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A new species of *Bananellodes* Strand, 1928 from Namibia (Hemiptera: Fulgoromorpha: Tropiduchidae)

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Abstract

A new species of the genus *Bananellodes* Strand, 1928 (Tropiduchidae), *B. davidi* sp. nov. is described from the Kuzikus Wildlife Reserve in the Namibian Kalahari and compared with the single species hitherto described in the genus, *B. rubrinervis* (Schmidt, 1924) from Democratic Republic of Congo. Habitus and details are illustrated for both species. Male genitalia of *B. davidi* sp. nov. are figured. An identification key and a distribution map for the two species of the genus are provided.

Keywords: Leopold III Funds, Duriina, Planthopper, Fulgoroidea, Malaise trap.

Introduction

The study of material collected in 2012 in the Kuzikus Wildlife Reserve, Namibia, during fieldwork in the frame of the project "Exploration of the entomological fauna of the Kuzikus wildlife reserve (Namibia) II" by the author and volunteers, revealed a second species of the Tropiduchid genus *Bananellodes*. That project was included in the Entomological Project organized by BRinK (Biological Research in Kuzikus).

Kuzikus Wildlife Reserve is a 10,500 ha nature reserve in the Kalahari, surrounded by cattle and sheep farms. It also used to be a cattle and sheep farmland from 1910 to 1980 when the founders of the reserve, Mrs Hiltrud and Dr Fritz Reinhard, bought it with the goal of regenerating a small area of the original Kalahari. After being a game reserve for several years, Kuzikus was in 2005 opened to nature-oriented tourism and, after the reintroduction of locally extinct species, it is now a biodiversity rich area in an environmentally endangered region.

The genus *Bananella* was described by SCHMIDT (1924) in the family Fulgoridae [at the time covering the current concept of Fulgoromorpha] to accommodate one new species: *B. rubrinervis* Schmidt, 1924 from Banana in [Democratic Republic of] Congo. He stated that the new genus was close to *Euhiracia* Melichar, 1908 (Dictyopharidae). STRAND (1928) proposed the new name *Bananellodes* in replacement of *Bananella* Schmidt, 1924 for reason of preoccupation by *Bananella* Labbé, 1895 in the Protozoa.

The genus was then placed in the Dictyopharidae: Orgeriinae: Lyncidini in the catalogue of METCALF (1946), following SCHMIDT's (1924) statement that it is close to *Euhiracia*.

SYNAVE (1957) redescribed the genus and species and transferred *Bananellodes* to the Issidae while, the year after, FENNAH (1958) finally moved the genus to the Tropiduchidae after

examining the type of *B. rubrinervis*. The latter author illustrated the head and thorax, and the tegmen, and gave a small set of characters for the species which are quite useless for its recognition. The tribal attribution was later resolved by FENNAH (1982) who placed the genus in his subtribe Duriina Fennah, 1982 of the Eutropistini Kirkaldy, 1906, in the subfamily Tropiduchinae.

The genus currently contains a single species (BOURGOIN, 2015) and the present paper aims at describing a second species and giving some comments on its natural history.

Material and methods

The genitalia were extracted after boiling the abdomen about one hour in a 10% solution of potassium hydroxide (KOH) at about 100°C. Some drops of saturated alcoholic Chlorazol black solution were added for contrasting (CARAYON, 1969). The pygofer was separated from the abdomen and the aedeagus dissected with a needle blade for examination. The whole was then placed in glycerine for preservation.

The terminology of the venation follows BOURGOIN *et al.* (2014).

The measurements were taken as in CONSTANT (2004) and the following acronyms are used:

BF = maximum breadth of the frons
BTg = maximum breadth of the tegmen
BV = maximum breadth of the vertex
LF = length of the frons in median line
LTg = maximum length of the tegmen
LT = total length (apex of head to apex of tegmina)
LV = length of the vertex in median line

Photographs were taken with a Canon EOS 600D camera equipped with a Tamron DI SP 90 mm Macro lens, staked with CombineZ software and optimized in Adobe Photoshop CS3. Observations were done with a Leica MZ8 stereo microscope.

The types of the new species are deposited in the collections of the Royal Belgian Institute of Natural Sciences, Brussels, Belgium (RBINS); the type of *B. rubrinervis* is stored in the collections of the Royal Museum of Central Africa, Tervuren, Belgium (RMCA).

Taxonomy

Family **Tropiduchidae** Stål, 1866

Subfamily **Tropiduchinae** Stål, 1866

Tribe **Eutropistini** Kirkaldy, 1906

Subtribe **Duriina** Fennah, 1982

Genus ***Bananellodes*** Strand, 1928

Bananellodes STRAND, 1928: 73 [nom. nov. for *Bananella* Schmidt, 1924 *nec Bananella* Labbé, 1895 (Protozoa)].
Type species: *Bananella rubrinervis* Schmidt, 1924.

Bananella SCHMIDT, 1924: 105 [described, close to *Euhiracia* Melichar, 1908 (erroneous)].

Bananellodes Strand, 1928 – METCALF, 1946: 183 [catalogued in the Dictyopharidae: Orgeriinae: Lyncidini] – SYNAVE, 1957: 37 [transferred to the Issidae and redescribed] – FENNAH 1958: 141 [transferred to the Tropiduchidae] – FENNAH, 1967: 685 [mentioned as previously transferred in the Tropiduchidae] – FENNAH, 1982: 640 [placed in the Eutropistini, Duriina]. – FLOW, BOURGOIN, 2015: http://hemiptera-databases.org/flow/?page=explorer&db=flow&lang= fr&card=name&id=27685.

The definition of the genus given by SYNAVE (1957) and the suprageneric placement in the Eutropistini Duriina proposed by FENNAH (1982) are here followed.

Identification key to the species of *Bananellodes*

– Frons concave on dorsal half in lateral view, slightly projecting anteriorly (Figs 1A, 2C); tegmina with anteapical row of cross-veinlets but no cells along apical margin (Figs 1A-B, 2A-C) ..... ***B. davidi*** sp. nov.
– Frons straight in lateral view, not projecting (Fig. 3A); tegmina with a row of open cells after anteapical line of cross-veinlets (Fig. 3A, C) ..... ***B. rubrinervis*** (Schmidt, 1924)

Bananellodes davidi sp. nov.
Figs 1, 2, 4, 5, 6

ETYMOLOGY. The species epithet refers to my Polish colleague and friend David Schimrosczyk (Museum and Institute of Zoology, Warsaw, Poland) in memory of the two collecting trips we made together in Kuzikus.

TYPE MATERIAL. Holotype ♂ (dissected, left hind wing mounted): Namibia: [Coll. I.R.Sc.N.B., Namibia, Kuzikus W.R., 23°14'17"S 18°23'29"E, 17.IX-5.X.2012 Malaise trap, leg. J. Constant, V. Sougnez & N. Maes, I.G.:32.223] (RBINS).
Paratypes: 2♂, 3♀: same data as holotype (RBINS); 1♂ (dissected, right hind wing mounted): [Coll. I.R.Sc.N.B., Namibia: Kuzikus W.R., 23°14'16"S 18°23'24"E, 19.X.2010, Hand Catch, Leg. Johanna Reinhardt, I.G.: 31.767] (RBINS).

ADDITIONAL MATERIAL.
1 nymph: same data as holotype (RBINS).

DIAGNOSIS. The species is easily separated from *B. rubrinervis* by the characters given in the key. It is also different in colouration, being mottled grey and brown with black markings while *B. rubrinervis* is yellowish with reddish markings. However, it is possible that the colour of the single known female of *B. rubrinervis* is faded.

DESCRIPTION

Measurements and ratios ♂ (n = 3): LT = 3.53 mm (3.5-3.6); ♀ (n = 4): LT = 4.32 mm (4.0-5.3). LTg/BTg = 2.5; LV/BV = 2.1; LF/BF = 1.97.

Head: (Figs 1 A–B, 2 A, C–E) laterally compressed, 0.6 times as broad as pronotum; strongly elevated with eyes above level of dorsum. Black-brown variegated with pale yellow; vertex black-brown with a few small pale yellow spots. Vertex elongate and narrow, slightly more than two times longer than broad, deeply grooved longitudinally and with median carina on basal 2/3; laminate on sides; anterior margin narrowly rounded in dorsal view; lateral margins subparallel in dorsal view; posterior margin concave and carinate; dorsal margin

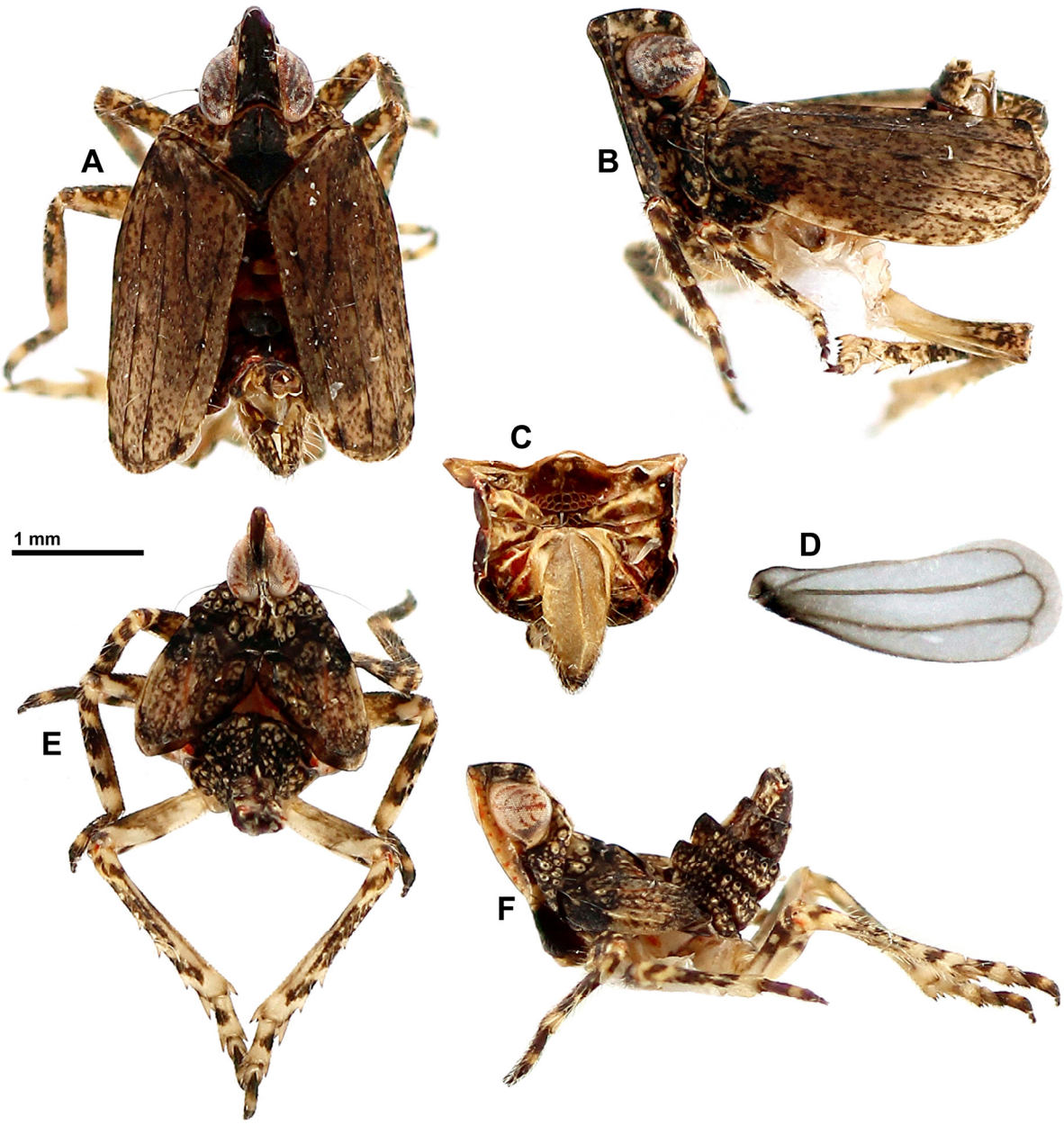

Fig. 1 A–E. *Bananellodes davidi* sp. nov. A-D, holotype ♂, total length: 3.6 mm. A, habitus, dorsal view. B, habitus, lateral view. C, abdomen, ventral view. D, right posterior wing. E-F, Nymph. E habitus, dorsal view. F, habitus, lateral view.

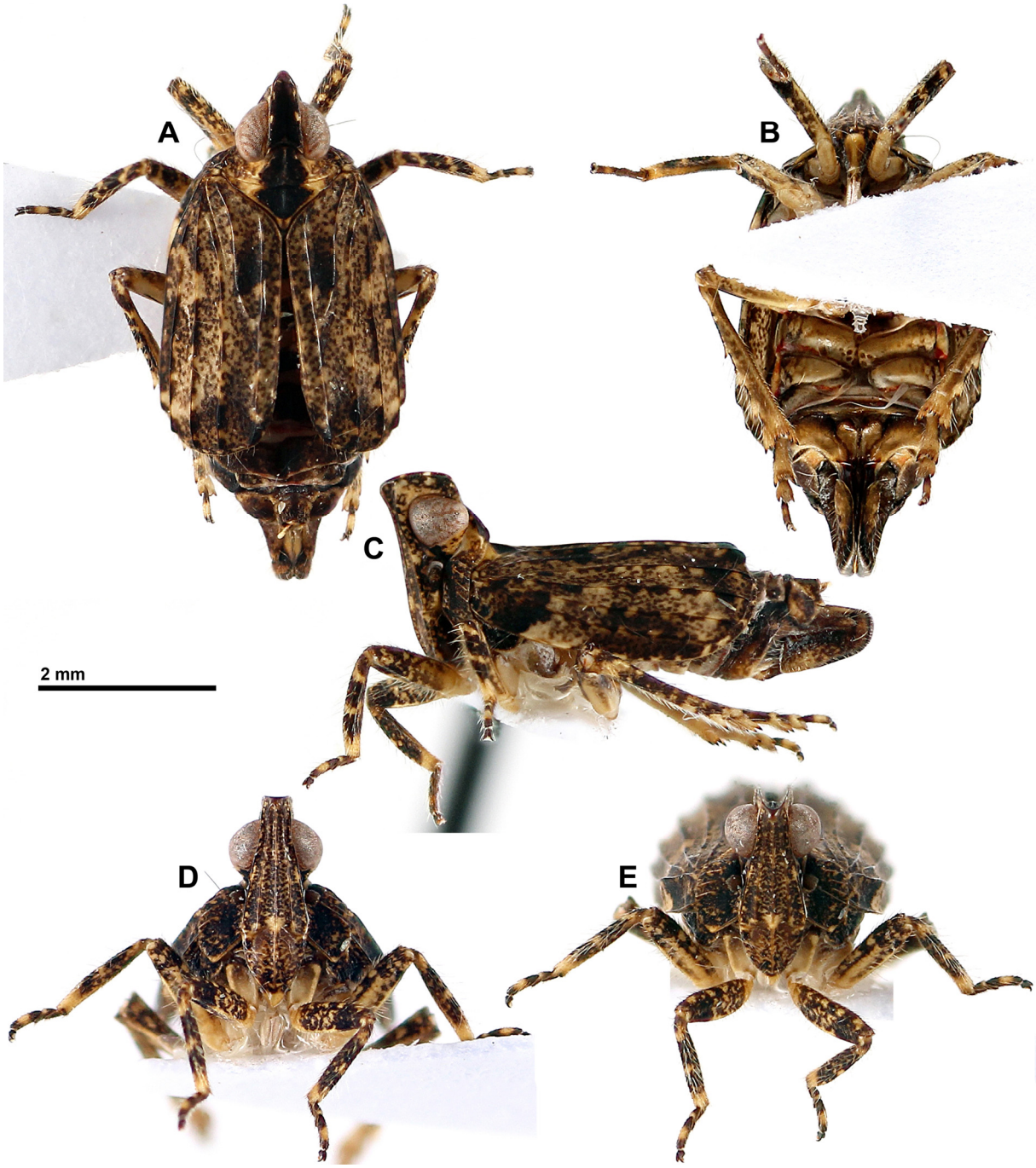

Fig. 2 A–E. *Bananellodes davidi* sp. nov., paratype ♀, total length: 5.3 mm. A, habitus, dorsal view. B, habitus, ventral view. C, habitus, lateral view. D, head and thorax, normal view of frons. E, habitus, frontal view.

slightly rounded in lateral view. Frons elongate and narrow, about two times longer than broad, sinuate in lateral view with dorsal half concave and upper part slightly projecting anteriorly; 3 longitudinal carinae fused together before dorsal margin; median carina extending to apex of clypeus, lateral carinae stopped at fronto-clypeal suture. Clypeus subtriangular, slightly longer than broad, paler apically. Antennae short, black-brown with scape very short, ring-shaped and pedicel subcylindrical, about as long as broad. Labium elongate and narrow, reaching metacoxae; ocelli absent.

Thorax: (Figs 1 A–B, 2 A, C–E) pro- and mesonotum dark brown variegated with pale yellow and with broad black band in middle prolongating vertex; black area often margined with yellow laterally; tegulae variegated brown and yellow. Pronotum short and strongly elevated anteriorly; median and peridiscal carinae present; 4 small longitudinal carinae on lateral lobes; posterior margin broadly rounded; anterior margin strongly sinuated, and roundly produced and slightly carinate between eyes. Mesonotum about as long as pronotum with median carina and strongly oblique peridiscal carinae.

Tegmina: (Figs 1 A–B, 2A, C) brachypterous, variegated with black-brown and yellow brown with more or less visible pattern of pale and dark patches varying individually; slightly elongate and convex; costal and sutural margins parallel, apical margin broadly rounded with sides angularly rounded. Venation reduced to main longitudinal veins, all acutely elevated; only one subapical row of veinlets parallel to apical margin; Pc+CP absent; ScP+RA and RP diverging basally; MP straight; CuA not distinct basally; CuP (claval joint) visible only on basal 1/3; Pcu and A1 merging at mid length with Pcu+A1 reaching apex of tegmen, parallel to sutural margin.

Hind wings: (Fig. 1 D) pale grey-brown, elongate and narrow, nearly reaching apex of tegmen at rest. Venation reduced with 4 longitudinal veins, ScP+R, MP, CuA and CuP, subparallel and roundly merging together subapically; C merging with ScP+R before basal ¼ of wing. Apical margin rounded; sutural margin broadly rounded; costal margin slightly concave.

Legs: (Figs 1 A–B, 2 A–E) elongate, narrow, variegated black-brown and pale yellow-brown; pro- and mesofemora and all tibiae covered with long, pale erected hairs. Metatibiae with 3 (rarely 4) lateral spines and 8 apical spines; spines black apically. First metatarsomere elongate, ventrally with 7-8 apical spines black at apex; second metatarsomere with 2 lateral spine. Metatibiotarsal formula: (3-4) 8/7-8/2.

Abdomen: (Figs 1 C, 2 B) short and broad, dorso-ventrally compressed; 2 rows of sensory pits along apical margin of sternite 3.

Male genitalia: (Fig. 4) pygofer very narrow, strongly reflexed dorsally and with posterior margin slightly curved in lateral view (Fig. 4 A). Anal tube short and broad, narrowing towards apex in dorsal view (Fig. 4B); apical margin slightly emarginate in dorsal view (Fig. 4 B). Gonostyli elongate with apex rounded; left gonostylus broadening from base to 3/4 in lateral view (Fig. 4 A), right gonostylus broadening from base to 2/3 in lateral view (Fig. 4 C); left gonostylus narrower than right one basally in lateral view. Gonostyli elongate in ventral view (Fig. 4 D), narrowing from base to apex; left gonostylus more developed than right one in ventral view. Aedeagus elongate and strongly reflexed anteroventrally (Figs 4 E, F); sinuate in ventral view (Fig. 4 G). Periandrium strongly asymmetrical with elongate laminate process on left side rounded apically and showing in middle a rounded process projecting anterodorsally (Fig. 4 E); on right side (Fig. 4 F), one process ended in a curved fine hook projecting dorsally and another, spatulate apically and narrowing in middle, projecting ventrally.

BIOLOGY. Most of the specimens were collected with a Malaise trap in the dry savannah, under a *Prosopis glandulosa* bush (Fabaceae; Fig. 5), ca. 1000 m asl.

DISTRIBUTION. Recorded from the Kalahari Desert in Namibia (Fig. 6).

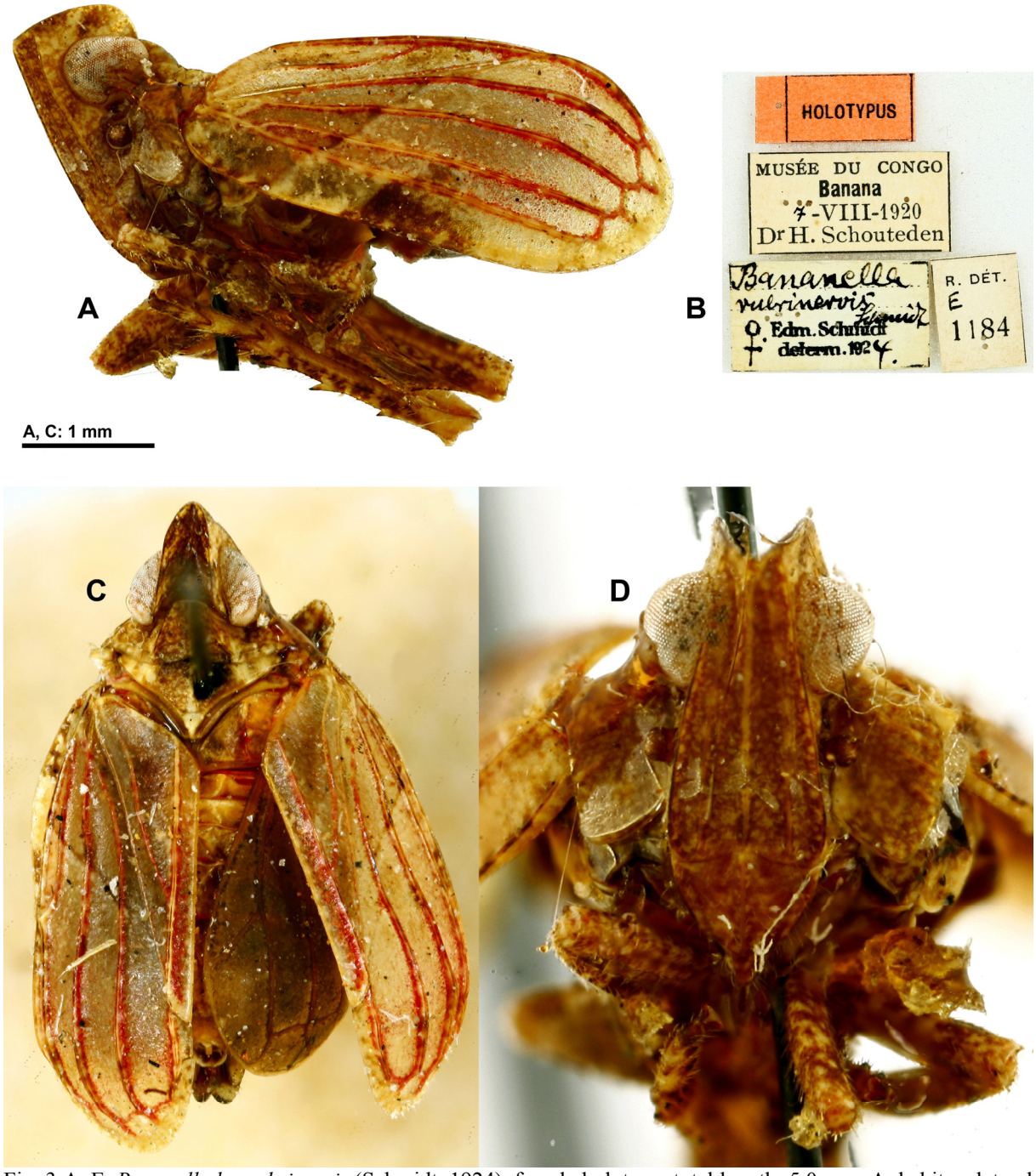

Fig. 3 A–E. *Bananellodes rubrinervis* (Schmidt, 1924), female holotype, total length: 5.0 mm. A, habitus, lateral view. B, labels. C, habitus, dorsal view. D, head, frontal view (photographs S. Hanot).

***Bananellodes rubrinervis* (Schmidt, 1924)**

Figs 3, 6

Bananella rubrinervis SCHMIDT, 1924: 106 – SCHMIDT, 1925: 43 [Type in RMCA].
Bananellodes rubrinervis (Schmidt, 1924) – STRAND, 1928: 73 [transferred to *Bananellodes*] – METCALF, 1946: 184 [catalogued in the Dictyopharidae: Orgeriinae: Lyncidini] – SYNAVE, 1957: 37 [redescription] – FENNAH, 1958: 141, fig. 88A–D [short list of characters, head and tegmen illustrated]. – FLOW, BOURGOIN, 2015: http://hemiptera-databases.org/flow/?page=explorer&db=flow&lang=fr&card=taxon&rank=species&id=6288.

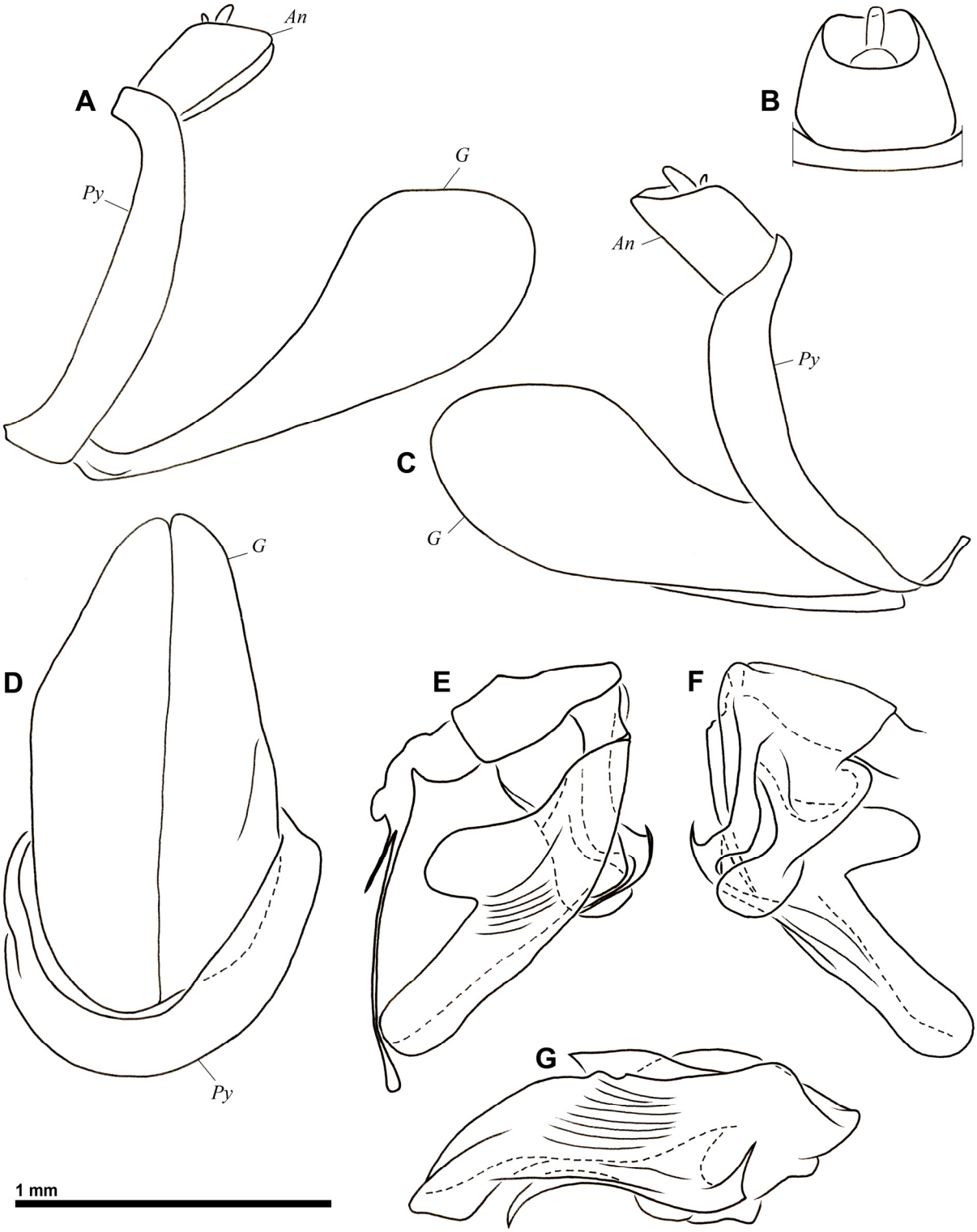

Fig. 4 A–G. *Bananellodes davidi* sp. nov, holotype, male genitalia. A, pygofer, anal tube and gonostylus, left lateral view. B, anal tube and pygofer, dorsal view. C, pygofer, anal tube and gonostylus. D, Pygofer and gonostyli, ventral view. E, aedeagus, left lateral view. F, aedeagus, right lateral view. G, aedeagus, ventral view. *An*: anal tube; *G*: gonostyli; *Py*: pygofer.

Fig. 5. *Bananellodes davidi* sp. nov, habitat (photograph J. Reinhard).

ETYMOLOGY. The species epithet derives from *ruber* (adj., Latin) = red and *nerva* (Latin) = vein, and refers to the reddish colouration of the veins of the tegmina.

TYPE MATERIAL EXAMINED. Holotype ♀ (examined on photographs): Congo Democratic Republic: [Musée du Congo, Banana, 7.VIII.1920, Dr H. Schouteden] [*Bananella rubrinervis* Schmidt ♀. Edm. Schmidt determ. 1924] [Holotypus] [R. Det. E 1184] (RMCA).

DIAGNOSIS. The species is easily separated from *B. davidi* by the characters given in the key. It is also different in colouration, being yellowish with reddish markings while *B. davidi* is mottled grey and brown with black markings. However, it is possible that the colour of the single known female of *B. rubrinervis* is faded.

The male genitalia are not known.

DISTRIBUTION. See map Fig. 6.

● ***Bananellodes davidi* sp. nov.** ● ***Bananellodes rubrinervis* (Schmidt, 1924)**

Fig. 6. Distribution map of the species of *Bananellodes*.

Discussion

The male genitalia of a species of *Bananellodes* are here described for the first time and their disymmetrical conformation matches with the tribal placement of the genus (see also FENNAH, 1982).

The specimens of *B. davidi* sp. nov. were collected in the hard environment of the Kalahari Desert while the single known specimen of *B. rubrinervis* comes from Banana at the mouth of the Congo River. This new discovery in a very different biotope represents a broad ecological spectrum for the genus and, accordingly, more species are probably awaiting discovery.

Nothing is known of the feeding habits of the two species but, as the zones surrounding the Malaise trap in Namibia were actively sampled by sweeping the lower vegetation and beating the bushes without any result in terms of *Bananellodes*, it is likely that the species lives on or very close to the ground. Furthermore, the species is flightless and this could be an additional clue in relation with that way of life.

As recently mentioned (CONSTANT & PHAM, 2014a, b), Malaise traps are an efficient way to collect Fulgoromorphs, even if not in large numbers, and should be more intensively used by hemipterists. They often allow the collecting of very interesting species which are not collected by other methods.

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References

BOURGOIN T., WANG R.R., ASCHE M., HOCH H, SOULIER-PERKINS A., STROINSKI A., YAP S. & SZWEDO J., 2014. - From micropterism to hyperpterism: recognition strategy and standardized homology-driven terminology of the fore wing venation patterns in planthoppers (Hemiptera: Fulgoromorpha). *Zoomorphology*, 134: 63-77 DOI 10.1007/s00435-014-0243-6.

BOURGOIN T., 2015. - FLOW (Fulgoromorpha Lists on The Web): a world knowledge base dedicated to Fulgoromorpha. V.8, updated [iv.2015]. http://hemiptera-databases.org/flow/ (Accessed April 1st, 2015).

CARAYON J., 1969. - Emploi du noir chlorazol en anatomie microscopique des insectes. *Annales de la Société entomologique de France (N.S.)* 5: 179-193.

CONSTANT J., 2004. - Révision des Eurybrachidae (I). Le genre *Amychodes* Karsch, 1895 (Homoptera: Fulgoromorpha: Eurybrachidae). *Bulletin de l'Institut royal des Sciences naturelles de Belgique*, 74: 11-28.

CONSTANT J. & PHAM H.T., 2014a. - A new species of *Orthophana* Melichar, 1923 from Vietnam (Hemiptera: Fulgoromorpha: Nogodinidae). *Belgian Journal of Entomology* 23: 1-8.

CONSTANT J. & PHAM H.T., 2014b. - A new species of *Paricanoides* Liang, 2003 from Northern Vietnam (Hemiptera: Fulgoromorpha: Tropiduchidae). *Belgian Journal of Entomology* 24: 1-9.

FENNAH R.G., 1958. - Fulgoroidea from the Belgian Congo. *Annales du Musée royal du Congo Belge* (8), 59: 1-206. [1957].

FENNAH R.G., 1967. - New and little known Fulgoroidea from South Africa (Homoptera). *Annals of the Natal Museum*, 18(3): 655-714.

FENNAH R.G., 1982. - A tribal classification of the Tropiduchidae (Homoptera: Fulgoroidea), with the description of a new species on tea in Malaysia. *Bulletin of Entomological Research*, 72: 631-643.

METCALF Z.P., 1946. - General Catalogue of the Homoptera. Fascicle IV Fulgoroidea. Part 8 Dictyopharidae. North Carolina State College, Raleigh, NC, USA. 246pp.

SCHMIDT E., 1924. - Zikaden-Gattungen und Arten aus dem tropischen Afrika. *Entomologische Mitteilungen*, 13: 97-109.

SCHMIDT E., 1925. - Zwei neue Singcicaden von der Insel Sumba. *Societas Entomologica*, 40(11): 42-43.

STRAND E., 1928. - Miscellanea nomenclatoria zoologica et palaeontologica. I-II. *Archiv für Naturgeschichte. Berlin*, 92: 30-75.

SYNAVE H., 1957. - Issidae (Homoptera-Fulgoroidea). *Exploration du Parc National de l'Upemba, Mission G.F. De Witte*, 43(1): 1-78.