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A NEW SPECIES OF THE GENUS *RAMULISETA* (DIPTERA, CTENOSTYLIDAE) FROM MADAGASCAR, WITH A KEY TO SPECIES

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A New Species of the Genus *Ramuliseta* (Diptera, Ctenostylidae) from Madagascar, with a Key to Species. Korneyev, V. A. — *Ramuliseta dolini* sp. n. is described; it is similar to *R. madagascariensis* Hennig, 1961, differing by wing pattern; a key to three Afrotropical species is provided.

Key words: Diptera, Cyclorrhapha, Tephritoidea, Ctenostylidae, *Ramuliseta*, taxonomy, new species.

Новый вид рода *Ramuliseta* (Diptera, Ctenostylidae) с Мадагаскара с таблицей для определения видов. Корнеев, В. А. — Описана *Ramuliseta dolini* sp. n.; вид близок *R. madagascariensis* Hennig, 1961, отличаясь крыловым рисунком; составлена таблица для определения видов.

Ключевые слова: Diptera, Cyclorrhapha, Tephritoidea, Ctenostylidae, *Ramuliseta*, таксономия, новый вид.

Introduction

While preparing the Ctenostylidae chapter for the Manual of Afrotropical Diptera (Korneyev, in press) a previously unknown species of the genus *Ramuliseta* Keiser, 1951 was found among the material collected by V. G. Dolin and R. V. Andreeva on Madagascar. A key to three species from the Afrotropical Region is provided.

Material

The specimens examined in this study are deposited in the following collections: BMNH — the Natural History Museum, London, U. K.; MHNP — Muséum National d'Histoire Naturelle, Paris, France (C. Daugeron; E. Delfosse); NHMB — Naturhistorisches Museum, Basel, Switzerland (D. Burkhardt); NMPM — Natal Museum, Pietermaritzburg, Kwa-Zulu Natal, South Africa (M. Mostovsky); SANC — South African National Collection of Insects, Pretoria, South Africa (R. Urban); SDEI — Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (F. Menzel); SIZK — Schmalhausen Institute of Zoology, Kyiv, Ukraine (V. A. Korneyev). SMNS — Staatliches Museum für Naturkunde, Stuttgart, Germany (H.-P. Tschorsnig). The slash character (/) is used to separate lines, and the square brackets are for data absent in the literally cited labels.

Ramuliseta Keiser, 1951

Keiser, 1951: 119; Hennig, 1960: 323; Steyskal, 1980: 556; McAlpine, 1990: 365, 369; Barraclough, 1994: 6, 1995: 135, 1998: 115; Korneyev, 2001: 48; 2006: 63, 2010: 963, 965; Rafael et al., 2009: 63, 64; Câmara & Rafael, 2013: 147; Pereira-Colavite & Mello, 2014: 219.

Type species: *Ramuliseta palpifera* Keiser, 1951 (by original designation).

Diagnosis. The flies of the genus *Ramuliseta*, similarly to the other Higher Tephritoidea (sensu Korneyev, 1999) have pictured wings and telesopic ovipositor of the females.

Similarly to the other ctenostylids, they can be easily distinguished by the combination of lacking ocelli, vestigial proboscis, incomplete vein Sc, cell cup closed by arcuate crossvein without triangular lobe along vein CuA_2+A_1 , strongly dimorphic arista (dendritical in females, simple and short pubescent in males), transverse prosternum, proepisternum bare or at most with one fine seta, spiracles round and open, without marginal fringe, anterior notopleural seta lacking, male genitalia with surstyli indistinguishable, without prenisetae, phallus spimple, tubular, with reduced glans, and female with aculeus simple, tubular, non-sclerotized, with small, blunt and short setulose, non-piercing cercal unit. Flies of the genus *Ramuliseta* have well developed palp as in species of Neotropical *Furcisetia* Aczél, 1956, Oriental *Nepaliseta* Barraclough, 1995 and *Sinolochochmostyilia* Yang, 1995 differing from them all by veins R_{2+3} and R_{4+5} subparallel: distance along costal margin between R_{2+3} and R_{4+5} less than twice distance between R_{4+5} and M (strongly divergent, with R_{2+3} conspicuously bowed anterobasally in *Furcisetia*, *Nepaliseta*, and *Sinolochochmostyilia*). The species of *Ramuliseta* differ from *Furcisetia* also by having frons of males unmodified, not strongly narrowed (sexually dimorphic in *Furcisetia* very narrow in males and unmodified in females) and vein M developed in distal half of cell bm (vein M lacking basally of crossvein bm-cu in *Furcisetia*). The species of *Ramuliseta* differ from *Nepaliseta* and *Sinolochochmostyilia* by having flagellomere 1 of females elongate, with narrowed apical projection, and arista with multiple branching (in *Nepaliseta* and *Sinolochochmostyilia*, flagellomere 1 of females almost spherical, without apical projection, and arista extremely modified, disk-like).

The genus was described by Barraclough (1994) in details, and I do not repeat the description here.

Distribution. Afrotropical (Nigeria and Tanzania to South Africa; Madagascar) and Oriental Region (Lesser Sunda Islands).

The genus now includes 3 species: Palaeotropical *Ramuliseta palpifera* Keiser, 1951 (= *R. lindneri* Keiser, 1952), Afrotropical *R. madagascariensis* Hennig, 1960 and *R. dolini* sp. n. (Madagascar). The Oriental *R. thaica* Korneyev, 2001 belongs elsewhere, either to *Sinolochochmostyilia* or *Nepaliseta* (Korneyev, in prep.).

Key to species of *Ramuliseta*

1. Smaller (wing shorter than 5.5 mm) dark brown flies; wing with brown wing pattern; cell R_{4+5} entirely brown in apical half (fig. 1, 3). Mainland sub-Saharan Africa, Lesser Sunda Islands. *Ramuliseta palpifera* (Keiser, 1951)
- Larger (wing shorter than 6.5 mm) yellow flies; wing with yellow wing pattern; cell R_{4+5} with one or two hyaline areas in apical half (fig. 1, 1, 2). Madagascar. 2.
2. Wing apex hyaline; cell r_{4+5} distal of crossvein dm-cu with two hyaline areas separated by rounded brown spot between them (fig. 1, 2). *Ramuliseta madagascariensis* Hennig, 1961
- Wing apex yellow; cell r_{4+5} distal of crossvein dm-cu with one large hyaline area and apical yellow band reaching its apex (fig. 1, 1). *Ramuliseta dolini* sp. n.

Ramuliseta dolini V. Korneyev, sp. n. (fig 1, 1; 2)

Material. Type. Holotype ♀: **Madagascar:** Andasibe, Perinet Nat. Reserve, 18°50' S 48°23' E, h = 1200 m, at light, 30.12.2003–8.01.2004 (Dolin & Andreeva) (SIZK).

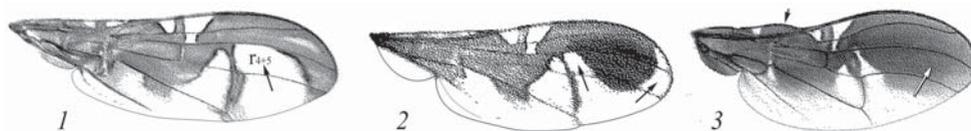


Fig. 1. *Ramuliseta*, wing: 1 — *R. dolini* sp.n.; 2 — *R. madagascariensis*; 3 — *R. palpifera* (arrows show key characters).

Diagnosis. Moderately large fly with yellow body and its vestiture, and wing with yellow base, two hyaline incisions in the costal cell, two triangular hyaline incisions at anterior margin distal to vein R_1 reaching R_{2+3} and R_{4+5} vein, correspondingly, and 3 large hyaline incision at posterior margin, separated by yellow bands: two from cell cu_{a1} (basal reaching CuA_1 vein and distal entering through cell dm into r_{4+5}) and the apical incision covering almost all cell m and widely entering into cell r_{4+5} ; wing apex is covered by moderately wide yellow crossband. It is similar to *R. madagascariensis* Hennig 1960, in most features, differing by the wing pattern as noted in the key.

Description. Head. Length : height : width ratio = 1 : 1 : 1.1. Unicolorous yellow; microtrichia often indistinguishable in the holotype. Frons densely yellow setulose, except bare postero-medial $\frac{1}{4}$ of frons length bare; anteriormost setulae proclinate, middle inclinate, and posteriormost ones reclinate. Vertical plate sparsely microtrichose, with 1–2 orbital setae (1 pro- and 1 re-latero-clinate setae at left and 1 re-latero-clinate). Ocellar triangle indistinguishable; only 1 unpaired ocellar seta as long as orbital setae present. Medial vertical setae well-developed, lateral vertical setae lacking. Face membranous, flat, matt-grey, non-translucent, with low medial carina in dorsal half and epistome slightly produced anteriorly. Parafacial and gena matt, smooth, yellow setulose. Antenna yellow, scape long and densely yellow setulose dorsally; pedicel without notch or incision, long and densely yellow setulose on its medial surface and somewhat shorter and sparser setulose on lateral surface. Flagellomere 1 yellowish, rather short, wide at base, narrow, finger-like in apical 0.7 of its length, with arista inserted into dorsal surface at its base. Arista strongly branching at base into 2–3 main stems, with numerous further dendritical branchings. Mouthparts rudimentary. Palp present, narrow and long, ventrally setulose.

Thorax. Ground colour yellow. Thorax 1.1 times as long as wide. Scutum measured between notopleural setae almost as long as wide, bearing: 0 acrostichal, 2–3 dorsocentral, 2 posterior notopleural, 1 intraalar and 1 postalar seta. Postpronotal lobe without setae, but 1–2 setae and 4–5 smaller setulae. Notopleuron without setulae. Scutellum 2.5 times as wide as long, with 2 pairs of setae (basal and apical) and with at least 2 pairs of marginal setulae between them and 6 irregular setulae on disk. Prosternum transverse, sclerotised at posteroventral margin. Proepisternum without setae or setulae. Anepisternum wrinkled in antero-ventral portion, dorsally setulose, at posterior margin with 2 setae and 7–8 setulae. Katepisternum with strong setulae inserted in antero-ventral area, medially of fore coxa margin; postero-ventral margin adjacent to mid coxa with 4–5 long setulae; latero-dorsal area with 4–5 subequal setae and setulae. Anepimeron with 6–7 subequal setae and setulae.

Legs yellow, with yellow setulae. Fore coxa robust, slightly compressed in antero-dorsal direction, with moderately long yellow setae and setulae. Fore trochanter with two longer dorsal setulae. Fore femur and tibia without strong and long setae. Fore tarsus as long as tibia, yellowish-brown setulose; tarsomere 2 0.65 times as long as tarsomere 1. Mid coxa conspicuously smaller than fore and hind coxa. Mid trochanter with 2 setulae on dorsolateral surface. Mid femur, tibia and tarsus yellow setulose 6; tibia without any thickened setae at apex, with two constrictions. Hind coxa large, almost cylindrical, finely setulose on anterior surface and on sides, posterior surface mostly bare. Hind trochanter finely setulose on posterior surface. Hind femur without setae, tibia with two constrictions.

Wing as on fig. 2, 6. Costa thickened, with costagial break, indistinct humeral break and broad subcostal break. Humeral vein joining subcostal vein somewhat distad of its separation from R_1 . Subcostal vein broken at apex, not reaching costa. Vein R_1 setulose along its whole length on dorsal side; cell r_{2+3} apically widened; vein R_{4+5} bare; vein M almost parallel to R_{4+5} ; ratio of its three last sections: $M_2 : M_3 : M_4 = 1 : 0.8 : 1.3$, i. e., penultimate section shorter than ultimate and second one. Wing pattern, as in most ctenostylinines, with yellow basal cells and well-developed chelate pattern of connected yellow crossbands separated by hyaline incisions in apical two thirds: two hyaline incisions in the costal cell, two triangular hyaline incisions at anterior margin distal to vein R_1 reaching R_{2+3} and

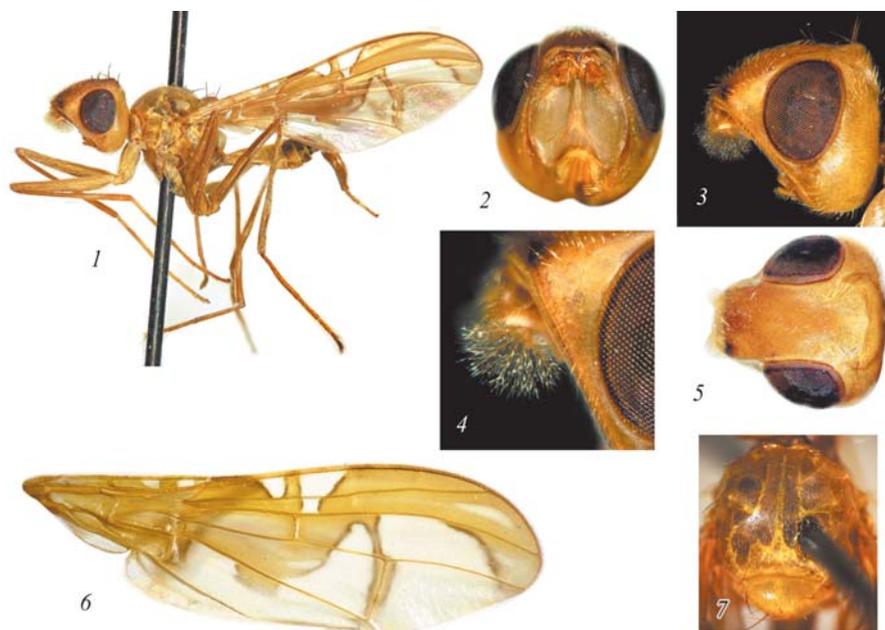


Fig. 2. *Ramuliseta dolini* sp. n., holotype ♀: 1 — habitus, lateral view; 2–5 — head (2 — left, 3 — anterior, 4 — dorsal view); 6 — wing; 7 — mesonotum, dorsal view.

R_{4+5} vein, correspondingly, and 3 large hyaline incision at posterior margin, separated by yellow bands: two from cell *cua*₁ (basal reaching CuA_1 vein and distal entering through cell *dm* into r_{4+5}) and the apical incision covering almost all cell *m* and widely entering into cell r_{4+5} ; wing apex is covered by moderately wide yellow crossband. Vein CuA_2+A_1 straight, in apical 1/6 of its length fold-like, but visible to its extreme tip. Vein A_2 long. Alula moderately wide, entirely hyaline. Upper calypter narrow, with clutch of long yellow setulae ventrally; lower calypter narrow. Haltere yellow, with large sparsely microtrichose knob; L-shaped.

Abdomen yellow. Syntergite 1+2 yellow, 1.7 times as long as wide, slightly longer than tergites 3–6 combined; tergites 5 and 6 with large laterobasal black spots. Sternites yellow, black setulose. Sternite 1 longitudinal trapezoid, as well as sternite 2, with clear seam between them; sternites 3–6 subquadrate, poorly sclerotized. Membrane without any setulae, short microtrichose. Oviscape convex, yellow, yellow setulose, as long as tergites 3–6 combined. Oviscape simple, tubular, with microtrichose cercal unit, flexibly joined to its apico-dorsal surface

Measurements. Body 9.5 mm, wing 8.7 mm.

Male unknown.

Etymology. This species is named in memory of its collector, famous Ukrainian entomologist Prof. Vladimir G. Dolin (1932–2004).

Ramuliseta madagascariensis Hennig, 1960 (fig. 1, 2; 3)

Hennig, 1960: 326; Rohlfien, Ewald, 1970: 422; Steyskal, 1980: 556; Barraclough, 1994: 9, 1998: 116; Rafael et al., 2009: 64; Pereira-Colavite & Mello, 2014: 219.

Material. Type. Lectotype ♀ (here designated): [Madagascar:] “Sandrangato” [“Centre-Est, Moramanga”], “Institute / Scientifique / Madagascar”, “Holotypus” [dark red printed label] (MHNP). Paralectotype ♀: same labels as in lectotype, except “Paratypus” [dark red printed label] (SDEI).

Diagnosis. Moderately large fly with yellow body and its vestiture, and wing with yellow base, two hyaline incisions in the costal cell, two triangular hyaline incisions at anterior margin distal to vein R_1 reaching R_{2+3} and R_{4+5} vein, correspondingly, and 3 large

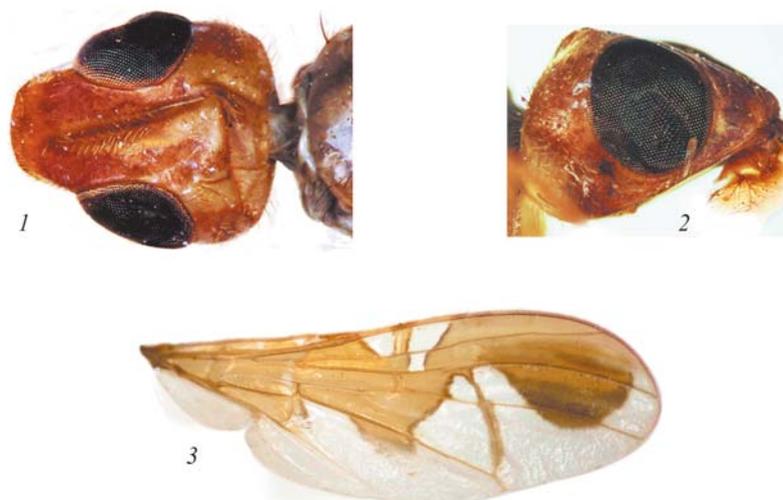


Fig. 3. *Ramuliseta madagascariensis*, paralectotype ♀: 1 — head dorsal, 2 — same, right; 3 — wing.

hyaline incision at posterior margin, separated by yellow bands: two from cell cua_1 (basal reaching CuA_1 vein and distal entering through cell dm into r_{4+5}) and the apical crescent-like area covering almost all cell m and widely entering into cell r_{4+5} anterior of crossvein $dm-cu$ and along costa; wing apex hyaline, at most costal vein narrowly yellow. It is similar to *R. dolini*, in most features, differing by the wing pattern as noted in the key.

Description. Head as described for *R. dolini* sp. n., in paralectotype conspicuously compressed.

Thorax as described for *R. dolini* sp. n. Scutum bearing: 0 acrostichal, 2–3 dorsocentral, 2 posterior notopleural, 1 intraalar and 1 postalar seta. Postpronotal lobe without setae, but 1–3 setae and 4–6 smaller setulae. Scutellum with 2 pairs of setae (basal and apical) and 15–20 irregular setulae on disk and margin. Prosternum transverse, sclerotised at posteroventral margin.

Legs yellow, with yellow setulae, as described for *R. dolini* sp. n.

Wing as on fig. 3, 3. Vein M almost parallel to R_{4+5} ; ratio of its three last sections: $M_2 : M_3 : M_4 = 1 : 0.9 : 1.2$. Wing pattern, as in most ctenostylinines, with yellow basal cells and well-developed pattern of connected yellow crossbands and rounded subapical yellow-brown area separated by yellow bands: two from cell cua_1 (basal reaching CuA_1 vein and distal entering through cell dm into r_{4+5}) and the apical crescent-like area covering almost all cell m and widely entering into cell r_{4+5} anterior of crossvein $dm-cu$ and along costa; wing apex is hyaline, at most costal vein narrowly yellow. The rest as in *R. dolini* sp. n.

Abdomen yellow. Syntergite 1+2 yellow, 1.7 times as long as wide, slightly longer than tergites 3–6 combined; tergites 5 and 6 with large laterobasal black spots. Sternites yellow, black setulose. Sternite 1 longitudinal trapezoid, as well as sternite 2, with clear seam between them; sternites 3–6 subquadrate, poorly sclerotized. Membrane without any setulae, short microtrichose. Oviscape convex, yellow, yellow setulose, as long as tergites 3–6 combined. Oviscape simple, tubular, with microtrichose cercal unit, flexibly joined to its apico-dorsal surface

Measurements. Body 8.4 mm, wing 7.2–7.4 mm.

Male unknown.

Discussion. Hennig (1960: 327) described this species based on two females, without designation of holotype, so both specimens were syntypes; the subsequent statement by Pereira-Colavite & Mello (2014) that one of them is a holotype and the other one is para-

type, based on the labels they bear, is therefore erroneous. I herewith designate the specimen deposited in MHNP (good condition, both wings and most legs present) as lectotype and the specimen deposited in SDEI (fair condition: head shriveled, all tarsi and tibiae and femora of 3 legs missing, left wing partly broken; one wing and abdomen detached and possibly are stored separately on slides, but not located by far) as paralectotype.

***Ramuliseta palpifera* Keiser 1951 (fig. 1, 3; 4)**

palpifera Keiser, 1951: 120, 121; Barraclough, 1998: 117; Rafael et al., 2009: 64; Pereira-Colavite & Mello, 2014:219. *lindneri* Keiser, 1952: 325; Hennig, 1960: 326, 327; Stuckenberg, 1963: 125; Steyskal, 1980: 556; Barraclough, 1994: 9, 1998: 122. Synonymy in Barraclough, 1998: 122; Pereira-Colavite & Mello, 2014: 219.

Material. Type. Holotype ♀ *Ramuliseta palpifera* Keiser: **Indonesia:** "W.-Sumba / Waimanggura / 15.8.1949 / Expedition / Bühler-Sutter", "a/Licht." [handwritten on reverse of label], "TYPUS" [Red card]; (NHMB). Holotype ♀ *Ramuliseta lindneri* Keiser: **Tanzania:** "Kware /17-21.I.1952 / D.O.Afrika Exp." [according to Barraclough, 1994: 3°22' S 37°12' E] (blue printed label), "Ramuliseta / lindneri n. sp. / F.Keiser det." (pink label); abdomen missing, four legs glued to card (SMNS). Non-type specimens: **Tanzania:** "Makoa, T.T.- O. Afrika, Lichtfang, 11, 16.i.1959", 3 ♀ (E. Lindner leg.) (SMNS; BMNH); **Congo:** Bambesa, 19.v.1937, 1 ♀ (J. Vrydagh) (MRAC); **South Africa:** Transvaal, Fanie Bota Nature Reserve near Tzaneen, 23.56° S 30.10° E, 2-6.iii.1986, 2 ♀ (B. Grobbelaar) (SANC); "ZouTpb. dist.", vi.1920, 1 ♀ (abdomen lost) (Natal Museum) (det. D. A. Barraclough); **Uganda:** Fort Portal, 4.xii.1934, 1 ♀; Ruwenzori Range, Bwamba Pass (west side), 5,500-7,500 ft., xii.1934-i.1935, 1 ♀ (F. W. Edwards; B.M. E. Afr. Exp.) (BMNH).

Head (fig. 6-7) slightly wider than thorax, with strongly receding face; length : height : width ratio = 1 : 1 : 1.2. (fig. 6). Frons 1.3-1.4 times as long as wide, yellow or brownish yellow setulose in anterior four-fifths, with two, rarely one short pro-laterocline orbital and pair of ocellar setae. Inner vertical seta present, 1.2 times as long as ocellar seta, postocellar and outer vertical setae lacking. Parafacial with serial yellow setulae to ventral margin of eye. Eye as long as high, slightly oblique oval, 1.5-1.6 times as high as gena. Lunule narrow, bilobate, only slightly exposed, often reddish tinged. Face receding in profile, in female matt brownish yellow, with 2 large and flat antennal grooves separated by low facial carina; in male carina and antennal grooves short, and peristomal cavity membranous, microtrichose, twice as long as face height and twice as long as palp. Antenna yellow, matt, with pedicel and scape densely yellow setulose, with setulae unmodified in both sexes; flagellomere 1 in both sexes basally wide, apically produced into a finger-like lobe (fig. 4, 4, 5, 8, 11); arista simple and short pubescent in male, but strongly dendritic in female, with three main branches subsequently branched into long pale pubescent secondary branches. Epistome very slightly produced anteriorly, sclerotized only on margin between face and peristomal (= buccal) cavity. Gena and postgena wrinkled, bulged, often reddish tinged, short yellowish setulose. Proboscis vestigial, palp short and bare, without setae.

Thorax mainly yellow to brownish or reddish yellow, usually with muscle insertions darker; sparsely microtrichose, subshining; setulae yellow; postpronotal lobe yellow, with one short brown seta and 2-3 shorter setulae; pleuron often reddish; prosternum transverse, bare, yellow; proepisternum bare, at most with 1-2 fine setulae. Setae brown: 0 ac, 2 dc (anterior just posterior of transverse suture, posterior at level of wing bases) 1 ia, 1 pa; 1 npl. Anepisternum bare anterodorsally, with 2 postsutural setae and 5-6 setulae. Katepisternum with one short yellow seta medial of fore coxa, virtually no setae or setulae posteroventrally, at midcoxa base, and with one seta and 2-5 setulae dorsally; 2, sometimes 3 scutellar setae at each side pairs and 6-10 marginal and discal setulae; basal half of scutellum bare.

Legs entirely yellow to yellow-brown, yellow setulose, femora and tibiae without outstanding setae. Hind tibia with striking curvature at about basal third, here narrowed to at least half apical width.

Wing (fig. 4, 2, 6, 7, 9, 10) venation and pattern same in male and female. Base of wing and alula almost entirely yellowish brown. Costal cell with one subbasal hyaline spot, costa

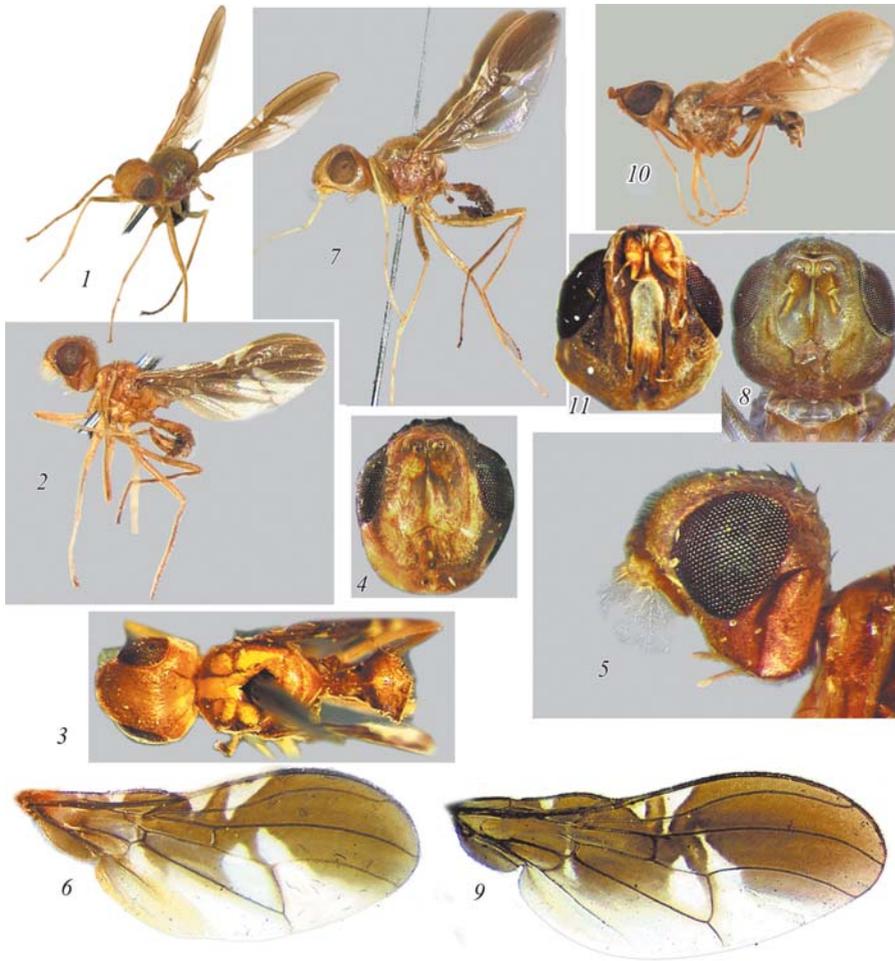


Fig. 4. *Ramuliseta palpifera* (1 — non-type ♀, Tanzania; 2–6 — holotype ♀ *R. palpifera*; 7–9 — holotype ♀ *R. lindneri*; 10–11 — non-type ♂, Congo): 1 — habitus, dorso-lateral view; 2, 7, 10 — same, left; 3 — head and mesonotum, dorsal view; 4, 8, 11 — head, antero-ventral view; 5 — same, left; 6, 9 — wing.

with outward curvature proximally of subcostal break; pterostigma strongly narrowed, apically with hyaline area extending posteriorly into cell r1 and reaching vein R_{2+3} ; cell r1 distal of pterostigma with second hyaline triangular or trapezoid spot reaching vein R_{4+5} . R_{2+3} apically curved, parallel to R_{4+5} and M; distance along costal margin between R_{2+3} and R_{4+5} about 1.4–2 times distance between R_{4+5} and M. Cells R_1 , R_{2+3} , and R_{4+5} entirely brown in apical part of wing. Vein M almost parallel to R_{4+5} ; ratio of its three last sections: $M2 : M3 : M4 = 1 : 0.5–0.7 : 2–2.3$ and reduced in basal half of section M1: cell bm partly open anterobasally. Crossvein dm-cu oblique and usually arcuate. Posterior margin of wing greyish microtrichose or hyaline, with 2 hyaline incisions at both sides of dm-cu reaching into cell r_{4+5} . Cell cup entirely brown, closed by arcuate crossvein. Anal cell with posterodistal corner receded.

Wing length: 2.8–4 mm (♂), 4.5–4.7 mm (♀).

Abdomen brownish yellow, yellow setulose, with moderately narrowed segments 1 and 2, syntergite 1+2 with short and wide petiole; sternite 1 elongate trapezoid, partly fused to sternite 2. Tergite 5 of both male and female laterobasally with shining black spot.

Male and female terminalia described by Barraclough (1994, 1998) and not dissected in this study, in general similar to genitalia of *Nepaliseta* as described by Korneyev (2001).

Distribution: Nigeria (Barraclough, 1998), Uganda, Tanzania, Congo, South Africa; Indonesia (Lesser Sunda Islands).

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