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Review of the genus *Monteira* Melichar, 1906 with a new species from Namibia (Hemiptera: Fulgoromorpha: Nogodinidae)

Jérôme CONSTANT

Royal Belgian Institute of Natural Sciences, O.D. Phylogeny and Taxonomy, Entomology, Vautier street 29, B-1000 Brussels, Belgium. E-mail: jerome.constant@naturalsciences.be
urn:lsid:zoobank.org:author:6E6072A1-9415-4C8D-8E60-2504444DB290

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Abstract

The species of the genus *Monteira* Melichar, 1906 (Nogodinidae) are illustrated and keyed. A new species, *M. ameliae* sp. nov. is described from the Kuzikus Wildlife Reserve in the Namibian Kalahari and compared with the three species hitherto described in the genus. Male genitalia of *M. ameliae* sp. nov. are figured. A distribution map for the four species of the genus is provided.

Keywords: Leopold III Fund, Epacriini, Planthopper, Fulgoroidea.

Introduction

The study of material collected in 2011 in Kuzikus Wildlife Reserve, Namibia, during fieldwork in the frame of the project "Exploration of the entomological fauna of the Kuzikus wildlife reserve (Namibia) I" by the author, revealed a fourth, minute species of *Monteira*, which is here described. 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 *Monteira* was described by MELICHAR (1906) in the family Issidae for one new species from Delagoa Bay (Mozambique) and Damaraland (Namibia), *M. cornicula* Melichar, 1906. The year after, DISTANT (1907) redescribed and illustrated the species under the name *Telmessus tesudinarius* Distant, 1907 (pl. XIX, fig. 15) while under the name *M. cornicula* (pl. XX, fig. 7), he treated another species later described as *M. distanti* by SYNAVE (1957).
LALLEMAND (1931) described the genus *Monteirina* for one species, *M. horni* Lallemand, 1931 from Transvaal and placed it together with *Monteira* in the Issidae, Issinae, Hysteropterini. He gave the presence of a median carina on frons and of 3 lateral spines on posterior tibiae as characters allowing separation from *Monteira*. Those characters are actually also present in *Monteira* and SYNAVE (1957) proposed *Monteirina* Lallemand, 1931 as a junior synonym of *Monteira*, with its single species, *Monteirina horni* Lallemand, 1931,

as well as *Telmessus testudinarius* Distant, 1907 both proposed as junior synonyms of *M. cornicula*. He added two new species: *M. distanti* Synave, 1957 from South Africa and *M. upembensis* Synave, 1957 from [Democratic Republic of] Congo. He described *M. distanti* based on specimens erroneously identified and illustrated by DISTANT (1907) as *M. cornicula*.
In his catalogue of the Issidae, METCALF (1958) followed LALLEMAND's (1931) view and placed the genus in the Issidae: Issinae: Hysteropterini but listed a single species in the genus: *M. cornicula*. He also kept *Monteirina* as a valid genus with one species: *M. horni*.
FENNAH (1967) moved the genus from the Issidae to the Nogodinidae Mithymnini, a tribe erected in the same paper for 6 afrotropical genera sharing the following characters: (1) tegmina broad and coriaceous; (2) costal margin of tegmina deeply deflected in basal portion; (3) costal vein submarginal distally; (4) basal cell about twice as long as broad with vein ScP+RA emerging more basally than MP; (5) eyes truncate posteriorly and shaped like the quadrant of a sphere, only narrowly emarginate above antennae; (6) ocelli distinct, opaque, rarely represented only by a scar. FENNAH (1984) later redefined the tribe Mithymnini and accordingly transferred the genus into his tribe Epacriini Fennah, 1978.

The genus currently contains three species (BOURGOIN, 2015).

Materials 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 in a tube attached to the pin of the specimen.

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 = breadth of the frons
BV = breadth of the vertex
LF = length of the frons
LT = total length
LV = length of the vertex.

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 with Adobe Photoshop CS3. Observations were done with a Leica MZ8 stereo microscope.

The type of the new species is deposited in the collections of the Royal Belgian Institute of Natural Sciences, Brussels, Belgium (RBINS).

Taxonomy

Family **Nogodinidae** Melichar 1898

Tribe **Epacriini** Fennah, 1978

Genus ***Monteira*** Melichar, 1906

Monteira MELICHAR 1906: 158.
Type species: *M. cornicula* Melichar, 1906, by monotypy.

Monteirina LALLEMAND, 1931: 255 [described in the Issidae, Issinae, Hysteropterini; synonymized by SYNAVE, 1957].
Type species: *Monteirina horni* Lallemand, 1931, by monotypy [synonymized under *Monteira cornicula* Melichar, 1906 by SYNAVE, 1957]

Monteira – DISTANT, 1907: 199 [listed] – SCHUMACHER, 1913: 88 [listed from South Africa] – HESSE, 1925: 159 [listed from Namibia] – LALLEMAND, 1931: 255 [placed in the Issidae, Issinae, Hysteropterini and compared with *Monteirina*] – SYNAVE, 1957: 65 [redescribed, senior synonym of *Monteirina*, new species, key] – METCALF, 1958: 296 [catalogued] – FENNAH, 1967: 697 [transferred from Issidae to Nogodinidae: Mithymnini] – FENNAH, 1984: 85 [transferred from Nogodinidae: Mithymnini to Nogodinidae: Epacriini].

Monteirina – SYNAVE, 1957: 66 [junior synonym of *Monteira*] – METCALF, 1958: 299 [catalogued].

The definition of the genus given by SYNAVE (1957) and the tribal placement in the Epacriini Fennah, 1978 proposed by FENNAH (1984) are here followed.

The genus is distributed in the Afrotropical region.

Identification key to the species of *Monteira*

Adapted from SYNAVE (1957).

1. larger, length ≥ 6 mm 2
- smaller, length < 5 mm (Fig. 1) ..... ***M. ameliae*** sp. nov.

2. tegmina with dark markings inside the cells and a pale patch along sutural margin 3
- tegmina without dark markings inside the cells and without pale patch along sutural margin ..... ***M. upembensis*** Synave, 1957

3. tegmina with costal margin strongly convex basally, then slightly concave; brown with darker markings on cells, a whitish patch along costal margin slightly anterior to middle and a second smaller semicircular one on sutural margin, covering the fork of claval veins; vertex nearly 4 times broader than long (Fig. 2) ..... ***M. cornicula*** Melichar, 1906
- tegmina with costal margin regularly convex; greenish with dark markings on cells, no patch on costal margin but a pale patch along sutural margin, strongly margined with black externally; vertex 5 times broader than long (Fig. 3) ..... ***M. distanti*** Synave, 1957

Fig. 1 A-F. *Monteira ameliae* sp. nov. Holotype ♂. A, habitus, dorsal view. B, habitus, ventral view. C, habitus, lateral view. D, head and thorax, normal view of frons. E, label. F, habitus, frontal view.

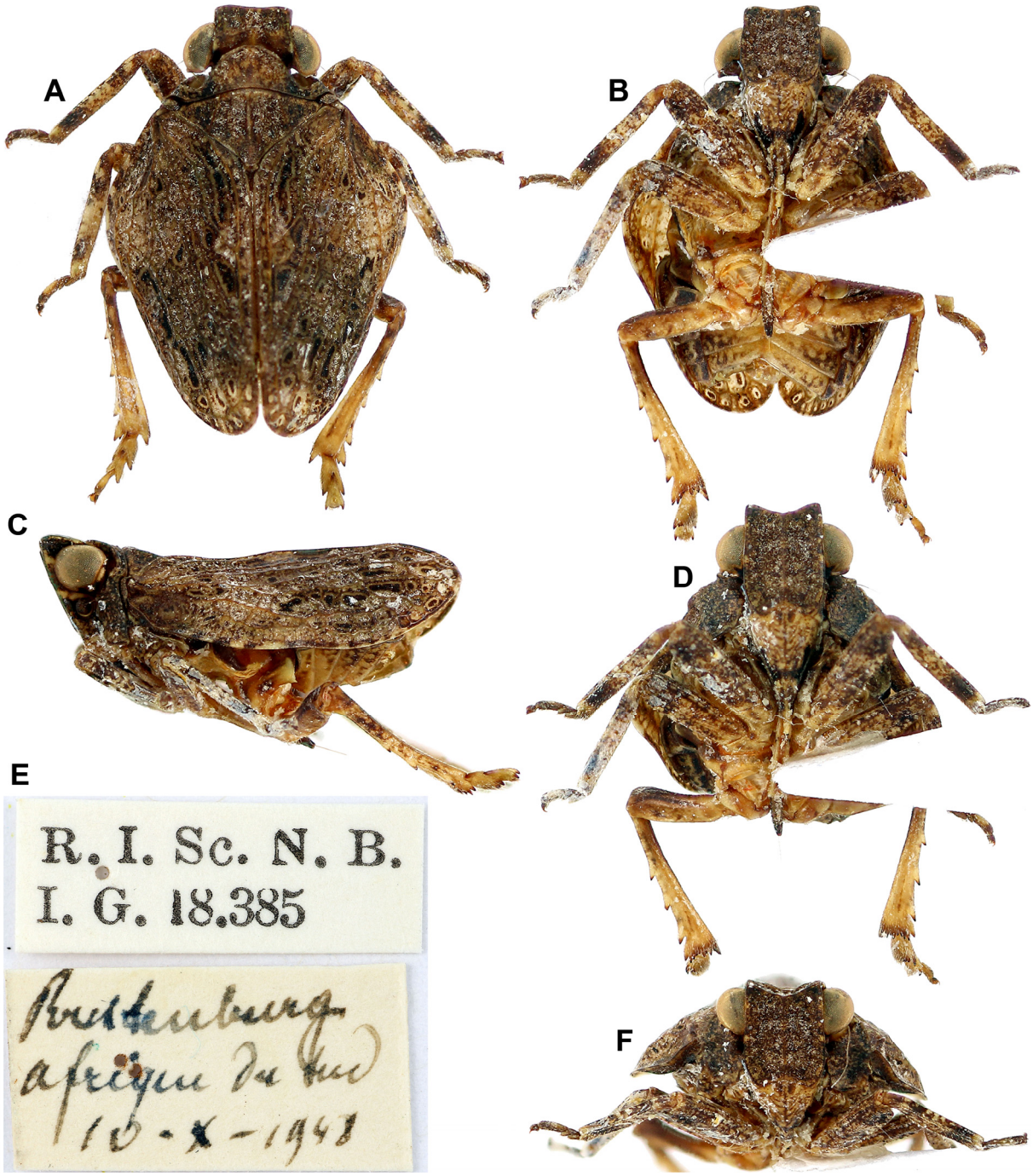

Fig. 2 A-F. *Monteira cornicula* Melichar, 1906 ♂. A, habitus, dorsal view. B, habitus, ventral view. C, habitus, lateral view. D, head and thorax, normal view of frons. E, labels. F, habitus, frontal view.

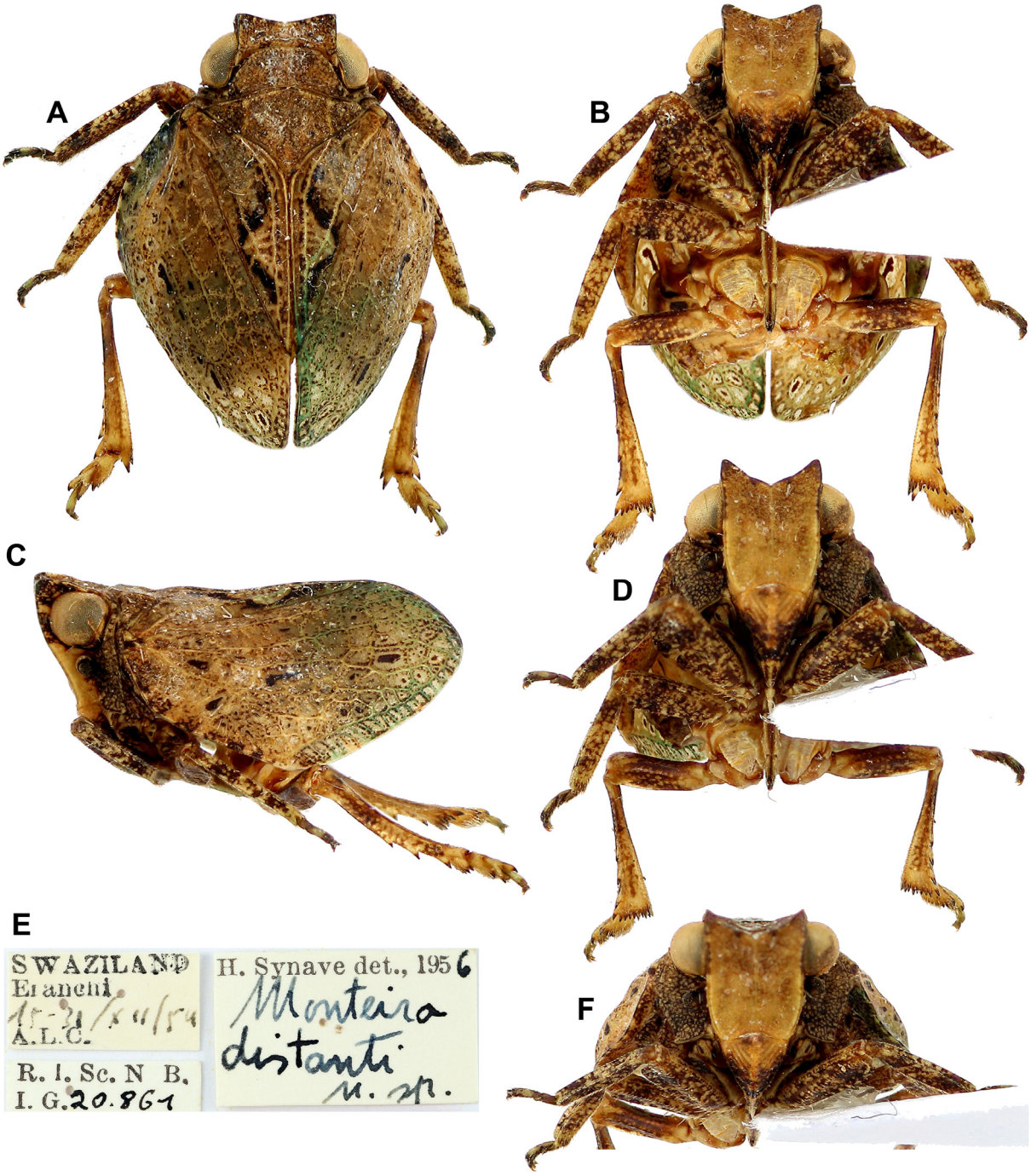

Fig. 3 A-F. *Monteira distanti* Synave, 1957, paratype ♂. A, habitus, dorsal view. B, habitus, ventral view. C, habitus, lateral view. D, head and thorax, normal view of frons. E, labels. F, habitus, frontal view.

Monteira ameliae sp. nov.
Figs 1, 4, 6

ETYMOLOGY. The species epithet refers to a new small and cute inhabitant of Kuzikus Wildlife Reserve, Amelie Luisa, the young daughter of my friends Johanna Reinhard, the leader of BRinK and David Schimrosczyk of the Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw, Poland.

TYPE MATERIAL. Holotype ♂ (dissected): Namibia: [Coll. I.R.Sc.N.B., Namibia, Kuzikus W.R., 23°14'17.2"S 18°23'28.8"E, under grass 11.IV.2011, I.G. 31.840 Leg J. Constant] (RBINS).

DIAGNOSIS. The species is easily separated from all others in the genus by its small size (4 mm *vs* more than 6 mm). It can also be separated from *M. upembensis* by the presence of dark markings inside the cells of the tegmina, and from *M. cornicula* by the regularly rounded costal margin of the tegmina.
However, the examination of the male genitalia should be used to recognize the species of the genus (see Fig. 4).

DESCRIPTION

Measurements and ratios ♂ (n = 1): LT = 4.00 mm; LTg/BTg = 1.79; BV/LV = 5.44; BF/LF = 0.92.

Head: vertex and frons yellowish grey-brown; sides dark brown with yellow transverse markings on genae; clypeus yellowish with lateral blackish markings; antennae brown-black. Frons slightly convex, elongate with median carina, sides parallel and dorsal margin strongly emarginate. Clypeus longer than broad with median carina. Vertex broader than long, deeply grooved in middle and with anterior margin strongly emarginate. Labium elongate and narrow, reaching metatrochanters, with apical segment about half as long as penultimate. Antennae with scape very short and pedicel cylindrical, 1.5 times longer than broad. Ocelli absent.

Thorax: pronotum yellowish grey-brown, slightly concave in middle, with anterior margin rounded and obsolete median carina; posterior margin concave. Mesonotum yellowish grey-brown with obsolete median carina, slightly longer than pronotum. Tegulae yellowish grey-brown.

Tegmina: yellowish brown with veins and small markings in cells blackish brown; pale yellow line on clavus along claval suture, broadened in middle and margined with black. Elongate and strongly rounded laterally, as long as broad taken together in dorsal view. Numerous cross-veins resulting in reticulum; cells smaller along posterior and lateral margins. Tegmina slightly impressed basally on costal area, rounded apically. Hypocostal plate narrow, extending to level of mesotrochanters.

Hind wings: grey-brown, strongly reduced.

Legs: variegated pale yellow and grey-brown; posterior legs mainly pale yellow; rather short. Pro- and mesotibiae elongate and narrow. Metatibiae broadening from base to apex, with 3-4 lateral spines and 10 apical spines, pale yellow-brown; spines brown apically. First metatarsomere elongate, broad and deeply excavate apically, with small pad of microsetae ventrally and strong curved spine on each side. Second metatarsomere short and broad, deeply excavate apically, with strong curved spine at each side and small pad of microsetae ventrally. Metatibiotarsal formula: (3-4) 10/2/2.

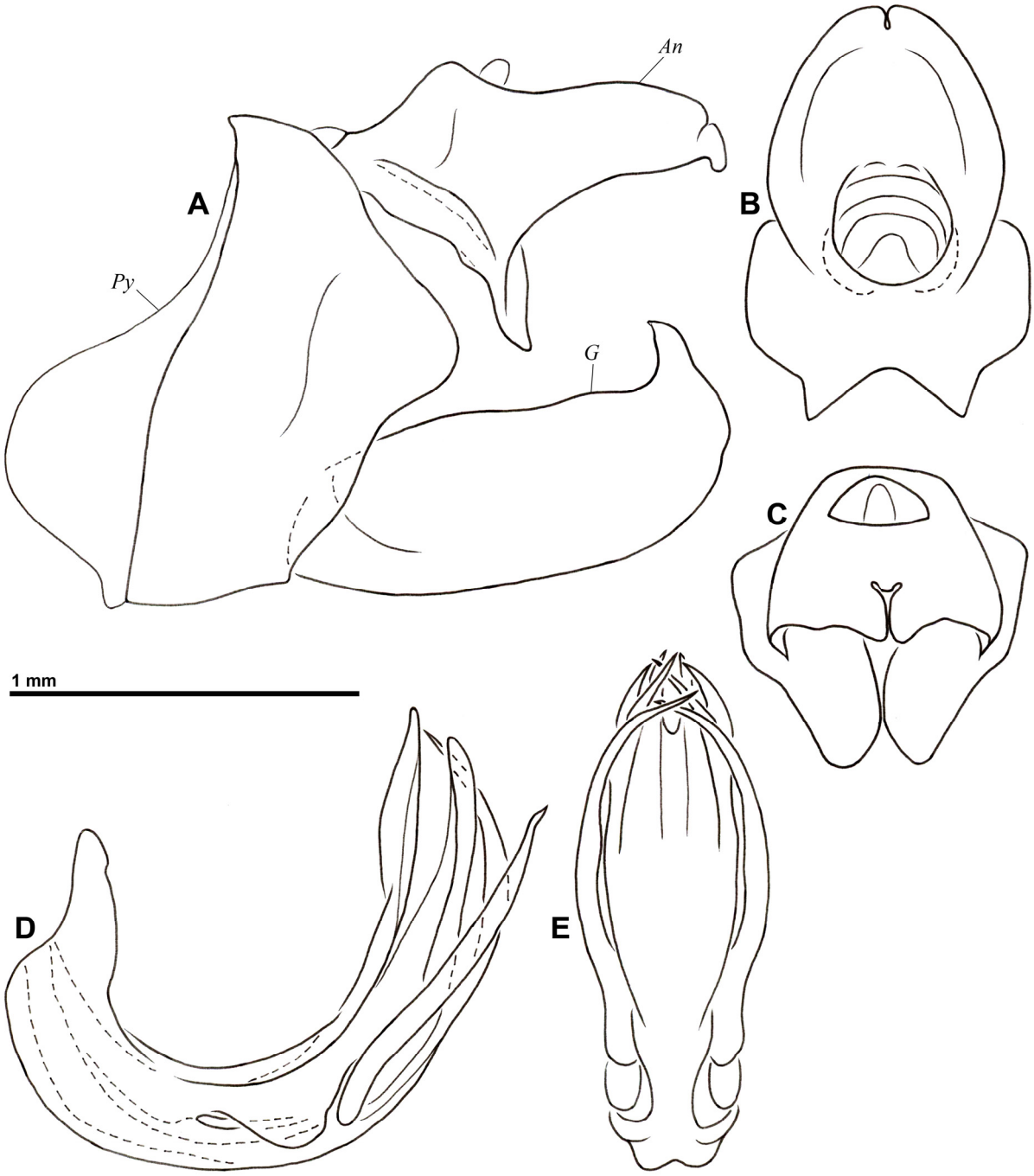

Fig. 4 A-E. *Monteira ameliae* sp. nov., holotype, male genitalia. A, pygofer, anal tube and gonostylus, left lateral view. B, anal tube, dorsal view. C, anal tube, posterior view. D, aedeagus, left lateral view. E, aedeagus, posterior view. *An*: anal tube; *G*: gonostylus; *Py*: pygofer.

Male genitalia: (Fig. 4) pygofer higher than long in lateral view, with anterior margin slightly sinuate and posterior margin with strong rounded projection in middle. Anal tube elongate with strong ventral projection ventrally on each side at 1/3 and apex hook-shaped; apical 2/3 strongly concave ventrally and with vertical narrow indention apically; apical 2/3 oval in dorsal view; basal 1/3 subrectangular, broader than long in dorsal view. Gonostyli elongate and narrow in lateral view, rounded apically and with strong tooth projecting dorso-internally on dorsal margin, near apex. Aedeagus strongly curved in lateral view, with a series of simple, elongate and narrow processes.

BIOLOGY. The biotope is a savannah (ca 1000 m asl.) dominated by the grasses *Aristida* L. spp. and *Stipagrostis uniplumis* (Licht.) De winter (both Poaceae), and with some *Acacia erioloba* E. Mey. trees and *Acacia hebeclada* DC. shrubs (both Fabaceae). The specimen was collected at the base of an *Aristida* tuft which was uprooted and dismantled to search for insects (see also CONSTANT & GAPON, 2011).

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

Monteira cornicula Melichar, 1906
Figs 2, 5 A–B, 6

Monteira cornicula MELICHAR, 1906: 158, fig. 24 [described, vertex and thorax, frons and tegmen illustrated].

Telmessus testudinarius Distant, 1907: 199, pl. XIX figs 15, 15a [described, habitus and head illustrated (misidentification of *M. cornicula*) – synonymized by SYNAVE, 1957].

Monteirina horni Lallemand, 1931: 255 [synonymized by SYNAVE, 1957].

Monteira cornicula – SCHUMACHER, 1913: 88 [listed from South Africa] – HESSE, 1925: 159 [listed; distribution in Namibia] – LALLEMAND, 1931: 255 [compared with *Monteirina horni*] – SYNAVE, 1957: 65 [redescribed, senior synonym of *Monteirina horni* and *Telmessus testudinarius*, key, distribution, genitalia figured] – METCALF, 1958: 296 [catalogued].

Telmessus testudinarius – HESSE, 1925: 159 [listed, distribution in Namibia] – SYNAVE, 1957: 66 [junior synonym of *Monteira cornicula*] – METCALF, 1958: 296 [catalogued].

Monteirina horni – SYNAVE, 1957: 66 [junior synonym of *Monteira cornicula*] – METCALF, 1958: 299 [catalogued].

non Monteira cornicula – DISTANT, 1907: 199, pl. XX figs 7, 7a [listed, habitus and head illustrated (misidentification of *M. distanti*)].

MATERIAL EXAMINED.
TYPE MATERIAL. Syntype ♂ of *Monteirina horni*: South Africa: Waterpoort, N. Transvaal, W.A. Lingnan (RBINS).

South Africa (all RBINS): 11♂, 6♀, 3 nymphs: Rustenburg, 10.X.1948, A.L. Capener; 1♂: idem, 9.XI.1952; 1♂: idem, XII.1952; 1♂, 1♀: idem, 1.I.1944; 1♂, 2♀: idem, no date; 1♂, 1♀: Pretoria, Wonderboom, 27.XII.1945, A.L. Capener; 1♀: Waterberg, 1898-1899, V. Jutrzencka; 1♂: Middlefontein, 15-20.XII.1953, N. Nylstroom; 1♂, 1♀: Natal, Malvern, 15.XI.1953.
One female specimen labelled "Transvaal, Tsumeb, 5.II.1930, Gustav Meyer" (RBINS) was also examined. There is a discrepancy in the information on the label as Tsumeb is actually situated in Namibia.

DIAGNOSIS. The species is easily separated from *M. ameliae* by its larger size (more than 6 mm). It can be separated from *M. upembensis* by the presence of dark markings inside the cells of the tegmina, and from *M. distanti* by the sinuate costal margin of the tegmina and the narrower vertex (4 times broader than long; 5 times in *M. distanti*).
However, the examination of the male genitalia should be used to recognize the species of the genus (see Fig. 5 A-B).

DISTRIBUTION. See map Fig. 6.

NOTE. HESSE (1925) mentioned the species (under *Telmessus testudinarius*) from Namibia: Andoni and Otjimbumbe on Kunene River, both locations in the Ovamboland.

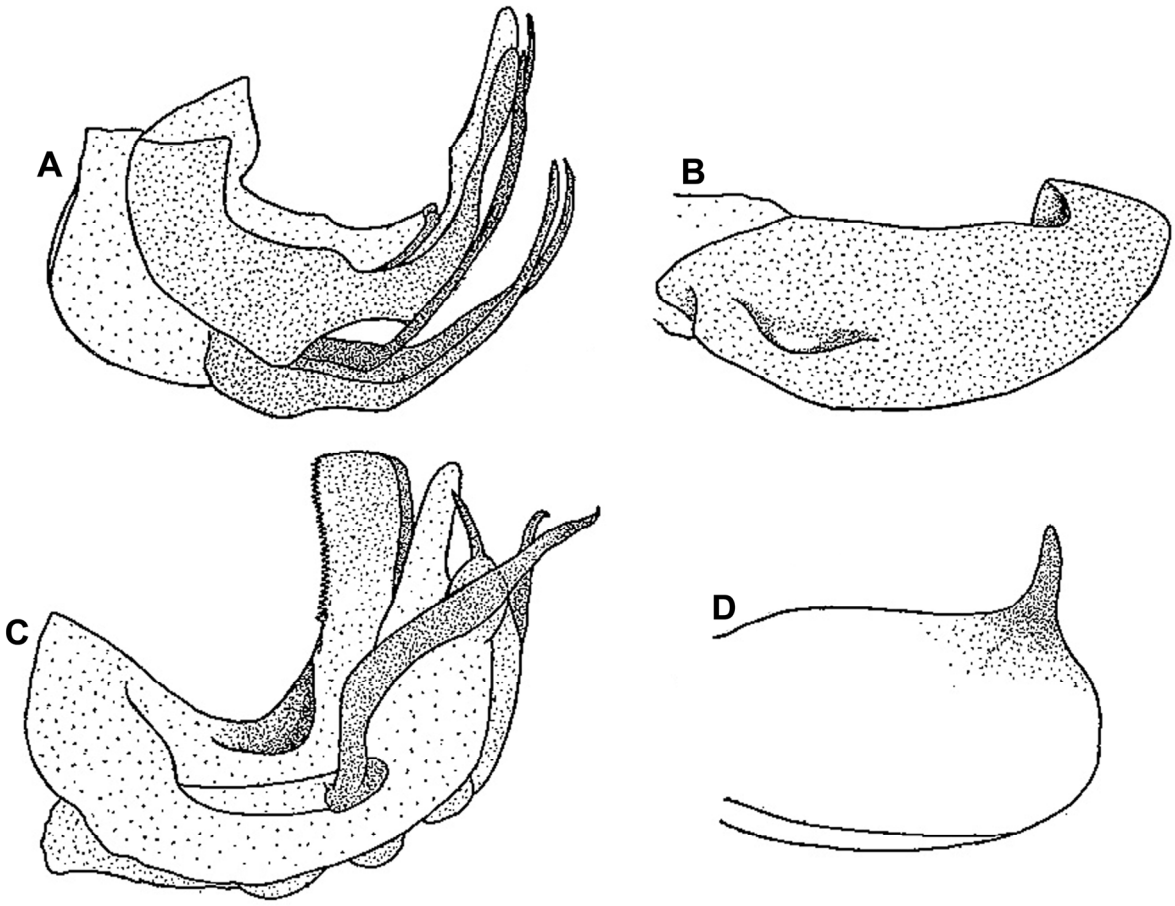

Fig. 5 A-D. Male genitalia. A-B, *Monteira cornicula*. A, aedeagus, left lateral view. B, left gonostylus, lateral view. C-D, *Monteira distanti*. C, aedeagus, left lateral view. D, left gonostylus, lateral view. Modified from SYNAVE (1957).

Monteira distanti Synave, 1957
Figs 3, 5 C–D, 6

Monteira distanti SYNAVE, 1957: 68, figs 31, 32 [described, aedeagus illustrated].

Monteira cornicula – DISTANT, 1907: 199, pl. XX figs 7, 7a [listed, habitus and head illustrated (misidentification of *M. distanti*)]

MATERIAL EXAMINED.
TYPE MATERIAL. Paratypes: 6♂, 6♀: Swaziland, Eranchi, 15-31.XII.1954, A.L. Capener (RBINS); 1♂, 1♀: Swaziland, Eranchi, 1-10.I.1955, A.L. Capener (RBINS).

Swaziland: 1♂, 1♀: Eranchi, A.L. Capener (RBINS). South Africa: 1♀: Shiluwane, XI.1899, Rev. Junod (RBINS); 1♂: Barberton, XII.1952, E. Beverley (RBINS).

DIAGNOSIS. The species is easily separated from *M. ameliae* by its larger size (more than 6 mm). It can be separated from *M. upembensis* by the presence of dark markings inside the cells of the tegmina, and from *M. cornicula* by the regularly rounded costal margin of the tegmina and the broader vertex (5 times broader than long; 4 times in *M. cornicula*).
However, the examination of the male genitalia should be used to recognize the species of the genus (see Fig. 5 C-D).

DISTRIBUTION. See map Fig. 6.

Monteira upembensis Synave, 1957
Fig. 6

Monteira upembensis SYNAVE 1957: 68 [described].

MATERIAL EXAMINED. No material of the species was examined. The holotype was not found in the collections of the Royal Museum of Central Africa, Tervuren, where it is deposited according to SYNAVE (1957) (Stéphane Hanot pers. com. May 2015).

DIAGNOSIS. According to SYNAVE (1957), the species should be easily separated from *M. ameliae* by its larger size (more than 6 mm). It can be separated from *M. upembensis* and *M. cornicula* by the absence of dark markings inside the cells of the tegmina.
The male genitalia of the species are still undescribed.

DISTRIBUTION. See map Fig. 6.

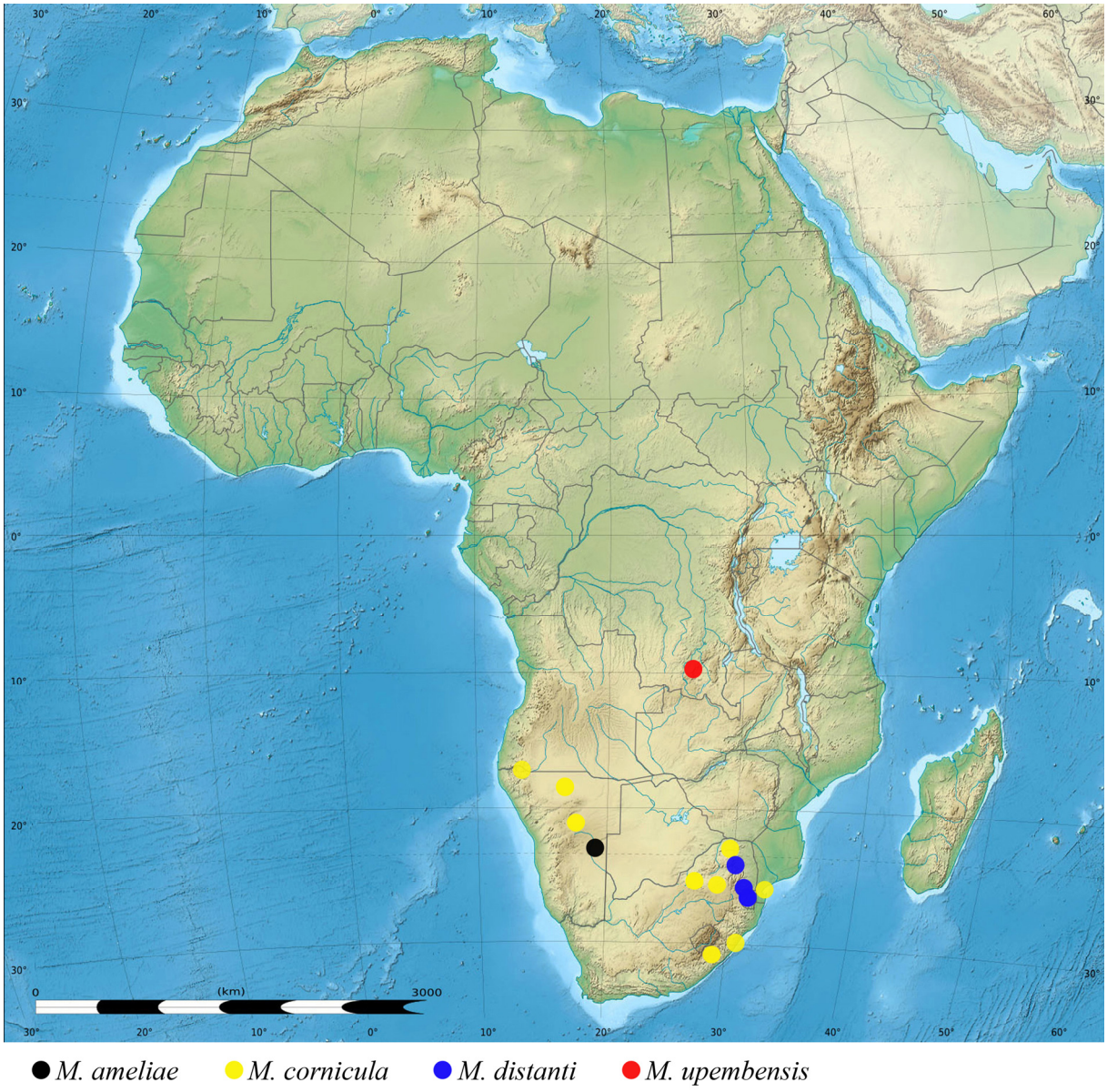

Fig. 6. Distribution map of the species of *Monteira*.

Discussion

The specimens *Monteira* were collected in grassy areas of the southern part of the Afrotropical region. All species have strongly reduced posterior wings and are flightless.

Two of the four species are currently known from single specimens and it is likely that more species are awaiting discovery.

The natural history of three species is totally unknown, while *M. ameliae* sp. nov. was collected at the base of grass tuft. The species was however not collected by sweeping or pitfall traps.
More fieldwork is necessary to improve our knowledge of those species which seem to be at least locally not uncommon in South Africa

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