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Gedruk deur / Printed by:
John Meinert (Pty) Ltd., Box 56, Windhoek — 9·476

Prys / Price R8,20

MADOQUA

Vol. II. No. 3, 1979

GEPUBLISEER DEUR DIE AFDELING NATUURBEWARING EN TOERISME
VAN DIE ADMINISTRASIE VAN SUIDWES-AFRIKA

PUBLISHED BY THE NATURE CONSERVATION AND TOURISM DIVISION
OF THE SOUTH WEST AFRICA ADMINISTRATION

Five new species of *Sergentomyia* (Diptera: Psychodidae: Phlebotominae) from southern Africa.

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Accepted: 2 February 1979

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ABSTRACT

Five new species namely *Sergentomyia cunicula, metzi, vulpes, villosa* and *welwitschii* are described. *Sergentomyia macintoshi* is redescribed, the male for the first time. Their taxonomic position in relation to other Phlebotomine species is discussed.

1 INTRODUCTION

The six *Sergentomyia* species described here correspond with none of the subgenera of the genus defined so far. These subgenera are namely *Sintonius* (Nitzulescu, 1931), *Capensomyia* (Davidson, 1979), *Sergentomyia* s. str., (Franca & Parrot, 1920), *Parrotomyia* (Theodor, 1958) and *Rondanomyia* (Theodor, 1958). Species belonging to these subgenera may be separated on a number of combined characters discussed later. These six species are the only ones known so far from southern Africa that are as yet unplaced in any specific subgenus. There are many other species, described from the Ethiopian Region, namely those assigned by Abonnenc (1972) to his species groups *similima, ingrami* and *incertae sedis* of the genus *Sergentomyia*, considered at the time to be a subgenus of the genus *Phlebotomus*. Further taxonomic investigation of these species may well indicate that these species can be separated into a number of well defined subgenera and groupings. The six species described here, for instance, can be divided into four such categories on spermathecal characters, which, although they are diagnostic in separating the above mentioned subgenera, may well prove to be an inadequate subgeneric character for those species as yet unplaced. Until such time as further work is undertaken these species remain best *incertae sedis*.

Characters used in keys and descriptions follow those of Abonnenc (1972). Taxonomic aspects relate as closely as possible to those laid down by Theodor (1958).

Explanation of terms used in text

The only term which may not be familiar to readers is the ratio c/b. This refers to the ascoids and is explained in Abonnenc 1972, p. 72 and fig. 35E.

Sergentomyia species *incertae sedis* in southern Africa.

It is a combination of characters which present criteria in separating various so far defined subgenera of the genus *Sergentomyia*. Briefly, the aforementioned subgenera may be defined as follows: *Sintonius* females have small distinctly segmented spermathecae, males with aedeagi an elongate conical-shape terminating apically in a sharp point, parameres hooked apically, pharynges of both sexes constricted posteriorly to their anterior width and scarcely armed; *Capensomyia* females have convoluted spermathecae, males with broad aedeagi, upturned slightly apically, tips rounded and

translucent, parameres hooked apically, pharyngeal armature of both sexes coarse to elaborate; *Sergentomyia* s. str. females have elongate tubular smooth-walled spermathecae doubled back on themselves, males with aedeagi finger-shaped, pharyngeal armature slight to coarse; *Parrotomyia* females have elongate, oval smooth-walled capsules as spermathecae, males with elongate cone-shaped aedeagi with blunt tips; and *Rondanomyia* females have cylindrical transversely striated spermathecae, males with aedeagi a narrow cone-shape with a blunt tip, parameres hooked apically.

For convenience the six species described here may be divided into four groupings defined as follows: Group A, *Sergentomyia villosa* spec. nov. and *Sergentomyia metzi* spec. nov., females with spermathecae a short cylindrical to slightly elongate oval capsule, anteriorly with a broad collar surrounding the apical crown of hair-like ductules, spermathecal ducts broad and transversely striated, males with 4 spines on the style, all more or less terminal, parameres hooked terminally slightly, aedeagi a broad conical-shape with a slightly upturned and rounded tip, no abdominal tergite setae insertion scars; Group B, *Sergentomyia macintoshi* Abonnenc & Pastre (1972) and *Sergentomyia vulpes* spec. nov., females with spermathecae a long narrow cylindrical capsule doubled back on itself, no collar surrounding the apical crown of hair-like ductules, males with 4 spines on the style, 2 terminal and 2 submedian, the latter pair arising from the dorsal surface, parameres scarcely hooked apically, aedeagi a long narrow conical shape with a rounded tip, abdominal tergites with many setae insertion scars in females; Group C, *Sergentomyia cunicula*, female spermathecae a short cylindrical to slightly oval capsule, no collar surrounding the apical crown of hair-like ductules, spermathecal ducts very narrow, male with 4 spines on the style, 2 terminal and 2 subterminal, paramere narrow and hooked terminally, aedeagi a long narrow tapering cone with the tip blunt and curved upwards, no erect setae insertion scars on abdominal tergites; Group D, *Sergentomyia welwitschii* spec. nov., female spermathecae are bloated conical capsules doubled back on themselves, sculptured with numerous transverse folds, the anterior apical crown of hair-like ductules recessed in a deep pit, males with 4 spines on the style, 2 terminal and 2 submedian, the latter arising from the dorsal surface, paramere narrow and hooked terminally, aedeagi a short narrow tapered cone-shape its tip rounded, many erect setae insertion scars on the abdominal tergites in females.

Relationships between these species and other Phlebotomines, predominantly those from the Ethiopian Region, are discussed under each individual species description.

2 GROUP A *Incertae sedis*

2.1 *Sergentomyia villosa* spec. nov. figs. 1a, 2a–2c

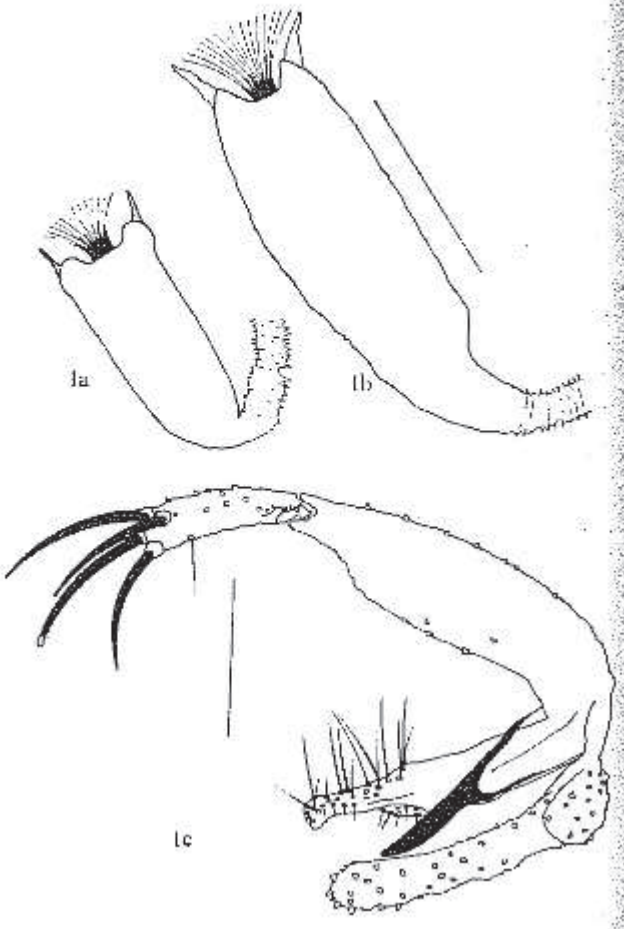

FIGURE 1: a)–b) Spermathecae (scale line 0,05 mm). 1a *Sergentomyia villosa* spec. nov. 1b *Sergentomyia metzi* spec. nov. c) Male terminalia (scale line 0,1 mm). *Sergentomyia metzi* spec. nov.

FEMALE: (figs. 1a, 2a, 2b) Mean length (excluding head) 1,72 – 2,03 mm. Wing length 1,75 – 1,96 mm; breadth 0,46 – 0,53 mm; Alpha/Beta ,73 – 1,21. Antennal segment 3 is 0,19 – 0,25 mm, being ,95 – 1,12 length of segments 3 plus 4; longest ascoid 0,04 – 0,047 mm, being ,17 – ,24 length of segment; c/b ratio 1,13 – 1,67. Antennal segment 4 is 0,10 – 0,12 mm; longest ascoid 0,04 – 0,052 mm, being ,38 – ,47 length of segment; c/b ratio 1,48 – 1,81. Ascoid formula 2/III–XV. Labrum 0,19 – 0,22 mm, segment 3 being ,97 – 1,20 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:21:37:44:80.

Cibarium with 12 – 15 short, stout, pointed denticles arranged on an almost flat plane. No pigment plate. Pharynx armed with rows of loose scales serrated along their posterior margins.

No erect setae insertion scars on abdominal tergites II – VI.

Each spermatheca 0,048 – 0,064 mm in length, a short, cylindrical to slightly elongate oval capsule, its anterior extremity with a broad 'dog-collar', the spermathecal ducts broad and transversely striated.

MALE: (fig. 2c) Mean length (excluding head and terminalia) 1,65 mm. Wing length 1,80 mm; breadth 0,48 mm; Alpha/Beta ,70. Antennal segment 3 is 0,22 mm, being ,95 length of segments 4 plus 5; longest ascoid 0,035 mm, being ,16 length of segment; c/b ratio 1,77. Antennal segment 4 is 0,12 mm, longest ascoid 0,039 mm, being ,32 length of segment; c/b ratio 2,26. Ascoid formula 1/III — XV. Labrum 0,205 mm, segment 3 being 1,09 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:23:38: 45:71.

Cibarium with circa 7 short, stout denticles plus a number of scattered anterior punctiform denticles. No pigment plate. Pharynx armed with loose scales serrated along their posterior margins.

Style 0,12 mm long, has 4 approximately terminal elongate stout spines; pre-apical seta, minute. Coxite 0,18 mm. Paramere 0,22 mm long, hooked terminally, with many elongate setiferous setae on its dorsal surface. Aedeagus 0,11 mm long, an elongated cone-shape with a rounded extremity. Genital pump 0,12 mm long, its filaments 3,33 its length.

No erect setae insertion scars on abdominal tergites II — VI.

Male terminalia as in 1c.

Material: Holotype ♀ (No. M1542—A2), 11 Paratype ♀♀ (Nos. M1539—A1,3,4,6,7,8,11, M1542—A5,9) and 1 Paratype ♂ (No. M1539—A1), South Africa, North Eastern Transvaal, farm 'Hope' (24°02'S; 30°52'E), Phalaborwa, at light in mammal ground burrows. (B. McIntosh, 25/26.2.77). All material in SAIMR collection except 2 Paratype ♀♀ deposited in BMNH collection.

Diagnosis: A number of other Ethiopian region species resemble this species with respect to the cibarial armature; *Sergentomyia collarti* (Adler, Theodor & Parrot, 1929) has shorter antennal segments (3 & 4), a shorter labrum and abdominal tergite erect setae insertion scars in females; *Sergentomyia moreli* (Abonnenc & Hamon, 1958) has longer antennal segments (3 & 4); *Sergentomyia hamoni* (Abonnenc, 1958), *Sergentomyia similima* (Newstead, 1914) and *Sergentomyia dissimillima* (Abonnenc, 1958, 1972) may be separated from *Sergentomyia villosa* spec. nov. on pharyngeal armature.

The species name is derived from the latin word *villosus* (adj. m) meaning hairy, this species being more so than normal.

2.2 *Sergentomyia metzi* spec. nov.
figs. 1b, 2d—2f

FEMALE: (figs. 1b, 2d, 2e) Mean length (excluding head) 1,64 — 1,96 mm. Wing length 1,64 — 1,96 mm; breadth 0,45 — 0,58 mm; Alpha/Beta ,69 — 1,25. Antennal segment 3 is 0,23 — 0,31 mm, being 1,12 — 1,25 length of segments 4 plus 5; longest ascoid 0,07 — 0,09 mm, being ,26 — ,29 length of segment; c/b ratio ,9 — 1,08. Antennal segment 4 is 0,10 — 0,13 mm; longest ascoid 0,07 — 0,09 mm, being ,58 — ,69 length of segment; c/b ratio 1,09 — 1,24. Ascoid formula 2/III — XV. Labrum 0,22 — 0,27 mm, segment 3 being 1,06 — 1,25 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:26:38: 40:74.

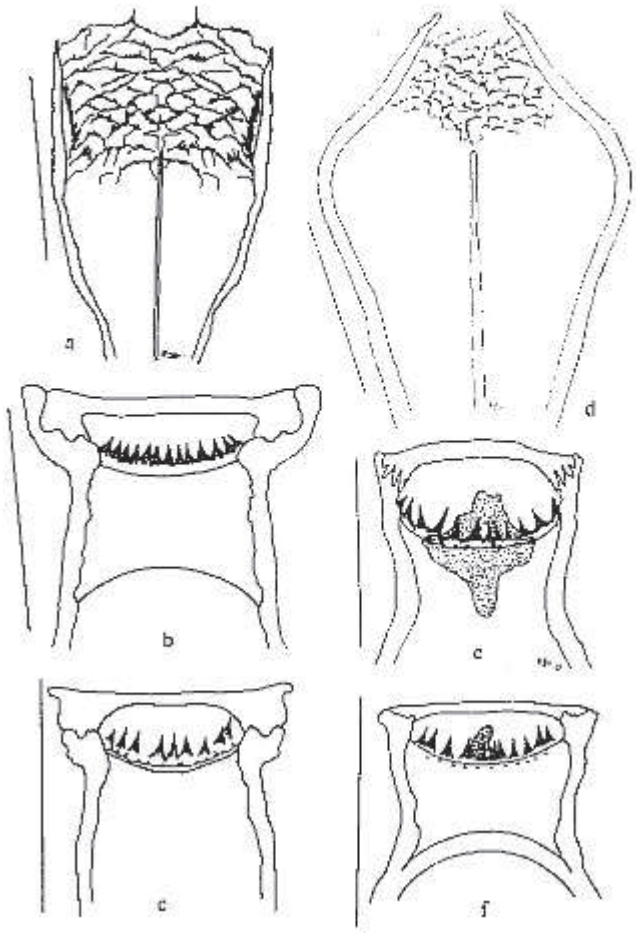

FIGURE 2: a)—c) *Sergentomyia villosa* spec. nov. a. ♀ pharynx. b. ♀ cibarium. c. male cibarium. d) — f) *Sergentomyia metzi* spec. nov. d. ♀ pharynx. e. ♀ cibarium. f. male cibarium. (scale line 0,05 mm).

Cibarium with 14 — 18 long pointed teeth, median ones closer together, anterior to these numerous punctiform denticles; pigment plate pyramidal with an irregular basal margin. Pharynx very broad narrowing to its anterior width posteriorly, armed with rows of loose scale-like denticles, serrated along the posterior margins.

Each spermatheca 0,064 — 0,072 mm in length, slightly oval, elongated cylindrical capsule, anteriorly with a broad 'dog-collar', its spermathecal ducts broad and concentrically striated.

No erect setae insertion scars on abdominal tergites II — VI.

MALE: (figs. 1c, 2f) Mean length (excluding head and terminalia) 1,25 — 1,33 mm. Wing length 1,64 — 1,65 mm; breadth 0,43 — 0,46 mm; Alpha/Beta ,95 —

1,15. Antennal segment 3 is 0,28 – 0,31 mm, being 1,08 – 1,20 length of segments 4 plus 5; longest ascoid 0,07 – 0,08 mm, being ,24 – ,25 length of segment; c/b ratio 1,09 – 1,11. Antennal segment 4 is 0,13 – 0,14 mm; longest ascoid 0,08 – 0,083 mm, being ,60 – ,63 length of segment; c/b ratio 1,17 – 1,20. Ascoid formula I/III – XV. Labrum 0,195 – 0,205 mm, segment 3 being 1,41 – 1,59 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:23:34:42:71.

Cibarium with 12 – 13 short, stout pointed denticles on a slightly concave arc and an anterior row of spiculate denticles. Pigment plate small. Pharynx with large loose scale-like denticles, some serrated along the posterior margins.

Style 0,10 mm long, bearing 4 approximately terminal elongate stout spines. Pre-apical seta fine, but very long. Coxite 0,22 – 0,24 mm. Paramere 0,18 – 0,19 mm in length, hooked terminally and provided with many elongate equally lengthed fine setae along its dorsal surface. Aedeagus 0,10 – 0,12 mm long, a short broad cone-shape rounded apically. Genital pump 0,11 – 0,12 mm long, its filaments 2,86 – 3,14 its length.

No erect setae insertion scars on abdominal tergites II – VI.

Material: Holotype ♀ (No. T4–B17) and 2 Paratype ♂♂ (No. T4–B11,T7–B12), North Eastern Transvaal, farm 'Jaffray' (23°45'S; 30°25'E), 16 miles E. Tzaneen ex mammal burrows in termite hills (I. H. Davidson, 18 and 21.1.77); 1 Paratype ♀ (No. M1539–B16), North Eastern Transvaal, farm 'Hope' (24°S; 31°07'E), Phalaborwa, at light in mammal ground burrows. (B. McIntosh, 25.2.77); 1 ♀ Paratype (No. LM11a–15), North Eastern Transvaal farm 'Lillie' (24°02'S; 30°50'E), near Mica (I. H. Davidson, 1.12.77, ground burrow); 2 ♀♀ Paratypes (No. HH4e–13,14) North Eastern Transvaal, Lebowa, Haffenden Heights (24°07'S; 30°07'E), (I. H. Davidson, 24.11.77, at light in cave). All material in SAIMR except 1 ♀ Paratype (No. HH4e–13 in BMNH).

Diagnosis: The pharyngeal armature resembles that of a number of Ethiopian region species; *Sergentomyia kitonyi* (Minter, 1963) and *Sergentomyia dureni* (Parrot, 1934) come closest but the longer ascoids, palpal ratio and AIII/E separates *Sergentomyia metzi* from these two species. *Sergentomyia collarti* (Adler, Theodor & Parrot, 1929) has shorter antennal segments (3 & 4), a pigment plate of a different shape and abdominal tergite erect setae insertion scars. *Sergentomyia moreli* (Abonnenc & Hamon, 1958) has shorter ascoids, pigment plate a different shape and a lesser number of cibarial teeth.

This species is named after Professor J. Metz, Director of the South African Institute for Medical Research, Johannesburg.

3 GROUP B *incertae cedis*

3.1 *Sergentomyia macintoshi* (Abonnenc & Pastre, 1972) figs. 3a, 3b, 3d–3f

Phlebotomus (Sergentomyia) macintosh Abonnenc & Pastre, 1972

FEMALE: (figs. 3b, 3d, 3e) Mean length (excludin head) 1,48 – 1,80 mm. Wing length 1,64 – 1,9 mm; breadth 0,32 – 0,44 mm; Alpha/Beta ,67 – ,73. Antennal segment 3 is 0,14 – 0,17 mm, bein ,92 – ,98 length of segments 4 plus 5; longest ascoi 0,029 – 0,038 mm, being ,20 – ,22 length of seg ment; c/b ratio 1,3 – 1,5. Antennal segment 4 i 0,07 – 0,09 mm, longest ascoid 0,03 – 0,045 mm being ,38 – ,5 length of segment; c/b ratio 1,44 – 1,67. Ascoid formula 2/III – XV. Labrum 0,17 – 0,20 mm, segment 3 being ,79 – ,88 its length. Palpa formula 1,2,3,4,5 or 1,2,(3,4),5 or 1,2,4,3,5. Mea ratio of segments 10:18:31:31:58.

Cibarium with 38 – 40 long equal teeth on a slightl concave arc and an anterior row of punctiform den ticles. Pigment plate very densely pigmented obscurin most of the cibarial teeth. Pharynx narrowed posterio ly to its anterior width and armed with loose scale-lik denticles with serrated posterior margins.

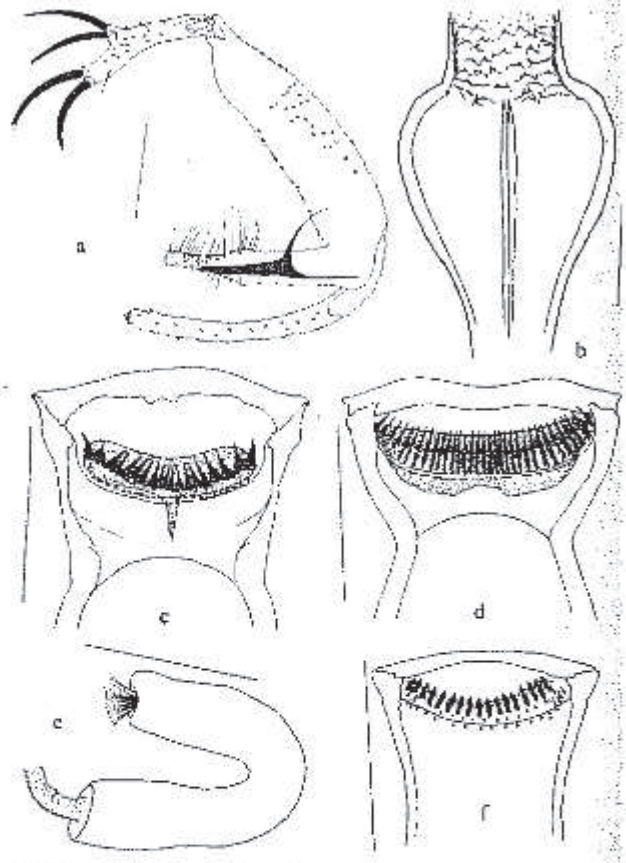

FIGURE 3: a), b), e) and f) *Sergentomyia macintoshi* spec. nov. a ♂ terminalia. b. ♀ pharynx. e. spermatheca. f. ♂ cibarium c) *Sergentomyia vulpes* spec. nov. ♀ cibarium. d) *Sergentomyi macintoshi*. ♀ cibarium. (scale line in fig 3a. 0,1 mm, all other 0,05 mm).

Spermathecae 0,09 — 0,10 mm long, an elongate cylindrical capsule doubled back on itself; anteriorly with no 'dog-collar'; spermathecal ducts narrow and concentrically striated.

Erect setae insertion scars on abdominal tergites II — VI respectively 10 — 14; 20 — 23; 26 — 28; 25 — 33; 15 — 31.

MALE: (figs. 3a, 3f) Mean length (excluding head and terminalia) 1,17 — 1,33 mm. Wing length 1,48 — 1,65 mm; breadth 0,31 — 0,33 mm; Alpha/Beta ,47 — ,86. Antennal segment 3 is 0,15 — 0,20 mm, being ,87 — ,91 length of segments 4 plus 5; longest ascoid 0,023 — 0,030 mm, being ,13 — ,17 length of segment; c/b ratio 1,9 — 2,4. Antennal segment 4 is 0,088 — 0,105 mm; longest ascoid 0,023 — 0,033 mm, being ,26 — ,33 length of segment; c/b ratio 2,15 — 2,55. Ascoid formula 1/III — XV. Labrum 0,13 — 0,15 mm, segment 3 being 1,15 — 1,35 its length. Palpal formula 1,2,3,4,5. or 1,2,(3,4),5. Mean ratio of segments 10:16:30:32:61.

Cibarium with 13 — 18 elongate, closely-packed denticles on a concave arc, anterior to these are 2 rows of punctiform denticles. Pigment plate small and globular. Pharynx narrowed slightly posteriorly, armed with many loose scales with elongate fine setae.

Style 0,12 — 0,15 in length, with 4 stout spines, 2 terminal and 2 submedian, the latter arising from the dorsal surface; very long fine pre-apical seta arising between the 2 pairs of spines. Coxite 0,27 — 0,30 mm. Paramere 0,20 — 0,23 mm long, hooked terminally with many fine short and elongate fine setae. Aedeagus 0,10 — 0,12 mm long, an elongated conical shape, the tip shaped like a 'fountain pen nib'. Genital pump 0,08 — 0,12 mm long, its filaments 3,4 — 4,7 its length.

Erect setae insertion scars on abdominal tergites II — VI respectively 0 — 2; 0 — 1; 5 — 10; 6 — 13; 0 — 8.

Type material

Holotype ♀, South Africa, Ndumu Nature Reserve (26°58'S; 32°14'E), Natal, at light. (ORSTOM, à Bondy, No. J. P. 2110).

Material examined

1 ♀ and 5 ♂♂, South Africa, farm 'Hope' (24°02'S; 30°52'E), Phalaborwa, at light in mammal burrows (B. McIntosh, 25/6.2.77). 1 ♀, South Africa, Waterpoort (22°50'S; 29°35'E), Louis Trichardt, Northern Transvaal (R. Downes) (asymmetrical antennae). 1 ♀, farm 'Acacia' (25°30'S; 27°05'E), Boshoek, Rustenburg, Transvaal. (B. McIntosh, January, 1977).

Diagnosis: This species and *Sergentomyia vulpes* spec. nov. have similar cibarial, pharyngeal, spermathecal, and male terminalia features to that of *Sergentomyia hodgsoni pawlowski* (Perfil'ev, 1933) of the Middle East. Neither of the two species described here resemble any other Ethiopian region described species. *Sergentomyia macintoshi* (Abonnenc, 1972) may be separated from *Sergentomyia vulpes* spec. nov. on cibarial armature characters. These two species appear to be very closely related but distributionally they are widely separated.

3.2 *Sergentomyia vulpes* spec. nov.
figs. as for *macintoshi* 3a, 3b, 3c, 3e, 3f

FEMALE: (figs. 3b, 3c, 3e) Mean length (excluding head) 1,56 mm. Wing length 1,91 mm; breadth 0,34 mm; Alpha/Beta ,72. Antennal segment 3 is 0,15 mm, being ,86 length of segments 4 plus 5; longest ascoid 0,04 mm, being ,27 length of segment; c/b ratio 1,35. Antennal segment 4 is 0,085 mm, longest ascoid 0,04 mm, being ,47 length of segment; c/b ratio 1,43. Ascoid formula 2/III — XV. Labrum 0,20 mm, segment 3 being ,76 its length. Palpal formula 1,2,4,3,5. Mean ratio of segments 10:18:33:29:

Cibarium with 24 elongate pointed denticles, situated on a concave arc, plus an anterior row of punctiform denticles. Pigment plate is densely pigmented obscuring all the denticles; anterior plate chitinised and heavily pigmented. Pharynx narrowed posteriorly to almost its anterior width and armed with many loose scale-like denticles serrated along their posterior margins.

Spermathecae 0,08 mm long, an elongate cylindrical capsule doubled back on itself; no anterior 'dog-collar', the spermathecal ducts narrow and concentrically striated. (Spermathecae of Holotype have collapsed but are very similar to those of *Sergentomyia macintoshi* (Abonnenc, 1972).)

Erect setae insertion scars on abdominal tergites II — VI respectively 8:19;21;27;18.

MALE: (figs. 3a, 3f) Mean length (excluding head and terminalia) 1,33 mm. Wing length 1,96 mm; breadth 0,31 mm; Alpha/Beta ,33. Antennal segment 3 is 0,185 mm being ,86 length of segments 4 plus 5; longest ascoid 0,027 mm, being ,15 length of segment; c/b ratio 2,2. Antennal segment 4 is 0,10 mm, longest ascoid 0,03 mm, being ,29 length of segment; c/b ratio 2,5. Ascoid formula 1/III — XV. Labrum 0,165 mm, segment 3 being 1,12 its length. Palpal formula 1,2,(3,4),5. Mean ratio of segments being 10:18:34:34:65.

Cibarium with approximately 13 short pointed denticles, anterior to these are 2 rows of punctiform denticles, one of these arising along the anterior cibarial edge. Pigment plate small. Pharynx with large, loose scale-like denticles serrated posteriorly with fine spines.

Style 0,12 mm in length, with 4 approximately terminal elongate spines. Coxite 0,27 mm. Paramere 0,22 mm long, hooked terminally, with many short stout setae along its dorsal surface. Aedeagus 0,10 mm long, an

elongated cone-shape, rounded apically. Genital pump 0,11 mm long, its filaments 3,70 its length.

Erect setae insertion scars on abdominal tergites II — VI respectively 0;0;2;3;0.

Material: Holotype ♀ (No. W29—C30) and Paratype ♂ (No. W28—C25), South West Africa, Waterberg Plateau Park (20°20'S; 17°18'E), east of Otjiwarongo, ex *Procavia capensis* (Pallas) rock holes. (I. H. Davidson, 13.3.77). (Male cibarium and pharynx missing). All material deposited in SAIMR collection.

Diagnosis: See under *Sergentomyia macintoshi* (Abonnenc, 1972).

The species name is derived from the Latin word *vulpes* (adj.f.) meaning wolf or fox and refers to the cibarial armature which is very wolf-like.

4 GROUP C *incertae cedis*

4.1 Sergentomyia cunicula spec. nov. figs. 4a—4e

FEMALE: (figs. 4b, 4c, 4d) Mean length (excluding head) 2,03 — 2,5 mm. Wing length 1,95 — 2,35 mm; breadth ,52 — ,72; Alpha/Beta ,63 — ,77. Antennal segment 3 is 0,27 — 0,29 mm, being 1,16 — 1,26 length of segments 4 plus 5; longest ascoid 0,044 — 0,051 mm, being ,16 — ,18 length of segment; c/b ratio 1,3 — 1,7. Antennal segment 4 is 0,11 — 0,12 mm, longest ascoid 0,045 — 0,057 mm, being ,4 — ,5 length of segment; c/b ratio 1,52 — 1,85. Ascoid formula 2/III — XV. Labrum 0,20 — 0,24 mm, segment 3 being 1,24 — 1,38 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:24:40:48:70.

Cibarium with 9 — 12 short, stout, pointed denticles. Pigment plate small and lightly pigmented, situated mid-anteriorly to the cibarium. Pharynx constricted posteriorly and armed with loose scale-like denticles having serrated posterior margins.

Each spermatheca 0,04 — 0,06 mm in length, a short, elongate oval capsule; anteriorly with no 'dog-collar'; spermathecal ducts narrow and concentrically striated.

No erect setae insertion scars on abdominal tergites II — VI.

MALE: (figs. 4a, 4e) Mean length (excluding head and terminalia) 1,95 — 2,35 mm. Wing length 1,87 — 1,98 mm; breadth 0,46 — 0,55 mm; Alpha/Beta ,37 — ,56. Antennal segment 3 is 0,29 — 0,31 mm, being 1,06 — 1,17 length of segments 4 plus 5; longest ascoid 0,028 — 0,035 mm, being ,09 — ,12 length of segment; c/b ratio 2,34 — 2,96. Antennal segment 4 is 0,125 — 0,14 mm, longest ascoid 0,029 — 0,033 mm, being ,22 — ,25 length of segment; c/b ratio 2,94 — 3,33. Ascoid formula 1/III — XV. Labrum 0,18 — 0,21 mm, segment 3 being 1,49 — 1,67 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:22:36:44:71.

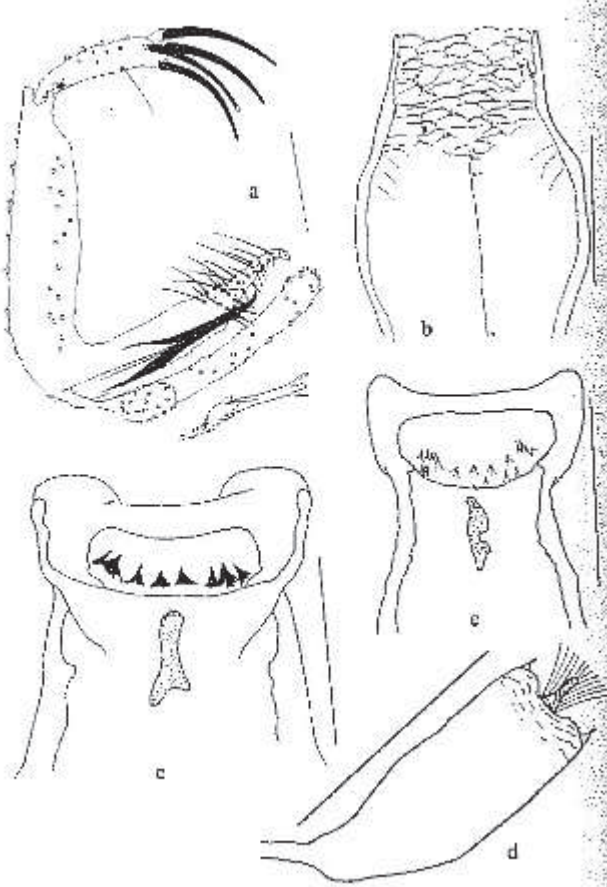

FIGURE 4: a) — e) *Sergentomyia cunicula* spec. nov. a. male terminalia. b. ♀ pharynx. c. ♀ cibarium. d. spermatheca. e. male cibarium. (scale line in fig 4a, 0.1 mm, all others 0,05 mm).

Cibarium with approximately 2 rows of 11 — 16 short, stout to small denticulate denticles. Pigment plate small and vertically elongate, situated mid-anteriorly to the cibarium. Pharynx armed with rows of loose scale-like denticles serrated along their posterior margins.

Style 0,12 — 0,14 mm in length, with 4 elongate stout spines, 3 terminal and 1 subterminal. Coxite 0,27 — 0,32 mm. Paramere 0,22 — 0,27 in length, very shallow in depth, hooked terminally with a number of short to elongate stiff setae on its dorsal surface. Aedeagus 0,10 — 0,15 mm long, a very elongate conical shape, rounded terminally. Genital pump 0,10 — 0,12 mm long, its filaments 3,8 — 4,5 its length.

No erect setae insertion scars on abdominal tergites II — VI.

Material: Holotype ♀ (No. 60) and 4 Paratype ♀♀ (No. 61, 63 — 65), South West Africa, Otjiwarongo (20°28'S; 16°35'E), ex old tree holes (E. Zielke, 14.2.70); 1 Paratype ♀ (No. 62) and 3 Paratype ♂♂ (No. 62, 64, 65), Owambo, Oshakati (17°46'S; 14°12'E), ex termite hill (R. Downes, 17.2.71); 1 Paratype ♂ (No. 61), Owambo, Ruacana

Falls (17°25'S; 14°12'E), ex rock holes (R. Downes, 23.2.70). All material in SAIMR collection except 1 Paratype ♀ (No. 61), locality as per Holotype, and 1 Paratype ♂ (No. 61), Owambo, Ruacana Falls in BMNH.

Diagnosis: On cibarial armature only, this species resembles *Sergentomyia hamoni* (Abonnenc, 1958), *Sergentomyia dissimillima* (Abonnenc, 1958, 1972) and *Sergentomyia simillima* (Newstead, 1914), but is separable from these on pharyngeal armature. Spermathecae vaguely resemble those of *Sergentomyia villosa/metzi* spec. nov. except that those of *Sergentomyia cuniculi* have no anterior collar.

This species name is derived from the Latin word *cuniculus* (adj. m) meaning in a broad sense burrows (of rabbits) or cavities from where the specimens were collected.

5. GROUP D *incertae sedis*

5.1 *Sergentomyia welwitschii* spec. nov.
figs. 5a – 5e

FEMALE: (figs. 5b, 5c, 5d) Mean length (excluding head) 1,32 – 2,03 mm. Wing length 1,64 – 1,96 mm; breadth 0,34 – 0,45 mm; Alpha/Beta ,39 – ,61. Antennal segment 3 is 0,125 – 0,155 mm, being ,74 – ,82 length of segments 4 plus 5; longest ascoid 0,018 – 0,026 mm, being ,13 – ,17 length of segment; c/b ratio 1,73 – 2,67. Antennal segment 4 is 0,084 – 0,095 mm, longest ascoid 0,02 – 0,027 mm, being ,24 – ,30 length of segment; c/b ratio 2,11 – 2,86. Ascoid formula 2/III – XV. Labrum 0,145 – 0,16 mm, segment 3 being ,84 – 1,01 its length. Palpal formula 1,2,3,4,5 or 1,2,(3,4),5 or 1,2,4,3,5. Mean ratio of segments 10:13:33:33:70.

Cibarium with 8 – 10 short, stout, pointed denticles, some specimens with a few punctiform denticles anteriorly. Pigment plate not visible. Pharynx heavily armed with closely-packed elongate, stout setae of the 'antennata' type.

Spermatheca 0,10 – 0,14 mm long, a bloated conical capsule, doubled back on itself, with numerous folds; anterior cluster of hair-like ductules recessed in a deep pit.

Erect setae insertion scars on abdominal tergites II – VI respectively 3 – 13; 3 – 9; 5 – 22; 10 – 26; 11 – 31.

MALE: (figs. 5a, 5e) Mean length (excluding head and terminalia) 1,01 – 1,18 mm. Wing length 1,47 – 1,56 mm; breadth 0,31 – 0,36 mm; Alpha/Beta ,11 – ,30. Antennal segment 3 is 0,10 – 0,14 mm, being ,70 – ,85 length of segments 4 plus 5; no ascoids present. Antennal segment 4 is 0,075 – 0,090 mm, longest ascoid 0,013 – 0,017 mm, being ,16 – ,21 length of segment; c/b ratio 3,1 – 4,1. Ascoid formula 1/IV – XV. Palpal formula 1,2,3,4,5 or 1,2,(3,4),5 or 1,2,4,3,5. Mean ratio of segments 10:14:32:30:56.

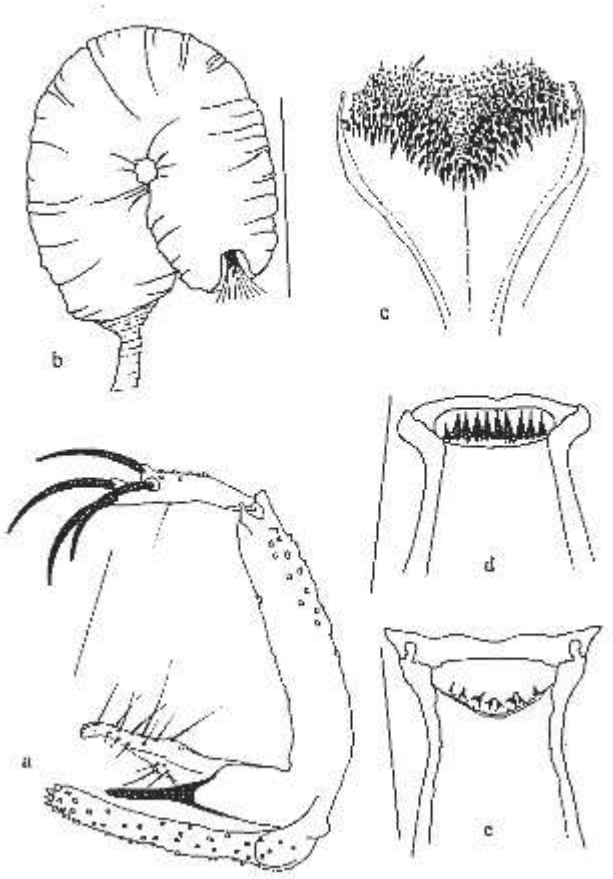

FIGURE 5: a) – e) *Sergentomyia welwitschii* spec. nov. a. male terminalia. b. spermatheca. c. ♀ pharynx. d. ♀ cibarium. e. male cibarium. (scale line in fig 5a. 0,1 mm, all others 0.05 mm).

Cibarium with 5 – 10 short, stout denticles, plus numerous punctiform denticles lateral and anterior to them. Pigment plate not apparent. Pharynx armed with many loosely-spaced, stout, elongate setae.

Style 0,10 mm long, with 4 stout spines, 2 terminal and 2 submedian, the latter pair arising from the dorsal surface. Preapical seta very small and short. Coxite 0,20 – 0,24 mm. Paramere 0,20 – 0,24 mm long, hooked terminally, dorsal surface sparsely provided with long and short stout setae. Aedeagus, a short cone-shape, 0,06 – 0,09 mm long, its filaments 2,8 – 3,7 its length.

Erect setae insertion scars on abdominal tergites II – VI respectively 0 – 2;0;0;0;0.

Material: Holotype ♀ (No. NDP53–114), 2 Paratype ♀♀ (No. NDP53–116, NDP53A–117) and 1 Paratype ♂ (No. NDP53–50), South West Africa, Namib Desert Park, Tumasberge (23°10'S; 15°30'E), near Ganab, ex *Procavia capensis* (Pallas) rock burrows (I. H. Davidson, 29.4. – 4.5.77); 7 Paratype ♀♀ (No. KOR48–110–113,115,118/9) and 7 Paratype ♂♂ (No. KOR48–51–57), Kaoko-

veld, Orumana (State Hospital) (18°10′S; 13°55′E), near Ohopoho, ex *Procavia welwitschii* (Gray) and/or *Heterohyrax brucei* (Gray) rock burrows (I. H. Davidson, 8 – 12.4.77); Additional material not designated includes 24 ♀♀ and 44 ♂♂ specimens, localities as above and Kaokoveld near Okanguati (17°26′S; 13°15′E), ex *Procavia welwitschii* (Gray) rock burrows (I. H. Davidson). All in SAIMR collection except 1 Paratype ♀, locality as per Holotype, and 1 Paratype ♀ (No. KOR48–119) and 2 Paratype ♂♂ (No. KOR48–55,56) Kaokoveld, Orumana (State Hospital) (18°10′S; 13°55′E), near Ohopoho, in BMNH.

Diagnosis: This species closely resembles the following species on cibarial and pharyngeal armature: – *Sergentomyia simillima* (Newstead, 1914) and *Sergentomyia dissimillima* (Abonnenc, 1958, 1972) separable from this species on ascoid formula and third antennal segment length; *Sergentomyia hamoni* (Abonnenc, 1958) separable on antennal segment length. Males of *Sergentomyia welwitschii* spec. nov. may easily be separated from those of the above mentioned species in that the style of the terminalia has one pair of spines terminally, the other pair is situated dorsally submedian compared with subterminally. Females have many erect setae insertion scars on their abdominal tergites.

This species name is taken from the specific name of one of its rock hyrax host species.

6 ACKNOWLEDGEMENTS

Thanks are due to the following persons for providing material and assistance in various ways, making possible this publication: Dr B. McIntosh, Arbovirus Research, Rietfontein; Deryck Day; the Director of South West Africa Nature Conservation Division, Windhoek and J. Lensing; L. van der Merwe, Public Health Department Kaokoland.

I also thank Drs. David Lewis and John Ledger for their assistance and constructive criticism of this paper. This work was supported in part by a grant from the South African Medical Research Council.

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