

Description of *Huebneriella rosanti* gen. et sp. n. from French Guiana (Lepidoptera: Hepialoidea, Hepialidae)

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Abstract: *Huebneriella rosanti* gen. et sp. n. (Lepidoptera: Hepialoidea: Hepialidae) is based on some specimens from the rainforest in French Guiana. The distinct female and male genitalia and wing ornamentation separate this taxon from other genera of Hepialidae although four derived characters states are shared in common with the cibyrene clade. The holotype male is deposited in the collection of the Museum für Naturkunde in Berlin (formerly Museum für Naturkunde der Humboldt-Universität zu Berlin), Germany.

Key words: morphology, Neotropical, new genus, taxonomy.

Beschreibung von *Huebneriella rosanti* gen. et sp. n. aus Französisch-Guayana (Lepidoptera: Hepialoidea: Hepialidae)

Zusammenfassung: *Huebneriella rosanti* gen. et sp. n. (Lepidoptera: Hepialoidea: Hepialidae) basiert auf einigen Exemplaren aus dem Regenwald von Französisch-Guayana. Die deutlich von anderen Arten unterschiedenen weiblichen und männlichen Genitalien und die Flügelzeichnung unterscheiden dieses Taxon von anderen Gattungen der Hepialidae, wobei jedoch vier offenbar abgeleitete Merkmalszustände mit den Gattungen übereinstimmen, die als „Cibyra-Gattungsgruppe“ (oder „Cibyrene clade“; eine vermutlich monophyletische Gruppe) bekannt sind. Der männliche Holotyp ist in der Sammlung des Museums für Naturkunde in Berlin (früher Museum für Naturkunde der Humboldt-Universität zu Berlin), Deutschland, hinterlegt.

Introduction

During a tour of European Museums, the first author found a few specimens of an unidentified species which looked distinct from any other known Hepialidae by the combination of the immediately recognisable “oxycanine” venation (Rs1+Rs2 and Rs3 stalked; DUMBLETON 1966) and a non-contrasting wing pattern. Years later, further material became available through Bernard HERMIER, Daniel HERBIN and Thibault ROSANT who each kindly donated additional specimens, making the examination of its morphology possible.

Some apomorphic characters found in *Huebneriella rosanti* gen. et sp. n. lead us to describe it in a new genus as well as a new species. A discussion about its potential relationships with other American Hepialidae is presented.

Material and methods

The abdomen and genitalia were examined following standard procedures, KOH-maceration, stained with gentian violet when necessary and preserved in glycerol. Terminology for genitalia and wings follows MIELKE & CASAGRANDE (2013) and the tergosternal connection definition follows GREHAN & MIELKE (2017).

The male holotype is deposited in MfNB and paratypes in CGCM and NHMUK (see below).

Collections abbreviations

CGCM Coll. Carlos G. C. MIELKE, Curitiba, Paraná, Brazil.

MfNB Museum für Naturkunde, Berlin; formerly Museum für Naturkunde der Humboldt-Universität zu Berlin (MNHU), Germany.

NHMUK Natural History Museum, London, U.K.

Other abbreviations used:

FW forewing.

HT holotype.

HW hindwing.

PT paratype.

Huebneriella, gen. n.

Type species: *Huebneriella rosanti* sp. n., monotypic, by present designation.

Etymology. This new genus is named for Jacob HÜBNER, a German entomologist, who described species of Hepialidae in the 19th century. The name follows the tradition of *Druceiella* VIETTE, 1949, *Dugdaleiella* GREHAN & C. MIELKE, 2018, *Hampsoniella* VIETTE, 1950, *Kozloviella* GREHAN & C. MIELKE, 2018, *Pfitzneriella* VIETTE, 1950 and *Walkeriella* C. MIELKE, GREHAN & GRADOS (2019). The gender of the name is feminine.

Description

♂ (Figs. 1, 2a, 2b, 4–9). Clypeus anteriorly glabrous and mesally projected, differentiated from the frons. Labial palpus with two tiny, rounded palpomeres. Distitarsus without arolium. Fore- and hindwing venation typical for cibyrine genera with Sc and R aligned very close together over much of the distal wing (GREHAN & RAWLINS 2018); oxycanine venation; FW with Sc1 present; HW with CuP incomplete, 1A and 2A both present (Fig. 5); FW without prominent markings, other than pairs of longitudinal, curved lines between veins, slightly offset between each vein, throughout the wing. Abdomen slightly sclerotized, but darker on the anterior and posterior segments; tergosternal connection with short dorsal and lateral brace curving together next to triangular intermediate zone with prominent posterior-ventral tergal lobe, upper anterior margin with small anterior break (Fig. 6); tuberculate plates discernable; tergum I with lateral ridge meeting anteriolateral tuberculate plate; sternum I subrectangular; tergum and sternum VIII pronounced, longer than any other segment (Figs. 7–8).

♂ **genitalia** (Figs. 9a, 9b, 9c). Tegumen fused dorsally and antero-proximally to the pseudotegumen. Tergal lobes not discernable. Pseudotegumen compound of two

Diagnosis

Externally distinguished from all other Panamerican Hepialidae by the following apomorphic characters:

1. ♂ genitalia with tegumen fused mesally,
2. lamella antevaginalis extended anteriorly,
3. ♀ sternum VIII membranous, and
4. ♀ genitalia with ductus bursae attached laterally to the apparatus.
5. In addition, by the combination of the following characters:
6. labial palpus two segmented on both sexes,
7. oxycanine venation,
8. FW with Sc1 on both sexes,
9. ♂ HW with CuP incomplete,
10. ♀ HW with CuP complete,
11. ♂ tergum and sternum VIII pronounced,
12. pseudotegumen fused dorsal and ventrally and
13. pseudotegumen asymmetrical.

Remarks

The wing shape and venation of *Huebneriella* gen. n. resembles that of *Vietteogorgopis* ÖZDIKMEN, 2007, including the oxycanine pattern and the absence of prominent marking. *Vietteogorgopis*, so far known only from south-eastern and southern Brazil, is a replacement name for the preoccupied *Paragorgopis* VIETTE, 1952 (MIELKE & GREHAN 2012) which was described mainly on the genitalia of the ♂ and only few extra characters have been detailed such as antenna pectinate, epiphysis present and Rs1+Rs2 stalked (VIETTE 1952). Excluding the genitalic features listed, all these other characters have been considered for species differences only (MIELKE 2014, 2015, MIELKE & GREHAN 2015).

The symmetrical and free plates of the pseudotegumen and the presence of tergal lobes found in *Vietteogorgopis* easily distinguish it from *Huebneriella* gen. n. *Alloaepyptus* VIETTE, 1951 and *Roseala* VIETTE, 1950 share with the newly described taxa the lack of any prominent marking on the FW and especially, the longitudinal sets of paired lines between veins throughout the wing. However, *Alloaepyptus* shows hepialine venation and both genera have tergal lobes that makes them very easy to distinguish. Furthermore, *Huebneriella* gen. n. shows an allopatric distribution with all these genera.

Huebneriella rosanti, sp. n.

(Figs. 1, 2a, 2b, 3, 4, 5, 6, 7, 8, 9a, 9b, 9c, 10, 11a, 11b, 11c, 12.)

Holotype ♂ with the following labels (separated by forward slashes): /HOLOTYPUS, *Huebneriella rosanti* C. MIELKE & GREHAN des. 2019/ /55/ Rte forestière de Saut Léodate, pK 4.5, 4°55' N, 52°33' W, 14. x. 1995, J.-L. GIUGLARIS [leg.], [piège lumineux] [= light trap]/ HERMIER n° 22891/ barcode SNB 4990/. Fig. 1. Deposited in MfNB.

Paratypes, in total 3 ♂♂, 1 ♀. All from French Guiana. 1 ♀, Wayabo, 19. x. 2011, W 52°36'30", N 5°3', J.-L. GIUGLARIS leg.

(HERMIER n°. 25066, CGCM 31.068; CGCM); 1 ♂, St. Laurent du Maroni, Village Esperance, 30. ix. 2015, T. ROSANT leg. (CGCM 33.011; CGCM); 1 ♂, St. Jean du Maroni (NHMUK); 1 ♂, Road Patagai-Counamama, W 53°12'47", N 5°20'34", 58 m, 3. x. 2013, HERBIN & FELIS leg. (CGCM 30.241; CGCM).

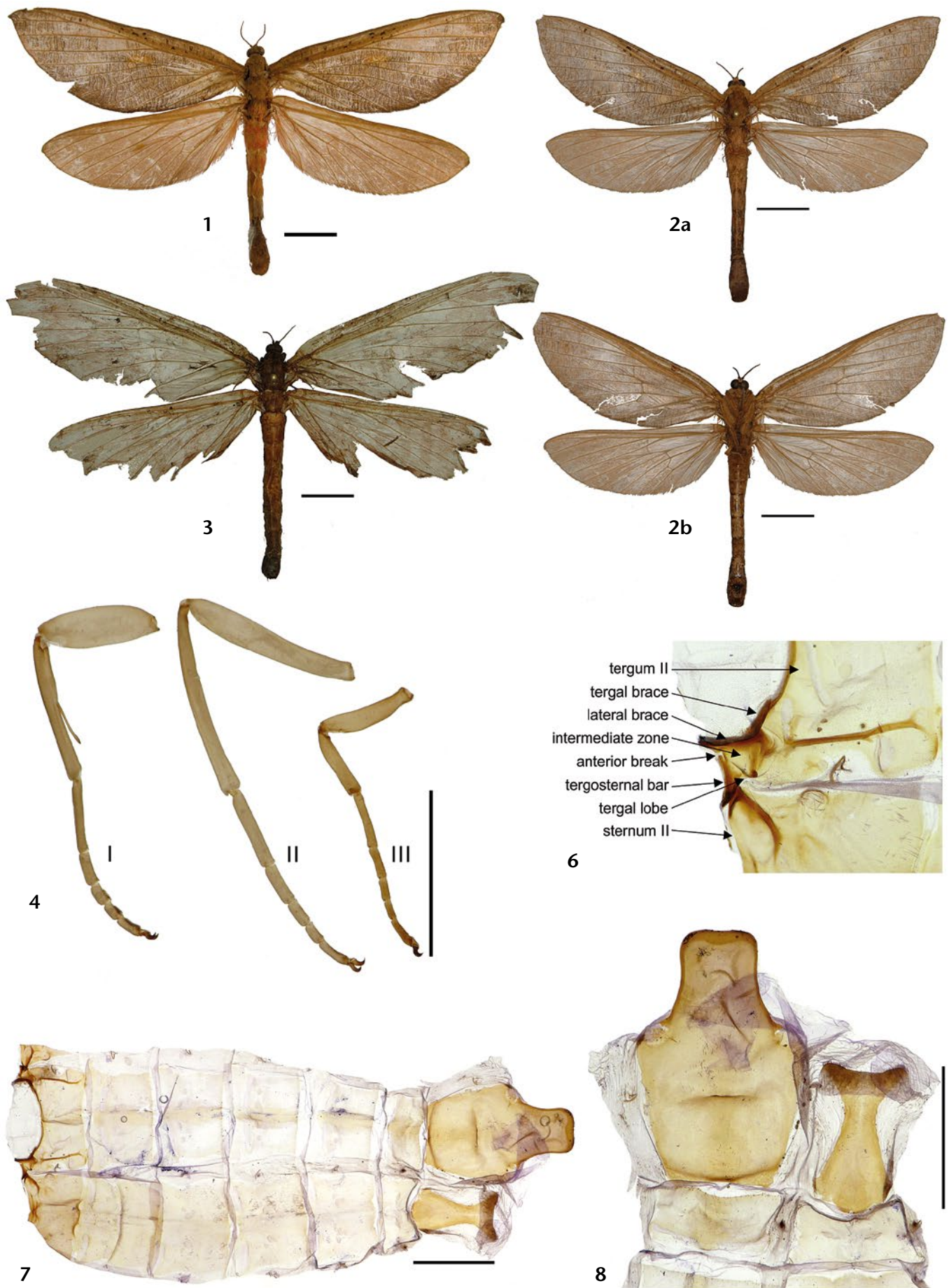
Etymology. The species name *rosanti* is named after Thibault ROSANT (Saint Laurent du Maroni), who kindly donated one ♂ PT for examination.

♂ (Figs. 1, 2a, 2b, 4, 5, 6, 7, 8). FW length: 41–46 mm; wingspan: 82–100 mm.

Frons and vertex straw coloured. Antenna lamellate with about ca. 38 antennomeres covered by sensilla trichodea ventrally. Thorax coloured as the head. FW costal margin convex in the basal third, then straight to apex; apex acute; outer and inner margins convex without distinct tornus. Dorsal ground colour light orangish-brown; costal margin with interspersed brown and black spots; basoproximal, basodistal, postdiscal and submarginal bands concolourous and not distinguished with numerous pairs of transverse thin lines between veins, some forming an ovoid spot; pale-yellow spots within the discal cell, sometimes rounded and obliquely arranged from the base of CuA₁ to apex; stigma light yellow, badly marked. HW dorsally light orangish-brown, basally with pink hue, lighter distally. Legs coloured as the thorax; epiphysis present, pin-like, distally enlarged, arolium absent (Fig. 4). Abdomen coloured dorsally as for thorax, basally with pink hue, distal portion lighter as ventrally; tergum VIII well developed, at least twice longer than any other segment, widening posteriorly, then narrowing in distal third projected posteriorly; sternum VIII more sclerotized than other sterna, shaped as an inverted cup (Figs. 6–8).

♂ **genitalia** (Figs. 9a, 9b, 9c). Tegumen plates form a dorsal arch fused across the midline, and anterior-proximally fused to the pseudotegumen; ventral portion articulated with saccus. Saccus V-shaped with lateral expansions, projected anteriorly and proximally curved dorsally. Tergal lobes not discernable. Pseudotegumen compound of two conspicuous and irregular plates with a prominent dorsal notch where the membrane of the phallus attaches; plates fused antero-dorsally and convergent to the fusion point of the tegumen; distal portion asymmetrical, left side larger, with a dorsal projection and converging ventrally to a well sclerotized apex; from the ventral apex to the dorsal projection, a spiny keel submarginally and marginally. Fultura inferior as a vertical bar. Fultura superior represented by membrane thickening shaped as the fultura inferior. Valva curved, tapered and hook-like distally; ventro-proximal portion with numerous short bristles. Phallus half-length of the sclerotized apparatus, when everted, apex enlarged as a balloon with two dorsal curved projections.

♀ (Figs. 3, 10). FW length: 53 mm; wingspan: 109 mm. Only differences from the ♂ are mentioned. Body colour, see remarks. Antenna lamellate with about 37 antennomeres.



Figs. 1–3: *Huebneriella rosanti* sp. n. ♂ HT, dorsal view (1); ♂ PT (CGCM 30.011), dorsal view (2a), ventral view (2b); ♀ PT (CGCM 31.068), dorsal view (3). Scale bars = 1 cm. — **Fig. 4:** *Huebneriella rosanti* sp. n. ♂ PT (CGCM 30.011). Legs. Scale bar = 0,5 cm. **Figs. 6–8:** *Huebneriella rosanti* sp. n., ♂ PT (CGCM 33.011). Tergo-sternal connection (6). Abdomen upper dorsal, lower ventral view (7). Tergum (left) and sternum (right) VII and VIII (8). Scale bars = 0.5 cm.

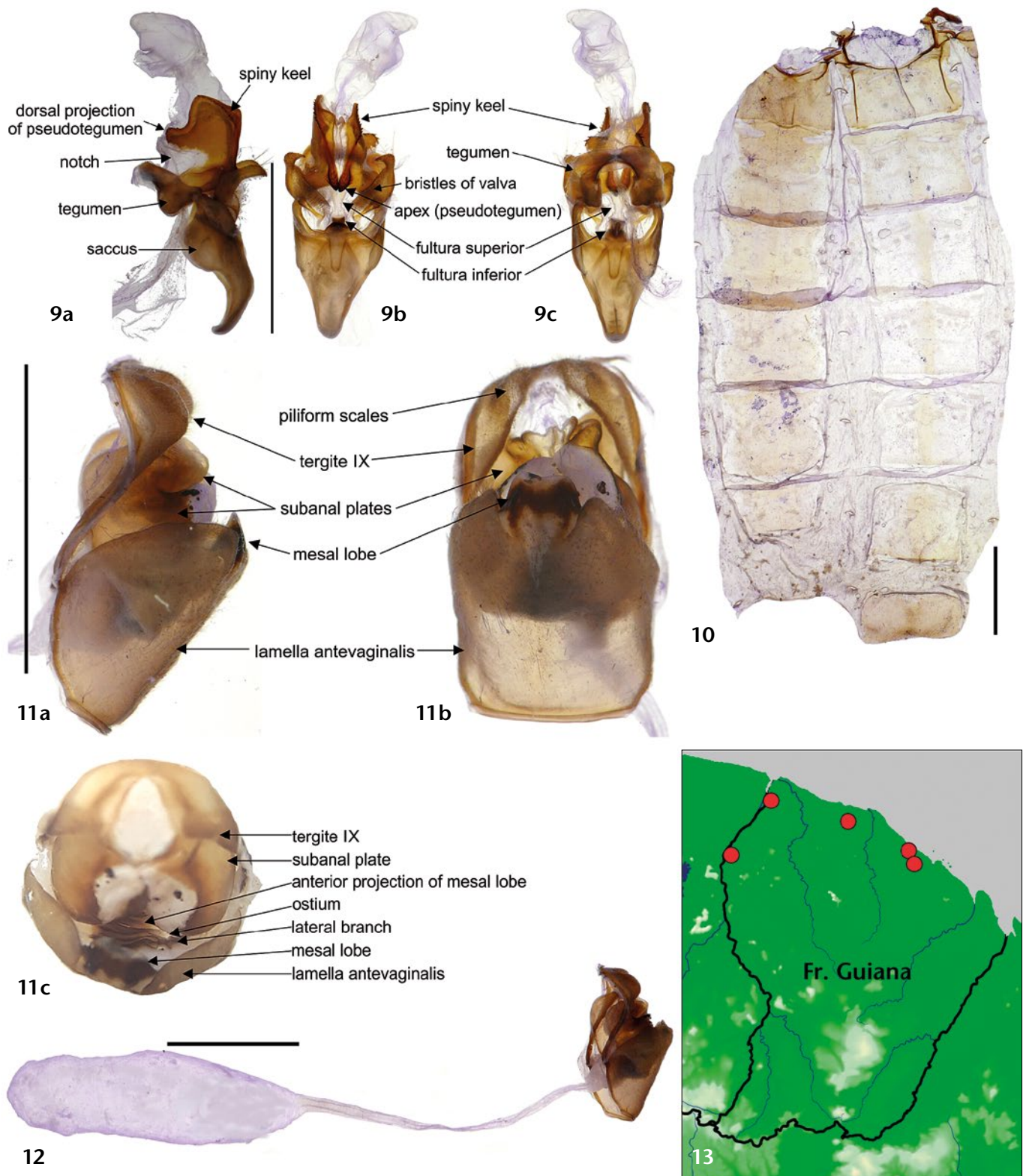


Fig. 9: *Huebneriella rosanti* sp. n., ♂ PT (CGCM 33.011). Genitalia: lateral view (9a), anterior view (9b), ventral view (9c). Scale bars = 0.5 cm. **Figs. 10–12:** *Huebneriella rosanti* sp. n., ♀ PT (CGCM 31.068). Abdomen upper dorsal, lower ventral view (10). Genitalia: lateral view (11a, 11b), anterior view (11c), ductus and corpus bursae (12). Scale bars = 0.5 cm. — **Fig. 13:** Geographical distribution of *Huebneriella rosanti* sp. n. in French Guiana (red dots).

conspicuous and irregular lateral plates fused dorsally and ventrally; distal plate asymmetrical with spiny keel submarginally and marginally. Fultura superior represented by membrane thickening. Valva with numerous bristles ventro-proximally. Phallus membranous.

♀ (Figs. 3, 10–12). Only differences from the ♂ are mentioned. HW with CuP complete. Tergum VIII not

differentiated; sternum VIII membranous (Fig. 10).

♀ **genitalia** (Figs. 11a, 11b, 11c, 12). Tergum IX dorsally pronounced, ventrally as slender arms that articulate with the lamella antevaginalis. Subanal plates densely sclerotized, fused dorsally, meeting mesally the anterior projection of the lamella antevaginalis. Ductus bursae attached laterally to the apparatus.

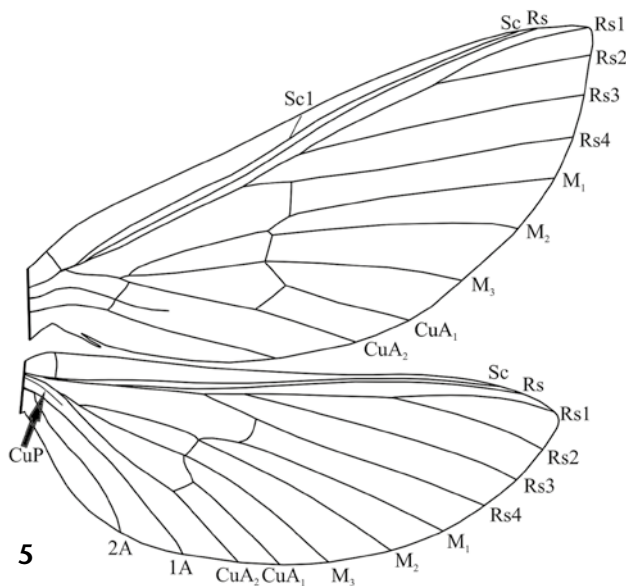


Fig. 5: *Huebneriella rosanti* sp. n. ♂ PT (CGCM 30.011), wing venation.

♀ genitalia (Figs. 11a, 11b, 11c, 12). Tergum IX with dorso-proximally covered by piliform scales. Lamella antevaginalis prominent, shield shaped and projected posteriorly with a well sclerotized mesal lobe; from the later emerges antero-ventrally a long and wrinkled process, initially downwards and then upwards which occupies the mesal region of the apparatus posteriorly, ending between the subanal plates; from the lower portion of this process emerges a lateral and thin branch of same texture, that together with the former, surrounds the ostium opening laterally. Subanal plates dorsally with folds. Ductus and corpus bursae subequal in length.

Ethology. All specimens with personal or collecting information were attracted to light at dusk.

Distribution. *Huebneriella rosanti* sp. n. is known from several lowland localities in French Guiana (Fig. 13).

Host plant. Unknown.

Diagnosis. The single known species may be recognized using diagnostic attributes of the genus. In addition, the ♂ genitalia show the following diagnostic features:

- 1) a spiny keel on the pseudotegumen margin of the anogenital region, and
- 2) phallus half-length of the apparatus, expanding distally with two dorsal curved projections when everted.

Remarks. The unique known ♀ was labelled as collected in an interception trap and likely conserved in alcohol. Most of the wing scales are lost and along with that the pattern of wing ornamentation is not discernable.

Taxonomic and systematic remarks

The new species bears the four characters that define the cibyrine clade of Hepialidae according to GREHAN (2010, 2012): a triangular tergo-sternal bar connection,

- 1) an indentation on the anterior margin,

- 2) a knob at or near the posterior border of the intermediate zone (Fig. 6), and

- 3) a very narrow or almost absence of spacing between Sc and R on the HW for much of their length (Fig. 5).

However, we were unable to recognize any features that would necessarily link *Huebneriella* gen. n. to one or more genera within the cibyrine clade. The posterior sternite in the ♂ is distinct for its hourglass-shape that is unlike that of any other American Hepialidae. The dorsal extension of the tergite VIII as a hood beyond the genitalia is also found in an undescribed species of "*Pseudodalaca* VIETTE, 1950" (generic placement of that species currently under evaluation) in Costa Rica. In the latter species, the projection is more triangular in shape, narrowing to a rounded posterior edge.

Whether there is any particular homology involved will require further investigation. The shared oxycanine venation is of potential phylogenetic interest as discussed by MIELKE et al. (2019). The newly described taxon is the sixth South American genus with this characteristic in addition to *Aepytus* HERRICH-SCHÄFFER, [1856], *Roseala*, *Tricladia* C. & R. FELDER, 1874, *Vietteogorgopis*, and *Walkeriella* (MIELKE et al. 2019). The distinctive transverse markings of *Huebneriella* gen. n. distinguishes this genus from all the other oxycanine cibyrines.

There is currently no corroborating feature shared by these genera to support a monophyletic group and the genitalia of *Aepytus* share features more in common with the hepialine veined *Cibyra* WALKER, 1856 than other oxycanines.

There are two aspects of the male genitalia for *Huebneriella* gen. n. that are reminiscent of *Walkeriella* from Peru. Both of genera have a subrectangular (at least for the basal portion) shaped valva with a slight concave longitudinal surface on the medial (inner) side of the valva. The principal difference in the valva between the two genera is in the distal end where *Huebneriella* gen. n. terminates with hooked spine. In *Walkeriella*, the pseudotegumen is produced dorsally as rounded prominence or lobe to either side of the basal phallus (MIELKE et al. 2019: fig. 9a) and this may be homologous with the 'dorsal projection' present in *Huebneriella* gen. n. (Fig. 9a).

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