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Studies of southern African sandflies (Diptera: Psychodidae: Phlebotominae): the subgenus *Sintonius* of *Sergentomyia* with description of a new subgenus

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ABSTRACT

All but one of the species formerly assigned to the subgenus *Sintonius* in southern Africa, are assigned to a new subgenus *Capensomyia*. Three new species namely, *Sergentomyia drakensbergi*, *S. kalaharia* and *S. xera*, are described. All known southern African species are redescribed. A key to all southern African species is given.

1 INTRODUCTION

First proposed by Nitzulescu in 1931 as a subgenus of the genus *Phlebotomus*, *Sintonius* has since been recognized as such, or placed within the genus *Sergentomyia*. The latter arrangement is considered best. As originally defined, and revised in subsequent major revisions (Kirk & Lewis, 1946/51; Theodor, 1948/58; Pervil'ev, 1968; and Lewis, 1974), *Sintonius* as a subgenus contains species having the following characteristics:

- Clusters of raised setae insertion scars on the posterior mid-dorsal region of the tergites, (the remainder being recumbent), especially on tergites II and III, notably in males.
- females having segmented spermathecae (fig 1b); males having parameres hooked terminally, a short cone-shaped aedeagus, as well as an enlarged sixth abdominal tergite, style with 4 spines, 2 terminal and 2 subterminal (fig 1d).
- buccal armature and pigmented plate well developed; pharynx narrowed apically and underdeveloped in both sexes. (figs. 6a and 6b).

2 DESCRIPTION OF TAXA

Of the species known from southern Africa, and formerly assigned to *Sintonius*, only one in fact complies fully with the above definition. The remaining southern African species appear to constitute a group with important and consistent differences from *Sintonius*, and I therefore establish a new subgenus of the genus *Sergentomyia* to accommodate this assemblage of species.

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

2.1 *Capensomyia* subgen. nov.

Type species: *Sergentomyia drakensbergi* spec. nov.

Definition: Spermathecae are convoluted (fig 1a); apically with a crown-shaped arrangement of ductules, a narrow collar surrounding this arrangement. Male terminalia; style with 4 elongate spatulate tipped spines, 2 terminal and 2 subterminal; the pre-apical setae long but fine. Paramere decurved apically giving a hooked

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appearance, armed along its dorsal and lateral surfaces with a number of fairly stout elongate setae plus a number of shorter finer setae. Aedeagus an elongated cone-shape, the ventral surface of the apical quarter curved upwards forming a sharply rounded translucent extremity. Sixth abdominal tergite same size as the fifth. Female pharyngeal armature is well developed, broad, being 3 – 6 times its anterior width, coarsely developed. Buccal armature of females well developed; in males to a marked lesser degree. Females all have erect setae insertion scars on the mid-posterior to lateral margins of the abdominal tergites, if not on all segments always on tergites V and VI. Males are rarely provided with erect setae insertion scars as above, never on tergite VI, but if they are present they occur on tergites II and III.

Discussion: The spermathecae present the most important criteria in separating *Sintonius* from *Capensomyia*, the former segmented and narrow, the latter convoluted, twice as broad and longer than those of *Sintonius*. In the male terminalia the only essential difference between the two subgenera is the shape of the aedeagi, that in *Sintonius* being short, and narrowed uniformly toward the tip, which is more or less pointed; whilst that of *Capensomyia* being an elongated cone-shape with the ventral surface of the apical quarter upcurved forming a sharply rounded translucent extremity. In *Capensomyia* the pharyngeal armature is well-developed, compared with only lightly so in *Sintonius*, and never narrowed posteriorly to its anterior width as is the case in *Sintonius*.

The subgenus *Sintonius* has only one known representative in southern Africa, that being *Sergentomyia (Sintonius) meilloni* (Sinton 1933). One other species, not mentioned before, *Sergentomyia transvaalensis* (Sinton 1933), is incorrectly assigned to the subgenus *Sintonius* and will be discussed in a forthcoming paper in preparation.

The erect setae insertion scars on the posterior mid to lateral dorsal surface of the abdominal tergites, thought at the time to be important criterion in separating *Sintonius* from other subgenera of the Phlebotominae, is in fact a character of minor taxonomic use. Many species of *Sergentomyia sens. strict.*, the subgenus *Rondanomyia* and species *incertae sedis*, have these insertion scars.

Capensomyia may be divided into two easily differentiated species groups. In the *caffrarica* species group, comprising species occurring in the east of the southern African sub-continent, the pharynges of the females are 4 – 6 times as broad posteriorly as anteriorly, elaborately and ornately armed. In the *namibensis* species group, comprising species occurring in the west of the southern African sub-continent, the pharynges of the females are 2 – 3 times as wide posteriorly as anteriorly, and coarsely armed with large scale-like denticles with serrated posterior margins. Males of both species groups are inseparable except on locality (i.e. east or west of southern African sub-continent).

Explanation of terms used in text and key: The only term which may not be familiar to readers is the ratio c/b. This refers to the ascoids and as explained in Abonnenc (1972 p. 72 and fig 35E), is the ratio of the distance from the anterior edge of the socket of the longest ascoid to the posterior end of its antennal segment (c), to the length of the longest ascoid of the segment (b).

2.2 The *caffrarica* species-group

Sergentomyia (Capensomyia) caffrarica (De Meillon & Lavoipierre, 1944) figs. 1, 10.

Phlebotomus caffraricus De Meillon & Lavoipierre, 1944; Kirk & Lewis 1946; Zielke, 1971

Phlebotomus (Sintonius) caffraricus, Kirk & Lewis, 1951; De Meillon, 1955.

Phlebotomus (Prophlebotomus) caffraricus, Abonnenc, 1967.

Phlebotomus (Sergentomyia) caffraricus, Abonnenc, 1972.

This species is known only from the Holotype female which is in a poor state of preservation. The cibarium has been lost by a previous worker. All notations below in parentheses are after De Meillon & Lavoipierre, 1944. The male is unknown.

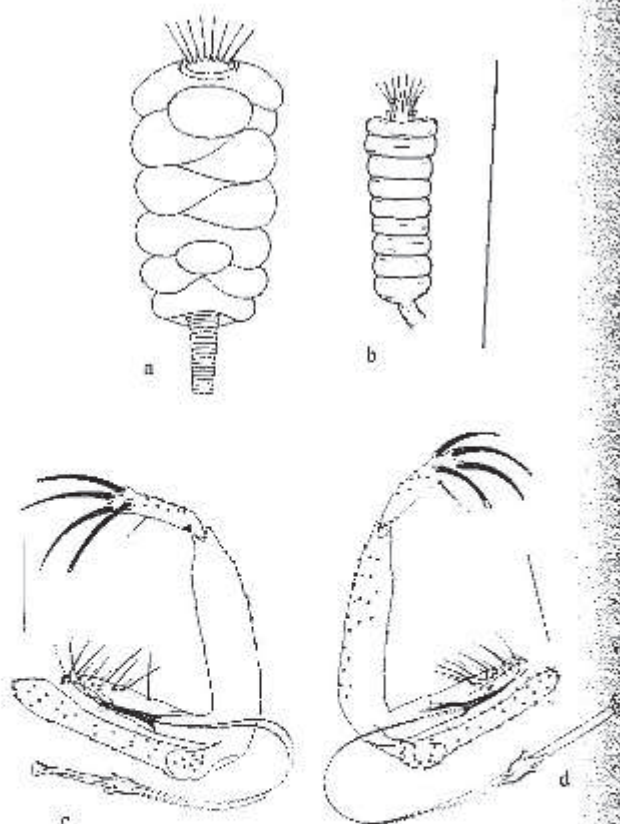


FIGURE 1: Figs. a), b). Spermathecae. (scale line 0.05 mm). a. *Capensomyia* subgen. nov. b. *Sintonius*. Figs. c) – d). Male terminalia (scale line 0.1 mm). c. *Capensomyia* subgen. nov. d. *Sintonius*.

FEMALE: (figs. 1a, 1b) Length (excluding head) 1,95 mm. Wing length 2,51 mm; breadth 0,67 mm. Antennal segment 3 is 0,26 mm; ascoid length 0,065 mm, being ,25 length of segment; c/b ratio 1,15. Antennal segment 4 is missing. Ascoid formula (2/III - XV). Labrum (0,30 mm), segment 3 being ,86 its length. Palpal formula (1,2,3,4,5).

(Cibarium armed with an even row of 40 subequal pointed denticles, anterior to these a row of fine punctiform dots. Pigment plate very dense, obscuring teeth). Pharynx armed with large curved denticles along its lateral margins; posteriorly armed with one row of large curved teeth, area anterior to these very heavily chitinised with many ridges, and posterior to this row numerous elongate setae. Spermathecae (striated transversely, not distinctly segmented).

Erect setae insertion scars on abdominal tergites II - VI respectively 4;1;4;7;15.

Material examined: Holotype ♀, Transkei, Bizana (30°50'S; 29°55'E) (February 1944) (SAIMR).

Discussion: Pharyngeal armature very like that of *Sergentomyia drakensbergi* spec. nov. but cibarial armature and ascoid formula will separate these two species. This species is only known from the type material.

Sergentomyia (Capensomyia) capensis (De Meillon, 1955) figs. 1, 5, 6.

Phlebotomus (Sintonius) capensis De Meillon, 1955.

Phlebotomus capensis, Abonnenc & Minter, 1965.

Phlebotomus (Prophlebotomus) capensis, Abonnenc, 1967.

Phlebotomus capensis, Zielke, 1971.

Phlebotomus (Sergentomyia) capensis, Abonnenc, 1972.

MALE: Unknown.

FEMALE: (figs. 1a, 2a, 2b) Length (excluding head) 1,79 - 2,03 mm. Wing length 1,87 - 1,94 mm; breadth 0,43 - 0,47 mm. Antennal segment 3 is 0,14 - 0,16 mm, being ,74 - ,8 length of segments 4 plus 5; ascoid length 0,026 - 0,028 mm, being ,18 length of segment; c/b ratio 1,6 - 2,0. Antennal segment 4 is 0,09 - 0,10 mm, ascoid length 0,029 mm, being ,31 length of segment; c/b ratio 2,07. Ascoid formula 2/III - XV. Labrum 0,16 - 0,19 mm, segment 3 being ,85 - ,90 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:24:33:37:58.

Cibarium armed with a concave row of 7 - 9 irregularly placed large pointed denticles. No pigment plate or anterior row of spicules. Pharynx ornate and armed (anterior to posterior) with one row of large curved teeth followed by two rows of large rounded teeth each with an elongate stout seta, the remaining area with large irregular shaped denticles bearing elongate setae. Spermathecae convoluted.

Erect setae insertion scars on abdominal tergites II - VI respectively 4;1 - 4;4 - 5;4 - 7;9 - 15.

Type material: Holotype ♀ and 8 ♀♀ Paratype specimens, South Africa, Cape Province, Cape Peninsula, Hout Bay, Skoorsteenkop (34°03'S; 18°25'E) and 1 Paratype ♀, Cape Peninsula, Little Lions Head (33°55'S; 18°30'E).

Material examined: 3 Paratype ♀♀ (PI/54, 1963, 21.1.51; P1/54, 3959, 18.2.51; P1/54, 3952, 28.1.51) Data as per Holotype. (SAIMR Johannesburg). No further specimens have been collected.

Discussion: This species and *Sergentomyia haeselbarthi* Abonnenc have been confused on previous occasions, but although cibarial armature is relatively weak in both species, pharyngeal armature, ascoid formula and distribution, should separate the two species. This species is known only from the type material.

Sergentomyia (Capensomyia) drakensbergi spec. nov. figs. 1a, 1c, 3a-c, 4b.

FEMALE: (figs. 1a, 3a, 3b) Length (excluding head) 1,40 - 1,64 mm. Wing length 1,56 - 1,72 mm; breadth ,34 - ,38 mm. Antennal segment 3 is 0,13 - 0,15 mm, being ,75 - ,85 length of segments 4 plus 5; No ascoids present. Antennal segment 4 is 0,085 - 0,095 mm, longest ascoid 0,02 - 0,028, being ,23 - ,29 length of segment; c/b ratio 2,1 - 2,7. Ascoid formula 2/IV - XV. Labrum 0,16 - 0,18 mm, segment 3 being ,82 - ,86 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:19:29:36:73.

Cibarium with 9 - 10 large elongate pointed denticles. Pigment plate small and lightly pigmented. Pharynx armed with a single row of large elongate and curved denticles, and posterior to these numerous irregular block-like denticles each with a very long pointed tooth.

Spermathecae convoluted 0,04 - 0,05 mm in length.

Erect setae insertion scars on abdominal tergites II - VI respectively 0;0 - 1;2 - 4;2 - 5;4 - 6.

MALE: (figs. 1c, 3c, 4b) Length (excluding head and terminalia) 1,17 - 1,64 mm. Wing length 1,56 - 1,72 mm; breadth 0,34 - 0,38 mm. Antennal segment 3 is 0,13 - 0,15 mm, being ,7 - ,8 length of segments 4 plus 5; no ascoid present. Antennal segment 4 is 0,090 - 0,095 mm, longest ascoid 0,022 - 0,024 mm, being ,23 - ,26 length of segments; c/b ratio 2,25 - 2,75. Ascoid formula 1/IV - XV. Labrum 0,14 - 0,16 mm, segment 3 being ,9 - 1,10 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:18:25:34:68.

Cibarium armed with 2 rows of spiked denticles, irregular in size and length. Pigment plate large but indistinct. Pharynx armed with numerous irregular-

shaped large denticles each bearing many short spiculate spines.

Style 0,08 – 0,09 mm in length bearing 4 large spatulate tipped spines, 2 terminal and 2 sub-terminal. Coxite ,16 – ,18 mm. Paramere 0,14 – 0,19 mm long hooked terminally with 2 – 3 long stout setae and a number of finer ones. Aedeagus 0,08 – 0,12 mm in length, cone-shaped and rounded terminally. Genital pump 0,10 – 0,12 mm long, filaments 2,5 – 3,6 its length.

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

Material: Holotype ♀ (No. T1-1), 3 Paratype ♀♀ (No. T1-2, 3, 4) and 7 Paratype ♂♂ (No. T1-21, 3, 5, 7, 9, 31, 3), South Africa, N.E. Transvaal, Malta Forest, Selati River source (24°10'S; 30°10'E), Letaba district ex *Procapia capensis* (Pallas) rock holes in forested cliffs. (J. H. Davidson, 13.1.77). (All material in SAIMR except 1 ♂ (No. T29) and 1 ♀ (No. T1-2) Paratype in BMNH).

Discussion: Pharyngeal armature of this species closely resembles *Sergentomyia cafferica* De Meillon & Lavoipierre, but may be separated from this species on cibarial armature and ascoid formula. It may be separated from *Sergentomyia haeselbarthi* Abonnenc which has the same ascoid formula, on pharyngeal and cibarial armature.

Sergentomyia (Capensomyia) haeselbarthi (Abonnenc, 1967) figs. 1, 3, 7-9, 18

Phlebotomus (Prophlebotomus) haeselbarthi Abonnenc, 1967

Phlebotomus (Sergentomyia) haeselbarthi Abonnenc, 1972

Sergentomyia (Sintonius) brianti Lewis, 1967

FEMALE: (figs. 1a, 2c, 2d) Length (excluding head) 1,92 – 2,12 mm. Wing length 1,79 – 2,12 mm; breadth 0,42 – 0,50 mm. Antennal segment 3 is 0,17 – 0,20 mm being ,85 – ,97 length of segments 4 plus 5; no ascoids present. Antennal segment 4 is 0,09 – 0,11 mm, longest ascoid 0,04 – 0,05 mm, being ,4 length of segment; c/b ratio 1,25 – 1,4. Ascoid formula 2/IV – XV. Labrum 0,18 – 0,24 mm, segment 3 being ,75 – ,95 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:23:32:36:70.

Cibarium equipped with a row of punctiform denticles. Pigment plate absent. Pharynx (anterior-posterior) with 1 row of large curved short spines, 1 row of block-like denticles each with 3 – 4 short stout spiculate denticles, and numerous irregular block-shaped denticles armed with a few elongate setiferous setae.

Spermathecae convoluted 0,04 – 0,05 mm in length.

Erect setae insertion scars on abdominal tergites II – VI respectively 3 – 14; 2 – 14; 6 – 19; 9 – 15; 8 – 20.

MALE: (figs. 1c, 2e, 4b) Length (excluding head and terminalia) 1,32 – 1,80 mm. Wing length 1,56 – 1,88 mm; breadth 0,31 – 0,36 mm. Antennal segment 3 is 0,19 – 0,22 mm, being ,8 – ,9 length of segments 4 plus 5; no ascoid present. Antennal segment 4 is 0,11 – 0,13 mm, longest ascoid 0,03 – 0,045 mm, being ,25 – ,35 length of segment; c/b ratio 2,0 – 2,5. Ascoid formula 1/IV – XV. Labrum 0,15 – 0,18 mm, segment 3 being 1,1 – 1,4 its length. Palpal formula 1,2,3,4,5 or 1,2,4,3,5. Mean ratio of segments 10:19:29:28:57.

Cibarium: armature with a very convex anterior edge, provided with numerous scattered punctiform denticles. No pigment plate present. Pharynx armed with scattered ridges of spiculate setae.

Style 0,11 – 0,13 mm in length provided with 4 spines, 2 terminal and 2 sub-terminal. Coxite 0,26 – 0,28 mm. Paramere is 0,18 – 0,22 mm in length hooked apically with about 12 elongate stout setae along its upper surface. Aedeagus an elongate cone-shape with a rounded tip, 0,10 – 0,16 mm in length. Genital pump 0,16 – 0,18 mm long, filaments 3,4 – 5,4 its length.

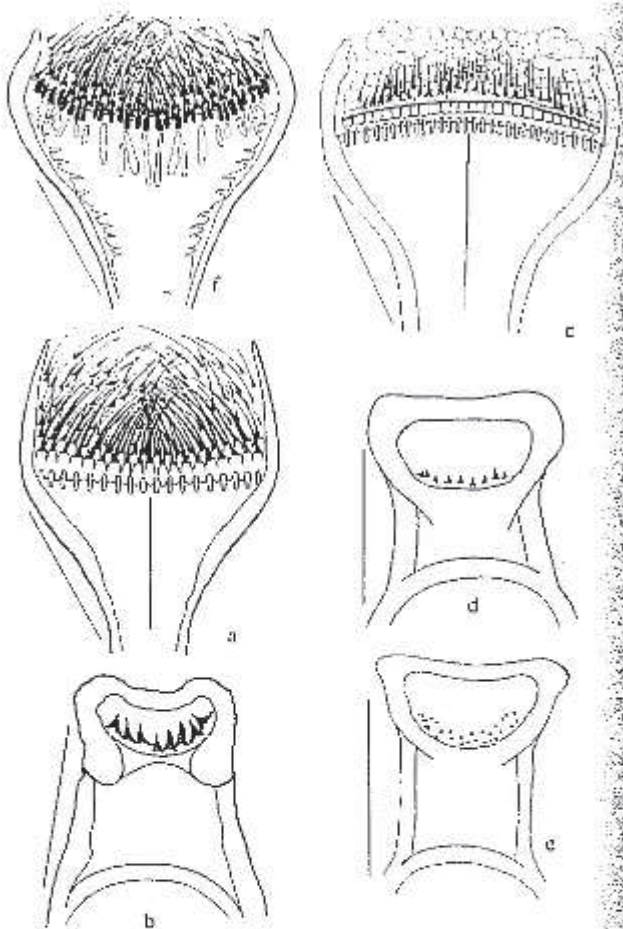


FIGURE 2: Figs a), b). *Sergentomyia capensis*. ♀. a. pharynx; b. cibarium. Figs. c) – e). *Sergentomyia haeselbarthi*. c. ♀ pharynx; d. ♀ cibarium; e. male cibarium. Fig f). *Sergentomyia cafferica*. ♀ cibarium. (scale line 0,05 mm).

Erect setae insertion scars on abdominal tergites II – VI respectively 0 – 6:0 – 2:0 – 4:0 – 4:0.

Material examined: Holotype ♂ (P1/59, SAIMR), originally labelled as *Phlebotomus capensis* De Meillon, (see Abonnenc, 1967), South Africa, Cathedral Peak (28°57'S; 29°12'E) (B.R. Stuckenberg, 7700 feet, March 1959); Paratype ♀ (P1/59, SAIMR), data as per Holotype; 1 ♂ (Paratype, *Sergentomyia briani* Lewis), South Africa, Natal, Impolweni Valley Gillets (B.R. Stuckenberg, 29.11.62); 7 ♀♀, South Africa, Natal, Hilton (29°35'S; 30°15'E) (L. G. Mason, May 1970); 4 ♂♂, South Africa, Natal, Giants Castle Game Reserve (29°12'S; 29°30'E) (B. R. Stuckenberg, 11.4.68, 5600 feet); 4 ♂♂ South Africa, Natal, Zululand, Dhinza Forest Nature Reserve, Eshowe (28°52'S; 31°30'E), (B. R. Stuckenberg, 6.12.77, alt. 500 m ex bark of tree).

Discussion: Pharyngeal armature of this species and *Sergentomyia capensis* De Meillon are similar in some respects. However differences in cibarial armature, ascoid formula and ascoid lengths are characteristic.

Sergentomyia (Capensomyia) meeseri (De Meillon & Hardy, 1953) figs. 1, 3, 14–16, 18

Phlebotomus (Sintonius) meeseri De Meillon & Hardy 1953; De Meillon, 1955.

Phlebotomus (Prophlebotomus) meeseri, Abonnenc, 1967.

Phlebotomus meeseri, Abonnenc & Minter, 1965; Zielke, 1971.

Phlebotomus (Sergentomyia) meeseri, Abonnenc, 1972.

FEMALE: (figs. 1a, 3d, 3c) Length (excluding head) 1.56 – 2.03 mm. Wing length 1.56 – 2.18 mm; breadth 0.45 – 0.60 mm. Antennal segment 3 is 0.13 – 0.20 mm, being .79 – .93 length of segments 4 plus 5; longest ascoid 0.022 – 0.030 mm, being .14 – .20 length of segment; c/b ratio 1.6 – 2.32. Antennal segment 4 is 0.075 – 0.11 mm, longest ascoid 0.025 – 0.031 mm, being .27 – .38 length of segments; c/b ratio 1.9 – 2.62. Ascoid formula 2/III – XV. Labrum 0.16 – 0.21 mm. segment 3 being .79 – .93 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:21:28:36:72.

Cibarium armed with 15 – 18 sub-equal pointed denticles on a flat plane. Pigment plate triangular lightly pigmented. Pharynx armed anteriorly to posteriorly with 1 row of large stout curved denticles and 2 rows of large rounded denticles each equipped with a long spine; remaining posterior region armed with block-shaped denticles with fine setae.

Spermathecae convoluted 0.40 – 0.50 mm in length.

Erect setae insertion scars on abdominal tergites II – VI respectively 0 – 4; 0 – 2; 0 – 4; 1 – 5; 1 – 8.

MALE: (figs. 1c, 3f, 4b) Length (excluding head and terminalia) 1.17 – 1.56 mm. Wing length 1.48 – 1.96 mm; breadth 0.32 – 0.48 mm. Antennal segment 3 is 0.135 – 0.20 mm, being .85 – 1.16 length of segments 4 plus 5; longest ascoid 0.012 – 0.024 mm, being .08 – .1 length of segment; c/b ratio 2.54 – 3.83. Antennal segment 4 is 0.08 – 0.12 mm, longest ascoid 0.019 – 0.028 mm, being .19 – .26 length of segment; c/b ratio 2.78 – 3.69. Ascoid formula 1/III – XV. Labrum 0.14 – 0.18 mm, segment 3 being .85 – 1.16 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:20:29:38:69.

Cibarium armed with 12 – 14 very small pointed denticles. Pigment plate an indistinct blob shape. Pharynx anteriorly armed with large spike like teeth, posteriorly lined with many fine spicules.

Style .08 – .09 mm in length provided with 4 spines, 2 terminal and 2 sub-terminal. Coxite .19 – .20 mm; Paramere 0.16 – 0.17 mm in length hooked apically and provided with about 6 stout elongate setae and a few shorter ones along its upper surface. Aedeagus a short cone-shape rounded apically. Genital pump 0.14 – 0.16 mm long. filaments 2.7 – 3.0 its length.

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

Material examined: Holotype and 2 Paratype ♀♀, Rhodesia Cranleigh Park or Raheen farm, Umtali (SAIMR); 28 ♀♀, South Africa, North Eastern Transvaal, Skukuza (25°S; 31°35'E), Kruger National Park, (E. Nevill, 3.12.69); 1 ♀, South Africa, North Eastern Transvaal, Lebowa, Rooipoort (24°11'S; 30°E) (I. H. Davidson); 1 ♀ and 2 ♂♂, Southern Rhodesia, 27 miles west of Beit Bridge (R. Downes, 9.8.70); 4 ♂♂ and 3 ♀♀, South Africa, North Eastern Transvaal, Fertilis (24°10'S; 30°08'E), Lebowa, (I. H. Davidson, 24.11.77, ex Hyrax rock holes); 21 ♂♂ and 9 ♀♀, South Africa, North Eastern Transvaal, Haffenden Heights (24°07'S; 30°07'E), Lebowa, (I. H. Davidson, 23/4.11.77, at light in cave).

Discussion: Pharyngeal armature may initially confuse this species with *Sergentomyia capensis* De Meillon, but cibarial armature will separate the two species.

2.3 The *namibensis* species-group

Sergentomyia (Capensomyia) namibensis (De Meillon & Hardy, 1953) figs. 1, 3, 17–20

Phlebotomus (Sintonius) namibensis De Meillon & Hardy, 1953.

Phlebotomus namibensis De Meillon, 1955; Abonnenc & Minter, 1965; Zielke, 1971.

Phlebotomus (Prophlebotomus) namibensis, Abonnenc, 1967.

Phlebotomus (Sergentomyia) namibensis, Abonnenc, 1972.

FEMALE: (figs. 1a, 4a, 4c) Length (excluding head) 1.61 – 2.03 mm. Wing length 1.61 – 2.19 mm; breadth 0.35 – 0.62 mm. Antennal segment 3 is 0.14 – 0.19 mm being .84 – 1.07 length of segments 4 plus 5; longest ascoid 0.025 – 0.032 mm, being .14 – .19 length of segment; c/b ratio 1.4 – 2.1. Antennal segment 4 is 0.085 – 0.10; longest ascoid 0.029 – 0.037 mm being .32 – .41 length of segment; c/b ratio 1.45 – 2.10. Ascoid formula 2/III – XV. Labrum 0.16 – 0.19 mm, segment 3 being .85 – 1.15 its length. Palpal formula 1,2,3,4,5 or 1,2,(3,4),5. Mean ratio of segments 10:19:32:36:71.

Cibarium with 12 – 18 short pointed denticles plus an anterior row of stout punctiform denticles. Pigment plate large, lightly to heavily pigmented. Pharynx armed with many individual elongate spines.

Spermathecae with many convolutions 0.04 – 0.045 mm in length.

Erect setae insertion scars on abdominal tergites II – VI respectively 5 – 24; 5 – 7; 4 – 27; 6 – 20; 9 – 24.

MALE: (figs. 1c, 4b, 4d) Length (excluding head and terminalia) 1.32 – 1.96 mm. Wing length 1.56 – 1.88 mm; breadth 0.37 – 0.47 mm. Antennal segment 3 is 0.16 – 0.22 mm being .85 – 1.15 length of segments 4 plus 5; longest ascoid 0.019 – 0.022 mm, being .09 – .13 length of segment; c/b ratio 1.89 – 2.87. Antennal segment 4 is 0.09 – 0.11 mm; longest ascoid 0.02 – 0.027 mm being .22 – .28 length of segment; c/b ratio 2.15 – 2.9. Ascoid formula 1/III – XV. Labrum 0.15 – 0.18 mm, being 1.05 – 1.28 its length. Palpal formula 1,2,3,4,5 or 1,2,(3,4),5. Mean ratio of segments 10:19:32:36:71.

Cibarium with 8 – 12 short pointed denticles and an anterior row of spiculate denticles. Pigment plate large but lightly pigmented. Pharynx armed with numerous irregularly shaped denticles with numerous spicules.

Style 0.10 – 0.14 mm in length equipped with 4 spatulate tipped spines, 2 terminal and 2 sub-terminal. Coxite 0.24 – 0.29 mm. Paramere 0.16 – 0.23 mm in length, hooked terminally with a number of elongate scitiferous setae along its upper surface. Aedeagus 0.12 – 0.14 mm in length, conc-shaped with a rounded tip. Genital pump 0.12 – 0.16 mm long, its filaments 3.25 – 4.10 its length.

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

Material examined: Holotype ♀ and Paratype ♂, South West Africa, Otjimbingwe (22°20'S; 16°10'E), Karabib district (25.3.50); 3 ♀♀ and 7 ♂♂, locality as per Holotype; 10 ♀♀ and 7 ♂♂, Kaokoland, 3rd Hoarusib river crossing (18°16'S; 13°14'E), near Outjo (I. H. Davidson, 17.4.77); 1 ♀, Kaokoland, 60 miles W. Ohopoho; 5 ♀♀, South West Africa, farm 'Sandmodder' (26°55'S; 18°55'E), Karasburg mountains (J. Ledger, 10.4.75); 1 ♀, South West Africa, farm

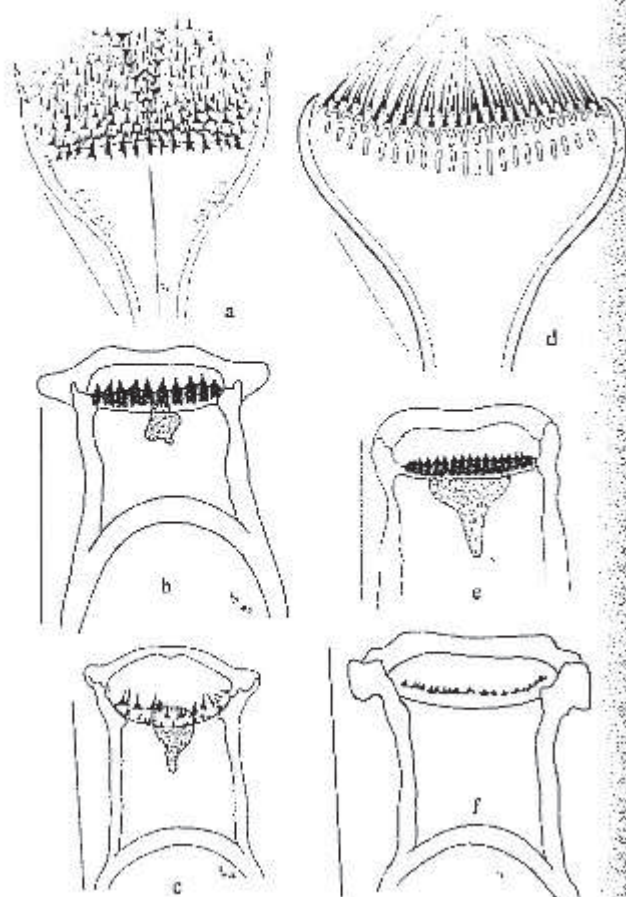


FIGURE 3: Figs. a) – c). *Sargentomyia drakensbergi* spec. nov. a. ♀ pharynx. b. ♀ cibarium. c. male cibarium. Figs. d) – f). *Sargentomyia naeseri*. d. ♀ pharynx. e. cibarium. f. male cibarium. (scale line 0.05 mm).

'Waldsee' (27°S; 17°18'E), Bethanie district (I. H. Davidson, 26.3.76). Type material SAIMR.

Discussion: Collected in the Kaokoland from the ground burrows of *Xerus princeps* (Thomas), the Kaokoland Ground Squirrel, and in the South from rock holes and at light in predominantly rocky or montane type habitat. Pharyngeal armature of this species, *Sargentomyia kalaharia* spec. nov. and *Sargentomyia xera* spec. nov. are more or less identical. The cibarial teeth of this species are shorter, more compact and placed on a flatter plane than the latter two species. There is an overlap in measurements between *Sargentomyia kalaharia* spec. nov. but cibarial armature and typical habitat separate these two species.

Sargentomyia (Capensomyia) kalaharia spec. nov. figs. 1a, 1c, 4a, 4b, 5a, 5b

FEMALE: (figs. 1a, 4a, 5a) Length (excluding head) 1.48 – 1.72 mm. Wing length 1.48 – 1.72 mm; breadth 0.34 – 0.41 mm. Antennal segment 3 is 0.12 – 0.15 mm, being .85 – .98 length of segments 4 plus 5; longest ascoid 0.025 – 0.035 mm, being .19 – .21 length of segment; c/b ratio 1.5 – 1.7.

Antennal segment 4 is 0,065 – 0,080 mm, longest ascoid 0,027 – 0,035 mm being ,40 – ,45 length of segment; c/b ratio 1,4 – 1,7. Ascoid formula 2/III – XV. Labrum 0,15 – 0,18 mm, segment 3 being ,75 – ,90 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 10:16:29:28:57.

Cibarium with 7 – 11 large elongate pointed denticles plus an anterior row of punctiform denticles. Pigment plate dark, bean seed-shaped, obscuring 4 – 5 denticles. Pharynx armed with large irregular-shaped denticles bearing spicules and short spine-like setae.

Spermathecae with numerous convolutions 0,04 – 0,05 mm long, the spermathecal ducts concentrically striated.

Erect setae insertion scars on abdominal tergites II – VI respectively 5 – 9; 3 – 5; 6 – 8; 6 – 12; 7 – 13.

MALE: (figs. 1c, 4b, 5b) Length (excluding head and terminalia) 1,09 – 1,54 mm. Wing length 1,40 – 1,56 mm; breadth 0,28 – 0,35 mm. Antennal segment 3 is 0,15 – 0,18 mm, being ,85 – ,93 length of segments 4 plus 5; longest ascoid 0,016 – 0,028 mm, being ,10 – ,16 length of segment; c/b ratio 1,9 – 2,6. Antennal segment 4 is 0,085 – 0,09 mm longest ascoid 0,023 – 0,029 mm being ,27 – ,31 length of segment; c/b ratio 2,1 – 2,4. Ascoid formula 1/III – XV. Labrum 0,13 – 0,16 mm, segment 3 being 1,0 – 1,2 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 10:18:29:28:66.

Cibarium armed with 6 – 9 large irregularly shaped denticles, apically bearing numerous spicules, plus an anterior row of punctiform denticles. Pigment plate not apparent. Pharynx armed with large irregularly shaped denticles bearing numerous spicules.

Style 0,09 – 0,12 mm long equipped with 4 spatulate tipped spines, 2 terminal and 2 sub-terminal. Coxite 0,2 – 0,22 mm. Paramere 0,16 – 0,19 mm long, hooked terminally and equipped with a number of very long stout setae along its length. Aedeagus an elongated cone with a rounded tip 0,10 – 0,13 mm long. Genital pump 0,14 – 0,16 mm long, its filaments 3,1 – 4,5 its length.

Sixth abdominal tergite darker than remaining tergites, pitted with many circular indentations with very few recumbent setae insertion scars. No erect setae insertion scars on abdominal tergites II – VI.

Material examined: Holotype ♀ (No. KN10–82), South Africa, Northern Cape Province, Kalahari Gemsbok National Park, Nossob Camp (25°15'S; 20°30'E) (I. H. Davidson, 25.2.77); 2 Paratype ♀♀ (No. KT7–83/4), South Africa, Northern Cape Province, Kalahari Gemsbok National Park, 5 miles N. Rooiputs (20°10'S; 20°50'E) (I. H. Davidson, 24.2.77); 1 Paratype ♀ (No. 81), South Africa, Northern Cape Province, Kalahari Gemsbok National Park; 1 Paratype ♀ (No. NDP52A–94) and 2 Para-

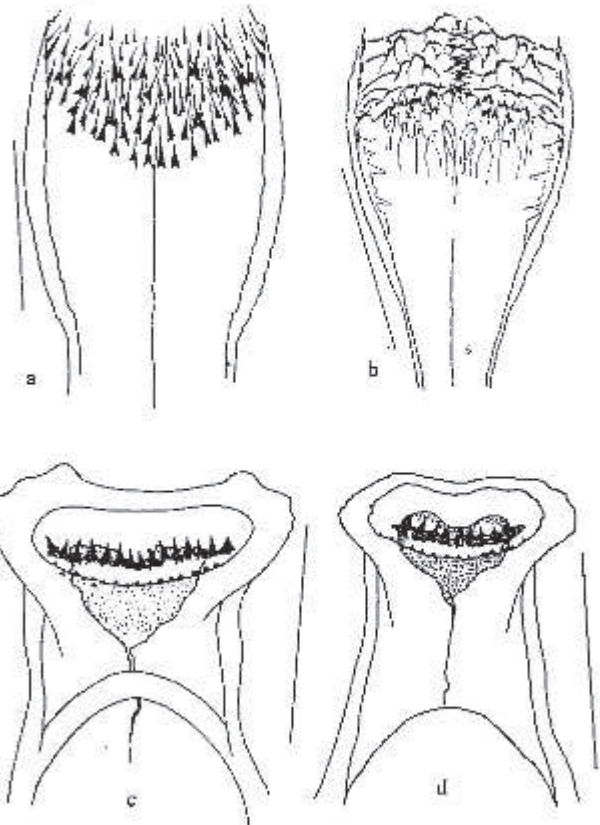


FIGURE 4: Figs. a), b). *Capensomyia* subgen. nov. *namibensis* species group. a. ♀ pharynx. b. male pharynx. Figs. c), d). *Sergentomyia namibensis*. c. ♀ cibarium. d. male cibarium. (scale line 0,05 mm).

type ♂♂ (No. NDP52A–161, 169), South West Africa, Namib Desert Park, Zebra Pan (23°15'S; 15°30'E) (I. H. Davidson, 29.4.77); 3 Paratype ♂♂ (No. SL22–173/4/5), South West Africa, farm 'MacKenzie' (23°26'S; 18°45'E), Leonardville (I. H. Davidson, 1.3.77); All material in SAIMR except 1 Paratype ♂ (No. SL22–173) and 1 Paratype ♀ (No. KT7–84) in BMNH.

Discussion: This species and *Sergentomyia xera* spec. nov. would appear to be very closely associated with *Xerus inauris* (Zimmermann), the Cape Ground Squirrel. In one locality, the Namib Desert Park, both species were collected from the same burrows indicating that these two species are sympatric, at least over some of their range. Cibarial and pharyngeal armature of both species is very similar, the shapes of the pigment plates being different. Antennal segments 3 and 4 and their ascoids differ markedly in their lengths.

Sergentomyia (Capensomyia) xera spec. nov.
figs. 1a, 1c, 4a, 4b, 5c, 5d.

FEMALE: (figs. 1a, 4a, 5c) Length (excluding head) 1,56 – 2,03 mm. Wing length 1,79 – 2,19 mm; breadth 0,48 – 0,57 mm. Antennal segment 3 is 0,21 – 0,26 mm being 1,0 – 1,1 length of segments 4 plus

5; longest ascoid 0,045 – 0,055 mm being ,18 – ,28 length of segment; c/b ratio 1,2 – 1,45. Antennal segment 4 is 0,10 – 0,125 mm; longest ascoid 0,050 – 0,060 mm being ,40 – ,57 length of segment; c/b ratio 1,3 – 1,55. Ascoid formula 2/III – XV. Labrum 0,17 – 0,21 mm, segment 3 being 1,1 – 1,35 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 10:18:32:33:77.

Cibarium equipped with 6 – 11 large elongate pointed denticles plus an anterior row of a few punctiform denticles. Pigment plate triangular in shape, lightly pigmented. Pharynx armed with many spiculate denticles.

Spermathecae with many convolutions 0,05 – 0,06 mm in length.

Erect setae insertion scars on segments II – VI respectively 13 – 32; 13 – 30; 14 – 36; 13 – 28; 10 – 20.

MALE: (figs. 1c, 4b, 5d) Length (excluding head and terminalia) 1,25 – 1,72 mm. Wing length 1,56 – 1,88 mm; breadth 0,28 – 0,35 mm. Antennal segment 3 is 0,23 – 0,29 mm being ,9 – 1,1 length of segments 4 plus 5; longest ascoid 0,04 – 0,055 mm, being ,15 – ,19 length of segment; c/b ratio 1,5 – 2,0. Antennal segment 4 is 0,11 – 0,15 mm; longest ascoid 0,045 – 0,055 mm being ,32 – ,40 length of segment; c/b ratio 1,7 – 1,95. Ascoid formula 1/III – XV. Labrum ,14 – ,16 mm, segment 3 being 1,6 – 2,0 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 10:18:33:32:76.

Cibarium armed with 7 – 8 teeth, most with several points, and an anterior row of punctiform denticles. Pigment plate miniscule or not apparent. Pharynx armed with irregular-shaped denticles bearing numerous spicules.

Style 0,11 – 0,13 mm in length is equipped with 4 spatulate tipped spines, 2 terminal and 2 sub-terminal; Coxite 0,25 – 0,28 mm; Paramere is 0,22 – 0,26 mm in length with a hooked tip and with a number of elongate strong setae arising along its ventral surface; Aedeagus 0,12 – 0,15 mm long is an elongated cone-shape with a rounded tip; Genital pump 0,15 – 0,18 mm long, filaments 2,9 – 3,5 its length.

Erect setae insertion scars on abdominal tergites II – VI respectively 4 – 8; 2 – 5; 0 – 4; 0 – 2; 0.

Material examined: Holotype ♀ (No. NDP52A-90), South West Africa, Namib Desert Park, Zebra Pan (23°15'S; 15°30'E) (I. H. Davidson, 29.4.77); 6 ♀♀ Paratype (No. NDP52A-92/3, 95-98) and 9 Paratype ♂♂ (No. NDP52A-162-168, 170/2), data as per Holotype; 1 Paratype ♀ (No. 91) and 1 Paratype ♂ (No. 171), South West Africa, Gobabis (22°25'S; 18°55'E) (13 and 22.3.71). 43 ♂♂ specimens not designated, locality as per Holotype. All ex *Xerus inauris* (Zimmermann) ground burrows. All in SAIMR except 1 ♂ Paratype

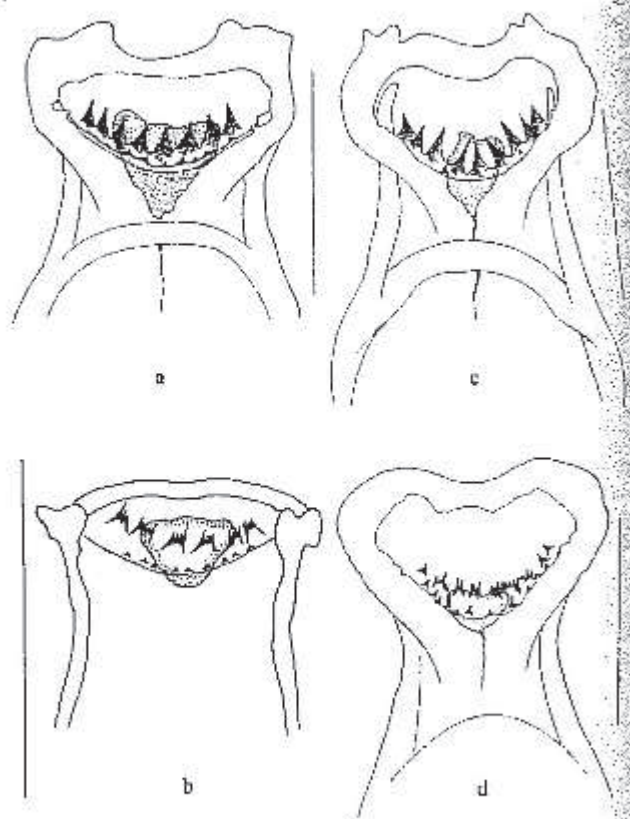


FIGURE 5: Figs. a), b). *Sergentomyia kalaharia* spec. nov. a. ♀ cibarium. b. male cibarium. Figs. c), d). *Sergentomyia xera* spec. nov. c. ♀ cibarium. d. male cibarium. (scale line 0,05 mm).

(No. NDP52A-162) and 1 ♀ Paratype (No. NDP52A-92) in BMNH.

Discussion: See under *Sergentomyia kalaharia* spec. nov.

This species name is taken from the generic name of its host species (*Xerus inauris*) which is derived from the Greek word *Xeros* meaning dry or arid;

2.4 Key to species

FEMALES:

1. Pharynx 3 – 5 times as broad posteriorly as anteriorly, very elaborately and ornately armed; Eastern species of Southern African sub-continent (*cafferica* species group) 2.
 - Pharynx not as above; Western species of Southern African sub-continent (*namibensis* species group) 6.
2. Ascoid formula 2/IV – XV 3.
 - Ascoid formula 2/III – XV 4.
3. Ascoid IV = 0,04 – 0,05 mm; c/b IV = 1,25 – 1,4 *haeselbarthi* (Abonnenc), 1967.
 - Ascoid IV = 0,02 – 0,028 mm; c/b IV = 2,1 – 2,7 *drakensbergi* spec. nov.

4. AIII = 0,26 mm; Ascoid III = 0,065 mm; cibarium with 40 sub-equal teeth.
 *caffraria* (De Meillon & Lavoipierre), 1944
 - Not as above 5
5. Cibarium with 15 - 19 sub-equal pointed denticles on a flat plane; AIV = 0,075 - 0,11 mm; AIII/AIV + V = ,79 - ,93.
 *meeseri* (De Meillon & Hardy), 1953
 - Cibarium with 7 - 9 irregularly placed large pointed denticles on a convex arch; AIV = 0,090 - 0,10 mm; AIII/AIV + V = ,74 - ,8 *capensis* (De Meillon), 1955
6. AIII = 0,21 - 0,26 mm; Ascoid III = 0,045 - 0,055 mm; Ascoid IV = 0,05 - 0,06 mm *xera* spec. nov.
 - Not as above 7
7. Cibarium with 12 - 18 short pointed denticles; AIV = 0,08 - 0,10 mm; Asc IV/AIV = ,32 - ,41 mm
 *namibensis* (De Meillon & Hardy), 1953
 - Cibarium with 7 - 11 large elongate pointed denticles; AIV = 0,065 - 0,08 mm; Asc IV/AIV = 0,4 - 0,45
 *kalaharia* spec. nov.

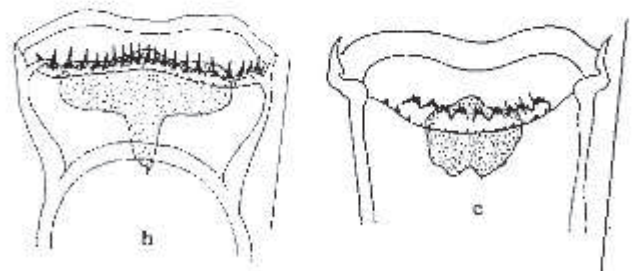
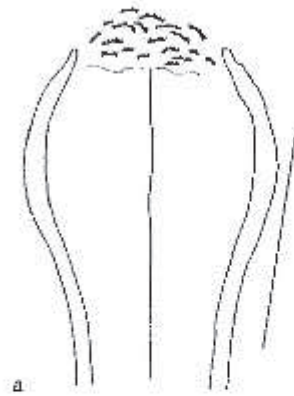


FIGURE 6: Figs. a) - c). *Sergentomyia meilloni*. a. ♀ pharynx. b. ♀ cibarium. c. male cibarium.

MALES:

1. Ascoid formula 1/IV - XV 2
 - Ascoid formula 1/III - XV 3
2. AIII = 0,19 - 0,22 mm; AIV = 0,11 - 0,13 mm
 *haeselbarthi* (Abonnenc), 1967
 - AIII = 0,13 - 0,15 mm; AIV = 0,09 - 0,095 mm
 *drakensbergi* spec. nov.
3. AIII = 0,23 - 0,29 mm; Asc III = 0,04 - 0,055 mm; AIII/E = 1,6 - 2,0 mm *xera* spec. nov.
 - Measurements less than above 4
4. AIII/E = ,85 - 1,16; c/b IV = 2,78 - 3,69; AIII/AIV + V = ,77 - ,87; c/b III = 2,54 - 3,83 *meeseri* (De Meillon & Hardy), 1953
 - AIII/E = 1,0 - 1,3; c/b IV = 2,1 - 2,9; AIII/AIV + V = ,85 - 1,15 mm; c/b III = 1,89 - 2,67 5
5. AIV = 0,09 - 0,11 mm; Cibarium with 8 - 12 short pointed denticles *namibensis* (De Meillon & Hardy), 1953
 - AIV = 0,085 - 0,09 mm; Cibarium with 6 - 9 irregular-shaped denticles apically bearing numerous spicules *kalaharia* spec. nov.

Sergentomyia (Sintonius) meilloni (Sinton, 1932) figs. 2, 4, 25-27

Phlebotomus meilloni Sinton, 1932; Kirk & Lewis, 1948; Abonnenc & Minter, 1965; Zielke, 1971.

Phlebotomus (Sintonius) meilloni, Kirk & Lewis, 1951; De Meillon, 1955.

Phlebotomus (Prophlebotomus) meilloni, Abonnenc, 1967.

Phlebotomus (Sergentomyia) meilloni, Abonnenc, 1972.

FEMALE: (figs. 1b, 6a, 6b) Length (excluding head) 1,87 - 2,19 mm. Wing length 1,97 - 2,35 mm; breadth 0,54 - 0,68 mm. Antennal segment 3 is 0,28 - 0,35 mm, being 1,01 - 1,16 length of segments 4 plus 5; ascoid length 0,03 - 0,045 mm, being ,10 - ,15 length of segment; c/b ratio 1,7 - 2,5. Antennal segment 4 is 0,13 - 0,16 mm; ascoid length 0,035 - 0,043 mm, being ,2 - ,3 length of segment; c/b ratio 2,56 - 3,4. Ascoid formula 2/III - XV. Labrum 0,23 - 0,28 mm, segment 3 being 1,15 - 1,35 its length. Palpal formula 1,2,3,4,5. Mean ratio of segments 10:29:42:52:95.

Cibarium armed with a row of 13 - 17 elongate pointed denticles placed on a slightly convex plane, plus an anterior row of punctiform denticles. Pigment plate large, mushroom-shaped, heavily pigmented. Pharynx narrowed anteriorly to its anterior width and armed lightly with ridges of spiculate denticles.

Spermathecae with 9 - 14 segmentations 0,04 - 0,045 mm long.

Erect setae insertion scars on abdominal tergites II - VI respectively 12 - 29; 8 - 28; 9 - 25; 6 - 18; 2 - 8.

MALE: (figs. 1d, 6c) Length (excluding head and terminalia) 1,48 – 2,19 mm. Wing length 2,03 – 2,44 mm; breadth 0,54 – 0,68 mm. Antennal segment 3 is 0,33 – 0,42 mm, being ,98 – 1,05 length of segments 4 plus 5; ascoid length 0,02 – 0,035 mm, being ,05 – ,095 length of segment; c/b ratio 2,6 – 6,3. Antennal segment 4 is 0,16 – 0,21 mm, ascoid length 0,023 – 0,035 mm, being ,14 – ,20 length of segment; c/b ratio 4,0 – 7,4. Ascoid formula 1/III – XV. Labrum 0,2 – 0,26 mm, segment 3 being 1,45 – 1,69 its length. Palpal formula 1,2,3,4,5. Mean ratio 10:30:46:58:103.

Cibarium armed with 8 – 14 square denticles each provided with a number of spicules posteriorly. An anterior row of punctiform denticles is present. Pigment plate small but dense. Pharynx narrowed posteriorly to its anterior width and armed very lightly with ridges of spiculate denticles.

Style 0,11 – 0,14 mm in length provided with 4 spines, 2 terminal and 2 sub-terminal; Coxite 0,24 – 0,28 mm; Paramere 0,18 – 0,22 mm in length, hooked terminally, its dorsal surface bearing many short setae; Aedeagus 0,06 – 0,08 mm long, a very short pointed cone-shape; Genital pump 0,11 – 0,16 mm long, filaments 3,6 – 5,2 its length.

Erect setae insertion scars on abdominal tergites II – VI respectively 4 – 11;3 – 9;0 – 5;0 – 4;0.

Type designation: Sinton (1932) designated from 4 ♀♀ and 7 ♂♂ from the same locality 1 type ♀ and 3 Paratype ♀♀ as well as 1 type ♂ and 3 Paratype ♂♂ specimens. The Paratype preparations are however labelled as co-types. The material is distributed as follows: BMNH, 1 ♂ type, 1 ♀ co-type, + 2 ♂♂ not designated; SAIMR, 1 ♀ co-type and 1 ♂ not designated. The remainder of the designated material is assumed to be lost. As first reviser it is my prerogative to designate the type ♂ (BMNH) as Holotype and the 2 remaining co-type ♀♀ as Paratypes.

Material examined: (Measurements taken from 10 of each sex). 1 ♀ (co-type), South Africa, North Eastern Transvaal, Letsitele, Tzaneen (De Meillon, 1. 3. 32); 1 ♂, data as per co-type; 5 ♀♀ and 44 ♂♂; South Africa, North Eastern Transvaal, farm 'Jalfray', 16 miles E. Tzaneen (I. H. Davidson, 18 – 21.1.77); 12 ♀♀ and 10 ♂♂, South Africa, North Eastern Transvaal, farm 'Hope', Phalaborwa (B. McIntosh, January 1977, 25/6.2.77); 1 ♀ and 1 ♂, South Africa, Lebowa, Rooipoort (24°11'S; 30°E) (I. H. Davidson, 19.1.77); 2 ♀♀ and 19 ♂♂, South Africa, N. Transvaal, Levuwhe (22°45'S; 30°25'E) (D. L. Theron, 22.4.76); 1 ♀ and 4 ♂♂, South Africa, Transvaal, farm 'Kaalplaas', Onderstepoort (B. McIntosh, January 1977, 9.12.75); 2 ♀♀, South Africa, N. Transvaal, farm 'Cleavesley', Elim Hospital (E. Nevill, 14.2.72); 1 ♀, South Africa, E. Transvaal, farm 'Ludwicks Lust', Hectorspruit; 4 ♀♀ and 10 ♂♂,

South Africa, N. Transvaal, Letaba, Mamitwa (D. L. Theron, 28.2.75); 1 ♀ and 5 ♂♂, South Africa, E. Transvaal, Modjadji, Madumelane (D. L. Theron, 26.11.74); 1 ♀, South Africa, N. Transvaal, Sibasa Area, Matangari (B. De Meillon, 23.10.74); 1 ♀, South Africa, Letaba District, Mengoma; 1 ♀, South Africa, Hlabeleni, Modjadji (D. L. Theron, 27.11.74); 1 ♀ and 4 ♂♂, Swaziland, Croydon (8.3.49); Swaziland, Mbabane, (Maustbaum); 1 ♀, Mocambique, Quelimane, Aguas Quentes (3.6.40); 1 ♀ and 1 ♂, Rhodesia, Salisbury, Cranleigh Park (28.1.46); 1 ♀ and 6 ♂♂, Rhodesia, Salisbury, Cranleigh Park and Umtali, farm 'Raheen' (1946 + 1949); 5 ♀♀ and 6 ♂♂, Rhodesia, 'Raheen', Umtali; 1 ♀, South West Africa, Windhoek (E. Zielke, 6.3.70).

Discussion: The only species of true *Sintonius* known in southern Africa. Habitat preference is rather difficult to analyse in view of the fact that a large number of the specimens have been caught at light. Those specimens collected by myself have been from rock holes in otherwise flat sandy grassveld to African mud-huts in montane areas surrounded by high cliffs.

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