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A new *Ventrops* (Diptera: Rhinophoridae) from Ethiopia

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ABSTRACT

A new species of the Afrotropical endemic rhinophorid genus *Ventrops* is described, illustrated and compared with congeners.

KEY WORDS: Afrotropical Region, Diptera, Rhinophoridae, *Ventrops*, new species.

INTRODUCTION

The Afrotropical genus *Ventrops* was erected by Crosskey (1977) for the single species *V. milichioides* Crosskey on the basis of specimens from Zimbabwe and Kenya, and later Pape (1987) added three new species from South Africa and Tanzania. Recently, Cerretti and Pape (2012) revised *Ventrops*, giving cladistic arguments for a proper genus-level definition (see also Cerretti *et al.* 2014), and they described three more species from Namibia, Tanzania and Ethiopia. The present paper was prompted by the recent collection of three specimens of an undescribed species of *Ventrops* from Ethiopia, and the use of molecular sequence data from this material (Ziegler & Tóthová 2014). In this paper we describe these Ethiopian specimens as a new species in order to have a name for forthcoming studies aimed at elucidating phylogenetic relationships among rhinophorid lineages.

MATERIAL AND METHODS

Male terminalia were dissected and prepared for examination following the methods described by Cerretti and Pape (2012). Composite focus-stacking images were produced from multiple images captured using a Nikon DS-L1 digital camera (Nikon, Tokyo, Japan) mounted on a Leica MZ12.5 stereomicroscope (head and wing) or on a Leica DMLS compound microscope (terminalia) (both microscopes: Leica, Wetzlar, Germany), and processed with CombineZM (http://combinezm.software.informer.com/). Environmental scanning electron microscope (ESEM) digital images were taken with a Hitachi TM1000 (Hitachi, Tokyo, Japan). Morphological terminology essentially follows McAlpine (1981) with a few exceptions as specified by Cerretti *et al.* (2014); measurements follow Cerretti (2010).

Label data of primary types are given verbatim, and the lines on each label are separated by a slash '/'.

Repositories of specimens are given using the following acronyms:

MZUR – Zoological Museum, 'Sapienza' University of Rome, Rome, Italy;
ZMHB – Museum für Naturkunde, Leibniz Institute for Evolution and Biodiversity Science, Berlin, Germany;

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ZMUM – Zoological Museum, Moscow State University, Moscow, Russia.

TAXONOMY

Ventrops vikhrevi sp. n.

Fig. 1

Etymology: This species name is a patronym for Nikita Vikhrev, who has provided invaluable specimens from his collecting for our studies, including the species newly described here.

Diagnosis: The new species *V. vikhrevi* sp. n. is characterised by (i) compound eye large but not enormously developed so that both gena and parafacial are distinct; (ii) posterior eye margin not indented; (iii) parafacial setose (Fig. 1A); (iv) lateral vertical seta well differentiated from postocular row; (v) basicosta yellow; (vi) wing cell r_{4+5} open (Fig. 1B); (vii) cercus not shortened, 0.8× as long as surstylus (Fig. 1E, F); and (viii) median process of ventral sclerotisation of distiphallus very long, extending beyond the acrophallus, asymmetrical and apically branching into several, long, finger-shaped sclerites (Fig. 1D).

Description (measurements in square brackets refer to the holotype):

Body length. 5.1–5.3[5.3] mm.

Coloration. Head shiny black covered with light brownish microtomentum only on genal dilation. Palpus blackish brown. Thorax black, covered with weak brownish grey reflecting microtomentum, legs and abdomen shiny black. Halter with yellow stalk and black knob. Upper and lower calypteres whitish. Tegula black. Basicosta yellow. Wing membrane brownish anteriorly and around veins.

Head (Fig. 1A). Arista thickened only proximally, covered with microtrichia which are shorter than maximum proximal diameter of arista. First and second aristomeres not elongated. Postpedicel sub-ovoid, about as long as pedicel. Frons at its narrowest point 1.25–1.43[1.43]× as wide as compound eye in dorsal view. Ocellar seta well developed, proclinate. One or 2 pairs of lateroclinate setae, behind ocellar triangle, between ocellar and postocellar setae with variable size. Medial vertical seta strong, reclinate. Lateral vertical seta well developed. Usually 3 to 4 strong proclinate orbital setae, the holotype has on the right side only 2 setae. Five to 8 frontal setae (of different thickness and length) descending anteroventrally to level of proximal edge of pedicel (or slightly above). Parafacial with a row of stout, short setulae along its whole length. Parafacial at its narrowest point (i.e. true width, not in strict lateral view), [0.8]0.8–1.0× as wide as postpedicel. Face and lower facial margin not visible in lateral view. Vibrissa well developed. Vibrissal angle receding. Facial ridge strongly concave, with 3 decumbent setulae above vibrissa. Genal dilation well developed, covered with robust setulae. Gena in profile about 0.25–0.35[0.30]× as high as compound eye. Postocular setae short. Occiput slightly convex, covered with black setulae. Prementum stubby, not longer than wide. Palpus slightly clavate with some setulae on distal half.

Thorax. Prosternum and proepisternal depression bare. Ventral proepimeral seta oriented anteroventrally. Two or 3 postpronotal setae arranged in a straight line. One pair of prescutellar acrostichal setae, 2 + 3 dorsocentral setae, 0 + 2 intra-alar setae and 1 + 3 supra-alar setae (first and third postsutural supra-alar setae very short, second one

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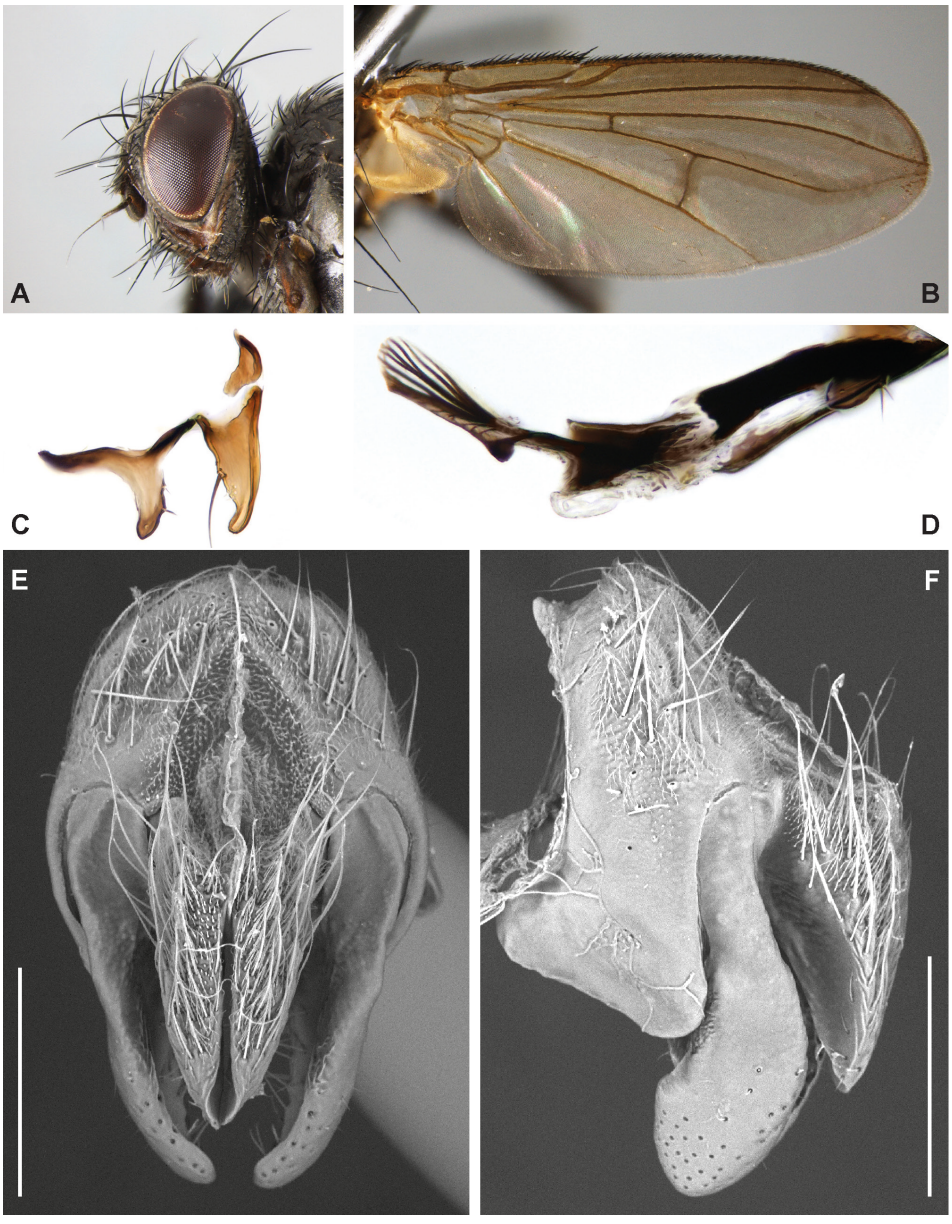


Fig. 1. *Ventrops vikhrevi* sp. n. (paratype ♂): (A) head in lateral view; (B) right wing in dorsal view; (C) left pregonite and postgonite in lateral view; (D) distiphallus in lateral view; (E) epandrial complex in posterior view; (F) epandrial complex in lateral view. Scale bars (E, F) = 200 µm.

enormous); 1 posthumeral seta, 2 well-developed notopleural setae. Anatergite bare. Two upper katepisternal setae (posterior one clearly longer), plus 3–4 smaller additional setulae and a tuft of setulae in the lower part. One strong and 1–4 short anepimeral

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setae. Katepimeron bare or with 1 small seta anteriorly. Scutellum with 2 pairs of strong marginal setae (apicals and subapicals); basal pair absent or barely distinguishable (i.e. at most ¼ the length of subapical setae). Subapicals robust and slightly divergent; apical pair crossed and horizontal, approx. ¾ as long as subapical setae. One pair of discal scutellar setae, in subapical position.

Wing (Fig. 1B). Costal spine well differentiated. Base of R_{4+5} with 2–3 relatively long setulae dorsally. Bend of *M* widely obtuse. Section of *M* between *dm-cu* and bend of *M* about 1.5× as long as section between *dm-cu* and *r-m*. Cell r_{4+5} open.

Abdomen. Mid-dorsal depression on syntergite 1+2 confined to anterior ⅓ of that segment. Syntergite 1+2 with 1 pair of median marginal setae; tergite 3 with 1 pair of erect median marginal setae. Tergite 4 with a complete row of marginal setae; tergite 5 with a row of marginal setae (median pair erect).

Male terminalia (Fig. 1C–F). Sternite 5 with a deep posterior median notch. Tergite 6 unmodified, bare. Connection between tergite 6 and syntergosternite 7+8 membranous. Sternite 6 asymmetrical, articulated with segment 7+8 on left side, and attached to it by a membrane on its right side. Cerci, in posterior view, narrow and relatively long, not fused medially. Bacilliform sclerites flattened dorso-ventrally and converging medially. Surstylus well developed, longer than cercus. Bacilliform sclerite firmly fused to base of surstylus. Articulation between surstylus and epandrium membranous. Intermedium not fused to pregonites. Pregonite lobe-like, gently bent forward, with 2 or 3 setulae along posterior margin. Postgonite subtriangular in shape, apically bent forward; submedian anterior seta of postgonite present. Postgonal apodeme present. Epiphallus strong, with simple tip (i.e. not sagitally bilobed). Extension of dorsal sclerite of distiphallus entirely fused medially. Median process of ventral sclerotisation of distiphallus very long, extending beyond acrophallus, asymmetrical and apically branching into several, long, finger-shaped sclerites (Fig. 1D). Dorsal sclerotisation of acrophallus semi-cylindrical, open ventrally. Distiphallus with long and pointed, scale-like spinulae latero-ventrally.

Holotype ♂, Paratypes 2♂: ETHIOPIA: Amhara, Zengena L. / 2530 m, 10.910N 36.965E / 02.VIII.2012 N. Vikhrev. *Holotype:* The second author added a label printed on red paper: "HOLOTYPUS / *Ventrops* / *vikhrevi* / Cerretti, Ziegler & Pape 2014". The holotype was deposited in ZMUM. *Paratypes*: Both specimens are labelled with "PARATYPUS / *Ventrops* / *vikhrevi* / Cerretti, Ziegler & Pape 2014" (printed on red paper). One specimen was deposited in MZUR, the other in ZMHB.

DISCUSSION

Ventrops vikhrevi sp. n. possesses more than two proclinate orbital setae in the male and an acrophallus with a semicylindrical dorsal sclerite, therefore sharing both autapomorphic character states supporting the monophyly of *Ventrops* as recently defined by Cerretti and Pape (2012) and Cerretti *et al.* (2014). Cerretti and Pape (2012) divided the genus into three species groups as follows:

i) '*freidbergi'* — characterised by two homoplasious apomorphies (postpronotum with three setae; *M* vein gradually vanishing on wing membrane where bend of *M* should be).

ii) '*milichioides'* — characterised by two homoplasious (microtrichia of the arista longer that its maximum basal diameter; male tergite 6 divided into two hemitergites) and one nonhomoplasius (posterior margin of compound eye distinctly indented) apomorphies.

iii) '*hannemariae'* — characterised by one homoplasious (median process of ventral sclerotisation of distiphallus longitudinally divided) and one non-homoplasious

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(median process of ventral sclerotisation of distiphallus ending far beyond tip of acrophallus) apomorphies.

Ventrops vikhrevi sp. n. does not share any of the apomorphies supporting the monophyly of the '*freidbergi'* and '*milichioides'* groups. Instead it has the median process of the ventral sclerotisation of distiphallus both divided longitudinally and very long, thus suggesting inclusion in the '*hannemariae*' group. *Ventrops vikhrevi* sp. n. is further characterised by having the median process of the ventral sclerotisation of distiphallus strongly asymmetrical. A strongly asymmetrical ventral sclerotisation of distiphallus emerged as a non-homoplasious synapomorphy shared by *V. hannemariae* and *V. intermedius* in the analysis of Cerretti and Pape (2012), and in the absence of conflicting evidence this will support an inclusion of *V. vikhrevi* sp. n. in the '*hannemariae*' group. While *V. hannemariae* and *V. intermedius* have the asymmetrical portion of the ventral sclerite harpoon-shaped (see figs in Cerretti & Pape 2012), that of *V. vikhrevi* sp. n. branches distally into several, long, finger-shaped sclerites (Fig. 1D). This is likely to be an apomorphic condition, but as it can be derived from the harpoon-shaped condition we cannot assess the relative position of the three species currently included in this group.

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