thorax: Pronotum about 2.5 times as wide as long; lateral margins parallel at humeri, then sinuately converging anteriorly to rounded anterolateral angles; surface with smooth, ovate callosities on anterior lobe, then transversely striate and smooth on posterior lobe. Scutellum (damaged by pin) wider than long; surface transversely striate with an anteromedian oval, smooth callus.

Abdomen: deltg II–VII separated by sutures; surface, smooth with two apodemal impressions each. Tergite VII with triangular paratergite VII, deeply incised at middle for



Figs. 22–26 (22) *Aneurus micropygus* sp.n.; (23) *Aneurus championi* (from Panama); (24) *Iralunelus brachati* sp.n.; (25) *Iralunelus bolivari* sp.n.; (26) *Iralunelus guatopoensis* sp.n.; (a) terminal segments of males; (b) pygophore lateral; (c) head.

the reception of the slender, posteriorly produced pygophore. Spiracles II+VII lateral, III–VI ventral.

Distribution: Recorded from Bolivar state in Guyana Region from an area known as Guiana highlands or as Gran Sabana, bordering Colombia and the Brazilian Amazonas Basin.

***Iralunelus guatopoensis* sp.n.** (Figs. 15, 26)

Type material: Male holotype labelled: P.N. Guatopo Mi. / 13 – 28 VIII 1965 / L.J.Joly leg. // *Aneurus leptocerus* / Hussey / N.Kormilev 70 // (CEHI, ex coll. Kormilev). This specimen is designated and provided with a type label.

Etymology: The name refers to the Guatopo National Parc in Miranda state where it was collected.

Diagnosis: This specimen does not represent *I. leptocerus*, as indicated on the label, which is of larger size, with a less transverse scutellum, and smooth lateral margins of deltg II–VII. *Iralunelus leptocerus* was described from Guatemala and Panama, but is not yet recorded from Venezuela. The habitus of *I. guatopoensis* sp.n. resembles *I. bolivari* sp.n. which differs at once by rounded postocular lobes, and *I. tenuis* that shows a much shorter pygophore and ptg VIII.

Description of male: Measurements: length 3.9; width of abdomen 1.68.

Head slightly longer than wide (0.58 / 0.55); genae not reaching apex of clypeus; clypeus as long as antennal segment I. Antennae 1.91 times as long as width of head; length of antennal segments I / II / III / IV = 0.15 / 0.20 / 0.23 / 0.48. Eyes sunken in head; postocular lobes produced laterally.

Thorax: Pronotum 2.4 times as wide as long (1.20 / 0.50); lateral margins with subparallel humeri, then angularly sinuately converging toward anterolateral angles; surface of disk transversely striate, with four oval, smooth callosities on anterior lobe and two elongate transverse smooth calli before posterior margin. Scutellum about twice as long as wide; surface striate with an anteromedian smooth callosity, anterior margin finely carinate.

Abdomen: deltg II–VII separated by sutures; surface smooth on medial two thirds, bearing two apodemal impressions; lateral third and lateral margin finely granulate. Tergite VII with triangular paratergite VII. Pygophore longer than wide (0.42 / 0.35). Spiracles I+VII lateral, III–VI ventral.

Distribution: The type specimen was collected from Parque National Guatopo in Estado Miranda y Guárico, southeast of Caracas.

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