Taxonomy of the Muscidae (Diptera) of Namibia: A Key to Genera, Diagnoses, New Records and Description of a New Species

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Taxonomy of the Muscidae (Diptera) of Namibia: a key to genera, diagnoses, new records and description of a new species

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ABSTRACT

The Muscidae (Diptera) of Namibia were previously known to comprise 42 species in 16 genera. The study of material from the Namibia National Insect Collection, National Museum of Namibia and the Albany Museum (South Africa) loaned to the authors enabled this paper to be written, in which three new generic records and 14 new species records are provided and one new species is described. With the present contribution, the muscid fauna of Namibia is now known to comprise 57 species in 19 genera, with Musca L. being the most species-rich genus. A key to the identification of all recorded genera is provided and diagnoses of the genera and species found in the material studied are provided when pertinent. Musca fragilis sp. n. is described from the Khorixas District.

INTRODUCTION

The muscid fauna of the Afrotropical Region was last catalogued by Pont (1980). More recent contributions include those by Deeming (1987) and Dike (1989, 1990) for Afrotropical Atherigona Rondani, and Couri et al. (2006), with a partial revision of the muscid fauna of Madagascar.

Forty-two muscid species in 16 genera are recorded from Namibia in the published literature. Pont (1980) specifically cited only five species for Namibia—Atherigona falcata (Thomson, 1869); Musca lasiophthalma Thomson, 1869; M. transvaalensis Zielke, 1971; Lispe barbipes Stein, 1908; and Spilogona aristalis Zielke, 1971—as individual countries were only cited in the Afrotropical Catalogue if distribution was limited. The other records from Namibia are covered in the catalogue collectively as “Eastern to southern Africa”, “Congo Basin to South Africa”, etc.

This study is based on material loaned from the Namibian National Insect Collection, National Museum of Namibia (Windhoek, Namibia) and the Albany Museum (Grahamstown, South Africa). As a result of the study the number of recorded species is raised to 57 species in 19 genera. The present paper also provides a key for the identification of genera, diagnoses of genera and species when pertinent and the description of one new species.

MATERIAL AND METHODS

This review is largely based on material from Namibia deposited in the National Museum of Namibia, Windhoek, Namibia (NMNW) and the Albany Museum, Grahamstown, South Africa (AMGS), kindly loaned at different periods to MSC and CJBC by Ashley H. Kirk-Spriggs (now National Museum, Bloemfontein, South Africa).
specimens are deposited in the Museu Nacional, Universidade Federal do Rio de Janeiro (MNRJ) and Pe. Jesus Santiago Moure Entomological Collection in Curitiba, Paraná, Brazil (DZUP).

Dissected terminalia have been placed in glycerine in microvials pinned beneath the respective specimens.

Terminology follows McAlpine (1981), and for the special characters of *Atherigona*, such as the trifoliate process, Pont (1986) and Pont & Magpayo (1995). “Postpedecel” is used for “antennal flagellomere”, following Stuckenberg (1999).

Data on the distributions of the species are mainly taken from the Afrotropical catalogue (Pont 1980). Genera, and species within genera, are listed alphabetically. Comments on genera or species are added when pertinent. Material examined sections are arranged alphabetically by region.

### TAXONOMY

**Key to the genera of Muscidae from Namibia (modified from Couri et al. 2006)**

1. Proboscis adapted for piercing: elongate, strongly sclerotised and non-retractile, tapering from a broad base to a slender apex, with labella atrophied
   - Proboscis not adapted for piercing: moderately or weakly sclerotised and retracted into head, not tapering strongly to apex, with labella well developed, often fleshy

2. Palpus shorter than half length of proboscis; 1 species
   - Palpus about as long as proboscis

3. Arista with dorsal branches only; notopleuron without setulae; 1 species
   - Arista with dorsal and ventral branches; notopleuron setulose; 1 species

4. Head angular in profile, with long face and postpedicel; antenna long, inserted above mid level of eye; presutural dorsocentral setae very short and fine, almost indistinct from ground setulae; 11 species
   - Head shape not as above; antenna short or long, inserted below mid level of eye; presutural dorsocentral setae well developed, very rarely not differentiated from ground setulae

5. Anepimeron setulose
   - Anepimeron bare

6. Lower calypter of the *Musca*-type, *i.e.*, inner margin at first following margin of scutellum then diverging abruptly outward into more-or-less broadly truncated apical margin
   - Lower calypter of the *Phaonia*-type, *i.e.*, inner margin diverging immediately and at right-angles from supra-squamal ridge; tongue-like in shape

7. Body black or bluish black, not metallic shiny green or blue; mid tibia without ventral seta
   - Body shiny metallic green or blue; mid tibia with strong ventral seta

8. Vein $M$ with an angular forward bend towards vein $R_{4+5}$; 18 species
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*Stomoxys* Geoffroy

*Haematobia* Le Peletier & Serville

*Haematobosca* Bezzi

*Atherigona* Rondani

*Musca* Linnaeus
– Vein $M$ with a smoothly rounded forward curve towards vein $R_{4+5}$; 1 species ................................................................. *Morellia* Robineau-Desvoidy

9 Suprasquamal ridge setulose (Fig. 2); greater ampulla setulose; 2 species ................................................................. *Neomyia* Walker

– Suprasquamal ridge bare; greater ampulla bare; 3 species ................................................................. *Pyrellia* Robineau-Desvoidy

10 Palpus greatly enlarged in apical part, spoon-like; parafacial with setulae; prosternum bare; all wing veins bare; 4 species ................................................................. *Lispe* Latreille

– Palpus not enlarged, narrow; parafacial bare; prosternum setulose or, if bare, base of vein $R_{4+5}$ with setulae on lower wing surface .................................................. 11

11 Prosternum bare; 3 or 4 pairs of postsutural dorsocentral setae; acrostichals 3:3, strongly developed; 1 species ................................................................. *Pseudohelina* Vockeroth

– Prosternum setulose; 2, 3 or 4 pairs of postsutural dorsocentral setae; acrostichals 1:2, developed; 2 species ................................................................. *Dichaetomyia* Malloch

12 Wing with subcosta running in smooth even curve from humeral cross-vein to costa; body colour metallic black or blue; gena with a strong differentiated upcurved seta; ♀ ocellar triangle shiny, long or short, almost reaching lunule; ♀ frons with one pair of proclinate orbital setae and one pair of inclinate interfrontal setae; 2 species .... ................................................................. *Hydrotaea* Robineau-Desvoidy

– Wing with subcosta with a slightly sinuous course from humeral cross-vein to costa, not smoothly bowed; body colour not metallic black or blue; gena without a differentiated upcurved seta; ♀ ocellar triangle short and dusted; ♀ frons without proclinate orbital or inclinate interfrontal setae ................................................... 13

13 Wing with at least 1 setula on ventral surface of $R_s$ node or base of $R_{4+5}$ ....... 14

– Wing without setulae on ventral surface of $R_s$ node and on base of vein $R_{4+5}$ .... 16

14 Prosternum with many lateral setulae; proboscis with labella reduced; prealar seta absent; anterior katepisternal seta present; 4 species ................................................................. *Limnophora* Robineau-Desvoidy

– Prosternum bare or only with 1–2 setulae on either side; proboscis with labella developed; prealar seta present or absent; katepisternal seta present or absent.... 15

15 Anterior katepisternal seta absent; lower calypter broad and truncated, of the *Musca*-type (see couplet 6 for description); vein $R_{4+5}$ without dorsal setulae; 1 species..... ................................................................. *Graphomya* Robineau-Desvoidy

– Anterior katepisternal seta present; lower calypter not broad and truncated, tongue-shaped, of the *Phaonia*-type (see couplet 6 for description); $R_{4+5}$ with a few dorsal setulae basally [other characters: veins $Sc$, $Rs$ and $M$ setulose, usually as follows: vein $R$ before humeral cross-vein, on both surfaces; basal part of $Sc$, on both surfaces; ventral surface of $R_{4+5}$ almost to cross-vein $r–m$; both surfaces of $M$ to beyond cross-vein $dm–cu$; ventral surface of $Cu$]; 1 species............. *Dimorphia* Malloch

16 Proboscis with labella not reduced and prestomal teeth barely developed, and prementum dusted; prealar seta present; katepisternal setae not 1:1:1 ................. 17

– Proboscis with labella usually reduced and/or prestomal teeth strongly developed, and prementum shiny, undusted; prealar seta absent; katepisternal setae 1:1:1, placed at the angles of an imaginary equilateral triangle ........................................... 19
Fifteen species of Muscidae are added to the 42 species previously recorded from Namibia, including one new species. The Namibian muscid fauna is now known to contain 57 species and subspecies assigned to 19 genera (Appendix).

Genus *Atherigona* Rondani, 1856

*Atherigona* (see Couri et al. 2006, for diagnosis) contains 126 species in the Afrotropical Region, 14 in the subgenus *Acritochaeta* Grimshaw, 1901 and 112 in the subgenus *Atherigona* s.str. (Pont 1980). Deeming (1971, 1979) studied the species from Nigeria and Comoros Archipelago, respectively. Dike (1989) presented a key for the identification of the Afrotropical species and described new species from Africa. One year later (Dike 1990) described two new species from Nigeria and presented a key for the Afrotropical species of the subgenus *Acritochaeta*. More recently, Couri *et al.* (2006) described three new species of the subgenus *Atherigona* and presented two new records, one of each subgenus from Madagascar.

Nine species of *Atherigona* have previously been recorded from Namibia; eight from subgenus *Atherigona*: *A. bedfordi* Emden, 1940 (Deeming 2000: 284, Brandberg Massif); *A. falcata* (Thomson, 1869) (Deeming 1975: 2, Ongeama); *A. hyalinipennis* Emden, 1959 (Deeming 2000: 284, Brandberg Massif); *A. lineata ugandae* Emden, 1940 (Deeming 2000: 284–285, Brandberg Massif); *A. naqvii* Steyskal, 1966 (Deeming 1975: 2, Daan Viljoen; Deeming 2000: 285, Brandberg Massif); *A. rubricornis* Stein, 1913 (Deeming 2000: 286, Brandberg Massif); *A. tetrastigma* Paterson, 1956 (Lindner 1976: 79, Krumhuk and Daan Viljoen); *A. theodori* Hennig, 1963 (Deeming 2000: 286, Brandberg Massif) and one from *Acritochaeta* subgenus: *A. orientalis* Schiner, 1868 (Pont 1992: 64, Otjikoko Süd Farm 33 miles ENE Omaruru).

Among the studied material, only one species was found, *A. mitrata*, which represents a new record for Namibia.

*Atherigona mitrata* Séguy, 1955

Diagnosis: Frons strongly projecting; markedly yellow; palpus pale yellow; pedicel yellow, postpedicel grey pollinose, scutum grey; postpronotum and legs yellow, except fore femur brown on apical third of dorsal and anterior surfaces, fore tibia and tarsus light brown.
Material examined: NAMIBIA: Oshikoto, 6–26.vii.1986, J. Irish, Malaise trap (1♂ MNJR, 1♂ DZUP, other NMNW).

Distribution: Cameroun, Namibia, Nigeria, Zimbabwe and Zambia.

Genus Coenosia Meigen, 1826

Coenosia is the largest muscid genus occurring in the Afrotropical Region, with 110 described species (Pont 1980). Couri et al. (2006) recently described a new species from Madagascar and Pont (2009) described a new species from the Seychelles. See Couri et al. (2006) for generic diagnosis. Coenosia strigipes Stein, 1916 is the only species recorded from Namibia (Emden 1958: 7, “S. W. Africa”). This species was found in the material examined.

Coenosia strigipes Stein, 1916

Diagnosis: Legs yellow, including coxae; arista extremely short, plumose; postpedicel black (yellow in some  ); small species, <4 mm in length.

Material examined: NAMIBIA: Caprivi, 1♂ 2♀ [10 specimens without abdomen] Katima Mulilo Dist., Ndopu village, 1 km SE Bukalo, SE1724Da, 14–20.iv.2006, A.H. Kirk-Spriggs, Malaise trap (AMGS).

Distribution: Widespread in Afrotropical Region (including Aldabra, Astove, Cape Verde and Madagascar Is.), Namibia and the Palaearctic Region.

Genus Dichaetomyia Malloch, 1921

Dichaetomyia is a species-rich genus in the Afrotropical Region, with 35 species in the subgenus Dichaetomyia s.str. and 30 in the subgenus Panaga Curran, 1928 (Pont 1980; Couri et al. 2006). Both subgenera are widespread in the Afrotropical Region, and Panaga is restricted to it. The subgenus Panaga can be distinguished by the presence of setulae or stiff setulae on the greater ampulla (infra-alar bulla), which is bare in the subgenus Dichaetomyia. See Couri et al. (2006) for generic diagnosis. Dichaetomyia cuthbertsoni Emeden, 1942 was recorded by Zielke (1971a: 176, Otjiwarongo, Farm Abechaus), whilst D. luteiventris (Rondani, 1873) represents a new record for Namibia.

Dichaetomyia luteiventris (Rondani, 1873)

Diagnosis: Scutum grey pollinose, scutellum and abdomen dark yellow; dorsocentral setae 2+3; scutellum with setulae on lateral wall; fore tibia without median posterior seta.

Material examined: NAMIBIA: Caprivi: 1♂ 2♀ Katima Mulilo Dist., Ndopu village, 1 km SE Bukalo, SE1724Da, 14–20.iv.2006, A.H. Kirk-Spriggs, Malaise trap (AMGS). Erongo: 5♀ Namib-Naukluft Park, Namib desert Research Station, Kuiseb River, 23°33’34”S 15°02’38”E, 420 m, 15–23.i.1997, I. Kapofi & M.E. Irwin, Malaise trap in riparian vegetation (1♀ MNJR, 1♀ DZUP, other NMNW). Kavango: 1♀ Kaudun Game Reserve, 6 km E Soncana, 19°58’32”S 20°39’36”E, 18–21.i.1991, E. Marais. Omaheke: 1♂ Kehoro Witvei, i.1968, Pack. Oshikoto: 3♂ 10♀ Etosha Nat. Park, Helio, 19°01’S 16°30’E, 27.iv–24.v.1988, E. Griffin, pitfall traps; 1♂ Etosha Nat. Park, Kaneseb, 19°04’S 16°41’E, 9.viii–14.ix.1987, E. Griffin, pitfall traps; 1♂ 1♀ Etosha Nat. Park, S Mushara, 18°37’31”S 16°53’E, 6.vii–11.viii.1987, E. Griffin, pitfall traps; 1♀ Etosha Nat. Park, 19°03’S 15°52’E, 12.ii–16.iii.1987, E. Griffin, pitfall traps; 1♀ Etosha Nat. Park, Bloubokdraai, 18°50’34”S 16°57’E, 15.ii–13.iii.1987, E. Griffin, pitfall traps. Otjozondjupa: 1♂ 1♀ Okahandja, 17.xii.1968, F. Gaerdes Collection; 1♀ Waterberg Plateau Park, Restcamp Fountain, 20°30’S 17°14’E, 18.iv.1993, M. Pusch & E. Marais, light trap (all NMNW).

Distribution: Widespread continental Afrotropical Region, Oriental Region to Indonesia (Java, Sumatra and Sulawesi).
Genus *Dimorphia* Malloch, 1922

Known only from the Afrotropical Region, with five recorded species (Pont 1980). *Dimorphia tristis* (Wiedemann, 1819) was recorded from Namibia by Zielke (1971a: 180, “Südwestafrika, Port Elizabeth”) but this is clearly erroneous as Port Elizabeth is in the Eastern Cape Province of South Africa. No species of *Dimorphia* was found among the studied material.

Genus *Graphomya* Robineau-Desvoidy, 1830

Thirteen species of *Graphomya* have been recorded from the Afrotropical Region. See Couri et al. (2006) for generic diagnosis. The genus and the species *G. maculata* (Scopoli, 1763) represent new records for Namibia.

*Graphomya maculata* (Scopoli, 1763)

Diagnosis: With characteristic pattern on scutum different in each sex. Male scutum dark brown, including median area, with 2 silvery white vittae along dorsocentral rows of setae and 2 silvery white lateral vittae; scutellum with median triangular brown macula, wider at base, with grey pollinose areas laterally; abdomen predominantly yellow, with brown median marks and brown tergite 5. Female scutum with silvery areas more extensive than in ♂ including median area; abdomen grey with brown median and lateral marks.

Material examined: NAMIBIA: Kavango 1♀ Popa Falls, 18°07'S 21°33'E, 26–31.viii.1971, [State Museum staff] (NMNW).

Distribution: Widespread in the Afrotropical, Neotropical, Oriental, Australasian-Pacific and Palaearctic Regions.

Genus *Gymnodia* Robineau-Desvoidy, 1863

Twenty-two species are recorded from the Afrotropical Region (Pont 1980). *Gymnodia ÀH* (Wiedemann, 1830), was recorded from Namibia by Pont (1977: 367, Omaruru), but was not found among the studied material.

Genus *Haematobia* Le Peletier & Serville, 1828

Represented by six species in the Afrotropical Region. The genus and one species are here recorded from Namibia for the first time. Zumpt (1973) revised the Afrotropical fauna.

*Haematobia throuxi* (Roubaud, 1906)

Diagnosis: Overall length 2–3.5 mm; prosternum bare; anal vein short, ending abruptly about half distance to wing margin; palpus club-shaped; fore tibia without submedian ventral seta.
Material examined: NAMIBIA: Kapango: 1♀ 2♂ Mahango Game Park, Okavango River, 18°13'19"S 21°45'10"E, 18–19.x.1999, A.H. Kirk-Spriggs, T. Pape & W. Hauwanga, Malaise trap (NMNW).

Distribution: Widespread continental Afrotropical and southern Palaearctic regions.

Genus Haematobosca Bezzi, 1907

Eleven species of Haematobosca are recorded from the Afrotropical Region. A key to world species was provided by Pont & Dsouli (2009). The genus and one species are recorded from Namibia for the first time.

Diagnosis: General coloration dark; palpus long, as long as proboscis, grooved internally and dilated apically; arista with setulae on dorsal and ventral surfaces.

Haematobosca uniseriata (Malloch, 1932)

Diagnosis: Overall length 3–5 mm; wing veins without setulae; meron and proepisternal depression bare; prosternum with lateral setulae.

Material examined: NAMIBIA: Erongo: 1♀ Brandberg, below Wasserfallfläche, 21°10’43”S 14°32’51”E, 18–22.iii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap. Oshikoto: 2♂ Etoha Nat. Park, 18°43’S 14°35’E, 5.v.1987, J. Irish & E. Marais. Kapango: 1♀ Rundu Dist., Sovo, Mile 46 camp, 18°18’06.7”S 19°15’30”E, 21–24.iv.2001, E. Marais, S. Kasch & K. Vohland (all NMNW). Omaheke: 6♂ 6♀ Gobabis District, Somerkoms 521, 22°01’59”S 18°57’22”E, 6–8.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap (1♀ MNRJ, 1♂ DZUP, other NMNW); 1♀ 2♂ Gobabis Dist., De Hoek 878, 21°56’26”S 20°58’55”E, 3–6.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap. Otjozondjupa: 2♂ Tsumkwe Dist., Nama, 19°54’34”S 20°44’08”E, 20–22.xii.1998, A.H. Kirk-Spriggs, E. Marais & D.J. Mann, Malaise trap; 2♂ Gautseke Pan, Bushmanland, 19°48’S 20°35’E, 9–13.vi.1971, [State Museum staff] (all NMNW).

Distribution: Southern Africa.

Genus Helina Robineau-Desvoidy, 1830

Helina is one of the most species-rich genera of Afrotropical Muscidae, with 99 species (Pont 1980; Couri et al. 2006). See Couri et al. (2006) for generic diagnosis. Two species are recorded from Namibia: H. coniformis (Stein, 1903) (Lindner 1976: 79, Ongeama) and H. lucida (Stein, 1913) (Lindner 1976: 79, Krumhuk). Both species were found among the material examined, and H. icterica (Séguy, 1937) and H. usitata Emden, 1951 represent new records for Namibia.

Helina coniformis (Stein, 1903)

Diagnosis: Femora predominantly yellow, tibiae yellow, tarsi brown; fore tibia with posterior seta; mid tibia with 3 posterior setae, without anterodorsal setae; hind tibia with 3 anterodorsal setae, 2 anteroventral, with short posterodorsal setae in apical ¼; wing without maculae.

Material examined: NAMIBIA: Caprivi: 1♂ 2♀ Katima Mulilo Dist., Salambala campsite, 17°50’01”S 24°36’09”E, 1–4.iii.2001, A.H. Kirk-Spriggs, Malaise trap; 1♀ Katima Mulilo Dist., 4 km NE of Salambala, 17°49’21”S 24°36’07”E, 25.ii.–1.iii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap (all NMNW).

Distribution: Widespread in East and central Africa to southern Africa, Annobon I., eastern Mediterranean and South Yemen.

Helina icterica (Séguy, 1937)

Diagnosis: 1 postsutural intra-alar; meron with short setulae on dorsal part; legs yellow, tarsi brown; fore tibia with posterior seta; mid tibia with 2 posterior setae, without
anterodorsal setae; hind tibia with 2 anterodorsal, 1 or 2 anteroventral, without post-
erodorsal setae; wing with brown maculae on crossveins r–m and dm–cu.

Material examined: NAMIBIA: Oshikoto: 11♀ Tsumeb Dist., Ghaub 47, 19°28′S 17°00′E, 16–26.vii.1986, J. Irish, Malaise trap (1♂ MNRJ, 2♂ DZUP, other NMNW).

Distribution: Cameroun, Namibia and Nigeria.

**Helina lucida** (Stein, 1913)

Diagnosis: Scutum with an Anthomyia-pattern, with a transverse brown band just behind suture, partially or entirely interrupted by grey dust along the dorsocentral rows of setae; fore tibia with posterior seta; mid tibia with 2 posterior setae, without anterodorsal setae; hind tibia without posterodorsal setae; wing hyaline, without brown maculae.

Material examined: NAMIBIA: Erongo: 2♂ 2♂ Brandberg, below Wasserfallfläche, 21°10′43″S 14°32′51″E, 18–22.iii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap (NMNW); 4♂ 2♂ Brandberg Dist., Mason Shelter, 21°04′30″S 14°05′43″E, 1750 m, 5–14.iii.2002, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed (1♂ MNRJ, 1♂ DZUP, other NMNW). **Kunene**: 5♂ Khorixas Dist., Leeukop 664, 19°53′15″S 14°21′44″E, 26–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed; 1♂ Opwo Dist., Sesfontein Fort, 18°07′15″S 13°37′03″E, 1–3.i.2000, E. Marais, D.J. Mann & D. Newman, sweeping. **Omahahe**: 1♂ Gobabis Dist., De Hoek 878, 21°56′26″S 20°58′55″E, 3–6.i.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap (all NMNW).

Distribution: East Africa to southern Africa.

**Helina usitata** Emden, 1951

Diagnosis: Antenna, palpus and femora brown; tibiae predominantly yellow; fore tibia without posterior seta; mid tibia with 2 posterior setae, without anterodorsal setae; hind tibia with 2 anterodorsal, 1 anteroventral and posterodorsal setae; wing with brown maculae on crossveins r–m and dm–cu.

Material examined: NAMIBIA: 1♂ Lüderitz [District], Skorpion area, 27°49′S 16°36′E, 9–12.viii.1997, E. Marais & A.H. Kirk-Spriggs, Malaise trap (NMNW).

Distribution: Kenya, Namibia and Uganda.

**Genus Hydrotaea** Robineau-Desvoidy, 1830

Represented by 22 species in the Afrotropical Region, one of which has been recorded from Namibia. For generic diagnosis, see Couri et al. (2006). **Hydrotaea capensis** (Wiedemann, 1818) was recorded from Namibia by Emden (1948: 170, Windhoek); Zielke (1971a: 176, Otjiwarongo, Farm, Abechaus); and Lindner (1976: 79, Ongeama) and was also found among material examined here. **Hydrotaea jeanneli** Séguy, 1938 represents a new record for Namibia.

**Hydrotaea capensis** (Wiedemann, 1818)

Diagnosis: Body with strong bluish gloss; eye emarginate at middle of posterior margin; lower calypter white, with whitish border; male fore tarsi entirely black; mid femur with 1 or 2 setae near base.

Material examined: NAMIBIA: Caprivi: 1♀ Katima Mulilo Dist., Ndopu village, 1 km SE Bukalo, SE1724Da, 14–20.iv.2006, A.H. Kirk-Spriggs, Malaise trap (AMGS); 2♂ Riverside 135, Bethanie SE2626Ca, 23–16.x.1971, [State Museum staff] (all NMNW).

Distribution: Widespread in Afrotropics (incl. Fernando Póo, St Helena and Socotra Is.); Palaearctic Region to China, India, Sri lanka; USA; Chile, Argentina and Brazil.
Hydrotaea jeanneli Séguy, 1938

Diagnosis: Eye bare; acrostichal setulae forming 2 rows; prealar seta absent; male fore femur concave at anteroventral apex; mid tibia with anteroventral seta near apical third; hind tibia without distinct posterodorsal seta; abdominal syntergite 1+2 grey-dusted in posterior half.

Material examined: NAMIBIA: Kavango $XQWUDQJ 175°45'10"E, 18–19.x.1999, A.H. Kirk-Spriggs, T. Pape & W. Haungwa, Malaise trap (1♀ MRJ, 1♂ DZUP, other NMMW); 1♂ West Caprivi Pk., Susuwe, Kwando R., 17°45'37"S 23°20'55"E, 28.i.x.–2.x.1999, A.H. Kirk-Spriggs, Malaise trap dry woodland; 1♂ West Caprivi Pk., 18 rest-stop, 17°48'56"S 24°16'31"E, 13–15.xii.1999, E. Marais, D.J. Mann & D. Newman, elephant dung. Omaheke: 2♂ Gobabis Dist., Somerkoms 521, 22°01'59"S 19°57'22"E, 6–8.xi.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap. Caprivi: 1♀ Katima Mulilo Dist., Salambala campsite, 17°50'01"S 24°36'09"E, 1–4.xi.2001, A.H. Kirk-Spriggs, Malaise trap. Ojozondjupa: 3♂ Tsumkwe Dist., 1 km of Nhoma River, 19°10'00"S 20°36'09"E, 28.xii.1998, E. Marais, A.H. Kirk-Spriggs & D.J. Mann, Malaise trap; 1♂ Tsumkwe Dist., 2 km W of Xawasha pan, 19°09'57"S 20°52'55"E, 26–27.xi.1998, E. Marais, A.H. Kirk-Spriggs & D.J. Mann, Malaise trap; 1♂ Tsumkwe Dist., Xawasha pan, 19°09'58"S 20°54'40"E, 27.xii.1998, A.H. Kirk-Spriggs, Malaise trap; 1♂ Tsumkwe Dist., Aha Hills, 19°47'36"S 20°59'51"E, 21–25.xii.1998, E. Marais, A.H. Kirk-Spriggs & D.J. Mann, Malaise trap (all NMMN).

Distribution: Cameroon, Democratic Republic of Congo, Kenya, Namibia, Tanzania, Uganda and Zimbabwe.

Genus Limnophora Robineau-Desvoidy, 1830

Limnophora is another species-rich Afrotropical muscid genus, with 76 described species (Pont 1980; Couri et al. 2006). See Couri et al. (2006) for generic diagnosis. Three species are recorded from Namibia: L. quaterna (Loew, 1852) (Emden 1951: 409, “S.W. Africa”, as L. notabilis Stein in Becker 1903; Emden 1956: 517, “S.W. Africa”, as L. notabilis; Lindner 1976: 79, Ongeama, as L. notabilis); L. simulans Stein, 1913 (Lindner 1976: 79, Ongeama); L. thomasseti Emden, 1951 (Emden 1951: 423, Hoffnung).

None of the three recorded species was found among the studied material. Limnophora obsignata (Rondani, 1866) is newly recorded for Namibia.

Limnophora obsignata (Rondani, 1866)

Diagnosis: Male holoptic; arista plumose, with individual branches longer than width of postpedicel; scutum with postsutural transverse brown fascia, not extending back medially as brown vitta that reaches scutellum, scutellum pale-dusted at apex; postsutural dorsocentrals 4; mid tibia with 2 or 3 posterior setae.

Material examined: NAMIBIA: Caprivi: 1♂ 2♀ Katina Mulilo Dist., Salambala campsite, 17°50'01"S 24°36'09"E, 22–24.xi.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap. Erongo: 1♂ 2♀ Brandberg, below Wasserfallfläche, 21°10'43"S 14°32'51"E, 18–22.xi.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap (all NMMW). Kunene: 11♂ 63♀ Khorixas Dist. Leeukop 664, 19°53'15"S 14°21'44"E, 26–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed (1♂ 1♀ MRJ, 1♂ 1♂ DZUP, other NMMW).

Distribution: Widespread throughout Africa, including Madagascar and Socotra I.; and southern Europe, east to Iran.

Genus Lispe Latreille, 1797

Lispe is represented by 50 species in the Afrotropical Region, four of which have been recorded from Namibia: L. barbipes Stein, 1908 (Zielke 1974: 43, 10 miles SE Namutoni and 10 miles N Marienthal, Hardap Dam); L. irvingi Curran, 1937 (Lindner 1976: 79, Windhoek, identification queried by the author); L. leucospila (Wiedemann,
Diagnosis: Frontal triangle reaching lunule; palpus yellow; dorsocentral setae 1+3; crossvein dm–cu straight; femora brownish grey, tibiae yellow; fore tibia with posteroventral seta; mid tibia with 1 posterodorsal seta; hind tibia with 1 or 2 anteroventral setae; abdomen with dark brown lateral maculae, strongly grey-pollinose on median vitta and laterally, around the maculae.

Material examined: NAMIBIA: Caprivi: 2♂ 1♀ Katima Mulilo Dist., Salambala pan, 17°50′01″S 24°36′09″E, 1–4.i.2001, A.H. Kirk-Spriggs, Malaise trap; 3♂ 4♀ same except 17°50′00″S 24°35′58″E; 3♂ Katima Mulilo Dist., Salambala, 4 km NE of, 17°49′21″S 24°36′07″E, 25.i–i.i.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap (all NMNW). *Erongos*: 34♂ 26♂ Brandberg Dist., Mason Shelter, 21°04′39″S 14°05′43″E, 1750 m, 5–14.i.2002, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed (1♂ 1♀ MNRJ, 1♂ 1♀ DZUP, other NMNW); 3♂ 1♀ Brandberg, below Wasserfallfläche, 21°10′43″S 14°32′51″E, 18–22.i.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap; 1♂ Brandberg, Sonusib Ravine, 1435 m, 21°04′54″S 14°36′95″E, 2.xii.2000, E. Marais & W. Mey, Malaise trap. *Kavango*: 1♂ 2♀ Takuasa [= Takwasa], SE1720Cd, 14–19.vii.1971, [State Museum staff]; 1♂ Kaudom Game Reserve, Leeupan, 18°40′S 20°52″E, 25.xi.1992, E. Marais & M. Pusch. *Khomas*: 3♂ 10♂ Windhoek District, Regenstein 32, 22°43′04″S 17°01′54″E, 1–8.iii.1999, E. Marais & A.H. Kirk-Spriggs, Malaise trap; 1♂ Windhoek, Koreangab Dam, SE2217Ca, 12.ii.1971, [State Museum staff]. *Kunene*: 1♂ Khorixas Dist., Leeukop 664, 19°33′15″S 14°21′44″E, 26–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed. *Oshikoto*: 10♂ 4♀ Tsumeb Dist., Ghaub 47, 19°28′S 17°00′E, 16–26.vii.1986, J. Irish, Malaise trapping; 1♂ 5♀ Tsumeb, Otjikoto Lake, SE1917Ba, 17.ii.1972, [State Museum staff]; 1♂ 4♀ Etosha Nat. Park, Narawanda road, 18°51′04″S 15°32′55″E, 24–25.xi.1999, E. Marais, D.J. Mann & D. Newman, MMN22.MV/UV light; 1♂ 2♂ Etoha Nat. Park, Okondeka plains, 19°02′06″S 15°49′47″E, 23.xii.1999, E. Marais, D.J. Mann & D. Newman, MMN18.MV/light; 1♂ Etoha Nat. Park, Sproikeswoud, 19°05′S 15°37″E, 11.i–13.i.1987, E. Griffin, pitfall traps; 3♂ Etoha Nat. Park, Klippan, 19°04′S 14°26″E, 8.v.1987, E. Marais & J. Irish; 1♂ 1♀ Etoha Nat. Park, Dorsland, 18°43′S 14°52′E, 4.v.1987, E. Marais & J. Irish; 1♂ Etoha Game Park, Dorsland, 18°43′S 14°52′E, 11.v–16.v.1986, E. Marais & J. Irish, preservation pitfall traps; 2♂ Etoha Nat. Park, Vredekoppies Perdekamp, 19°20′S 16°54″E, 15.i.1987, J. Irish & E. Marais; 1♂ Etoha Nat. Park, Okakuejo, 19°10′S 15°53′E, 12.ii.1989, E. Marais & J. Irish; 1♂ Etoha Nat. Park, Halali, 19°02′S 16°58″E, 18–20.i.1987, E. Marais & J. Irish; 1♂ Etoha Nat. Park, Starkpark, 18°57′S 14°32′E, 9–10.v.1987, E. Marais & J. Irish; 1♂ Etoha Nat. Park, Kaross, 19°23′S 14°33″E, 6.v.1987, J. Irish & E. Marais; 2♂ Etoha Nat. Park, Otjozasandu, 19°15′S 14°30″E, 7.v.1987, J. Irish & E. Marais. *Otjozondjupa*: 1♂ Bushmanland, Gutsche Pan, 19°48′ S 20°35″E, 9–13.vi.1971, [State Museum staff]; 4♂ 3♀ Otjiwarongo, Otjihaenamaparero 92, SE2116Ab, 16.x.1971, [State Museum staff] (all NMNW).

Distribution: Widespread in the Afrotropical Region (including Cape Verde, Socotra Is., South Yemen), Mediterranean subregion, Oriental Region and New Guinea.

Genus *Morellia* Robineau-Desvoidy, 1830

Sixteen species of the genus are recorded from the Afrotropical Region (Pont 1980, 2006). *Morellia nilotica* (Loew, 1856) was recorded from Namibia by Zielke (1971c: 68, “Süd-West-Afrika”), but was not included in the material examined.

Genus *Musca* Linnaeus, 1758

*Musca* is represented by 39 species in the Afrotropical Region 13 of which were previously recorded from Namibia: *M. albina* Wiedemann, 1830 (Patton 1936: 480, “South-West Africa”; Emden 1948: 173, “South-West Africa”; Zielke 1970: 501, Zessfontein; Zielke 1971a: 174, Okahandja; Zielke 1971c: 108, “Sud-West-Afrika”); *M. alpesa* Walker, 1849 (Bezzi 1908: 190, Rooibank in the hinterland of Walvischbay);
Musca conducens Walker, 1860 (Lindner 1976: 78, Ongena, Okahandja, Swakopmund, Walvis Bay and Gobabeb); Musca confisca Speiser, 1924 (Zielke 1971c: 124, “Süd-West-Afrika”, as M. fasciata Stein, 1910); Musca domestica calleva Walker, 1849 (Zielke 1974: 4–5, 10 miles NW Windhoek); Musca domestica domestica Linnaeus, 1758 (Bezzi 1908: 190, Prince of Wales Bay and Lüderitz Bay; James 1947: 140, “South-West Africa”; Paterson 1960: 397, Outjo; Zielke 1971a: 173, Otjiwarongo, Farm Abechaus; Lindner 1976: 78, Ongena); Musca freedmani Paterson, 1957 (Paterson 1957: 108, Kalahari; Zielke 1970: 502, Kalahari); Musca lasiophthalma Thomson, 1869 (Malloch, 1929: 114, Windhoek, actually labelled Farm Otijitueza, 66 km NE of Windhuk, as Lissasterna polita Malloch; Zielke 1970: 504, Ohopoho; Zielke 1971c: 130, “Süd-West-Afrika”; Lindner 1976: 79, Gobabeb); Musca tempestatum Bezzi, 1908 (Zielke 1971a: 174, Otjiwarongo, Farm Abechaus; Zielke 1971c: 117, “Süd-West-Afrika”); Musca xanthomelaena Wiedemann, 1824 (Zielke 1970: 504, Aminuis and Karibib; Zielke 1971c: 128, “Süd-West-Afrika”).

The following species are new for Namibia: Musca crassirostris, Musca hugonis, Musca patersoni, Musca ventrosa and Musca fragilis sp. n. No specimens of Musca alpesa, Musca confisca, Musca domestica domestica or Musca freedmani were included in the material examined.

Musca albina Wiedemann, 1830

Diagnosis: Eye bare; anterior spiracle white; postalar ridge without setulae; proepisternal depression bare; dorsocentral setae 0+1; katepisternal setae absent; fore tibia without posterior seta in apical half, mid tibia with 2 or 3 posterior setae.

Material examined: NAMIBIA: Caprivi: 1♂ West Caprivi Park, Nova, 5 km N, 18°09′56″S 21°44′31″E, 16–18.xii.1999, E. Marais, D.J. Mann & D. Newman. Erongo: 2♂ Brandberg Dist., Mason Shelter, 21°04′39″S 14°05′43″E, 1750 m, 5–14.iii.2002, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed. Kavango: 1♂ Hereroland East, Eiseb River, Western Veterinary Fence, 20°38′S 20°05′E, 17.xi.1988, E. Marais. Kunene: 1♂ Opuwo Dist., Sesfontein Fort, 18°07′15″S 13°37′03″E, 1–3.1.2000, E. Marais, D.J. Mann & D. Newman, sweeping; 1♂ Khorixas Dist., Leeukop 664, 19°53′15″S 14°21′44″E, 26–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed (all NMNW). Omaheke: 4♂ Gobabis Dist., Somerkoms 521, 22°01′59″S 19°57′22″E, 6–8.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap (♂ MNRJ, ♀ 1 DZUP, other NMNW). 1♂ De Hoek 878, 21°56′26″S 20°58′55″E, 3–6.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap sample; 1♂ Hereroland East, Epukuro River, 30 km NE Steenboklagte, 21°18′S 20°35′E, 23.xi.1988, E. Marais (all NMNW).

Distribution: In xeric areas of the Afrotropical and southern Palaearctic regions and the Indian subregion.

Musca conducens Walker, 1859

Diagnosis: Eye bare; scutum brown with grey pollinosity, with four dark brown vittae; dorsocentral setae 2+4; proepisternal depression bare; anterior spiracle white; legs dark brown; fore tibia with posterior seta; mid tibia with about 4 posterior setae.
Material examined: NAMIBIA: *Caprivi*: 1♀ 4♂ Katima Mulilo Dist., Salambala pan, 17°50′00″S 24°35′58″E, 1–4.iii.2001, A.H. Kirk-Spriggs, Malaise trap; 4♂ Katima Mulilo Dist., Salambala campsite, 17°50′01″S 24°36′09″E, 22–24.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap; 1♀ 2♂ same except 1–4.iii.2001, A.H. Kirk-Spriggs (all NMNW). *Erongo*: 3♂ Brandberg Dist., Mason Shelter, 21°04′39″S 14°05′43″E, 1750 m, 5–14.iii.2002, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed (MNRJ, DZUP, NMNW). *Kavango*: 3♂ Rundu Dist., Sovo, 18°18′37″.2″S 19°15′36″.7″E, 21–24.iv.2001, E. Marais, S. Kasch & K. Vohland, Malaise trap, deciduous woodland (NMNW). *Kunene*: 1♀ 1♂ Khorixas Dist., Leeukop 664, 19°53′15″S 14°21′44″E, 26–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed (1♂ MNRJ, 1♂ DZUP, other NMNW).

Distribution: Widespread in the Afrotropical and Oriental regions, Middle East, eastwards to China and Melanesia.

*Musca crassirostris* Stein, 1903

Diagnosis: Eye bare; proboscis swollen, boat-shaped, with strongly developed pre stomal teeth; palpus yellow; anterior spiracle dark brown; postalar ridge without setulae; proepisternal depression bare; scutum brown, with grey pollinosity and 4 dark brown vittae behind suture; dorsocentral setae 2+4; fore tibia without posterior seta in apical half; mid tibia with strong anteroventral seta on middle third.

Material examined: NAMIBIA: *Caprivi*: 1♀ 8♂ Katima Mulilo Dist., Ndpou village, 1 km SE Bukalo, SE17242A, 14–20.iv.2006, A.H. Kirk-Spriggs, Malaise trap (AMGS); 1♀ Katima Mulilo Dist., Salambala campsite, 17°50′01″S 24°36′09″E, 22–24.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap. *Kavango*: 1♀ Rundu Dist., Katara, 17°48′56″S 18°53′38″E, 20–23.1.1998, A.H. Kirk-Spriggs & E. Marais, sweeping marginal grasses & reeds; 1♂ same, except 17°48′56″S 18°53′38″E, Malaise trap. *Khomas*: 1♂ 2♂ Windhoek Dist., Kupferberg 33°22′40.65″S 16°59′18.5″E, 20.xii.2000, Malaise trap, Marais & S. Kasch (NMNW).

Distribution: Widespread in the Afrotropical Region (including Cape Verde and Socotra Is.); North Africa, Middle East; Oriental Region to Taiwan and Lombok.

*Musca domestica calleva* Walker, 1849

Diagnosis: *Musca domestica* L., 1758, *sensu lato*, differs from all other species recorded from Namibia in having fine setulae on the proepisternal depression. The subspecies *M. d. calleva* differs from *M. d. domestica* and *M. d. curviforceps* Saccà & Rivosecchi, 1956, by having the presutural and first few postsutural dorsocentral setae reduced and barely half the length of the posterior two pairs of postsutural dorsocentral setae.

Material examined: NAMIBIA: *Caprivi*: 1♀ West Caprivi Park, Nova, 5 km N, 18°09′56″S 21°44′31″E, 16–18.xii.1999, E. Marais, D.J. Mann & D. Newman, Warthog burrows. *Erongo*: 1♂ 1♀ Brandberg Dist., below Wassertalfläche, 21°10′43″S 14°32′51″E, 18–22.iii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap; 3♂ Brandberg Dist., Mason Shelter, 21°04′39″S 14°05′43″E, 1750 m, 5–14.iii.2002, A.H. Kirk-Spriggs & E. Marais, Malaise trap. *Kavango*: 1♀ Rundu Dist., Kuring-Kuru, 6.vii.1965, S. Stein; 1♀ Rundu Dist., Mile 46 Agric. Research Station, 18°18′22″S 19°15′24″E, 21–24.iv.2001, E. Marais, S. Kasch & K. Vohland. *Khomas*: 1♂ Windhoek, 22°34′S 17°05′E, iii.1985, [State Museum staff]. *Kunene*: 2♂ Khorixas Dist., Leeukop 664, 19°53′15″S 14°21′44″E, 26–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed; 1♀ Khorixas Dist., Hoanib R near Dubis, 19°13′36″S 13°22′84″E, 28.xii.1999, E. Marais, D.J. Mann & K. Vohland, elephant dung (all NMNW).

Distribution: Widespread and common in the Afrotropics (incl. Aldabra, Astove, Madagascar, Seychelles and Socotra Is.), North Africa and Middle East, Azores, Canary Is.

*Musca fragilis* sp. n.

Figs 1–5

Etymology: From Latin *fragilis* (fragile).
Diagnosis: *Musca fragilis* sp. n. is very small with a shiny brown scutum, contrasting markedly with the shiny translucent yellow abdominal tergites 1+2–4.

Description (based on holotype):

Overall length: 3.8 mm.

**General colouration:** Scutum shiny brown, abdomen shiny yellow, with translucent tergites 1+2–4, tergite 5 brown, with grey pollinosity; fronto-orbital plate and parafacial brown, silver pollinose from certain angles; lunule reddish brown; antenna, arista and palpus dark brown; anterior spiracle brown; calypters whitish; haltere with yellow knob. Wing hyaline. Legs uniformly brown, pulvilli white.

**Head:** Eyes well developed, closely approximated, separated at vertex by distance slightly wider than diameter of ocellar triangle. Fronto-orbital plate narrow. Vertical setae more distinct. Antenna inserted below mid level of eye; postpedicel about 1.8× as long as pedicel. Arista with long plumes. Palpus filiform, of equal diameter throughout its length.

**Thorax:** Acrostichals 0+1; dorsocentra 2+4, first two postsutural setae short, last long; 2 postpronotals; 1 presutural; 2 intra-alar; 1 supra-alar; prealar absent. Notopleuron with 2 setae, similar in size, disc without setulae. Postalar ridge bare. Scutellum with

Figs 1–5. *Musca fragilis* sp. n., male: (1) sternite 5; (2, 3) cercal plate and surstyli, dorsal (2) and lateral (3) views; (4, 5) phallic complex, dorsal (4) and lateral (5) views.
basal and apical pair of long setae and short preapical pair. Anepisternum with series of 5 fine setae. Katepisternals 1+2, all of similar size; disc of katepisternum with some fine setulae. Anepimeron setulose; meron bare. Lower calypter of the Musca-type. Wing veins bare. Fore femur with complete rows of posterodorsal and posteroventral setae; fore tibia without posterior median seta. Mid femur with 1 anterior median seta; 1 ventral seta in basal third and 2 subapical posterior setae; mid tibia with 2 posterior setae on mid third and one strong apical ventral seta. Hind femur with complete rows of setae on anterodorsal and anteroventral surfaces, the setae on anteroventral row are stronger on apical half than on basal half; hind tibia with long dorsal preapical seta.

Abdomen: All tergites clothed in fine setae, the setae are a little longer on marginal rows and on discal row of tergite 5.

Terminalia: Cercal plate as high as wide; surstylus large (Figs 2, 3). Aedeagus as in Figs 4, 5.

Holotype: ♂ NAMIBIA: Khorixas District, Leeukop 664, 19°53′15″S 14°21′44″E, 26–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap sample riverbed (NMNW).

Paratype: ♂ same data as holotype (MNRJ).

Musca hugonis Pont, 1980

Diagnosis: Eye bare; postalar ridge without setulae; proepisternal depression bare; scutum brown with grey pollinosity and 4 dark brown vittae; fore tibia with 1 posterior seta in apical ½; mid tibia with anteroventral setae in apical half.

Material examined: NAMIBIA: Caprivi 8♂ Katima Mulilo Dist., Salambala pan, 17°50′00″S 24°35′58″E, 1–4.iii.2001, A.H. Kirk-Spriggs, Malaise trap (1♂ MNRJ, 1♂ DZUP, other NMNW); 5♂ Katima Mulilo Dist., Salambala campsite, 17°50′01″S 24°36′09″E, 1–4.iii.2001, A.H. Kirk-Spriggs, Malaise trap. Hardap: 2♂ Mariental Dist., Viljoenskroon 507, 26°08′39″S 19°57′11″E, 7–9.ii.1998, E. Marais & A.H. Kirk-Spriggs. Kunene: 4♂ Khorixas Dist., Leeukop 664, 19°53′15″S 14°21′44″E, 26–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed. Omahweke: 1♂ Gobabis Dist., Somerkoms 521, 22°01′59″S 19°57′22″E, 6–8.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap (all NMNW).

Distribution: Botswana, Namibia and South Africa.

Musca lasiophthalma Thomson, 1869

Diagnosis: Eye densely hirsute; scutum brown, with grey pollinosity and 4 dark brown vittae; presutural dorsocentral setae absent or setula-like, postsutural setae 1 pair; proepisternal depression bare; anterior spiracle white; legs dark brown; fore tibia with posterior seta; mid tibia with 4 posterior setae.

Material examined: NAMIBIA: Caprivi: 2♂ Katima Mulilo Dist., Ndopu village, 1 km SE Bukalo, SE1724Da, 14–20.iv.2006, A.H. Kirk-Spriggs, Malaise trap (AMGS).

Distribution: Democratic Republic of Congo, Nigeria, eastern and southern Africa, Yemen.

Musca lusoria Wiedemann, 1824

Diagnosis: Eye bare; fronto-orbital plate and gena silvery pollinose; anterior spiracle white; dorsocentral setae 2+4; proepisternal depression bare; scutum dark brown, with grey pollinosity and 4 dark brown vittae; dorsocentral setae 2+4; vein R₄₊₅ with row of ventral setulae extending at least to r–m crossvein; fore tibia without posterior seta in apical half.
Material examined: NAMIBIA: *Caprivi*: 2♂ 15♀ Katima Mulilo Dist., Ndpou village, 1 km SE Bukalo, SE1724Da, 14–20.iv.2006, A.H. Kirk-Spriggs, Malaise trap (AMGS); 3♀ Katima Mulilo Dist., Salambala pan, 17°50′00″S 24°35′58″E, 1–4.iii.2001, A.H. Kirk-Spriggs, Malaise trap; 3♀ Katima Mulilo, Salambala, 4 km NE, 17°49′21″S 24°36′07″E, 25.i–1.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap (all NMNW); 1♂ 10♀ Katima Mulilo Dist., Salambala campsites, 17°50′01″S 24°36′09″E, 22–24.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap (1♀ MNRJ, 1♀ DZUP, other NMNW); 1♂ same except 1–4.iii.2001, A.H. Kirk-Spriggs; 1♀ Mudumu Game Reserve, Nakatwa, 18°11′S 23°25′E, 8–13.i.1992, E. Marais & M. Pusch. *Erongo*: 2♂ Namib-Naukluft Park, Namib Desert Research Station, Kuiseb River, 23°33′45″S 15°02′38″E, 420 m, 15–23.1.1997, I. Kafop & M.E. Irwin, Malaise in riparian vegetation; 1♀ Brandberg, below Wasserdalfläche, 21°10′43″S 14°32′51″E, 18–22.iii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap; 2♂ Brandberg, Mason Shelter, 21°04′39″S 14°05′43″E, 1750 m, 5–14.iii.2002, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed. *Hardap*: 1♀ Mariental Dist., Viljoenskroon 507, 25°10′S 19°58′E, 24–25.xii.1995, E. Marais; 1♀ Rehoboth, Ella West 427, 4.ix.1972, [State Museum staff]; 1♀ Fischersbrunn, Diamond Area 2, 24°39′S 14°43′E, 20–21.v.1984, J. Irish & H. Liessner. *Karas*: 1♀ Bethanie, Riverside 135, 23–16.x.1971, [State Museum staff]; 1♀ Keetmanshoop, Nouchabeb 97, 7–12.i.1972, [State Museum staff]. *Kavango*: 1♀ Popa Falls, 18°07′S 21°33′E, 26–31.vii.1971, [State Museum staff]; 2♂ Andara, 20–25.viii.1971, [State Museum staff]; 1♀ Shadkongora, 24.vii.1971, [State Museum staff]; 1♀ Rundu Dist., Mile 46 Agricultural Research Station, 18°18′22″S 19°15′24″E, 21–24.viii.2001, E. Marais, S. Kasch & K. Vohland, Malaise trap; 1♀ Rundu, Sovo, 18°18′37″S 19°15′36″E, 21–24.iv.2001, E. Marais, S. Kasch & K. Vohland, Malaise trap. *Khomass*: 1♀ Windhoek, Avis Dam, 27–28.ii.1974, [State Museum staff]; 1♀ Windhoek, Ospemambawa, 22°30′S 17°30′E, 2–7.ii.1984, H. Liessner; 1♀ Windhoek Dist., 22°34′S 17°05′E, 1984, [State Museum staff]; 1♀ Windhoek Dist., Wasserkallei 382, 21–23.xii.1973, [State Museum staff]; 4♀ Windhoek, Arnhem 222, 23–27.x.1972, [State Museum staff]. *Kunene*: Khorixas Dist., Leeukop 664, 19°53′15″S 14°21′44″E, 26–30.x.2001, 2♂ 1♀ Kirk-Spriggs & Marais, Malaise trap, riverbed. *Omaseke*: 2♂ Gobabis Dist., Somerkoms 521, 22°01′59″S 19°57′22″E, 6–8.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap; 1♀ Gobabis Dist., De Hoek 878, 21°56′26″S 20°58′55″E, 3–6.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap. *Oshikoto*: 2♂ Tsumeb, Ghaub 47, 19°28′S 17°00′E, 16–26.vi.1986, J. Irish, Malaise trapping; 1♀ Etosha N.P., Onundo Hills, 19°15′S 15°43′E, 8.viii.–16.ix.1987, E. Griffin, preservation pitfall traps; 1♀ Omaruru Dist., Okatjerute 66/Otjikete 07, 17.xi.1971, [State Museum staff] (all NMNW).

Distribution: Widespread in the continental Afrotropical Region, Indian subregion, Egypt and Iran.

*Musca patersoni* Zielke, 1971

Diagnosis: Eye bare; anterior spiracle white; postalar ridge without setulae; proepisternal depression bare; scutum dark brown with grey pollinosity and 4 brown vittae; dorsocentral setae 2+4; vein $R_{4+5}$ with 1 ventral seta at base; fore tibia without posterior seta in apical half.

Material examined: NAMIBIA: *Oshikoto*: 1♂ Etosha Game Park, 18°30′S 16°45′E, 19.v.–26.vi.1986, E. Griffin, pitfall traps (NMNW).

Distribution: Democratic Republic of Congo, Namibia and Rwanda.

*Musca sorbens* Wiedemann, 1830

Diagnosis: Eye bare; postalar ridge without setae; proepisternal depression bare; scutum brown with grey pollinosity and 2 dark brown vittae behind suture; dorsocentral setae 2+4; meron setulose below spiracle; anterior spiracle white or pale yellow; fore tibia without posterior seta in apical half; mid tibia with $ca$ 4 posterior setae.

Material examined: NAMIBIA: *Erongo*: 5♀ Brandberg Dist., Mason Shelter, 21°04′39″S 14°05′43″E, 1750 m, 5–14.iii.2002, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed (1♀ MNRJ, 1♀ DZUP, other NMNW). *Karas*: 1♀ 1♂ Lüderitz [District], Rooberg, 27°38′S 16°28′E, 22–24.iv.1997, A.H. Kirk-Spriggs & E. Marais, Malaise trap; 1♂ Lüderitz [District], Klinghardt Mnts., 27°20′04″S 15°46′00″E, 27.vi.–3.ix.1998, A.H. Kirk-Spriggs & E. Marais, Malaise trap; 1♀ Lüderitz [District], Oibib Waters, 28°00′08″S 16°38′46″E, 25–26.vii.1998, A.H. Kirk-Spriggs & E. Marais, Malaise trap. *Kavango*: 1♀ Rundu Dist., Sovo, 18°18′37″S 19°15′36″E, 21–24.iv.2001, E. Marais, S. Kasch & K. Vohland, Malaise trap. *Kunene*: 2♀ 2♂ Khorixas Dist., Leeukop 664, 19°53′15″S 14°21′44″E, 26–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap,
Musca tempestatum (Bezzi, 1908)
Diagnosis: Eye bare; proboscis with long labella; ca 7 pairs of frontal setae; anterior spiracle dark brown; dorsocentral setae 1+3; postalar ridge without setulae; proepisternal depression bare; scutum brown with grey pollinosity and 2 dark brown vittae behind suture; dorsocentral setae 1+3; fore tibia with 1 posterior seta in apical half.
Material examined: NAMIBIA: Kunene: 1♂ Opupwo, Ondjamu Hill, 17°48’S 12°50’E, 28.ii.1996, E. Marais & A.H. Kirk-Spriggs (NMNW).
Distribution: Widespread in continental Afrotropical Region, except Congo Basin.

Musca ventrosa Wiedemann, 1830
Diagnosis: Eye bare; ca 13 pairs of frontal setae; anterior spiracle white; postalar ridge without setae; proepisternal depression bare; scutum dark brown, with grey pollinosity and 4 dark brown vittae; dorsocentral setae 2+4; fore tibia without posterior seta in apical half; abdomen predominantly orange-red.
Material examined: NAMIBIA: Caprivi: 2♂ 2♀ Katima Mulilo Dist., Ndupu village, 1 km SE Bukalo, SE1724Da, 14–20.iv.2006, A.H. Kirk-Spriggs, Malaise trap (AMGS); 2♂ Salambala campsite, 17°50’01”S 24°36’09”E, 22–24.ii.2001, A.H. Kirk-Spriggs, Malaise trap (NMNW).
Distribution: Throughout the continental Afrotropical Region, Oriental Region, east to Melanesia, Australia and Vanuatu.

Musca xanthomelaena Wiedemann, 1824
Diagnosis: Eye bare; anterior spiracle white; postalar ridge without setulae; proepisternal depression bare; scutum dark brown, with grey pollinosity and 4 dark brown vittae; dorsocentral setae 4+5; vein R_{4+5} with ca 4 ventral setulae at base; fore tibia without posterior seta on apical half; abdominal sternites orange.
Material examined: NAMIBIA: Caprivi: 7♂ 1♀ Katima Mulilo Dist., Ndupu village, 1 km SE Bukalo, SE 1724Da, 14–20.iv.2006, A.H. Kirk-Spriggs, Malaise trap (AMGS); 1♀ Katima Mulilo Dist., Salambala campsite, 17°50’01”S 24°36’09”E, 1–4.iii.2001, A.H. Kirk-Spriggs, Malaise trap; 5♂ 1♀ Katima Mulilo Dist., Salambala campsite, 17°50’01”S 24°36’09”E, 22–24.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap.
Kavango: 2♂ 1♀ Rundu Dist., Soyo, 18°18’37.2”S 19°15’36.7”E, 21–24.iv.2001, E. Marais, S. Kasch & K. Vohland, Malaise trap.
Khomas: 1♂ Windhoek, Kuperberg 33, 22°40.65’S 16°59.18’E, 20.xii.2000, E. Marais & S.S. Kasch, Malaise trap.
Kunene: 5♂ Khorixas Dist., Leeukop 664, 19°53’15”S 14°21’44”E, 26–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed (all NMNW); 6♀ Khorixas Dist., Leeukop 664, 19°53’15”S 14°21’44”E, 26–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed (1♂ MNRI, 1♂ DZUP, other NMNW).
Omahahe: 1♂ Gobabis Dist., Somerkoms 521, 22°01’59”S 19°57’22”E, 6–8.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap.
Oshikoto: 1♂ Etosha N.P., Ekuma river, 18°34’S 15°59’E, 30.iv.1987, E. Marais & J. Irish; 1♀ Etoша N.P., Kaross, 19°23’S 14°32’E, 9–10.v.1987, J. Irish & E. Marais (all NMNW).
Distribution: Widespread in the Afrotropical Region (including Cape Verde, Comoros, Madagascar, Mauritius, Réunion and Rodriguez Is.); Palaeartic Region (Egypt).
Genus *Muscina* Robineau-Desvoidy, 1830

Two species are known from the Afrotropical Region (Pont 1980). *Muscina stabulans* (Fallén, 1817) was recorded from Namibia by Bezzi (1908: 191, Rooibank in the hinterland of Walvischbay) and Lindner (1976: 78, Swakopmund). The species was not found among the material examined.

Genus *Neomyia* Walker, 1859

Forty-three species of the genus are recorded from the Afrotropical Region (Pont 1980), only one is recorded from Namibia: *N. splendidia* (Adams, 1905) (Bezzi 1908: 191, Kubub and Aar, as *Pyrellia boersiana* (Bigot, 1877); Zielke 1971a: 175, Otjiwarongo, Farm Abechaus). For generic diagnoses see Couri *et al.* (2006), Emden (1939) and Zielke (1971c). *Neomyia splendidia* was found among the material examined here.

*Neomyia splendidida* (Adams, 1905)

Diagnosis: Overall length *ca* 6–7 mm; anterior pair of presutural dorsocentral setae setula-like; wing membrane with at least basal part of discal cell without microtrichiae; abdominal tergite 5 pollinose or not.

Material examined: NAMIBIA: Karas: 2♀ Bethanie, Vogelstrassklucht 87, 24–29.ix.1974, [State Museum staff]; 2♂ Lüderitz [District], Skorpionkop, 27°46′00″S 16°29′56″E, 20–22.ix.1997, A.H. Kirk-Spriggs & E. Marais, yellow trays; 1♀ Lüderitz, Tsaus, 27°10′29″S 16°07′06″E, 24–26.ix.1997, A.H. Kirk-Spriggs & E. Marais, yellow trays. Hardap: 1♂ Mariental Dist., Viljoenskroon 507, 25°10′S 19°58′E, 3–9.xii.1998, G. Oliver, Malaise trap (all NMNW).

Distribution: Widespread in the continental Afrotropical Region.

Genus *Pseudohelina* Vockeroth, 1972

An Afrotropical genus containing nine species (Pont 1980). *Pseudohelina rufina* (Stein, 1906) was recorded from Namibia by Zielke (1974: 35–36, 12 miles NW Nambutoni), but was not found among the material examined.

Genus *Pyrellia* Robineau-Desvoidy, 1830

Twelve species of the genus are known from the Afrotropical Region (Pont 1980). Couri *et al.* (2006) described a new species from Madagascar. See Couri *et al.* (2006) for generic diagnosis. Zielke (1971c) revised the Afrotropical species. Only *Pyrellia scintillans* (Bigot, 1888) (Paterson 1960: 400, Anabib (Orupembe), 100 miles W of Ohopoho) is recorded from Namibia. *Pyrellia spinthera* (Bigot, 1878) and *P. natalensis* Paterson, 1958 represent new records.

*Pyrellia natalensis* Paterson, 1958

Diagnosis: Prescutum with median white pollinose vitta; anterior spiracle dark brown; greater ampulla bare; mid tibia with 4–6 posterior setae, 1 strong ventral apical seta, without apical anterodorsal setae; vein $R_{4+5}$ almost bare with few setulae only at base.

Material examined: NAMIBIA: Caprivi: 1♀ Katima Mulilo Dist., Salambala campsite, 17°50′01″S 24°36′09″E, 1–4.iii.2001, A.H. Kirk-Spriggs, Malaise trap (NMNW).

Distribution: Namibia and South Africa.
Pyrellia spinthera (Bigot, 1878)

Diagnosis: Prescutum without median white pollinose vitta; anterior spiracle dark brown; greater ampulla bare; mid tibia with 4 posterior setae and 1 long posteroventral seta.

Material examined: NAMIBIA: *Caprivi*: 1♂ Katima Mulilo Dist., Salambala campsite, 17°50′01″S 24°36′09″E, 22.–24.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap; 3♂ same except 1–4.iii.2001, A.H. Kirk-Spriggs; 1♂ West Caprivi Park, Ougali River, 18°01′S 22°18′E, 7.iv.1990, E. Marais. *Karas*: 1♂ Bethanien, Vogelstrausskluft 87, 24.–29.ix.1974, [State Museum staff]. 1♂ Bethanien District, Aukam 104, 26°49′1″S 16°56′E, 7.–19.viii.1990, C. Roberts & E. Marais, preservation pitfall traps. *Khomas*: 1♂ Windhoek Dist., Kuperberg 33, 22°40.65′S 16°59.18′E, 20.xii.2000, E. Marais & S.S. Kasch, Malaise trap (all NMNW). *Kunene*: 2♂ Khorixas Dist., Leeukop 664, 19°53′15″S 14°21′44″E, 26.–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed (MNRJ, NMNW).

Distribution: Cameroun, Democratic Republic of Congo, Mozambique, Namibia, South Africa, Tanzania and Uganda.

Genus *Spilogona* Schnabl, 1911

Seventeen species are known from the Afrotropical Region (Pont 1980). *Spilogona aristalis* Zielke, 1971 was described from Namibia (Zielke 1971b: 294, Walvis Bay and Windhoek), but was not found among material studied here.

Genus *Stomoxys* Geoffroy, 1762

Fourteen species are known from the Afrotropical Region, but this is the first record of the genus from Namibia. Emden (1939) studied Afrotropical material and Zumpt (1973) revised the Afrotropical species. For generic diagnosis see Couri et al. (2006). Bezzi (1908: 191) recorded *S. korogwensis* Grünberg, 1906 from Rooibank in the hinterland of Walfschbach, but *S. korogwensis* is a junior synonym of *Stomoxys calcitrans* (Linnaeus, 1758) and it appears certain that Bezzi’s specimens must represent *S. niger* Macquart, 1851.

*Stomoxys niger* Macquart, 1851

Diagnosis: Frons subparallel in posterior half; width of ♂ frons at narrowest point about quarter or less than eye-length; width of ♀ frons <0.5 of eye length; abdomen with dark brown transverse band on hind margin of syntergite 1+2, and transverse band on posterior third of tergites 3 and 4, abutting posterior margin; median dark maculae on basal half of tergites 3–5.

Material examined: NAMIBIA: *Caprivi*: 8♂ Katima Mulilo Dist., Ndpou village, 1 km SE Bukalo, SE1724Da, 14.–20.iv.2006, A.H. Kirk-Spriggs, Malaise trap (AMGS). *Erongo*: 1♂ Blinkpan Saltworks, 22°57′S 29°19′E, 14.i.1988, E. Holm & E. Marais, fruit bait traps. *Karas*: 5♂ Karasburg Dist., Aussenkehr, Fountain 2, 28°26′1″S 17°36′2′E, 25.viii.2000, E. Marais, at light. *Kunene*: 4♂ 9♀ Khorixas Dist., Leeukop 664, 19°53′15″S 14°21′44″E, 26.–30.x.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap, riverbed (all NMNW).

Distribution: Widespread in the Afrotropical Region, including Cape Verde, Madagascar, Mauritius, Réunion, Rodriguez, Seychelles Is. and South Yemen.

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Appendix. List of genera and species of Muscidae recorded from Namibia. New records for Namibia are indicated with an asterisk (*).

| Genus               | Species                                      | Location         |
|---------------------|----------------------------------------------|------------------|
| Atherigona         | Rondani, 1856                               |                  |
| A. bedfordi         | Emden, 1940                                  |                  |
| A. falcata          | Thomson, 1869                                |                  |
| A. hyalinipennis    | Emden, 1959                                  |                  |
| A. lineata ssp. ugandae | Emden, 1940                  |                  |
| A. mitrata          | Séguy, 1955*                                 |                  |
| A. naqvii           | Steyskal, 1966*                              |                  |
| A. orientalis       | Schiner, 1868*                               |                  |
| A. rubricornis      | Stein, 1913*                                 |                  |
| A. tetrastigma      | Paterson, 1956*                              |                  |
| A. theodori         | Hennig, 1963*                                |                  |
| Coenosia            | Meigen, 1826                                 |                  |
| C. strigipes        | Stein, 1916*                                 |                  |
| Dichaetomyia        | Malloch, 1921*                               |                  |
| D. cuthbertsoni     | Emden, 1942*                                 |                  |
| D. luteiventris     | (Rondani, 1873)*                             |                  |
| Graphomya           | Robineau-Desvoidy, 1830*                     |                  |
| G. maculata         | (Scopoli, 1763)*                             |                  |
| Gymnodia            | Robineau-Desvoidy, 1863                      |                  |
| G. flexa            | (Wiedemann, 1830)                            |                  |
| Haematobia          | Le Peletier & Serville, 1828*                |                  |
| H. thironxi         | (Roubaud, 1906)*                             |                  |
| Haematobosca        | Bezzi, 1907*                                 |                  |
| H. uniseriata       | (Malloch, 1932)                              |                  |
| Helina              | Robineau-Desvoidy, 1830                      |                  |
| H. coniformis       | (Stein, 1903)                                |                  |
| H. icterica         | (Séguy, 1937)*                               |                  |
| H. lucida           | (Stein, 1913)                                |                  |
| H. ustata           | Emden, 1951*                                |                  |
| Hydrotaea           | Robineau-Desvoidy, 1830                      |                  |
| H. capensis         | (Wiedemann, 1818)                            |                  |
| H. jeannelli        | Séguy, 1938*                                 |                  |
| Limnephora          | Robineau-Desvoidy, 1830                      |                  |
| L. obsignata        | (Rondani, 1866)*                             |                  |
| L. quaterna         | (Loew, 1852)                                 |                  |
| L. simulans         | Stein, 1913*                                 |                  |
| L. thomasseti       | Emden, 1951*                                |                  |
| Lispe               | Latreille, 1797                              |                  |
| L. barbipes         | Stein, 1908*                                 |                  |
| L. irvingi          | Curran, 1937*                                |                  |
| L. leucospila       | (Wiedemann, 1830)                            |                  |
| L. zumpti           | Paterson, 1953*                              |                  |
| Morellia            | Robineau-Desvoidy, 1830                      |                  |
| M. nilotica         | (Loew, 1856)                                 |                  |
| Musca               | Linnaeus, 1758*                              |                  |
| M. albina           | Wiedemann, 1830                              |                  |
| M. alpesa           | Walker, 1849*                                |                  |
| M. conducens        | Walker, 1860*                                |                  |
| M. confiscata       | Speiser, 1924*                               |                  |
| M. crassirostris    | Stein, 1903*                                 |                  |
| M. domestica calleva| Walker, 1849*                                |                  |
| M. domestica domestica | Wiedemann, 1758          |                  |
| M. fragilis sp. n.  | *                                             |                  |
| M. freedmani        | Paterson, 1957*                              |                  |
| M. hugonis          | Pont, 1980*                                  |                  |
| M. lasiophthalma    | Thomson, 1869*                               |                  |
| M. lasoria          | Wiedemann, 1824                              |                  |
| M. patersoni        | Zielke, 1971*                                |                  |
| M. sorbens          | Wiedemann, 1830                              |                  |
| M. tempestatum      | Bezzi, 1908*                                 |                  |
| M. ventrosa         | Wiedemann, 1830*                             |                  |
| M. xanthomelaena    | Wiedemann, 1824                              |                  |
| Muscina             | Robineau-Desvoidy, 1830                      |                  |
| M. stabulans        | (Fallén, 1817)                               |                  |
| Neomyia             | Walker, 1859*                                |                  |
| N. splendida        | (Adams, 1905)                                |                  |
| Pseudohelina        | Vockeroth, 1972                              |                  |
| P. rufina           | (Stein, 1906)                                |                  |
| Pyrellia            | Robineau-Desvoidy, 1830                      |                  |
| P. natalensis       | Paterson, 1958*                              |                  |
| P. scintillans      | Bigot, 1888*                                 |                  |
| P. spinthera        | Bigot, 1878*                                 |                  |
| Spilogona           | Schnabl, 1911                                |                  |
| S. aristalis        | Zielke, 1971*                                |                  |
| Stomoxys            | Geoffroy, 1763*                              |                  |
| S. niger            | Macquart, 1851*                              |                  |
