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New species of the subgenus *Sergentomyia* (Diptera: Psychodidae: Phlebotominae) from southern Africa.

by

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Three new species of the subgenus *Sergentomyia* are described viz. *S. caliginosa*, *S. formica*, and *S. rima*. Keys to males and females of the seven known species occurring in Zambia, Zimbabwe, Malawi, Namibia and South Africa, are given.

INTRODUCTION

The taxon *Sergentomyia* was first described by França & Parrot (1920) as a subgenus of *Phlebotomus* Rondani. *Sergentomyia* has since been assigned generic status (Theodor 1948) and is itself composed of a number of subgenera, one of which is *Sergentomyia*. In the females of this subgenus the spermathecal sacs are characteristically long, broad and tubular, their walls smooth or sometimes with folds or creases. They are usually doubled back on themselves or have the apical one-third angled at 90° and have apically a small tuft of ductules. The pigment plate is dark and usually obscures the cibarial teeth. The pharynx is usually indented anterior to the armature. Raised setae insertion sockets may be present on the midposterior margin of abdominal tergite VI but are never present on tergites II–V. In males the aedeagus is always polymorphic and digitiform. In this text southern African material was examined from Zambia, Zimbabwe, Malawi, Namibia and South Africa. Four other species, *S. bedfordi* (Newstead 1914), *S. congolensis* (Bequaert & Walravens 1930) [formerly known as *Phlebotomus bedfordi congolensis* or synonymised with *P. bedfordi* but now considered to be a good species (Davidson in prep.)], *S. salisburiensis* (Abonnenc 1967) and *S. yusafi* (Sinton 1930), occur in this region. Keys to the known species are given here.

Material examined is deposited in the British Museum (Natural History) (BMNH) and the South African Institute for Medical Research (SAIMR).

TERMINOLOGY

Terms used in descriptions and keys.

A3(4) — antennal segment 3 or 4.

Asc3(4) — longest ascoid on antennal segment 3 or 4.

Asc3/A3 or Asc4/A4 — ratio of length of ascoid 3(4) to length of antennal segment 3(4).

A_3/L — ratio of length of antennal segment 3 to labrum length.
c/b_3 or c/b_4 — ratio where b is longest ascoid 3(4) and c is the distance from this ascoid socket to the junction with the fourth (fifth) antennal segment.

Mouthpart terminology

The nomenclature followed is derived from Lewis (1975) and Harbach & Knight (1980). The cibarium is redefined and new terminology is suggested so as to be able to refer to certain areas that, before, have not been considered to be of taxonomic importance (Fig. 1).

The labrum extends anteriorly from the union with the clypeus to the tips of the apical sensilla (Fig. 1b). The cibarium extends posteriorly from the union with the clypeus to the cibarial armature arch (Fig. 1a). The lateral flanges border the hard palate and the cibarial armature (Fig. 1c). The hard palate is that area immediately anterior to the cibarial armature (Fig. 1g), extending laterally to the lateral flanges and anteriorly to the cibarial arch (Fig. 1h). The cibarial teeth make up the cibarial armature at the posterior end of the cibarium (Fig. 1f). The pigment plate is variable in shape and lies behind the cibarial armature (Fig. 1e).

The antero-lateral margin of the hypopharynx may be smooth, weakly undulating, strongly undulating or have deep, narrow indentations forming broad tooth-like structures (Figs 2a, b, c).

Mandibular tooth counts are made 0,01 mm from the apex of the mandible (Fig. 3) and are noted as number of teeth per 0,01 mm.

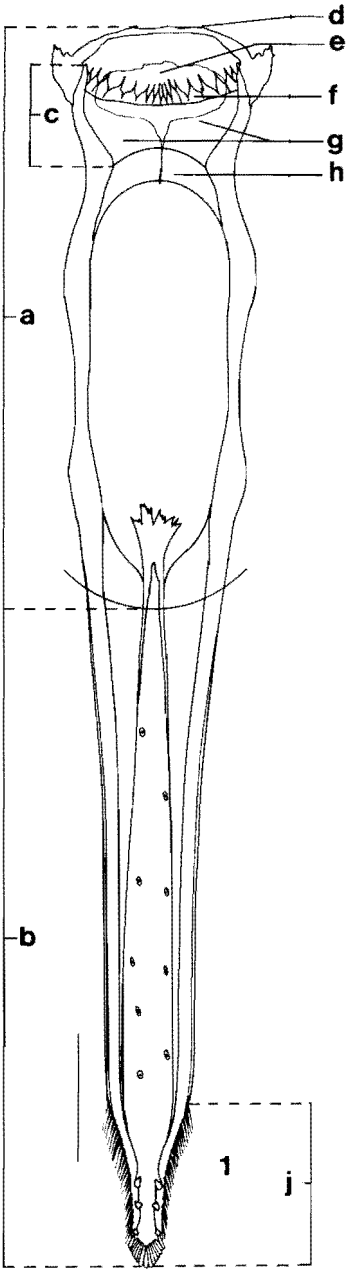
Sergentomyia França & Parrot

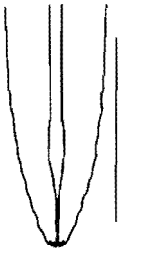
Subgenus *Sergentomyia* França & Parrot

Key to southern African females

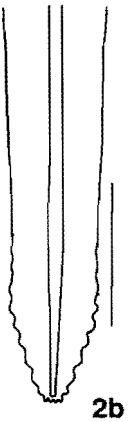
1 Posterior margin of hard palate with deep and broad median indentation ..... *S. salisburiensis*
— Posterior margin even-edged, flat to convex 2
2 Apical margin of hypopharynx strongly undulating or with deep indentations forming broad tooth-like structures (Figs 2b, c) ..... *S. formica*
— Apical margin of hypopharynx smooth to weakly undulating (Fig. 2a) 3
3 Raised setae insertion sockets on abdominal tergite VI absent 4
— Raised setae insertion sockets on abdominal tergite VI present 6
4 Pigment plate with a posterior median projection; mandibles with 6–7 teeth per 0,01 mm 5
— Pigment plate without a posterior median projection, usually with ragged posterior margin; mandibles with 7–9 teeth per 0,01 mm ..... *S. rima*
5 Cibarial armature with 18–30 large evenly spaced monomorphic teeth ..... *S. yusafi*
— Cibarial armature with 35–40 long closely packed monomorphic teeth ..... *S. caliginosa*
6 Cibarial armature with 20 large irregular teeth, those lateral longer and broader than those median ..... *S. bedfordi*
— Cibarial armature with 30–50 long closely packed monomorphic teeth, in some specimens those median a little shorter in length than those lateral ..... *S. congolensis*

Figs 1–3. Mouthparts. 1. labrocibarium (a-cibarium, b-labrum, c-lateral flange, d-cibarial armature arch, e-pigment plate, f-cibarial teeth, g-hard palate, h-cibarial arch, j-labral tip) (scale line 0,05 mm). 2. hypopharynx (a-weakly undulating, b-strongly undulating, c-deep indentations). 3. mandible. (scale lines 0,025 mm).





2a



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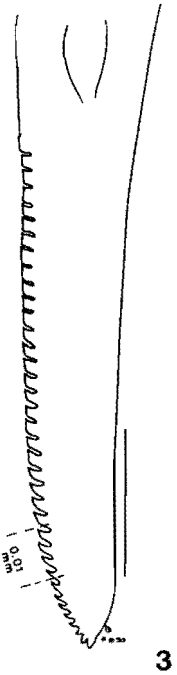

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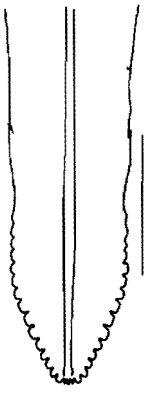


2c

Key to southern African males

NOTE: it is difficult to identify males; there is some overlap with measurements; they have been correlated with females based on cibarial armature in conjunction with ascoid and antennal segment 3 and 4 lengths.

1 Posterior margin of hard palate with raised tooth-like eruptions 2
— Not as above 3
2 Asc3 is 0,017–0,024 mm long; cibarial armature with 30–42 short closely packed teeth; no anterior row of spiculate denticles ..... *S. formica*
— Asc3 is 0,024–0,036 mm long; cibarial armature with 20–30 short pointed teeth and, medianly, a row of spiculate denticles; posterior margin of hard palate indented medianly .... *S. salisburiensis*
3 Asc3 is 0,015–0,020 mm long; Asc4 is 0,016–0,020 mm long ..... *S. caliginosa*
— Asc3 is 0,020–0,036 mm long; Asc4 is 0,021–0,036 mm long 4
4 A3 is 0,13–0,20 mm long; Asc3 is 0,020–0,036 mm long; A4 is 0,08–0,12 mm long; A3/L is 0,8–1,25 ..... *S. congolensis*
— A3 is 0,095–0,145 mm long; Asc3 is 0,020–0,026 mm long; A4 is 0,06–0,09 mm long; A3/L is 0,69–0,9 ..... *S. rima* or *S. yusafi*

Sergentomyia (Sergentomyia) caliginosa sp. nov., Figs 4–6

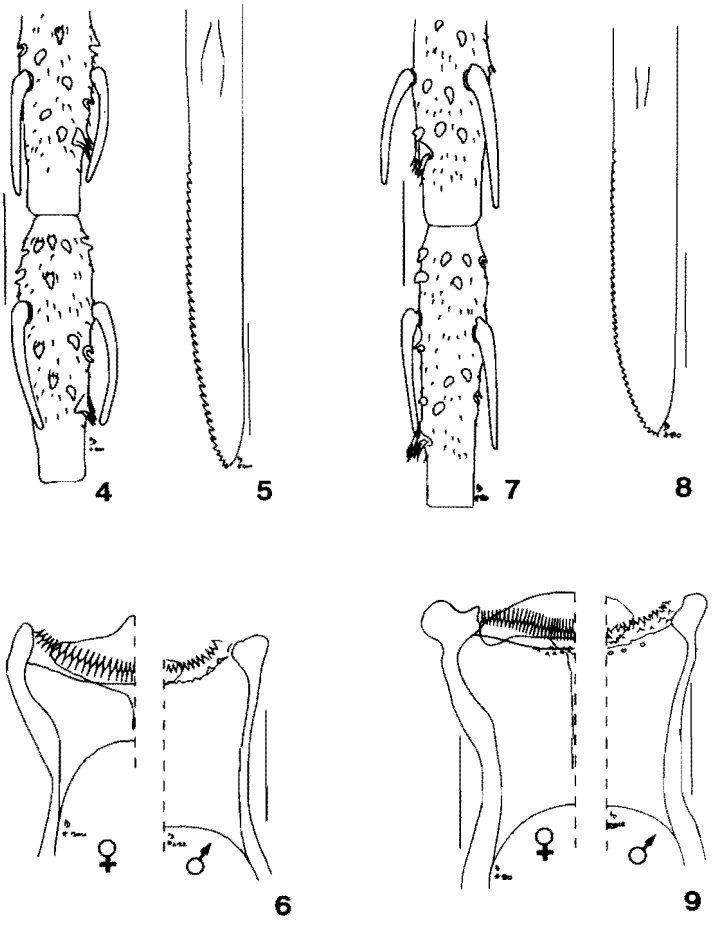
FEMALE (10 measured). Wing length 1,4–1,7 mm; breadth 0,32–0,38 mm. Third antennal segment 0,09–0,12 mm long, 0,77–0,87 times as long as segments 4 and 5 together; longest ascoid 0,023–0,031 mm long, 0,21–0,31 times as long as segment; c/b ratio 1,04–1,40. Fourth antennal segment 0,055–0,07 mm long; longest ascoid 0,024–0,035 mm long, 0,40–0,54 times as long as segment; c/b ratio 1,17–1,61. Ascoid formula 2/III–XV. Labrum 0,14–0,155 mm long, third antennal segment 0,60–0,86 times as long as labrum. Actual lengths of palpal segments two to five are 0,06–0,08; 0,10–0,12; 0,12–0,17 and 0,22–0,34 mm, respectively.

Cibarial armature 0,040–0,045 mm wide with 35–42 long, closely packed, monomorphic teeth; anterior row of spiculate denticles absent. Pigment plate 0,032-0,041 mm wide, concave anteriorly, not overlapping posterior margin of hard palate, and convex posteriorly with a weak median projection; posterior part of plate (which appears sausage-shaped) more pigmented than anterior section. Hard palate heavily pigmented, especially posterior and lateral margins; lateral flanges as dark as pigment plate. Pharyngeal pump broad and heavily armed with many overlapping, long spines, its lateral margin indented at base of armature.

Mouthparts. Apical margin of hypopharynx weakly undulating. Tapered labral tip appears short; lateral and tip sensilla fine. Mandibles narrow with 6–7 small recurved teeth per 0,01 mm.

No raised setae insertion sockets on midposterior margin of abdominal tergite VI.

MALE (10 measured). Wing length 1,3–1,45 mm; breadth 0,25–0,31 mm. Third antennal segment 0,10–0,125 mm long, 0,74–0,81 times length of segments 4 and 5 together; ascoid 0,015–0,02 mm long, 0,14–0,17 times as long as segment; c/b ratio 1,76–2,31. Fourth antennal segment 0,064–0,077 mm long; ascoid 0,016–0,02 mm long, 0,23–0,28 times as long as segment; c/b ratio 2,3–2,94. Ascoid formula 1/III–XV. Labrum 0,12–0,145 mm long, third antennal segment 0,8–0,92 times as long as labrum. Actual lengths of palpal segments two to five are 0,05–0,08; 0,09–0,12; 0,12–0,16 and 0,23–0,30 mm, respectively.



Figs 4–9. *Sergentomyia* species. 4–6. *S. caliginosa* **sp. nov**. 4. ♀ antennal segments 3 and 4. 5. ♀ mandible. 6. cibaria. 7–9. *S. formica* **sp. nov**. 7. ♀ antennal segments 3 and 4. 8. ♀ mandible. 9. cibaria. (Scale lines 0,025 mm).

Cibarial armature 0,025–0,033 mm wide, with 16–24 short monomorphic teeth; anterior row of spiculate denticles present. No pigment plate present. Pharyngeal pump armed with many, strongly serrated, transverse ridges.

Style 0,08–0,10 mm long bearing 4 stout spatulate spines, two apical and two dorso-subapical; ventral accessory seta originates just behind dorso-subapical spines. Paramere 0,14–0,17 mm long, appears hooked apically and bears a few, very long, fine setae and a number of smaller ones for three-eighths of its length. Aedeagus dark, stout, 0,07–0,09 mm long. Genital pump is 0,07–0,09 mm long with filaments 3,0–4,25 times its length.

MATERIAL EXAMINED. Type material. Holotype ♀, ZAMBIA: near Mguwe Lodge, S Luangwa National Park, termite hill at light, 21.xi.1980, R. Killick-Kendrick & L. R. Rickman (SAIMR, No 1300). 9 ♀ 10 ♂ Paratypes (♀ Nos 1301–1309; ♂ Nos 2125–2134): MALAWI: 1 ♀, Zomba, at light, 24–27.xi.1980, 1100 m, Londt & Stuckenberg (SAIMR). SOUTH AFRICA: 1 ♀, N Transvaal, Messina Agricultural Research Station, 3.iv.73, R. F. Badenhorst (SAIMR); 1 ♀ 3 ♂, NE Transvaal, Gazankulu, Nkomo near Giyani (23° 24′ S; 30° 45′ E), 24.xi.1981, termite hills, I. H. Davidson (BMNH, SAIMR). ZAMBIA: 3 ♀ 7 ♂, data as holotype, 20–21.xi.1980, (BMNH, SAIMR); 1 ♀, Mfuwe, Chipata district, Luangwa river, light trap in tree at river edge, 22–3.vi.1982, R. Killick-Kendrick (BMNH). ZIMBABWE: 2 ♀, Chiredzi Research Station, light trap at dam, 21 & 25.i.1980, P. Taylor (BMNH).

Other specimens excluded from type series. MALAWI: 1 ♀, Cholo, 10.xii.1916, R. C. Wood (BMNH); 3 ♀, Ruo, 23.iv.1916, R. C. Wood (BMNH). MOZAMBIQUE: 2 ♀, Aquas Quentes, Quelimane, 3.iv.1940, (SAIMR). SOUTH AFRICA: 1 ♂, NE Transvaal, Gazankulu, Nkomo near Giyani (23° 24′ S; 30° 45′ E), 24.xi.1981, termite hills, I. H. Davidson (SAIMR); 1 ♀, NE Transvaal, farm Hope, Phalaborwa, at light in hyrax burrows and ground burrows, 25.ii.1977, B. McIntosh (SAIMR); 1 ♀, Messina Agricultural Research Station, 30.iii.1975, F. Badenhorst (SAIMR). ZAMBIA: 8 ♀ 3 ♂, data as holotype, 20–21.xi.1980, (SAIMR); 1 ♀, N Province, Kampumba, 6.viii.1981, termite hill at light, L. R. Rickman (SAIMR); 5 ♀, Mfuwe, Luangwa river, Chipata district, light trap in tree at river edge, 22–23.vi.1982, R. Killick-Kendrick (SAIMR). ZIMBABWE: 1 ♀, Cranleigh Park, Salisbury, 28.i.1945, (SAIMR).

COMMENTS. This species may be confused with *S. yusafi* (Sinton 1930) (Figs 14–16) and *S. rima* sp. nov., but the female cibarial armature, number of mandibular teeth and the shape of the pigment plates should enable one to separate the three species. This species takes its name from the Latin adjective *caliginosus* meaning obscure, as it was initially difficult to pinpoint what features distinguished it from *S. rima*.

Sergentomyia (Sergentomyia) formica sp. nov., Figs 7–9

FEMALE (30 measured). Wing length 1,4–1,8 mm; breadth 0,35–0,45 mm. Third antennal segment 0,095–0,125 mm, 0,78–0,91 times as long as segments 4 and 5 together; longest ascoid 0,024–0,035 mm long, 0,2–0,3 times as long as segment; c/b ratio 1,0–1,48. Fourth antennal segment 0,056–0,072 mm long; longest ascoid 0,025–0,042 mm long, 0,36–0,52 times as long as segment; c/b ratio 1,16–1,8. Ascoid formula 2/III–XV. Labrum 0,13–0,165 mm long, third antennal segment 0,68–0,84 times as long as labrum. Actual lengths of palpal segments 2 to 5 are 0,06–0,075; 0,095–0,125; 0,13–0,155 and 0,25–0,325 mm, respectively.

Cibarial armature 0,036–0,046 mm wide with 45–65 closely packed, long fine, monomorphic teeth. Median posterior margin of hard palate with large tooth-like eruptions. Pigment plate crescent-shaped 0,035–0,040 mm wide, densely pigmented, the curvature toward the pharynx. Hard palate lightly pigmented; lateral flanges as dark as pigment plate. Pharyngeal pump broad and heavily armed with many elongate fine-tipped denticles.

Mouthparts. Apical margin of hypopharynx strongly undulating or with deep indentations forming broad tooth-like structures. Tapered labral tip appears short; lat-

eral and tip sensilla fine. Mandibles narrow, armed with 6–7 medium sized recurved teeth per 0,01 mm.

There are usually no raised setae insertion sockets on the mid-posterior margin of abdominal tergite VI but some specimens may have up to 4.

MALE (20 measured). Wing length 1,25–1,55 mm, breadth 0,26–0,34 mm. Third antennal segment 0,10–0,14 mm long, 0,68–0,85 times as long as segments 4 and 5 together; ascoid 0,017–0,024 mm long, 0,14–0,20 times as long as segment; c/b ratio 1,7–2,4. Fourth antennal segment 0,066–0,084 mm long; ascoid 0,018–0,025 mm long, 0,24–0,37 times as long as segment; c/b ratio 1,8–2,95. Ascoid formula 1/III–XV. Labrum 0,125–0,15 mm long, third antennal segment 0,77–1,02 times as long as labrum. Actual lengths of palpal segments 2 to 5 are 0,06–0,08; 0,09–0,12; 0,10–0,16 and 0,18–0,30 mm, respectively.

Cibarial armature 0,03–0,035 mm wide with 30–42 short, closely packed teeth. Posterior margin of hard palate with large tooth-like eruptions. Pigment plate 0,005–0,013 mm wide, an irregular lightly pigmented oval-shape, medianly placed. Pharyngeal pump narrow and provided with rows of irregular transverse ridges armed with spiculate denticles.

Style 0,085–0,125 mm long, bearing apically 4 stout spatulate spines; ventral accessory seta originating at four-fifths the length of style. Paramere 0,145–0,18 mm long, bearing, for three-eighths of its length, a number of long, stiff setae and a number of smaller setae. Aedeagus dark and stout, 0,08–0,09 mm long. Genital pump 0,07–0,10 mm long, its filaments 2,61–4,04 times its length.

MATERIAL EXAMINED. Type material. Holotype ♀, NAMIBIA: Owamboland, Odibo, termite hill, E. Zielke (SAIMR, No 810). Paratypes 29 ♀ 20 ♂ (♀ Nos 800–824 except 810, 850–852, 857–859; ♂ Nos 2350–2369): NAMIBIA: 3 ♀ 1 ♂, data as holotype, 20.ii.1970, 20.iv.1970, 22.v.1970, (SAIMR); 1 ♀, Owamboland, Oshakati, 20.ii.1970, E. Zielke (SAIMR); 2 ♀ 3 ♂, Owamboland, Engele, 22.v.1970, E. Zielke (SAIMR); 8 ♀, Owamboland, 5 km S Oshakati, termite hills, 25.iii.1977, I. H. Davidson (SAIMR, BMNH); 1 ♂, Owamboland, Ombulantu, termite hills, 1.iv.1977, I. H. Davidson (SAIMR); 1 ♂, Owamboland, Oshikango, termite hill, 21.v.1970, E. Zielke (SAIMR); 1 ♂, Odibo, 6 km from Otjikango, termite hill near native hut, 20.ii.1970, E. Zielke (SAIMR); 2 ♂, 70 miles E Rundu, vi.1970, E. Zielke (SAIMR); 3 ♀, Kavango, Rundu, termite hill, E. Zielke (SAIMR, BMNH); 1 ♀, Kavango, 30 km W Rundu, termite hill, E. Zielke (SAIMR); 1 ♀, Otjimbingwe, burrow, R. Downes (SAIMR); 5 ♀, farm Okakeua, termite hill, 16.xii.1972, R. Downes (SAIMR, BMNH); 1 ♂, farm Kleinhuis, 70 km E Grootfontein, aardwolf burrows in termite hills, 23–24.ii.1981, I. H. Davidson (SAIMR). SOUTH AFRICA: 3 ♀, N Transvaal, Waterpoort district, termite hill, 13.viii.1970, R. Downes (SAIMR); 1 ♂, N Transvaal, Waterpoort district, termite hill, 13.viii.1970, R. Downes (SAIMR); 5 ♂, N Transvaal, farm Rochdale, 10 km E Waterpoort, termite hill, 8/9.vii.1980, I. H. Davidson (SAIMR, BMNH). ZIMBABWE: 2 ♀ 4 ♂, 27 miles W Beit Bridge, termite hill next Limpopo river, 9.viii.1970, R. Downes (SAIMR).

Other specimens excluded from type series. NAMIBIA: 38 ♀ 90 ♂, Owamboland, 5 km S Oshakati, termite hills, 25.iii.1977, 31.iii.1977, 2.iv.1977, I. H. Davidson (SAIMR, BMNH); 2 ♀ Owamboland, Odibo, termite hill, 20.ii.1970, E. Zielke (SAIMR); 4 ♀ 3 ♂, farm Kleinhuis, 70 km E Grootfontein, aardwolf burrows in ter-

mite hills, 23–24.ii.1981, I. H. Davidson (SAIMR, BMNH); 24 ♂, Owamboland, Engele district, termite hill, 22.v.1970, E. Zielke (SAIMR); 20 ♂, Owamboland, Odibo, termite hill, 20.ii.1970, 21.v.1970, v.1970, vi.1970 E. Zielke (SAIMR, BMNH); 2 ♂, Owamboland, Odibo near Otjikango, lizard hole in old tree, 20.ii.1970, E. Zielke (SAIMR); 14 ♂, Owamboland, Oshikati, termite hill, 21.v.1970, E. Zielke (SAIMR); 6 ♂, Kavango, Rundu, E. Zielke (SAIMR); 3 ♂, 70 miles E Rundu, vi.1970, E. Zielke (SAIMR); 1 ♂, Otjiwarongo, (SAIMR). SOUTH AFRICA: 2 ♀, 12 ♂, N Transvaal, farm Rochdale, 10 km E Waterpoort, termite hill, 8–9.vii.1980, I. H. Davidson (SAIMR); 2 ♂, N Transvaal, farm Scott, near Vivo, termite hill and rock cracks, 9–10.vii.1980, I. H. Davidson (SAIMR); 1 ♀ 5 ♂, N Transvaal, Waterpoort, termite hill, (SAIMR). ZIMBABWE: 12 ♂, 27 miles W Beit Bridge, termite hill next Limpopo river, 9.viii.1970, R. Downes (SAIMR).

COMMENTS. This species has been collected in open woodland in sandy terrain. It makes use of termite hills with ventilation shafts for its microhabitat, hence the derivation of its name, i e *formica* (f) meaning ant. It should not be confused with any other species within its range. Female pigment plates are a characteristic crescent-shape.

Sergentomyia (Sergentomyia) rima sp. nov., Figs 10–13

All records referring to *Sergentomyia schoutedeni* (Adler, Theodor & Parrot 1929) from Mozambique, Namibia, South Africa, Zambia and Zimbabwe probably relate to this species.

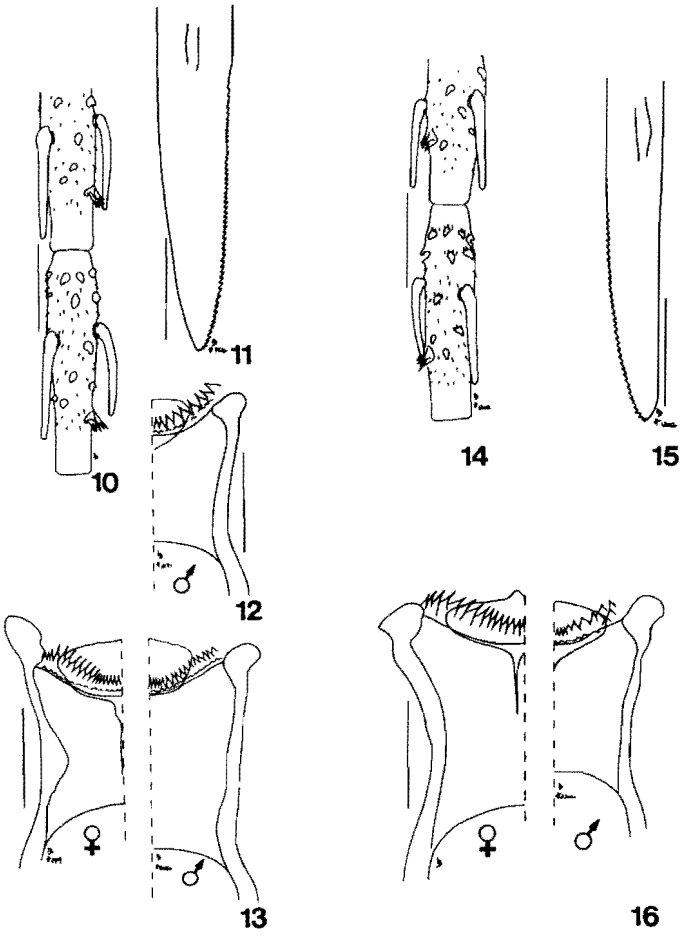
FEMALE (56 measured). Wing length 1,4–1,9 mm, breadth 0,29–0,45 mm. Third antennal segment 0,09–0,14 mm long, 0,6–0,9 times as long as segments 4 and 5 together; longest ascoid 0,021–0,038 mm long, 0,20–0,33 times as long as segment; c/b ratio 0,9–1,52. Fourth antennal segment 0,057–0,085 mm long; longest ascoid 0,023–0,034 mm long, 0,35–0,55 times as long as segment; c/b ratio 1,2–2,0. Ascoid formula 2/III–XV. Labrum 0,135–0,19 mm long, third antennal segment 0,59–0,75 times as long as labrum. Actual lengths of palpal segments 2 to 5 are 0,06–0,10; 0,09–0,13; 0,10–0,16 and 0,20–0,34 mm, respectively.

Cibarial armature 0,04–0,045 mm wide with 27–39 closely packed teeth; those median, narrower and shorter than those lateral; anterior row of spiculate denticles absent. Pigment plate avoid to oblong (sausage-shaped), 0,035–0,045 mm wide, heavily pigmented, obscuring the cibarial teeth but not overlapping posterior margin of hard palate. Posterior margin of hard palate strongly pigmented, the remainder lightly pigmented with slightly raised irregular transverse ridges; lateral flanges as dark as pigment plate. Pharyngeal pump broad, armed with rows of densely packed overlapping short stout teeth.

Mouthparts. Apical margin of hypopharynx weakly undulating. Labral tip appears short; lateral and tip sensilla fine. Mandibles narrow with 7–9 small closely packed recurved teeth per 0,01 mm.

No raised setae insertion sockets on midposterior margin of abdominal tergite VI.

MALE (25 measured). Wing length 1,4–1,7 mm, breadth 0,24–0,31 mm. Third antennal segment 0,095–0,145 mm long, 0,68–0,83 times as long as segments 4



Figs 10–16. *Sergentomyia* species. 10–13. *S. rima* **sp. nov**. 10. ♀ antennal segments 3 and 4. 11. ♀ mandible. 12–13. cibaria. 14–16. *S. yusafi* (Sinton). 14. ♀ antennal segments 3 and 4. 15. ♀ mandible. 16. cibaria. (scale lines 0,025 mm).

and 5 together; ascoid 0,020–0,026 mm long, 0,17–0,24 times as long as segment; c/b ratio 1,27–1,8. Fourth antennal segment 0,06–0,09 mm long; ascoid 0,022–0,028 mm long, 0,28–0,39 times as long as segment; c/b ratio 1,56–2,22. Ascoid formula 1/III–XV. Labrum 0,135–0,17 mm long, third antennal segment 0,69–0,86 times as long as labrum. Actual lengths of palpal segments 2 to 5 are 0,06–0,085; 0,09–0,12; 0,11–0,16 and 0,23–0,37 mm, respectively.

Cibarial armature 0,03–0,04 mm wide with 20–24 short closely packed monomorphic teeth; anterior row of spiculate denticles present. Pigment plate more or less

circular, lightly pigmented, 0,012–0,02 mm wide. Pharyngeal pump armed with many finely serrated transverse ridges.

Style 0,08–0,12 mm long, bearing apically 4 long fine spatulate spines; ventral accessory seta subapical. Paramere 0,14–0,18 mm long, curved ventroapically, appears hooked and bears a number of very long stiff setae and numerous shorter ones for three-eighths of its length. Aedeagus dark, stout, 0,07–0,10 mm long. Genital pump 0,07–0,10 mm long, its filaments 2,6–4,3 times its length.

MATERIAL EXAMINED (all material collected by I. H. Davidson unless specified). Type material. Holotype ♀, SOUTH AFRICA: NW Cape, farm Gemsbok near Bulletrap, ex rock cracks, 11–12.ii.1981, (SAIMR, No 779). Paratypes, 51 ♀ 25 ♂, (♀ Nos 700–724 except 706, 712; 750–780 except 755, 764, 779; ♂ Nos 2150–2174): NAMIBIA: 6 ♀ 2 ♂, Waterberg Plateau Park, E Otjiwarongo, 12 & 14.iii.1977, hyrax rock holes, (SAIMR, BMNH); 1 ♂, Naukluft, near Maltahöhe, hyrax entrance holes, 20.iv.1976, (SAIMR); 3 ♀, Aus, rock holes, 17.i.1972, Eastwood & Gauchet (SAIMR); 2 ♂, Namib Desert, 5 km S Awasib (25° 25′ S; 15° 37′ E), hyrax rock holes and rock clefts, 28.ii.1981 to 4.iii.1981, 4–5.iii.1981, (SAIMR); 1 ♂, farm Mackenzie, Leonardville, hyrax entrance holes, 3.iv.1976, (SAIMR); 1 ♀ Namib Desert Park, Tumasberge near Ganab, *Procavia capensis* rock holes, 29.iv.1977, (SAIMR); 2 ♀, Groenrivier, Karasberg, hyrax rock holes, 1.iv.1976, (SAIMR, BMNH); 2 ♀, Kaokoland, Ohopoho (Opuwa), 24.ii.1970, E. Zielke (SAIMR); 2 ♀, Kaokoland, Orumana, hyrax rock holes, 8–12.iv.1977, 14.iv.1977, (SAIMR); 1 ♀, 10 km E Otavi, hyrax and other rock holes, 17–19.iii.1977, (SAIMR); 6 ♀, Windhoek, meercat/viverrid burrow, base of tree, 2.ix.1970, 3.ix.1971, vii.1970, R. Downes, E. Zielke (SAIMR, BMNH); 2 ♂, Hardap dam near Mariental, oiled cards in rock holes, 26.iii.1980, 10.iv.1980, (SAIMR); 3 ♀, Hardap dam near Mariental, hyrax rock holes, 8–9.iv.1981 and at light 18–20.iv.1981, (SAIMR); 1 ♀ 1 ♂, Hardap dam near Mariental, at light 18–19.iv.1981 [♂ laboratory bred from eggs laid by ♀], (SAIMR). SOUTH AFRICA: 1 ♀ 2 ♂, data as holotype; 6 ♀, Transvaal, Onderstepoort near Pretoria, light trap near Warthogs, 21.viii.1978, G. R. Thomson (SAIMR, BMNH); 1 ♂, Transvaal, Kaalplaas Onderstepoort, hyrax burrows, 9.xii.1975, B. McIntosh (SAIMR); 12 ♀ 2 ♂, NE Transvaal, Malta forest, Selati river source near The Downes, hyrax rock holes in forested cliffs, 13.i.1977, 21.xi.1977, 23.iv.1977, (SAIMR, BMNH); 2 ♀ 8 ♂, Transvaal, farm Lillie near Mica (24° 02′ S; 30° 50′ E), hyrax rock holes, 29.xi.1977, 1.xii.1977, (SAIMR, BMNH); 1 ♀ 1 ♂, NE Transvaal, Lebowa, Rooipoort (24° 11′ S; 30° 00′ E), hyrax rock holes, 19.ii.1977, (SAIMR); 1 ♀, NE Transvaal, Leopards Crag (24° 12′ S; 29° 59′ E), hyrax rock holes, 22–23.xi.1977, (SAIMR); 2 ♂, NW Cape, Richtersveld, Tierhoek (28° 38′ S; 17° 01′ E), hyrax rock holes, 12–13.ii.1981, (SAIMR). ZIMBABWE: 1 ♀, 27 miles W Beit Bridge, bat cave, 7.viii.1970, (R. Downes) (SAIMR).

Other specimens excluded from type series. MALAWI: 2 ♀ 2 ♂, Zomba, 1100 m, at light, 24–27.xi.1980, Stuckenberg & Londt (SAIMR); 1 ♀, Mulanje mtn, Likabula river valley in riverine brachystegia woodland, 28–30.ix.1980, Londt & Stuckenberg (SAIMR). NAMIBIA: 25 ♀ 28 ♂, Waterberg Plateau Park, E Otjiwarongo, hyrax rock holes, 12–15.iii.1977, (SAIMR, BMNH); 8 ♀ 9 ♂, Namib Desert, 5 km S Awasib (25° 25′ S; 15° 38′ E), rock clefts and hyrax holes, 28.ii.1981–4.iii.1981, 26–27.ii.1981, 4–5.ii.1981, (SAIMR, BMNH); 1 ♀ 5 ♂, De Hoop, Omitara, hyrax entrance holes, 25.iv.1976, (SAIMR); 7 ♀ 3 ♂, Mackenzie, Leonardville, hyrax holes, 23.iv.1976, (SAIMR); 1 ♀ 2 ♂, Naukluft, Maltahöhe, hyrax entrance holes,

20.iv.1976, (SAIMR); 4 ♀ 2 ♂, Hardap dam near Mariental, ex rock holes, 10.iv.1980, (SAIMR); 2 ♀ 4 ♂, 10 km E Otavi, hyrax rock holes, 20.iii.1977, (SAIMR); 3 ♀, 17.i.1972, Eastwood & Gauchet (SAIMR); 1 ♂, Tweespruit near Aus, hyrax entrance holes, 25.iii.1976, (SAIMR); 1 ♂, Waldsee near Bethanie, hyrax entrance holes, 26.iii.1976, (SAIMR); 1 ♂ Groenrivier near Karasburg, hyrax entrance holes, 1.iv.1976, (SAIMR); 3 ♂, Windhoek, meerkat burrow, 2.ix.1970, R. Downes (SAIMR); 1 ♀, Namib Desert Park, Tumasberge near Ganab, *Procavia capensis* rock holes, 29.iv.1977, (SAIMR); 1 ♂, Grootfontein district, termite hill, 16.ii.1970, E. Zielke (SAIMR); 1 ♂, Narubis, Dassie hole, 18.x.1975, J. A. Ledger (SAIMR); 3 ♀, Kaokoland, Orumana, hyrax rock holes, 9.iv.1977, 10.iv.1977, 12.iv.1977, (SAIMR); 1 ♀, Sandmodder, SE Keetmanshoop, at light, 16.iv.1975, J. A. Ledger (SAIMR). SOUTH AFRICA: 2 ♀ 5 ♂, NW Cape, Richtersveld, Tierhoek (28° 38′ S; 17° 01′ E), hyrax holes, 12–13.ii.1981, (SAIMR); 14 ♀ 5 ♂, NW Cape, farm Gemsbok, 4 km NW Bulletrap, rock clefts, 11–12.ii.1981, (SAIMR, BMNH); 1 ♀ 1 ♂, NE Transvaal, farm Lillie (24° 02′ S; 30° 50′ E) near Mica, hyrax rock holes, 29.xi.1977, 1.xii.1977, (SAIMR); 2 ♀, NE Transvaal, Lebowa, Rooipoort (24° 22′ S; 30° 00′ E), hyrax rock burrows, 19.i.1977, (SAIMR); 1 ♀, E Transvaal, Tours, Tzaneen, inside huts, 17.x.1974, D. L. Theron (SAIMR); 2 ♀ 8 ♂, NE Transvaal, Malta forest, Selati river source near The Downes, hyrax rock holes in forested cliffs, 13.i.1977, 22–24.xi.1977, (SAIMR); 1 ♀, NE Transvaal, Leopards Crag (24° 12′ S; 29° 59′ E), 22–23.xi.1977, hyrax holes, (SAIMR); 1 ♂, Hangklip forest, Louis Trichardt, rock cleft, 5.viii.1976, (SAIMR).

Comments. This species may be confused with *S. caliginosa* sp. nov. The two species are probably allopatric with *S. rima* being found in rocky habitat whereas *S. caliginosa* is found in association with ground burrows and termite hills in open woodland. *S. caliginosa* is restricted to rocky habitat and particularly escarpment edges. It occurs from Malawi in the north east southwards to, as far as is known at present, the Transvaal Drakensberg mountain range, and from the north western Cape Province to Kaokoland in the north west corner of Namibia. Females are separable from both *S. yusafi* (Sinton) (Figs 14–16), and *S. caliginosa* sp. nov. on cibarial armature, mouthpart morphology and a lightly armed pharyngeal pump compared to heavily armed in the other two species. This species takes its name from the habitat in which it is usually collected, ie. rock cracks, hence the Latin word *rima* (f) meaning crack.

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