



Redescription of the monotypic genus *Volkeliopsis* Poppius (Hemiptera: Heteroptera: Miridae: Bryocorinae)

IZABELA SADOWSKA-WODA¹ & FRÉDÉRIC CHÉROT²

¹Department of Biochemistry and Cell Biology, University of Rzeszow, Cegielniana 12, 35-310 Rzeszow, Poland.

E-mail: isadowska@poczta.fm

²Systematic and Animal Ecology, Department of Population Biology, Free University of Brussels, C.P. 160/13, av. F. D. Roosevelt, 50 B - 1050 Brussels, Belgium. E-mail: fcherot@ulb.ac.be

Abstract

The monotypic genus *Volkeliopsis* POPPIUS and its type species *Volkeliopsis frontalis* are redescribed. The male genital structures are described for the first time.

Key words: taxonomy, Heteroptera, Miridae, Bryocorinae, *Volkeliopsis*, redescription, male genital structures

Introduction

The genus *Volkeliopsis* was established by Poppius (1915) to accommodate his new species *Volkeliopsis frontalis*, collected in Luzon, the largest and northernmost island group in the Philippines. This genus belongs to the subtribe Odoniellina, tribe Dicyphini, subfamily Bryocorinae (Schuh, 1976, 2005). Since that time *V. frontalis* has been listed in only four works: Carvalho's keys to Miridae genera of the world (1952, 1955) and two catalogs (Carvalho 1957: 149 and Schuh, 1995: 533). So far, no other reports on the genus have been published. Consequently, until now, the male genital structures of *V. frontalis* remain unknown.

During her stay in the Zoological Museum, University of Helsinki, Finland (MZHF), the senior author found two male specimens of *Volkeliopsis frontalis*, including the holotype by monotypy. We provide here a redescription, including a first description of the male genital structures, of the genus and species on the basis of these two male specimens.

Taxonomy

VOLKELIOPSIS Poppius

Volkeliopsis Poppius, 1915: 81–82 (as new genus)

Volkeliopsis: Carvalho, 1952: 60 (catalog)

Volkeliopsis: Carvalho, 1955: 41 (key)

Volkeliopsis: Carvalho, 1957: 149 (catalog)

Volkeliopsis: Schuh, 1995: 533 (catalog)

Type species: *Volkeliopsis frontalis* Poppius, 1915 (original designation)

Volkeliopsis frontalis Poppius

Volkeliopsis frontalis Poppius, 1915: 82–83 (monotypy)

Volkeliopsis frontalis: Carvalho, 1952: 60 (catalog)

Volkeliopsis frontalis: Carvalho, 1957:149 (catalog)

Volkeliopsis frontalis: Schuh, 1995: 533 (catalog)

Type material examined. Holotype (♂): PHILIPPINES ISLANDS: “Mt. Makiling Luzon, Baker” / “*Volkeliopsis frontalis* n. gen. et. sp” / “Mus. Zool. H: fors; spec. typ. No 10169, *Volkeliopsis frontalis* Popp.” / “Holotypus (male)” / “Mus. Zool. Helsinki Loan no HE 5256” / “*Volkeliopsis frontalis* g. n. sp. n. B. Poppius 1915” (MZHF).

Other material examined: 1 ♂: PHILIPPINES ISLANDS: Luzon: Mt Makiling, Baker leg. (MZHF).

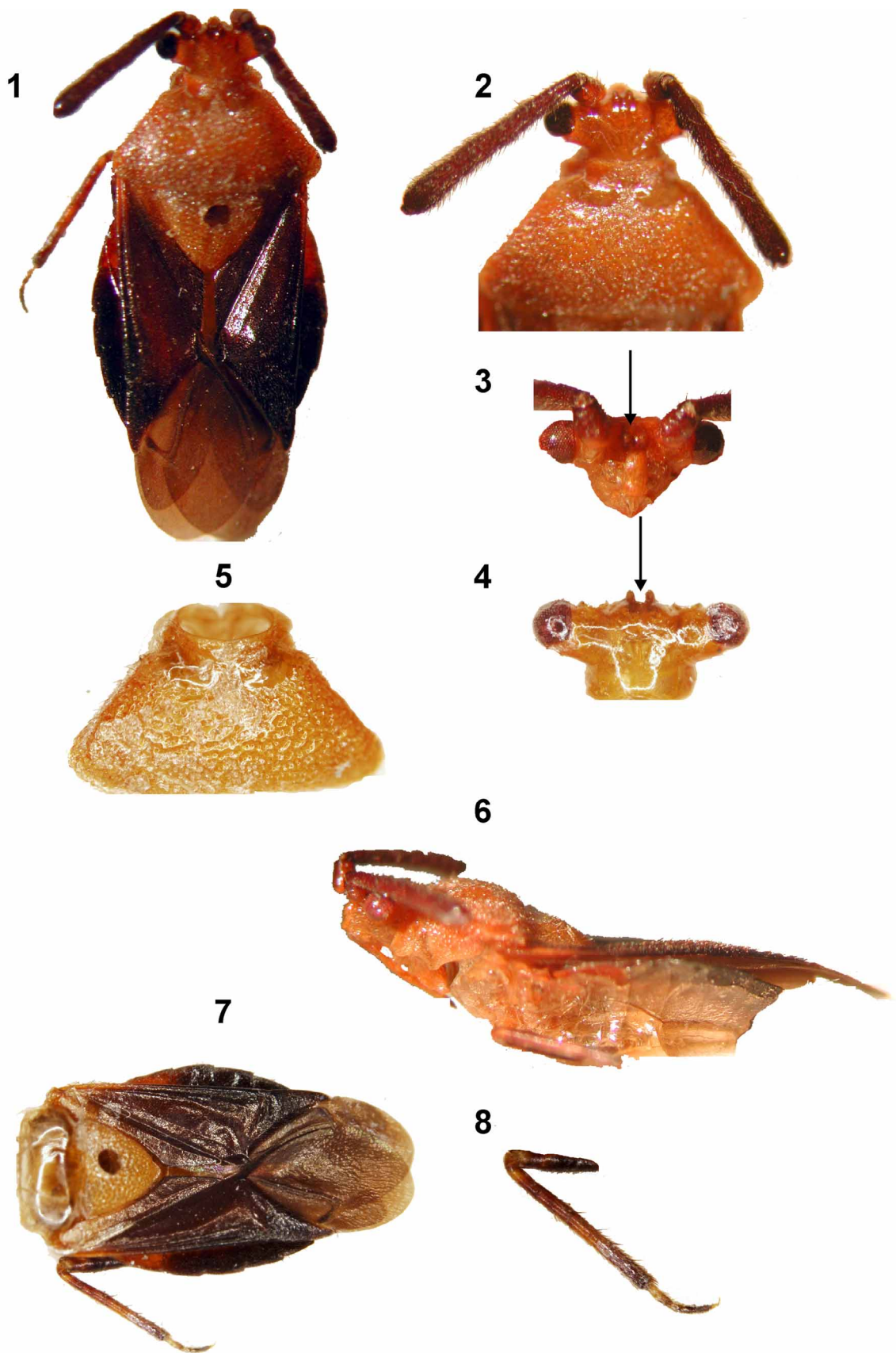
In his original description, Poppius (1915: 83) mentioned only one specimen (“1 exemplar”), so the second one cannot be included in the type series. However, the identification of the “true” holotype is uncertain because the two specimens have the same origin (same place and collector). The “type” label, too recent, cannot help. We suggest considering the damaged specimen as the holotype because it bears an apparently original handwriting label with following indications: “*Volkeliopsis frontalis* n. gen. et sp”.

Redescription. Body stout, relatively wide, shining, covered with pale, rather long, semi-erect simple setae. Total length of the body 4.77–6.81 mm, total width 3.0–3.13 mm. Head, pronotum, and scutellum light yellowish brown to orange-brown, eyes blackish brown, hemelytra brown to dark brown with grayish membrane (Figs 1, 7).

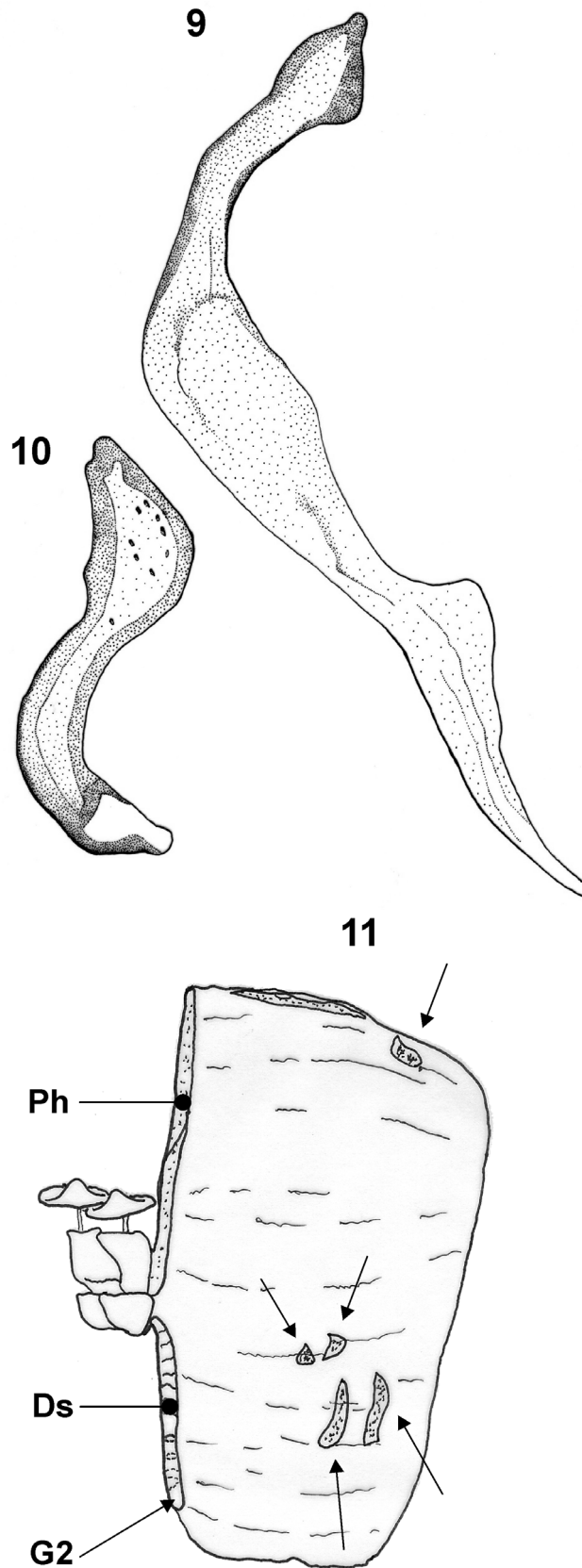
Head broad, short, with strongly pedunculate eyes (Fig. 4). Length of head (dorsal view) 0.9 mm, width across eyes 1.5 mm. Clypeus free, not covered by frons, barely or not visible in dorsal view, orange-brown, with brown patches. Lorae and juga orange-brown, large, lacking tubercles, with sparse short recumbent simple setae. Frons prominent, orange-brown, darker medially, practically smooth, with several semi-erect simple setae and two wide submedian tubercles (Figs 3, 4). Eyes pedunculate, glabrous, blackish brown. Ocular peduncles distinctly removed from pronotal collar (Fig. 4). Anterolateral part of frons distinctly notched by large antennal socket. Antennae covered with rather long, dense, dark, semi-erect or erect simple setae (Fig. 2). First antennal segment short, its length about equal to head length anterior to eyes, wide, three times wider than long, yellowish brown, second antennal segment thick, dark brown, slightly thickened apically (Figs 1, 2). Third and fourth segments broken in the two available specimens (all segments lacking on holotype), but according to Poppius (1915), third segment apically thick, about half shorter than length of second. Length of antennal segments in mm: I: 0.36, II: 2.09. Vertex smooth, glabrous, orange-brown, narrower posteriorly. Posterior margin of vertex rounded, devoid of carina. Rostrum thick, yellowish brown, tinged with dark brown at acute apex, extremely short, reaching slightly beyond apex of procoxae [extending to mesocoxae according to POPPIUS (1915)]. Length of rostrum 1.14 mm, last segment 0.44 mm, length of other individual segments immeasurable in the examined specimens (Fig. 6). First segment thicker, not reaching posterior margin of head.

Pronotum wide, yellow-orange or orange-brown, punctured, punctuation wide and deep (Fig. 5). Length of pronotum 1.36 mm (excluding pronotal collar), length the anterior margin 0.99–1.45 mm, lateral margins 1.45–1.5 mm, posterior margin 2.68–2.86 mm. Pronotal collar orange, wide, smooth, with sparse black erect setae. Anterior lobe of pronotum very small, smooth, separate from pronotal disk. Callosities distinct, elongated, relatively flat to weakly elevated, smooth, dark brown. Pronotal disk strongly punctured, with dark, stiff, semi-erect or erect simple setae. Posterior margin concave medially. Humeral angles rounded. Mesoscutum totally covered.

Scutellum punctured, slightly swollen, lateral margins rounded, anterior margin right, slightly curved medially, posterior margin triangular. Length of anterior margin 1.09–1.36 mm, lateral margin 1.18–1.36 mm (Figs 1, 7).



FIGURES 1–8. *Volkeliopsis frontalis* Poppius, 1915, male. 1. Dorsal habitus. 2. Dorsal view of head and pronotum. 3. Frontal view of head of holotype. 4. Dorsal view of head of holotype. 5. Pronotum of holotype. 6. Lateral view of habitus. 7. Dorsal view of scutellum and hemelytra of holotype. 8. Second leg.



FIGURES 9–11. *Volkeiopsis frontalis* Poppius, 1915, holotype, male genitalia. 9. Left paramere. 10. Right paramere. 11. Phallus (probably dissected by G. Schmitz; original drawing).

Hemelytra. Clavus and endocorium dark brown, anteriorly orange-brown, punctation narrow, shallow, pilosity simple, dense, relatively long and stiff, semi-erect or erect. Exocorium narrow, darker, practically black. Cuneus black. Membrane brown, with brown veins and only one cell, reaching beyond pygophore. Stub lacking. Maximum wide across hemelytra 2.13–2.5 mm (Figs 1, 7).

Legs. Short (Fig. 9). Forefemora dark brown, tinged light yellowish brown at the extreme apex, foretibiae yellowish brown with slightly darker extreme apices, covered with dense, protruding setae, becoming slightly denser apically. Foretarsi black (except anterior part of first segment yellow), first segment practically as long as second and third together. Claw yellow.

Abdomen: Connexivum wide (Fig. 6), flat, dark red-brown or orange brown, black on margins, laterally rounded, its vestiture identical to hemelytra. Ventral surface brown, setae narrower. Total length of pygophore: 1.77 mm ; total width of pygophore: 2.68 mm.

Male genital structures. Left paramere (Fig. 9) large. Right paramere (Fig. 10) distinctly smaller than left, simple. *Ductus seminis* (Ds, Fig. 11) elongated, coiled, with rings, secondary gonopore (G2) rounded, unarmed, simple, phallosome (Ph) elongated, practically flat, slightly twisted, sclerotized at dorsal side only, endosoma *sensu* Kerzhner & Konstantinov (1999) membranous, with sclerotized armament (five small slightly curved sub-triangular sclerites ; arrows), probably undivided into a vesica and a conjunctiva *sensu* Kerzhner & Konstantinov (*op. cit.*) (Fig. 11).

Female. Unknown.

Distribution: Philippine Islands: Luzon.

Discussion

Volkeliopsis frontalis possesses all the main diagnostic characters of the subtribe Odoniellina as defined by Carvalho (1981, who treats it as a tribe; unlike Schuh, 1976), i.e., (1) first antennal segment very short, equal (or shorter) in length to half of vertex width, incrassate, about as long as wide; (2) a coarsely punctate pronotum; (3) a noticeably inflated scutellum; (4) a relatively large and wide body, stout; (5) some species (mainly from Africa) have auxiliary veins on the membrane and three tubercles on the head; however, these species have a longer first antennal segment.

Presently, we do not have any comprehensive review of the Odoniellina of the World and of course we have no phylogenetic analysis of the group. Consequently, we cannot suggest the relationships of the genus *Volkeliopsis* in this subtribe, or even suggest some hypotheses to explain several assumed diagnostic characters of the genus (such as stalk eyes — not a sexual dimorphism according to Stonedahl [1986] and the two frontal tubercles...).

The collection of additional specimens – including females – would be very desirable.

Acknowledgments

We would like to express our sincere thanks to Dr. Larry Huldén (ZMHF) and to Dr P. Grootaert and M. J. Constant (Royal Belgian Institute of Natural Sciences, Brussels, Belgium) for their help during the stay of the authors in their Institutions and for loaning the type material for the present study.

Dr Carl W. Schaefer (University of Connecticut, Storrs, USA) provided helpful review of the manuscript.

The senior author received support from SYNTHESIS project (BE-TAF 2672) which is financed by European Community Research Infrastructure Action under the FP6 “Structuring the European Research Area” Programme.

References

- Carvalho, J.C.M. (1952) On the major classification of the Miridae (Hemiptera, Heteroptera) (with keys to subfamilies and tribes and a catalog of the world genera). *Anais da Academia brasileira de Ciencias*, 24, 31–110.
- Carvalho, J.C.M. (1955) Key to the Genera of Miridae of the World. *Boletim do Museu Paraense Emilio Goeldi*, 11 (2), 1–151.
- Carvalho, J.C.M. (1957) Catálogo dos Mirídeos do Mundo. Parte I. *Arquivos do Museu Nacional*, XLIV, 1–216.
- Carvalho, J.C.M. (1981) The Bryocorinae of Papua New Guinea. *Arquivos do Museu Nacional*, 56, 35–89.
- Kerzhner, I.M. & Konstantinov, F.V. (1999) Structure of the aedeagus in Miridae (Heteroptera) and its bearing to suprageneric classification. *Acta Societatis Bohemoslovaca*, 63, 117–137.
- Poppius, B. (1915) Neue orientalische Bryocorinen. *Philippine Journal of Science*, 10, 75–88.
- Schuh, R.T. (1976) Pretarsal Structure in the Miridae (Hemiptera) with a Cladistic Analysis of Relationships Within the Family. *American Museum Novitates*, 2601, 1–39.
- Schuh, R.T. (1995) *Plant bugs of the world* (Insecta: Heteroptera: Miridae). *Systematic Catalog, Distributions, Host List, and Bibliography*. Entomological Society of New York, New York. xii + 1329 pp.
- Stonedahl, G.M. (1986) *Stylopomiris*, a new genus and three species of Eccritotarsini (Heteroptera: Miridae: Bryocorinae) from Viet Nam and Malaya. *Journal of the New York Entomological Society*, 94, 226–234.