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FIVE NEW AFROTROPICAL SPECIES OF OPACIFRONS (DIPTERA: SPHAEROCERIDAE)

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The genus *Opacifrons* DUDA, 1918 is re-defined and five new species are described from the Afrotropical region. They are *O. afrobrevisecunda* sp. n. (Ghana, Congo), *O. compacta* sp. n. (Ethiopia), *O. dilatata* sp. n. (Republic of South Africa – RSA), *O. serrata* sp. n. (Ethiopia) and *O. subserrata* sp. n. (RSA). *Opacifrons coxata* (STENHAMMAR) does not occur in the Afrotropical region. The status of *Opacifrons rubrifrons* (VANSCHUYTBROECK, 1950) is corroborated. The existence of at least another two new Afrotropical species of *Opacifrons* is indicated. *Opacifrons ghesquierei* VANSCHUYTBROECK, 1951 is a junior synonym of *Bifronsina bifrons* (STENHAMMAR, 1855). With 55 original drawings and 2 photographs.

Key words: Sphaeroceridae, Limosininae, *Opacifrons*, new species, taxonomy, Afrotropical region

INTRODUCTION

The genus *Opacifrons* DUDA, 1918 consists of less conspicuous limosinine species of Sphaeroceridae with rather simple body characters (wings not coloured, legs not particularly armoured, male genitalia not too intricate, etc.).

Opacifrons was included in the genus *Leptocera* Olivier as a subgenus (SPULER 1924, HACKMAN 1968, PAPP 1984). Currently it is treated as a genus (PAPP 1991, MARSHALL & SMITH 1993).

Opacifrons is a diverse genus in the Palaearctic, Oriental and Neotropical regions. It occurs also in the Afrotropical region but only two species have been described hitherto (DUDA 1925, VANSCHUYTBROECK 1950, 1951), cf. ROHÁČEK *et al* (2001); a third species, *O. coxata* is a Palaearctic species, which has repeatedly been reported, does not occur there (misidentifications). Five new species are described below but more are expected to be found.

In the Diptera Collection of the HNHM, 201 *Opacifrons* specimens were found from the Afrotropical region.

MATERIALS AND METHODS

This paper is the result of the examination of many double mounted (mostly minuten pinned) specimens of *Opacifrons*, which are housed in the: Diptera Collection of the Department of Zoology, Hungarian Natural History Museum, Budapest (HNHM), Institut Royal des Sciences Naturelles,

Brussels (IRSN), Muséum Royal d'Afrique Central, Tervuren (MRAC), KwaZulu-Natal Museum, Pietermaritzburg, R.S.A. (NMSA).

Abdomina of several specimens of each species were removed and treated with sodium-hydroxide and lactic acid, washed, etc. on the standard way; those abdomina with genitalia are kept in plastic microvial with glycerol.

In the records below, label data are quoted letter by letter; hand-written label data are given in quotation marks, whereas my annotations of label data are in square brackets.

Opacifrons DUDA, 1918

Opacifrons DUDA, 1918: 22, as subgenus of *Limosina* MACQUART, 1835.

Type species: *Limosina coxata* STENHAMMAR, 1855 (subsequent designation by SPULER, 1924: 121).

Gender: female.

Its Latin name means "opaque frons" and indeed, the (post)frons is not shiny. Cephalic setae: 2 pairs of fronto-orbitals; ocellars, outer and inner verticals, both outer and inner occipitals very long, postocellars very small. Some setulae present just medially and anteriorly to anterior fronto-orbital pair. No inner orbital setae. Genal seta always conspicuous. Vibrissa as long as eye. Scape rather small, its medial seta indistinct. Pedicel with very long setae. First flagellomere broader than long, with a blunt upper apex. Lunule linear, a triangle present between antennal bases. Mouth edge broadly but only moderately protruding. No bulbous emergence below inter-antennal triangle, but a moderately high ridge may be developed (e.g. in *O. afrobreviscutellata*); even sagittal line is always concave.

Thoracic chaetotaxy: 1 postpronotal, 2 notopleurals, posterior one emerges on a large prealar callus (so it may be named as prealar), 1 presutural just posterior to the level of anterior notopleural (rather high on mesonotum); the posterior dorsocentral and 2 scutellar pairs rather strong; one very strong supra-alar in postalar position; in the intra-alar line a smaller intra-alar just above wing base and a postalar behind the level of posterior dorsocentral pair; a shorter dorsocentral pair emerge anterior to prealar seta. One (posterior) katepisternal seta, not even a setula in the place of anterior katepisternal. Pleura otherwise bare.

Wing not patterned. First costal section of wing with medium-long setae (only 2 to 3 times as long as costal vein diameter) but 1 long pair of sub-basal costal setae (c. 0.1 mm) always present.

Mid tibia without proximal posterodorsal seta, i.e. no paired setae on mid tibia proximally. Mid basitarsus with a sub-basal ventral seta both in males and females. No ventral apical or subapical seta on male mid tibia ventrally. Male with a partial or complete row of anteroventral, black, thick, thorn-like setae on mid tibia,

a partial row of posteroventral (weaker) setae may also be present. In some species, thorn-like seta may also be present anteroventrally and posteroventrally on basal half of mid femur. Females always with subapical ventral seta on mid tibia. I do not consider the conspicuous feature of perpendicular short setulae in a distinct complete row on second hind tarsomere as well as on basitarsus as a characteristic feature (as it occurs also in numerous species); for instance, *O. pseudimpudica* (DEEMING) females are also with that feature. Male postabdomen and genitalia comparatively simple but very characteristic. No medial rod of hypandrium (at most a flap of membrane there), hypandrium short and strongly fused to epandrium (Fig. 42). Modified cerci (cercal part of epandrial complex) with or without a pair of large cercal pegs. Subepandrial sclerite connected to the medial sclerite of the surstylus through a distinct lath (e.g. Fig. 21). A single pair of surstyli. Surstylus (as usual) with a lateral and a medial wall, the movement of surstylus is dependent on the muscular connections of the two walls, outer (lateral) sclerite of surstylus ham-shaped (cf. ROHÁČEK 1975: fig. 5) or otherwise shaped (e.g. Figs 6, 8), surstylus asymmetrical in cases, and connected but not fused to the epandrium. Distiphallus short, basiphallus with a large ventral epiphallus.

Female abdomen rather short, without long setae. Sternite 7 (Figs 47, 53) rather large and much longer than tergite 7, causing the anal opening to turn dorsally. Epiproct comparatively large (Figs 50, 55), sagittally less melanised and sclerotised, houseroof-shaped. Cerci (Figs 50–51, 55) short, not or not much longer than broad, upright with or without distinct hair-like setae but always with 2 pairs of discoloured thick thorns (in numerous cases: pegs); apices always sharp and may be lengthened in thin curved projections, cercal pegs without/with ventral incisions. Spectacles shaped sclerites comparatively large (Fig. 52). Spermathecae (ROHÁČEK 1975: figs 13–14, Figs 48, 54, PAPP 1991: fig. 41,) globular or long, common duct of paired spermathecae rather short.

I do not think that *Opacifrons* is closely related to the *Pseudocollinella* complex. The most important paper to judge relationships is MARSHALL and SMITH'S (1993) revision of the Nearctic *Pseudocollinella* species. Some shared features, i.e. mid basitarsal ventral seta may be a convergent characteristic. In any case, I think the male genital structures are far more suitable to judge relationships, than features of legs. Having said that some specimens of *Pseudocollinella* from Africa may indeed key out to *Opacifrons*. The *Pseudocollinella* species from the Old World tropics will be discussed in a forthcoming paper.

In the male genitalia of the *Opacifrons* species, cercal part of the epandrial complex, the surstylus, the postgonite, basi-and distiphallus as well as subepandrial sclerite carry important differentiating characters. Here I name the sclerotised

structures above the basiphallus (phallobase) and ventral to the cerci (connecting ventral arms of epandrium) as subepandrial sclerite, although its origin may be more complex. In the female postabdomen cerci and spermathecae may hold specific features (mostly not, so not all species are described in this respect in this paper).

Opacifrons coxata (STENHAMMAR, 1855)

A Palaearctic species; all the reports on its occurrence in the Afrotropical region are based on misidentifications (see below). In the HNHM there are specimens from several countries of Europe, Tunisia, Afghanistan, etc. (for detailed distribution data see ROHÁČEK *et al*. 2001).

Opacifrons ghesquierei VANSCHUYTBROECK, 1951

Opacifrons ghesquièrei VANSCHUYTBROECK, 1951: 10.

Material studied. Holotype male (IRSN): Congo belge, Eala- 6-II–1935, J. Guesquière, 179 – R. Mus. Hist. Nat., Belg. I. G. 10.482 – P. VANSCHUYTBROECK det. Opacifrons quesquièréi Vansch. [pencil] "Opacifrons quesquièrei" –[red] Type – cf. Bull. Inst. Sc. Nat. Belg. "T. XXVIII, no 41, 1951, p. 10. – "Bifronsina bifrons (Stenh.) det. L. PAPP 2009.

Paratypes: 11 males 12 females (IRSN), 1 male and 1 female (HNHM, through an exchange in the '70ties): 4 males 6 females: same as for holotypes; 6 males 6 females: ibid., Flandria IV. 1935; 1 male: ibid., Eala-II–1935.

Having studied the holotype, 11 male and 12 female paratypes in the IRSN, as well as a pair of paratypes preserved in the HNHM, incl. identifying males through genitalia preparation, I can state convincingly that they all belong to *Bifronsina bifrons* (STENHAMMAR). That is, *Opacifrons ghesquierei* VANSCHUYTBROECK, 1951 is a junior subjective synonym of *Bifronsina bifrons* (STENHAMMAR, 1855), **syn. n.**

Opacifrons afrobrevisecunda sp. n.
(Figs 1–7, 56)

Holotype male (HNHM): Ghana, Kumasi, air plancton [sic] – Kum.[asi] – Accra road, 25 km, 17:15–18:15, 25. 6. 1969, No. 376, leg. ENDRŐDY-Y. The holotype and a paratype had been prepared from alcohol to minuten pin rather recently. That is, they were kept in alcohol for nearly 40 years. They are dirty (with very small particles) and their body is somewhat constricted.

Paratypes (HNHM): 1 male: same data [abdomen and genitalia in a plastic microvial with glycerol; 1 male: ibid., Kumasi, 1–25. VI. 1965. [abdomen and genitalia in a plastic microvial with glycerol]. 1 male: Congo, Brazzaville, ORSTOM park, 30. XII. 1963, No. 563, S. ENDRŐDY-Y.1 male: ibid., 19. XI., No. 214; 1 male (genitalia lost while in alcohol): Congo, Loudima, Sagro, 15. XII. 1963, No. 468, J. BALOGH – A. ZICSI.

Measurements in mm: body length 1.15 (holotype), 1.07–1.21 (paratypes), wing length 1.06 (holotype), 1.15 –1.37 (paratypes), wing width 0.41 (holotype), 0.46 –0.54 (paratypes).

Body dark greyish brown, mesonotum with some weak shine.

Mouth edge less protruding than in the other Afrotropical species, inter-antennal triangle continued in a sagittal ridge. Although this ridge is slightly concave, it supports 2 more concave hollows below antennae. 3 medium long pairs of interfrontal setae (longest one 0.05 mm), and a 4th anterior minute interfrontal (not seen on holotype). Gena below eye 0.06 mm, longest (oblique) diameter of eye 0.19 mm. Genal seta 0.07 mm. Arista 0.41 mm long (not precisely measurable along its curvature). Aristal cilia at most 0.015 mm, cilia on first flagellomere apically even shorter.

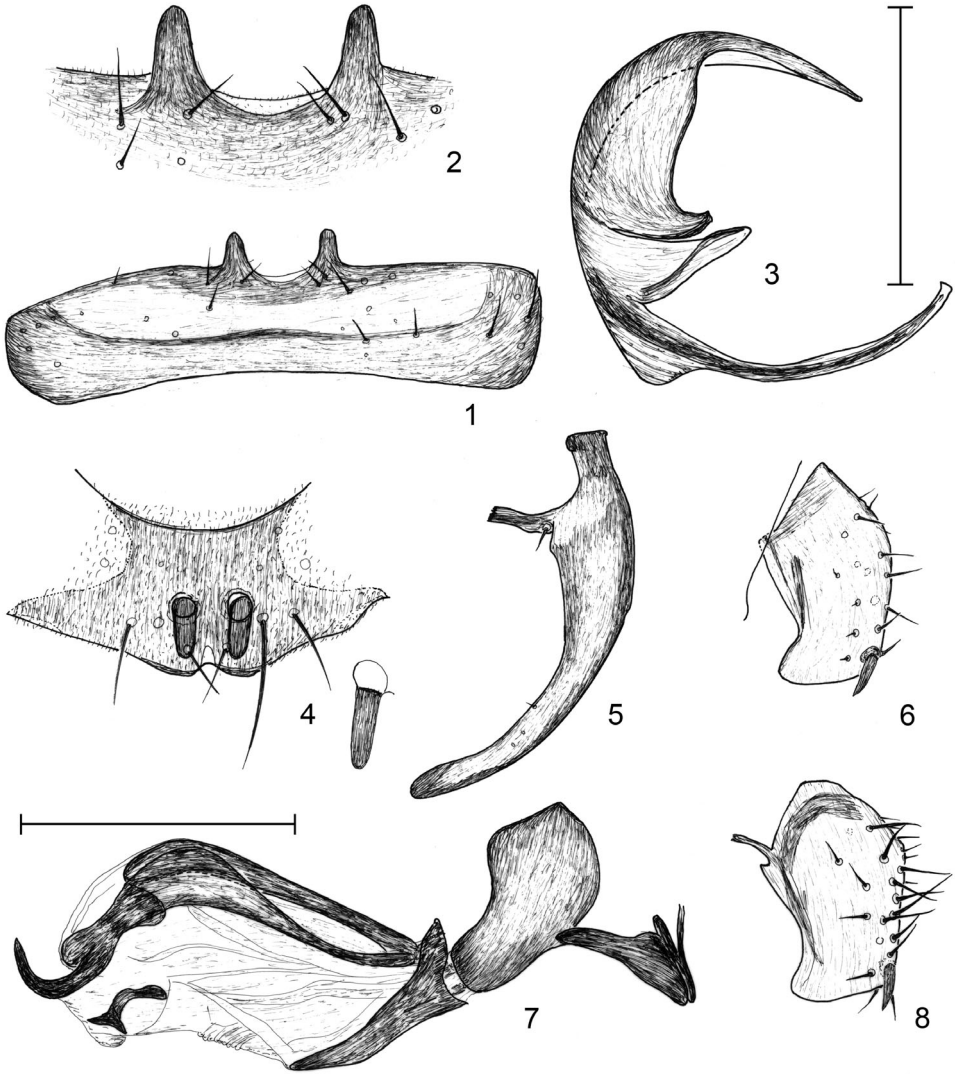
Wing (Fig. 56) without any pattern. Veins yellowish. Costal ratio 0.22 mm / 0.37 mm, i.e. 60 (holotype). Vein R_{2+3} more arcuately curved than in the other Afrotropical species. Inter-crossvein section 0.10 mm, M-M crossvein 0.06 mm (holotype), ratio about 2.0 in the other specimens. Knob of halter dirty yellow, stalk greyish brown.

Legs all yellowish brown on holotype (discoloured), actually darker brown, coxae, trochanters and small parts of pleura reddish. Anterodorsal setae on mid tibia at 9/27 and at 17/27 (small) a dorsal seta at 21/27 and a comparatively small posterodorsal at 22/27. Ventral seta on mid basitarsus comparatively short.

Abdominal tergal setae comparatively short. Male sternite 5 with a paired, almost symmetrical pair of caudal processes (Figs 1–2, cf. PAPP 1991: fig. 42). Sternite 6 part of the syntergosternite thin medially and on the right side and definitely lengthened to the right. Subepandrial sclerite of a specific shape, cercal part of the epandrial complex high, cercal pegs just below its mid level, cercal peg comparatively small. Surstylus subquadrate (Fig. 6, cf. Fig. 8 and PAPP 1991: fig. 43) with a caudal subapical thorn, caudal (posterior) margin with a few setae only. Distiphallus (Fig. 7) with a strong apical, dorsally curved process, postgonite (Fig. 5) long, comparatively thin and curved.

Female unknown but probably close to *O. brevisecunda*, incl. cerci and spermathecae (see PAPP 1991: figs 40–41).

The relationships of this new species cannot be judged by the key below. Indeed, it is very different from the rest of the Afrotropical species. Actually *O. afrobrevisecunda* sp. n. is closely related to *O. brevisecunda* L. PAPP, 1991, but I found some details in the male genitalia, which are distinctive enough to define another species. The caudal processes of sternite 5 in *O. afrobrevisecunda* males are distinctly longer (Figs 1–2, cf. PAPP 1991: fig. 42). The surstylus of *O. brevisecunda* (Fig. 8) has more and much longer setae posteriorly than the new species (it is true also for the types but those setae were omitted from PAPP's (1991) fig. 43). It is conspicuous that the distiphallus of *O. brevisecunda* is more curved, and consequently the distiphallus of *O. afrobrevisecunda* seems longer



Figs 1–8. 1–7 = *Opacifrons afrobrevisecunda* sp. n., paratype male, postabdomen and genitalia. 1 = sternite 5, ventral view, 2 = same, medio-caudal part in higher magnification, 3 = postabdominal sclerites (synsternite), ventral view, 4 = subepandrial sclerite (inside) and modified cerci, caudal view (outset: cercal peg at its longest), 5 = postgonite, broadest (slightly sublateral) view, 6 = surstylus, broadest (sublateral-subventral) view, 7 = phallus, lateral view. 8 = *O. brevisecunda* L. PAPP, a male from Taiwan, surstylus, broadest (sublateral-subventral) view. Scales: 0.2 mm for Figs 1, 3, 0.1 mm for Figs 2, 4–8

(Fig. 7, cf. PAPP 1991: fig. 44). Female genitalia are probably similar to those of *O. brevisecunda* (cf. PAPP 1991: fig. 40).

Opacifrons compacta sp. n.
(Figs 9–16, 47–51)

Holotype male (HNHM): Ethiopia, Ambo, No. 513, 25. XI. 1980, leg. [ANDRÁS] DEMETER [abdomen and genitalia in a plastic microvial with glycerol].

Paratypes (HNHM, several males and a female with abdomen and genitalia in a plastic microvial each with glycerol): 4 males 2 females: Ethiopia, Ambo, No. 513, 25. XI. 1980, leg. [ANDRÁS] DEMETER; 4 males: ibid., 23. XI.; 1 male 1 female: Abyssinia, Kovács – Dire-Daua, "1911. 11. 19." – "O. coxata St. ?" det. Dr. O. DUDA. R.S.A: 2 males: KwaZulu Natal, N Drakensberg, Cathedral Peak Park, on cow pats, Jan 31, GPS33, S28° 55' 55.7" E29° 16' 06.2", 1359 m, No. 47, leg. L. PAPP & M. FÖLDVÁRI; 2 males: KwaZulu Natal, N Drakensberg, along eNdumeni River, on sedge and on mud, Jan 31, 2007, No. 45, leg. L. PAPP.

Measurements in mm: body length 1.61 (holotype), 1.32–1.65 (paratypes), wing length 1.63 (holotype), 1.54 –1. 81 (paratypes), wing width 0.68 (holotype), 0.64 –0.72 (paratypes).

A species rather close to *O. dilatata* sp. n., features not mentioned below may be found in the description of that species, and vice versa.

Body dark grey, incl. facial plate, frons anteriorly and fore coxa and tarsi.

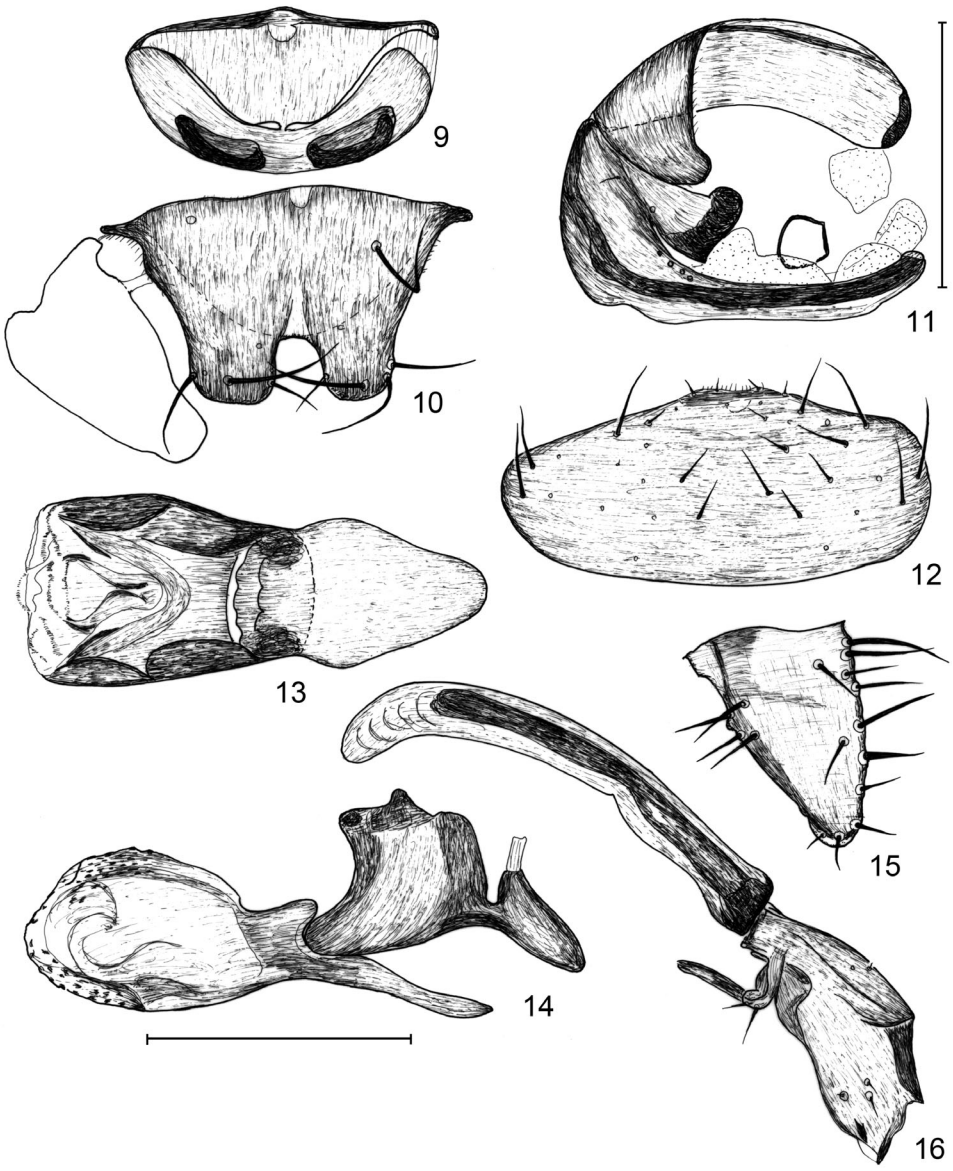
Four rather long interfrontal pairs, longest pair 0.12 mm long. Facial plate shiny. Gena 0.09 mm below eye, longest (oblique) diameter of eye 0.24 mm. Arista 0.60 mm long (holotype). Aristal cilia shorter, at most 0.025 mm, cilia on apex of first flagellomere of the same length.

Prealar callus similar to that of *O. subserrata* sp. n., i.e. much higher than in *O. dilatata* sp. n.. Prescutellar acrostichal pair very short, 0.08 mm.

Costal index 0.45 mm / 0.60 mm, i.e. 0.75 only (slightly more on paratypes). Intercrossvein section of M 0.20 mm, crossvein M-M 0.08 mm. Knob of halter dirty yellow, stalk grey.

Male mid tibia with a complete row of anteroventral setae but less dense than in *O. dilatata*. Anterodorsal setae on mid tibia at 5/18, 5/6, a more anterior (short) one at 25/36, a strong posterodorsal seta at 26/36. Ventral seta on mid basitarsus 0.06 mm, i.e. slightly shorter than in *O. dilatata* sp. n.. As in its congeners, hind basitarsus and 2nd tarsomere with a row of perpendicular setulae. Claws short and slightly curved, usually parallel with sides of 5th tarsomere.

Abdominal tergites without long marginal setae. Sternite 5 (Fig. 12) rather simple, without caudal processes and medial caudal part is with some very short setae only. Postabdominal sclerites (synsternite with "right-side sclerites", Fig. 11) have specific features: sternite 6 part comparatively broad (actually: long), sternite 7 part broad and curved laterally, sternite 8 part comparatively long. Right side sclerites (see PAPP 2008) slightly but definitely sclerotised. Subepandrial sclerite (Fig. 9) rather broad. Modified cerci (Fig. 10) with a few setae only, blunt and broad apically. Surstylus (Fig. 15) rather simple, sub-triangular, without special apical structures but with rather strong setae both cranially and caudally. Phallus small, compact (Fig. 13). Distiphallus (Figs 13–14) much smaller than in *O. dilatata*, not broad with dark sclerotised walls. Distiphallus with long flat and broad basal (caudal) extension, which reaches epiphallus base. Basiphallus robust. Postgonite (Fig. 16) short



Figs 9–16. *Opacifrons compacta* sp. n., male postabdomen and genitalia. 9 = subepandrial sclerite with contours of cerci, ventral view, 10 = modified cerci with contours of left surstylus, inner anterior (cranial) view, 11 = postabdominal sclerites (synsternite with "rightside sclerites"), ventral view, 12 = sternite 5, ventral view, 13 = distiphallus, ventral view, 14 = phallus, lateral view, 15 = surstylus in broadest extension, 16 = postgonite and phallapodeme, lateral view. Scales: 0.2 mm for Figs 11–12, 0.1 mm for Figs 9–10, 13–16

(shorter than 0.1 mm) and broad with a broad apical and a short but sharp caudal projections. Female abdomen rather short, without long setae. Sternite 7 (Fig. 47) rather long, much longer than tergite 7, causing the anal opening to turn dorsally. Epiproct comparatively large (Fig. 50), sagittally less melanised and sclerotised, houseroof-shaped when at rest. Cerci (Figs 50–51) short, not much longer than broad, upright (slightly pressed down on Fig. 50) with indistinct hairs but with 2 pairs of thick thorns, whose apices lengthened in thin curved projections. In addition, cercal pegs with1 definite ventral incisions each. Spectacles shaped sclerites well-formed, medial sclerite small (Fig. 49). Spermathecae (Fig. 48) long, longer than pear-shaped, rather racket-shaped, common duct of paired spermathecae rather short.

Etymology. This new species is named after its compact distiphallus.

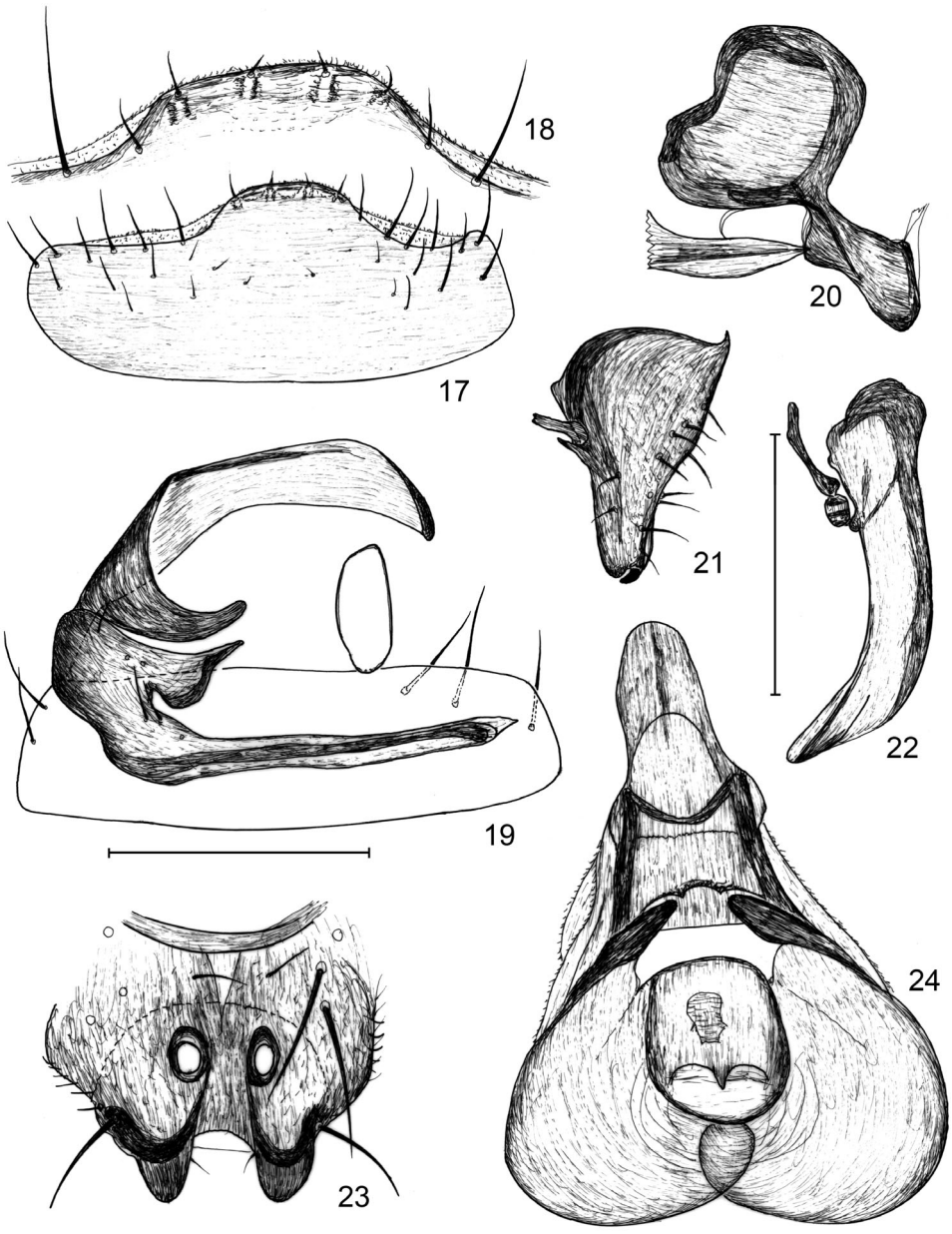
Remark. Until the last phase of preparing the present paper a male from Tanzania (Tanzania: Kwasambia, Tanga region, 1–18. II. 1987, leg. Mahunka, Zicsi) had been relegated to the paratypes. However, I found minor differences in the male genitalia and so I did not designate it as a paratype. More material collected in Tanzania and from between those two parts of East Africa is needed to make a good decision.

Opacifrons dilatata sp. n.
(Figs 17–24)

Holotype male (HNHM): RSA: KwaZulu Natal, S Drakensberg, Garden Castle, along Mlambonja River, Jan 22, GPS21, S29° 44' 59.4" E29° 12' 42.1", 1811 m, No. 33, leg. L. PAPP & M. FÖLDVÁRI.

Paratypes (HNHM, several males and a female with abdomen and genitalia in a plastic microvial each with glycerol): Republic of South Africa, 2007: 8 males 1 female: same as for holotype; 3 males: Eastern Cape, Lottering River, on riverside vegetation, Jan 14, GPS15, S33° 58' 22.2" E23° 44' 49.8", 225 m, No. 22, leg. L. PAPP & M. FÖLDVÁRI; 1 male: Eastern Cape, in a forest nr R102, Jan 15–16, GPS19, S33° 56' 57.3" E23° 36' 20.8", 224 m, No. 25, leg. L. PAPP & M. FÖLDVÁRI; 1 male: KwaZulu Natal, S Drakensberg, roadside ruderalia nr Lime Farm, Jan 21, GPS23, S29° 49' 47.9" E29° 19' 36.9", 1711 m, No. 30, leg. L. PAPP & M. FÖLDVÁRI; 1 male: KwaZulu Natal, S Drakensberg, Himeville, Thomas Str., on compost and fallen fruits, Jan 22, GPS 25, S29° 44' 36.6" E29° 30' 49.5", 1541 m, No. 35, M. FÖLDVÁRI & L. PAPP; 1 female: Eastern Cape, Hogsback, 39 Steps Waterfall, Jan 7–8, GPS06, S32° 35' 22.8" E26° 55' 57.5", 1233 m, No. 4, leg. M. FÖLDVÁRI & L. PAPP; 2 males: KwaZulu Natal, N Drakensberg, along eNdumeni River, on sedge and on mud, Jan 31, 2007, No. 45, leg. L. PAPP; 1 male: Eastern Cape, Bloukrans Pass, in a side valley, Jan 14–16, GPS16, S33° 57' 09.6" E23° 37' 59.4", 70 m, No. 23, leg. M. FÖLDVÁRI & L. PAPP. Ethiopia: 2 males 2 females: Ethiopia, unknown locality, leg. DEMETER 1979–80; 1 male: ibid., Indibir, 30. XI. 1980.

Measurements in mm: body length 1.70 (holotype), 1.41–1.81 (paratypes), wing length 1.70 (holotype), 1.45 –1.88 (paratypes), wing width 0.69 (holotype), 0.62 –0.75 (paratypes).



Figs 17–24. *Opacifrons dilatata* sp. n., male postabdomen and genitalia. 17 = sternite 5, ventral view, 18 = same, medio-caudal part in higher magnification, 19 = postabdominal sclerites with contours of tergite 5, 20 = epiphallus, basiphallus and caudal end of distiphallus, 21 = surstylus, with connection to subepandrial sclerite, broadest view, 22 = postgonite, broadest view, 23 = modified cerci with holes (bases) of thin cercal pegs, caudal view, 24 = distiphallus, ventral view. Scales: 0.2 mm for Figs 17, 19, 0.1 mm for Figs 18, 20–24

A species close to *O. compacta.* Body dark grey, incl. all the frons, facial plate and fore coxa. Mesonotum moderately shiny.

All the (post)frons and facial plate (prefrons) dark grey. Facial plate shiny. 4 pairs of rather long interfrontal setae, last but one seta 0.09 mm long. Genal seta (close to mouth margin) 0.15 mm. Gena 0.08 mm broad below eye, longest diameter of eye 0.24 mm. Aristal cilia shorter, 0.02 mm, cilia on first flagellomere 0.02 mm or slightly longer. Arista 0.53 mm long.

Prealar callus not very high (much lower than in *O. compacta*). Prescutellar acrostichal pair 0.11 mm. Acrostichals rather long but irregularly placed and scattered. Dorsocentral microchaeta just anterior to posterior dorsocentral seta enlarged, 0.11 mm long.

Wing rather long, grey, moderately shiny, veins light brown. Sub-basal costal seta c. 0.12 mm long. Costal index 0.91, 0.82–0.92 (paratypes). Inter-crossvein section of M 0.17 mm, M-M crossvein 0.09 mm. Vein M_{3+4} with a distinct lower continuation distally to discal cell; pigmented part longer than M-M. Alula liguliform, apex narrowly rounded.

Male mid femur with some (not a row of) posteroventral setae on basal half only. Anteroventral row of thorns of mid tibia complete, posteroventrals not developed (normal setae there). Anterodorsal setae on mid tibia at 10/37, 29/37 (large), a more anteral at 25/37, a posterodorsal aeta at 24/37. Mid ventral basitarsal seta 0.06 mm. Hind basitarsus and 2nd tarsomere as in *O. subserrata* sp. n.. Claws normal.

Sternite 5 (Fig. 17) with a broad round medio-caudal emargination but without caudal processes; medial caudal part with 4 short setae, whose bases are structured (Fig. 18). Postabdominal sclerites (synsternite with "right-side sclerites", Fig. 19) with sternite 6 part rather broad (reaching far towards the right) and thin, sternite 7 part small and narrowed medially, sternite 8 part less long than in *O. compacta* sp. n.. Right side sclerites seem less sclerotised. Subepandrial sclerite (Fig. 23, covered) smaller. Modified cerci (or, cercal part of epandrial complex, Fig. 23) with 2 pairs of long thin narrow (lath-shaped) pegs (0.055 long), rather protruding and therefore, easily lost, their bases are shown on Fig. 23. That is, this species is with cercal pegs. Surstylus (Fig. 21) narrowed in its apical half with a caudal subapical peg (thick blunt thorn) with medium long setae caudally but with short setae cranially (anteriorly). Phallus large, distiphallus (Fig. 24) rather flat and much dilated apically. Distiphallus with a long flat and broad basal (caudal) extension (Fig. 20), which reaches epiphallus base. Basiphallus robust. Postgonite (Fig. 22) robust but rather long (definitely longer than 0.1 mm), apically curved.

Female cercal pegs rather similar to those of *O. compacta* sp. n., although the extruded thin apical part seems less curved.

Etymology. This new species is named after its very much dilated distiphallus.

Remark. I much prefer to prepare paratypes rather than holotypes whenever numerous paratypes are available. However, in the particular case with closely related species, the only safe solution was to prepare the holotype.

Opacifrons rubrifrons (VANSCHUYTBROECK, 1950) (Figs 25–31)

Limosina (Opacifrons) rubrifrons VANSCHUYTBROECK, 1950: 57.

Material studied. Holotype male (IRSN): 1) ♂; 2) Tshikay, Zaire, 21-V–1948, P. VANSCHUYTBROECK; 3) P. VANSCHUYTBROECK det. "1950: Opacifrons rubrifrons Vansch."; 4) [red] Type; 5) "cf. Bull. Inst. Nat. Belg. I. G. "17315". Right mid and hind legs lost.

Paratype male (IRSN, abdomen and genitalia in a plastic microvial with glycerol): 1) ♀ [it is actually a male specimen]; 2) Banana, 13-xii–1948, P. VANSCHUYTBROECK; 3) = 3) of HT; 4) [red] Paratype; 5), 6) = 5) and 6) of HT. In the original description it was erroneously reported as female.

Measurements in mm: body length 1.87 (holotype), (paratype) 1.81, wing length 2.25 (holotype), 1.89 (paratype), wing width 0.90, 0.88. 3 medium long interfrontal pairs plus 1 minute anterior pair. Postfrons reddish anteriorly. Genal seta long, 0.19 mm. Arista cilia 0.035 mm. Facial plate rather microtomentose, sub-shiny.

Anterior dorsocentral seta rather strong. Basal scutellar seta 0.45 mm, apical scutellar 0.58 mm long (left scutellar broken off on holotype).

Costal ratio 0.66 mm / 0.76, i.e. 0.87; wings clear without pecularities. Longest costal setae 0.10 mm. Inter-crossvein section of M_{1+2} 0.31 mm, M-M crossvein 0.11 mm. Discal cell with distinct lower edge.

Male mid femur without ventral setae but with a sub-basal white hair of 0.12 mm. Mid tibia with an almost complete row of anteroventral thorn-like setae, which are weaker than in *O. subserrata* sp. n. or *O. serrata* sp.n.. Mid basitarsus with a 0.06 mm long ventral seta.

Sternite 5 (Fig. 12) large but rather simple, without definite caudal processes but medial caudal part is with a pair of very small subapical emarginations. Stenite 5 with short setae only. Postabdominal sclerites with sternite 6 part thin and rather straight as for its medial part, sternite 7 part small and narrowed medially, sternite 8 part rather large.

Male genitalia (Figs 25–31) different from those in the *O. serrata* group. Subepandrial sclerite (Fig. 25) short but rather broad. Modified cerci (Fig. 26) without deep sagittal incision, cercal pegs very large and emerge rather close to each other (Figs 25–26). Cercal part with long setae. Surstylus (Fig. 29) with strongly narrowed apical half, apex with a blunt peg; surstylus seems very long and narrow in caudal view (Fig. 26). Phallus with comparatively thin distiphallus (Fig. 30), distiphallus with a short basal (caudal) extension only. Basiphallus robust and touches distiphallus on a large surface. Epiphallus strongly fused to basiphallus (Figs 30–31). Postgonite (Fig. 28) robust, rather broad and almost 0.2 mm long with a narrow apical projection but with minute setulae only.

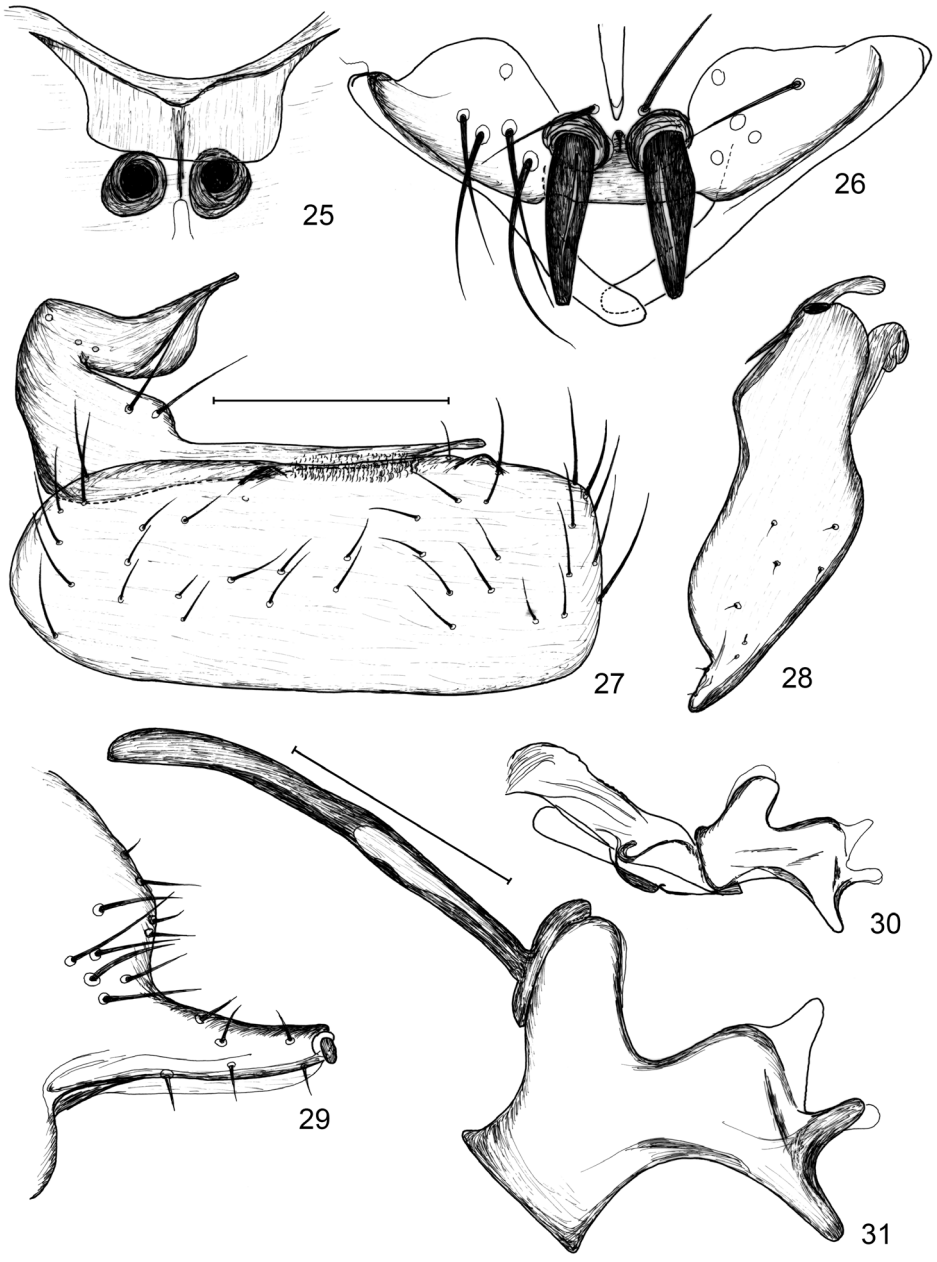
Female unknown.

Hitherto known from its type locality (Zaire) only.

Opacifrons serrata sp. n. (Figs 32–38)

Holotype male (HNHM): Ethiopia, Akaki River, Addis Ababa, No. 115, 6. X. 1980, leg. [András] DEMETER.

Paratypes (HNHM): all paratypes from Ethiopia, leg. DEMETER, 1980: 2 males, 2 females: same as for holotype; 1 male: as for holotype, without No.; 2 males: ibid., 12. X., No. 191; 1 male 1



Figs 25–31. *Opacifrons rubrifrons* VANSCHUYTBROECK, male postabdomen and genitalia. 25 = subepandrial sclerite with bases of cercal pegs, inner view, 26 = cercal pegs with contours of surstyli, caudal view, 27 = sternite 5 and sternite 6 and 7 part of synsternite, ventral view, 28 = postgonite, broadest view, 29 = surstylus, broadest (sublateral) view, 30 = phallus, lateral view, 31 = epiphallus, basiphallus and phallapodeme, lateral view. Scales: 0.2 mm for Figs 27, 30, 0.1 mm for Figs 26, 28–29 and 31

female: ibid., 29. Sept., No. 67; 1 female: ibid., 29. IX., No. 55; 1 female: ibid., 4. Nov., No. 375; 1 male 1 female: Ambo, 23. 11.; 1 female: ibid., 10 km NW of Indibir, 30. 11. [abdomen and genitalia of two males in a plastic microvial each with glycerol].

Measurements in mm: body length 1.46 (holotype), 1.38–1.87 (paratypes), wing length 1.64 (holotype), 1.38 –2.00 (paratypes), wing width 0.75 (holotype), 0.70 –0.83 (paratypes).

A species rather close to *O. subserrata* sp. n., features not mentioned below may be found in the description of that species.

Body slightly darker microtomentose than that of *O. subserrata* sp. n.

Facial plate microtomentose, less shiny. 4 pairs of long interfrontal seta, middle pair 0.11 mm long. Genal seta 0.14 to 0.16 mm long. Arista c. 0.60 mm long (not measurable on holotype). Aristal cilia 0.025 mm long, cilia on first flagellomere 0.025 mm, i.e. slighly longer than in *O. subserrata* sp. n.

Acrostichal setae rather sparse but comparatively long. A pair of medium-long (0.11 mm) prescutellar acrostichal present. As in *O. subserrata* sp. n., some setae in the dorsocentral line may be longer than adjacent setae but they cannot be evaluated as characteristic setae.

Costal index 0.54 mm / 0.63 mm, i.e. 0.86, but up to 0.92 in paratypes. Inter-crossvein section of M 0.23 mm, M-M crossvein 0.10 mm, i.e. slightly less than in *O. subserrata* sp. n., but the difference is not sufficient to distinguish it from its sister species.

Male sternite 5 large caudally without any processes (Figs 32–33), medio-caudally less sclerotised, its setae short. Sternite 6 part of synsternite long and broad, sternite 7 short, not reaching even sagittal line, narrowing apically, sternite 8 part large, long and broad. Ventral processes of cerci (Fig. 34) broad with nearly straight apex. Male cercal pegs large and emerge far from each other (Fig. 34). Surstyli strongly asymmetrical (Figs 35–36) without an apical thorn and bear short or medium long setae on medial margin only. Left surstylus (Fig. 35) much narrower than right surstylus, with very small lateral lobe. Right surstylus (Fig. 36) broad with broad lateral lobe. Distiphallus (Fig. 38) rather large, ventral caudal projection (below distiphallus) very small. Epiphallus (Fig. 38) narrowly connected to basiphallus, rather similar to that of *O. subserrata* sp. n., with 3 small ventral projections subbasally. Postgonite (Fig. 37) broad in its basal 3/5 only, with sharp apex and conspicuously serrate posteriorly.

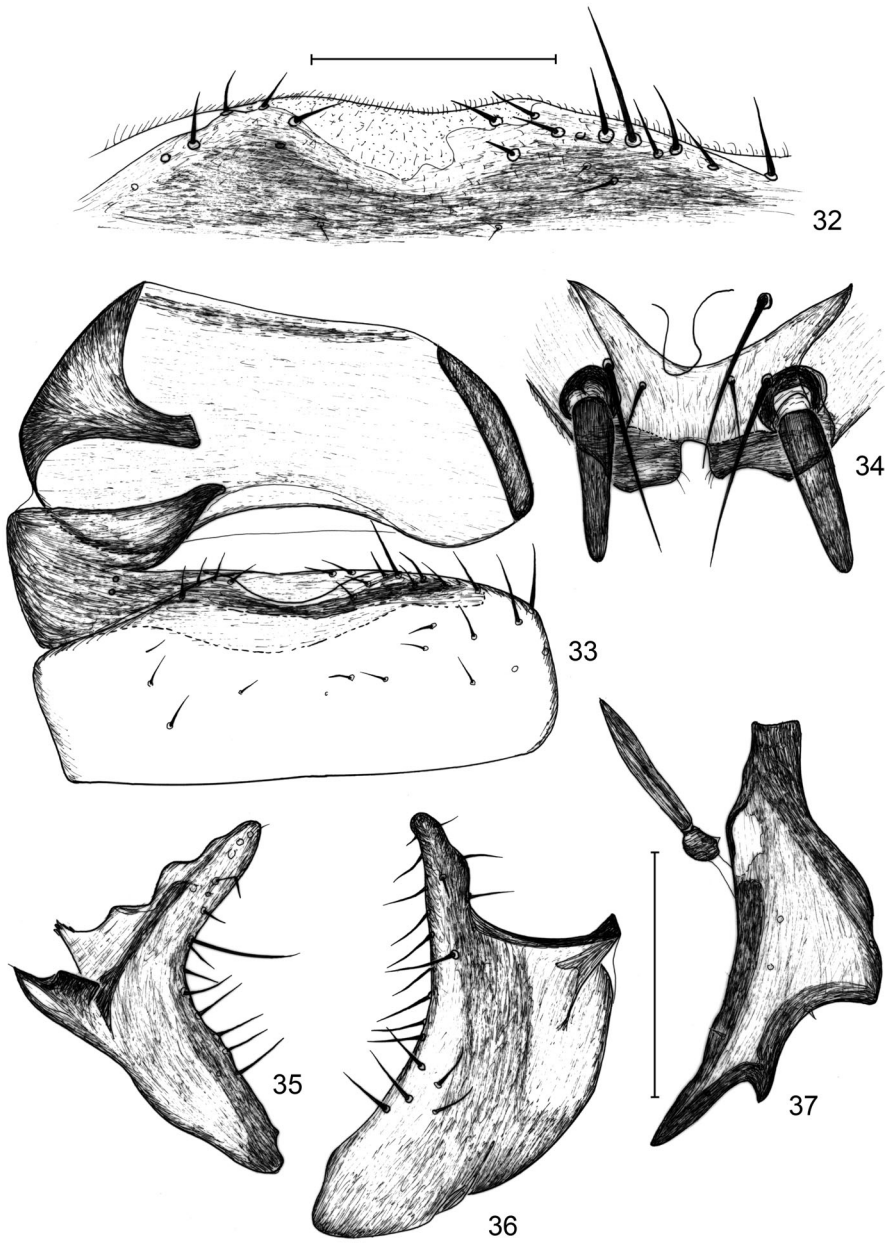
Female cerci with 2 pairs of thicker discoloured cercal pegs, similar to Fig. 55.

Etymology. This new species is named after its serrate postgonite.

Opacifrons subserrata sp. n.
(Figs 39–46, 52–55, 57)

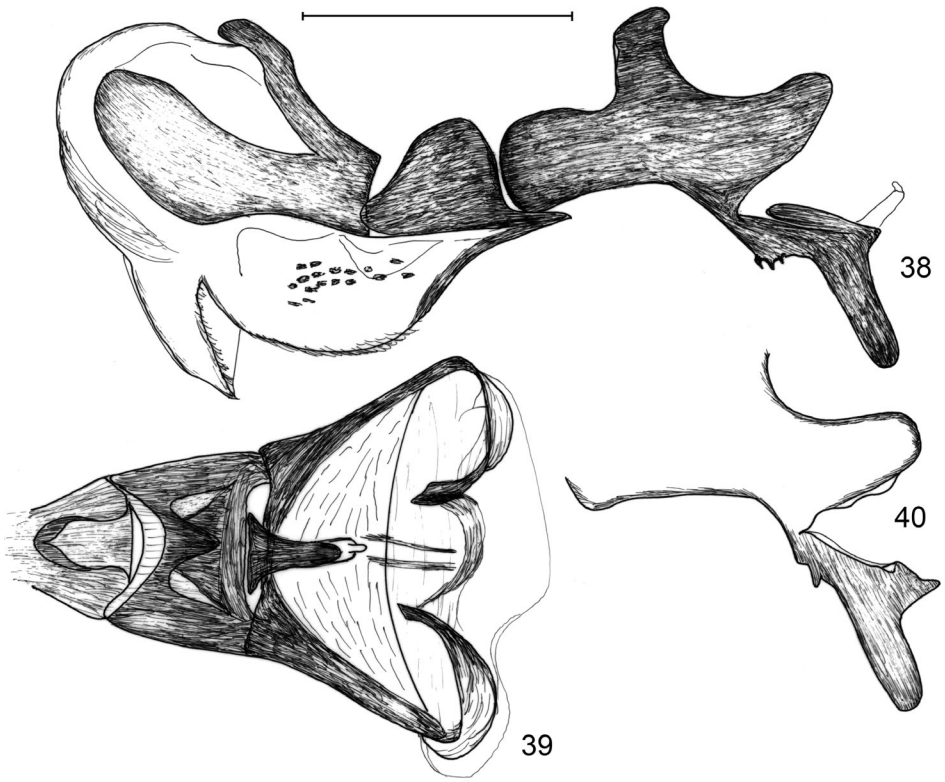
Holotype male (HNHM): RSA: Eastern Cape, in a forest nr R102, Jan 15–16, 2007, GPS19, S33° 56’ 57.3” E23° 36’ 20.8”, 224 m, No. 25, leg. L. PAPP & M. FÖLDVÁRI.

Paratypes (HNHM): all from the Republic of South Africa, leg. L. PAPP & M. FÖLDVÁRI, 2007: 30 males 2 females: same as for holotype [abdomen and genitalia of two males in a plastic microvial each with glycerol]; 29 males 3 females: Eastern Cape, Bloukrans Pass, in a side valley, Jan 14–16, GPS16, S33° 57’ 09. 6” E23° 37’ 59.4”, 70 m, No. 23; 5 males 2 females: 39 Steps Waterfall, Jan 7–8, GPS06, S32° 35’ 22.8” E26° 55’ 57.5”, 1233 m, No. 4; 1 male: Eastern Cape Prov., Hogsback, Wolf Ridge Road, undergrowth along a small brook, Jan 8, GPS03, S32° 35’ 42.2” E26° 56’



Figs 32–37. *Opacifrons serrata* sp. n., male postabdomen and genitalia. 32 = medio-caudal part of sternite 5, ventral view, 33 = sternite 5 and postabdominal sclerites, 34 = modified cerci with pegs and subepandrial sclerite (covered), caudal view, 35 = left surstylus, broadest (subventral) view, 36 = right surstylus, broadest (subventral) view, 37 = postgonite with connection to hypandrum, broadest view. Scales: 0.2 mm for Fig. 33, 0.1 mm for Figs 32 and 34–37

51.3”, 1143 m, No. 5; 1 male 2 females: ibid., nr Kettlespout Falls, Jan 8–9, GPS04, S32° 35’ 27.9” E26° 57’ 36.1”, 1338 m, No. 6; 7 males 6 females: ibid., Contour Path, Jan 8–9, GPS04, S32° 35’ 27.9” E26° 57’ 36.1”, 1338 m, No. 7; 4 males: ibid., in a park, Jan 8–9, GPS05, S32° 35’ 18.0” E26° 56’ 56.0”, 1298 m, No. 8; 4 males: ibid., Marie & Child Falls, along a streamlet, Jan 9, GPS07, S32° 36’ 23.5” E26° 57’ 55.3”, 1101 m, No. 10; 1 male 1 female: ibid., stony hillside with cow pats, Jan 9, GPS07, S32° 36’ 23.5” E26° 57’ 55.3”, 1101 m, No. 11; 1 male: Eastern Cape Prov., Shamwari Game Reserve, on elephant dung, Jan 11, GPS10, S33° 24’ 47.0” E26° 05’ 45.0”, 301 m, No. 14; 1 male: Eastern Cape, Keurboomstrand, on sea-shore plants, Jan 17, GPS14, S34° 00’ 17.5” E23° 27’ 00.4”, 2 m, No. 27; 1 male 2 females: KwaZulu Natal, S Drakensberg, Garden Castle, along Mlambonja River, Jan 22, 2007, GPS21, S29° 44’ 59.4” E29° 12’ 42.1”, 1811 m, No. 33; 3 males 1 female: KwaZulu Natal, S Drakensberg, Himeville, Thomas Str., on compost and fallen fruits, Jan 22, GPS 25, S29° 44’ 36.6” E29° 30’ 49.5”, 1541 m, No. 35; 1 male 1 female: RSA: KwaZulu Natal, S Drakensberg, over and along Mashai River, Jan 24, GPS26, S29° 45’ 13.4” E29° 11’ 30.4”, 1897 m, No. 37; 4 males: ibid., under a waterfall of the Mashai River, Jan 25, No. 37a; 1 male 3 females/1 male: KwaZulu Natal, N Drakensberg, Rainbow Gorge, Jan 26–28/30, GPS29, S28° 57’ 36.7” E29° 13’ 33.6”, 1529 m, No. 39/43; 4 males: ibid., along Rainbow Gorge streamlet, yellow pans, Jan



Figs 38–40. *Opacifrons* spp., phallus. 38 = *O. serrata* sp. n., lateral view. 39–40 = *O. subserrata* sp. n.: 39 = distiphallus, ventral view, 40 = epiphallus with caudal part of basiphallus, lateral view. Scale: 0.1 mm for all.

28–31, GPS31, S28° 57' 42.3" E29° 13' 18.4", 1516 m, No. 41; 2 females/2 males: ibid., over and along iMpofane River, Jan 29/31, GPS32, S29° 03' 12.7" E29° 23' 06.2", 1531 m, No. 42/46; 1 female: ibid., along eNdumeni River, on sedge and on mud, Jan 31, No. 45; 2 females: ibid., Cathedral Peak Park, on cow pats, Jan 31, GPS33, S28° 55' 55.7" E29° 16' 06.2", 1359 m, No. 47. 133 collection specimens.

Measurements in mm: body length 1.69 (holotype), 1.54–2.09 (paratypes), wing length 1.90 (holotype), 1.45 –2.08 (paratypes), wing width 0.74 (holotype), 0.66–0.88 (paratypes).

Body dark dusty grey.

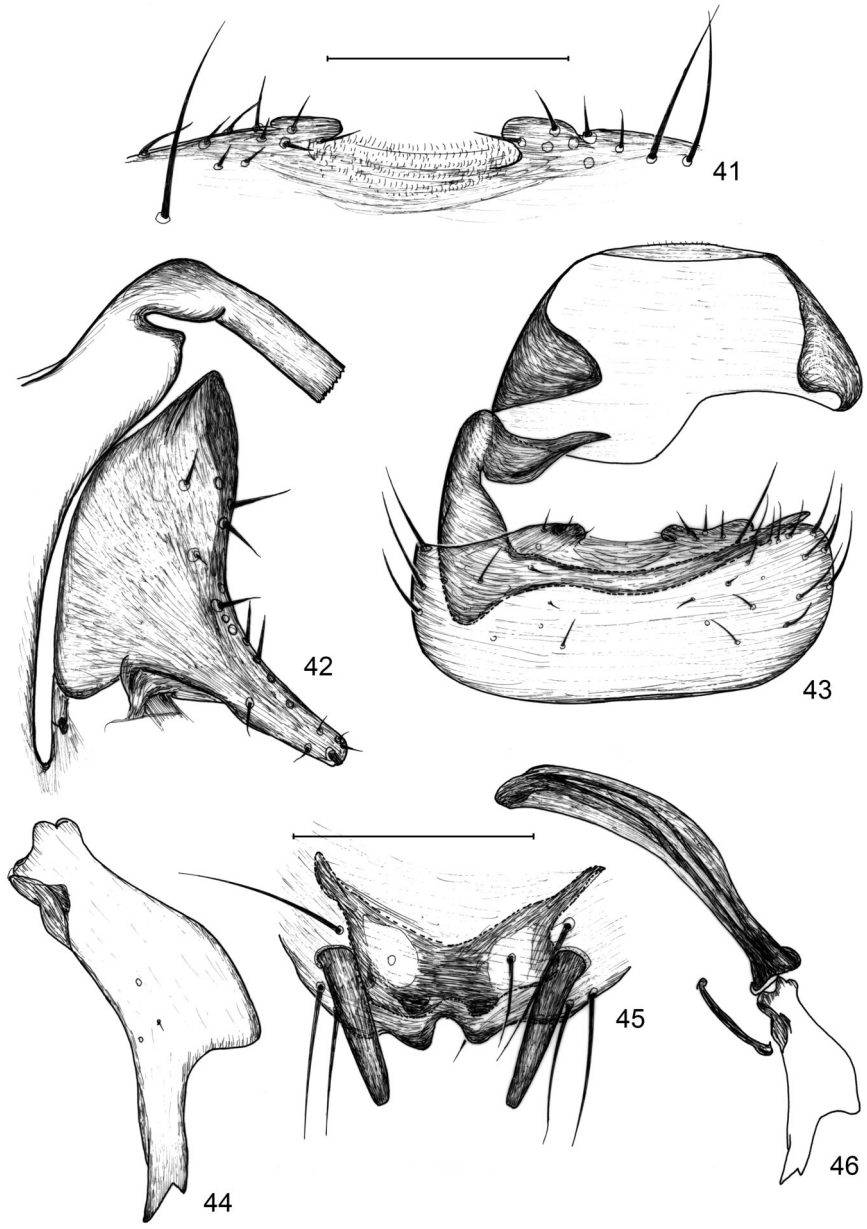
Frons reddish anteriorly, also facial plate and fore coxa apically with some yellowish hue. Facial plate more microtomentose, sub-shiny. 4 rather long interfrontal pairs. Longest ones (2 middle pairs) 0.12 mm long. Eye large, longest (oblique) diameter 0.30 mm, gena below eye 0.085 mm. Genal seta emerges not far from mouth margin, 0.14 mm, i.e. very long. Arista 0.71 mm long. Aristal cilia 0.025 mm long, cilia apically on first flagellomere 0.02 mm.

Wing clear grey (Fig. 57), veins light brown. Costa overruns R_{4+5} by c. 0.02 mm. Costal index 0.56 mm / 0.64 mm, i.e. 0.88 but up to 0.94 in paratypes. R_{2+3} not arcuately curved, R_{4+5} slightly curved up in apical 1/4. Both lower edges of discal cell somewhat more than 90°, lower edge with a thin but distinct vein reaching half section of the distance of discal cell and wing margin. Alula rather narrow, apex rounded. Halter light yellowish.

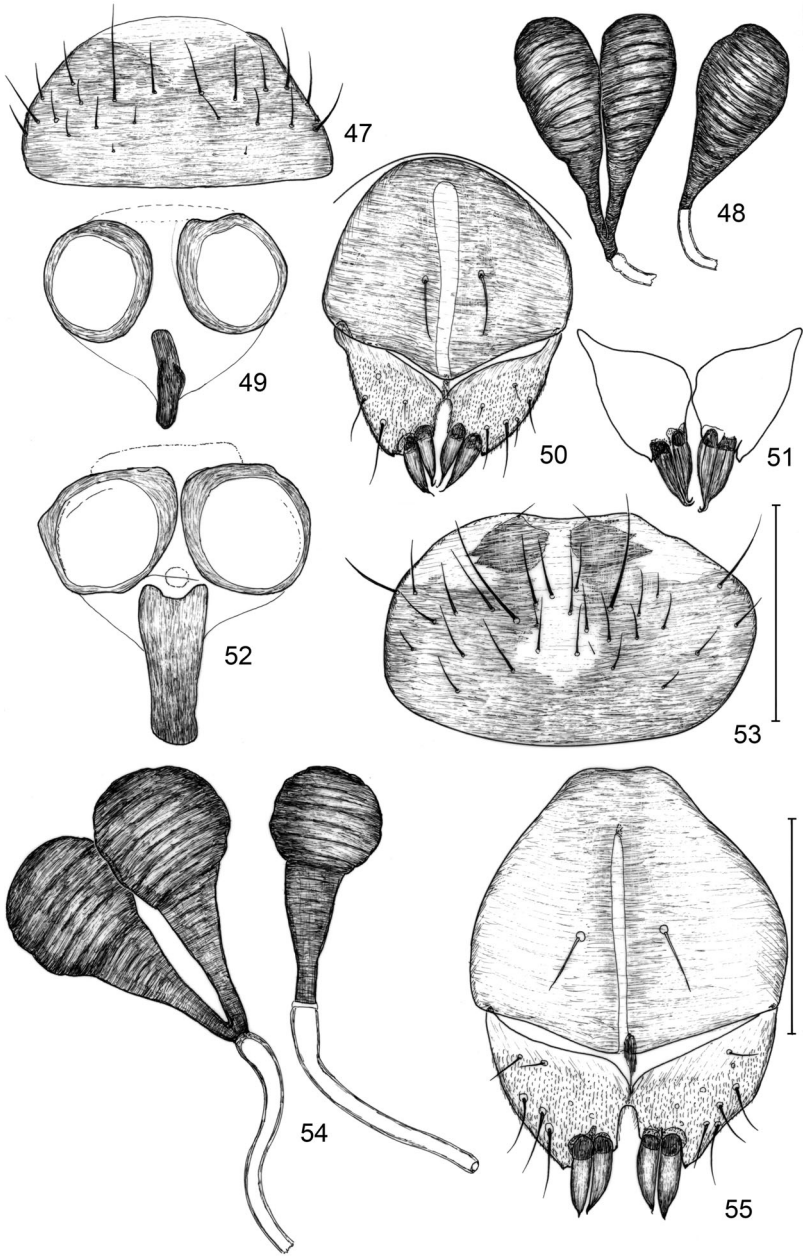
Fore and hind legs without special features, except for a row of thin but perpendicular setulae on hind basitarsus and 2nd tarsomeres; this seems characteristic for numerous *Opacifrons* spp. Male mid tibia with a complete row of short thick thornlets antero-ventrally turning ventral apically; postero-ventrally with a row of thinner setae. Anterior thorn-like setae of mid femur not particularly strong. Anterodorsal setae on mid tibia at 13/42 (strong), 35/42 (long), a more anterior seta at 31/42, a very long posteroventral seta at 30/42. Ventral (actually posteroventral) sub-basal seta of mid basitarsus 0.075–0.08 mm long.

Abdomen comparatively short, tergal setae medium-long. No large marginal setae like in *Leptocera* spp. Male sternite 5 large caudally with a pair of small, medially directed processes (Figs 41, 43), medio-caudally less sclerotised and without setae there. Mid and right sections of sternite 6 part of synsternite long and broad, sternite 7 short, not reaching even sagittal line, narrowing apically, sternite 8 part large, long and broad (Fig. 43). Ventral processes of cerci (Fig. 45) smaller with rounded apex. Male cercal pegs large and emerge far from each other (Fig. 45). Subepandrial sclerite (Fig. 45, covered) larger and ventrally broader than that of *O. rubrifrons*. Surstylus without an apical thorn (a small short peg there), surstyli symmetrical (Fig. 42). Apical half of distiphallus broadened apically (Fig. 39) but less broad than in *O. dilatata* sp. n.. Basiphallus as in *O. serrata* sp. n.. Epiphallus (Fig. 40) narrowly connected to basiphallus with only 1 projection sub-basally. Postgonite broad in its basal 3/5 only, apical third narrow with 2 apices (Figs 44, 46), i.e. with a second subapical apex posteriorly.

Female abdomen rather short, without long setae. Sternite 7 (Fig. 53) rather large with more numerous and longer setae than in *O. compacta* sp. n. and much longer than tergite 7, that makes anal opening to turn dorsally. Epiproct comparatively large (Fig. 55), sagittally less melanised and sclerotised, houseroof-shaped when at rest. Cerci (Fig. 55) short, not much longer than broad, upright (pressed down on Fig. 55) with indistinct hairs but with 2 pairs of discoloured thick thorns, whose apices are sharp but not lengthened/extruded in thin curved projections, cercal pegs without ventral incisions. Spectacles shaped sclerites comparatively large, medial sclerite large and flat (Fig. 52). Spermathecae (Fig. 54) long, distal part globular, proximal part even longer, its part below distal globular part slightly dilated, common duct of paired spermathecae rather short.



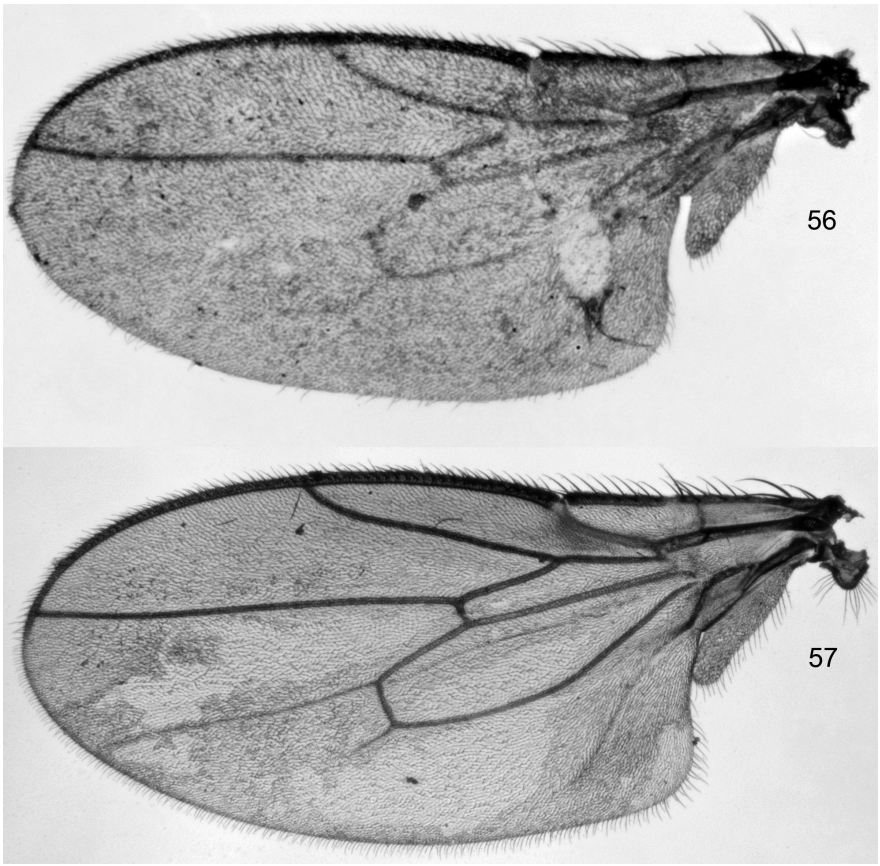
Figs 41–46. *Opacifrons subserrata* sp. n., male postabdomen and genitalia. 41 = medio-caudal part of sternite 5, ventral view, 42 = surstylus with ventral edge of epandrium and lateral part of hypandrium, broadest view, 43 = sternite 5 and postabdominal sclerites (sternite 8 part slightly dislocated caudally), 44 = postgonite, broadest view, 45 = modified cerci with pegs and subepandrial sclerite (covered), caudal view, 46 = postgonite with connecting lath to hypandrium and phallapodeme, lateral view. Scales: 0.2 mm for Figs 43, 46, 0.1 mm for Figs 41–42, 44–45



Figs 47–55. *Opacifrons* spp. paratypes, female postabdomen and genitalia. 47–51 = *O. compacta* sp. n.: 47 = sternite 7, ventral view, 48 = spermathecae, 49 = spectacles shaped sclerite, 50 = epiproct and cerci, dorsal view, 51 = cerci, ventral view. 52–55 = O. *subserrata* sp. n.: 52 = spectacles shaped sclerite, 53 = sternite 7, ventral view, 54 = spermathecae, 55 = epiproct and cerci, dorsal view. Scales: 0.2 mm for Figs 47, 53, 0.1 mm for Figs 48–52, 54–55

Etymology. The specific epithet of this new species ('sub serrata') refers to its relationship to *O. serrata* sp. n. with similarly shaped postgonite.

Remark. After finalising the manuscript, I found an additional species in the NMSA material. It keys out to *O. rubrifrons* (cercal pegs close to each other), but otherwise its genitalia show a mix of the 3 species: postgonite is similar to that of *O. serrata* sp. n. but surstyli are symmetrical (and slightly bilobed); aristal cilia are the longest one among the Afrotropical species (0.03 mm). 1 male (teneral specimen, abdomen with genitalia is a plastic microvial with glycerol): SOUTH AFRICA: KZ-Natal, Vernon Crookes Nature Res., Mthakati Valley, forest understorey, sweeping, 30° 17'S: 29° 36'E, 27. iv. 2007, GBP Davies.



Figs 56–57. *Opacifrons* spp., left wing of paratypes. 56 = *O. afrobrevisecunda* sp. n.; 57 = *O. subserrata* sp. n.

A KEY FOR THE AFROTROPICAL SPECIES OF *OPACIFRONS* DUDA

1 Aristal cilia shorter, 0.015 mm. Vein R_{2+3} more curved apically (Fig. 56). Costal index (2nd/3rd costal sections) less than 0.8, usually not more than 0.6. Male sternite 5 with a paired, almost symmetrical pair of caudal processes (Figs 1–2, cf. PAPP 1991: fig. 42), surstylus sub-quadrate (Fig. 6, cf. PAPP 1991: fig. 43). Distiphallus (Fig. 7) with a strong apical, dorsally curved process, postgonite (Fig. 5) long, comparatively thin and curved. Female unknown. Ghana, Congo **O. afrobrevisecunda** sp. n.

– Aristal cilia longer, 0.02–0.03 mm. Vein R_{2+3} less curved apically (Fig. 57). Costal index usually higher, mostly not less than 0.8. Male sternite 5 without a pair of caudal processes (e.g. Figs 12, 17). Male genitalia different. 2

2 Facial plate shiny. Anteroventral and posteroventral setal rows of mid femur normal also basally, at most some posteroventral thorn-like thick setae present. Cercal part of epandrial complex with or without long pegs (Figs 10, 23), if present then thin. Male sternite 8 smaller, shorter (Fig. 19). Female cerci with 2 pairs of thick thorns (pegs), whose apices lengthened/extruded in thin curved projections (Fig. 50), cercal pegs with 1 definite ventral incisions each (Fig. 51). Spermathecae (Fig. 48) long, longer than pear-shaped, rather racket-shaped. 3

– Facial plate more microtomentose, sub-shiny. Cercal part of epandrial complex with a pair of semicylindrical long thick pegs (Figs 26, 34, 45). Male sternite 8 very large (Figs 33, 43). Female cerci with indistinct hairs but with 2 pairs of discoloured thick thorns, whose apices are sharp but not lengthened/extruded in thin curved projections, cercal pegs without ventral incisions. Spermathecae (Fig. 54) long, distal part globular, proximal part even longer, its part below distal globular part slightly dilated. 4

3 Costal section lower (about 0.75). Male without cercal pegs but thick outstanding setae there. Phallus small, compact (Fig. 14), distiphallus (Fig. 13) not broad and much smaller than in *O. dilatata* sp. n. Postgonite (Fig. 16) short and broad. Claws short and slightly curved, usually parallel with sides of 5th tarsomere. Ethiopia, South Africa **O. compacta** sp. n.

– Costal section higher (about 0.9). Male with long thin cercal pegs. Phallus large, distiphallus (Fig. 24) rather flat and much dilated apically. Postgo-

nite (Fig. 22) robust but rather long, apically curved. Claws normal and laterally curved. South Africa, Ethiopia **O. dilatata** sp. n.

4 Male cercal pegs close to each other (Fig. 26). Surstylus (Fig. 29) with an apical thorn. Almost the entire postgonite broad, with a short narrow apical part (Fig. 28). Epiphallus fused to basiphallus (Figs 30–31). Female unknown. Zaire *O. rubrifrons* (VANSCHUYTBROECK, 1950)

– Male cercal pegs far from each other (Figs 34, 45). Surstylus without an apical thorn. Postgonite broad in its basal 3/5 only, apical third narrow with 2 apices (Figs 37, 44, 46). Epiphallus (Figs 38, 40) narrowly connected to basiphallus. Female cerci with 2 pairs of thicker discoloured cercal pegs. 5

5 Male sternite 5 caudally without any processes (Figs 32–33). Ventral processes of cerci (Fig. 34) broad with nearly straight apex. Surstyli strongly asymmetrical (Figs 35–36). Postgonite (Fig. 37) conspicuously serrate posteriorly. Ethiopia **O. serrata** sp. n.

– Male sternite 5 caudally with a pair of short processes (Figs 41, 43). Ventral processes of cerci (Fig. 45) smaller with rounded apex. Surstyli symmetrical (Fig. 42). Postgonite (Figs 44, 46) with narrow apical part with a second subapical apex posteriorly. South Africa **O. subserrata** sp. n.

*

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