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A new species of *Maculambrysus* Reynoso & Sites, 2021 (Hemiptera: Heteroptera: Naucoridae) from an aguaje palm swamp in southeastern Peru

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Abstract

The neotropical saucer bug genus *Maculambrysus* Reynoso & Sites is currently represented by five species from Tabasco, México to Pará, Brazil. Presented here is the description of a sixth species, *Maculambrysus gallicei* **n.sp.**, which was collected from rootmats and leafpacks in an aguaje palm swamp in southeastern Peru. It can be distinguished from most congeners by the concolorous dark-brown hemelytra and the mottled orange-brown pronotum, as well as characteristics of the male accessory genitalic process of tergum VI, and female subgenital plate and laterosternites VI. Other aquatic Heteroptera co-occurring with this new species are given.

Key words: Nepomorpha, Neotropics, South America, species description, aguaje palm swamp

Introduction

The genus *Maculambrysus* was created for a monophyletic group of neotropical saucer bugs formerly contained in the genus *Ambrysus* Stål as the *Ambrysus stali* La Rivers species complex (Sites & Reynoso-Velasco 2015). The complex currently contains five species (*M. bifidus* (La Rivers & Nieser), *M. maya* (Sites & Reynoso), *M. stali*, *M. scolius* (La Rivers), and *M. tricuspis* (La Rivers)) distributed from Pará, Brazil north to Tabasco, México.

Features consistent among species of *Maculambrysus* include males with the left ventral lobe of the phallosoma reflexed dorsad and the shape of the medial lobes (pseudoparameres) of abdominal tergum VIII. Females of these species have various degrees of modification of the posteromedial corner of left laterosternite VI into a tubercle or small spine, which generally is less developed or absent on the right side. Both sexes of most species have extensive brown maculation on the pronotum with irregular longitudinal stripes and brown punctation, and dark brown maculation on the fore femora with solid brown areas and brown punctation. *Maculambrysus stali* is an outlier in the latter two features; it does not exhibit the irregular brown maculation on the hemelytra and the females do not have the posteromedial corner of left laterosternite VI modified into a tubercle or spine.

Discriminating characters by which species of *Maculambrysus* can be recognized include the shape of the female subgenital plate (mediosternite VII) and the male accessory genitalic process of tergum VI. Presented here is the description of a new species from southeastern Peru, which dramatically extends the known distribution of the genus southwestward.

Materials and methods

Specimens were collected from two unnamed streams on the property of Finca Las Piedras, a research and education center in the southeastern Peruvian Amazon forest. The stream on the southern end of the property is associated with a *Mauritia* palm swamp.

Photographs of the type locality identified as L-numbers are available in a Locality Image Database via a link from the internet site of the Enns Entomology Museum, University of Missouri. The holotype was measured for body length and width and major structures, and all measurements are in mm. Body length and width also are given

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as a mean and range for paratypes. Length of the body is measured from the anterior margin of the head to the posterior margin of the abdomen, and width at the widest point, across abdominal segment II. Abdominal segment numbers are expressed as Roman numerals. Images of specimens were obtained by use of a Leica M205C stereo microscope coupled with the Leica Application Suite V4.10 Extended Depth of Focus module, followed by image preparation with Photoshop v. 24.3.0 (Adobe Systems Inc., San Jose, California). The margin of the subgenital plate is an important diagnostic character in these species, but it often is difficult to see clearly because of heavy setation. Thus, the setae were removed from one paratype for the subgenital plate image presented here. Specimens are deposited in the museums corresponding with the following abbreviations.

EMEC	Essig Museum of Entomology Collection (Berkeley, United States)
MHN	Museo de Historia Natural, Universidad Nacional Mayor de San Marcos (Lima, Peru)
UMC	University of Missouri (Columbia, United States)

Systematics

Ambrysinae Usinger, 1941

Maculambrysus Reynoso & Sites, 2021

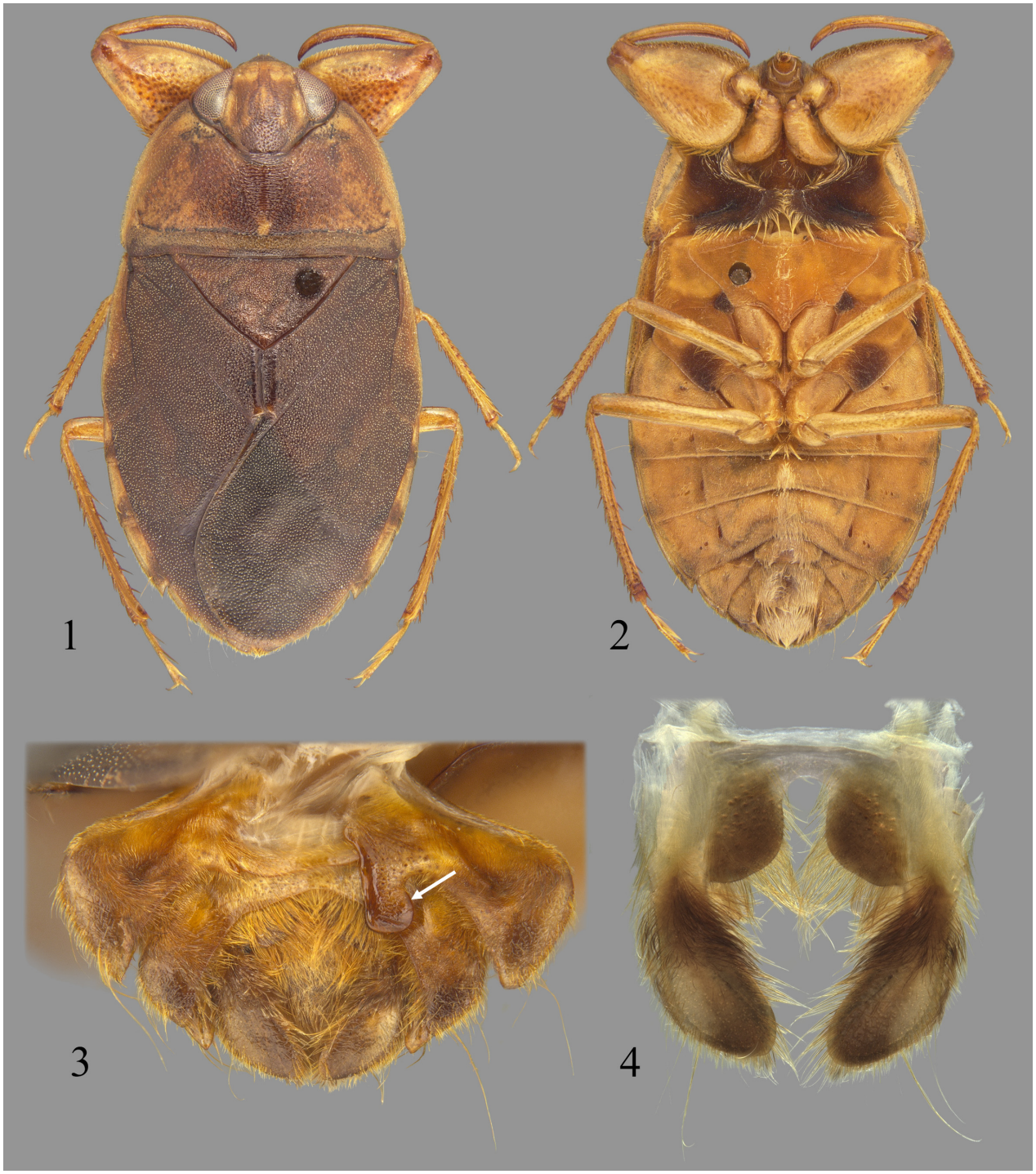
Maculambrysus gallicei Sites, NEW SPECIES

(Figs. 1–13)

Description. Macropterous male. HOLOTYPE, length 8.88; maximum width 4.64. Paratypes (n = 10), length 8.48–9.28 (mean = 8.78); maximum width 4.56–5.04 (mean = 4.71). General shape elongate, parallel-sided, broadly rounded anteriorly and posteriorly; widest across embolia at abdominal segment II (Fig. 1). Overall dorsal coloration dark-orange-brown with dark-brown hemelytra (Fig. 1). Exposed abdominal lateral margins with alternating light- and dark-checkered appearance. Dorsal surface coarsely punctate. Ventrally, mostly orange-brown, with dark-brown at mesepimeron and metepimeron bases and most of propleuron (Fig. 2).

Head. Head length 1.56; maximum width 2.24. Eyes convergent anteriorly, synthlipsis 0.84; thin band of cuticle posterior and laterad to eye; eyes flat and not raised above level of vertex or pronotum. Anterior margin between eyes shallowly convex, extending anteriorly in front of eyes 6% of head length; posterior margin between eyes strongly convex, extending posteriorly 35% of head length. Labrum width 2.1× length, evenly rounded. Labium orange-brown, with three visible segments, extending 0.52 beyond labrum. Antennal segment proportions 2:9:14:9, length 0.68, elongate hairs on segment 4 and distal 2/3 of 3.

Thorax. Pronotum mostly orange-brown with various lighter areas including behind eyes, anterior to posterior transverse band at midline and half distance to lateral margin and at lateral margin; coarsely punctate; lateral margins broadly and shallowly convex, convergent anteriorly, explanate; sparsely covered with short setae; posterior margin nearly straight at margin with scutellum, convex at clavus; anterior margin deeply concave receiving convex posterior margin of head; transverse line of dark punctures defining anterior margin of band in posterior 1/4; posterolateral corners rounded; width 2.8× length; length at midline 1.52; maximum width at posterolateral corners 4.32. Prothorax ventrally dark-brown and pruinose medially, with yellow glabrous lateral band; apices of propleura meeting broadly at midline, separated from level of prosternellum. Probasisternum orange-brown, with sharp medial carina and generally appearing pruinose, row of elongate pale hairs lateral to carina. Prosternellum light-brown, extending beneath apices of propleura. Elongate golden setae along anterior, mesal, and posterior margins and in posterolateral portion of pruinose area of propleuron. Scutellum with subtle mottling of dark- and light-orange-brown, triangular, densely punctate, width twice length, width 2.88, length 1.44. Hemelytra densely punctate, concolorous dark-brown except lighter at lateral margin of embolium. Claval commissure length 0.94. Embolium length 2.68, greatest width 0.62; lateral margin straight in proximal 2/3, convex in distal third. Hind wings well-developed. Mesobasisternum with midventral longitudinal tumescence with sulcus and erect light-colored hairs on midline; tumescence terminating posteriorly as acute mesosternellum between mesocoxae. Metasternellum (=metaxyphus), subtriangular, with apex acute. Mesepimeron and metepimeron with dark infuscation at coxal bases.



FIGURES 1–4. *Maculambrysus gallicei* **n.sp.** (1) Holotype dorsal habitus, (2) holotype ventral habitus, (3) male terminal abdominal terga, arrow indicates accessory genitalic process of tergum VI, (4) male abdominal tergum VIII.

Legs. All leg segments yellow-brown to orange-brown. Profemur with dark-brown punctation evident dorsally, somewhat diminished ventrally; basal half of posterior margin with brush row of elongate hairs and 5–6 combs of 2–5 short brown spines; anterior margin with dense pad of setae without associated spines. Protibia and tarsus with occlusal inner surface flattened and with spatulate setae; tarsus immovable, one-segmented; pretarsal claw single, minute, triangular. Procoxa posteromesal surface with hair-lined ridge where it meets median prosternal carina. Meso- and metacoxa partially recessed into thorax. Metacoxa with longitudinal sulcus that can accommodate flexed metafemur. Meso- and metafemora with row of short, brown spines on anterior margins; spines restricted to basal

1/3 and single on mesofemur, combs of 1–3 spines irregularly spaced along full length of metafemur. Mesotibia with ventrolateral, ventromedial, dorsolateral, and dorsomedial rows of stout reddish-brown spines, dorsolateral and dorsomedial rows include combs of up to 4 spines; dense comb of spines at apical rim dorsally, two transverse comb rows of stout spines at apex of ventral margin. Metatibia with ventrolateral, ventromedial, dorsolateral, and dorsomedial rows of stout reddish-brown spines, 2–3 transverse comb rows of stout spines at apex of ventral margin. Meso- and metatibiae and -tarsi with long, pale swimming hairs; hairs sparse on mesotibia and -tarsus, profuse on metatibia and -tarsus. Meso- and metapretarsi with paired claws slender, curved, with nascent basal tooth. Leg measurements as follows: foreleg, femur 2.28, tibia 1.74, tarsus 0.48; middle leg, femur 2.26, tibia 1.96, tarsomeres 1–3, 0.14, 0.26, 0.32; hind leg, femur 2.60, tibia 3.04, tarsomeres 1–3, 0.16, 0.58, 0.50.

FIGURES 5–11. *Maculambrysus gallicei* **n.sp.** (5–6) Male genital capsule with and without terga IX and X, respectively, (7) male left paramere, (8–10) male phallosoma in right, ventral, and left aspects, respectively (11) female terminal abdominal sterna, white arrow indicates production on posterior margin of right laterosternite VI, yellow arrow indicates small, digitate production at posteromedial corner of left laterosternite VI. sgp = subgenital plate.

Abdomen. Abdomen dorsally with lateral margins of III–VIII exposed and with checkered appearance (Fig. 1), III–VI with posterior third dark-brown, anterior 2/3 yellow-brown; lateral margin with row of pale short setae, group of trichobothria on dorsal surface near posterolateral corners of III–VIII; sparse brush of dark setae on terga III–VI beneath edge of hemelytra. Posterolateral corners of III–IV right-angled, V slightly produced, VI acute. Accessory genitalic process of VI broad, nearly parallel-sided, directed caudad, posterolateral corners rounded (Fig. 3). Tergum VIII with lateral lobes evenly convex on lateral margins, medial lobes (pseudoparameres) with posteromedial corners obsolete, continuously rounded from anteromedial to posterolateral corners (Fig. 4). Ventrally mostly orange-brown, pruinose, with pile of fine hairs. Lateral margin with thin glabrous band. Glabrous patches on laterosternites II–VII. Mediosternite V with posterior margin asymmetrical. Pygophore with anterior margin between parameres produced at midline, posterior apex with thick brush of setae (Figs. 5, 6). Parameres symmetrical, elongate, subquadrate, corners broadly rounded, with brush of long setae in apical third (Fig. 7). Phallosoma without ventral teeth or denticles, with proximal ends of left and right ventral lobes elevated from body of phallosoma forming open pockets (Figs. 8–10).

Macropterous female. Paratypes (n = 10), length 8.96–9.60 (mean = 9.22); maximum width 4.80–5.16 (mean = 4.91). Similar to male in general structure and coloration except as follows: Mediosternite V symmetrical. Mediosternite VII (subgenital plate) 0.82× as long as wide, width 1.24, length 1.02, posterior margin middle half truncate, bordered with small concavity and slightly produced, pointed posterolateral corners (Fig. 11); lateral lobes absent. Left laterosternite VI with posterior margin mostly straight, posteromedial corner with small digitate production; right laterosternite VI posterior margin shallowly convex and with small production in mesal fourth (Fig. 11).

Diagnosis and comparative notes. This species can be distinguished from most congeners by the dorsal color pattern. More specifically, the hemelytra are concolorous dark-brown and the pronotum is mottled orange-brown, whereas in *M. bifidus*, *M. maya*, *M. scolius*, and *M. tricuspis*, the hemelytra are mottled and the pronotum has distinct, irregular, brown stripes. *Maculambrysus gallicei* **n.sp.** is most similar to *M. stali*, with which it shares the concolorous hemelytra; however, the lateral margins of *M. gallicei* **n.sp.** are less convex in the anterior half, the accessory genitalic process of males is directed caudad rather than angled to the right, male tergum VIII lateral lobes are evenly convex laterally, but distinctly angled in *M. stali*, and the female subgenital plate lacks lateral lobes, which are present in *M. stali*, and has small productions on both laterosternites VI, which are absent in *M. stali*.

FIGURES 12–13. Type locality of *Maculambrysus gallicei* **n.sp.** (12) Aguaje palm swamp, (13) pools on muddy trail near aguaje palm swamp.

Habitat description. The type locality is an aguaje palm swamp on the property of Finca Las Piedras research and education center in southeastern Peru (Fig. 12). Other nearby streams north and south of the type locality were sampled for aquatic Heteroptera; however, *Maculambrysus gallicei* **n.sp.** was not found in any of them. The

slowly flowing water at the type locality was mostly clear, maximum depth was ≤ 1m, and was under a canopy of primarily *Mauritia flexuosa* Linnaeus, the aguaje palm. The substrate was sand and silt and substantial amounts of dead leaves accumulated in pools and along the margins. Filamentous roots from riparian vegetation extended into the water. *Maculambrysus gallicei* **n.sp.** was collected mostly from the leafpacks and filamentous roots. Standing pools of water on a mud trail (Fig. 13), disconnected from the flowing water of the aguaje palm swamp, also harbored surprising numbers of *M. gallicei* **n.sp.** specimens. Also collected from the type locality was the saucer bug *Picrops usingeri* La Rivers and other heteropterans, including *Belostoma stollii* (Amyot & Serville), *Belostoma* sp. *denticolle* group (Belostomatidae); *Brachymetra* sp., *Cylindrostethus palmaris* Drake & Harris, *Limnogonus adjuncus* Drake & Harris, *Neogerris lotus* (White), *Microvelia belterrensis* Santos, Rodrigues, Couceiro & Moreira, *Microvelia mimula* White, *Tachygerris adamsoni* (Drake) (Gerridae); *Hydrometra guianana* Hungerford & Evans (Hydrometridae); *Tenagobia romani* Lundblad (Micronectidae); *Ranatra* spp. (Nepidae); *Neoplea* sp. (Pleidae); *Paravelia dilatata* Polhemus & Polhemus, *Rhagovelia* sp. *robusta* group, *Steinovelia virgata* (White), *Stridulivelia anta* Polhemus & Spangler, and *Stridulivelia tersa* Polhemus & Spangler (Veliidae).

Etymology. The specific epithet honors Geoffrey Rene Gallice, president of Alliance for a Sustainable Amazon of the Finca Las Piedras education and research center, and who made his collecting permit available for this research.

Repositories. The holotype and some paratypes will be deposited in the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos (Lima, Peru); additional paratypes are deposited in the Enns Entomology Museum (University of Missouri) and Essig Museum of Entomology (University of California-Berkeley).

Type material examined. HOLOTYPE ♂: **PERU**: **Madre de Dios Departamento**, unnamed stream at Finca Las Piedras, 12.225562°S, 69.118373°W, elev 269 m, 28 July 2022, coll: R.W. Sites, small, slow, sandy stream w/ leafpacks & filamentous rootmats, L-2100. PARATYPES: same data as holotype L-2100 (2♂, 3♀ UMC; 2♂, 3♀ MHN); same stream, except 12.2272°S, 69.1171°W, elev. 255 m, 1 August 2022, coll: R.W. Sites, L-2112 (1♂ UMC); same stream, except 12°13.6'S, 69°7.7'W, 239 m, 27 July 2022, coll: W.D. Shepard, Aguaje palm swamp, WDS-A-2163 (1♀ UMC); same stream, except -12.2255, -69.1184, 28 July 2022, coll: W.D. Shepard, Aguaje palm swamp, WDS-A-2164 (2♂, 1♀ UMC; 2♂, 1♀ MHN); same stream, except N Puerto Maldonado, -12.2256, -69.1184, 28 July 2022, C.B. Barr, Quebrada Aguajal, Mauritia palm swamp (2♀ MHN; 2♂, 1♀ EMEC); same except 29 July 2022 (1♀ MHN); same except 28 July 2022, collected from muddy pool in trail (1♀ EMEC); same except 12.226380°S, 69.118415°W, elev. 270 m, 28 July 2022, coll: R.W. Sites, muddy trail next to unnamed stream, L-2101 (3♀ UMC); unnamed stream at Finca Las Piedras, 12°13.624'S, 69°6.432'W, elev 242 m, 28 July 2022, coll: R.W. Sites, slow, narrow, sandy intermittent stream w/ leafpacks, L-2102 (1♂, 1♀ UMC; 1♂ MHN); same stream, except, 12°13.6'S, 69°6.4'W, 242 m, stream by Anaconda tr., 28 July 2022, coll: W.D. Shepard, WDS-A-2165 (1♂, 1♀ UMC; 2♂ MHN).

Other material examined. Immatures: **PERU**: **Madre de Dios Departamento,** unnamed stream at Finca Las Piedras, 12°13'37"S, 69°7'01"W, elev 214 m, 27 July 2022, coll: R.W. Sites, standing stream in palm swamp w/ leafpacks & marginal veg, L-2099 (1–5th instar UMC); unnamed stream at Finca Las Piedras, 12.225562°S, 69.118373°W, elev 269 m, 28 July 2022, coll: R.W. Sites, small, slow, sandy stream w/ leafpacks & filamentous rootmats, L-2100 (2–5th, 1–4th, 1–3rd instars UMC); same except 12.226380°S, 69.118415°W, elev. 270 m, muddy trail next to unnamed stream, L-2101 (2–5th instars UMC).

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