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A revision of Afrotropical Chyromyidae (excluding *Gymnochiromyia* Hendel) (Diptera: Schizophora), with the recognition of two subfamilies and the description of new genera

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ABSTRACT

An account is provided of the family Chyromyidae in the Afrotropical Region and taxonomic characters are re-examined and discussed. A division of the family into two subfamilies, Chyromyinae and Aphaniosominae subfam. n., is proposed and a cladistic analysis corroborates the generic concepts. Illustrated keys are provided to aid identification of both sexes of all included species. African species in the genus *Gymnochiromyia* Hendel have been reviewed elsewhere (Ebejer 2008*b*) and are not included in the current revision. Five new genera are described, viz. *Krifomyia* gen. n., *Oroschyromya* gen. n., *Notiochyromya* gen. n., *Paraphaniosoma* gen. n. and *Tethysimyia* gen. n. *Aphaniosoma sexvittatum* Lamb, 1914, is newly assigned to *Paraphaniosoma* gen. n. and *Aphaniosoma deemingi* Ebejer, 1996, to *Tethysimyia* gen. n. *Rhicnoessa minutissima* Bezzi, 1908, previously removed from Canacidae (as Tethininae) and placed in Chyromyidae by Munari in 1994, is re-examined and newly assigned to *Krifomyia* gen. n., *Chyromya dubia* Lamb, 1914, to *Oroschyromya* gen. n. and *C. sexspinosa* Lamb, 1914 to *Notiochyromya* gen. n. The following 27 species are described as new: *Oroschyromya affinis* sp. n., *O. bicolor* sp. n., *O. elgonae* sp. n., *O. elongata* sp. n., *O. fusciceps* sp. n., *O. gracilipes* sp. n., and *O. peruncinata* sp. n.; *Notiochyromya filigera* sp. n., *N. lucida* sp. n., *N. monticola* sp. n., and *N. tripunctata* sp. n.; *Somatiosoma awashensis* sp. n., *S. grandicornis* sp. n., *S. messumensis* sp. n., and *S. setipygum* sp. n.; *Aphaniosoma aethiops* sp. n., *A. aldabrensis* sp. n., *A. atriceps* sp. n., *A. conspicuum* sp. n., *A. flavescens* sp. n., *A. frequens* sp. n., *A. gaiasicum* sp. n., *A. kirkspriggsi* sp. n., *A. micropygum* sp. n., *A. pullum* sp. n., *A. trilobatum* sp. n., and *A. ugabensis* sp. n.

KEY WORDS: Chyromyidae, Afrotropical, biology, faunistics, new genera, new species, systematics.

INTRODUCTION

The Chyromyidae is a family of 177 named species of small to very small acalyptrate flies (0.75–4.5 mm) currently classified close to the Heleomyzinae and Sphaerocerinae, which D.K. McAlpine (2007) grouped together under one family, the Heteromyzidae. All genera within the Chyromyidae agree more closely to this taxon than to any other group of acalyptrate flies. Most species have a pale yellow integument and bright iridescent green, red or purple eyes. The family is represented in all continents except Antarctica but, apart from the western Palaearctic, all other zoogeographical regions remain poorly studied. No comprehensive taxonomic study reviewing the generic limits of species in the family has previously been attempted.

The paucity of species known from the Afrotropical Region must be regarded as merely a reflection of the scant attention that the family has received. In a brief overview of the family, with an emphasis on Namibian species, it was indicated that further species awaited description (Ebejer 2000). Since then, an appreciation of additional taxonomic characters and the examination of a large number of additional specimens have delayed further taxonomic publication, pending resolution of generic limits. For this purpose, an examination of material from other regions was also required.

Only eight species in four genera are listed in the *Afrotropical Catalogue* (Cogan 1980). These eight include all those described from the Seychelles and Cape Verde [Cabo Verde]. Subsequently, additional species were described from the southern part

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of the Arabian Peninsula and one other from Yemen and Ethiopia (Ebejer 1996). The following are included in this contribution: *Aphaniosoma approximatum* Becker, 1903; *A. dhofaricum* Ebejer, 1996; *A. fissum* Collin, 1949; *A. gallagheri* Ebejer, 1996; *A. harteni* Ebejer, 1996; and *A. lamellatum* Collin, 1949. A fifth species (as *Somatiosoma* sp.) was recognised as new (Ebejer 1996) but was not described as males were not available for study. Since then, males have become available and it is now apparent that it is the second most widespread species in the genus and the only one to reach the southern Palaearctic (Ebejer 2008*a*). Of the species listed in the *Afrotropical Catalogue* (Cogan 1980), *A. approximatum* is a misidentification (see description of *A. frequens* sp. n. below), while the listed record of *Gymnochiromyia flavella* (Zetterstedt, 1848) from the island of St Helena has been questioned by Ebejer (2008*b*).

Lamb (1914) described four species from the Seychelles, namely: *Chiromyia* (= *Chyromya*) *dubia*, *C. sexspinosa*, *C. hirtiscutellata* and *Aphaniosoma sexvittata*. All the type material of these four species, housed in CUMZ and BMNH, has been examined, and all the species are here assigned to new genera. In the case of *C.* (*C.*) *dubia*, the type series comprises species in two genera, and in the case of *C. hirtiscutellata*, material of two species. These are treated in detail below.

Frey (1958) described two species of Chyromyidae from the Cape Verde, proposing the new subgenus *Somatiosoma* to accommodate one of these (*S. nitescens*), while the second (*suboculicauda*) he ascribed to *Aphaniosoma*. The types of *S. nitescens* were not examined, as the figures given by Frey and the description are adequate to identify and separate this species from congeners. On the other hand, the types of *A. suboculicauda* (MZH) were re-examined as part of this study and details are provided below.

As part of a study of African Tethinidae, Munari (1994) examined the types of *Rhicnoessa minutissima* Bezzi, 1908, recognising these as Chyromyidae and not Tethinidae. These types have been re-examined here and the current status of this species is discussed below under *Krifomyia* gen. n.

The genus *Gymnochiromyia* was revised recently (Ebejer 2008*b*), and 14 new species were described and keyed from southern Africa. For this reason, this genus is omitted from the current revision.

BIOLOGY AND ECOLOGY

The biology and ecology of the Chyromyidae are poorly known, the little that is known having been summarised by Ferrar (1987). In the Palaearctic Region, species of *Chyromya* and *Gymnochiromyia* have been reared from debris in the hollows of trees, from mammal nests and burrows, and from birds' nests (Collin 1933; Rotheray 1989). *Chyromya* is also recorded as having been reared from bat guano (Smith 1989). *Aphaniosoma* (*s. str.*) was reared from leaf litter beneath *Salicornia* (Chenopodaceae) and *Phragmites* (Graminae) in Malta (Ebejer 1996) and from a rodent nest on a beach in southern Spain (Ebejer & Deeming 1997).

Rotheray's (1989) tabulation of E.B. Basden's records of a diversity of families of Diptera in Britain indicated that 36.03 % of individuals reared from 19 of 106 burrows and nests of 11 species of mammal were Chyromyidae. These were mainly *Chyromya flava* (L., 1758) from the nest of the hedgehog, *Erinaceus europaeus* L. and from rabbit burrows, *Oryctolagus cuniculus* (L.), and *Gymnochiromyia inermis* (Collin, 1933) from

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the dreys of the squirrels *Sciurus carolinensis* Gmelin and *S. vulgaris* L. Almost 600 specimens of *G. inermis* reared from a squirrel's drey, make this by far the largest number of individuals from a single nest. Only 2.29 % of individuals were Chyromyidae, reared from 12 of 228 bird nests of 48 species, and all were *G. inermis*.

Larval feeding habits are unknown. From the location and circumstances in which puparia have been found, it must be assumed that larvae graze on decaying organic matter, the microhabitat probably being as significant as the larval food source itself. Most records, at least in so far as they refer to *Chyromya* and *Gymnochiromyia*, suggest that the larvae require the droppings of vertebrates. There are records, however, that indicate that this may not be true for all species in the family. Chandler (1973) and Cogan (1978), for example, recorded the rearing of *Gymnochiromyia* from decaying marram grass and elm wood debris but, as no details were provided, these records do not directly negate the assumption that vertebrate droppings may be an important food resource.

The only published descriptions of immature stages are of the puparia (with associated cephalopharyngeal skeletons) of *Gymnochiromyia* and *Aphaniosoma* (Ebejer & Deeming 1997; Deeming 1998) and *Chyromya* (Gibbs 2007), all from the Palaearctic Region.

Adults are usually encountered when sweeping vegetation with a hand net in suitable habitats, such as vegetated coastal dunes, grasses and Tamarisk trees near saltmarshes, and sometimes sweeping lower branches of trees along broadleaved woodland edges. They can also be collected, often in vast numbers, in pan traps and Malaise traps. Some species, in particular *Aphaniosoma*, frequently come to light. Adults are occasionally observed at flowers, including those of *Convolvulus* (Convolvulaceae) and *Matricaria* (Compositae) (Collin 1949), *Hibiscus* (Malvaceae) (Colless & McAlpine 1970), *Ipomoea* (Convolvulaceae) (Wheeler & Sinclair 1994), *Euphorbia* (Euphorbiaceae), *Foeniculum* (Umbelliferae) and *Tamarix* (Tamaricaceae) (Ebejer 1996).

The Chyromyidae are found throughout the year in the hotter regions of the world. In temperate regions, the general preference is for the hot and/or dry season. Thus, April to October is the main flight period in the northern hemisphere; conversely, in southern Africa, it is October to March.

In general, preferred habitats for the family comprise vegetated areas near still, saline or fresh water bodies within hot dry areas, or along the coast. There are exceptions, however. *Aphaniosoma socium* Collin, for example, is a north European species that appears to favour damp, regenerating landfill sites and old mines (Bährmann 2006; Ebejer *et al*. 2001). *Chyromya* spp. are generally associated with broadleaved woodland or savannah, *Notiochyromya* with tropical moist forests and *Oroschyromya* with less mesic, but montane, forest. A recent study of *Aphaniosoma* from central Asia (Ebejer 2006) has suggested for the first time that long cold winters and high altitude (2000–3000 m a.s.l.) do not represent a barrier to a diverse and rich fauna of Chyromyidae. Much still remains to be learnt regarding the ecology of this diverse family on a world-wide basis.

MATERIAL AND METHODS

The material used in this study was borrowed from several institutions, where the types are deposited. A list of institutional codens used in the text is provided below, with the names of respective curators being noted in parenthesis:

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BMNH – Natural History Museum, London, UK (N. Wyatt);
CUMZ – University Museum of Zoology, Cambridge, UK (W. Foster);
MZH – Zoological Museum, Finnish Museum of Natural History, Helsinki, Finland (P. Vilkamaa);
FBUB – Biological Collection, Universität Bielefeld, Bielefeld, Germany (M. von Tschirnhaus);
MHNG – Muséum d'Histoire Naturelle, Geneva, Switzerland (B. Merz);
MJE – M.J. Ebejer, personal collection, Cowbridge, UK;
MZLU – Museum of Zoology, Lund University, Lund, Sweden (R. Danielsson);
NMNW – National Museum of Namibia, Windhoek, Namibia (E. Marais);
NMSA – Natal Museum, Pietermaritzburg, KwaZulu-Natal, South Africa (M. Mostovski);
NMWC – National Museum and Gallery of Wales, Cardiff, UK (J. Deeming);
OXUM – Hope Entomological Collections, Oxford University Museum of Natural History, Oxford, UK (D. Mann);
TAUI – Tel Aviv University, Tel Aviv, Israel (A. Freidberg);
ZMHB – Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (J. Ziegler);
ZMUC – Zoological Museum, University of Copenhagen, Denmark (J. Pedersen);
ZSMC – Zoologische Staatssammlung, Munich, Germany (M. Kotrba).

Specimen data are given as they appear on the labels, except in the case of South African provinces, which are listed as current provincial names; where older names are on the label, these are given in parenthesis after the modern names. Specimen label data are listed in alphabetical order according to country, and are grouped in chronological order within each country. The mode of collection is stated, where known. Many specimens have been dry mounted and either pinned on minutens or mounted on card points. Other specimens are preserved in alcohol. The postabdomen is preserved with the remainder of the specimen in glycerine inside a small sealed plastic tube mounted on a pin, where a preparation of the postabdomen has been made from a specimen preserved in alcohol. In the case of dry material, the postabdomen is similarly preserved, and the plastic tube is pinned beneath the source specimen.

Measurements were made from the head (antenna excluded) to the apex of the abdomen; the wing was measured from its insertion into the thorax to the apex, the point where vein R_{4+5} meets the costal vein. Measurements are only a guide. Some specimens shrivel more than others when dry and some expand more than others in alcohol. Furthermore, individuals within a species can vary by as much as 25 % in length (pers. observ.). The descriptions and the measurements are based on the holotype and a female paratype. In most cases, the illustrations of the male postabdomens are also based on the holotype.

The postabdomen was macerated in 10 % potassium hydroxide, rinsed in water and alcohol and preserved in glycerine. Drawings were made freehand and with the specimen suspended in glycerine on a cavity slide or watch glass. It was orientated to allow view from the left lateral side, but it was frequently rotated and adjusted to allow better appreciation of the three-dimensional detail of the structures and their articulation. In many cases of male specimens, the view from below or behind was so complicated

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with overlapping pale structures that it was impossible to draw the composite structures clearly and reliably. For this reason, not many figures are given from these angles. However, where a particular structure such as a surstylus or a pregonite appeared very different from these angles, the structure was illustrated from both views. In a few instances, additional illustrations are given of one or both sexes of species previously described, where it is thought that this will clarify their structures and aid recognition.

Abbreviations used:

acrs – acrostichal
bac scl – bacilliform sclerite
basiph – basiphallus
cerc – cercus, cerci
dc – dorsocentral
distiph – distiphallus
ej apd – ejaculatory apodeme
ep – epandrium
epiph – epiphallus, epiphallic
fr – frons, frontal
hu – humeral
hyp – hypandrium
hypr – hypoproct
ia – intra-alar
ihu – intrahumeral
mtn – metanotum
ntpl – notopleuron, notopleural
oc – ocellus, ocellar
ocp – occiput, occipital
orb – orbital
pa – postalar
ph – phallus
ph apd – phallapodeme
posthu – posthumeral
post ia – posterior intra-alar
pprn – postpronotal lobe
pra – pre-alar
prg – pregonite
prpl – propleuron, propleural
prscut – prescutellar
prsut – presutural
psg – postgonite
pvt – postvertical
s – spermatheca(e)
sa – supra-alar
scut – scutellum, scutellar
st – sternite
surs – surstylus
tg – tergite
vt – vertical
vte – external vertical
vti – internal vertical

CLASSIFICATION

The systematic position of the Chyromyidae Hendel, 1916 remains somewhat unclear. D.K. McAlpine (1985) included the following families in the Heleomyzidae: Borboropsidae, Chiropteromyzidae, Cnemospathidae, Heteromyzidae, Notomyzidae, Rhinotoridae and Trixoscelididae, but excluded Chyromyidae and Sphaeroceridae although he accepted that these two families were closely related to the Heleomyzidae. J.F. McAlpine (1989) categorized all these families in the Sphaeroceroidea. Most recently, D.K. McAlpine (2007) categorized the Sphaeroceridae and Heleomyzidae into one family, the Heteromyzidae. He excluded the Chyromyidae on the grounds, that there remain several distinct morphological characters too far removed from his proposed groundplan of his concept of the Heteromyzidae. I concur with this view.

When studying Chyromyidae, especially from Africa, several species did not fit well into any currently accepted genus. The inevitable conclusion is either that all genera except *Aphaniosoma* are sunk as synonyms of *Chyromya*, or that new genera are erected to accommodate the additional species. The latter option is preferred for a number of reasons. There are many stable characters shared by groups of species (most of which

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are still undescribed) outside the Afrotropical Region. These characters were not given much importance or were not appreciated by previous authors. There also appears to be good correlation between the genera as proposed in this study and the type of habitat where their species are likely to occur. An improved classification at generic level may bring us closer to understanding the phylogenetic relationships within this family. When taking all the characters together it also becomes apparent that the differences between *Aphaniosoma s. l.* and the other genera are so substantial and fundamental that I consider there to be ample justification in placing them into two separate subfamilies. This proposal is treated below.

TAXONOMY

The nomenclature of somatic characters and chaetotaxy follows Sinclair (2000) and Ebejer (2006); for the female postabdomen see Kotrba (2000). The most recent comprehensive description of the family is given in the Manual of Palaearctic Diptera (Wheeler 1998). Wheeler's description of the family draws on published information available at the time. He accepted four genera, namely: *Chyromya* Robineau-Desvoidy, 1830, *Gymnochiromyia* Hendel, 1933, *Somatiosoma* Frey, 1945 and *Aphaniosoma* Becker, 1903. With the exception of *Somatiosoma*, the original descriptions were based on the Palaearctic species and in all of them, few characters were used. Reconsideration of relationships has required a review of several characters previously assumed to hold true across the family and others that were overlooked or underemphasized. These are described below.

The eye has enlarged facets at the extreme anterior angle near the antennae. The smallest facets are at the posterior extremity of the eye. In the intermediate area, facets diminish in size from anterior to posterior in a smooth gradation and there is no top to bottom demarcation line. All species have iridescent eyes, generally bright green, but this may vary from purple to reddish brown depending on the light and if the eye is wet. The ocelli are universally set in a small equilateral triangle on the vertex, and all species have a pair of proclinate, usually divergent, *oc* setae (or setulae) more or less in the middle of the *oc* triangle. In a few *Aphaniosoma* species these setae may be parallel.

The antenna (Fig. 1) exhibits little, but important, variation across the family. The two-segmented arista of *Aphaniosoma* was recognised as such only recently (McAlpine 2002). However, it is not two-segmented in all Aphaniosominae: in the new genus *Krifomyia*, all three segments are distinct. It is three-segmented in all Chyromyinae. The third antennal segment is round in almost all species (except for small indentations where it articulates with the arista and the second segment). In a few, it is slightly reniform.

At first sight, the wing (Figs 2, 3) appears uniform throughout the family, but microscopic examination under high magnification reveals a number of important characters. The *hu* crossvein varies from a small thin translucent vein (little more than a fold) to a broad thick set vein joining the costa at a point that is also thickened (e.g., *Krifomyia*). Just distal to this, the costa may be complete, weakened or broken. It is always broken in Aphaniosominae, but variably so in the Chyromyinae, where even within one genus there appears to be variation among species. The costa does not end abruptly at the wing apex, but rather tapers away after R_{4+5}, thus ending either some distance before or just after M_{1+2}. The anterior margin of the costa is always setulose, usually densely so,

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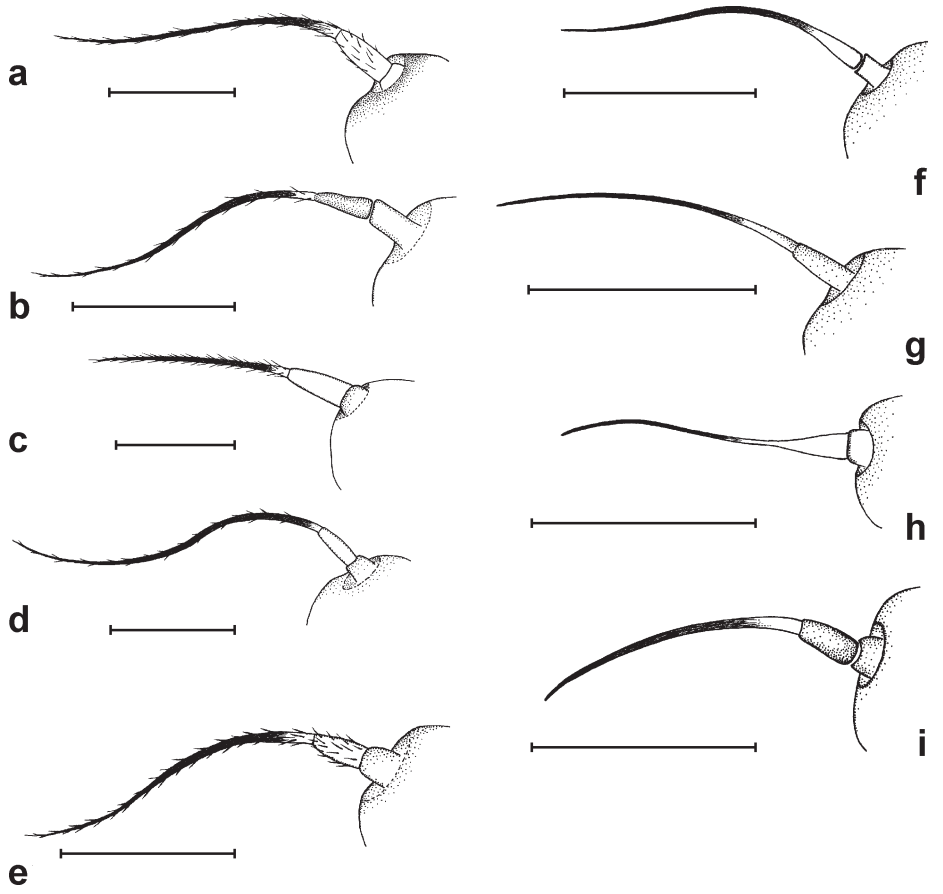

Fig. 1. Segmentation of arista in Chyromyidae: (a) *Chyromya robusta* Hendel, Israel; (b) *Gymnochiromyia balteata* Ebejer, Namibia; (c) *Somatiosoma messumensis* sp. n., Namibia; (d) *Notiochyromya monticola* sp. n., Ethiopia; (e) *Oroschyromya affinis* sp. n., Yemen; (f) *Aphaniosoma fissum* Collin, United Arab Emirates; (g) *Paraphaniosoma sexspinosum* (Lamb), Seychelles; (h) *Tethysimyia deemingi* (Ebejer), Egypt; (i) *Krifomyia minutissima* (Bezzi), Namibia. Scale bars = 0.1 mm.

but mixed in among these fine setulae are dark spine-like setulae that are usually of a similar length to the fine setulae though occasionally longer and set at variable distances from each other. They occur from the point where R_1 meets the costa to where R_{2+3} ends on the costa. Within the family, they are found in most species of Chyromyinae, where on the dorsal aspect of the costa in the same sector there is also a small number of similar spine-like setulae set at wide intervals from each other. These are absent in the Aphaniosominae. *Krifomyia* has only pale, close set, evenly spaced, spinose setulae along the anterior margin. The long veins, R_{4+5} and M_{1+2}, converge or diverge to a small but consistent degree that is a reliable character for separating some genera. The discal cell may or may not reach the middle of the wing, measured from base to apex, and it may be almost as wide as the cell formed between the R and M veins (the latter measured at its widest). Thus, the discal cell is short and narrow in the Aphaniosominae, whereas in the Chyromyinae it is broad and short (especially in *Notiochyromya* gen. n.) or narrow

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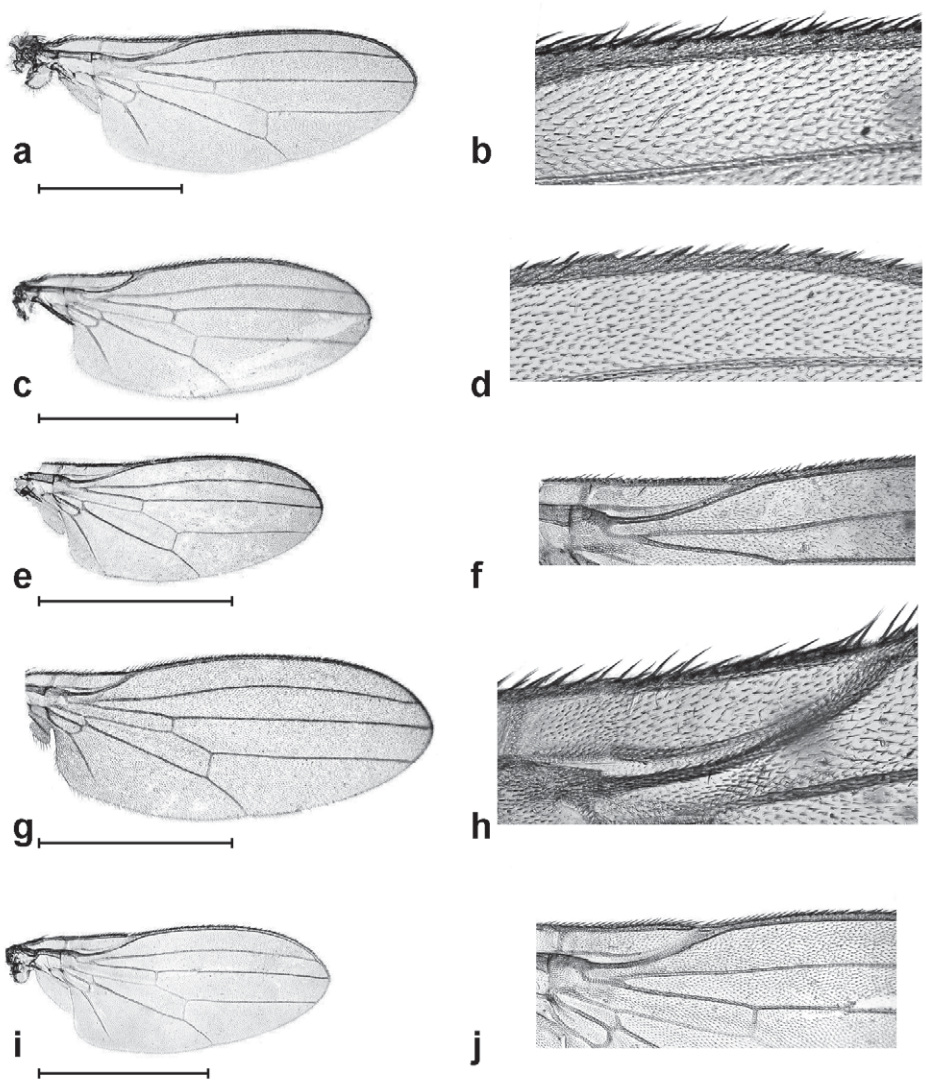

Fig. 2. Wings of representatives of Chyromyinae: (a) *Chyromya robusta* Hendel, Israel; (b) same, section of costa; (c) *Gymnochiromyia fallax* (Ebejer), Malta; (d) same, section of costa; (e) *Notiochyromya sexspinosa* (Lamb), Nigeria; (f) same, section of costa; (g) *Oroschyromya elongata* sp. n., Ethiopia; (h) same, section of costa; (i) *Somatiosoma eremicolum* Ebejer, Saudi Arabia; (j) same, section of costa. Scale bars = 1.0 mm.

but long (*Chyromya*). The wing membrane is hyaline in the vast majority of species, and is uniformly microtrichose.

The interpretation of some thoracic setae can be difficult and may benefit from a brief description. A seta (or setula) is inserted at the anterior margin of the scutum between the most anterior *dc* and the anterior border of the *pprn* lobe. I call this the *ihu* seta, and it is quite distinct from the *posthu*. In *Aphaniosoma s. str*. it is incurved. It is absent in the Chyromyinae. The *posthu* seta (absent in *Krifomyia*) may be confused

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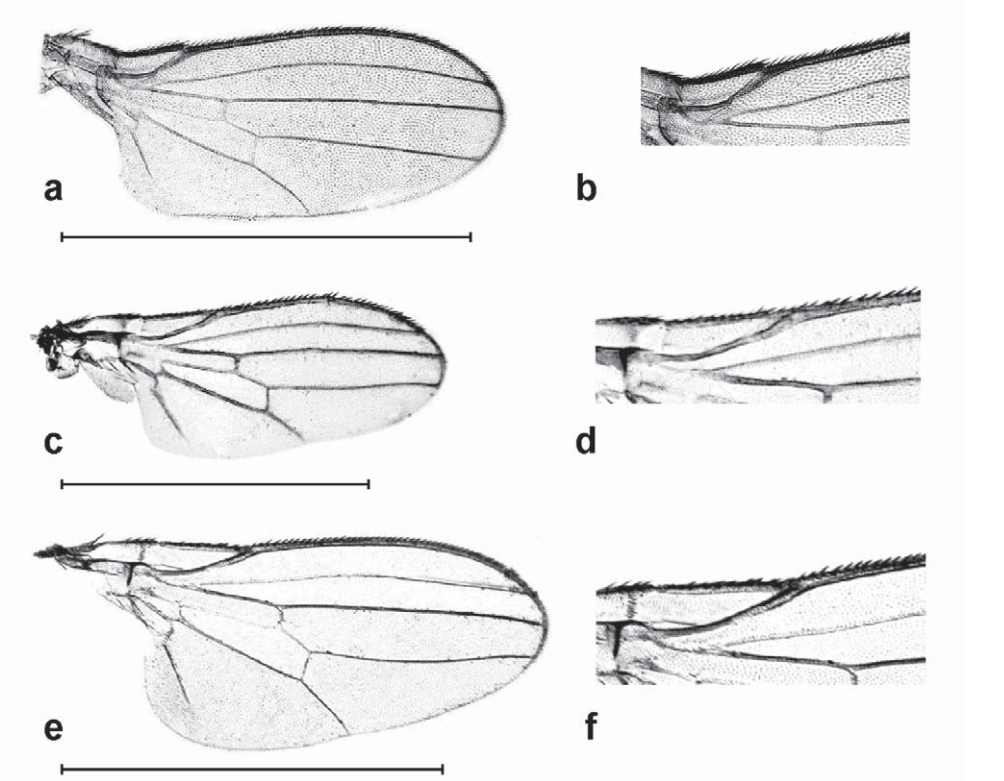

Fig. 3. Wings of representatives of Aphaniosominae: (a) *Aphaniosoma fissum* Collin, United Arab Emirates; (b) section of costa; (c) *Krifomyia minutissima* (Bezzi), Namibia; (d) section of costa; (e) *Tethysimyia deemingi* (Ebejer), Egypt; (f) same, section of costa. Scale bars = 1.0 mm.

with the *prsut ia*. However, it is inserted more lateral to the *ia* when this is present. The *pra* seta is inserted dorsally in the depression just above the *ntpl* and just posterior to the transverse suture of the scutum. In some Chyromyinae, there may be a few setulae present in this area, but when compared to an adjacent seta such as the *ntpl* or the *sa*, it will be apparent that these setulae are by no means equivalent to a true *pra*. Furthermore, the number of these setulae is inconsistent within a species. The *sa* setae/setulae are in line with the *pa*, often well developed and distinct from the *ia* line of setae or setulae. There is no *sa* in *Aphaniosoma*. The *post ia* is midway between the *pa* on the posterior callus and the hindmost *dc*. When present, this may be a strong seta, but in any case it is longer than the strong *prscut acrs* setae. The anepisternal seta is inserted on the posterior margin of the anepisternum, very near the suture between this sclerite and the anepimeron. In the Aphaniosominae, it is just within the upper one third of the vertical posterior margin of the anepisternum, whereas in the Chyromyinae it is inserted almost exactly at the middle. There may be supplementary setae adjacent to it, but these are invariably much shorter than the main seta (these supplementary setae are present in all members of a species group within *Aphaniosoma* found in the Mediterranean—those whose males have projections on the hind trochanter). The *prpl* seta or setula is often minute, and is absent in all Chyromyinae.

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Very little has been published on the female postabdomen of the Chyromyidae. Until now, little investigation has been done on the diversity of its form and consequently its usefulness in the taxonomy of species in this family. A recent study of *Gymnochiromyia* from southern Africa included an overview of this subject, and the female postabdomens of several species were illustrated (Ebejer 2008*b*).

The female abdomen in the Chyromyidae consists of seven easily recognised segments followed by the postabdomen, which consists of segments 8 to 10 and the *cerc*. In the Chyromyinae, segment 8 usually has a *tg*, which may be divided, and a *st*, which is always divided into a pair of distinct ventral or ventrolateral sclerites each bearing a small number of setae. These sclerites are useful in species diagnosis because their shape and the number and placement of their setae show remarkable consistency. Posterior to these sclerites is the genital opening, whose margins may be simple as in *Chyromya*, *Gymnochiromyia*, *Notiochyromya* and *Oroschyromya*, or extended into membranous lobes as in *Somatiosoma*. Posterior to this lies a small dorsal structure that is variously shaped, sclerotized and setulose. From its location, I take this to be the subanal plate but, as it is almost membranous in many species, I prefer the term hypoproct. This structure, too, appears to have a constant shape and setulosity within a species. In the Aphaniosominae, segment 8 is very close to the *cerc*. The dorsal sclerite usually is divided, and lies lateral to the *cerc*, attached to it or even apparently enclosing it. *St* 8 is less distinct in many species of this subfamily than it is in the Chyromyinae.

The paired spermathecae are very small (0.03–0.08 mm), round or nearly so, heavily sclerotized and pigmented in the Chyromyinae. They are proportionately larger (at least double the size) and of more varied shape in the Aphaniosominae. The spermathecal ducts are not visible at all in a majority of species (unless stained), although the base of the duct where it leaves the spermatheca is sometimes pigmented (e.g., *N. sexspinosa* (Lamb, 1914), Fig. 10). The darker internal structures appear to vary in shape depending on the degree of distortion produced by desiccation and/or subsequent preparation of the postabdomen. These internal structures are not reliable for separation of species in the Chyromyinae, but might prove to be useful in the Aphaniosominae because of greater diversity of form.

Two of the external characters that Becker (1903) applied to separate the genus *Aphaniosoma* from *Chyromya* also serve to separate the Aphaniosominae from the Chyromyinae. These are: (1) absence of an inclinate lower orbital (2) a concave *ocp*. The other characters he provided are variable in the subfamily Aphaniosominae. In addition to the above, the Aphaniosominae have a more derived ground plan of the male postabdomen, the Chyromyinae having a more pleisiomorphic ground plan. There are also chaetotaxic characters not noted in earlier works. The main features that separate the two subfamilies are detailed in Table 1. Some of these features are explained in more detail as follows.

The structure of the male postabdomen is fundamentally different in these two taxa. In the Chyromyinae, the *ep* is typical of most acalyptrate Diptera, namely the terminal abdominal segments form a more or less spherical sclerite that encloses most of the hypopygial structures within it. Tergite 6, the pregenital *tg*, is largely unmodified. The *hyp* and *ep* appendages are barely visible from an inferior aspect. Furthermore, these appendages do not deviate markedly in shape between species. In the Aphaniosominae, not only is the *ep* reduced and frequently split dorsally, but also it is largely or completely

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TABLE 1

Comparison of the somatic, chaetotaxic and hypopygial characters of the two subfamilies.

	Chyromyinae	Aphaniosominae
Head	Straight or convex; face always flat, never with carina even between antennae; palp short oval to round, appearing disc-shaped; arista with 3 segments.	Concave whether viewed from above or from the side; face variable, often with median carina, even if very low, sometimes strongly developed; palp elongate oval, almost club-shaped; arista with 2 segments, except in *Krifomyia*.
	Always 3 long *orb*, with anterior one inclinate relative to two posterior ones and all more or less equally spaced from each other on fronto-orbital plate.	0–6 *orb*, none inclinate, usually short and becoming progressively shorter anteriorly; when 2 *orb* present, these often long and inserted in upper half of fronto-orbital plate.
Thorax	Numerous setulae on all parts of scutum.	Setulae sparse; almost totally restricted to *acrs*, *dc* and *ia* lines in *Aphaniosoma*; more numerous in other genera.
	No inclinate seta at *ihu* location (at anterior end of scutum between *pprn* and most anterior *dc*).	Inclinate *ihu* seta or at least a setula present; reduced (apparently secondarily) in *Krifomyia* and *Tethysimyia*.
	Strong anepisternal seta placed at middle of hind margin of anepisternum.	Anepisternal seta placed in upper 1/3 of hind margin of anepisternum.
	No *prpl* seta or setula.	*prpl* setula (rarely a seta) present, often extremely short.
Legs	One or more pairs of femora swollen to a greater or lesser extent (except in *Oroschyromya*); apicoventral seta on mid tibia, if present (rarely), not longer than diameter of tibia at apex.	Femora never swollen; apicoventral seta on mid tibia always present and longer than diameter of tibia at apex.
Wing	Veins always paler towards posterior half of wing; vein separating basal and discal cells same colour as adjacent veins; costa often with spinose setulae on dorsal aspect.	Veins darker towards apex of wing and vein separating basal and discal cells always palest; costa never with spinose setulae on dorsal aspect.
Male abdomen	*tg* 1–6 always of normal development and appearance, even if *tg* 6 somewhat shorter and often partly hidden below *tg* 5.	*tg* 6 very often noticeably modified with secondary sexual characters; sometimes also *tg* 4 and/or 5 modified.
Male postabdomen	A more or less spherical *ep* always present, distinct from and lying outside of *tg* 6.	*ep* often divided into right and left halves; almost always poorly visible because it lies partly or wholly within *tg* 6; sometimes, viewed from behind (or from below), the two halves appear as shiny brown spots lateral to cerci.
	Cerci placed at lower ventral aspect of *ep* well away from dorsal edge of *tg* 6.	Cerci placed at dorsal aspect close to margin of *tg* 6.
	hyp in profile generally broad (high), especially at base.	*hyp* more variable, and in most cases narrow in profile.
	prg almost always a thin sclerite, setulose on its external (ventrolateral) surface, attached to posterior lateral arm of *hyp* before this articulates with *ep*; thus it lies anterior and below inferior anterior angle of *ep*.	*prg* extremely variable, usually setulose apically and typically attached to middle section of *hyp* after this articulates or fuses with *ep*, thus *prg* lies medial and above inferior posterior margin of *ep*.

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TABLE 1 (*continued)*

Comparison of the somatic, chaetotaxic and hypopygial characters of the two subfamilies.

	Chyromyinae	Aphaniosominae
Male postabdomen	*psg* usually small and loosely articulated close to base of *basiph*, but rarely extends out of epandrial cavity; if it does, then only tip usually apparent.	*psg* extremely variable, closely and more firmly articulated to base of *basiph*, but often is so large as to extend well out of epandrial and sixth tergal cavity; in many *Aphaniosoma* clearly visible as black elongated structure.
	surs generally small, more or less hook-shaped and loosely articulating with inner posteroventral margin of *ep*.	*surs* highly modified and often fused with epandrium; may appear on any part of margin of this sclerite.
	ph apd always long and rod-shaped; basal half free with extreme apex somewhat trumpet-shaped and poorly sclerotized.	*ph apd* usually broadly triangular with tbasal part very short and apex usually bilobed (in dorsal view) and heavily sclerotized.
	Separated *ej apd* present, variably sclerotized.	Separated *ej apd* not apparent.
	basiph short with a sclerotized anterior rod-like sclerite, acting as fulcrum for downward and backward extension of *ph*.	*basiph* very variable; when membranous, downward and backward extension of *ph* in most species achieved through a turgid "inflation" and unfolding of whole *ph*; when sclerotized, mechanics similar to those in Chyromyinae.
Female abdomen	Fecund females very often with large ova visible through integument of very distended abdomen.	Fecund females without such abdominal distension and never with ova as clearly visible as this.
Female postabdomen	Spermathecae small and round; *tg* 7 tending to be divided, *st* 8 with 2 distinct sclerites; *hypr* variable from well to poorly sclerotized, rarely membranous.	Spermathecae large, variably shaped; *tg* 7 not tending to be divided and *st* 8 not usually with 2 distinct sclerites; *tg* 8 often divided into small lateral plates that may lie anywhere from dorsal to ventral; *hypr* usually membranous.

enclosed within *tg* 6, leaving the *hyp* and the *basiph* appendages largely exposed and visible from the posterior aspect. The appendages are remarkably diverse in form, size and orientation. In addition to this, it is the norm in the Aphaniosominae to have remarkable development of the pregenital *st* and *tg* (segments 4, 5 and 6).

The female abdomen presents an interesting feature. In the Chyromyinae, the ova develop to a large size and result in a distended abdomen with a stretched cuticle through which each ovum may be seen clearly. Females are found very commonly in this condition. Conversely, in the Aphaniosominae, the distension is much less marked and the ova are poorly discernible. Furthermore, females with distended abdomens are rarely found. This reflects an important, albeit not understood, biological function. However, it is a character that also should be considered in the division into two subfamilies.

In the male, the *distiph* is generally symmetrical in the Aphaniosominae and usually asymmetrical in the Chyromyinae. Observation of numerous specimens of several species in water or alcohol revealed a range of inflation and eversion of the *distiph*. This allows a degree of interpretation of the mechanics that result in the folding or unfolding of the *distiph*, a character in which the two subfamilies appear to differ. In the Chyromyinae,

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the point of articulation of the *distiph* with the *basiph* moves ventrally and anteriorly, deflecting the apex of the *distiph* in an arc downwards and backwards relative to the long axis of the abdomen; the *distiph* itself does not alter its shape. In the vast majority of species of the Aphaniosominae, the point of articulation between the *distiph* and the *basiph* moves posteroventrally and the *distiph* inflates and unfolds, resulting in movment in an arc downwards and backwards relative to the long axis of the abdomen. Thus, the shape of the *distiph* can appear very different (indeed often much larger) when unfolded, from when it is folded. This, too, is a character I consider important in the classification of the two subfamilies.

When attempts are made to prepare the postabdomen for detailed anatomical examination, substantial technical difficulties are encountered because of the very small size of these flies, the pallor of their integument and the three-dimensional array of the *hyp*. Notwithstanding this, the main structures and their appendages can easily be compared between species and genera in the Chyromyinae, because of consistency in location and appearance. This is far from being the case in the Aphaniosominae, where the huge diversity of form of the basic structures and their appendages makes interpretation and comparison much more difficult.

Key to subfamilies of Chyromyidae

1 Occiput convex to flat, never distinctly concave; 3 well-developed *orb*, anterior usually inclinate; scutum without *ihu* seta; wing veins R_{4+5} and M_{1+2} parallel or slightly convergent towards apex; mid tibia usually without any apicoventral seta, if seta present (some species of *Somatiosoma* and *Notiochyromya*) then not longer than diameter of tibia at apex; *scut* often with additional setulae and/or setae; male postabdomen with more or less hemispherical *ep* completely external to *tg* 6 .... **Chyromyinae**

– Occiput concave; 0–6 *orb* of variable length, never inclinate; when more than 2, these are usually short and progressively shorter anteriorly; scutum with inclinate *ihu* seta or setula (except in *Krifomyia* and *Tethysimyia*); wing veins R_{4+5} and M_{1+2} parallel (*Paraphanisoma* and *Krifomyia*), convergent (*Tethysimyia*) or divergent (*Aphaniosoma*) towards apex; mid tibia always with long apicoventral seta; *scut* never with more than 2 pairs of marginal setae; male postabdomen never with hemispherical *ep*, this lies partially or entirely within *tg* 6..... ..... **Aphaniosominae** subfam. n.

Key to genera of Chyromyinae

1 Distinct *pra* seta behind transverse suture in depression between *ntpl* and scutum; *prsut dc* absent; *acrs* never differentiated from numerous mesonotal setulae except 2–4 *prscut*; head, in profile, with longest part towards lower eye margin; gena narrow, less than half height of eye at middle; mid tibia often with short apicoventral seta (shorter than diameter of tibia at apex)..... **Notiochyromya** gen. n.

– Distinct *pra* seta absent; if setulae present in this area, these are similar to setulae elsewhere on scutum; if setula in this position is interpreted as a short *pra* seta (some *Chyromya* and *Gymnochiromyia*) then mid tibial apicoventral seta completely absent; *prsut dc* seta may be present and *acrs* often differentiated; head, in profile,

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longer towards upper eye margin and gena usually broader than half height of eye at middle 2

2 Well-developed *post ia* seta present; *scut* bare on disc and with only 2 pairs of marginals; *fr* significantly narrower towards antennae (i.e. strongly convergent anteriorly); male cerci distinctly modified or spinose ..... **Oroschyromya** gen. n.

– Posterior *ia* absent; if seta or setula present, it is shorter than *prscut acrs*; *scut* with or without additional marginals or discals; *fr* usually less markedly convergent; cerci simple 3

3 Occiput distinctly convex, with numerous setae and setulae on disc in addition to those around *ocp* foramen and on postocular margin; *fr* parallel-sided or almost so; discal cell usually extends beyond middle of wing; males with dilated femora (not Afrotropical) ..... **Chyromya** Robineau-Desvoidy

– Occiput flat or slightly concave, no *ocp* setulae on disc, although rarely 2 or 3 short setulae may be present outside postocular row on each side; *fr* with sides converging towards antennae; discal cell extends only to middle of wing; males with little or no femoral dilation 4

4 Scutellum with setulae on disc and sometimes with additional marginal seta apart from usual 2 pairs; *prscut dc* never present; *prscut* setae or setulae poorly developed; short mid tibial apicoventral seta often present ..... **Somatiosoma** Frey

– Scutellum with only 2 pairs and bare on disc; *prscut acrs* longer than any setulae that may be situated in *post ia* area; *prscut dc* sometimes present; never with apicoventral seta on mid tibia ..... **Gymnochiromyia** Hendel

Key to genera of Aphaniosominae

1 Scutal setulae in 2 *acrs* rows, sometimes irregular; incurved *ihu* seta/setula almost always present; *sa* and *post ia* setae absent; R_{4+5} and M_{1+2} always divergent towards wing apex ..... **Aphaniosoma** Becker

– Scutal setulae in 4–10 rows, not differentiated into *acrs*; incurved *ihu* seta/setula sometimes present; at least *post ia* present, even if short; R_{4+5} and M_{1+2} parallel or convergent towards wing apex 2

2 Pre-alar seta present in depression behind transverse scutal suture; incurved *ihu* setula present; *sa* distinct; R_{4+5} and M_{1+2} parallel; head longer than high; eye margins on *fr* strongly convergent towards antennae; *fr* never inflated and not projecting above and in front of eye margin; 1–3 well-developed reclinate *orb*; *pvt* often absent, but if present, usually only one minute setula or entirely missing in some specimens of the same species; carina very indistinct, at most just visible immediately below lunule only; gena narrow, less than half height of eye ..... **Paraphaniosoma** gen. n.

– Pre-alar and *sa* setae absent, if *sa* present, not easily differentiated from adjacent setulae; *ihu* setula absent; R_{4+5} and M_{1+2} parallel or convergent towards wing apex; head higher than long; *fr* parallel-sided or nearly so, projecting anteriorly above antennae, appearing somewhat inflated; 0–4 short and usually inconspicuous *orb*; *pvt* present or absent, if present, always very short; carina distinct; gena broad, often much broader than half height of eye 3

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3 Facial carina exceptionally well-developed, broadening below antennae; antennae lie in deep fossae; gena very broad, almost equal to height of eye or more; katepisternal seta absent; scutal setulae in 4–6 irregular rows between *dc* lines, short and sparse; other scutal setulae scanty, short to minute; wing veins R_{4+5} and M_{1+2} parallel up to apex of wing; *hu* crossvein thickened ..... **Krifomyia** gen. n.

– Facial carina narrow, less conspicuous, less widened below antennae; antennae, though appearing recessed, do not lie in deep fossae; gena about as broad as half height of eye or a little more; katepisternal seta present; *acrs* in 4–10 rows, more numerous and longer, other scutal setulae more numerous and longer; wing veins R_{4+5} and M_{1+2} convergent towards apex of wing; *hu* crossvein normal .... **Tethysimyia** gen. n.

Subfamily Chyromyinae Hendel, 1916

Genus *Chyromya* Robineau-Desvoidy, 1830

Chyromya: Robineau-Desvoidy 1830: 620.

Type species: *Chyromya fenestratum* Robineau-Desvoidy, 1830: 621 [= *Musca flava* L., 1758], by monotypy.

Diagnosis: Broad *fr*, parallel sides or sides only slightly convergent anteriorly; in profile, gena recessed relative to projecting *fr*, and head generally higher than long; eye round and *ocp* clearly convex whether viewed from above or in profile; *ocp* setae and/or setulae scattered over whole disc, sparing only strip from vertex to short distance above occipital foramen; scutum with setulae scattered among strong setae; *acrs* rows irregular, composed of similar setulae; *prscut* pair stronger; *pra* and *post ia* setae absent, instead there are setulae of similar length to those on rest of scutum; *scut* with additional marginal setae to usual two pairs (basal and subapical); wing long, with discal cell being longest in family, thus length of vein separating basal and discal cells at least 2.5 times as long as apical section of M–Cu; posterior crossvein at middle or beyond middle of wing when measured from *hu* crossvein to apex; femora, especially fore and hind pairs in males, often strongly swollen; apicoventral seta on mid tibia absent.

Distribution: Holarctic. No species that corresponds to the genus as defined here has yet been found in the Afrotropical Region. However, in the Canary Islands, and coastal regions of North Africa, the following Palaearctic species do occur and their distribution may extend further south: *flava* (L., 1758); *intermedia* Ebejer, 2001; and *robusta* Hendel, 1931. These are not treated further in this paper.

Ecology: Compared to other genera, *Chyromya* species are encountered more frequently in open broadleaved woodland, parks and gardens. In the warmer parts of temperate regions, population densities can be high, but usually not as high as populations of *Aphaniosoma* and *Gymnochiromyia*. There are more records of an association with bird and especially mammal nests and burrows in *Chyromya* than in other genera of this family.

Genus *Gymnochiromyia* Hendel, 1933

Gymnochiromyia: Hendel 1933: 43; Ebejer 2008*b*: 81.

Type species: *Peletophila minima* Becker, 1904: 133 (= *Anthophilina flavella* Zetterstedt, 1848), by original designation.

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This genus was recently reviewed (Ebejer 2008*b*) and 14 new species were described, bringing to 15 the total number of confirmed species from the Afrotropical Region.

Diagnosis: Oval eyes lying horizontal or oblique; *fr* protruding beyond anterior eye margin and above antennae, visible in profile to greater or lesser extent; setae and setulae on *scut* absent except for usual basal and subapical pairs; *pra* and strong *post ia* setae absent; apicoventral seta on mid tibia absent; habitus of most species appearing more slender and less setulose than *Oroschyromya* and *Notiochyromya*, with which genera *Gymnochiromyia* could be confused.

Distribution: Afrotropical (Fig. 68), Holarctic.

Bionomics: Species of *Gymnochiromyia* appear to prefer vegetated dunes and drier, warmer areas within a generally temperate climatic region. In Europe, for example, at least two species, namely *G. homobifida* Carles-Tolrá, 2001 and *G. inermis* (Collin, 1933), exhibit an affinity for open oak woodland (Ebejer, pers. observ.).

Genus **Notiochyromya** gen. n.

Type species: *Notiochyromya tripunctata* sp. n., here designated.

Etymology: From Greek *notios* (southern), referring to the occurrence of the majority of species of the genus south of the equator, and *Chyromya*. Gender feminine.

Diagnosis: *fr* measured at level of anterior *oc* narrower than 1/3 width of head, with margins strongly convergent towards lunule, inclination of *fr* more toward vertical than horizontal, thus maximum length of head when seen in profile closer to lower eye margin than upper, *ocp* flat, *pra* seta present, *post ia* and *prsut dc* setae absent; *scut* usually with additional marginal or discal setae (not setulae) or both; a short apicoventral seta usually present on mid tibia; head usually narrower than thorax; *ep* relatively small in comparison to remainder of abdomen (similar to *Somatiosoma*, but in contrast to *Oroschyromya* and *Gymnochiromyia*); thorax robust, covered with dense fine setulae over whole of scutum; strong *prscut acrs* (often 4 setae in one transverse row), *dc*, *post ia* and *pa* setae close to *scut* suture and usually brown or black; *tg* frequently with matt or shiny brown or black spots.

The autapomorphies that characterize this genus are: a smaller head, longer in lower half than above, always higher than long, narrow *fr* strongly sloping such that it is inclined much more towards the vertical than the horizontal; a distinct *pra* seta, broad *prg* and large *ej apd*. In other respects, the habitus of the fly and the appearance of the scutum are similar to *Somatiosoma*.

Description:

Head: Higher than long, also a little broader than long; *ocp* flat in profile or only slightly convex; *fr* narrow at vertex, not more than 0.3 width of head, and eyes strongly convergent; *orb* plate distinct throughout. Chaetotaxy: 3 strong *orb*, 2 hind *orb* reclinate, anterior inclinate, *pvt* distinct and crossed, 1 *vti* and 1 *vte*, postocular setulae distinct, generally short, more or less in one row, lower postgenal seta present or absent; mouthparts normal, palp rather broad, almost disc-shaped; antenna with third segment round and arista bare.

Thorax: Broader than head and robust relative to remainder of fly. Chaetotaxy: *prpl* setula absent, 1 strong postsutural *dc*, often with 1 shorter seta anterior to this, *acrs* not

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differentiated from other scutal setulae, between *dc* lines in 8–12 rows with 2–4 distinct *prscut*; 1–2 *pprn*, 1 *posthu*, 2 *ntpl*, 1 distinct *pra* behind transverse scutal suture; 1 *sa* and 1 long *pa*, 1 short *post ia*, 2–4 pairs of marginal *scut* setae; sometimes with setulae on disc; anepisternum with 1 strong seta directed backwards at middle of posterior margin, katepisternum with 1 strong seta at upper posterior corner, each with a variable number of short setulae in front; tuft of numerous, fine, long setulae at ventral aspect of katepisternum.

Wing: Hyaline, R_{4+5} and M_{1+2} parallel towards wing apex or very slightly convergent at tip; discal cell wide beyond middle, about 2–3 times as wide as anterior basal cell; costal setulae short with variable number of stouter and darker setulae along anterior edge; costa, just beyond *hu* crossvein, narrowed but without distinct break. Haltere pale.

Legs: Yellow with fine setulae scattered on all pairs, in addition, a few longer setae usually present posterodorsally on fore femur; mid tibial apicoventral seta present or absent, but not longer than diameter of tibia at apex; femora, especially middle and posterior, slightly dilated; hind trochanter and tarsomeres not modified.

Abdomen: More or less compressed dorsoventrally; usually short but densely setulose, with longer setae along hind margin and lateral aspect of *tg* especially towards apex of abdomen; 6 visible *tg* in male and 7 in female, *tg* 6 normal; *st* sclerotized in both sexes, pollinose except for central part of *st* 2; pregenital *st* variably modified; female *tg* frequently with large brown to black shiny spots laterally.

Postabdomen: *ep* not usually as large as in other Chyromyinae; relatively large posteroventrally directed opening; *cerc* small, separated and poorly sclerotized with fine short setulae; *hyp* distinct and broad; *ph apd* broad and free from *hyp* for a short distance (cf. *Gymnochiromyia*); *ej apd* very large and well sclerotized; *distiph* complex as usual for the family, with sclerotized and membranous components; *prg* rather broad and flattened and variably sclerotized; *psg* of various forms in the species described.

Distribution: Afrotropical (Fig. 66); Pantropical.

Ecology: Species of *Notiochyromya* seem to prefer hot and wet (at least seasonally) environments. The genus is widespread in the tropics and subtropics of the Old World as well as the New World (New World species are undescribed), both on the continents and on islands. To date, most species are known from the Southern Hemisphere. Too little is known about their habits to make deductions on preference for vegetation cover, but by inference from data labels most appear to inhabit forests, or at least the edges of them. This includes forests encroaching on the seashore. *N. sexspinosa* was collected from entrances to caves in Nigeria (J.C. Deeming, pers. comm.).

Key to the Afrotropical species of *Notiochyromya*

[NB: The following key includes a number of undescribed species only known from females.]

Males

1 Scutellum with 4 marginal setae only; abdomen (Fig. 9b) with dark brown midline spots on tergites and *ep*, also with brown lateral areas on each *tg*, postabdomen Fig. 12 ..... **tripunctata** sp. n.

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– Scutellum with 6–8 marginal setae (if with short setae on disc, see key to females); abdominal markings various 2

2 Scutellum with 8 marginal setae; scutum shiny with barely a trace of pruinosity; abdomen lacking dark spots, postabdomen Figs 5, 6 ..... **lucida** sp. n.
– Scutellum with 6 marginal setae; scutum uniformly pruinose yellow to pale brown 3

3 Sternite 2 with a large shiny spot medially, leaving only a narrow margin of *st* with dense brown pruinosity, postabdomen Fig. 7 ..... **monticola** sp. n.
– Sternite 2 with a small medial shiny spot occupying middle 1/3 of diameter of *st*, leaving wide margin of brown pruinosity on *st*, postabdomen Fig. 4 .... **filigera** sp. n.

Females

1 Scutellum with 4 marginal setae and no setulae on disc ..... **tripunctata** sp. n.
– Scutellum with 6–8 marginal setae; with or without setulae on disc 2

2 Scutellum with 6 marginal setae (the pair between basals and subapicals are set medially; with or without a few short setae on disc); *mtn* pale 3
– Scutellum with 8 marginal setae; with or without a few additional short setae on disc; if with 6 setae on *scut*, then with short setae on disc and *mtn* dark 6

3 Scutellum without short setae on disc 4
– Scutellum with short setae on disc; tergites with dark spots on lateral borders only, and these only on *tg* 3–6 ..... sp. **A**, Namibia

4 Abdomen (Fig. 9a) with a small brown or black rounded spot on *tg* 3 to 6 laterally, and often with a darkening along midline that may or may not form a discrete spot; each spot is slightly shining and surrounded by a clear yellow margin; head short, in profile strongly sloping and frons narrower than 1/3 width of head at vertex, postabdomen Fig. 11 ..... **sexspinosa** (Lamb)
– Abdomen with large, oval, lateral, black spots completely shining and almost reaching anterior and posterior margin of each *tg* 5

5 Abdomen with shiny brown transverse bands on tergites ..... **filigera** sp. n.
– Abdomen with large black lateral spots on tergites, postabdomen Fig. 8 .... **monticola** sp. n.

6 Scutellum with 8 marginal setae, but no setae on disc; *mtn* yellow; abdomen with short longitudinal dark line at apex formed by midline spot on *tg* 6 and 7; bright pale yellow species with yellow vestiture ..... sp. **B**, Namibia
– Scutellum with 8 marginal setae (occasionally 6) and with short setae on disc; *mtn* dark; abdomen with spots on *tg* 5 and 6 out of line relative to those on *tg* 2–4, thus closer to midline of respective *tg* ..... sp. **C**, Namibia

Notiochyromya filigera sp. n.

Fig. 4

Etymology: From the Latin *filum* (thread) and *gerere* (to bear), and refers to the long, thread-like distiphallus of this species.

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Diagnosis: Pale yellow species with 3 pairs of marginal setae on *scut*; male with only a small central shiny spot on *st* 2; female with paired spots laterally on *tg* 2–7; head higher than long, entirely pale yellow; eyes slightly oval with long axis almost vertical; pleural setae and setulae on legs yellow; *distiph* with long apical filaments and broad curved *surs*, with posteriorly-directed flagelliform setae. Similar species: *N. monticola* sp. n.

Description:

Male.

Head: Entirely yellow, including *oc* triangle; ocelli black; *fr* narrow and long, at level of antennae 0.5 width that at level of anterior *oc* and 0.4 width of one eye viewed from in front; about 10 short pale setulae scattered over middle part and, on orbital plate, one brown setula in each of the intervening spaces between *orb*. *ocp* flat, in profile, barely visible behind eye; short postocular setulae irregularly in one row; isolated lower postgenal seta short. Gena broader near anterior buccal margin, narrow below eye, where at middle, about 0.3 height of eye and anteriorly about as broad as third antennal segment, yellow and with few pale setulae. Mouthparts yellow, palp round; setulae of buccal

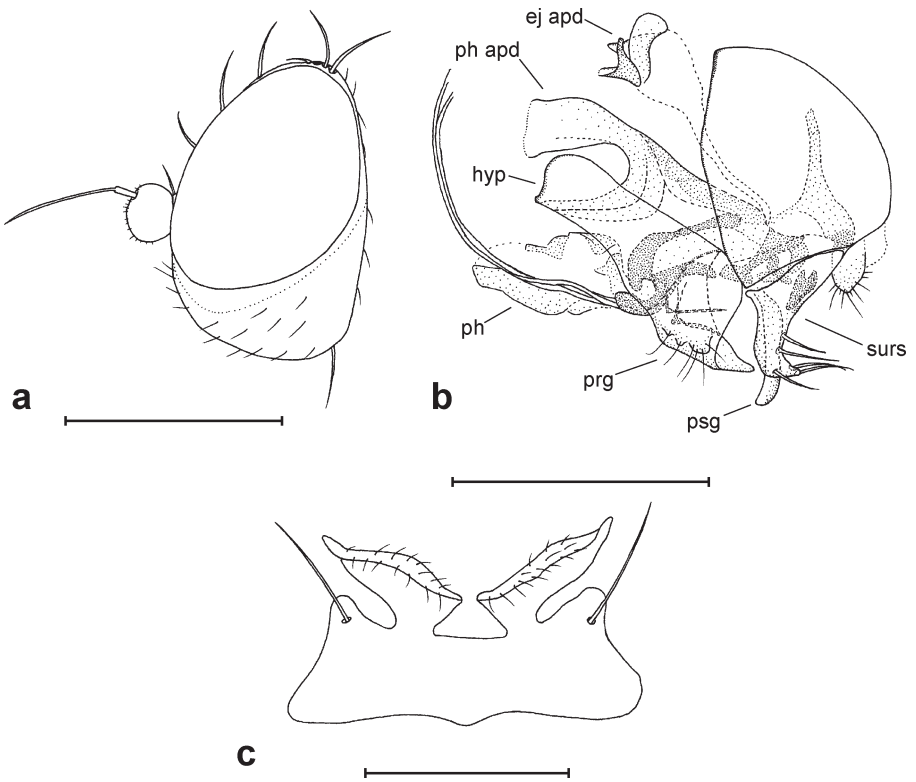

Fig. 4. *Notiochyromya filigera* sp. n., ♂: (a) head, lateral, scale bar = 0.3 mm; (b) hypopygium, lateral, scale bar = 0.18 mm; (c) *st* 5, ventral, scale bar = 0.1 mm.

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margin short. Face poorly sclerotized and depressed; median carina barely visible between bases of antennae. Antenna yellow, segment 3 about 0.35 length of horizontal diameter of eye, second segment with dorsal seta; arista brown, becoming pale at basal one third and with fine sparse pubescence. Chaetotaxy: 3 *orb*, anterior inclinate and as long as distance between orbits at this level, middle and posterior *orb* reclinate; *pvt* distinct and crossed, little more than half length of divergent ocellars; 1 *vti* and 1 *vte*, strong.

Thorax: Scutum and *scut* yellow and without pattern except for small brown spot basally on lateral *scut* margin, pleura paler, *mtn* yellow. Chaetotaxy: 1 *pprn* and 2 setulae, 1 *posthu*, 2 *ntpl*, 1 *pra*, 1 *sa* and 1 long *pa*, 1 long *dc* with a short seta in front of it about one third its length or less; *acrs* differentiated only as one *prscut* pair; scutum covered with numerous very short dark setulae in 8–10 rows between *dc* lines at level of transverse suture; *scut* with 3 pairs of marginals, middle pair shortest and situated just medial to a line joining basal and subapical setae; 1 anepisternal and 1 katepisternal, that on katepisternum at upper hind corner, that on anepisternum at middle of posterior margin; each with a few setulae in front.

Wing: Hyaline, veins all pale yellow; costal setulae brown to black with many stouter almost spinose setulae among them; dorsal aspect of costa with 3–6 spinose but very short setulae; costa beyond *hu* crossvein narrow but not distinctly broken; R_{4+5} and M_{1+2} run parallel to wing margin converging only in apical 1/4; distance between R_{2+3} and R_{4+5} about 0.7 that between R_{4+5} and M_{1+2}; discal cell broadest at level of anterior crossvein; distance between crossveins 1.2 length of apical section of vein Cu. Haltere pale yellow.

Legs: Not modified except for very slightly thicker femora; numerous fine setulae scattered on all pairs of legs, in addition longer setae present on fore femur; mid tibial apicoventral seta short, a little less than diameter of tibia at apex; all setae and setulae pale yellow; claws and pulvilli normal.

Abdomen: Yellow, with darker yellow and shiny transverse bands on all tergites and dark brown spot on ventrolateral aspect of *tg* 2; setulae brownish yellow and on *tg* 4–6 laterally and along hind margin with longer setae; sternites sclerotized, yellow, *st* 2 with small shiny spot at middle; *st* 5 with pair of posterior lobes broad at their apex with a fringe of fine setulae, long seta on lateral margin.

Postabdomen: *cerc* very small with few minute setulae; *ep* more or less hemispherical, *surs* broad, strongly curved and with 5 distinct broad setae along posterior edge at apex; *prg* broad with row of setae along middle of lateral surface, *psg* narrow, long, almost straight; *ej apd* large, bilobed sclerotized and of distinct shape; *ph apd* broad at base and distinctly curved towards *hyp*; *distiph* with sclerotized and membranous components, with very distinctive flagellate apex.

Female.

Similar to male, generally darker colouration of vestiture, and more defined and darker brown bands on abdominal *tg* with black or dark brown spot on lateral aspect of *tg* 2–7. Postabdomen: very similar to *monticola* (Fig. 8), but *st* 8 with one row of setae along middle third of sclerite, inserted parallel to long axis and each curved medially; *cerc* small, similar in size to *hypr*; first section of spermathecal duct thinly sclerotized.

Length: ♂ body 1.5 mm, wing 1.5 mm; ♀ body 1.7 mm, wing 1.6 mm.

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Holotype: ♂ MAURITIUS: Wolmar, 1–2 km S [20°18'S:57°22'E], 21.v.2000, J.W. Ismay, coast roadside (OXUM).

Paratypes: 1♀ same data as holotype (OXUM). KENYA: 1♂ Hunter's Lodge, nr Kiboko, 02°14'S:37°43'E, 8–9.viii.2003, A. Freidberg (TAUI); 2♀ Rt B8, nr Takaungu, 50 km N of Mombasa, 03°42'S:39°49'E, 12.viii.2003, A. Freidberg (TAUI, NMWC); 2♂ Simba, 02°09'S:37°35'E, 15.ix.2005, A. Freidberg (TAUI, NMWC). SOUTH AFRICA: *KwaZulu-Natal*: 1♀ Pietermaritzburg, 15.ix.1976, R.M. Miller (NMSA). YEMEN: 1♂ 1♀ Ta'izz, 5.i–2.ii.1998, A. van Harten & M. Mahyoub (NMWC).

Notiochyromya lucida sp. n.

Fig. 5

Etymology: From Latin *lucida* (shiny), and refers to the shiny, weakly pruinose scutum of this species.

Diagnosis: A small orange-yellow species with a relatively large third antennal segment; scutum very sparsely pruinose, scutal setulae between *dc* rows at level of tranverse suture in 10 rows, *scut* with 4 pairs of marginals and abdomen without any markings.

Description:

Male.

Head: All yellow, including *oc* triangle; *fr* narrowed anteriorly, at level of antennae 0.6 width that at level of anterior *oc* and 0.6 width of one eye viewed from in front; covered

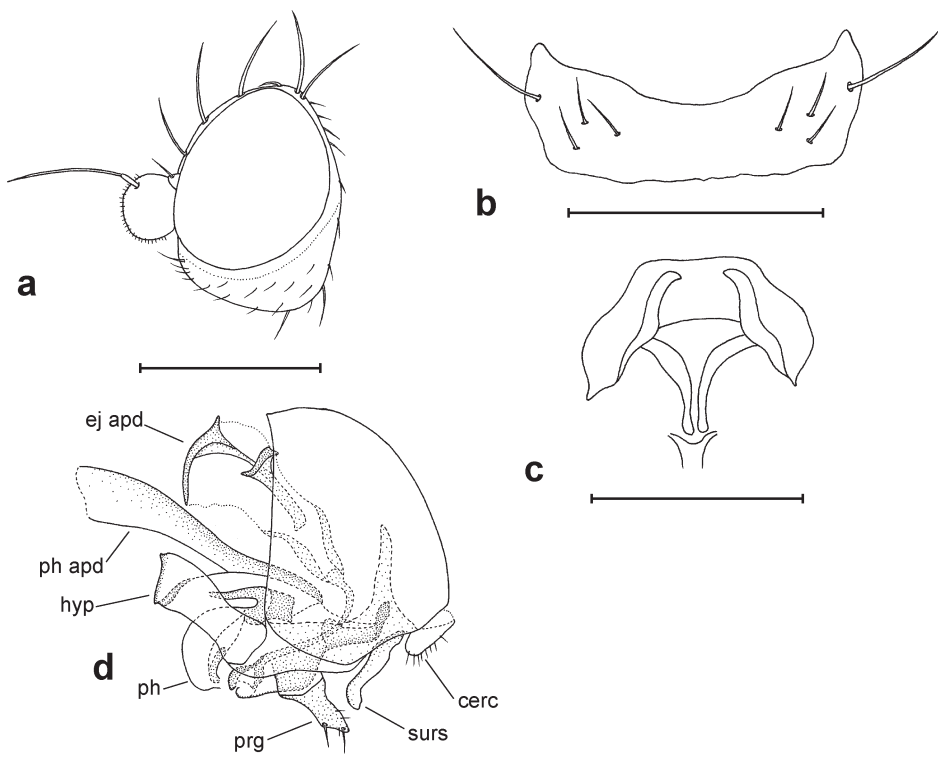

Fig. 5. *Notiochyromya lucida* sp. n., ♂: (a) head, lateral; (b) *st* 5, ventral; (c) *ej apd*, dorsal; (d) hypopygium, lateral. Scale bars = 0.2 mm in Figs 5a, b, d and 0.1 mm in Fig. 5c.

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with numerous minute pale setulae. Gena narrow, about 0.3 height of eye, yellow and with pale setulae. *ocp* yellow, in profile narrowly visible behind entire eye margin; with short postocular setulae irregularly in one row; isolated lower post-genal seta absent. Mouthparts small, yellow, palp short and round, vibrissal setulae of buccal margin longer, longest a little longer than anterior orbital. Face poorly sclerotized and depressed; median carina absent. Antenna yellow; second segment paler than third, with distinct short dark seta dorsally; third segment large and round, about 0.35 length of horizontal diameter of eye, finely pubescent; hairs shorter than diameter of arista at base; arista black almost throughout, yellow only at base and bare. Chaetotaxy: 3 strong *orb*, anterior strongly inclinate and longer than *fr* is wide at this level, middle *orb* closer to anterior than to posterior; *oc* short, divergent and shorter than *pvt*; 1 *vti* and 1 *vte* both strong.

Thorax: Yellow with somewhat darker *dc* and *ia* lines; *ntpl* contrasting very pale yellow; *scut*, *mtn* and pleura all yellow; *scut* flat on disc, lateral marginals about half length of subapicals, with shorter setae between marginals, but not on disc. Chaetotaxy: 1 *pprn*, 1 *pra*, 1 *sa*, 1 *pa*, 2 *ntpl*, 1 strong postsutural *dc* and another in front of this about one third its size; *acrs* undifferentiated; setulae on scutum at level of transverse suture in 8 irregular rows between *dc* lines; pleural setae not seen because of pin.

Wing: Hyaline, veins all pale yellow; R_{4+5} and M_{1+2} run parallel to wing margin converging only in apical 1/4; distance between R_{2+3} and R_{4+5} about 0.7 that between R_{4+5} and M_{1+2}; discal cell broadest at level of anterior crossvein; distance between crossveins 0.7 length of apical section of vein Cu. Haltere pale yellow.

Legs: Not modified, except for slightly thicker femora; generally fine pale setulae scattered on all pairs of legs, in addition about 6 long setae present on posterodorsal aspect of fore femur; mid tibial apicoventral seta almost as long as diameter of tibia at apex, yellow; claws and pulvilli normal; hind trochanter normal.

Abdomen: All yellow and without pattern of spots or bands; setae short; *st* 6 with a long seta laterally; *tg* 6 narrow and mostly covered by *ep*.

Postabdomen: *ep* large and yellow with a short *surs* projecting antero-ventrally; *ej apd* very large, umbrella-shaped and reaching far forward, *ph apd* long and broad; *prg* trapezoidal, *psg* not identified, *surs* narrow, curved at extreme apex.

Female. Unknown.

Length: ♂ body 1.6 mm, wing 1.6 mm.

Holotype: ♂ TANZANIA: E Usambara Mts, Amani Research Station [05°06'S:38°38'E], alt. 900 m, 19–27.vi.1974, D. Hollis (BMNH).

Notiochyromya monticola sp. n.

Figs 6, 7

Etymology: From the Latin *mons* (mountain) and *incola* (inhabitant), and refers to the high altitudes at which this species occurs.

Diagnosis: A species with an orange-brown head, yellow thorax with scutum a deeper yellow to pale brown, and pale brown to yellow abdomen; *mtn* yellow and all setae and setulae black; male with *st* 2 mostly shining and *st* 6 with two backwardly projecting lobes and strong lateral setae; *scut* with 3 pairs of marginals; *distiph* with apical filaments, *psg* narrow with normal setae. Similar species: *N. filigera* sp. n.

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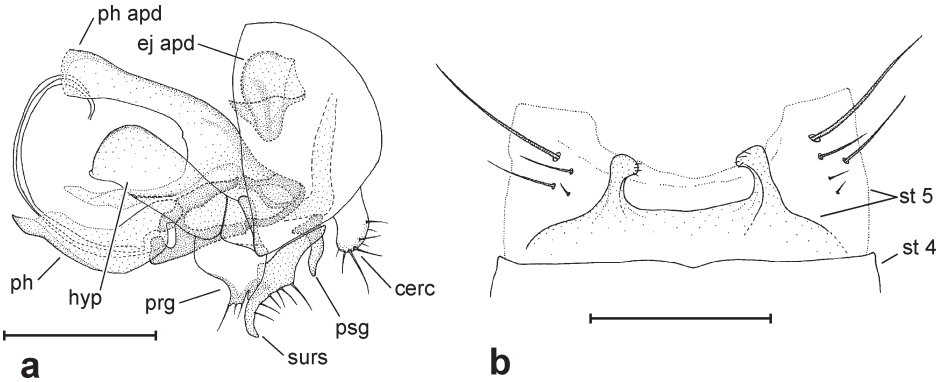

Fig. 6. *Notiochyromya monticola* sp. n., ♂: (a) hypopygium, lateral, scale bar = 0.2 mm; (b) *st* 5, ventral, scale bar = 0.15 mm.

Description:

Male.

Head: Higher than long, deep orange yellow including *oc* triangle; *fr* narrowed anteriorly: at level of antennae 0.2× width of head and 0.5× width of that at level of anterior *oc*, with several minute dark setulae across middle; lunule high, about equal to length of antennal segment 3; *ocp* brown except for upper 1/3 of postocular margin and behind vertex, which are yellow; *ocp* in profile narrowly visible behind eye margin in lower half; short postocular setulae in one row; eye almost round, just a little higher than long and anterior facets about twice size of posterior facets; mouthparts small, yellow, palp short and round, vibrissal setulae of buccal margin only a little longer that genal setulae; face small, poorly sclerotized and depressed; median carina absent. Gena about 0.3× height of eye at middle, yellow and with numerous brown setulae, isolated lower postgenal seta short but distinct; antenna small and yellow; second segment paler than third, with distinct short dark seta dorsally; third segment about 0.25× length of horizontal diameter of eye, finely pubescent: hairs shorter than diameter of arista at base; arista black almost throughout, yellow only at base and sparsely but at regular intervals with minute pubescence. Chaetotaxy: 3 strong *orb*, anterior strongly inclinate and as long as *fr* is wide at this level; *oc* long, erect, slightly divergent, *pvt* distinct and crossed; 1 *vti* and 1 *vte*, both strong.

Thorax: Yellow with somewhat darker yellow to pale brown scutum; *ntpl* contrasting pale yellow; *scut*, *mtn* and pleura all yellow. Chaetotaxy: all setae and setulae black or at least dark brown, 1 *pprn* with 2 adjacent setulae, 1 *posthu*, 1 *pra*, 1 *sa*, 1 *pa*, 1 short *post ia*, 2 *ntpl*, 1 strong postsutural *dc* and another in front of this about 1/3 its size; *acrs* undifferentiated; setulae on scutum at level of transverse suture in 8 irregular rows between *dc* lines; *prscut* pair strong, about as long as 0.5× length of hind *dc*, 1 anepisternal in upper 1/3 and 1 katepisternal at upper posterior corner with several short dark setulae in front of each; *scut* with 3 pairs of marginals, middle pair shortest and set just medial to line joining basal and subapical pairs.

Wing: Hyaline, veins yellow; anterior costal setulae black, no dorsal setulae present; distance between R_{2+3} and R_{4+5} about 0.6× that between R_{4+5} and M_{1+2}; apical section of Cu about 1.5× length of posterior crossvein; distance between crossveins about equal to length of apical part of Cu. Haltere yellow.

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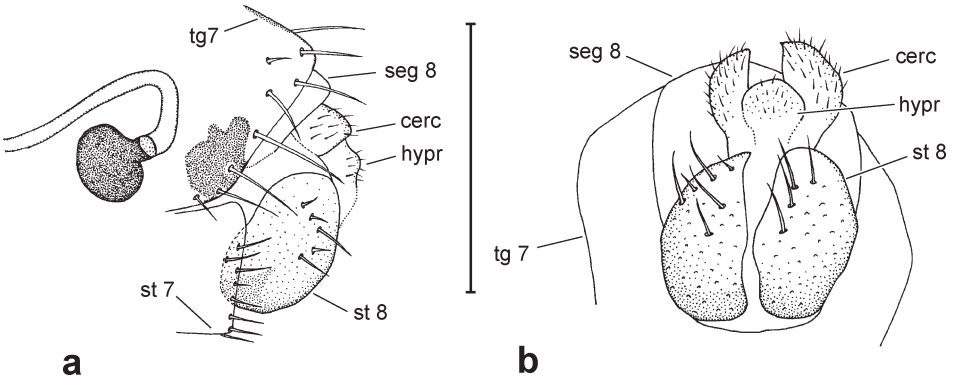

Fig. 7. *Notiochyromya monticola* sp. n., ♀ postabdomen, lateral (a) and ventral (b). Scale bar = 0.15 mm.

Legs: Not modified; fine dark setulae scattered on all pairs of legs; mid tibial apicoventral seta half as long as diameter of tibia at apex, dark brown; claws black.

Abdomen: Yellow to brown with numerous dark setulae on dorsum and laterally and on hind margin of *tg* 4–6 with several longer setae; large shiny black spot ventro-laterally on *tg* 2; *st* 2 also dark and shiny except for narrow brown dusted border, *st* 5 with a pair of lobes directed backwards and long setae laterally; *tg* 6 almost as broad as *tg* 5 and completely separated from *ep*.

Postabdomen: *ep* large, hemispherical and brownish yellow with a large *surs* projecting postero-ventrally and setulose on hind margin and curved at apex; *ej apd* very large and bilobed, *ph apd* long and broad; *prg* trapezoidal, with apex directed slightly forward and setulose, *psg* small and pointed, *distiph* with flagellum at apex, *cerc* without special modifications.

Female.

As in male, but abdomen with paired large shiny black spots laterally on each *tg* and along midline with a variably developed darkening. Postabdomen: Sclerotized sternal plates of segment 8 having long setae on posterior part; *hypr* small, poorly sclerotized and weakly setulose, similar in size to small *cerc*; spermathecal duct thinly sclerotized in first part from *s*.

Length: ♂ body 1.9 mm, wing 2.2 mm; ♀ body 2.0 mm, wing 2.3 mm.

Variation: Remarkably little in both sexes; the intensity and extent of dark areas varies a little as does the colour of the setae from black to brown; *scut* yellow, but in a few specimens with very small dark spot at base of lateral margin.

Holotype: ♂ ETHIOPIA: Shewa, Debre Tsige, 09°39'N:38°49'E, 2660 m, 28.ix.2005, A. Freidberg (TAUI).

Paratypes: 5♂ 4♀ same data as holotype (TAUI); 1♂ 1♀ same data (BMNH); 2♂ 2♀ same data (NMWC); 2♂ 1♀ same data (NMSA); 2♀ Tigray, Axum, 2220 m, 14°08'N:38°43'E, 4–5.x.2005, A. Freidberg (TAUI). SOUTH AFRICA: *Western Cape*: 1♀ Wilderness National Park, 17 km SE George, 35°59'S:22°39'E, 14.x.1994, R. Danielsson (MZLU).

Notiochyromya sexspinosa (Lamb, 1914), **comb. n.**

Chiromyia sexspinosa: Lamb 1914: 355.

Figs 8a, 9b, 10

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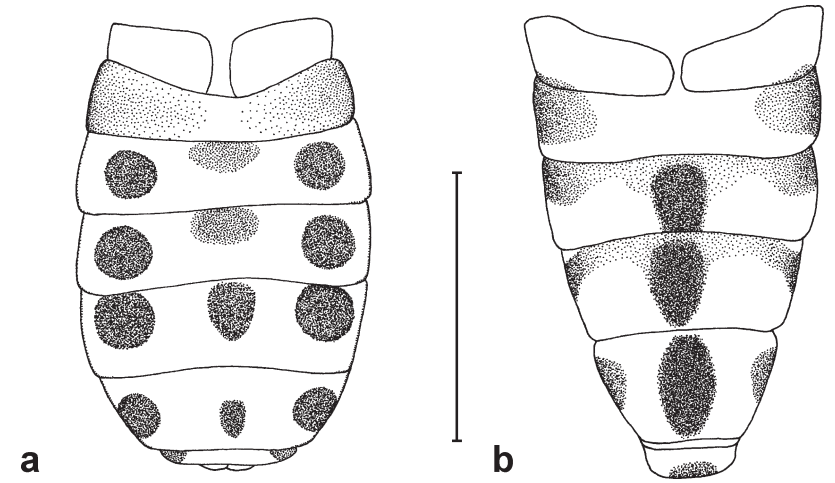

Fig. 8. Dorsal aspect of abdomen: (a) *Notiochyromya sexspinosa* (Lamb), ♀, Nigeria; (b) *Notiochyromya tripunctata* sp. n., ♂. Scale bar = 0.6 mm.

Diagnosis: A yellow species with abdomen (females) marked with dark spots: 1 large pair on *tg* 2, smaller pair on each of *tg* 3–6; *tg* 3–5 dorsally at middle sometimes with brown ill-defined spot; *scut* with 3 pairs of marginal setae. Postabdomen with very small *cerc* and *hypr*, the latter with about 6 microtrichia; *s* not uniformly black and with sclerotized first part of duct very short. The specimens from Niger Province listed below are rather pale with the spot on *tg* 2 light brown and the brown bands dorsally on *tg* absent.

Type material examined: SEYCHELLES: ♀ (holotype) 'Mahé 08-9, Seychelles Exp. / Prof. J.S. Gardiner' (BMNH); 3♀ (paratypes) same data (1 BMNH, 2 CUMZ).

Other material examined: GHANA: 1♀ Accra, 1921, J.W. Scott Macfie, laboratory windows (BMNH). NAMIBIA: 1♀ Rundu District, 20 km E Rundu, 17°55'46"S:19°58'43"E, 17–18.x.1999, A.H. Kirk-Spriggs, T. Pape & W. Hauwanga, Malaise trap (NMNW). NIGERIA: 1♀ Zaria, Samaru, 9.iii.1969, J.C. Deeming (NMWC); 2♀ Zaria, Samaru, viii.1967, [no collector], mercury vapour light trap (BMNH); 8♀ Niger Province, nr Mokwa, 2.v.1973, J.C. Deeming, at entrance to bat cave (NMWC).

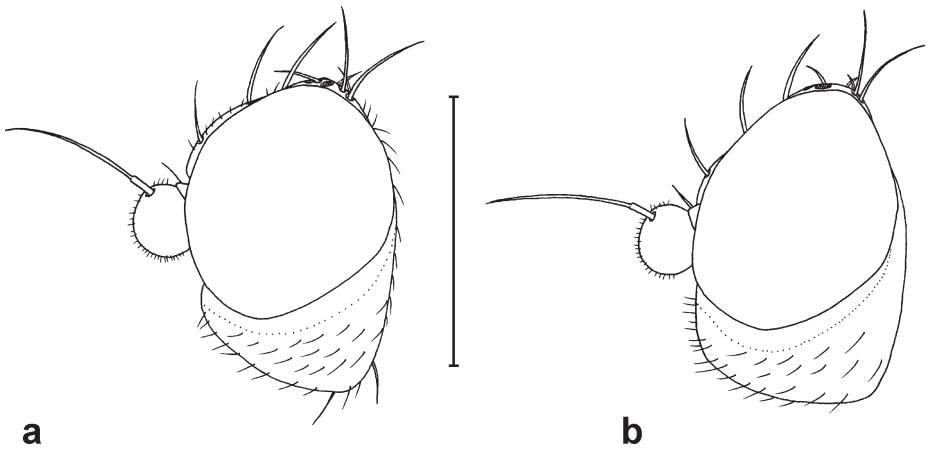

Fig. 9. Lateral aspect of head: (a) *Notiochyromya tripunctata* sp. n., ♂; (b) *Notiochyromya sexspinosa* (Lamb), ♀, Nigeria. Scale bar = 0.4 mm.

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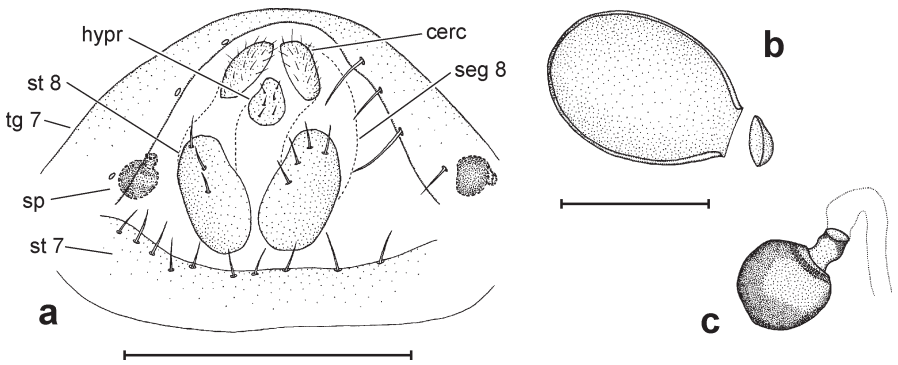

Fig. 10. *Notiochyromya sexspinosa* (Lamb), ♀, Nigeria: (a) postabdomen, ventral; (b) ovum; (c) spermatheca, enlarged. Scale bars = 0.3 mm in Figs 10a, b.

Distribution: Ghana, Namibia, Nigeria, Seychelles.

Remarks. Lamb (1914) wrote that he had four males. This is a surprising error as in fact they are all females with the ova developed to an advanced stage. They are almost identical to each other. In three of the specimens, the dark spots on the abdomen are brown and shiny rather than black. Lamb's description is not detailed enough to allow the identification and reliable separation of *sexspinosa* from the undescribed sp. C only on the basis of females (see below).

Notiochyromya tripunctata sp. n.

Figs 8b, 9a, 11

Etymology: From the Latin *tri-* (three-) and *punctata* (spotted), and refers to three sets of spots on the *tg*.

Diagnosis: Relatively large yellow species with very narrow gena and characteristic dark pattern of spots on *tg*; *scut* with disc flatter than usual and with 2 pairs of marginal setae; most setae and setulae dark brown to black.

Description:

Male.

Head: All yellow, including *oc* triangle; *fr* narrowed anteriorly: at level of antennae 0.6 width that at level of anterior *oc* and 0.4× width of one eye viewed from in front. *ocp* yellow, in profile barely visible behind eye; with short postocular setulae irregularly in one row; isolated lower postgenal seta short. Gena very narrow, about 0.2× height of eye at middle, yellow and with pale setulae. Mouthparts small, all yellow, palp round and short, vibrissal seta as long as anterior *orb*, other setulae of buccal margin short. Face poorly sclerotized and depressed, median carina absent. Antenna yellow, second segment paler than third, with short dark seta dorsally; third segment small and round about 0.25× length of horizontal diameter of eye, finely pubescent hairs shorter than diameter of arista at base; arista black almost throughout and completely bare. Chaetotaxy: 3 strong *orb*, the anterior strongly inclinate, middle and posterior *orb* reclinate; *pvt* minute, barely visible; 1 *vti* and 1 *vte* both strong; *oc* short and strongly lateroclinate; numerous fine short setulae over most of *fr*, including on intervening spaces between *orb* setae.

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Thorax: Yellow with a pair of light brown stripes in midline of scutum, between *dc* and *ia* lines, and posteriorly along *sa* line; a small brown patch on *pprn*. Scutum very flat on disc, bare except for 2 pairs of marginals, and with a small brown spot at base ventrolaterally; *mtn* brownish-yellow; pleura all yellow and paler than disc of *scut*. Chaetotaxy: 1 *pprn* and 3 setulae, 1 *posthu*, 1 *pra*, 1 *sa*, 1 *pa*, 2 *ntpl*, 1 strong *dc* and another in front of this about half its size; *acrs* undifferentiated apart from *prscut* pair which is a little longer than anterior *dc*; very short and very numerous setulae over whole of scutum, about 10–12 rows between *dc* lines at level of transverse suture; anepisternum with numerous scattered setulae in posterior half, 1 strong anepisternal seta directed horizontally backwards from middle of posterior margin of sclerite; 1 katepisternal at upper hind corner of katepisternum.

Wing: Hyaline, veins all pale yellow; costal setulae brown to black with many stouter almost spinose setulae among them; dorsal aspect of costa without spinose setulae; costa beyond *hu* crossvein narrow but not distinctly broken; R_{4+5} and M_{1+2} run parallel to wing margin converging only in apical 1/4; distance between R_{2+3} and R_{4+5} about 0.8 that between R_{4+5} and M_{1+2}; discal cell broadest at level of anterior crossvein; distance between crossveins about equal to length of apical section of vein Cu. Haltere pale yellow.

Legs: Not modified except for slightly thicker femora; generally fine pale setulae scattered on all pairs of legs, in addition about 6 longer setae present on posterodorsal aspect of fore femur; mid tibial apicoventral seta half diameter of tibia at apex, brown; all tarsomeres with several distinctly longer setulae on dorsal aspect, claws and pulvilli normal.

Abdomen: Relatively long and narrow, somewhat tapering apically; *tg* with a pattern of brown spots and bands at base; midline spots on *tg* 3, 4 and 5, slightly shining and almost black; setulae on discs of *tg* short, numerous and dark, longest less than half as long as *tg*; *st* all yellow.

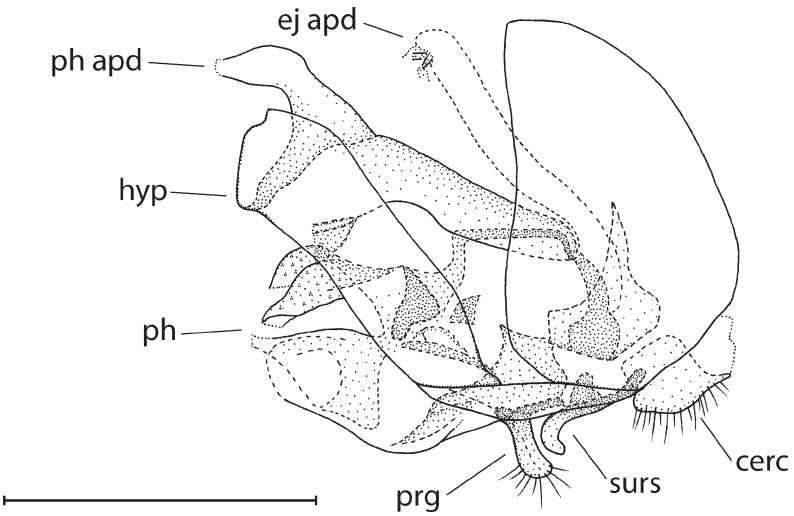

Fig. 11. *Notiochyromya tripunctata* sp. n., ♂ hypopygium, lateral. Scale bar = 0.2 mm.

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Postabdomen: *ep* with distinct dark spot at middle; small and with very short setulae; *hyp* broad and fused with anterior lower margin of *ep*; *ph apd* small, lying within curve of *hyp*; *ej apd* very small; *prg* short with rounded apex, *surs* short, curved inwards, *psg* not identified, *basiph* cuboid; *distiph* broad mostly membranous.

Female.

Similar to male, but no midline spots or stripe and lateral spots small. Postabdomen not dissected.

Length: ♂ and ♀ body 2.7 mm, wing 2.3 mm.

Holotype: ♂ MAURITIUS: Beline, 28.v.2000, J.W. Ismay, mangroves (OXUM).

Paratypes: 1♂ same data as holotype (OXUM). SOUTH AFRICA: *Eastern Cape*: 1♀ 5 km SW Grahamstown [33°16'S:26°29'E], 10.i.1984, D.J. Brothers (NMSA). YEMEN: 1♀ Mukalia, vi.2001, A. van Harten & M. Hubaishan, light trap (NMWC).

Notiochyromya sp. A

A yellow species except for large black spots laterally on *tg* 3–6; antennal segment 3 broader than gena (a character state that distinguishes this species from congeners); *mtn* yellow and scutal setulae between *dc* line in 6–8 rows; *scut* with 6 marginal setae, but the basals are the shortest.

Material examined: NAMIBIA: 1♀ Rundu District, 20 km E Rundu, 17°15'46"S:19°58'43"E, 17–18.x.1999, A.H. Kirk-Spriggs, T. Pape & W. Hauwanga, Malaise trap (NMNW).

Notiochyromya sp. B

This is a relatively large bright yellow species, which also has all the vestiture pale yellow; the *scut* has 8 marginal setae, but no setulae on disc; *mtn* yellow; abdomen with a short longitudinal dark line at apex formed of a fusion of the midline spots on *tg* 6 and 7.

Material examined: NAMIBIA: 1♀ Mahango Game Reserve, Thinderevu Omuramba, 18°15'S:21°40'E, 28.ii–13.iii.1992, M. Pusch & E. Marais; 1♀ Ovambo, Onduri, 17°32'S:16°37'E, 14–26.i.1993, E. Marais, pitfall trap (in alcohol, NWMC); 2♀ Ovambo, Onghwiya, 17°34'S:16°49'E, 14–26.i.1993, E. Marais, pitfall trap; 3♀ Ovambo, Enyana, 17°37'S:17°25'E, 14–27.i.1993, E. Marais, pitfall trap; 3♀ Kavango, Nangera, 17°37'S:18°08'E, 14–27.i.1993, E. Marais, pitfall trap; 1♀ Kavango, 5 km NE Dikweya, 17°41'S:18°32'E, 14–27.i.1993, E. Marais, pitfall trap (all in alcohol, NMNW); 1♀ Rundu District, Simanya Okavango R., 17°33'35"S:18°32'30"E, 23–24.i.1998, A.H. Kirk-Spriggs & E. Marais, Malaise traps, riverine forest; 2♀ Kaudom Game Park, 10 km W of Dussi, 18°48'32"S:20°43'57"E, 29–30.xii.1998, E. Marais, A.H. Kirk-Spriggs & D. Mann, Malaise traps; 3♀ Rundu District, Hamoye Nat. forest, 18°12'S:19°43'E, 5–8.iii.1999, E. Marais, Malaise trap; 1♀ Gobabis District, Somerkoms 521, 22°01'59"S:19°57'22"E, 6–8.ii.2001, A.H. Kirk-Spriggs & E. Marais, Malaise trap (all dry-pinned, NMNW).

Notiochyromya sp. C

A yellow species with completely dark *mtn* and paired spots on all *tg*, spots on *tg* 1 and 2 merge to form a large oval patch, spots from *tg* 3 to 7 gradually increasing in size towards apex of abdomen; *scut* with small brown spot at base ventrolaterally and short setae on disc apart from 6–8 additional marginal setae, which alternate in size, the basal shortest; scutal setulae between *dc* lines in 10 rows. This species is similar to *sexspinosa*. It differs in the number of *scut* setae and the progressively larger spots on the abdomen from base to apex.

Material examined: NAMIBIA: 8♀ Rehoboth District, Garles Oos 489, 23°54'S:16°33'E, 9.ii–23.iii.1993, E. Marais, pitfall trap (all in alcohol, NMNW); 1♀ Tsumkwe District, Nama, 19°54.34'S:20°44.08'E, 20–22.xii.1998, A.H. Kirk-Spriggs, E. Marais & D. Mann, Malaise traps (dry-pinned, NMNW).

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Notiochyromya sp. D

These specimens belong to a yellow species with the *scut* having no additional marginals and no short discal setae but, as in *filigera* and *monticola*, there is a pair of setae on the disc just medial and posterior to the subapical pair; scutal setulae between *dc* lines in 10 rows; *mtn* dark brown; abdomen with segments 3–7 having paired brown spots laterally. It is not included in the above key for lack of easily defined characters.

Material examined: NAMIBIA: 1♀ Windhoek, Hoffnung farm, lucerne fields, 7.ii.1972, British Museum Southern African Expedition 1972 (dry-pinned, BMNH). ZIMBABWE: 1♀ Zambezi, Rutometje-Res. St. RM2, 16°10'S:29°25'E, vii.1988, J. Weyrich (in alcohol, ZSMC).

Genus **Oroschyromya** gen. n.

Type species: *Oroschyromya peruncinata* sp. n., here designated.

Etymology: From the Greek *oros* (mountain), indicating the occurrence of the majority of species of the genus at high altitudes, and *Chyromya*, denoting the affinity to this genus.

Diagnosis: Head broader than thorax; *fr* narrow with moderate to strongly converging margins; eye oval, lying oblique in profile; *ocp* slightly convex with a few setulae on disc; femora long and slender; a well-developed *post ia* present; *scut* without additional marginals or setulae on disc; apicoventral seta on mid tibia absent; *ep* large, more or less rectangular and sits vertically relative to the long axis of the abdomen; *cerc* modified and *prg* large, heavily sclerotized, conical to pyramidal.

The autapomorphies that characterize this genus include a strong *post ia* seta, very large vertically elongated *ep*, an intermediate sclerite between the posterior edge of *hyp* and *prg*, large mobile *surs* and *prg*, and modified *cerc*. In the female, segments 6 and 7 usually membranous dorsally, therefore appearing divided, with heavily sclerotized lateral sclerites that are also strongly setose, giving them the appearance of a second pair of *cerc*. In other respects, scutum and *scut* appear similar to those in *Gymnochiromyia*, but in this genus the head is not so broad, the *post ia* is absent and the male and female postabdomens present different character states.

Description:

Head: Broader than long; *ocp* flat in profile or only slightly convex, somewhat concave when viewed from above; *fr* broad at vertex and eyes strongly convergent; orbital plate distinct. Chaetotaxy: 3 strong *orb* more or less reclinate, but also lateroclinate, anterior *orb* inclinate or reclinate; *pvt* distinct and crossed; strong *vti* and *vte*; postocular setulae distinct, especially behind *vt*, others short, more or less in one row, lower postgenal seta present; mouthparts normal, palp round or almost round.

Thorax: Elongated, narrower than width of head. Chaetotaxy: *prpl* setula absent, 1 or 2 strong posterior *dc*, sometimes with 2–4 short *dc* anterior to these, scutal setulae between *dc* lines in 4–8 irregular rows with one short, but distinct *prscut* pair; 1–2 *pprn*, 1 *posthu*, 2 *ntpl*, 1 *sa* and 1 long *pa*, 1 *post ia*, absent *pra*; 2 pairs of marginal *scut* setae: one subapical and one basal, no setulae on margin or on disc; anepisternum with 1 strong seta at middle of posterior margin directed backwards, often with another shorter seta above, katepisternum with 1 or 2 strong setae at upper posterior corner; tuft of numerous, fine, long setulae at ventral aspect of katepisternum.

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Wing: Hyaline or faintly and diffusely infuscated, R_{4+5} and M_{1+2} parallel to wing apex or very slightly convergent; vein closing anal cell often with a minute stump vein at middle; *hu* break present or absent, in which case a distinct weakening apparent, costal setulae with minute spine-like setulae interspersed among them along anterior margin of costal vein between R_1 and R_{2+3}, several similar short spine-like setulae present at irregular distances on dorsal aspect of costa.
Legs: Fine setulae scattered on all pairs, in addition longer setae present on fore femur; mid tibial apicoventral seta absent, femora not or hardly dilated, hind trochanter and tarsomeres not modified. One species has additional setal characters.

Abdomen: Variably compressed laterally; 6 visible *tg*, *tg* 6 narrow; *st* sclerotized, *st* 5 modified, *st* 6 often reduced to V-shaped sclerite.
Male postabdomen: *ep* well-developed, vertically elongated and variably compressed laterally with relatively large ventrally directed opening; *cerc* large sclerotized to a variable degree and usually with modified setae, either as 3–5 strong, but short spines in addition to fine setulae or longer and stronger setae than usual for family; *hyp* distinct with additional lateral sclerites between its posterolateral end and base of *prg*, *ph apd* long, narrow and free from *hyp* for a significant distance (cf. *Chyromya* and *Somatiosoma*), *ej apd* small, not recognisable (or not sclerotized) in some species; *distiph* complex as usual for the family, with sclerotized and membranous components; *prg* heavily sclerotized, more or less conical that is, more like a large spine than a flat sclerite, with strong setae, *psg* distinct and sometimes remarkably modified.
Female postabdomen: Segments 6–8 variously modified, usually with one or more segments having *tg* divided into large heavily sclerotized lateral sclerites with strong setae, *hypr* distinct, *s* relatively small and very deeply pigmented; *cerc* tending to be elongate.

Distribution: Afrotropical (Fig. 67).

Ecology: *Oroschyromya* is known only from Africa. The genus appears to favour well-vegetated habitats with a wide range of rainfall. All species but one are from high altitude (1200–3200 m). The single lowland (260 m) species (*O. dubia* (Lamb, 1914) from Mauritius and the Seychelles) is placed in this genus on the basis of strict character interpretation and postabdominal features of both sexes, but its general appearance is more like *Notiochyromya* or *Gymnochiromyia*.

Key to the species of *Oroschyromya*

Males

1 1 *prsut* + 3–5 postsutural *dc* setae 2
– 0 *prsut* + 1–2 postsutural *dc* setae 4

2 Cerci at least 3× longer than wide and *ca* 1/3 height of *ep*, viewed in profile; *prg* long and narrow, as long as or longer than cerci, postabdomen Figs 19a, b .... **elongata** sp. n.
– Cerci shorter, at most 1/4 height of *ep*; *prg* shorter and spine-like, clearly broader basally 3

3 Metanotum dark brown; 1+4–5 *dc*, scutal setulae arranged in 8 irregular rows and numerous from anterior to posterior; *post ia* seta strong; tarsomere 5 of all legs brown, postabdomen Fig. 14 ..... **bicolor** sp. n.

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– Metanotum pale brown; 1+3 *dc*, scutal setulae arranged in 4–6 rows, sparse from anterior to posterior; *post ia* short; tarsomere 5 of all legs yellow, postabdomen Fig. 18 ..... **elgonae** sp. n.

4 Scutum entirely pale yellow; wing hyaline 5
– Scutum with distinct longitudinal stripes; wing uniformly infuscated pale yellowish brown 7

5 Head *ca* 1.5× as broad as long; *post ia* seta weak; surstylus narrow, only slightly curved from base to apex, postabdomen Fig. 16 ..... **dubia** (Lamb)
– Head *ca* 2× as broad as long; *post ia* seta strong; surstylus in basal half broad and curved more-or-less at right angles, Figs 12d, 23b 6

6 Surstylus not twisted along its long axis; *psg* very large with several lobes, angled at 90° medially, postabdomen Fig. 23 ..... **peruncinata** sp. n.
– Surstylus twisted along its long axis; *psg* much smaller, straight and blade-shaped, ♂ postabdomen Fig. 12 ..... **affinis** sp. n.

7 Antenna entirely yellow; head with frontal setulae black; scutum with 4 brown stripes, legs with all tarsomeres yellow, postabdomen Fig. 22 ..... **gracilipes** sp. n.
– Third antennal segment brown; head with frontal setulae pale yellowish white, scutum with 6 longitudinal stripes; legs with distal three segments of all tarsomeres dark, ♂ postabdomen Fig. 21 ..... **fusciceps** sp. n.

Females

[NB: females of *O. elgonae*, *O. gracilipes* and *O. fusciceps* remain unknown and are not included in this key.]

1 Tergite 6 divided dorsally, forming two large, disc-shaped divisions laterally; *tg* 4–6 with very strong setae 2
– *tg* 6 normal; setae on apical segments of abdomen not unusually developed 3

2 Segment 6 with 5 or 6 strong setae on each disc-shaped sclerite; segment 4 with very strong setae along entire posterior margin; segment 5 with strong setae medially, and following a short interruption, laterally on posterior margin, postabdomen Fig. 13 ..... **affinis** sp. n.
– Segment 6 with 2–4 strong setae on each disc-shaped sclerite; segments 4 and 5 with strong setae along edge of posterior margin, close-set dorsally and more widely-spaced along lateral edge of posterior margin ..... **peruncinata** sp. n.

3 0+1–2 *dc*; scutal stripes absent and metanotum entirely yellow, postabdomen Fig. 17 ..... **dubia** (Lamb)
– 1+3–5 *dc*; scutum and metanotum not as above 4

4 Scutum with dark brown longitudinal stripes that may be confluent anteriorly; stripes extend to lateral aspect of scutellum leaving only middle 1/3 yellow; metanotum brown; abdominal *tg* dark brown, postabdomen Fig. 15 ..... **bicolor** sp. n.
– Scutum yellow, if with stripes, then these narrow and predominantly on posterior half, not extending onto scutellum; metanotum yellow (occasionally brown); abdominal *tg* yellow or brown, if the latter, then often with brown marking divided centrally leaving a pale yellow line on apical *tg* 1–3, postabdomen Fig. 20 .... **elongata** sp. n.

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Oroschyromya affinis sp. n.

Figs 12, 13

Etymology: From Latin *affinis* (similar), and refers to the close affinities of this species with *O. peruncinata* sp. n.

Diagnosis: Pale yellow species with dark fifth tarsomeres; large hypopygium with complex structures easily visible externally; spinose, elongate, separated *cerc*; differs from sibling species, *O. peruncinata* sp. n., in details of postabdomen.

Description:

Male.

Head: Yellow, small black *oc* triangle; not quite twice as broad as long; *fr* strongly narrowed anteriorly: at level of antennae 0.4 width that at level of anterior *oc*, at vertex 1.4 width of eye; gena narrow in front, deeper behind and in profile, below middle of eye, about equal to height of eye; yellow and pale haired. *ocp* in profile visible behind eye and slightly convex; short postocular setulae in one irregular row; isolated lower postgenal seta present, but little longer than other setulae. Mouthparts small, all yellow, palp rather broad almost round; vibrissal setulae moderately developed. Face short, poorly sclerotized and depressed. Antenna yellow; second segment pale yellow with distinct short dark seta dorsally; third segment round, finely pubescent: hairs as long as diameter of arista at base; arista black, only at base of second segment and whole of first segment yellow, minutely pubescent. Chaetotaxy: 3 strong *orb*, all reclinate; *pvt* distinct and convergent; 1 *vti* and 1 *vte* strong; ocellars long and lateroclinate; no setulae across middle of *fr*.

Thorax: Uniform pale yellow colour throughout and somewhat elongated with dorsal aspect more flattened than is usual in this family. Chaetotaxy: *prpl* absent, 0+2 strong *dc*, the anterior shorter, scutal setulae in 6 irregular rows between *dc* lines, with one short, but distinct *prscut* pair; 3 or 4 irregular rows of setulae also between the *dc* and *sa* lines; 2 *pprn*, 1 *posthu*, 2 *ntpl*, 1 *sa* and 1 *pa*, 1 *post ia*; 2 pairs of marginal *scut* setae: one subapical and one basal, no setulae on margin or on disc; anepisternum with about 14 setulae at middle and 1 strong seta directed backwards at middle of posterior margin, katepisternum with about 6 setulae at middle and 1 strong seta at upper posterior corner and a tuft of numerous, fine, long setulae at ventral angle. All setae and setulae pale brown. Wing: Hyaline with pale yellow veins; discal cell widest at apex; distance between R_{2+3} and R_{4+5} about 0.6 that between R_{4+5} and M_{1+2}; distance between crossveins about 0.9

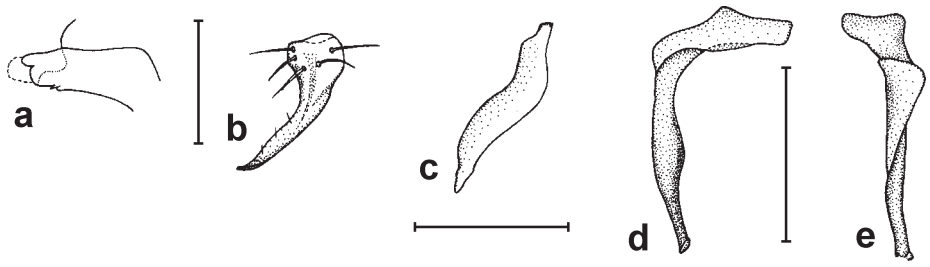

Fig. 12. *Oroschyromya affinis* sp. n., ♂: (a) apex of *hyp*, lateral; (b) *prg*, lateral; (c) *psg*, lateral; (d) *surs*, lateral; (e) same, posterior. Scale bars = 0.1 mm. (See Fig. 23 for comparison.)

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length of apical section of vein Cu. R_{4+5} and M_{1+2} parallel, converging only very slightly only towards wing apex. Haltere pale yellow, concolourous with thorax.
Legs: Not modified; fine setulae scattered on all pairs of legs; in addition longer setae present on fore femur, but not as long as diameter of femur; mid tibial apicoventral seta absent; tarsomere 5 of mid and hind legs brown; claws black, pulvilli normal; hind trochanter normal.

Abdomen: Entirely yellow and only slightly compressed laterally towards apex; 5 visible *tg*, *tg* 6 very narrow and incorporated within and along anterior margin of *ep*; *st* sclerotized; *st* 5 with ventrally directed pair of narrow projections and long setae on sides of posterior margin. Short setae on disc of *tg* and some *st*, about 1/3 length of *tg*.
Postabdomen: Outwardly almost identical to that in *peruncinata* (see Figs 29–31), *ep* well-developed and elongated dorsoventrally; *cerc* large with 3 strong, but short spines in addition to fine setulae, *hyp* distinct with short, poorly sclerotized flange directed towards base of abdomen, *ph apd* long and free from *hyp*, *ej apd* not recognisable (not sclerotised at all), *prg* large, heavily sclerotized, anterolaterally directed spine and *psg* in the form of a flat curved sclerite. *distiph* large with sclerotized and membranous components and asymmetrical at apex.

Female.

Similar to male, but with exceptionally strong setae on apex of abdomen and on lateral heavily sclerotized discoid-shaped plates of *tg* 6; strong setae and short setulae on apical margin of *tg* 5 missing from lateral third on each side. Postabdomen: *tg* 7 small, narrow

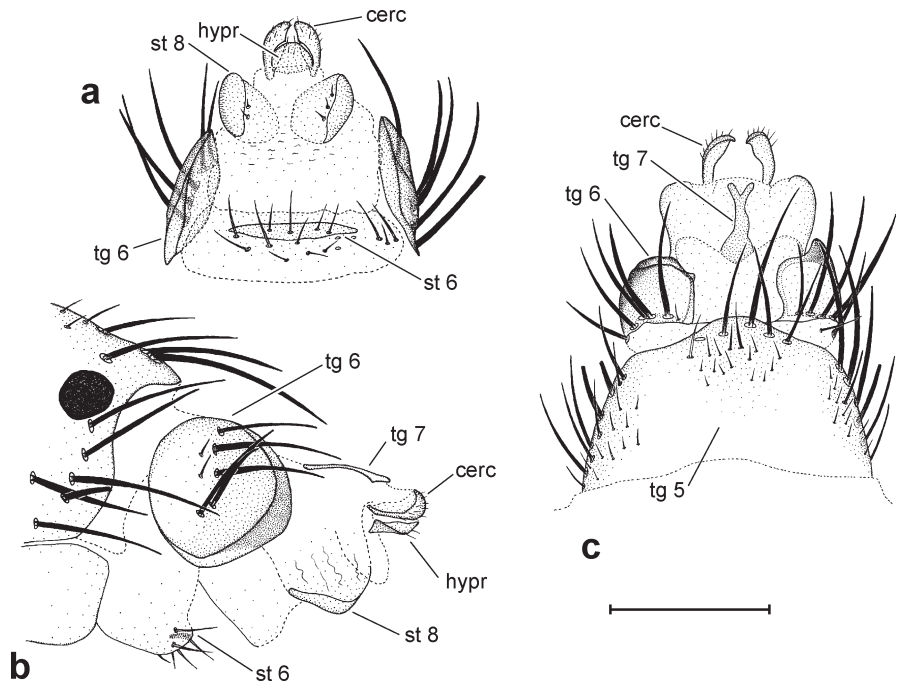

Fig. 13. *Oroschyromya affinis* sp. n., ♀ postabdomen: (a) ventral, (b) lateral, (c) dorsal. Scale bar = 0.2 mm.

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and Y-shaped at apex; setulae on *st* 8 short and obscured from lateral view; *hypr* small, more or less semicircular and microtrichose.

Length: ♂ body 2.0 mm, wing 1.7 mm, ♀ body 1.9 mm, wing 2.0 mm.

Holotype: ♂ YEMEN: Ta'izz [13°34'N:44°00'E], 3–24.1.1999, A. van Harten & M. Mahyoub (NMWC).

Paratypes: ETHIOPIA: 2♀ Tigray, Axum, 14°08'N:38°43'E, 2220 m, 4–5.x.2005, A. Freidberg (TAUI). KENYA: 1♂ S of Lake Naivasha, YMCA camp, 13.viii.1981, L. Fröberg, meadow at shore (MZLU). YEMEN: 1♀ Suq Bani Mansour, 28.viii–26.ix.2001, A. van Harten, Malaise trap (NMWC).

Note: A single female with the following data: NAMIBIA: 1♀ Keetmanshoop District, Narubis nr Lowen R., 870 m, riverine forest, 20.ii.1974, M.E. Irwin (NMSA), may belong to this species, but as it has been found on the other side of the continent I hesitate to confirm its identity.

Oroschyromya bicolor sp. n.

Figs 14, 15

Etymology: From Latin *bi-* (two-) and *color* (colour), and refers to the well-developed pale and dark contrasting colouration in both sexes.

Diagnosis: A smaller species than its congeners, with a pair of brown longitudinal stripes running from front of scutum on to *scut* as far as base of subapical setae; abdomen dark brown dorsally with contrasting yellow *ep*; tarsomere 5 of all legs brown.

Description:

Male.

Head: Yellow, broader that thorax, *fr* narrow, strongly converging towards front, at level of anterior *oc* about 0.35 width of head and at level of antennae 0.7 width of that at anterior *oc*; *vti* and *vte* on shiny pale brown spot; *ocp* yellow with postocular setulae in 2 rows, that nearest eye margin with setulae pointing downwards and outwards, that

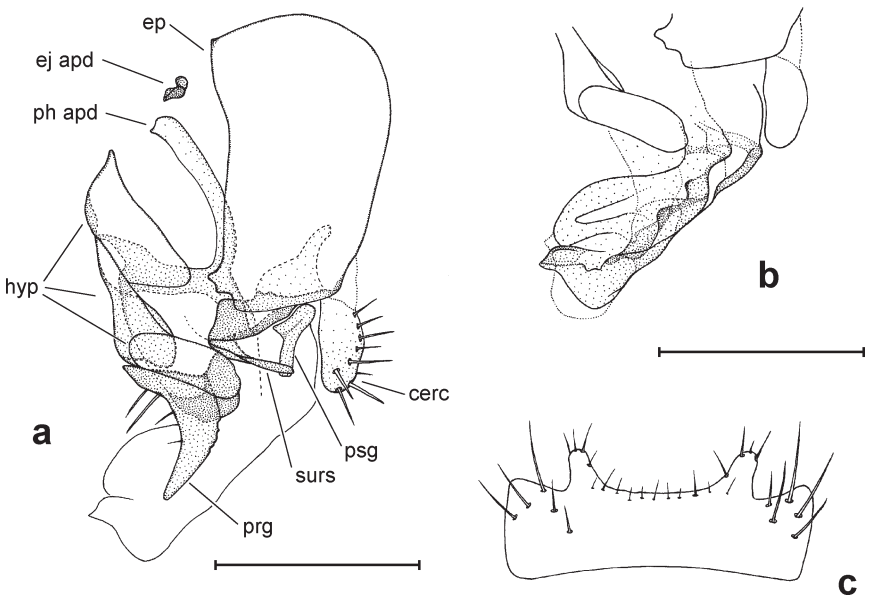

Fig. 14. *Oroschyromya bicolor* sp. n., ♂: (a) hypopygium, lateral; (b) *distiph*, lateral; (c) *st* 5, ventral. Scale bars = 0.2 mm.

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placed more on disc of *ocp* with setulae pointing inwards and upwards; eye elongate oval with anterior facets about 3× size of posterior facets; face flat, membranous and without any noticeable carina; gena pale yellow, about 0.8 height of eye at middle, with several fine very pale yellow setulae, postgenal seta very long, as long as anterior *orb*; mouthparts yellow, palp short oval, almost round; antenna yellow with central pale brown patch on external aspect of segment 3, which also has a distinct fringe of minute pale pubescence along anterior margin and is about 0.25 length of eye, second segment with long dorsal seta, arista with black third segment, which also has a sparse fine pubescence; 3 *orb* setae: anterior inclinate, posterior 2 lateroclinate, ocellars almost as long as anterior *orb*, strongly divergent, *pvt* only little shorter than these and crossed; all setae dark brown.

Thorax: Yellow, but scutum more orange-yellow and with a pair of lateral longitudinal stripes running from just medial to *pprn* to the lateral edge of *scut* as far as base of subapical setae, disc of *scut* remaining clear yellow; *mtn* yellow centrally, dark brown laterally. Chaetotaxy: 2 *pprn* and short setula between them, 2 *ntpl*, 1 *posthu*, 1 *sa*, 1 *pa*, 1 *post ia*, 3+3 *dc*, those in front of scutal suture very short, but easily discernable from scutal setulae, scutal setulae in in 6–8 irregular rows between *dc* lines, with 1 strong *prscut* pair, *scut* with subapicals about 1.5× length of *scut* and basals about 0.7 length of subapicals, 1 anepisternal with short seta above it and several setulae anterior to these, 1 katepisternal with short seta in front, which in turn has a few short setulae in front of it.

Wing: Hyaline with a uniformly diffuse faint smokey grey infuscation, veins brown, vein closing anal cell convex with minute stump vein at middle; distance between R_{2+3} and R_{4+5} about 0.8 that between R_{4+5} and M_{1+2}; distance between crossveins about equal to length of apical section of vein Cu, costa with break near *hu* crossvein; costal setulae along anterior margin brown with several black spine-like setulae interspersed and about 9 similar setulae on dorsal aspect of costa; R_{4+5} and M_{1+2} parallel up to apex of wing. Haltere yellow, concolourous with pleura.

Legs: Yellow, femora hardly dilated, fore femur with long setulae on dorsal and posterior aspects, setulae on legs becoming darker towards apical segments, setulae on dorsum of tarsomeres 4 and 5 longer than diameter of tarsomere, tarsomere 5 brown on apical half or more.

Abdomen: All *tg* brown dorsally and yellow laterally, *st* all pale yellow and poorly sclerotized, *st* 5 with long lateral setae and along posterior margin with small lobes bearing

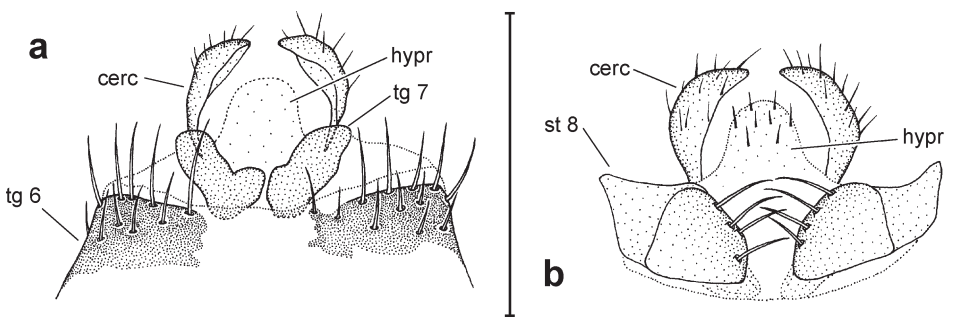

Fig. 15. *Oroschyromya bicolor* sp. n., ♀ postabdomen, dorsal (a) and ventral (b). Scale bar = 0.35 mm.

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setulae, *st* 6 reduced to a narrow V-shaped sclerite (similar to that in *O. elongata* sp.n., Fig. 19b), *tg* especially towards apex of abdomen with marginal and lateral setae almost as long as *tg*.

Postabdomen: *tg* 6 a little shorter than dorsal length of *ep*, which unlike *tg* is completely yellow, *ep* broader and longer in its upper part (similar to that in *gracilipes*; contrasting with that in *fusciceps*), *cerc* large and distinctly setose, *prg* large with anteriorly directed setae and notched posterior edge, *surs* with apical section long and narrow, *psg* simple, *distiph* complex without the punctate lateral sclerotized plate seen in similar species.

Length: ♂ body 2.0 mm, wing 1.9 mm; ♀ body 2.5 mm, wing 2.6 mm.

Female.

As in male, but palp spatulate and larger; brown scutal markings can be much more developed, either stripes reaching anterior margin of *pprn* and darker, or whole of scutum darkened leaving only short pale yellow middle area in front of *scut*; katepisternum and meron dark; stronger setae dark brown to black; darkening of tarsomere 5 variable from half to apical 1/4 of segment. Postabdomen: *tg* 7 divided; *cerc* relatively large, long and narrow compared to congeners; *tg* 5 with strong marginal setae more or less concentrated on pigmented area laterally; *hypr* thinly sclerotized, but distinct and microtrichose.

Holotype: ♂ TANZANIA, W Usambara, Lushoto [04°47'S:38°17'E], 18.viii.2003, S. Kleynberg (TAUI).

Paratypes: TANZANIA: 1♀ Usambara Mts, Gologolo, 1900 m, 23.viii.1996, A. Freidberg; 1♀ Njombe, 10 km SE Rt 84, 2000 m, 27–28.viii.1996, A. Freidberg; 1♀ nr Ngozi Crater, Rt A345, 1900 m, 1.xi.1996, A. Freidberg (all TAUI).

Oroschyromya dubia (Lamb, 1914), **comb. n.**

Figs 16, 17

Chiromyia dubia: Lamb 1914: 353.

Lamb wrote that he had 11 specimens, four of which were males. I examined these specimens and found them to be all females belonging to two species. The holotype has the abdomen missing, but otherwise has all the characters agreeing with the remaining series. One other of the five specimens at the Natural History Museum in London is a dissected female and it agrees with the figure given in this article (Fig. 17). Another specimen (BMNH) and three more (CUMZ) belong to a species of *Gymnochiromyia*. They have a thorax with chaetotaxy typical of that genus: the *mtn* is a clear yellow; the *tg* are uniformly dark chocolate brown and completely shiny, only the membrane separating one *tg* from the other is pale yellow; the *prscut acrs* are particularly strong. I am unable to assign this species with confidence to any of the recently described species from southern Africa (Ebejer 2008*b*), so until more material, including males, becomes available, it remains unnamed. I labelled each of the four specimens as '*Gymnochiromyia* female, sp. indet.'.

Diagnosis: An orange-yellow species with large hypopygium having vertically elongate *ep*. In spite of weak *pra* and *pa* setae suggesting this might be a *Notiochyromya*, the long *surs*, conical *prg* and accesssory ventral *hyp* plate properly place this within *Oroschyromya*. The female postabdomen also shows strong affinities with this genus. So far, it is the only species in the genus known from a relatively lowland habitat.

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Redescription:

Male.

Head: All yellow except for black *oc* triangle; *fr* narrow, at widest point less than half width of head; strongly narrowed anteriorly: at level of antennae 0.4 width that at level of anterior *oc* and 0.3 width of one eye viewed in front. Gena: only a little narrower in front than behind; in profile, below middle of eye, about 0.6 height of eye; pale yellow and pale-haired; *ocp* in profile narrowly visible behind eye; with short postocular setulae in one irregular row, the top 4 developed into short dark setae; isolated lower postgenal seta long. Mouthparts small, all yellow; setulae of buccal margin moderately developed. Face poorly sclerotized and small, hardly visible. Antenna yellow, second segment with short dark seta dorsally; third segment round, finely pubescent: hairs short, only those on lower margin as long as diameter of arista at base; arista dark almost throughout and completely bare. Chaetotaxy: 3 *orb*, all markedly reclinate, the anterior also slightly inclinate, middle and posterior *orb* closer together than middle is to first; *pvt* short and crossed; 1 *vti* and 1 *vte* strong; ocellars almost as long as hind *orb*, proclinate and divergent; about 8 short setulae across middle of *fr* and about 6 on each *orb* plate. All setae dark brown, setulae yellow.

Thorax: In profile, anterior margin of scutum rectangular; scutum, *scut*, *mtn* and all pleura yellow and without defined pattern, paler on pleura. Chaetotaxy: 1 *pprn* and another about half its size, 1 *posthu*, 2 *ntpl*, 1 *pra* and 1 *sa* (both short), 1 *pa*, 1 *post ia*,

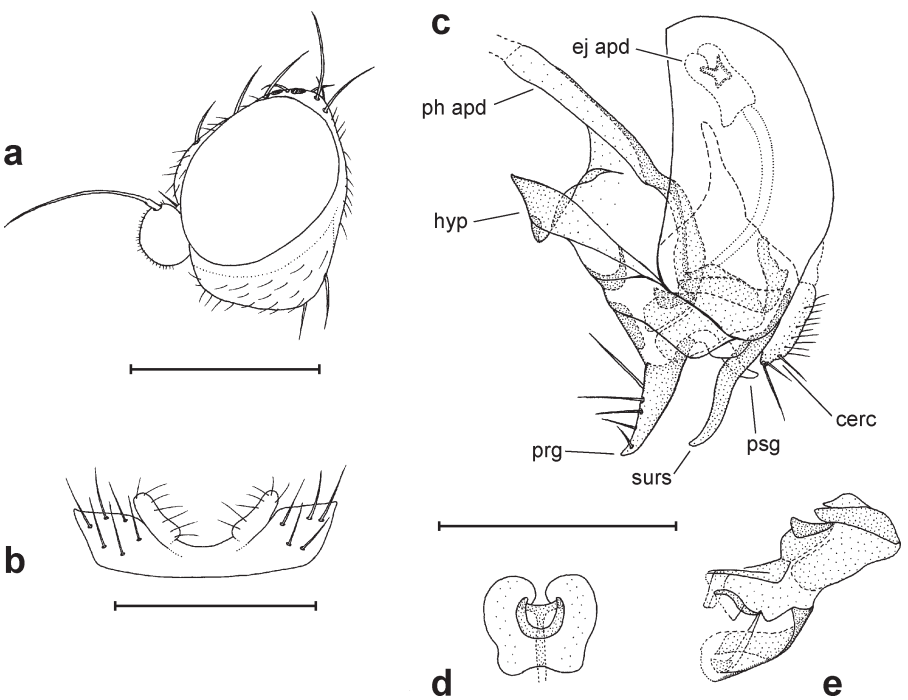

Fig. 16. *Oroschyromya dubia* (Lamb), ♂: (a) head, lateral; (b) *st* 5, ventral; (c) hypopygium, lateral; (d) *ej apd*, dorsal; (e) *distiph*, lateral. Scale bars = 0.3 mm in Fig. 16a and 0.2 mm in Figs 16b–e.

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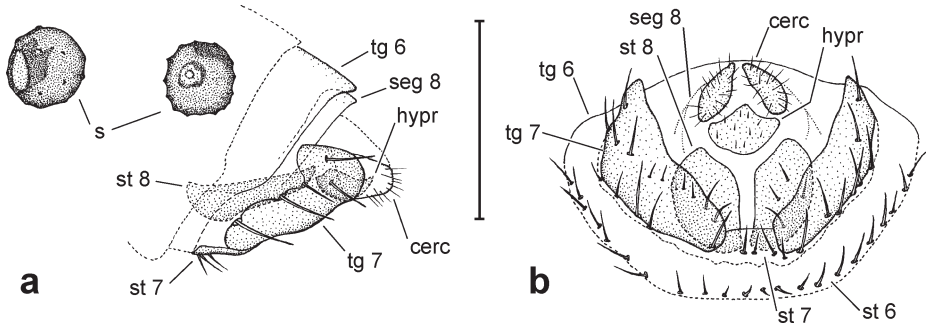

Fig. 17. *Oroschyromya dubia* (Lamb), ♀ postabdomen, lateral (a) and ventral (b). Scale bar = 0.15 mm.

1 *dc* with another half its size or less, in front of it, scutal setulae in 6–8 irregular rows at level of transverse suture between *dc* lines, 4 slightly stronger *prscut* setulae in a transverse row between *dc*, and 2 more on each side between *dc* and *pa*; subapical and basal *scut* as usual, 1 anepisternal and 1 katepisternal, all setae dark brown, only on pleura yellow.

Wing: Hyaline, veins pale brown; distance between R_{2+3} and R_{4+5} about 0.8 that between R_{4+5} and M_{1+2}; distance between crossveins from 0.8 length of apical section of vein Cu or about equal to it. Haltere pale yellow.

Legs: Not modified except for slightly thicker femora; fine setulae scattered on all pairs of legs, in addition to longer setae on fore femur; mid tibial apicoventral seta absent; claws and pulvilli normal.

Abdomen: Entirely yellow; pale setae, about half to two thirds length of *tg*.

Postabdomen: *ep* yellow and distinctly elongated from top to bottom, *cerc* also elongated and densely setulose; *surs* long and narrow; *hyp* basally with large distal section that fuses with *ep* and small accessory plate; *ph apd* long and narrow; *ej apd* moderately developed, narrow in profile; *prg* large, sclerotized and conical with strong setae on anterior surface; *psg* small and narrow.

Female.

Scutum with 4 pale brown stripes: 2 along midline reaching about half way to *scut*, and one on each side of these between *dc* and *ia* lines reaching just beyond wing base; setae and setulae darker and stronger; otherwise as male. Postabdomen: elongate lateral sclerites of *tg* 7 of distinctive shape due to irregular margins, these sclerites partly overlapping *st* 8; setae on *st* 8 short; *hypr* sclerotized, *cerc* small oval.

Length: ♂ body 1.5 mm, wing 1.5 mm; ♀ body 1.6 mm, wing 1.6 mm.

Type material examined: SEYCHELLES: ♀ (holotype) 'Mahé 08-9, Seychelles Exp. / Prof. J.S. Gardiner' (BMNH); 6♀ (paratypes) same data (3 BMNH, 3 CUMZ).

Other material examined: MAURITIUS: 3♂ 1♀ Wolmar, 1–2 km S, 21.v.2000, J.W. Ismay, coast roadside (OXUM); 1♂ 1♀ same data (NMWC).

Distribution: Mauritius, Seychelles.

Oroschyromya elgonae sp. n.

Fig. 18

Etymology: From the type locality, Mt Elgon in Uganda.

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Diagnosis: Yellow species with pair of longitudinal brown stripes on scutum commencing from behind transverse suture and running posteriorly along lateral margin of *scut*; 1+4 *dc* setae, but main identification features are in postabdomen.

Description:

Male.

Head: Yellow; *fr* narrow, at anterior *oc* only 1.2× width of eye, narrowing only slightly towards antennae where width is 0.8 that at anterior *oc*; *oc* triangle brown; *ocp* yellow, in profile, convex. Eye: elongated oval, 1.7 times as long as high. Gena: slightly recessed and broad, below middle of eye about 1.2× height of eye; pale setulose with 2 long setae on oral margin just below vibrissal angle. *ocp*, in profile clearly visible behind eye, with short postocular setulae in two irregular rows with additional setulae on disc; isolated lower postgenal seta pale but distinct. Mouthparts small, all pale yellow, palp particularly short oval. Face depressed, barely visible. Antenna with all segments yellow, second with pale long seta dorsally; third segment somewhat elongated ventrally, finely pubescent: pubescence a little shorter than diameter of arista at base; arista black except at extreme base of second segment and whole of first 2 segments where it is yellow. Chaetotaxy: 3 *orb*, anterior inclinate, middle and posterior *orb* reclinate, all equidistant from each other; 1 *vti* and 1 *vte* a little longer than hindmost *orb*; *pvt* crossed, about half length of *vt*; ocellars a little more than half length of *vt*; all setae pale; 1 setula in each of the spaces between the *orb* and about 8 pale setulae scattered on *fr*.

Thorax: Predominantly yellow; scutum with a small rectangular black patch anteriorly at neck and 2 brown stripes commencing behind transverse suture and extending along lateral margin of *scut*; remainder of *scut* and pleura all yellow; *mtn* brown. Chaetotaxy: 2 *pprn*, one short, 1 *posthu*, 2 *ntpl*, absent *pra*, 1 *sa*, 1 *pa*, 1 short *post ia*, 1+4 *dc*, scutal setulae in 4 irregular rows between *dc* lines; absent longer prescut *acrs*; *scut* with usual subapical and basal marginals, but no other setae or setulae; 1 anepisternal at middle of hind margin with a shorter seta above it, 1 katepisternal close to upper hind corner; both sclerites with additional pale setulae in front of setae. All setae on thorax yellow.

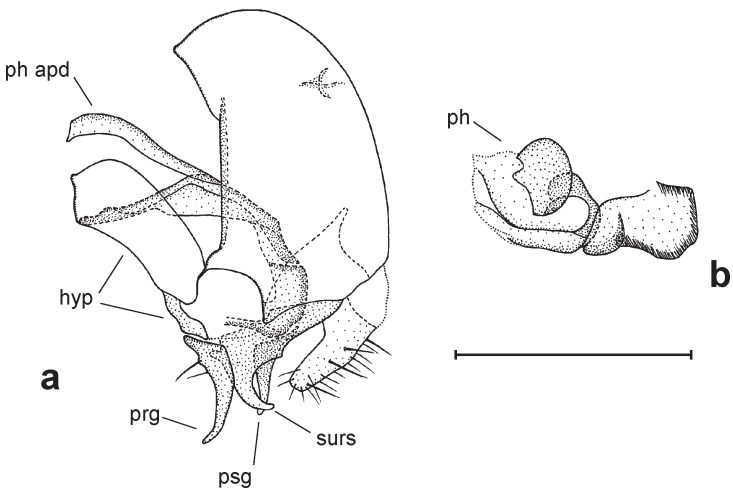

Fig. 18. *Oroschyromya elgonae* sp. n., ♂: (a) hypopygium, lateral; (b) *distiph*, lateral. Scale bar = 0.2 mm.

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Wing: Hyaline with pale yellow tinge over entire membrane; veins pale brown, a little lighter at base; vein closing anal cell convex with a minute stump vein at its middle; distance between R_{2+3} and R_{4+5} about 0.7 that between R_{4+5} and M_{1+2}; distance between crossveins about twice length of posterior crossvein; length of apical section of vein Cu about 2.8× length of posterior crossvein and about 0.9× distance between crossveins. Haltere pale yellow.

Legs: Yellow, all segments unusually slender for the family and rather long; tarsomere 5 of all legs dark brown in apical third; fine setulae scattered on all pairs of legs, in addition longer setae present on fore femur; mid tibial apicoventral seta absent; claws black except at extreme base and pulvilli normal.

Abdomen: Rather elongate and narrow; dorsally, *tg* 1 yellow, *tg* 2 dark brown, *tg* 3–5 paler brown; only on lateral margins pale; *st* yellowish white; setulae not numerous, short, about a quarter length of *tg*, but along hind margin of each *tg* is a row of uniform brown setae about 2/3 length of *tg*; *tg* 6 clearly visible, about half length of *tg* 5 and 0.8 length of *ep*; *st* 5, on each posterolateral corner with a more sclerotized circular part bearing stronger setulae.

Postabdomen: *ep* yellow, large, higher than long; cerc narrow, elongate and distinctly setose; *surs* strongly curved, shorter than *prg*, *prg* with complex folds at base and 1 long anteroventrally directed seta, long and narrow apically, *psg* very long and narrow, *hyp* very broad in profile, *ph apd* long and narrow, *ej apd* small, *distiph* complex with lateral punctate plate towards apex.

Female. Unknown.

Length: ♂ body 2.5 mm, wing 2.3 mm.

Holotype: ♂ UGANDA: Mt Elgon, Sasa [01°15'N:34°32'E], montane forest, alt. 3300 m, fogging of *Afrocrania volckensi* (Cornaceae), 10–19.ix.1997, T. Wagner (in alcohol, ZSMC).

Oroschyromya elongata sp. n.

Figs 19, 20

Etymology: From Latin *longus* (long), and refers to the unusually long cerci and pregonites of this species.

Diagnosis: Relatively large species of deep yellow colour heavily marked with dark brown or black; parafacial densely silvery white pruinose; 1+4 *dc* setae and in male, elongate *cerc* and very long curved *prg*.

Description:

Male.

Head: Yellow, a little broader than thorax; *oc* triangle black between ocelli; *fr* narrow, strongly converging, at level of antenna 0.4 width of that at anterior *oc* and 0.14 width of head, about 14 minute pale brown setulae scattered on *fr*; *ocp* yellow, in profile, flat and not visible behind eye margin, short postocular setulae in one irregular row; eye, elongated oval, 1.5 times as long as high, lying obliquely, anterior facets about 3× size of posterior facets; gena, slightly recessed and broad, below in profile about 0.8 height of eye at middle; pale setulose with 3 long setae on oral margin just below vibrissal angle, isolated lower postgenal seta pale and as long as anterior *orb*; mouthparts yellow, palp round; face short, depressed and no carina visible, parafacial with dense silvery

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white pruinosity when viewed at an angle; antenna with all segments yellow, second with long dark seta dorsally; segment 3 abort 0.25 length of horizontal diameter of eye, finely pubescent, pubescence as long as diameter of arista at base; arista black except on segments 1 and 2, where it is yellow. Chaetotaxy: 3 *orb*, anterior inclinate, middle and posterior *orb* reclinate, all equidistant from each other; 1 *vti* and 1 *vte* a little longer than hindmost *orb*; *pvt* crossed, about as long as anterior *orb*, ocellars a little more than half length of *vt*; all setae brown.

Thorax: Yellow with sparse pruinosity on scutum; scutum deeper yellow, *scut*, *mtn* and pleura all yellow. Chaetotaxy: 2 *pprn*, one short, and fine setula adjacent, 1 *posthu*, 2 *ntpl*, absent *pra*, 1 *sa*, 1 *pa*, 1 short *post ia*, 1+4 *dc*, anterior 2 short and difficult to separate from other scutal setulae, scutal setulae in 8 irregular rows between *dc* lines, *prscut* pair longer; *scut* 4 marginals, subapical pair about twice length of *scut*; 1 anepisternal at middle of hind margin with shorter seta above it, 1 katepisternal close to upper hind corner; both sclerites with additional pale setulae in front of setae and katepisternum with long white setulae above coxa; all other setae on thorax brown.

Wing: Hyaline with pale yellow tinge over entire membrane; veins yellow; vein closing anal cell convex, distance between crossveins about 1.8× length of posterior crossvein and about 0.9 length of apical section of vein Cu; costa without break near *hu* crossvein; costal setulae along anterior margin with several dark spine-like setulae interspersed and about 7 similar setulae on dorsal aspect of costa; distance on costal margin between R_{2+3} and R_{4+5} about 0.7 that between R_{4+5} and M_{1+2}, latter two veins parallel up to apex of wing. Haltere yellow, concolourous with pleura.

Legs: Yellow, all segments slender and rather long; tarsomere 5 of all legs dark brown in apical half to 2/3; fine setulae scattered on all pairs of legs, in addition longer setae present on dorsal and posterior aspect of fore femur; mid tibial apicoventral seta absent; all setae and setulae pale brown to yellow; claws black except at extreme base and pulvilli normal.

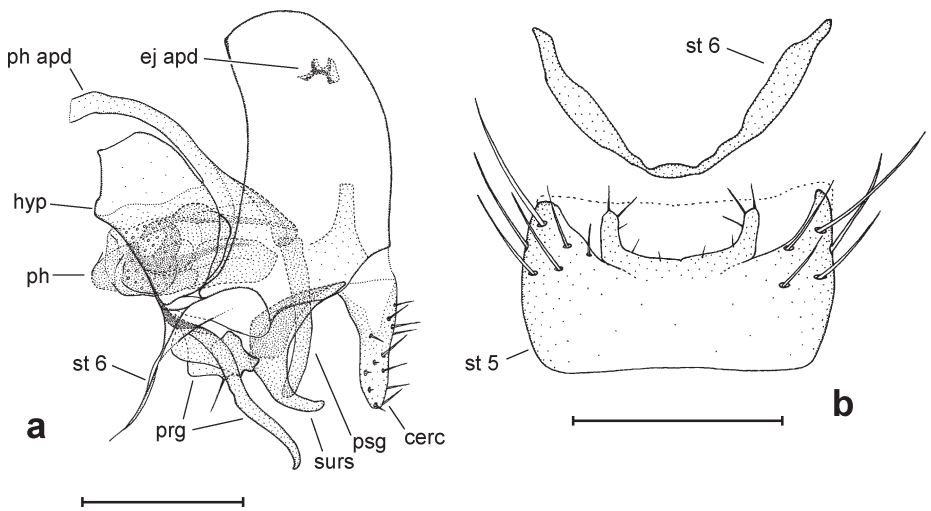

Fig. 19. *Oroschyromya elongata* sp. n., ♂: (a) hypopygium, lateral, scale bar = 0.2 mm; (b) sternites 5 & 6, ventral, scale bar = 0.15 mm.

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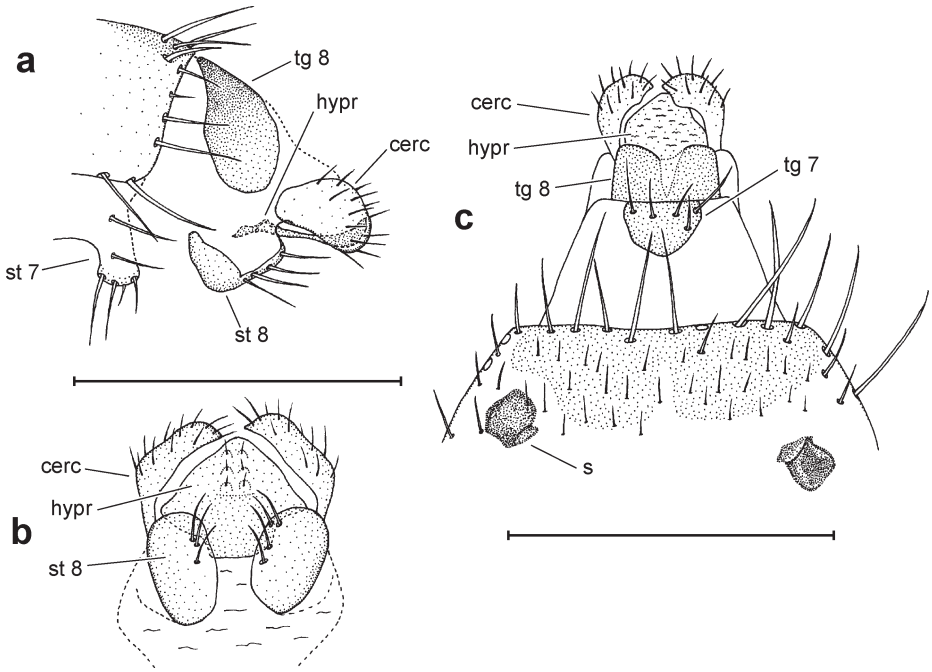

Fig. 20. *Oroschyromya elongata* sp. n., ♀ postabdomen: (a) lateral, (b) ventral, (c) dorsal. Scale bars = 0.35 mm.

Abdomen: Yellow, rather elongate and narrow; *tg* with comparatively long setulae and setae, several about 0.75 length of *tg*; *st* pale yellow, sclerotized and with a few long setae; *tg* 6 clearly visible, about half length of *tg* 5 and 0.8 length of *ep*; *st* 6 distinguishable as narrow V-shaped sclerite, *st* 5, on each side with a lobe projecting backwards and long setae.

Postabdomen: *ep* yellow, large and higher than long; *cerc* narrow, very elongate and distinctly setulose; *surs* short and broad; *prg* very long curved with a single strong seta at base.

Female.

As in male, but palp spatulate and larger; scutum often with 4 longer *acrs*; abdomen darker from deep yellow to dark brown, with most specimens showing distinctive pale longitudinal stripe giving appearance of divided *tg* at least on apical segments.

Postabdomen: *tg* 7 sclerotized only at middle apically, *tg* 8 with partly desclerotized central section and not setulose; *st* 8 oval in ventral view and with setae only along medial margin; *hypr* large thinly sclerotized and at middle with parallel series of microtrichia; *cerc* elongate and narrow.

Length: ♂ body 2.0 mm, wing 2.2 mm; ♀ body 2.1 mm, wing 2.5 mm.

Holotype: ♂ ETHIOPIA: Gonder, Goha Hotel, 12°37'N:37°28'E, alt. 2360 m, 1.x.2005, A. Freidberg (TAUI).

Paratypes: ETHIOPIA: 4♂ 1♀ same data as holotype (TAUI); 1♀ Gonder Province, Simien Mts National Park, 17 km NE Debark, 13°13.91'N:30°01.86'E, 3200 m, 25.iii.1995, M. von Tschirnhaus (in alcohol, ZSMC); 1♀ Kefa Jimma, 35 km S, 2700 m, 12.ii.2000, A. Freidberg & I. Yarom; 1♀ Bale, Bale Mts, Robe, 30 km W, 2900 m, 3.ii.2000, A. Freidberg & I. Yarom; 4♂ 3♀ Shewa, Debre Tsige, 09°39'N:38°49'E, 2660

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m, 28.ix.2005, A. Freidberg (all TAUI); 2♂ 2♀ same data (NMWC); 2♂ 2♀ same data (BMNH); 2♂ 2♀ same data (NMSA); 2♂ 1♀ Shewa, Chancho, 09°23'N:38°48'E, 2500 m, 28.ix.2005, A. Freidberg (TAUI).

Oroschyromya fusciceps sp. n.

Fig. 21

Etymology: From Latin *fuscus* (dark) and *caput* (head), and refers to the dark colouration of the frons and antennae of this species.

Diagnosis: Dull yellow species with pale brown *fr* and third antennal segment; 6 scutal stripes, 0+2 *dc* setae, distal three tarsomeres of all legs brown and strongly setose *cerc*.

Description:

Male.

Head: *fr* narrow almost parallel sided, at level of antenna 0.8 width that at level of anterior *oc* and at this level 1.2× width of eye; *fr*, *ocp* and third antennal segment brown, second segment yellow with narrow brown line on dorsal ridge, lunule and first antennal segment yellow; arista with first segment brown and second segment black; eye elongate oval; gena dull yellow, 0.8 height of eye, pale setulose, 3 setae on oral margin just below vibrissal angle, mouthparts yellow except sclerite inside buccal cavity dark brown, palp small oval; postgenal seta short but distinct. Chaetotaxy: 3 usual *orb* (hind pair broken), *vti* and *vte* long, *oc* and *pvt* half length of *vti*, postocular setae in one irregular row.

Thorax: Predominantly yellow, small brown patch anteriorly at neck extending laterally to just below *pprn*; scutum pale brown with 6 longitudinal stripes from transverse suture to posterior margin; *dc* setae on pale line; *scut* yellow with brown lateral margin; *mtn* brown, pleura dull yellow. Chaetotaxy: 1 *pprn*, 1 *posthu*, 2 *ntpl*, no *pra*, 1 *sa* and 1 *pa*, 1 short *post ia*, 0+2 *dc*, the anterior short, scutal setulae in 6 irregular rows between *dc* lines, no *prscut*, 4 usual marginals on *scut*, 1 anepisternal and 1 katepisternal with setulae in front of each.

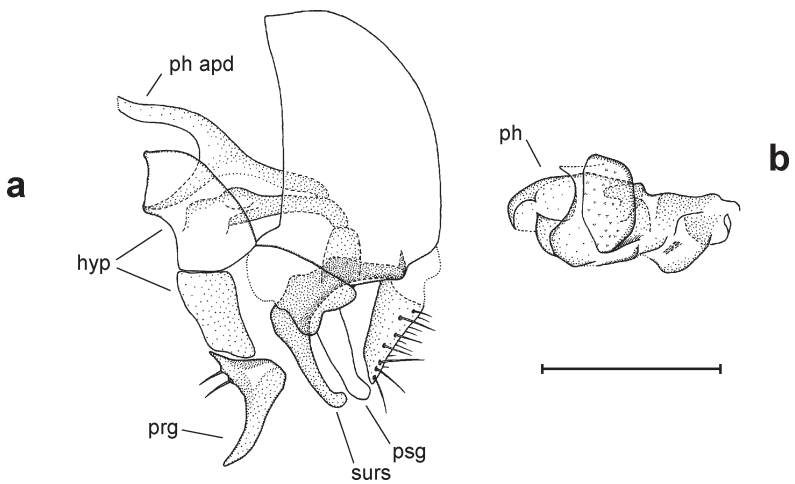

Fig. 21. *Oroschyromya fusciceps* sp. n., ♂: (a) hypopygium, lateral; (b) *distiph*, lateral. Scale bar = 0.15 mm.

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Wing: Hyaline with uniform pale yellowish brown tinge to membrane, veins pale brown, distance between crossveins 1.2× length of posterior crossvein, apical section of Cu 3× length of posterior crossvein and twice length of distance between crossveins; distance on costal margin between R_{2+3} and R_{4+5} about 0.6 that between R_{4+5} and M_{1+2}, latter two veins slightly convergent towards wing apex. Anal cell with stump vein reduced to a thickening on the vein. Haltere pale yellow.

Legs: Yellow except for distal 3 tarsomeres brownish; setae and setulae brown, legs relatively long, femora not dilated, but thicker than in *elgonae*; ventral apical spur on tibia 2 absent. Claws black, pulvilli normal, hind trochanter unmodified.

Abdomen: *tg* brown with longer setae along apical margin and on sides; *st* 5 with only a few setae grouped close together on posterolateral corner.

Postabdomen: *ep* brown, *tg* 6 a little less than half length of *tg* 5 and 0.6 length of *ep* which is higher than long, but not as much as in *elongata*, *cerc* narrow, elongate and somewhat pointed with distinct setae; *prg* large with setae directed anteriorly, *psg* narrow and about as long as *surs*, *surs* with rounded apex.

Female. Unknown.

Length: ♂ body 2.2 mm, wing 2.0 mm.

Holotype: ♂ RWANDA: Rusumu [02°22'S:30°47'E], Ibanda Makera, 9–24.x.1993, fogging of *Carapa grandiflora* (Meliaceae), T. Wagner (in alcohol, ZSMC).

Oroschyromya gracilipes sp. n.

Fig. 22

Etymology: From Latin *gracilis* (slim) and *pes* (foot), and refers to the relatively long slim legs of this species.

Diagnosis: Orange species with black rectangular patch at anterior margin of scutum above *ocp* foramen and pair of broad dark brown stripes on posterior half of scutum; femora are long and slender, basitarsus of middle leg ventrally with modified setulae.

Description:

Male.

Head: Orange-yellow except for brown *oc* triangle; *fr* long and narrow, at anterior *oc* about 0.8 width of eye; at level of antennae 0.4 width that at level of anterior *oc*. Gena: narrow, about 0.3 height of eye; yellow and pale haired; *ocp* in profile slightly convex; few short postocular setulae in one irregular row; isolated lower postgenal seta absent. Mouthparts small, all yellow; vibrissal setulae all short. Face poorly sclerotized and depressed. Antenna yellow with dark brown line along anterior and dorsal margin and pale brown infuscation laterally near base of arista; second segment yellow with distinct short dark seta dorsally; third segment round, finely pubescent: hairs not quite as long as diameter of arista at base; second segment black almost throughout and first and second segments light brown and shorter than usual for this family. Chaetotaxy: 3 strong *orb*, all inclinate, *pvt* distinct and crossed; 1 *vti* and 1 *vte* strong; ocellars lateroclinate; about 12 very short black setulae across middle of *fr*.

Thorax: Deep orange-yellow and somewhat elongated; a pale brown line runs from just medial to *pprn* to transverse suture; another dark brown stripe runs from behind suture to edge of *scut* along *dc* line, becoming broader posteriorly. *scut* with dark brown line

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along superior lateral margin; on meron at base of haltere with brown spot, otherwise all pleura orange-yellow. Chaetotaxy: *prpl* absent, 0+2 strong *dc*, scutal setulae few in number and very irregular, approximately in 4–6 rows with one short but distinct *prscut* pair; 3 or 4 irregular rows of setulae also between *dc* and *sa* lines; 1 *pprn*, 1 *posthu*, 2 *ntpl*, 1 *sa* and 1 *pa*, 1 *post ia*; 2 pairs of marginal *scut* setae: one subapical and one basal, no setulae on margin or on disc; anepisternum with 1 strong seta directed backwards at middle of posterior margin and about 10 short setulae in front, katepisternum with 1 strong seta at upper posterior corner and 3 short setulae in front; tuft of setulae at ventral angle with fewer, finer shorter and very pale; all other setae and setulae brown to black.

Wing: Uniformly pale brown infuscated and with pale brown veins; anal cell with minute stump vein; distal section of Cu about 3.5× length of posterior crossvein; distance between crossveins about 1.7× length of posterior crossvein and 0.8× length of apical section of Cu; distance on costal margin between R_{2+3} and R_{4+5} about 0.8 that between R_{4+5} and M_{1+2}, latter two veins slightly convergent towards wing apex. Haltere yellow.

Legs: Modified, rather longer and slimmer than is usual for this family; fine setulae scattered on all pairs of legs; in addition longer setae present on fore femur, but these are not as long as is usual in this family; setulae on dorsal aspect of tarsomeres of all legs distinctly longer; basitarsus of middle leg, ventrally with 3 irregular rows of spinescent setae, most of which are longer than diameter of basitarsus; hind femur with a row of fine setae on anteroventral and posteroventral aspect; hind tibia with 2 parallel rows of ventral setae in apical 2/3; mid tibial apicoventral seta absent; claws black and pulvilli normal; hind trochanter normal.

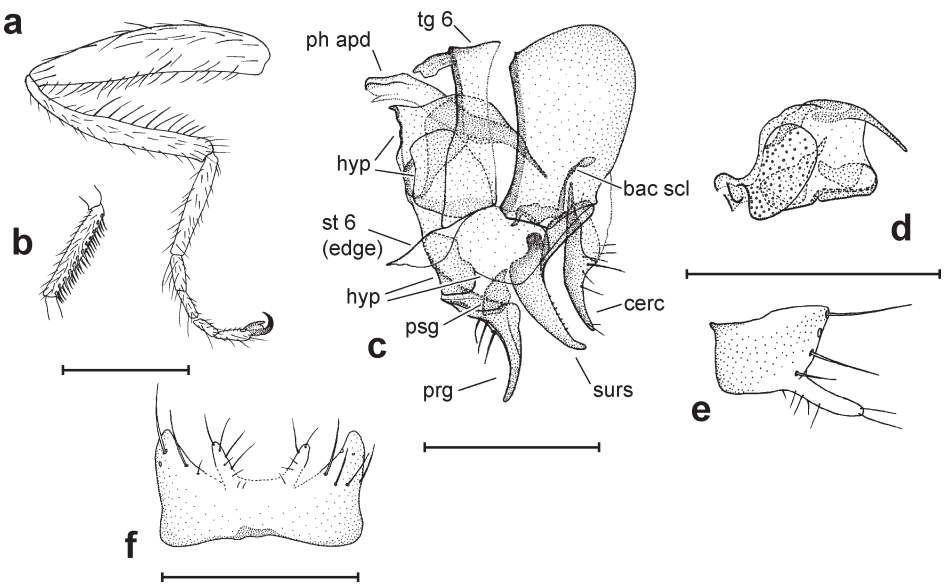

Fig. 22. *Oroschyromya gracilipes* sp. n., ♂: (a) hind leg, anterior aspect; (b) basitarsus, middle leg, lateral; (c) hypopygium, lateral; (d) *distiph*, lateral; (e) *st* 5, lateral; (f) same, ventral. Scale bars = 0.3 mm in Figs 22a–c and 0.2 mm in Figs 22d–f.

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Abdomen: Orange, slightly compressed laterally and with well sclerotized brownish dorsal *tg* plates; *tg* 6 narrow but separate from *ep*; *st* thinly sclerotized; *st* 5 with ventrally directed pair of narrow projections and long setae on sides of posterior margin. Short setae on disc of *tg* and on hind margin with setae almost as long as *tg*; *st* 4 and 5 also with very long marginal setae.

Postabdomen: *ep* well-developed and elongated dorsoventrally with distinctly rounded dorsal aspect; large posteroventrally directed opening; *cerc* large, long, narrow and sclerotized with a few very fine setulae, *hyp* distinct and broad, *ph apd* curved and at apex divided into lateral lobes, *ej apd* not identified; *prg* in form of large, heavily sclerotized, anteroventrally directed spine; *surs* similarly long, but curved posteroventrally; *distiph* large with sclerotized and membranous components.

Female: Unknown.

Length: ♂ body 2.1 mm, wing 1.9 mm.

Holotype: ♂ UGANDA: Budongo forest, Masindi District, 01°45'N:31°35'E, alt. 1200 m, seasonal rain forest, fogged from *Cynometra alexandri* (Caesalpiniaceae), nr Somso R., vi.1995, Wagner (in alcohol, ZSMC).

Oroschyromya peruncinata sp. n.

Fig. 23

Etymology: From Latin *per* (a prefix denoting superlative) and *uncinata* (hooked or spined) referring to the structures of the postabdomen and the spinose *cerc*.

Diagnosis: Yellow species with very large hypopygium with complex structures easily visible externally; spinose elongate *cerc*; anterior *orb* reclinate, posterior 2 *orb* lateroclinate; 1 strong posterior *dc* with shorter seta anterior to it.

Description:

Male.

Head: All yellow except for black *oc* triangle; twice as broad as long; *fr* strongly narrowed anteriorly: at level of antennae 0.4 width that at level of anterior *oc* and 0.4 width of one eye viewed from in front. Gena: narrow in front, deeper behind; in profile, below middle of eye, about 0.2 height of eye; yellow and pale haired; *ocp* in profile barely visible behind eye; short postocular setulae in one irregular row; isolated lower postgenal seta present, but little longer than other setulae. Mouthparts small, all yellow; vibrissal setulae moderately developed. Face poorly sclerotized and depressed. Antenna yellow; second segment pale yellow with distinct short dark seta dorsally; third segment round, finely pubescent: hairs as long as diameter of arista at base; arista black almost throughout and completely bare. Chaetotaxy: 3 strong *orb*, the anterior slightly reclinate, not at all inclinate, middle and posterior *orb* reclinate and lateroclinate; *pvt* distinct and crossed; 1 *vti* and 1 *vte* strong; *oc* short and strongly lateroclinate; about 8 short setulae across middle of *fr*.

Thorax: Pale yellow and somewhat elongated with dorsal aspect more flattened than is usual in this family. *scut* with flat dorsal aspect occupying little more than half the area as viewed from above. Chaetotaxy: *prpl* absent, 0+2 strong *dc*, scutal setulae in 4–6 irregular rows between *dc* lines, with one short but distinct *prscut* pair; 3 or 4 irregular rows of setulae also between *dc* and *sa* lines; 1–2 *pprn*, 1 *posthu*, 2 *ntpl*, 1 *sa* and 1 *pa*, 1 *post ia*; 2 pairs of marginal *scut* setae: one subapical and one basal, no setulae on

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margin or on disc; anepisternum with 1 strong seta directed backwards at middle of posterior margin, katepisternum with 1 or 2 strong setae at upper posterior corner and a tuft of numerous, fine, long setae at ventral angle. All setae and setulae pale.

Wing: Hyaline with pale yellow veins; discal cell widest at apex; distance between crossveins about equal to apical section of vein Cu; distance between R_{2+3} and R_{4+5} about 0.5 that between R_{4+5} and M_{1+2}; R_{4+5} and M_{1+2} parallel towards wing apex. Haltere pale yellow.

Legs: Not modified except for slightly thicker femora; fine setulae scattered on all pairs of legs; in addition longer setae present on fore femur; mid tibial ventral apical seta absent; claws and pulvilli normal; hind trochanter normal.

Abdomen: Entirely yellow and compressed laterally; 5 visible *tg*, *tg* 6 very narrow and incorporated as an infolded ridge along anterior margin of *ep* in its upper half (visible only after dissection). *st* sclerotized; *st* 5 with ventrally directed pair of narrow projections and 3 long setae on side of posterior margin. Short setae on disc of *tg* and some *st*; marginal setae on *tg* 3 and *tg* 4 longer.

Postabdomen: *ep* well-developed and elongated dorsoventrally with relatively large posteroventrally directed opening; *cerc* large with 4 strong, but short spines in addition to several fine setulae, *hyp* distinct with long flange directed towards base of abdomen, *ph apd* long and free from *hyp*, *ej apd* not recognisable (not sclerotised at all), *prg* in form of large, heavily sclerotized, anterolaterally directed spine and *psg* modified into a large sclerotized multilobed structure. An elongate sclerite articulating with ventral margins of *tg* 5 and *ep* may be a composite of *st* 5 and *prg*; *distiph* very large with sclerotized and membranous components and with some asymmetry at apex.

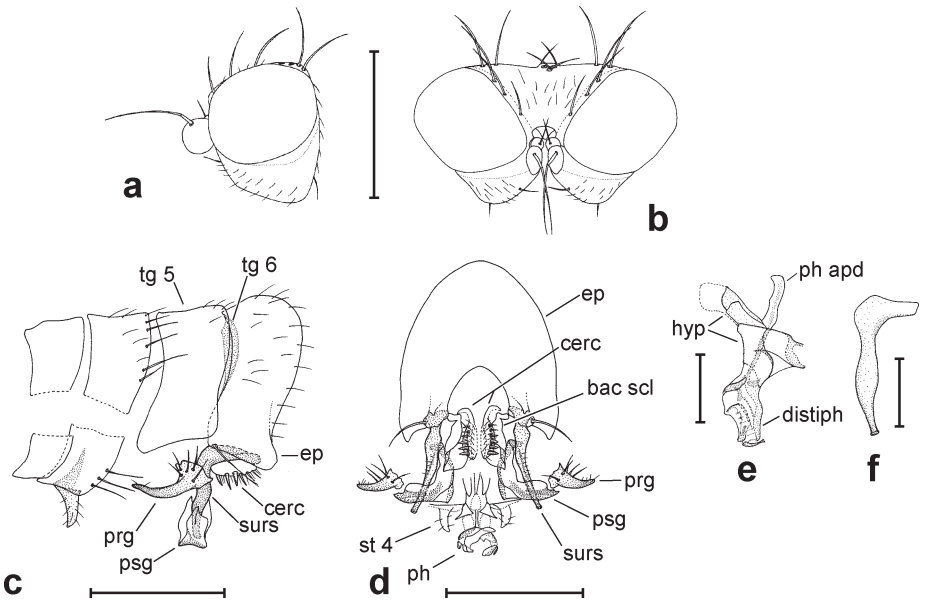

Fig. 23. *Oroschyromya peruncinata* sp. n., ♂: (a, b) head lateral and anterior, scale bar = 0.2 mm; (c) postabdomen, lateral, scale bar = 0.3 mm; (d) postabdomen, posterior, scale bar = 0.25 mm; (e) part of internal hypopygium, lateral, scale bar = 0.05 mm; (f) *surs*, lateral, scale bar = 0.1 mm.

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Female.

Similar to male. Postabdomen: *tg* 8 consisting of two lateral, discoid-shaped, sclerotized, strongly setose plates as in sibling species *affinis* sp. n.; margin of *tg* 5 with complete row of setulae and strong setae.

Length: ♂ body 2.3 mm, wing 2.2 mm; ♀ body 2.1 mm, wing 2.2 mm.

Variation: The male paratype has 1 *pprn* and a setula adjacent to it; and only one katepisternal. It is a little smaller than the type, but in all other respects identical.

Holotype: ♂ TANZANIA: Kimani [08°51'S:34°10'E], Rt A104, alt. 1400 m, 29.viii.1996, A. Freidberg (TAUI).

Paratypes: KENYA: 1♀ Hunter's Lodge, nr Kiboko, 02°14'S:37°43'E, 8–9.viii.2003, A. Freidberg (TAUI); 1♀ Rt A104, Gilgil, 00°34'S:36°21'E, 1962 m, 24.viii.2003, A. Freidberg (TAUI); 1♀ Awasi, Uguedhi, 30 km E of Kisumu, 00°09'S:35°02'E, 1200 m, 26.viii.2003, A. Freidberg (TAUI). UGANDA: 1♂ Kasese, 10 km S, 1500 m, 7.i.1996, I. Yarom & A. Freidberg (TAUI).

Genus *Somatiosoma* Frey, 1958

Somatiosoma: Frey 1958: 32.

Type species: *Somatiosoma nitescens* Frey, 1958: 32, by original designation.

Frey (1958) initially described *Somatiosoma* as a subgenus of *Chyromya*, on the basis of absent presutural *dc* setae and absent additional marginal setae on the *scut*, but with setulae on the disc (although Frey describes these as setae, a better description might be fine setulae, since these are the same as those on the scutum, and which Frey refers to as hairs). Frey also drew attention to the fine scutal vestiture.

Diagnosis: Head more or less round with *ocp* flat or only slightly convex when viewed from above or from side. Disc of *ocp* entirely or largely bare. Eyes round or almost so and *fr* about 1/3 width of head and not protruding above antennae, thus not visible in profile. No *pra* and no *post ia* setae, only one *dc* seta; these setae are present separately or together in some other genera. *scut* with several scattered fine setulae on disc in addition to usual four marginal setae. Short apicoventral seta on mid tibia indistinct and not as long as diameter of tibia at apex. Male postabdomen: *ph apd* stout and *psg* highly modified. In female postabdomen, 8th segment narrow dorsally and membranous; ventral part with two poorly sclerorized plates.

Description:

Head: Yellow, *fr* not protruding beyond anterior eye margin, sides moderately converging towards antennae, across middle, often with very fine pale setulae; *ocp* flat to slightly convex when viewed from above, in profile slightly convex and narrowly visible behind eye margin; short setulae on postocular margin and just above *ocp* foramen, but none on disc of *ocp*; gena narrow, finely, but distinctly setulose; on lower part, behind with a distinct pale seta directed downwards; vibrissal angle very poorly differentiated; 2 or 3 short vibrissal setulae; face short and depressed, poorly sclerotized, except for a narrow median line, carina never properly developed although this sclerotized median line may give the impression in some specimens that a shallow carina exists; eye round or slightly oval, upper and lower facets of ommatidia almost equal in size; antenna with round third segment, first and second segments short, latter with seta dorsally; arista 3-segmented, usually bare, sometimes very short pubescent; mouthparts small but normally

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developed, palp short and broad oval to almost round. Chaetotaxy: 3 well-developed *orb*, anterior inclinate; 1 strong *vti* and 1 strong *vte*, *oc* divergent, *pvt* distinct and convergent or crossed.

Thorax: Ground colour yellow; scutum with or without slightly darker yellow stripes; *mtn* and pleura yellow; scutum uniformly covered with short fine setulae. Chaetotaxy: 1–2 *pprn*, 1 *posthu*, 0+1 *dc*, scutal setulae in 8–12 rows between *dc* lines, with a longer *prscut* pair, 1 *sa* and 1 *pa*, 2 *ntpl*, *ia* and *pra* absent; 1 anepisternal at middle of hind margin and 1 katepisternal at upper posterior corner, sometimes with additional short setae or setulae adjacent to these, *prpl* absent.

Wing: Hyaline, uniformly microtrichose except for basal half of subcostal cell; costa thinner or broken just distal to weakly sclerotized *hu* crossvein and broken at R_1; subcosta merges with R_1 just before this reaches costa; veins R_{4+5} and M_{1+2} parallel to wing margin or very slightly convergent; costa ends just beyond end of vein R_{4+5}; costal setulae very short and of uniform length, sometimes a few setulae are longer than others at base of wing along anterior edge just before R_1 merges with costa; mixed in randomly amongst the pale costal setulae are darker and thicker setulae appearing as minute spines; 2–8 dark setulae set at intervals along dorsal aspect of costa between R_1 and apex of R_{2+3}.

Legs: Yellow and short setulose except front femur where longer posterodorsal and posteroventral setae may be present; mid tibia with short and inconspicuous apicoventral seta; claws black in apical half or more, pulvilli normal.

Abdomen: Predominantly pale yellow in most species; sparse short setulose on all segments; *tg* sclerotized; *st* from poorly sclerotized to wholly membranous and very thinly and microscopically setulose.

Male postabdomen: *tg* 6 distinct from *ep*, but narrower than *tg* 5 and ventral margin may be narrowed almost to a point; pregenital *st* not usually modified; *prg* always distinct, often highly modified, fused to or articulated with *hyp* laterally; *psg* and *bac scl* both short and difficult to see; *ej apd* often sclerotized and large; tubule to *basiph* sometimes visible; *distiph* large and of complicated structure, partly membranous, but with several sclerotized components; *cerc* always small, narrowly separated and finely setulose; *surs* usually separated from *ep*.

Female postabdomen: Segment 8 with only *st* sclerotized and this is divided into two lateral plates which, when viewed from below, appear velvety owing to a dense pruinosity; each structure extends medially to form a translucent membranous lobe, which serve to close the genital opening; *hypr* present, small, membranous or very poorly sclerotized, usually bare or with microtrichia; epiproct not developed; 2 small (0.04–0.07 mm) *s*, dark coloured (grey, brown or black), lying deep to lateral aspect of *tg* 6 or 7; *s* ducts not sclerotized or pigmented.

Length: ♂ and ♀ body 1.5–2.2 mm, wing 1.5–2.0 mm.

Distribution (Fig. 68): Parts of the Middle East (Arabia, Israel, Oman, Palestine and Yemen) and throughout Africa and many of its islands. It has not been recorded from the Indian subcontinent, but could well occur there.

Ecology: This genus appears to be the most arid-tolerant in the family, and species are more likely to be found in scrub vegetation in eremic zones than species of the other genera. It appears to be the only member of its subfamily to occur in deserts.

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Key to the Afrotropical species of *Somatiosoma*

[Note: *awashensis* is only known from the male; *hirtiscutellatum* and an undescribed species from Madagascar are only known from females.]

Males

1 Scutellum with a pair of minute, covergent or crossed, strictly apical setulae, postabdomen Figs 28a–d ..... **nitescens** Frey
– Scutellum without minute apical setulae 2

2 Pregonite visible externally as a very long process lying along ventral margin of *ep* and having a number of setae at its apex 3
– Pregonite of different shape, often not visible at all without dissection 4

3 Pregonite ending in a fan of at least 5 setae; gena not strongly receding in profile; antennal segment 3 about 1/4 diameter of eye, Fig. 25a .... **eremicolum** Ebejer (see Ebejer 2008*a*: 692, figs 17, 18)
– *prg* ending in only 2 setae; gena strongly receding in profile; antennal segment 3 about 1/2 diameter of eye, Fig. 26a, postabdomen Fig. 26b .... **grandicornis** sp. n.

4 Sternite 6 with long posteriorly directed lobes forming a U-shape, visible without dissection; *ep* with long setulae and near ventral margin with very long setae, postabdomen Fig. 29 ..... **setipygum** sp. n.
– Sternite 6 with no special modifications 5

5 Antennal segment 3 about 1/3 diameter of eye; gena receeding in profile; *prg* larger and Y-shaped often partly visible externally, postabdomen Fig. 27a .... **messumensis** sp. n.
– Antennal segment 3 about 1/4 diameter of eye; gena not significantly receding in profile; *prg* small, narrow, not visible externally, postabdomen Fig. 24 .... **awashensis** sp. n.

Females

1 Scutellum with minute convergent or crossed apical setulae ..... **nitescens** Frey
– Scutellum without minute crossed apical setulae 2

2 Abdomen with pair of black spots on at least one of apical tergites 3
– Abdomen completely yellow, no spots on apical tergites or sternites 5

3 Tergites and *st* 6 and 7, each with paired spots, *st* 8 with only a midline spot .... undescribed sp. (Madagascar)
– Sternites without spots 4

4 Tergite 7 and dorsal aspect of segment 8, each with pair of small round black spots; rarely, missing on segment 8; antennal segment 3 about 1/3 diameter of eye and narower than gena at its middle; gena not significantly receding, postabdomen Figs 25b–d ..... **eremicolum** Ebejer
– Only *tg* 7 with pair of black spots; antennal segment 3 about 1/4 diameter of eye and about equal to height of gena at its middle; gena obviously receding, postabdomen Figs 27b, c ..... **messumensis** sp. n.

5 Gena strongly receding and broad to about 1/3 height of eye; antennal segment 3 almost 1/3 diameter of eye; sclerites of segment 8 only with microtrichia, appearing

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velvety; *hypr* bare or only with occasional and minute setulae that are very difficult to see, postabdomen Figs 26c, d ..... **grandicornis** sp. n.

– Gena in profile barely receding and narrow to about 1/4 height of eye; antennal segment 3 a little less than 1/3 diameter of eye; sclerites of segment 8 with setae 6

6 Paired sclerites of segment 8 with setae of similar length to adjacent setae on *tg* 7; *hypr* with setae not much shorter than those on sclerite 8, and stronger than those on cerci, postabdomen Fig. 30 ..... **setipygum** sp. n.

– Paired sclerites of segment 8 with shorter setae and *hypr* with setulae no longer than those on cerci ..... **hirtiscutellatum** (Lamb)

Somatiosoma awashensis sp. n.

Fig. 24

Etymology: From the type locality, Awash National Park in Ethiopia.

Diagnosis: Pale yellow species with *orb* set far forward; gena about 1/4 diameter of eye and not significantly receding in profile; *prg* small, narrow, not visible externally; male has distinctive hypopygium, but features not easily appreciated from external examination.

Description:

Male.

Head: Yellow, *oc* triangle black; *fr* not visible in profile, at anterior *oc* 0.4× width of head, narrowed anteriorly, at level of antenae about 0.35× width of head; *ocp* in profile broadly visible behind eye margin and convex; face depressed and with distinct but shallow carina in upper half; gena slightly receding, 0.35× height of eye and with several minute pale setulae; mouthparts yellow, palp oval; antenna all yellow except third segment of arista which is dark in apical 3/4; third antennal segment round, about equal to height of gena at middle and about 0.28 diameter of eye, second segment with dorsal seta; 3 *orb*, all set far forward such that hind *orb* inserted half way from level of lunule to level of vertex, 1 *vte* and 1 *vti*, *oc* strongly divergent, *pvt* short, about 1/3 length of anteior *orb* and crossed, about 6 minute white setulae scattered on *fr*, postocular setulae very short and in 1 row, and postgenal seta short.

Thorax: Entirely pale yellow with most setae pale brown on dorsum and pale yellow on pleura. Chaetotaxy: 1 *pprn* with 1 setula adjacent to it, 1 strong *dc* and another about 1/3 its length just in front of it, *acrs* very short and undifferentiated from scutal setulae, setulae forming 8 irregular rows at level of transverse scutal suture between *dc* lines, *prscut* pair present but only a little stronger than other scutal setulae; 1 *posthu*, 1 short *sa* and 1 strong *pa*, *scut* with 2 pairs of marginals, subapical pair long, about twice length of basal pair, disc of *scut* with 8 scattered setulae, no fine crossed apical *scut* setulae; anepisternum with 1 seta at middle of posterior margin and katepisternum with 1 seta at upper margin, each with several pale setulae in front, more numerous on anepisternum.

Wing: Hyaline with pale yellow veins, costa with minute yellow spine-like setulae from R_1 to R_{2+3}, distance on costa between R_{2+3} and R_{4+5} about 0.7 that between R_{4+5} and M_{1+2}, apical section of Cu about 2× length of posterior crossvein. Haltere yellow.

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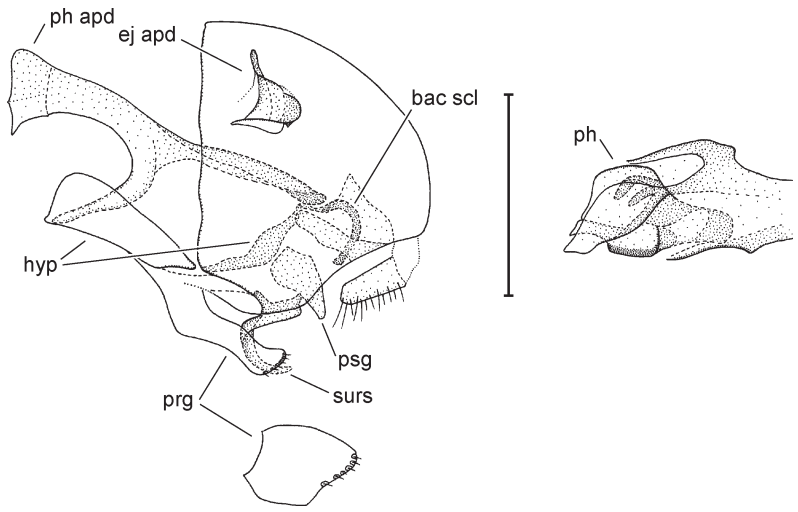

Fig. 24. *Somatiosoma awashensis* sp. n., ♂ hypopygium, lateral, with *prg* shown also in ventral view. Scale bar = 0.15 mm.

Legs: All yellow, only fore femur a little dilated, all setae and setulae pale yellow, longest on posterior aspect of fore femur, claws black, a little shorter than length of tarsomere 5, apicoventral seta on mid tibia yellow and distinctly shorter than diameter of tibia at apex.

Abdomen: Entirely yellow with a few short and fine pale yellow setulae on each *tg*, those on *tg* 5 about 1/3 length of *tg*.

Postabdomen: All yellow with small hypopygium and distinctive projecting lobes on *st* 6.

Female: Unknown.

Length: ♂ body 1.7 mm, wing 1.5 mm.

Holotype: ♂ ETHIOPIA: Awash National Park, ESE Metahara, 08°50'91"N:40°00'32"E, 16.iii.1995, M. von Tschirnhaus (in alcohol, ZSMC).

Somatiosoma eremicolum Ebejer, 2008

Fig. 25

Somatiosoma eremicolum: Ebejer 2008*a*: 692.

Diagnosis: Pale yellow species without crossed apical setulae on *scut*; male has characteristic long, stalked *prg* ending in fan of setae; female has pair of small black spots on *tg* 7 and usually also on *tg* 8. Female postabdomen: *st* 8 large, microtrichose and with distinct fleshy medial lobes; *hypr* membraneous, bare; *cerc* small; spermatheca small, black and with membraneous spermathecal ducts.

Material examined: NAMIBIA: 4♀ (W33), Sesriem Canyon, 5 km W Sesriem, 21–22.i.1972, British Museum Southern African Expedition 1972 (BMNH); 1♂ Kahn R., 8 km N Usakos, 30–31.i.1972, Southern African Expedition, British Museum 1972 (BMNH); 4♂ 2♀ 2315Ca, Namib Desert Park, Kuiseb R. at Gobabeb, 400 m, riverine forest and sand, 12.ii.1974, M.E. & B.J. Irwin (NMSA); 1♂ Mariental District, Viljoenskroon, 26°08'39"S:19°57'11"E, 7–9.ii.1998, Malaise trap, A.H. Kirk-Spriggs (NMNW); 5♂ 16♀ Brandberg, Messum Valley, 700 m, 21°13'29"S:14°30'98"E, Malaise trap, bushy Karoo-Namib shrubland, 5–17.iv.1999, S. Van Noort & S.G. Compton (NMNW); 1♀ Brandberg, Hungorob R., 1200 m, 21°13'5"S:14°31'01"E, light trap,

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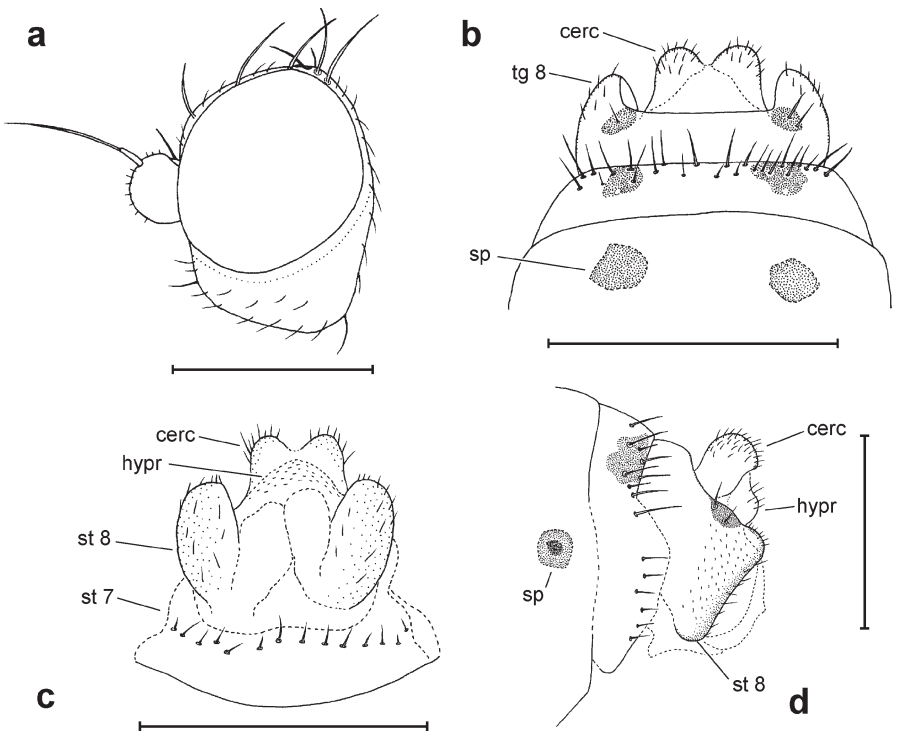

Fig. 25. *Somatiosoma eremicolum* Ebejer: (a) ♂ head, lateral, scale bar = 0.3 mm; (b–d) ♀ postabdomen: (b) dorsal, (c) ventral, (d) lateral, scale bars = 0.15 mm.

plateau edge, 9.ix.1998, A.H. Kirk-Spriggs (NMNW); 1♀ Brandberg, Hungorob Valley, 1180 m, 21°11'40"S: 14°31'69"E, Malaise trap, bushy Karoo-Namib shrubland, 5–16.iv.1999, S. Van Noort & S.G. Compton (NMNW); 1♂ 4♀ Karibib District, Tsaobismund 85, 22°22'40"S:15°44'58"E, Malaise traps, 13–15.iv.2001, A.H. Kirk-Spriggs & E. Marais (NMNW); 1♂ 4♀ Brandberg, Mason Shelter, 21°04'42"S 14°35'33"E, 5–14.iii.2002, 1750 m, light trap, A.H. Kirk-Spriggs (NMNW). OMAN: 2♀ Muscat, Al Khuwair, 10–11.i.1988 & 22–23.ii.1988, M.J. Ebejer (NMWC); 6♀ Muscat, Ruwi, Wattayeh, 1–7.iv.1988, M.D. Gallagher (NMWC); 2♀ same data but 17–20.iv.1988 (NMWC); 2♂ 6♀ Muscat, Haramel, 13.iii.1995 (1♂), 14.iii.1995 (4♀), 23.iii.1995 (1♀), 26.iii.1995 (1♀), 28.iii.1995 (1♂) S.P. Dance (all NMWC). SAUDI ARABIA: 3♂ Aseer, Maraba, 1–30.v.2004 (1♂), 5.x–30.xi.2004 (2♂), Malaise trap, H.A. Dawah (NMWC). YEMEN: 1♀ Ta'izz, 5.i–2.ii.1998, light trap, A. van Harten & M. Mahyoub (NMWC); 2♂ 3♀ Al-Kowd, viii.2000 (1♂ 2♀), x.2000 (1♀), xi.2000 (1♂), light trap, A. van Harten & S. Al Haruri (all NMWC).

Distribution: Widespread in the Afrotropical Region and the Middle East.

Somatiosoma grandicornis sp. n.

Fig. 26

Etymology: From Latin *grandis* (large) and *cornu* (horn), and refers to the large third antennal segment.

Diagnosis. Uniformly yellow species that has no crossed apical setulae on *scut* and no spots on apical *tg* of female abdomen; third antennal segment distinctly enlarged; in male, viewed in profile, about half diameter of eye, in female, just a little less. Male postabdomen: *prg* greatly elongated, external to lower margin of *ep* and ending in two broad setae.

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Description:

Male.

Head: Yellow, *oc* triangle black; *fr* not visible in profile, at anterior *oc* 0.4 width of head, narrowed anteriorly; face depressed and with distinct carina in upper half; gena strongly receding, 0.3 height of eye and with several minute pale setulae; *ocp* in profile broadly visible behind eye margin and convex; mouthparts yellow; antenna all yellow except third segment of arista which is black; third antennal segment large and round, reaching almost half diameter of eye, second segment with dorsal seta; 3 *orb*, the anterior inclinate, 1 *vte* and 1 *vti*, *oc* divergent and long, *pvt* short but distinct and crossed, about 30 minute pale brown setulae scattered on *fr* and between *orb*, postgenal seta long.

Thorax: Entirely pale yellow with most setae pale brown on dorsum and pale yellow on pleura. Chaetotaxy: 1 *pprn* with 4 setulae around it, 1 strong *dc* and another about 1/3 its length just in front of it, *acrs* undifferentiated from scutal setulae except short *prscut* pair, setulae in 10 irregular rows at level of transverse scutal suture between *dc* lines, 1 *posthu*, 1 short *sa* and 1 strong *pa*, *scut* with 3 pairs of marginals, subapical pair longest and basal pair short, about 1/4 length of subapicals, lateral pair intermediate in size, disc of *scut* with 6–17 scattered setulae, anepisternum with 1 seta at middle of posterior margin and katepisternum with 1 seta at upper posterior corner, each with several pale setulae in front, more numerous on anepisternum.

Wing: Hyaline with pale yellow veins, costa with minute black spine-like setulae from base to R_{2+3}. Haltere yellow.

Legs: All yellow, only fore femur a little dilated, all setae and setulae pale brown, longest on posterior aspect of fore femur, claws black, apicoventral seta on mid tibia distinctly shorter than diameter of tibia at apex.

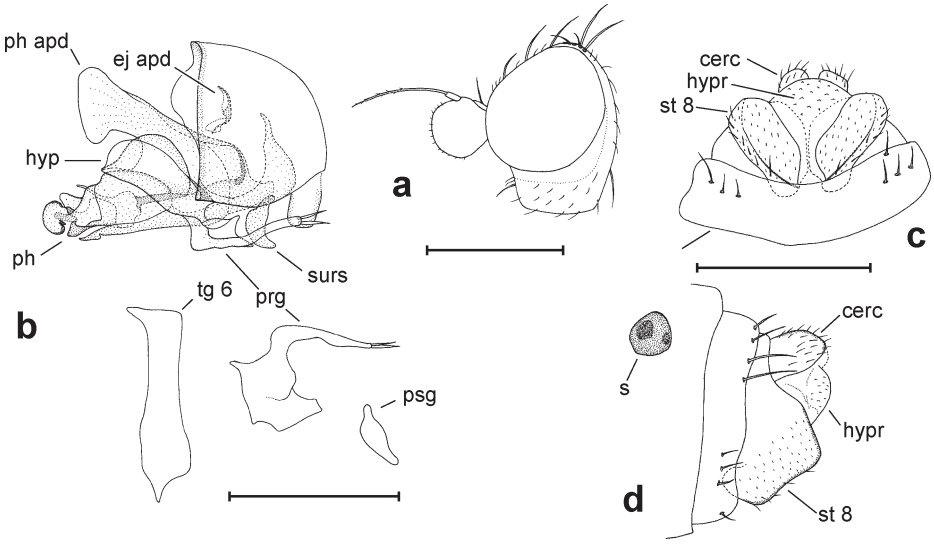

Fig. 26. *Somatiosoma grandicornis* sp. n.: (a) ♂ head, lateral; (b) ♂ hypopygium, lateral, with *prg* shown also in ventral view; (c, d) ♀ postabdomen, ventral (c) and lateral (d). Scale bar = 0.35 mm in Fig. 26a and 0.2 mm in Figs 26b–d.

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Abdomen: Entirely yellow with a few short and fine brown setulae on each *tg*. Postabdomen: All yellow with small hypopygium and distinctive elongated *prg* ending in 2 stout setae.

Female.

As male, but tending to have darker brown setae and setulae; also, third antennal segment not so obviously enlarged, but about 1/3 or slightly more than diameter of eye. Postabdomen: *st* 8 not as clearly oval as in *eremicolum*, setulose along lateral margin, and along midline of long axis distinctly more sclerotized; *hypr* bare but with minute tubercles; spermatheca small and dark and duct not sclerotized.

Length: ♂ body 2.0 mm, wing 1.8 mm; ♀ body 2.1 mm, wing 1.9 mm.

Variation: Very little variation noted other than the number of setulae on the dorsum of the *scut*.

Holotype: ♂ NAMIBIA: Brandberg, Mason Shelter, 21°04'42"S:14°35'33"E, 5–14.iii.2002, alt. 1750 m, light trap, A.H. Kirk-Spriggs (NMNW).

Paratypes: 2♂ 10♀ same data (NMNW); 1♂ 2♀ same data (NMSA); 1♀ Brandberg, Hungarob R., 1200 m, 21°13'05"S:14° 31'01"E, light trap, 9.xi.1998, A.H. Kirk-Spriggs; 1♂ 1♀ Brandberg, Messum Valley, 700 m, 21°13'29"S:14°30'98"E, Malaise trap, bushy Karoo-Namib shrubland, 5–17.iv.1999, S. Van Noort & S.G. Compton (in alcohol, NMNW); 4♀ *Karibib District*, Tsaobismund 85 at 22°22'40"S:15°44'58"E, 13–15.iv.2001, A.H. Kirk-Spriggs & E. Marais, Malaise traps (NMNW). MADAGASCAR: 1♂ 3♀ coastal dry scrub north of Toliara, 15.ii.1984, M.von Tschirnhaus (in alcohol, ZSMC); 1♂ between Ambrorompotsy (west) and Tranoroa (east), 23 km E Ampanihy, 24°41'S:44°55'E, 22.ii.1984, M. von Tschirnhaus (in alcohol, FBUB). YEMEN: 2♂ 2♀ Ta'izz, 5.i–2.ii.1998, light trap, A.van Harten & M. Mahyoub (NMWC).

Somatiosoma hirtiscutellatum (Lamb, 1914), **comb. n.**

Chiromyia hirtiscutellata: Lamb 1914: 355.

Lamb wrote that he had two males. The holotype (BMNH) is a female, but I was unable to recognize any external characters that would allow me to assign any of the new species to *hirtiscutellatum*. The paratype (CUMZ), on the other hand, is a headless male of a different species and it fits well the current concept of *nitescens* Frey, for which a diagnosis is given below. Therefore, for the time being, the species *hirtiscutellatum* is known only from the holotype.

Diagnosis: Orange-yellow species with deeper yellow scutal stripes: *scut* without crossed apicals, but with discals and additional marginals, scutal setulae in 10 rows between *dc* lines; *mtn* dark on sides with middle two thirds yellow; all abdominal *tg* with brown bands. Postabdomen not dissected and no external distinguishing features noted.

Distribution: Seychelles.

Somatiosoma messumensis sp. n.

Fig. 27

Etymology: From the type locality, MessumValley in Namibia.

Diagnosis. A completely yellow species that has a small third antennal segment which is a little narrower than height of gena at middle; female has one pair of black spots on *tg* 7. In some males, distinctive Y-shaped *prg* visible without dissection.

Description:

Male.

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Head: Yellow, *oc* triangle yellow; *fr* not visible in profile, at anterior *oc* 0.4 width of head, narrowed anteriorly, at level of antenae 0.28 width of head; face depressed and with distinct carina in upper half; gena strongly receding, 0.4 height of eye and with several minute pale setulae; *ocp* in profile broadly visible behind eye margin and almost straight; mouthparts yellow, palp short about half length of proboscis; antenna all yellow except third segment of arista which is brown; third antennal segment round, about equal to height of gena at middle and about 1/3 diameter of eye, second segment with dorsal seta; 3 *orb*, the anterior inclinate, 1 *vt*e and 1 *vti*, *oc* strongly divergent and long, *pvt* long and crossed, about 10 minute pale yellow setulae scattered on *fr* and between *orb*, postocular setulae in 1 row and postgenal seta long.

Thorax: Entirely pale yellow with most setae pale brown on dorsum and pale yellow on pleura. Chaetotaxy: 1 *pprn* with 5 setulae around it, 1 strong *dc* and another about half its length just in front of it, *acrs* undifferentiated from scutal setulae except short *prscut* pair, setulae in 8–10 irregular rows at level of transverse scutal suture, *prscut* pair only a little stronger than other scutal setulae; 1 *posthu*, 1 short *sa* and 1 strong *pa*, *scut* with 3 pairs of marginals, subapical pair longest, disc of *scut* with 18 scattered setulae, anepisternum with 1 seta at middle of posterior margin and katepisternum with 1 seta at upper margin, each with several pale setulae in front, more numerous on anepisternum.

Wing: Hyaline with pale yellow veins, costa with minute yellow spine-like setulae from base to R_{2+3}, distance on costa between R_{2+3} and R_{4+5} about 0.7 that between R_{4+5} and M_{1+2}, apical section of Cu about 2.5× length of posterior crossvein. Haltere yellow.

Legs: All yellow, only fore femur a little dilated, all setae and setulae pale yellow, longest on posterior aspect of fore femur, claws black, short, about 0.5 length of tarsomere

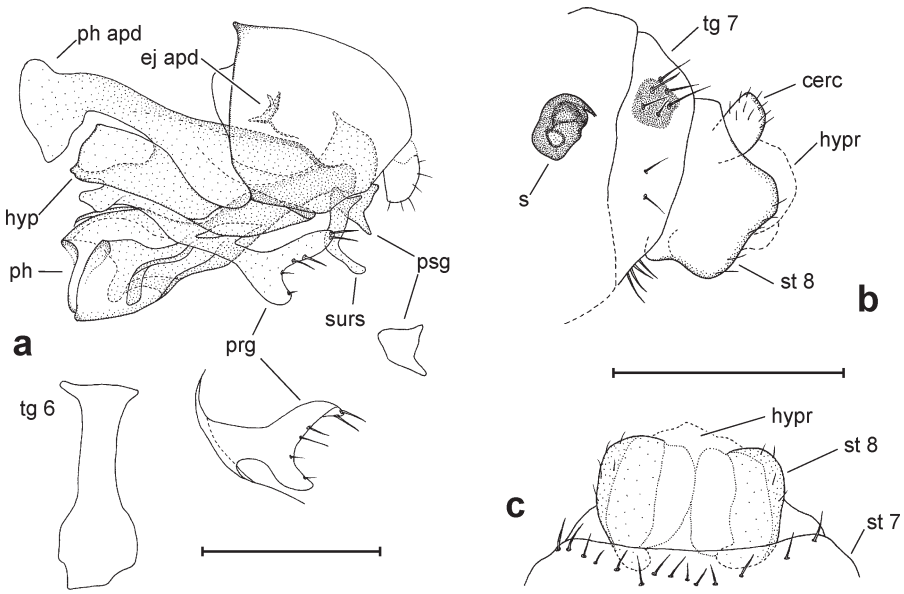

Fig. 27. *Somatiosoma messumensis* sp. n., (a) ♂ hypopygium, lateral, with *prg* shown also in ventral view, scale bar = 0.15 mm; (b, c) ♀ postabdomen, lateral (b) and ventral (c), scale bar = 0.2 mm.

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5, apicoventral seta on mid tibia yellow and distinctly shorter than diameter of tibia at apex.

Abdomen: Entirely yellow with a few short and fine pale yellow setulae on each *tg*, those on *tg* 5 about 1/4 length of *tg*.
Postabdomen: All yellow with small hypopygium and distinctive Y-shaped *prg*.

Female.

As in male, but tending to have brown setae and setulae; also, third antennal segment not so enlarged, but a little less than 1/3 diameter of eye. Postabdomen: *st* 8 relatively large compared to congeners, thinly sclerotized laterally and with few microtrichia along this margin; *hypr* entirely membraneous and barely visible, bare and without tubercles; *cerc* small, oval.

Length: ♂ and ♀ body 1.5 mm, wing 1.7 mm.

Variation: Very little variation noted other than the number of setulae on the dorsum of the *scut* and setae on the lateral margin.

Holotype: ♂ NAMIBIA: Brandberg, Mason Shelter, 21°04.42'S:14°35.33'E, 5–14.iii.2002, alt. 1750 m, light trap, A.H. Kirk-Spriggs (NMNW).

Paratypes: NAMIBIA: 5♂ 19♀ Karibib District, Tsaobismund 85, 22°22'40"S:15°44'58"E, 13–15.iv.2001, A.H. Kirk-Spriggs & E. Marais, Malaise traps (NMNW); 1♂ 1♀ same data (BMNH); 1♂ 1♀ same data (NMSA); 2♂ 4♀ same data (NMWC); 1♂ 1♀ same data (TAU); 3♂ 16♀ Brandberg, Messum Valley, 700 m, 21°13'29"S:14° 30'98"E, Malaise trap, bushy Karoo-Namib shrubland, 5–17.iv.1999, S. Van Noort & S.G. Compton (NMNW).

Somatiosoma nitescens Frey, 1958

Fig. 28

Somatiosoma nitescens: Frey 1958: 32.

Diagnosis. Uniformly pale yellow species with pair of minute crossed setulae at apex of *scut*. Third antennal segment narrower than height of gena at middle viewed in profile. Male postabdomen has no distinguishing external features. Female abdomen has no dark spots on any of apical segments. Postabdomen: characteristically has long setulae on *st* 8; *s* (when cleared in KOH) with two internal tubules, *s* ducts not sclerotized; *hypr* membraneous, but distinct, bare and without tubercles.

Material examined: ANGOLA: 2♀ Dolondolo, 13°49'S:13°07'E, 29–30.xi.1974, Malaise trap (NMSA). CAPE VERDE: 2♂ Valle São Jorge (Santiago), 8.ix.1982, P. Ohm (in alcohol, ZSMC); 1♀ Santiago, San Domingos-Praia, from Prosopis tree, 27.x.1982, P. Ohm (in alcohol, ZSMC); 2♀ S. Vincente, 26.i.1985, P. Ohm (in alcohol, ZSMC); 1♂ 4♀ garden near Mindelo, 27.i.1985, P. Ohm (in alcohol, ZSMC); 1♀ Fogo, São Jorge, 250 m, 19.x.1982, P. Ohm (in alcohol, ZSMC); 1♀ Fogo, below Caldeira, Mt Velha, 950 m, 22.x.1982, P. Ohm (in alcohol, ZSMC); 1♂ Santiago, Ribeiro Principal, 100 m, 29.x.1982, P. Ohm (in alcohol, FBUB); 6♀ Santiago, Variante, 2.xi.1982, P. Ohm (in alcohol, ZSMC); 4♂ 5♀ Santiago, Cidade Velha, 3.xi.1982, P. Ohm (in alcohol, ZSMC); 1♂ 2♀ St. Antão, Ribeiro Grande, 15.xi.1982, P. Ohm (in alcohol, FBUB); 1♂ 1♀ same data (in alcohol, MJE); 1♂ São Jorge de Orgãos, viii.1988, A.van Harten (in alcohol, NMWC); 2♀ São Jorge de Orgãos, ix.1988, A.van Harten (in alcohol, NMWC); 1♂ 5♀ São Jorge de Orgãos, 24.viii–7.ix.1989, A.van Harten (in alcohol, NMWC); 2♂ 4♀ same data (in alcohol, MJE). ETHIOPIA: 1♀ Shewa, Debre Zeit, 1890 m, 08°41'N:39°02'E, 27.ix.2005, A. Freidberg (TAUI); 1♀ Welo, Lalibela, 2470 m, 12°01'N:39°03'E, 8.x.2005, A. Freidberg (TAUI). THE GAMBIA: 1♀ Bakau, at Tropic Bungalow, 25.xi.1977, indoors and in hotel area, Lund University Systematics Department, Cederholm, Danielsson, Hammarstedt, Hedqvist, Samuelsson (MZLU). GHANA: 1♀ Accra, on window, iv.1920, J.W. Scott Macfie (BMNH); 2♀ Accra, laboratory windows, xi.1920, A. Ingram (BMNH); 1♂ Accra, i.1921, J.W. Scott Macfie (BMNH); 1♀ Accra, in laboratory, ii–iii.1921, J.W. Macfie (BMNH); 1♀ Accra, iv.1921, J.W. Scott Macfie (BMNH). KENYA: 1♂ 1♀ Wangala, Rt A109, 17–19.viii.1996, A. Freidberg (TAUI); 3♂ 3♀ Chepareria, 24.xi.1989, A. Freidberg & F. Kaplan (TAUI); 1♀ Koriema, 15 km W. Marigat, 13.v.1991, A. Freidberg & F. Kaplan (TAUI); 2♀ Ngong Hills, 2000–3000 m,

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15.v.1991, A. Freidberg & F. Kaplan (TAUI); 4♂ 7♀ Hunter's Lodge near Kiboko, 02°14'S:37°43'E, 8–9.viii.2003, A. Freidberg (TAUI); 6♂ 5♀ Kasambara, 15 km W of Gilgil, 00°34'S:36°22'E, 25.ix.2005, A. Freidberg (TAUI); 1♂ 1♀ same data (MJE). MADAGASCAR: 1♀ Arkarana, nr Ambilobe, ix.1986, S.V. Fowler (NMWC); 1♀ Ramakia, 9.iv.1991, A. Freidberg & F. Kaplan (TAUI); 1♀ Ramena, 10.iv.1991, A. Freidberg & F. Kaplan (TAUI); 3♂ 2♀ Fort Dauphin, Taolañaro, 18–23.iv.1991, A. Freidberg & F. Kaplan (TAUI); 1♂ 1♀ same data (MJE); 3♂ 1♀ between Ambrorompotsy (west) and Tranoroa (east), 23 km E. Ampanihy, 24°41'S:44°55'E, 22.ii.1984, M.von Tschirnhaus (in alcohol, FBUB); 3♂ 6♀ coastal dry scrub north of Toliara, 15.ii.1984, M.von Tschirnhaus (in alcohol, ZSMC); 1♂ same data (in glycerine, MJE). MALAWI: 2♂ 3♀ Center Nichisi, Rt T350, 16.ix.1998, F. Kaplan & A. Freidberg (TAUI); 1♂ 1♀ same data (MJE); 2♂ 1♀ Viphya Mts., Rt M1, 20 km S Mzimba, 20–30.ix.1998, F. Kaplan & A. Freidberg (TAUI). MAURITIUS: 1♂ 3♀ 1–2 km S of Wolmar, 21.v.2000, J.W. Ismay (OXUM); 1♂ nr Post de Flaq, 29.v.2000, J.W. Ismay (OXUM). NAMIBIA: 1♀ Keetmanshoop, Noachabeb 97, SE 2718 Ad/8c, 22–28.iv.1972, Malaise (NMNW); 1♀ Ovambo, Onduri, 17°32'S:16°37'E, pitfall trap, 14–26.i.1993, E. Marais (in alcohol, NMNW); 5♀ Kavango, Nangera, 17°37'S:18°08'E, pitfall trap, 14–27.i.1993, E. Marais (in alcohol, NMNW); 1♀ Ovambo, Enyana, 17°37'S: 17°25'E, pitfall trap, 14–27.i.1993, E. Marais (in alcohol, NMNW); 1♀ Ovambo, Mahanene Agric. Research Station, 17°26'S:14°47'E, pitfall trap, 5.ix–5.x.1993, B. Wohlleber (NMNW); 2♀ West Caprivi Park, Kwando

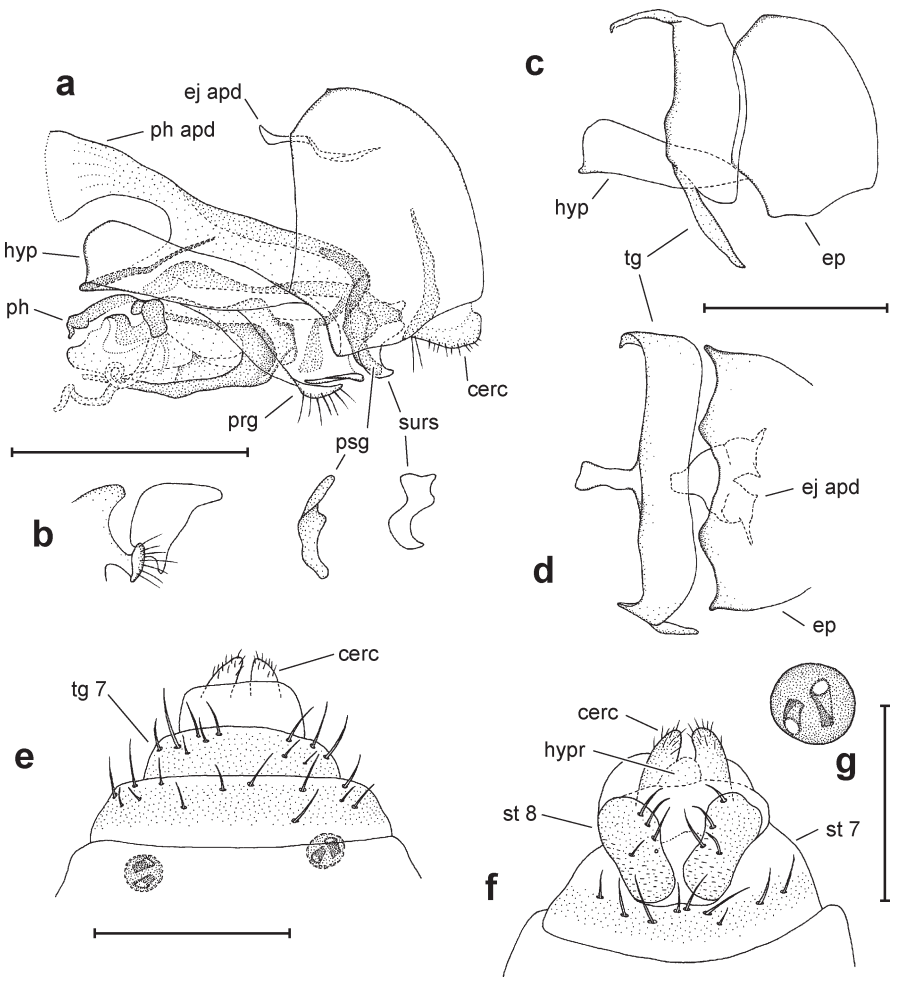

Fig. 28. *Somatiosoma nitescens* Frey: (a) ♂: hypopygium, lateral; (b) *prg*, ventral; (c, d) part of ♂ postabdomen, lateral (c) and dorsal (d); (e–g) ♀ postabdomen: (e) dorsal, (f) ventral, (g) spermatheca, enlarged. Scale bars = 0.15 mm.

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R., Susuwe, 17°45'37"S:23°20'55"E, Malaise trap in dry woodland, 28.ix–2.x.1998, A.H. Kirk-Spriggs (NMNW); 1♀ Rundu District, Simanya Okavango River, 17°33'35"S:18°32'30"E, 23–24.i.1998, A.H. Kirk-Spriggs & E. Marais (in alcohol, NMNW); 2♀ Tsumkwe District, 19°51'30"S:20°57'41"E, from dung of *Loxidonta africana*, 23.x.1998, A.H. Kirk-Spriggs (NMNW); 1♀ Tsumkwe District, Nama, 19°54'34"S: 20°44'08"E, Malaise traps, 20–22.xii.1998, A.H. Kirk-Spriggs, E. Marais & D. Mann (NMNW); 1♀ Tsumkwe District, 3 km E Xawasha pan, 19°09'53"S:20°57'40"E, from dung of *Loxidonta africana*, 25.xii.1998, A.H. Kirk-Spriggs (NMNW); 1♀ Tsumkwe District, 2 km W Xawasha pan, 19°09'57"S: 20°52'55"E, Malaise traps, 26–27.xii.1998, A.H. Kirk-Spriggs, E. Marais & D. Mann (NMNW); 1♀ West Caprivi Park, Fort Doppies, 17°49'28"S:23°18'49"E, 20–21.x.1999, A.H. Kirk-Spriggs, T. Pape & W. Hauwanga (NMNW); 1♀ Opuwo District, Sesfontein Fort, 19°07'15"S:13°37'06"E, Malaise trap, 1–3.i.2000, E. Marais, D. Mann & Newman, MMN 38 (NMNW); 2♀ Brandberg, Mason Shelter, 21°04'42"S:14°35'33"E, 5–14.iii.2002, 1750 m, light trap, A.H. Kirk-Spriggs (NMNW); 1♀ Rt B8, 60 km SW Rundu, 18°22'S:19°20'E, 8.ix.2003, A. Freidberg (TAUI). NIGERIA: 1♀ Zaria, Samaru, 4.viii.1969, J.C. Deeming (NMWC); 2♀ Zaria, Samaru, 6.vi.1978, J.C. Deeming (NMWC); 1♂ Zaria, Samaru, v.1979, J.C. Deeming (NMWC). SEYCHELLES: *Aldabra*: 1♀ South Island, Cinq Cases, 3–16.i.1968, B. Cogan & A. Hutson (Aldabra Atoll Royal Society Expedition 1967–68) (BMNH); 4♂ 4♀ South Island, Takamaka, 1–17.ii.1968, B. Cogan & A. Hutson (Aldabra Atoll Royal Society Expedition 1967–68) (BMNH); 1♀ South Island, Dune Jean-Louis, 13–20.iii.1968, B. Cogan & A. Hutson (Aldabra Atoll Royal Society Expedition 1967–68) (BMNH). SIERRA LEONE: 1♀ Freetown, Cape Sierra Hotel area, 08°31'N:13°17'W, 1.xii.1993, Lund University Sierra Leone Expedition, L. Cederholm & R. Danielsson (MZLU). SOUTH AFRICA: *KwaZulu-Natal*: 1♀ 32 km S Ndumu Game Reserve Camp [approx. 27°12'S:32°19'E], 2732Aa, dry scrub forest, 100 m, 29.xi.1971, M.E. & B.J. Irwin (NMSA); *Limpopo*: 1♀ (headless) Kruger National Park, Pafuri [22°21'S:31°17'E], 24.i.1979, L. Braack (NMSA); 1♀ same data but 14.ii–8.iii.1980, Malaise trap (NMSA); *North West*: 1♂ 3♀ Hartbeespoort [25°44'S:27°54'E], 25 km W Pretoria, 30.xii.1994, A. Freidberg (TAUI); 1♀ same data (NMSA); 3♀ Hartbeespoort Dam [25°46'S:27°49'E], 40 km W Pretoria, 30.xii.1994, A. Freidberg (TAUI); 1♂ 1♀ same data (NMSA). ZIMBABWE: 2♀ Zambezi, 16°10'S:29°25'E, Rutometje-Res. St. RM2, vi.1988, J. Weyrich (ZSMC); 2♀ same data but viii.1988 (ZSMC); 1♀ Zambezi, 16°08'S:30°15'E, SE Angwa Bridge M2, viii.1988, J. Weyrich (ZSMC).

Distribution. Throughout the Afrotropical Region and in many parts of the Middle East from sea level to 2470 m. In the Cape Verde Islands, it has been found from sea level to 950 m; in plantations of coffee, citrus, mango and maize on lava soils; near water as well as on dunes; in coastal as well as inland localities.

Somatiosoma setipygum sp. n.

Figs 29, 30

Etymology: From Latin *seta* (seta) and *pyga* (buttocks), and refers to the setulose hypoproct in the female and the long setae on the male epandrium.

Diagnosis: Entirely yellow species in both sexes, easily recognized in male because of long setae on *ep*; apical segments of female abdomen also have setae that are longer than usual, but a distinctive feature is the *hypr*, which has numerous setulae that can be seen without dissection. These are similar in size and density to setulae on *cerc*.

Description:

Male.

Head: Yellow, *oc* triangle black; *fr* not visible in profile, at anterior *oc* 0.3 width of head, narrowed anteriorly, at level of antenae 0.7 width of that at anterior *oc*; face very short and depressed and with no distinct carina in upper half; gena receding, 0.25 height of eye at middle and with several minute pale setulae; *ocp* in profile broadly visible behind eye margin, slightly convex; mouthparts yellow, palp short oval about half length of proboscis; antenna all yellow except third segment of arista which is brown; third antennal segment round, about 1.4× height of gena at middle and about 0.35 diameter of eye, second segment with dorsal seta; 3 *orb*, the anterior inclinate, 1 *vte* and 1 *vti*, *oc*

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strongly divergent and long, *pvt* long and crossed, about 10 minute pale yellow setulae scattered on *fr* and between *orb*, postocular setulae in 1 row and postgenal seta long.

Thorax: Entirely pale yellow with most setae also pale yellow including those on pleura. Chaetotaxy: 1 *pprn* with 3–5 setulae around it, 1 strong *dc* and another about half its length just in front of it, *acrs* undifferentiated from scutal setulae except short *prscut* pair, setulae in 8–10 irregular rows at level of transverse scutal suture; 1 *posthu*, 1 short *sa* and 1 strong *pa*, *scut* with 2 pairs of marginals, subapical pair longer, disc of *scut* with 14 scattered setulae, anepisternum with 1 seta at middle of posterior margin and a short seta above it; katepisternum with 1 seta at upper margin, each with several pale setulae in front, more numerous on anepisternum.

Wing: Hyaline with pale yellow veins, costa with minute dark spine-like setulae from R_1 to R_{2+3}, distance on costa between R_{2+3} and R_{4+5} about 0.6 that between R_{4+5} and M_{1+2}, apical section of Cu about 2.2× length of posterior crossvein. Haltere yellow.

Legs: All yellow, only fore femur a little dilated, all setae and setulae pale yellow, longest on posterior aspect of fore femur, claws black, short, about half length of tarsomere 5, apicoventral seta on mid tibia yellow and distinctly shorter than diameter of tibia at apex.

Abdomen: Entirely yellow with a few short and fine pale yellow setulae on each *tg*.

Postabdomen: All yellow with small hypopygium and three distinctive long setae on each side of *ep*, *prg* simple, digitate and fine setulose on outer aspect.

Female.

As male, but tending to have pale brown setae and setulae. Postabdomen: *st* 8 almost translucent and with distinct setae; *hypr* membranous and small, but with setulae as dense and as long as those on *cerc*; *s* small and black; duct membraneous.

Length: ♂ body 2 mm, wing 1.8 mm; ♀ body 1.9 mm, wing 1.7 mm.

Holotype: ♂ NAMIBIA: Brandberg, Mason Shelter, 21°04'42"S:14°35'33"E, 5–14.iii.2002, alt. 1750 m, A.H. Kirk-Spriggs, light trap (NMNW).

Paratypes: 1♂ 2♀ same data (NMNW).

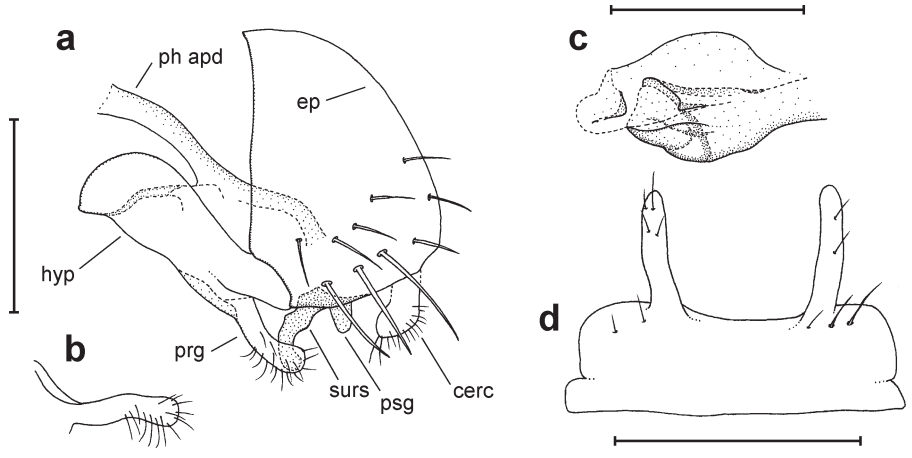

Fig. 29. *Somatiosoma setipygum* sp. n., ♂: (a) hypopygium, lateral; (b) *prg*, ventral; (c) *distiph*, lateral, scale bars = 0.15 mm; (d) *st* 6, ventral, scale bar = 0.2 mm.

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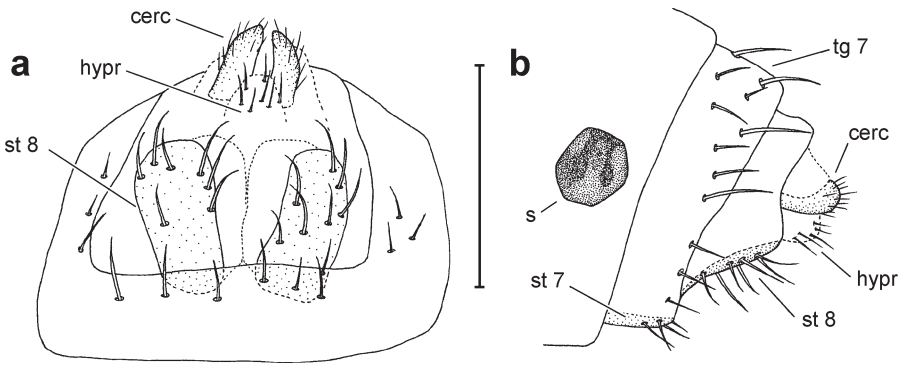

Fig. 30. *Somatiosoma setipygum* sp. n., ♀ postabdomen, ventral (a) and lateral (b). Scale bar = 0.2 mm.

Somatiosoma sp.

I have seen only females of this species and although distinctive and easily separated from the other species of *Somatiosoma*, I hesitate to name it without males.

Description:

Head all yellow, antenna short with segment 3 about 1/4 diameter of eye and about equal to height of gena at middle; gena about 0.4 height of eye. Thorax pale brownish yellow. Abdomen with pale brown *tg* and a yellow *mtn*. The apex of the abdomen has small paired dark spots laterally on *tg* 6, 7 and 8, and a single midline spot on *st* 6 and 7, the latter triangular; the two sclerites of *st* 8 are also deeply pigmented; 1 and 1/2 *dc*; scutal setulae in 10 rows between *dc* lines.

Material examined: MADAGASCAR: 14♀ coastal dry scrub north of Toliara, 15.ii.1984, M. von Tschirnhaus (in alcohol, ZSMC); 3♀ between Ambrorompotsy (west) and Tranoroa (east), 23 km E Ampanihy, 24°41'S: 44°55'E, 22.ii.1984, M. von Tschirnhaus (in alcohol, FBUB).

Distribution: Madagascar.

Subfamily **Aphaniosominae** subfam. n.

Type genus: *Aphaniosoma* Becker, 1903: 186.

Diagnosis: Occiput concave; 0–6 *orb* of variable length, never inclinate; when more than 2, these are usually short and progressively shorter anteriorly; scutum with inclinate *ihu* seta or setula (except in *Krifomyia* and *Tethysimyia*); wing veins R_{4+5} and M_{1+2} parallel (*Paraphanisoma* and *Krifomyia*), convergent (*Tethysimyia*) or divergent (*Aphaniosoma*) towards apex; mid tibia always with long apicoventral seta; *scut* never with more than 2 pairs of marginal setae; male postabdomen never with hemispherical *ep*, this lies partially or entirely within *tg* 6.

Genera included: *Aphaniosoma*, *Krifomyia* gen. n., *Paraphanisoma* gen. n., *Tethysimyia* gen. n.

Genus *Aphaniosoma* Becker, 1903

Aphaniosoma: Becker 1903: 186.

Type species: *Aphaniosoma approximatum* Becker, 1903: 186, by original designation.

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Diagnosis: Concave *ocp* with only postocular row of setulae (none on disc), *acrs* in 2 rows, *prpl* setula present, costa broken a little beyond *hu* crossvein and at apex of R_1, veins R_{4+5} and M_{1+2} diverge towards wing apex; posterior crossvein placed before middle of wing and section of M–Cu separating basal and discal cell shorter than 2.5× length of apical section of M–Cu (usually 1.7–2.0×); strong apicoventral seta on mid tibia always present and longer than diameter of tibia at apex.

Description:

Head: Broad as thorax or a little more, more or less round to elongate, though usually longer than high; *oc* triangle small always equilateral; *ocp* concave when veiwed either from above or in profile, disc bare, only a few fine setulae at *ocp* foramen and along upper postocular margin; postgenal seta absent; gena narrow from 0.2 to 0.5 height of eye, vibrissal angle variously produced and rounded, but never significantly extending beyond eye margin, with 1–4 vibrissa-like setulae present; eye oval, sometimes strongly so, lying oblique or horizontal, anterior facets enlarged to about 3× size of facets at posterior pole of eye; at level of antennae eyes converge significantly and margins of *fr* therefore also converge; face always small, depressed with a vertical midline linear suture that may be developed into a shallow carina, otherwise face membranous; mouthparts small but normally developed with short, broad labellum, palpus small, elongate oval to slightly club-shaped; antenna small with round segment 3, sometimes slightly reniform, always pubescent especially along anterior margin, segment 1 very short, segment 2 a little longer with strong dorsal seta, arista 2-segmented, with segment 2 always dark, thin and finely pubescent. Chaetotaxy: 0–6 *orb* of decreasing length from back to front in a majority of species, in some species 2 long posteriorly placed *orb* of almost equal size; *fr* with a few scattered setulae, sometimes with a long proclinate pair of setae in front of *oc* triangle; ocellars long, proclinate and divergent; strong *vti* and *vte*, short to very short, parallel or crossed *pvt*.

Thorax: Robust relative to rest of fly, often with darker scutal pattern of longitudinal stripes, *scut* more or less triangular with smooth rounded margin and apex, more or less as long as broad. Chaetotaxy: from zero to several presutural *dc* setae and always with at least 1 *dc* postsuturally near margin with *scut* (when setae are reduced in number these are replaced by setulae) 1–2 *pprn*, 1–2 *posthu*, 1 *ihu*, 2 *ntpl*, 0+3 to 4+10 *acrs*, 0+2 to 2+6 *ia*, 1 *pa*, absent *sa*, *pra* and *post ia*, *scut* always with 1 pair of subapical and 1 pair basal; 1 anepisternal placed within upper 1/3 of posterior margin, sometimes with shorter seta adjacent and/or with fine setulae on middle of sclerite; 1 katepisternal always at upper posterior corner, sometimes with short seta in front and fine setulae in front of it or at anterior lower margin; *prpl* seta or (more usually) a fine setula present. Wing: About a long as body, hyaline with completely microtrichose membrane, veins brown to very pale yellow, vein separating discal from basal cell always palest; costa broken a short distance beyond *hu* crossvein and at junction of R_1 with costa, subcosta complete, merging with R_1 where latter merges with costa; all veins bare except for anterior margin of costa from base to apex of M_{1+2} where fine setulae are interspersed with short stouter dark spine-like setulae; alula always well-developed though narrow, axillary lobe of wing round and well-developed; R_{2+3} strongly arched from origin to apex of wing, where it approximates R_{4+5}; R_{4+5} and M_{1+2} always diverge and darken slightly towards wing apex. Haltere always with pale stem and paler knob.

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Legs: Slender and setose only on fore femur posterodorsally, otherwise uniformly fine and very short setulose; femora never dilated; mid tibia always with a distinct dark apicoventral seta that is longer than diameter of tibia at apex; hind trochanter modified in the males of one species group, to exhibit, on its posterior inner surface, a distinct projection that may have minute spines or setulae; tarsomeres very rarely modified.

Abdomen: Somewhat dorsoventrally flattened, more or less oval, male with 6 segments, female with 8 segments; *st* usually poorly sclerotized; disc of *tg* and along hind margins with short setulae that are usually about half length of *tg* or much less.

Male postabdomen: Always highly modified; never with a complete external *ep*; *cerc* simple, separated (though often appearing fused in dry specimens), with short fine setulae on posterior surface and generally with 1 or 2 long fine setulae at tip; pregential *st* (any combination from *st* 4 to 6) highly modified, often ornate with diagnostic features; *prg* attached to inner lobe of *hyp* after this fuses/articulates with *ep*; *psg* originates from very base of *basiph* and is often a long, dark, heavily sclerotized structure; *surs* very variable, often fused with *ep*; *ph* always large, very variable, often complex with membranous and sclerotized components.

Female postabdomen: Segments 7 and 8 narrow and invaginated in most dry specimens, though usually distinct when the abdomen is macerated; segment 8 often with small lateral and ventral sclerites; *hypr* membranous and very small; *cerc* small, separated and only finely setulose, frequently attached to sclerite of segment 8.

Length: Body 0.75–2.2 mm; wing 0.75–2.2 mm.

Distribution: Holarctic, Afrotropical (Fig. 69).

Note: Some species from other zoogeographical regions are not true *Aphaniosoma*, but belong to the other genera in Aphaniosominae.

Ecology: *Aphaniosoma* is widespread in regions with hotter and drier habitats. Most species have a strong affinity to dunes and the shores of standing water bodies, particularly saline marshes. In localities with saline marshes, the flies exhibit a strong affinity to certain plants in this order (pers. observ.): *Tamarix* trees, Gramineae, including *Phragmites* stands, Chenopodaceae. I found three species simultaneously on the flowers of (non-indigenous) *Eucalyptus* in Malta. The attraction to *Tamarix* is more than just circumstantial. It is not merely because the tree provides shade, or nectar; when alternatives for both exist in close proximity, it is still the *Tamarix* that very strongly attracts these flies in very large numbers and in a diversity that reflects what species exist in the area. One may speculate that species of *Aphaniosoma* breed either on the tree or in association with other organisms that do so, or that there is some particularly strong chemical or floral attraction.

Key to the identification of African species of *Aphaniosoma*

1 Well-developed presutural *ia* seta present, similar in length to long *prsut dc* and *posthu*; 2 long posterior *orb* setae; a yellow species ..... **harteni** Ebejer
– No well-developed presutural *ia* seta, if setula present in this position, then neither is it as long as *posthu*, nor is first *dc* well-developed 2

2 Occiput, scutum and scutellum completely dark grey to black, or nearly so, at least no definite scutal stripes apparent, pleura mostly dark 3

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– Scutum yellow with or without stripes, scutellum yellow and occiput yellow or, if brown around middle, then a clear pale postocular margin is easily visible 5

3 Antennal segment 3 dark and contrasting with pale first 2 segments and frons ... 4
– Antennal segment 3 yellow, similar in colour to first 2 segments and frons; abdomen almost entirely dark brown, only membrane between segments yellow, postabdomen ♂ Fig. 43, ♀ Fig. 44 ..... **frequens** sp. n.

4 Scutellar setae short, at most as long as scutellum; frontal setulae all more or less equal in length (no longer pair in front of *oc* triangle), postabdomen ♂ Fig. 36a, ♀ Figs 36b–d ..... **atriceps** sp. n.
– Scutellar setae clearly longer than scutellum; frons with pair of setulae in front of *oc* triangle clearly longer than others scattered on frons, postabdomen ♂ Fig. 50, ♀ Fig. 51 ..... **pullum** sp. n.

5 Occiput, scutum (except for longitudinal stripes), scutellum, anepisternum and anepimeron yellow 6
– At least occiput brown or black centrally, even if postocular margin broadly yellow anepisternum and anepimeron usually also partly darkened 12

6 Abdomen yellow or almost so, at most tergites darkened at middle on basal segments and each brown band not more than about half length of *tg*, tarsomeres 5 usually yellow 7
– Abdomen predominantly brown in colour, tarsomeres 5 brown 10

7 Frons without pair of longer setulae in middle in front of *oc* triangle, all setulae of more or less equal length; yellow species with grey longitudinal scutal stripes, dark *mtn* and tarsomeres 5, postabdomen ♂ Fig. 37, ♀ Fig. 38 ..... **conspicuum** sp. n.
– Frons with one or two pairs of setulae about twice as long as others on frons 8

8 Frons with one pair of frontal setulae (about twice as long as others) just in front of *oc* triangle, setulae on gena little longer than *orb*; *mtn* yellow; an entirely yellow species in the male, females may have darkened tarsomeres 3–5, postabdomen ♂ Fig. 41, ♀ Fig. 42 ..... **flavescens** sp. n.
– Frons with two pairs of longer setulae, one in front of *oc* triangle and one just above lunule; *mtn* dark 9

9 Scutum with distinct dark brown to grey longitudinal stripes, ♂ postabdomen Fig. 45 ..... **gaiasicum** sp. n.
– Scutum yellow, any stripes are only of a deeper yellow colour, ♂ postabdomen Fig. 55 ..... **ugabensis** sp. n.

10 Frons with two pairs of longer setulae, one in front of *oc* triangle and one just above lunule; elongate slender eyes, about 3 times as long as high in male and about 2 times in female; *scut* with dark lateral margin reaching base of subapical setae; abdomen yellow with light brown bands dorsally on tergites, ♂ postabdomen Fig. 47 ..... **kirkspriggsi** sp. n.
– Frons with one pair of longer setulae, *scut* yellow laterally or at most lateral margin dark only at base; eye long oval, but not as much as in foregoing species 11

11 Two *posthu* setae, setulae and all setae except the longest very pale, almost white especially in males and on front half of body, darker in females; apical section of

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Cu about 2× length of posterior crossvein, postabdomen ♂ Fig. 33, ♀ Fig. 34 .... **aldabrensis** sp. n.

– One *posthu* seta and short presutural *ia* setula; setae and setulae yellow to brown; apical section of Cu about 2.8× length of posterior crossvein, postabdomen ♂ Fig. 48, ♀ Fig. 49 ..... **micropygum** sp. n.

12 Lateral margin of *scut* at base completely yellow (a small spot can be seen in specimens in alcohol), all tarsomeres yellow, pleura mostly yellow; hypopygium appearing mostly yellow; female with yellow margins to tergites becoming broader towards apex of abdomen, especially on sides 13

– Lateral margin of *scut* at base with distinct black spot or short stripe, tarsomeres dark or pale, pleura usually with more extensive dark areas; hypopygium dark or pale; ♀ abdomen with tergites having more extensive brown bands even at apex 14

13 Two pairs of frontal setulae in front of *oc* triangle with hind pair appearing a little longer, but not longer than about 1/3 length from its base to lunule, middle scutal stripes more or less pointed posteriorly; hypopygium with black *distiph*; female with *tg* 1 and 2 often yellow, postabdomen ♂ Fig. 39, ♀ Fig. 40 ..... **fissum** Collin

– One pair of long frontal setae in front of *oc* triangle about half length from base to lunule, middle scutal stripes appearing truncate posteriorly; hypopygium all yellow, at most small brown spot on *ep* and *distiph* brown near junction with *basiph*; female with basal tergites dark brown, ♂ postabdomen Fig. 52 ..... **suboculicauda** Frey

14 Pair of long frontal setae very long, at least 2/3 length from base to lunule, scutal stripes appearing black even through pollinosity; hypopygium with brown *ph*; female with brown tergites to apex of abdomen, postabdomen ♂ Fig. 53, ♀ Fig. 54 .... **trilobatum** sp. n.

– Frontal setae/setulae when present not longer than half distance from their base to lunule, scutum with brown to light brown or grey stripes; hypopygium pale (except *dhofaricum*); female abdomen with tergites having broader yellow hind margins especially on apical segments, laterally (except *dhofaricum*) 15

15 Frons without a distinct pair of long setae in front of *oc* triangle; female with dark brown tergites to apex of abdomen 16

– Frons with a pair of setae longer than others; female abdomen often with broader yellow hind margins especially on sides of apical segments (except *dhofaricum*) 17

16 Hypopygium with very large black *ph*, easily seen in undissected specimens; narrow yellow surstyli, postabdomen ♂ Fig. 31, ♀ Fig. 32 ..... **aethiops** sp. n.

– Hypopygium with pale brown *ph*, not easily seen without dissection; long yellow sinuous surstyli ..... **lamellatum** Collin
[Females of *aethiops*, *lamellatum* and *dhofaricum* are very difficult to separate]

17 Scutal stripes dark brown to black even when seen through scutal pollinosity; hypopygium with large black *ph* and long narrow black postgonites; female with apical segments of abdomen dark ..... **dhofaricum** Ebejer

– Scutal stripes appearing paler owing to dense greyish pollinosity, more confluent anteriorly; hypopygium almost entirely pale brown to yellow; female abdomen with broader yellow hind margins, especially on sides of apical segments 18

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18 Scutum with dense greyish white pollinosity, scutal stripes grey, middle pair appearing truncate posteriorly, setae pale yellowish white and setulae over whole body and legs mostly white, postabdomen ♂ Figs 46a, b, ♀ Figs 46c, d .... **gallagheri** Ebejer

– Scutum with brownish yellow, less dense pollinosity, scutal stripes brown to black, middle pair appearing pointed posteriorly, setae brown to pale brown and most setulae on body and legs pale yellowish brown, ♀ postabdomen Fig. 35 .... **approximatum** Becker

Aphaniosoma aethiops sp. n.

Figs 31, 32

Etymology: From Latin *Aethiopia* (Ethiopia), and refers to the country where it was first discovered.

Diagnosis: Predominantly yellow species; no long pair of *fr* setae/setulae in front of *oc* triangle, buccal margin has thin brown line, scutum with longitudinal brown stripes, abdominal *tg* yellow with broad brown transverse band, male postabdomen with large dark phallic complex and long, narrow, pale *surs*, tarsomere 5 of all legs dark brown. Female has diffuse brownish transverse band across middle of *fr*, abdomen with *tg* 6 and 7 completely brown, *st* 7 pigmented brown, tarsomeres 5 yellow.

Description:

Male.

Head: Yellow, *oc* triangle and *ocp* black, latter with a broad yellow stripe from vertex to neck and narrow yellow postocular margin; *fr* broad, about 1.3× width of eye at vertex, with margins only slightly convergent; eye oval, lying oblique, length of horizontal diameter about 1.3× length of vertical diameter; gena narrow, equal to 0.4 height of eye, yellow and with fine pale yellowish white setulae; face small membranous, with

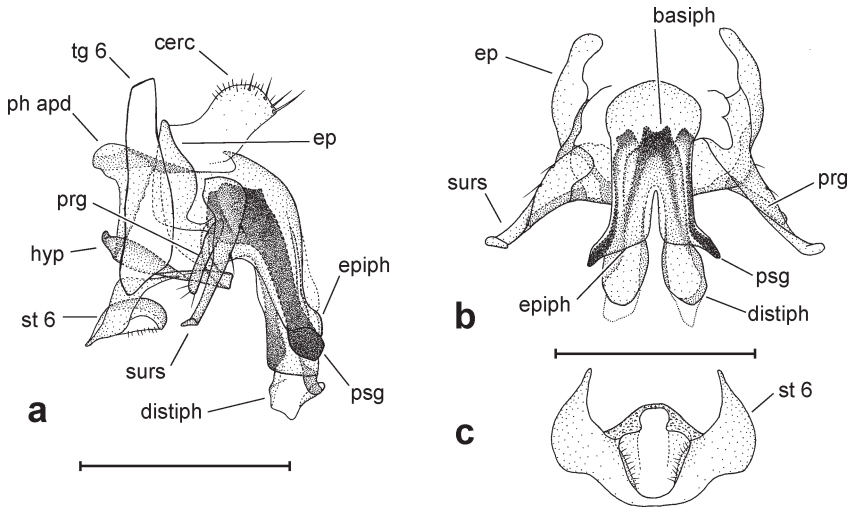

Fig. 31. *Aphaniosoma aethiops* sp. n., ♂: (a, b) hypopygium lateral (a) and posterior (b); (c) *st* 6, ventral. Scale bars = 0.15 mm.

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distinct linear facial carina; 2 short setae at anterior buccal margin; mouthparts small, yellow, palp elongate oval, buccal margin with thin brown line; antenna yellow, arista black in apical half of second segment, yellow basally and on first segment; 6–7 short *orb*; 10 minute pale yellow *fr* setulae of more or less equal length, ocellars long, divergent, 1 *vti* and 1 *vte*, short *pvt*, postocular setulae in one row; all setae yellow.

Thorax: Scutum yellow, yellow pollinose with 6 brown longitudinal stripes, all confluent anteriorly and middle pair remain confluent almost to posterior end, lateral stripes reach to base of *pa* seta; *mtn* brown, *scut* brown at base of lateral margin and beneath, pleura mostly yellow, but katepisternum with dark brown triangle in lower part, meron dark brown in lower half and anepimeron with dark brown line along suture with anepisternum, anepisternum with narrow paler brown border along lower margin and anterior margin. Chaetotaxy: 1+6 *dc*, only hindmost well-developed, remainder as short as other scutal setulae, 1+3 *acrs*, 1 *pprn*, 1 *ihu*, 1 *posthu*, 2 *ntpl*, 1 *pa*, 0+3 *ia*, 4 *scut*, 1 anepisternal and 1 katepisternal.

Wing: Hyaline with yellow veins; distance between crossveins about 0.6 length of apical section of Cu; distance between R_{2+3} and R_{4+5} on costa about 0.6 that between R_{4+5} and M_{1+2}, apical section of Cu about 2× length of posterior crossvein. Haltere pale yellow.

Legs: Yellow and pale setulose, setulae becoming a little darker on tarsomeres; tarsomere 5 of all legs dark brown.

Abdomen: Yellow with a broad brown transverse band on each *tg*, setulae sparse and mostly along hind margin of *tg*, *cerc* pale yellow.

Postabdomen: Yellow apart from the large dark brown to black *ph* structures.

Female.

As male, but brown marking more extensive, abdomen with *tg* 6 & 7 completely brown; tarsomeres 5 yellow; *fr* with diffuse brownish transverse band across middle; *st* 7 pigmented brown. Postabdomen: very small; *tg* 8 and *st* 8 sclerotized, but minute and bare, each smaller than *cerc*.

Length: ♂ body 1.2 mm, wing 1.1 mm; ♀ body 1.5 mm, wing 1.5 mm.

Holotype: ♂ ETHIOPIA: Lake Abiata [Abiyata], 143 km S Addis Ababa [07°40'N:38°41'E], 1.iv.1962, Lund University Expedition, Brink, Andersson, Cederholm (MZLU).

Paratypes: 4♂ (3 headless) 6♀ same data as holotype (MZLU). KENYA: 2♀ Tsavo National Park, Voi R., 22.ii.1971, M. von Tschirnhaus (in alcohol, ZSMC); 1♂ Lake Elmenteita, 24.iii.1970, M. von Tschirnhaus (in alcohol, ZSMC).

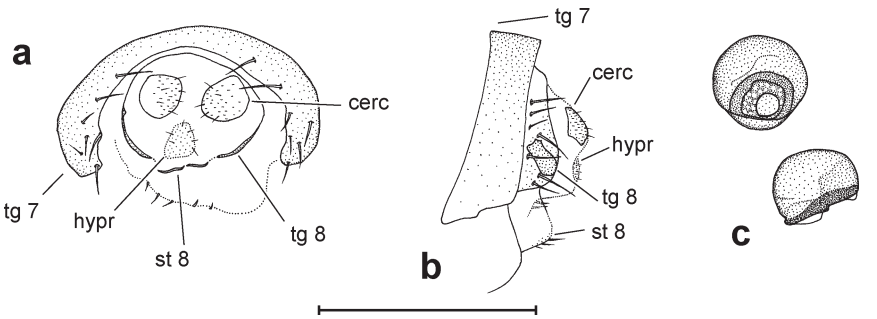

Fig. 32. *Aphaniosoma aethiops* sp. n., ♀ postabdomen: (a) posterior, (b) lateral, (c) spermathecae. Scale bar = 0.15 mm.

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Aphaniosoma aldabrensis sp. n.

Figs 33, 34

Etymology: From the type locality, Aldabra, the southwestern atoll of the Seychelles.

Diagnosis: Extensively yellow species with elongate narrow eyes, brown scutal stripes, katepisternum with dark triangular patch; *acrs* widely separated, scutal setae moderately developed, 2 *posthu* setae, setulae and all setae except the longest very pale, almost white. Male with highly modified pregential *st*, sinuous *surs* and *prg*.

Description:

Male.

Head: Yellow, only ocelli ringed with black; *fr* with markedly convergent side margins so that at level of antenna this is 0.5 width that at level of anterior *oc*; eye very narrow and elongated oval, lying horizontal, horizontal diameter about 2.5× length of vertical diameter; gena almost equal to height of eye, yellow and with fine white setulae; face small, membranous with low linear facial carina; 2 short setae at anterior buccal margin; mouthparts small, yellow; antenna yellow, arista brown except for yellow first segment; 4 *orb*, 6 fine *fr* setulae and a longer pair in front of *oc* triangle, ocellars long, divergent, 1 *vti* and 1 *vte*, short *pvt*; setae and setulae all white except for hind *orb* and *vti*, which are yellowish brown.

Thorax: Scutum yellow, yellow pollinose with 3 brown longitudinal stripes on each side, one along *acrs* line, one between *dc* and *ia* lines and one between *ia* line and *ntpl*; *mtn* black, *scut* and pleura yellow. Chaetotaxy: 4+5 *dc* only hindmost well-developed, 2 most anterior pale and inclinate, 3+4 *acrs*, 1 *pprn*, 1 *ihu*, 1 *posthu*, 2 *ntpl*, 1 *pa*, usual 4 *scut*, 1 very short anepisternal and 1 long katepisternal at upper posterior corner with 3 short pale setulae in a vertical row in front.

Wing: Hyaline and uniformly microtrichose, veins pale yellow, distance between R_{2+3} to R_{4+5} on costal margin about 0.7 that between R_{4+5} and M_{1+2}, distance between crossveins about 1.3× length of posterior crossvein and length of apical section of Cu about 2× length of posterior crossvein. Haltere yellow.

Legs: Yellow and pale setulose, no special modifications, tarsomere 5 a little brownish.

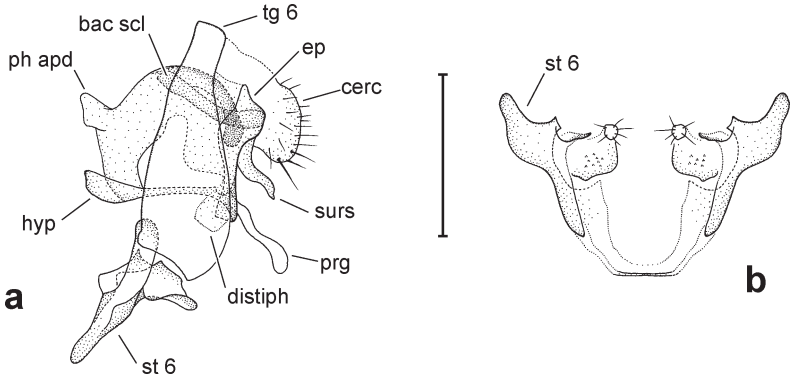

Fig. 33. *Aphaniosoma aldabrensis* sp. n. ♂: (a) hypopygium, lateral; (b) *st* 6, ventral. Scale bar = 0.08 mm.

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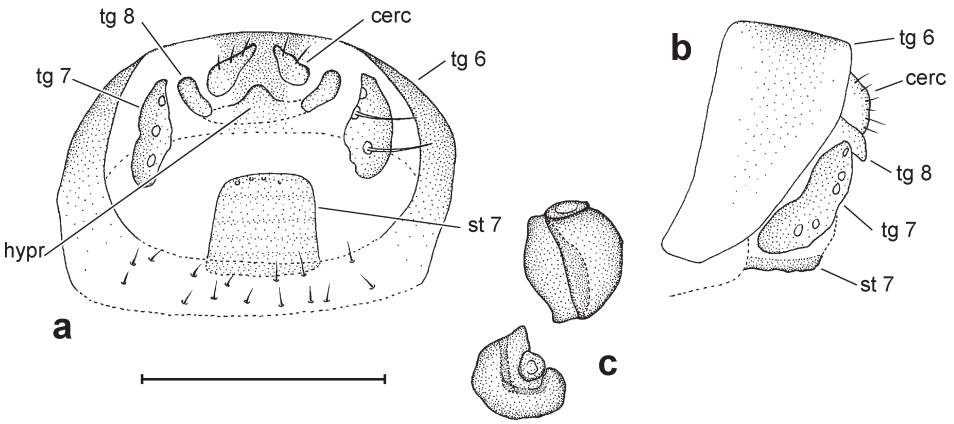

Fig. 34. *Aphaniosoma aldabrensis* sp. n., ♀ postabdomen: (a) posterior, (b) lateral, (c) spermathecae. Scale bar = 0.15 mm.

Abdomen: Each *tg* with broad brown band dorsally leaving posterior 1/3 and sides of *tg* yellow; brown setulae dorsally, yellowish white laterally and ventrally, those on *tg* 5 forming fringe around hypopygium; *cerc* forming broad plate posteriorly.

Female.

As in male, but scutum with darker stripes and darker thoracic setae. Postabdomen: *st* 7 sclerotized and pigmented, almost square; *tg* 7 divided into lateral plates bearing setae; *hypr* appearing as small tubercle in membrane between sclerites of segment 8.

Length: ♂ body 1.2 mm, wing 1.2 mm; ♀ body 1.4 mm, wing 1.3 mm.

Holotype: ♂ SEYCHELLES: Aldabra, South Island, Takamaka pool, at light, 1–17.ii.1968, B. Cogan & A. Hutson, Aldabra Atoll Royal Society Expedition 1967–68 (BM 1968–333) (BMNH).

Paratypes (all BMNH): 1♀ same data as holotype; 1♂ 1♀ Astove Atoll, around coconut plantation, 5.iii.1968, B. Cogan & A. Hutson (BM 1968–333); 3♂ Aldabra, South Island, Dune Jean-Louis, 13–20.iii.1968, B. Cogan & A. Hutson, Aldabra Atoll Royal Society Expedition 1967–68 (BM 1968–333); 3♀ Aldabra, West Island, near settlement, 21–31.iii.1968, B. Cogan & A. Hutson, Aldabra Atoll Royal Society Expedition 1967–68 (BM 1968–333).

Aphaniosoma approximatum Becker, 1903

Fig. 35

Aphaniosoma approximatum: Becker 1903: 186.
Aphaniosoma arabicum Ebejer, 1996: 286; Ebejer 2008*a*: 683.

This species is widespread in the Middle East. The series from the Cape Verde represents the most western locality of this species. The male postabdomen has been previously illustrated (Collin 1949; Ebejer 1996, 1998, 2008*a*). Female with *tg* 7 complete and large. Postabdomen: *st* 8 large and of peculiar shape, *s* with distinct external ridge around operculum.

Material examined: CAPE VERDE: 3♂ Santiago, b. Variante, "Trockenribeiro und Staatsfarm", 2.xi.1982, P. Ohm (in alcohol, FBUB). ETHIOPIA: 19♂ 10♀ Welo Province, nr National Road Number 18, 11°07'47"N: 40°45'54"E, 17.iii.1995, M. von Tschirnhaus (in alcohol, FBUB). NIGER: 3♂ 19♀ Air Massif, Wadi Iberkom, 18°55'N:08°40'E, 24.viii.1983, P.C. Matteson (NMWC).

Distribution: Cape Verde, Egypt, Ethiopia, Niger and Arabian Peninsula.

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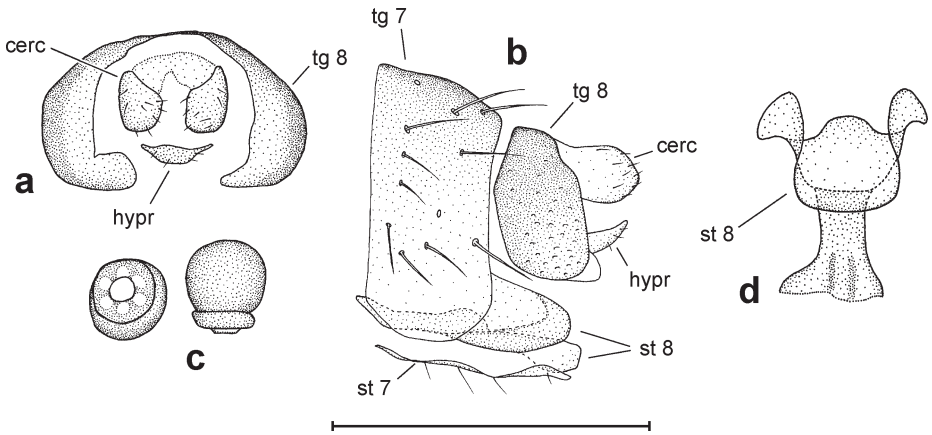

Fig. 35. *Aphaniosoma approximatum* Becker, ♀ postabdomen: (a) posterior, (b) lateral, (c) spermathecae, (d) *st* 7. Scale bar = 0.15 mm.

Aphaniosoma atriceps sp. n.

Fig. 36

Etymology: From Latin *ater* (dark) and *caput* (head), and refers to the distinctive (but not unique) dark brown antenna which gives the head a dark appearance.

Diagnosis: Yellow *fr* and contrasting dark brown antennal segment 3, very narrow gena, dark grey scutum and *scut* which has setae shorter than its length, tarsomere 5 of all legs brown, abdominal *tg* brown with narrow, pale yellow hind margins. Male postabdomen with no distinguishing external features, but internally with large dark *psg* and with pregenital *st* having ventrally projecting lobes near apex.

Description:

Male.

Head: Yellow, *ocp* dark grey to black, *oc* triangle black, *fr* narrow and converging anteriorly so that at level of antennae it is about 0.75 as wide as at level of anterior *oc*, face small, depressed and with distinct, narrow but low facial carina, eye narrow, oval, lying oblique, gena yellow, narrow, at middle about 0.3 height of eye and having numerous fine pale yellow setulae, 3 short setae at vibrissal corner, mouthparts yellow except for two small brown spots deep to proboscis an anterior margin of roof of buccal cavity, 8 setulae on *fr* with no longer setulae in front of *oc* triangle, 6 short *orb*, especially anterior 4, becoming progressively shorter from back to front, 1 *vti* and 1 *vte*, *pvt* distinct and convergent, ocellars long, divergent, antennal segment 3 dark brown contrasting with yellow segments 1 and 2, arista dark brown to base.

Thorax: Scutum and *scut* uniformly dark grey, *mtn* entirely dark grey, *pprn* and *ntpl* yellow, pleura mostly dark grey, but for narrow yellow margins to sutures. Chaetotaxy: 1 *pprn*, 1 *posthu*, 1 *ihu*, 2 *ntpl*, 0+4 *ia*, 1+5 *acrs*, 3+5 *dc* only the posterior one well-developed, *prpl* short, 1 *pa*, 2 pairs of marginal *scut*, shorter than usual compared to congeners such that subapical setae, usually the longest, are here shorter than length of *scut*, 1 katepisternal and several setulae on anterior part of sclerite, 1 anepisternal, all setae pale, with shorter ones and setulae inconspicuous.

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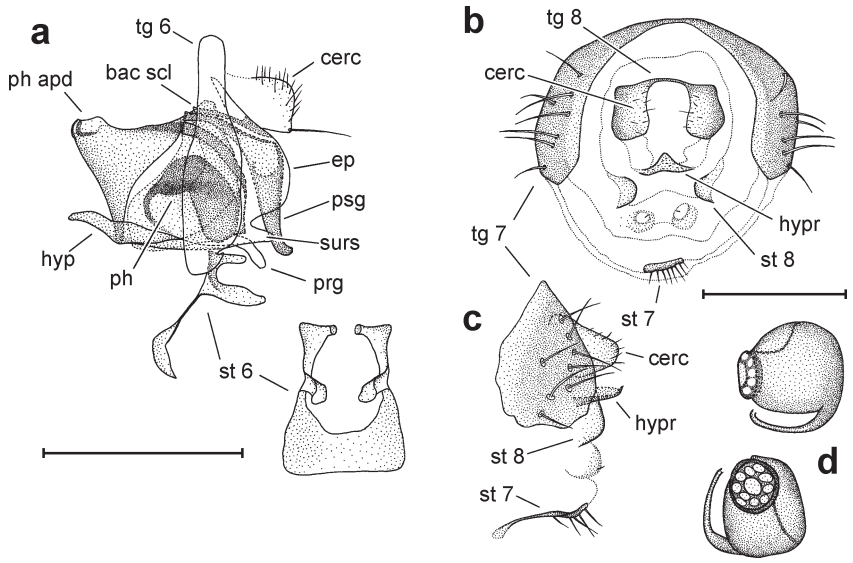

Fig. 36. *Aphaniosoma atriceps* sp. n.: (a) ♂ hypopygium, lateral, scale bar = 0.15 mm; (b–d) ♀ postabdomen: (b) posterior, (c) lateral, (d) spermathecae, scale bar = 0.1 mm.

Wing: Hyaline and uniformly microtrichose, veins brown, distance between R_{2+3} to R_{4+5} on costal margin about 0.6 that between R_{4+5} and M_{1+2}, distance between crossveins about 1.7× length of posterior crossvein and length of apical section of Cu about 2.5× length of posterior crossvein. Haltere dusky yellow.
Legs: Yellow and fine yellow setulose, tarsomere 5 of all legs brown.

Abdomen: Brown with narrow, pale yellow hind margins to all *tg*, especially on sides and on apical segments.
Postabdomen: Yellow with no distinctive external features.

Female.

As male, but several specimens have diffusely infuscated femora dorsally over middle third. Postabdomen: *tg* 7 complete and broader laterally; *cerc* and *hypr* more sclerotized than usual among congeners; *st* 8 with small sclerites apically and just proximal to these, two small membraneous structures with single microtrichium in centre of each; *s* with short section of duct sclerotized.

Length: ♂ body 1.0 mm, wing 0.9 mm; ♀ body 1.2 mm, wing 1.1 mm.

Holotype: ♂ NAMIBIA: Khorixas District, Huab R. at Krone, 721, 20°37'09"S:13°54'31"E, sweeping grasses and sedges, 23–26.x.1998, A.H. Kirk-Spriggs (NMNW).

Paratypes: 2♂ 3♀ same data as holotype (NMNW); 2♀ Walvis Bay, alt. 5 m, 22°60'S:14°28'E, 6.ix.2003, A. Freidberg (TAUI).

Aphaniosoma conspicuum sp. n.

Figs 37, 38

Etymology: From Latin *conspicuus* (conspicuous), and refers to the large postabdominal structures.

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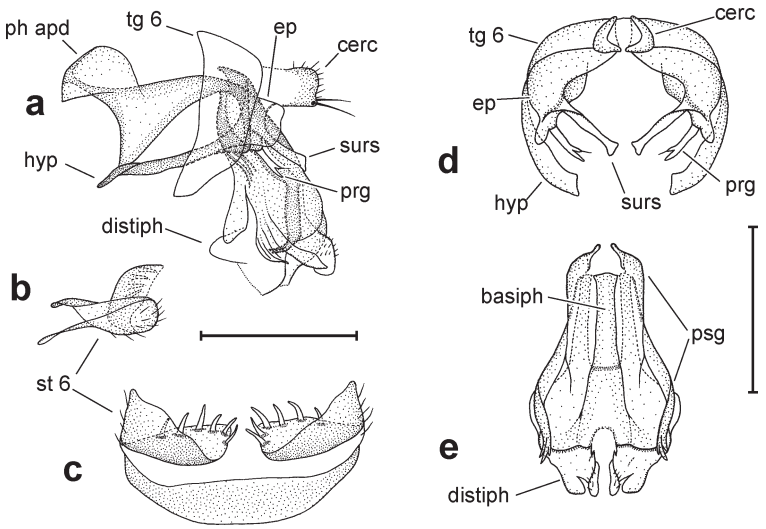

Fig. 37. *Aphaniosoma conspicuum* sp. n., ♂: (a) hypopygium, lateral; (b) *st* 6, lateral; (c) *st* 6, ventral; (d) hypopygium, phallus omitted, posterior; (e) phallus, posterior. Scale bars = 0.15 mm.

Diagnosis: Yellow species with all setulae on *fr* of more or less uniform length; scutum with grey longitudinal stripes, *scut* completely yellow, abdominal *tg* brown with yellow hind margins, but apical one or two segments in both male and female pale. Male post-abdomen pale and phallic structures large, pregenital *st* with distinct dentate processes on apical margin; *ph apd* with very large basal lobes.

Description:

Male.

Head: Yellow, only ocelli ringed with black; *fr* with markedly convergent side margins so that at level of antenna *fr* 0.5× width that at level of anterior *oc*; eye oval, lying oblique, length of horizontal diameter about 1.5× length of vertical diameter; gena broad, equal to about 0.7 height of eye, yellow and with fine pale yellowish white setulae; face small, membranous, with low linear facial carina; 2 short setae at anterior buccal margin; mouthparts small, yellow; antenna yellow, arista brown except for yellow first segment; 2 *orb* and 3 short setulae in front of these; 8–10 brown *fr* setulae of more or less equal length, ocellars long, divergent, 1 *vti* and 1 *vte*, short *pvt*; setae and setulae dark brown.

Thorax: Scutum yellow, yellow pollinose with 4 brown longitudinal stripes; *mtn* brown, *scut* and pleura yellow. Chaetotaxy: 4+6 *dc* the hindmost well-developed, one preceding it about half its length, remainder as short as other scutal setulae, 2+6 *acrs*, 1 *pprn*, 1 *ihu*, 1 *posthu*, 2 *ntpl*, 1 *pa*, 6 *ia*, 4 *scut*, 1 anepisternal and 1 katepisternal at upper posterior corner.

Wing: Hyaline with pale brown veins; distance between crossveins about 1.4× length of posterior crossvein; distance between R_{2+3} and R_{4+5} on costa about 0.5 that between R_{4+5} and M_{1+2}, apical section of Cu about 2.8× length of posterior crossvein. Haltere yellow.

Legs: Yellow and pale setulose, setulae becoming a little darker on tarsomeres; tarsomere 5 a little brownish.

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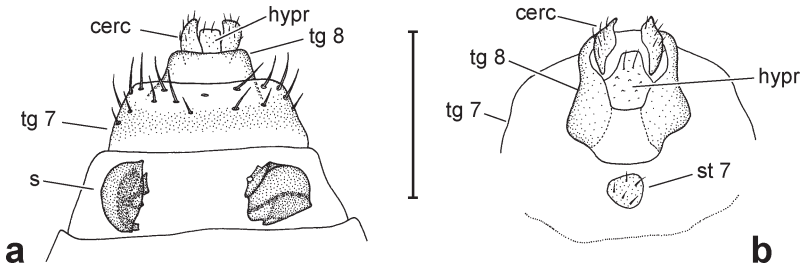

Fig. 38. *Aphaniosoma conspicuum* sp. n., ♀ postabdomen, dorsal (a) and ventral (b). Scale bar = 0.15 mm.

Abdomen: Each *tg* brown with a yellow hind margin; brown setulae dorsally, yellowish white laterally and ventrally; *cerc* pale yellow.

Postabdomen: Almost entirely yellow, only a very small spot on middle of *ep* brown. Very large, pale phallic complex is easily seen, since it is extruded in most of the specimens.

Female.

Similar to male. Postabdomen: Very small; *tg* 8 broader laterally, *st* 8 membraneous, *hypr* thinly sclerotized and with pair of short apical setulae and some minute tubercles; *st* 7 small almost round.

Length: ♂ body 1.1 mm, wing 1.2 mm; ♀ body 1.2 mm, wing 1.3 mm.

Holotype: ♂ KENYA: Hunter's Lodge nr Kiboko, 02°14'S:37°43'E, 8–9.viii.2003, A. Freidberg (TAUI).

Paratypes: 3♂ 1♀ same data as holotype (TAUI); 2♀ Hunter's Lodge, 02°13'S:37°43'E, 13–16.ix.2005, A. Freidberg (TAUI); 4♂ 2♀ Simba, 02°09'S:37°35'E, 15.ix.2005 (2♂ TAUI, 1♂ 1♀ NMWC), 21.ix.2005 (1♂ 1♀ NMSA), A. Freidberg.

Aphaniosoma dhofaricum Ebejer, 1996

Aphaniosoma dhofaricum: Ebejer 1996: 290.

Although not yet found on mainland Africa, this species is abundant in Dhofar, the southern region of Oman. *A. gallagheri* Ebejer, 1996 (see below), also common in southern Oman, has been found as far west as the Cape Verde. Therefore, I have included *dhofaricum* here for completeness and because southern Oman is zoogeographically within the Afrotropics.

Distribution: Oman (Dhofar), Cape Verde.

Aphaniosoma fissum Collin, 1949

Figs 39, 40

Aphaniosoma fissum: Collin 1949: 138.

Collin (1949) described several species from an inland oasis in northern Egypt. Since then, several of them have been found in the Middle East and *fissum* is here confirmed from sub-Saharan Africa. Although Collin illustrated the male postabdomen, he did not give enough detail to enable reliable identification, given the many new similar species described since. Hence, a more detailed description and illustrations of the postabdomen of both sexes are presented below.

Diagnosis: Very variable in colour, but predominant form yellow with longitudinal stripes on scutum becoming dark and confluent anteriorly in some specimens or being pale

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brown and restricted to behind scutal suture in others. Area in front of *scut* yellow, but sometimes with small dark midline spot abutting suture with *scut*; yellow *fr* and antennae, abdomen yellow or with brown *tg* having yellow hind margins, sometimes *tg* all yellow, *tg* 6 with small posteroventral lobe, tarsomere 5 yellow or brown; male postabdomen with clearly visible yellow *surs* and *prg*; female sometimes with distal 3 tarsomeres darkened. *distiph* black at apex, otherwise hypopygium overwhelmingly yellow.

Redescription:

Male.

Head: Yellow, *ocp* dark brown except for broad yellow postocular margin and wedge-shaped area from vertex to neck, *oc* triangle black, *fr* broad, but converging anteriorly so that at level of antennae about 0.7 as wide as at level of anterior *oc*, face small, depressed and with distinct, narrow but low facial carina, eye oval lying oblique, gena yellow, at middle about 0.7 height of eye and having numerous yellow setulae, 2 short setae at vibrissal corner, mouthparts yellow except for two small brown spots deep to proboscis and anterior margin of roof of buccal cavity, 2 pairs of setulae on *fr*, one of which, slightly longer in front of *oc* triangle, 4 short *orb* getting progressively shorter from back to front, 1 *vti* and 1 *vte*, *pvt* distinct and convergent, ocellars long, divergent, antenna yellow, most of second segment of arista dark.

Thorax: Scutum and *scut* with yellow ground but with 6 dark grey longitudinal stripes on scutum confluent anteriorly, only the 2 lateral stripes becoming separated posteriorly, *scut* a little greyish on disk, *mtn* entirely dark grey, postpronotal lobe and *ntpl* yellow, pleura mostly dark grey, but for broad yellow margins to sutures, whole of anepimeron and posterior half of anepisternum chaetotaxy: 1 *pprn*, 1 *posthu*, 1 *ihu*, 2 *ntpl*, 0+4 *ia*, 1+4 *acrs*, 4+5 *dc* only the posterior one well-developed, *prpl* distinct, 1 *pa*, 2 pairs of

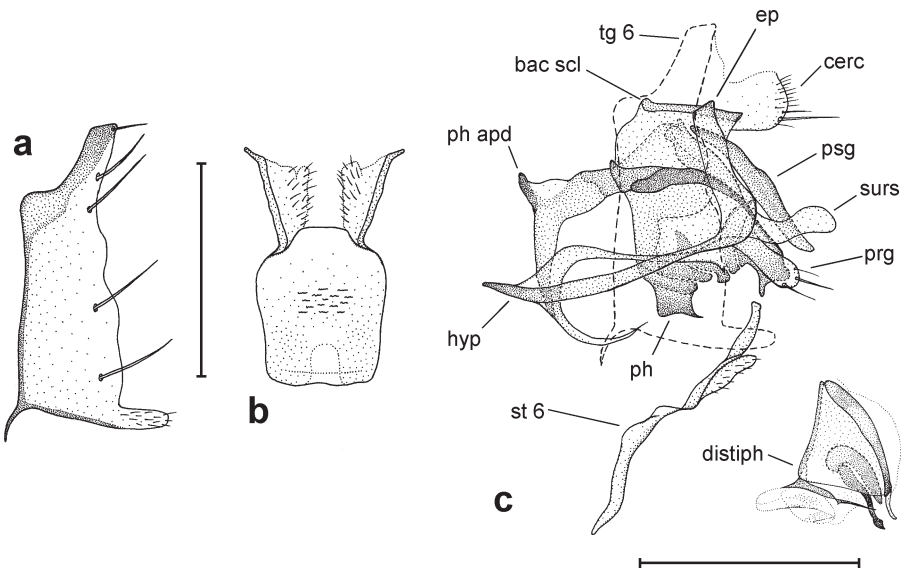

Fig. 39. *Aphaniosoma fissum* Collin, ♂: (a) *tg* 6, lateral; (b) *st* 6, ventral; (c) hypopygium, lateral. Scale bars = 0.15 mm.

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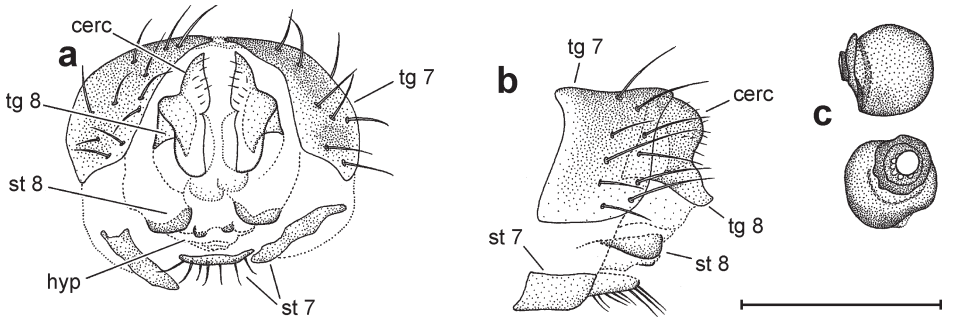

Fig. 40. *Aphaniosoma fissum* Collin, ♀ postabdomen: (a) posterior, (b) lateral, (c) spermathecae. Scale bar = 0.15 mm.

marginal *scut*, 1 katepisternal with shorter seta in front and several setulae on anterior part of sclerite, 1 anepisternal, all setae pale yellow to pale brown.

Wing: Hyaline and uniformly microtrichose, veins pale brown, distance between R_{2+3} to R_{4+5} on costal margin about 0.5 that between R_{4+5} and M_{1+2}, distance between crossveins about 1.3× length of posterior crossvein and length of apical section of Cu about 2.2× length of posterior crossvein. Haltere yellow.

Legs: Yellow and fine yellow setulose, tarsomere 5 of all legs brown.

Abdomen: Brown with narrow, pale yellow hind margins to all *tg*, especially on sides. Postabdomen: Yellow with distinctly visible yellow *surs* and finely setulose *prg* adjacent to black *ph* structures.

Female.

As male, but several specimens have tarsomeres 3 and 4 also darkened. Postabdomen: *tg* 7 narrowly divided dorsally; *st* 7 with lateral and central sclerotized plates; 8 of curious shape and closely attached to *cerc*; *hypr* membraneous.

Length: ♂ body 1.0 mm, wing 1.0 mm; ♀ body 1.2 mm, wing 1.3 mm.

Material exmained: KENYA: 2♂ 5♀ Tsavo National Park, Voi R., 22.ii.1971, M. von Tschirnhaus (in alcohol, FBUB); 1♂ same data (in glycerine, MJE); 1♂ 3♀ same data (in alcohol, NMWC); 1♂ Hunter's Lodge, 02°13'S:37°43'E, 13–16.ix.2005, A. Freidberg (TAU). NAMIBIA: 4♂ 2♀ Lüderitz District, Angra Bay, 26°37'11"S:15°11'42"E, sweeping lush vegetation at effluent run-off stream, 27.iii.1998, A.H. Kirk-Spriggs (NMNW); 27♂ 19♀ Khorixas District, Huab R. at Krone 721, 20°37'09"S:13°54'31"E, sweeping grasses and sedges, 23–26.x.1998, A.H. Kirk-Spriggs (NMNW); 1♂ 3♀ same data (in alcohol, NMWC); 4♂ 2♀ Khorixas District, Gai-As spring, 20°46'01"S:14°01'12"E, 22.x.1998, A.H. Kirk-Spriggs & E. Marais (in alcohol, NMWC); 1♂ Omaruru District, Brandberg Wes salt spring, 20°56'51"S:14°07'28"E, sweeping marginal grasses and sedges, 23–26.x.1998, A.H. Kirk-Spriggs & E. Marais (in alcohol, NMWC); 1♂ 3♀ *Khorixas District*, Huab R. at Krone 721, 20°37'09"S:13°54'31"E, sweeping grasses and sedges, 23–26.x.1998, A.H. Kirk-Spriggs (in alcohol, NMNW); 1♂ Khorixas District, Huab R. at Vrede 19, 20°24'00"S: 14°10'16"E, 26.x.1998, swept from fresh elephant dung, A.H. Kirk-Spriggs (NMNW); 1♀ Skeleton Coast Park, Kunene R. mouth, 17°15'97"S:11°46'83"E, sweeping marginal grasses and reeds on flood plain, 17–18.iii.1998, A.H. Kirk-Spriggs (NMNW); 1♀ Brandberg, Messum Valley, alt. 700 m, 21°13'29"S:14°30'98"E, 3.iv.1999, S. van Noort & S.G. Compton, Malaise trap, Bushy-Karoo-Namib shrubland (in alcohol, NMWC); 1♂ Kahn R., 8 km N Usakos, 30–31.i.1972, Southern African Expedition (29) B.M. 1972–1 (BMNH); 2♂ 1♀ nr Onseepkans, Orange R. banks, 8–10.i.1972, Southern African Expedition (W1) B.M. 1972–1 (BMNH); 1♂ 1♀ Walvis Bay, 25–26.i.1972, pool edge in dunes, Southern African Expedition (W24) BM 1972–1 (BMNH); 73♂ 114♀ Swakopmund, general sweeping, 26–30.i.1972, Southern African Expedition (W25) BM 1972–1 (BMNH); 2♂ 4♀ Swakopmund, swept vegetation around sewage farm settling tanks, 26–30.i.1972, Southern African Expedition (W25) BM 1972–1 (BMNH); 12♂ 8♀ Walvis Bay, pool edge in dunes, 25–26.i.1972, Southern African Expedition (W27) BM 1972–1 (BMNH); 1♂ Otjitambi farm, 47 km ESE Kamanjab, 13–15.ii.1972, Southern African Expedition (W37) BM 1972–1 (BMNH); 1♀ Onguma

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farm, 55 miles NW Tsumeb, 17–19.ii.1972, Southern African Expedition (W43) BM 1972–1 (BMNH); 1♀ Lüderitz District, Agate Beach, 10 km N Lüderitz, alt. 3 m, low coastal vegetated dunes, 18.ii.1974, M.E. and B.J. Irwin (NMSA); 1♂ 2♀ Lüderitz, alt. 20 m, 14.ix.2003, A. Freidberg (TAUI); 1♂ 1♀ Orange R., 25 km Rosh Pinah, 28°05'S:16°24'E, 15.ix.2003, A. Freidberg (TAUI). SOUTH AFRICA: *Western Cape*: 1♂ Sandfontein Coast, west of Van Rhynsdorp, 15–17.x.1964, B. & P. Stuckenberg (NMSA).

Distribution: Middle East, Egypt, Kenya, Namibia, South Africa.

Aphaniosoma flavescens sp. n.

Figs 41, 42

Etymology: From Latin *flavus* (yellow), and refers to entirely yellow colour of the body and postabdominal structures of this species.

Diagnosis: Entirely yellow species, with distance between crossveins on wing about as long as posterior crossvein and length of apical section of vein Cu a little more than 3× length of posterior crossvein; male postabdomen also yellow with broad *surs* clearly visible and large *psg* truncate at tip in lateral view.

Description:

Male.

Head: Entirely yellow, including *oc* triangle, *fr* broad but converging anteriorly so that at level of antennae it is about 0.7 as wide as at level of anterior *oc*, face small, depressed and with distinct, narrow but low facial carina, eye oval lying oblique, gena yellow, at middle about 0.5 height of eye and having numerous golden yellow setulae that are longer than is usual in this genus, in this species longer than *orb*, 2 short setae at vibrissal corner, mouthparts yellow, 2 setulae on *fr* with 1 pair of longer setulae in front of *oc* triangle, 4 short *orb* getting progressively shorter from back to front, 1 *vti* and 1 *vte*, *pvt* distinct and convergent, ocellars long, divergent, antenna yellow, most of second segment of arista dark.

Thorax: Scutum, s*cut*, pleura and *mtn* entirely yellow. Chaetotaxy: 1 *pprn*, 1 *posthu*, 1 *ihu*, 2 *ntpl*, 0–1+2–3 *ia*, 1+5 *acrs*, 4+4 *dc* only the posterior one well-developed, *prpl* short, 1 *pa*, 2 pairs of marginal *scut*, 1 katepisternal with several setulae on anterior part of sclerite, 1 anepisternal, all setae pale yellow to pale brown.

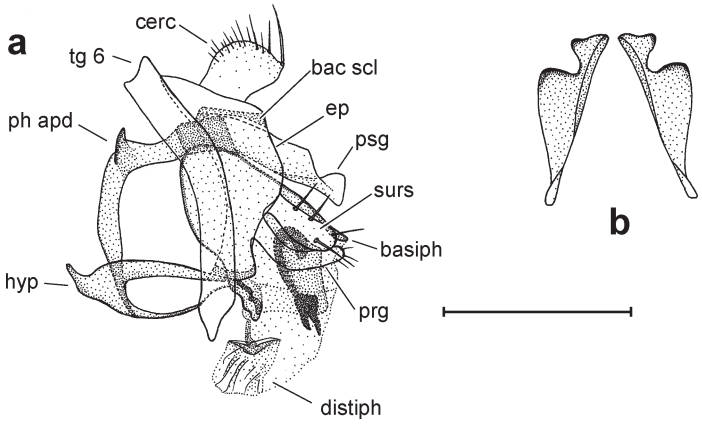

Fig. 41. *Aphaniosoma flavescens* sp. n., ♂: (a) hypopygium, lateral; (b) *psg*, posterior. Scale bar = 0.15 mm.

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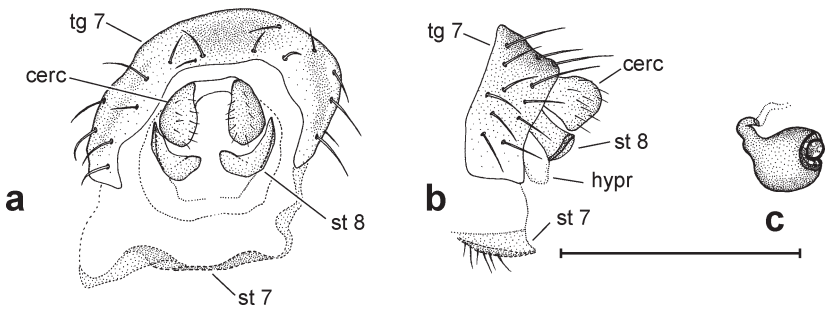

Fig. 42. *Aphaniosoma flavescens* sp. n., ♀ postabdomen: (a) posterior, (b) lateral, (c) spermatheca. Scale bar = 0.15 mm.

Wing: Hyaline and uniformly microtrichose, veins yellow, distance between R_{2+3} to R_{4+5} on costal margin about 0.4 that between R_{4+5} and M_{1+2}, distance between crossveins about 0.9× length of posterior crossvein and length of apical section of Cu about 3.2× length of posterior crossvein. Haltere yellow.
Legs: Entirely yellow and fine yellow setulose.

Abdomen: Entirely yellow.
Postabdomen: Yellow with relatively broad *surs* clearly visible.

Female.

As male, but tarsomere 5 darkened and several specimens have tarsomeres 3 and 4 also darkened. Postabdomen: *tg* 8 divided into two lateral sclerites; *st* 8 membraneous; *hypr* not recognizable; spermatheca with short sclerotized section of duct.

Length: ♂ body 1.1 mm, wing 1.4 mm; ♀ body 1.4 mm, wing 1.5 mm.

Holotype: ♂ NAMIBIA: Skeleton Coast Park, Kunene R. mouth, 17°15'97"S:11°46'83"E, sweeping marginal grasses and reeds on flood plain, 17–18.iii.1998, A.H. Kirk-Spriggs (NMNW).

Paratypes: NAMIBIA: 7♂ 1♀ same data as holotype (NMNW); 12♂ 3♀ same data (in alcohol, NMNW); 5♂ 1♀ same data (in alcohol, NMWC); 2♂ 5♀ nr Onseepkans, Orange R. banks, 8–10.i.1972, Southern African Expedition (W1) B.M. 1972–1 (BMNH); 1♂ 4♀ Walvis Bay, 25–26.i.1972, pool edge in dunes, Southern African Expedition (W24) BM 1972–1 (BMNH); 1♂ Khorixas District, Gai-As spring, 20°46'01"S: 14°01'12"E, 22.x.1998, A.H. Kirk-Spriggs & E. Marais (NMNW); 1♂ 4♀ Khorixas District, Huab R. at Krone, 721, 20°37'09"S:13°54'31"E, sweeping grasses and sedges, 23–26.x.1998, A.H. Kirk-Spriggs (NMNW); 1♂ Skeleton Coast, Kunene R. mouth, 17°16'S:11°47'E, 20–22.iv.1994, yellow tray (water trap), E. Marais (in alcohol, NMWC); 1♀ Omaruru District, Ugab R., 2 km W Brandberg Wes, 20°58'05"S: 14°06'36"E, 22–24.x.1998, Malaise trap, A. Kirk-Spriggs & E. Marais (in alcohol, NMWC); 3♂ 1♀ Walvis Bay, alt. 5 m, 22°60'S:14°28'E, 6.ix.2003, A. Freidberg (TAUI); 1♂ Gobabeb, Kuseib R., 23°34'S:15°03'E, 5.ix.2003, A. Freidberg (TAUI).

Aphaniosoma frequens sp. n.

Figs 43, 44

Etymology: From Latin *frequens* (frequent), denoting its common and widespread occurrence in the samples taken in Africa.

Diagnosis: Dark grey species with yellow *fr* and antennae, pleural sutures narrowly bordered with yellow, tarsomere 5 of all legs brown and male postabdomen with large, dark, broad *psg*, beaked at tip most often easily visible without dissection, *prg st* of unusual shape with midline process at apex and *distiph* with long divergent lobes.

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Description:

Male.

Head: Yellow, *ocp* dark grey except for narrow yellow postocular border, *oc* triangle dark grey, *fr* broad but converging anteriorly so that at level of antennae it is about 0.6 as wide as at level of anterior *oc*, face small, depressed and with distinct, narrow but low facial carina, eye oval lying oblique, gena yellow, at middle about 0.6 height of eye and having numerous pale setulae, 2 short setae at vibrissal corner, mouthparts small, yellow, 6 setulae scattered on *fr* with 2 pairs of longer setulae in front of *oc* triangle, 4 *orb* getting progressively shorter from back to front, 1 *vti* and 1 *vte*, *pvt* distinct and convergent, *oc* long, divergent, antenna yellow, most of second segment of arista dark.

Thorax: Scutum, *scut* and *mtn* entirely dark grey, *pprn* and *ntpl* yellow, pleura mostly dark grey, but for narrow yellow margins to sutures. Chaetotaxy: 1 *pprn*, 1 *posthu*, 1 *ihu*, 2 *ntpl*, 0+2 *ia*, 2+5 *acrs*, 2+4 *dc* only the posterior two well-developed, *prpl* distinct, 1 *pa*, 2 pairs of marginal *scut*, 1 katepisternal with shorter seta in front and several setulae on anterior part of sclerite, 1 anepisternal, all setae pale yellow to pale brown.
Wing: Hyaline and uniformly microtrichose, veins pale brown, distance between R_{2+3} to R_{4+5} on costal margin about 0.5 that between R_{4+5} and M_{1+2}, distance between crossveins about 1.3× length of posterior crossvein and length of apical section of Cu about 2.6× length of posterior crossvein. Haltere pale yellow.
Legs: Yellow and fine yellow setulose, tarsomere 5 of all legs brown.

Abdomen: Almost entirely dark brown, only the narrowly visible membrane between segments pale. Postabdomen: No distinguishing external features.

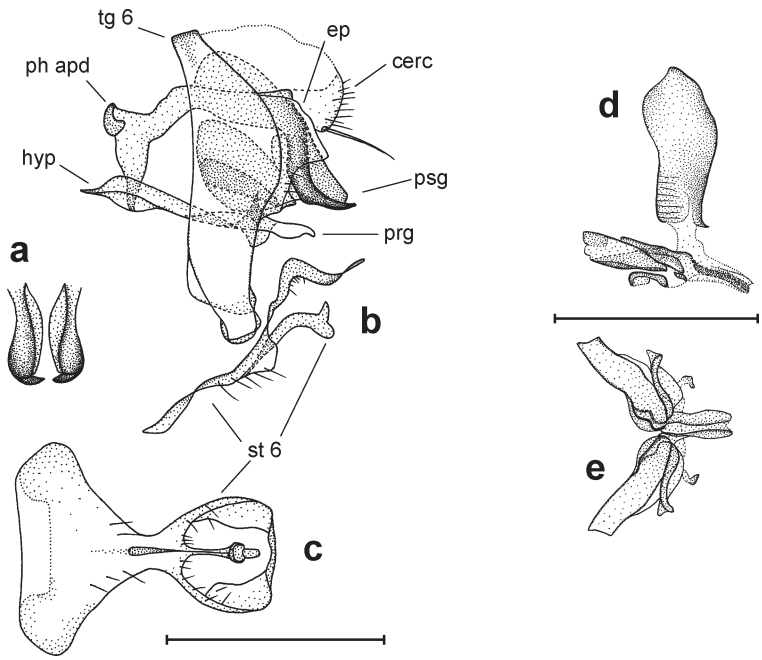

Fig. 43. *Aphaniosoma frequens* sp. n., ♂: (a) *psg*, posterior; (b) hypopygium, lateral; (c) *st* 6, ventral; (d, e) *distiph*, lateral (d) and ventral (e). Scale bars = 0.2 mm.

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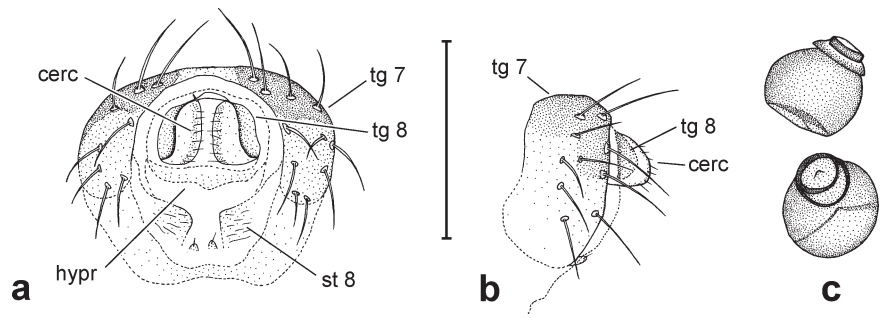

Fig. 44. *Aphaniosoma frequens* sp. n., ♀ postabdomen: (a) posterior, (b) lateral, (c) spermathecae. Scale bar = 0.15 mm.

Female.

As male, but some specimens have a yellow longitudinal midline stripe on *tg* 6 & 7 (not a diagnostic feature as it is present in many species) as a result of partial desclerotization. Postabdomen: *tg* 8 closely attached to *cerc*, *hypr* large, but membraneous; *st* 8 thinly sclerotized with middle section showing two very small tubercles with a microtrichium on each.

Length: ♂ and ♀ body 0.9 mm, wing 1.1 mm.

Variation: A few specimens are of a lighter grey on the thorax and those from St Helena have a pale *scut*.

Holotype: ♂ NAMIBIA: Skeleton Coast Park, Kunene R. mouth, 17°15'97"S:11°46'83"E, sweeping marginal grasses and reeds on flood plain, 17–18.iii.1998, A.H. Kirk-Spriggs (NMNW).

Paratypes: NAMIBIA: 7♂ 4♀ same data as holotype (NMNW); 2♂ 2♀ nr Onseepkans, Orange R. banks, 8–10.i.1972, Southern African Expedition (W0) B.M. 1972–1 (BMNH); 86♂ 9♀ Otjitambi farm, 47 km ESE Kamanjab, 13–15.ii.1972, Southern African Expedition (W37) BM 1972–1 (BMNH); 7♂ 6♀ nr Onseepkans, Orange R. banks, 8–10.i.1972, Southern African Expedition (W1) B.M. 1972–1 (BMNH); 6♂ 2♀ Kuiseb R. canyon, 22–23.i.1972, riverside vegetation, Southern African Expedition (W22) B.M. 1972–1 (BMNH); 1♀ Khorixas District, Gai-As spring, 20°46'01"S:14°01'12"E, 22.x.1998, A.H. Kirk-Spriggs & E. Marais (NMNW); 1♂ 3♀ Khorixas District, Huab R. at Krone 721, 20°37'09"S:13°54'31"E, sweeping grasses and sedges, 23–26.x.1998, A.H. Kirk-Spriggs (NMNW); 1♂ 1♀ Brandberg, Messum valley, alt. 700 m, 21°13'29"S:14°30'98"E, 3.iv.1999, S. van Noort & S.G. Compton, UV-light trap in sparsely vegetated river valley, Bushy-Karoo-Namib shrubland (in alcohol, NMWC); 11♂ 4♀ Windhoek District, Greylingshof 107, Gaub Canyon, 23°29'S:16°48'E, 2–3.x.1999, Malaise trap, A.H. Kirk-Spriggs & T. Pape (NMNW). KENYA: 1♂ Hunter's Lodge nr Kiboko, 02°14'S:37°43'E, 8–9.viii.2003, A. Freidberg (TAUI); 1♂ Simba, NBI-MSA rd, 02°09'S:37°34'E, 23.viii.2003, A. Freidberg (TAUI); 1♂ 3♀ Hunter's Lodge, 02°13'S:37°43'E, 13–16.ix.2005, A. Freidberg (TAUI). ST HELENA ISLAND: 1♀ Sandy Bay, 17.ii.1962, A. Loveridge (BMNH); 2♂ 4♀ St Helena Island, 1963, A. Loveridge; all specimens are glued on a card on the same mount, one has been removed and macerated, and is preserved in a glycerine vial on the same pin (BMNH).

Remarks. The specimens from St Helena bear the identification label "*Aphaniosoma approximatum*, Becker, det. J.C. Deeming 1963". The identification was based on a dissected male and the available literature at the time. I re-examined this specimen, which, although a little faded, remains in good condition and the postabdomen matches that of *frequens* and not that of *approximatum*. There are minor differences in the hypopygial structures of the species from St Helena: the *psg* is very slightly broader, the lower edge of *tg* 6 is more pointed where this projects laterally from the plane of the *tg*, the distal end of the *basiph* is notched in both, but in the St Helena specimens it is slightly deeper. I do not consider these to be anything more than minor variations and,

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given the highly characteristic pregenital *st* and *distiph* being the same in both series, I consider the St Helena specimens merely a variation of *frequens* and not a sibling species or a subspecies.

Aphaniosoma gaiasicum sp. n.

Fig. 45

Etymology: The species name is derived from Gai-As, the type locality.

Diagnosis: Yellow species with 2 pairs of setulae on *fr* longer than others, dark spot on meron, pale brown stripes on scutum, tarsomeres of all legs yellow and shiny brown spot on *ep* contrasting with otherwise entirely yellow abdomen. Male postabdomen with distinctive long narrow lobes of *distiph* and flattened upturned process on *basiph*.

Description:

Male.

Head: Yellow, including *oc* triangle only ocelli ringed black, *fr* broad but converging anteriorly so that at level of antennae it is about 0.7 as wide as at level of anterior *oc*, face small, depressed and with distinct, narrow but low facial carina, eye oval lying oblique, gena yellow, at middle about 0.6 height of eye and having several yellow setulae, 2 short setae at vibrissal corner, mouthparts yellow, 4 setulae on *fr* with 1 pair of longer setulae above lunule and another in front of *oc* triangle, 3 *orb* with 1 short setula in front, 1 *vti* and 1 *vte*, *pvt* distinct and convergent, ocellars long, divergent, antenna yellow, most of second segment of arista dark.

Thorax: Scutum and *scut* with yellow ground but with pale brown longitudinal stripes on scutum, *mtn* brown, pleura all yellow except for a pale brown inverted triangle on lower katepisternum and dark brown spot on meron. Chaetotaxy: 1 *pprn*, 1 *posthu*, 1 *ihu*, 2 *ntpl*, 0+4 *ia*, 2+4 *acrs*, 3+4 *dc* only the posterior one well-developed, *prpl* not seen, 1 *pa*, 2 pairs of marginal *scut*, 1 katepisternal, 1 anepisternal, all setae pale yellow. Wing: Hyaline and uniformly microtrichose, veins pale yellow, distance between R_{2+3} to R_{4+5} on costal margin about 0.4 that between R_{4+5} and M_{1+2}, distance between crossveins

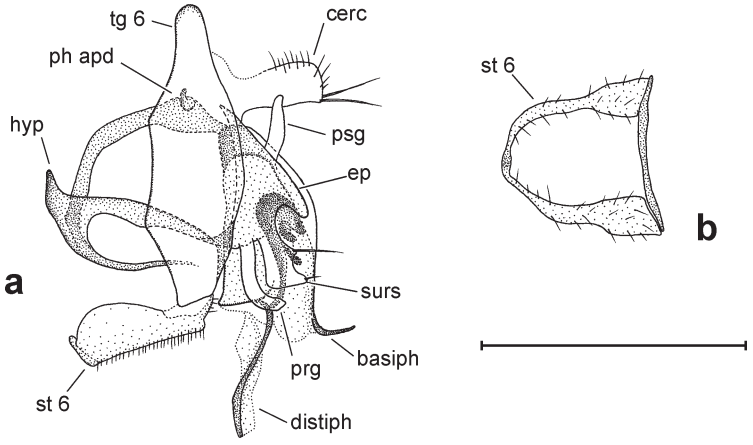

Fig. 45. *Aphaniosoma gaiasicum* sp. n., ♂: (a) hypopygium, lateral; (b) *st* 6, ventral. Scale bar = 0.18 mm.

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about 1.2× length of posterior crossvein and length of apical section of Cu about 2.8× length of posterior crossvein. Haltere yellow.
Legs: Yellow and fine yellow setulose, tarsomere 5 of all legs yellow.

Abdomen: Yellow with narrow, brown anterior margins to all *tg*.
Postabdomen: Yellow with shining brown *ep* spot lateral to *cerc*.

Female.

As male. (Postabdomen not dissected due to poor condition.)

Length: ♂ body 1.2 mm, wing 1.4 mm; ♀ body 1.4 mm, wing 1.5 mm.

Holotype: ♂ NAMIBIA: Khorixas District, Gai-As spring, 20°46'01"S:14°01'12"E, 22.x.1998, A.H. Kirk-Spriggs & E. Marais (in glycerine, NMNW).

Paratypes: 2♀ in alcohol, same data and depository.

Aphaniosoma gallagheri Ebejer, 1996

Fig. 46

Aphaniosoma gallagheri: Ebejer 1996: 292.

The finding of this species in The Gambia and Cape Verde was a surprise, given its apparent absence from intervening countries. It was described from southern Oman. The species is illustrated again using specimens from Cape Verde (male) and The Gambia (female) in order to supplement the original figures with more detail. The female is very similar to the male in external features. Postabdomen: *tg* 7 divided into lateral plates with relatively long setulae; *tg* 8 in two small sclerotized lateral plates, *st* 7 membraneous; *hypr* small barely discernable except for minute setulae.

Material examined: CAPE VERDE: 31♂ 11♀ Sal, Saline Pedra Lumen, 5–7.i.1985, P. Ohm (in alcohol, FBUB); 1♀ Santiago, b. Variante, "Trockenribeiro und Staatsfarm", 2.xi.1982, P. Ohm (in alcohol, FBUB). THE GAMBIA: 1♂ 2♀ Kotu stream, about 3 km SW Bakau, 23.xi.1977, swept in vegetation, Lund University

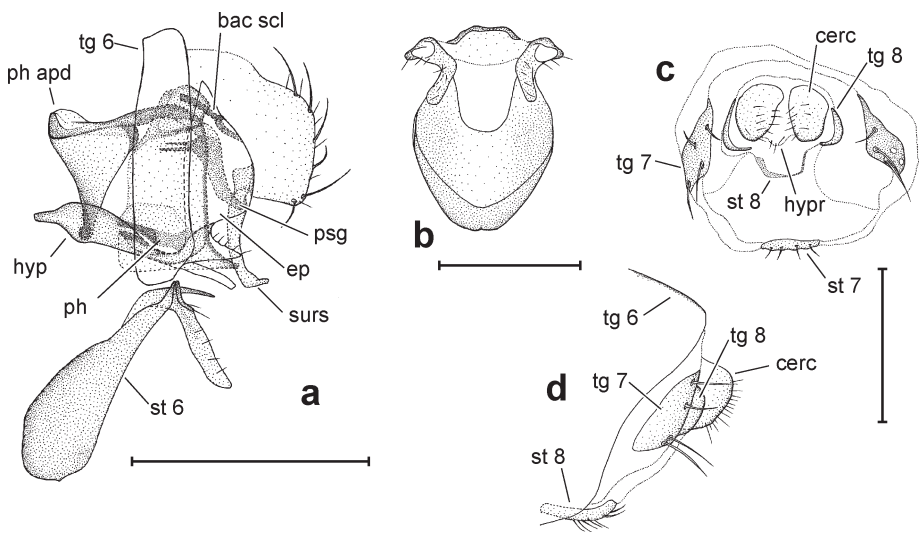

Fig. 46. *Aphaniosoma gallagheri* Ebejer: (a) ♂ hypopygium, lateral, scale bar = 0.15 mm; (b) ♂ *st* 6, scale bar = 0.1 mm; (c, d) ♀ postabdomen, posterior (c) and lateral (d), scale bar = 0.1 mm.

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Systematics Department, Cederholm, Danielsson, Hammarstedt, Hedqvist, Samuelsson (MZLU); 1♀ same data but 23.ii.1977, in vegetation and freshwater (MZLU); 2♀ Bakau, at Tropic Bungalow, 16–18.xi.1977, swept in meadow rich in flowers at the beach, Lund University Systematics Department, Cederholm, Danielsson, Hammarstedt, Hedqvist, Samuelsson (MZLU); 1♀ West Division, Bakau Carmalou Corner, 22.xi.1993, on *Phragmites* in saltmarsh, J.C. Deeming (NMWC); 1♀ West Division, 26.xi.1993, on grasses bordering Kotu stream, J.C. Deeming (NMWC); 1♂ West Division, Lamin Bridge, Lamin Bolan, 2.viii.1997, D.J. Mann (NMWC).

Distribution: Cape Verde, The Gambia, Oman (Dhofar).

Aphaniosoma harteni Ebejer, 1996

Aphaniosoma harteni: Ebejer 1996: 293.

Described from Yemen and later found in Tunisia, this species is unique in the Afrotropical fauna. It is the only representative of the group of species with a strong presutural *dc* seta. This species group is distributed across the Mediterranean, with four species recorded from the Canary Islands and one from Mongolia.

Distribution: Tunisia, Yemen.

Aphaniosoma kirkspriggsi sp. n.

Fig. 47

Etymology: Named after Ashley Kirk-Spriggs, who collected many Chyromyidae in Namibia.

Diagnosis: Yellow species with black ringed ocelli, elongate slender eyes, dark longitudinal scutal stripes, *scut* with dark lateral margin reaching base of subapical setae; abdomen yellow with light brown bands dorsally on *tg*; male postabdomen with large shiny dark brown phallic structures easily visible, owing to their contrast with yellow *tg* and *st*. Male postabdomen with setulose *surs* and *prg*, and bilobed *distiph*.

Description:

Male.

Head: *fr*, *oc* triangle and *ocp* entirely yellow, only ocelli black; eye narrow and horizontal, about 3 times as long as high; gena yellow and pale yellowish white setulose, about

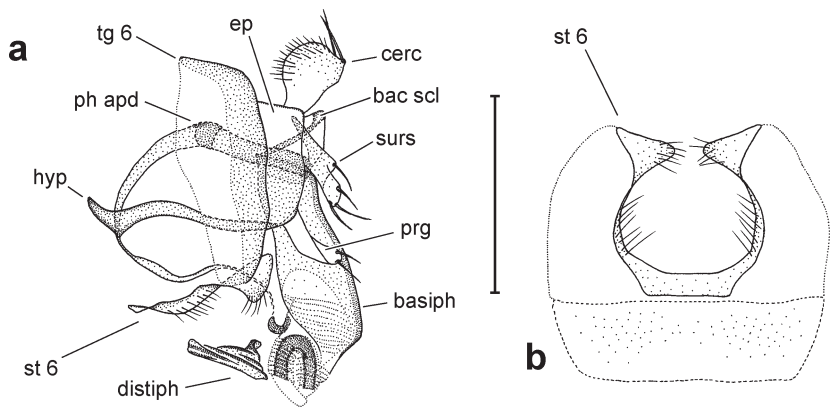

Fig. 47. *Aphaniosoma kirkspriggsi* sp. n., ♂: (a) hypopygium, lateral; (b) *st* 6, ventral. Scale bar = 0.15 mm.

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equal to height of eye; face very small and membranous with shallow linear carina; antenna including first segment of arista yellow, second aristal segment dark brown; mouthparts yellow. Chaetotaxy: 3 reclinate *orb* with short setula in front, 2 long ocellars widely spaced almost parallel, 10 *fr* setulae and a pair of long setae in front of *oc* triangle; 1 *vti* and 1 *vte*, *pvt* convergent.

Thorax: Scutum yellow and pale yellow pollinose with dark grey scutal stripes confluent anterior to transverse suture; *scut* yellow with brown lateral margin up to subapical setae; *mtn* dark and pleura yellow with dark greyish brown triangular mark on katepisternum and spot on meron. Chaetotaxy: 2+5 *dc* only hindmost developed to a seta, 0+4 *acrs* in two irregular rows, 1 *pprn*, 1 *ihu*, 1 *posthu*, 1 *ia*, 2 *ntpl*, 1 *pa*, 1 anepisternal and 1 katepisternal with a few setulae near each.

Wing: Hyaline with yellow veins becoming darker towards apex; distance between R_{2+3} and R_{4+5} about 0.5 that between R_{4+5} and M_{1+2}; distance between crossveins equal to length of posterior crossvein. Haltere pale yellow.

Legs: No special modifications, yellow and yellow setulose, tarsomere 5 brown.

Abdomen: *tg* pale brown with yellow hind margins which occupy about 1/4 length of *tg* dorsally, but become broader on sides.

Postabdomen: *cerc* small yellow and pointed; *distiph* large shiny and dark.

Female.

Very similar to male; eye less elongated. (Postabdomen not dissected.)

Length: ♂ body 1.1 mm, wing 1.0 mm; ♀ body 1.2 mm, wing 1.3 mm.

Variation: The male paratype has the eye only twice as long as high and the tarsomeres being all yellow.

Holotype: ♂ NAMIBIA: Lüderitz District, Angra Bay, 26°37'11"S:15°11'42"E, sweeping lush vegetation at effluent run-off stream, 27.iii.1998, A. Kirk-Spriggs (NMNW).

Paratypes: NAMIBIA: 4♂ 2♀ same data as holotype (NMNW); 1♂ 1♀ Otjitambi farm, 47 km ESE Kamanjab, 13–15.ii.1972, Southern African Expedition (W37) BM 1972–1 (BMNH). SOUTH AFRICA: *Western Cape*: 1♂ (headless) 1♀ Sandfontein Coast, west of Van Rhynsdorp, 15–17.x.1964, B. & P. Stuckenberg (NMSA).

Aphaniosoma lamellatum Collin, 1949

Aphaniosoma lamellatum: Collin 1949: 137.

This is one of the species that Collin described from Egypt. Although it has not been found on mainland Africa south of the Sahara, it has been recorded from Oman (Ebejer 1996) and is included here for completeness as it could easily be more widely distributed. The long yellow lamellae referred to by Collin are the *surs*, and these are indeed long and broad with somewhat sinuous margins as illustrated by him.

Distribution: Egypt, Oman.

Aphaniosoma micropygum sp. n.

Figs 48, 49

Etymology: From Greek *micros* (small) and Latin *pyga* (buttocks), and refers to the particularly small hypopygium.

Diagnosis: Yellow species with brown longitudinal stripes on scutum and short *pra* setula; brown tarsomeres 5; abdomen yellow with *tg* having brown band along anterior

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margin, male postabdomen particularly small, yellow and with most structures translucent; lower margin of *tg* 6 with posterior indentation.

Description:

Male.

Head: Entirely yellow, only ocelli ringed with black; antenna yellow, arista missing, mouthparts yellow; face very small and sunken; gena yellow and pale setulose; gena about 0.6 height of eye, which is long oval and lies almost horizontal. Chaetotaxy: 2 *orb* and 2 setulae in front of these, 8 scattered short *fr* setulae and 1 pair of long setae in front of *oc* triangle; 1 *vti* and 1 *vte* and short *pvt*; postoculars in 1 row.

Thorax: Yellow, with brown longitudinal stripes on scutum, *scut* yellow, *mtn* brown, pleura yellow except for brown triangular patch on katepisternum, narrow brown line on anepisternum and anepimeron near suture, meron all brown. Chaetotaxy: 1 *pprn*, 1 *posthu*, 1 *ihu*, 3+4 *dc* only hindmost developed to a seta, 0+4 *acrs*, 1+3 *ia* setulae, 1 *pa*, 1 anepisternal and 1 katepisternal, latter with vertical row of 4 short setulae down middle of sclerite.

Wing: Hyaline and uniformly microtrichose, veins pale brown to yellow, distance between R_{2+3} to R_{4+5} on costal margin about 0.7 that between R_{4+5} and M_{1+2}, distance between crossveins about 1.2× length of posterior crossvein and length of apical section of Cu about 2.8× length of posterior crossvein. Haltere pale yellow.

Legs: All yellow and yellow setulose, tarsomere 5 brown.

Abdomen: Yellow, with brown bands along anterior half of *tg* and pale hind margin becoming broader at sides.

Postabdomen: Very small and pale hypopygium; most structures translucent; *hyp* particularly small and narrow; *surs* and *prg* run parallel to each other, *surs* originating from lower end of *ep* and *prg* from posterior end of *hyp* where this fuses with *ep*; *ep* itself small, trapezoidal and invaginated into space within *tg* 6; pregenital *st* small and narrow forming loop around ventral hypopygial opening, posteriorly at midline forms a keel in front of *distiph*.

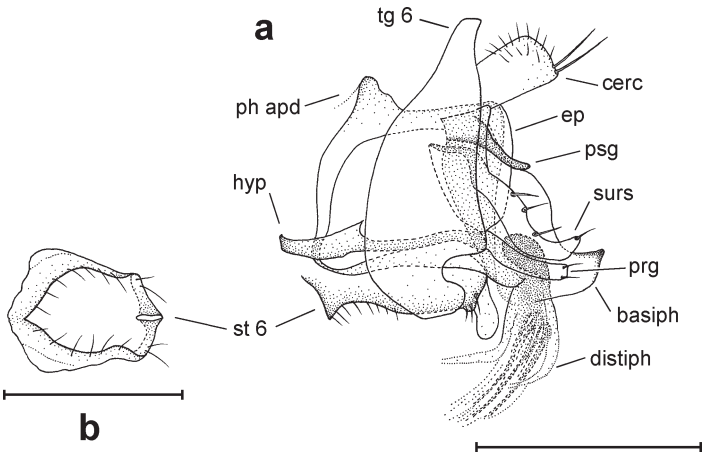

Fig. 48. *Aphaniosoma micropygum* sp. n., ♂: (a) hypopygium, lateral, scale bar = 0.07 mm; (b) *st* 6, ventral, scale bar = 0.05 mm.

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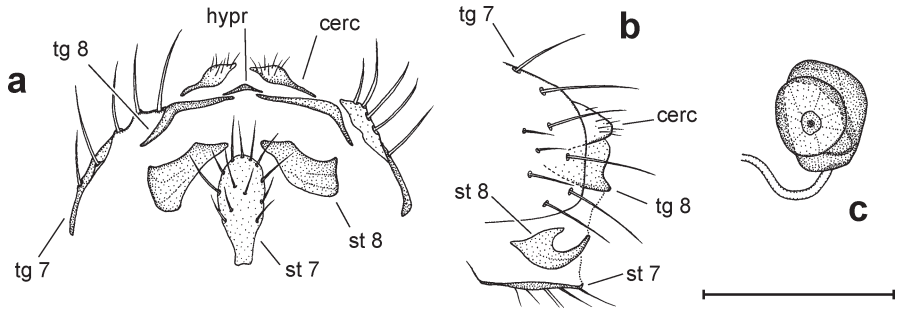

Fig. 49. *Aphaniosoma micropygum* sp. n., ♀ postabdomen: (a) ventral, (b) lateral, (c) spermatheca. Scale bar = 0.1 mm.

Female.

Very similar to male. Postabdomen: *tg* 7 broad with long setulae; tg and st 8 sclerotized and divided, latter of characterisitc shape, *st* 7 elongate oval with distinct setulae; *s* with thinly sclerotized first part of duct; *cerc* small.

Length: ♂ and ♀ body 1.4 mm, wing 1.5 mm.

Holotype: ♂ NAMIBIA: Swakopmund [22°40'S:14°33'E], general sweeping, 26–30.i.1972, Southern African Expedition (W25) B.M. 1972–1 (BMNH).

Paratypes: 1♂ 7♀ same data as holotype (BMNH).

Aphaniosoma pullum sp. n.

Figs 50, 51

Etymology: From Latin *pullum* (blackish), and refers to this species being predominantly dark coloured.

Diagnosis: Extensively greyish black species with brown third antennal segment and tarsomeres of all legs yellow in ♂ but often brown in ♀, *scut* setae longer than length of *scut*, *ep* shiny dark brown contrasting with the pale *cerc*; *surs* unusual, with very short lobes and bilobed *distiph* projecting backwards rather than forwards.

Description:

Male.

Head: Yellow (rather dusky due to postmortem changes), *ocp* black, *oc* triangle black, *fr* broad but markedly converging anteriorly so that at level of antennae it is about 0.5 times as wide as at level of anterior *oc*, face small, depressed and with distinct, narrow but low facial carina, eye oval lying oblique, gena yellow, narrow, at middle about 0.4 height of eye and having numerous pale yellow setulae, 2 short setae at vibrissal corner, mouthparts yellow, 4 setulae on *fr* with 1 pair of longer setulae in front of *oc* triangle, 4 short *orb* getting progressively shorter from back to front, 1 *vti* and 1 *vte*, *pvt* distinct and convergent, ocellars parallel, antenna brown (though not as dark chocolate brown as in *atriceps*), arista dark, only extreme base of segment 1 yellow.

Thorax: Scutum dark grey, *scut* dark brown, *mtn* entirely dark grey, *pprn* and *ntpl* yellow, pleura mostly dark grey, but for narrow yellow margins to sutures. Chaetotaxy: 1 *pprn*, 1 *posthu*, 1 *ihu*, 2 *ntpl*, 0+2–3 *ia*, 1+5 *acrs*, 4+5 *dc* only the posterior one well-developed,

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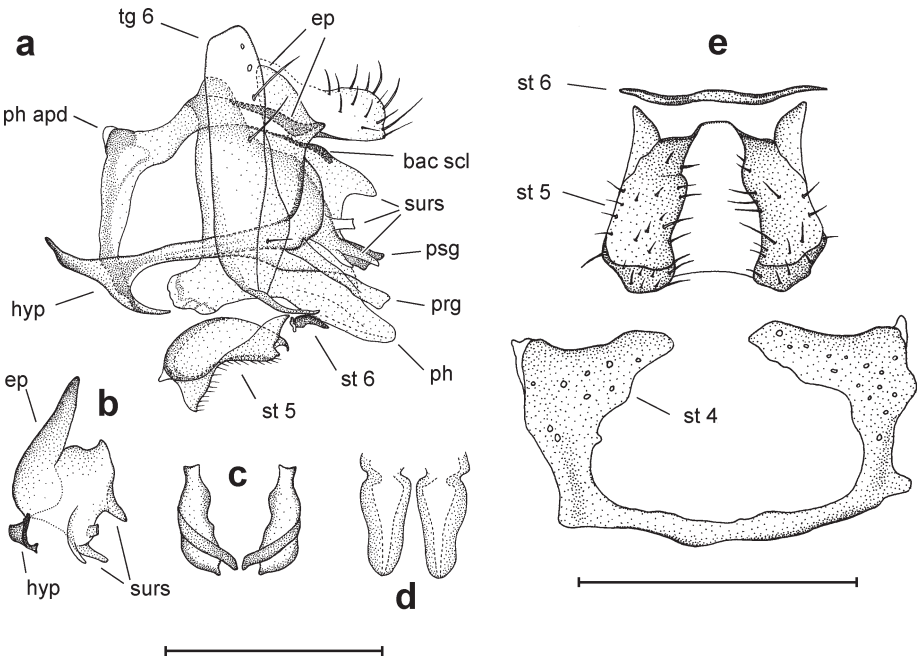

Fig. 50. *Aphaniosoma pullum* sp. n., ♂: (a) hypopygium, lateral; (b) left *ep*; (c) *psg*, posterior; (d) *distiph*, ventral; (e) sternites, ventral. Scale bars = 0.15 mm.

prpl minute, 1 *pa*, 2 pairs of marginal *scut*, all longer than length of *scut*, 1 katepisternal with shorter seta in front and several setulae on anterior part of sclerite, 1 anepisternal, all setae pale at front of body becoming darker brown on posterior parts.

Wing: Hyaline and uniformly microtrichose, veins brown, distance between R_{2+3} to R_{4+5} on costal margin about 0.6 that between R_{4+5} and M_{1+2}, distance between crossveins about 1.3× length of posterior crossvein and length of apical section of Cu about 2.8× length of posterior crossvein. Haltere yellow.

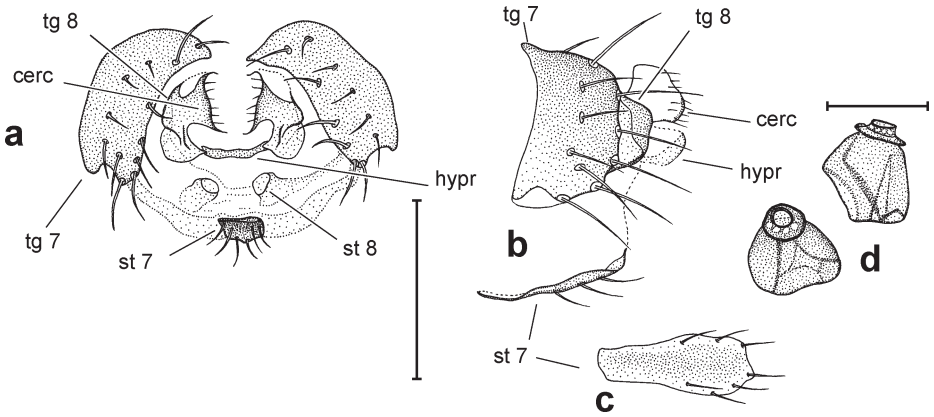

Fig. 51. *Aphaniosoma pullum* sp. n., ♀ postabdomen: (a) posterior, (b) lateral, (c) ventral, scale bar = 0.1 mm; (d) spermathecae, scale bar = 0.06 mm.

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Legs: Yellow and fine yellow setulose, tarsomere 5 of all legs yellow.

Abdomen: Dark brown with narrow, pale yellow hind margins to all *tg*.
Postabdomen: Yellow with upper part of *ep* shiny brown on each side of *cerc*.

Female.

As male, but several specimens have tarsomeres 5 darkened. Postabdomen: *tg* 7 divided, *st* 7 elongated oval with distinct setulae; *cerc* appear fused to *tg* 8; *hypr* distinct, but no special features; *st* 8 in two small lobes.

Length: ♂ body 1.0 mm, wing 1.1 mm; ♀ body 1.0 mm, wing 1.2 mm.

Holotype: ♂ NAMIBIA: Lüderitz [26°39'S:15°10'E], alt. 20 m, 14.ix.2003, A. Freidberg (TAUI).

Paratypes: 1♂ 5♀ same data as holotype (TAUI).

Aphaniosoma suboculicauda Frey, 1958

Fig. 52

Aphaniosoma suboculicauda: Frey 1958: 34.

Frey's description, though accurate on most points, has some errors and his illustration of this species is difficult to interpret. Given that so many species have been described since that time, an examination of the types was mandatory. The series of specimens that I received for study from MZH consisted of 11 specimens, none of which is labelled by Frey with the name of the species. The two specimens with a species's name are those that I examined and labelled in 1997 (Ebejer 1998) for the revision of the Palaearctic species of this genus. Although not labelled by Frey as types, all the specimens I examined bear the same data as given in his paper for an unspecified number of specimens. There is no other species of *Aphaniosoma* that he refers to. For this reason, I consider them all to constitute the type series as Frey implied in his article.

The holotype ♂ carries the following labels: "Holotypus" [red label]; "spec.typ." [typed], "holotyp [sic]" [hand written below]; "Ins. Cabo Verde, Maio Rib. da Lagoa, 2.2.1954, Lindberg". It is indeed a male in perfect condition with the phallic complex partly extruded. The apex of the *distiph* is not visible, but no black structures can be made out, even though the postabdomen is pale and semi translucent. In such cases, dark internal structures are visible through the integument, although detail might not be appreciated. The *basiph*, *surs* and *psg* are pale throughout. The *prg* cannot be discerned. Frey describes a pair of black spots on *tg* 6. None of the males in this series has a black spot. The small brown spot that is present is on the *ep*. Frey's illustration of the male postabdomen and his comments upon it raise the possibility that the specimen it comes from might not be the same species as the one designated as the holotype. However, since all the type series represents one species, I am more inclined to believe that Frey rather overstated the features and in his illustration of the *distiph* over-inked the dark areas. There are no hairs on the *distiph* either in the male I dissected or indeed in any species of *Aphaniosoma* that I have seen with the sole exception of *trilobatum* sp. n. (see below). Dr Vilkamaa informs me that he has been unable to trace the slide preparations of the two abdomens that are missing from the type series and upon which Frey based his illustration. For these reasons, I give an illustration of a male paratype that I dissected in order to allow this species to be properly recognized. I labelled the remaining specimens as paratypes since they are so referred to, albeit indirectly, in Frey's paper.

♂ "Ins. Cabo Verde, Maio Rib. da Lagoa, 2.2.1954, Lindberg", in very good condition.

"Paratypus" [red label]; "♂"; "17" [typed in large font]; "Ins. Cabo Verde, Boavista, Fundo de Figueiras, 30.1.1954, Panelius". This specimen is in very good condition, but the abdomen was neatly removed from *tg* 3 onwards and therefore I cannot confirm the sex. The colouration of the head and thorax, the proportions of the wing veins and spaces between them and the chaetotaxy suggest that this is the same species as the holotype.

"Paratypus" [red label]; "pinz" [hand written, deciphered correctly?]; "Ins. Cabo Verde, Maio Pedro Vas, 3.2.1954, Lindberg". This specimen is greasy and very badly damaged: headless, all right legs missing, tarsomeres of middle and hind leg missing on left side, right wing folded, left wing mostly missing and apex

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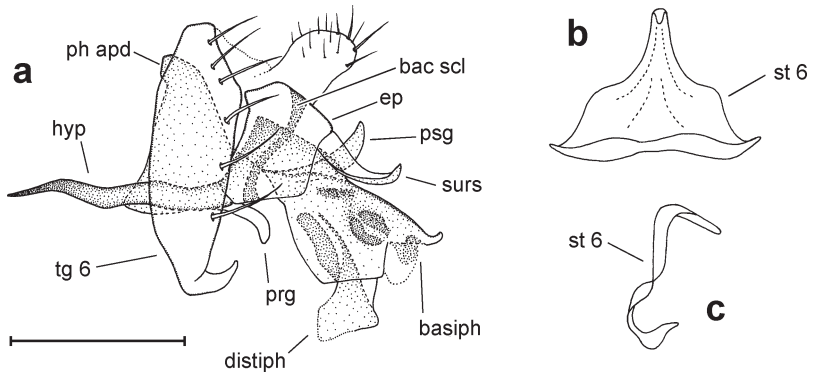

Fig. 52. *Aphaniosoma suboculicauda* Frey, ♂: (a) hypopygium, lateral; (b) *st* 6, ventral; (c) same, lateral. Scale bar = 0.1 mm.

of abdomen missing (apparently through damage). There is nothing about the remains of this specimen that suggests it is a different species to the above. There are three more males bearing the same data and all are the same species as this. I dissected one of these.

"Paratypus" [red label]; "18" [typed in large font]; "Ins. Cabo Verde, Boavista Rabil, 31.1.1954, Lindberg". The specimen is damaged: headless and left wing folded. The abdomen has been cleanly removed from *tg* 3 onwards. Therefore, I cannot determine the sex. This is the same species as the rest.

"Paratype, ♀ *Aphaniosoma suboculicauda* Frey, det. M.J. Ebejer, 1997"; "Ins. Cabo Verde, Boavista, Fundo de Figueiras, 30.1.1954, Panelius". Apart from missing the left wing the specimen is in good condition.

"Paratype, ♀ *Aphaniosoma suboculicauda* Frey, det. M.J. Ebejer, 1997"; "Ins. Cabo Verde, Maio Pedro Vas, 3.2.1954, Lindberg". The specimen has the scutum badly cracked, but the parts are still present, the head is shrivelled, but the chaetotaxy can be made out. This is a darker specimen than all the foregoing. It has more extensive darkening of pleura, scutal stripes and abdominal *tg*. The chaetotaxy is very similar to the foregoing specimens and I consider the chromatic differences of minor importance and well within the variation commonly seen in species of this genus.

Finally, a ♂ also belonging to the same species as above, bears the following label: "Ins. Cabo Verde, S. Tiago Achada, Robao Areia, 11.2.1954, Lindberg". It has a rather shrivelled head and the scutum is broken, but all parts are present.

Distribution: Cape Verde.

Aphaniosoma trilobatum sp. n.

Figs 53, 54

Etymology: From Latin *tri-* (three-) and *lobatus* (lobed), and refers to the shape of the male postabdominal processes.

Diagnosis: Predominantly yellow species with 6 dark grey longitudinal stripes on scutum, rather longer setae and setulae, including those on gena, than in congeners, *fr* with 2 pairs of longer setulae, tarsomere 5 of all legs brown. Male postabdomen with three broad yellow lobes, easily visible without dissection and appearing to be part of same structure. However, when dissected these are *surs*, *prg* and tip of *ep*.

Description:

Male.

Head: Yellow, *ocp* dark brown except for broad yellow postocular margin and wedge-shaped area from vertex to neck, *oc* triangle black, *fr* broad but converging anteriorly so that at level of antennae it is about 0.7 as wide as at level of anterior *oc*, face small,

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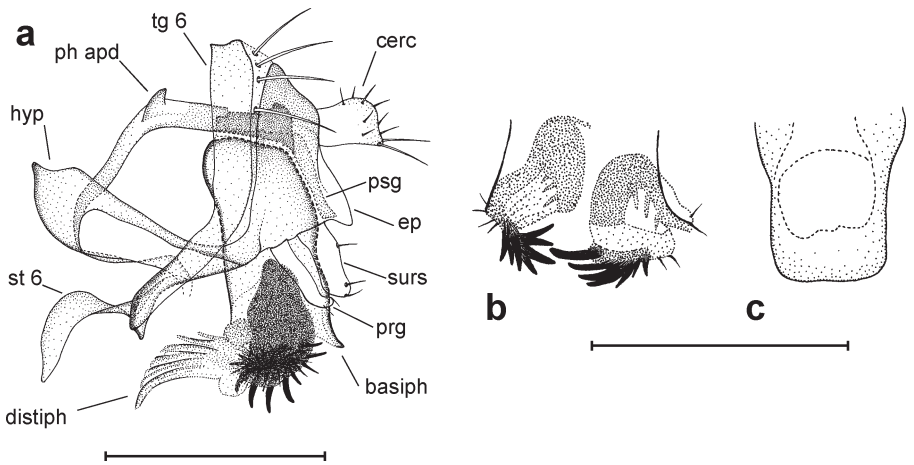

Fig. 53. *Aphaniosoma trilobatum* sp. n., ♂: (a) hypopygium, lateral, scale bar = 0.2 mm; (b) *distiph*, posterior; (c) *st* 6, ventral, scale bar = 0.15 mm.

depressed and with distinct, narrow but low facial carina, eye oval lying oblique, gena yellow, at middle about 0.5 height of eye and having numerous rather longer yellow setulae, 2 short setae at vibrissal corner, mouthparts yellow, 8 setulae on *fr* with 1 pair of longer setulae above lunule and another in front of *oc* triangle, 3 *orb* with 1 short setula in front, 1 *vti* and 1 *vte*, *pvt* distinct and convergent, ocellars long, divergent, antenna yellow, most of second segment of arista dark.

Thorax: Scutum and *scut* with yellow ground but with 6 dark grey longitudinal stripes on scutum, middle pair confluent anteriorly, *scut* a little pale brownish on disk, *mtn* brown, *pprn* and *ntpl* yellow, pleura mostly yellow except for a brown patch on anterior and lower part of anepisternum and an inverted dark grey triangle on each lower part of katepisternum and meron, base of haltere black. Chaetotaxy: 1 *pprn*, 2 *posthu*, 1 strong *ihu*, 2 *ntpl*, 0+4 *ia*, 2+5 *acrs*, 3+4 *dc* only the posterior one well-developed, *prpl* short, 1 *pa*, 2 pairs of marginal *scut*, 1 katepisternal with shorter seta in front and several setulae on anterior part of sclerite, 1 anepisternal, all setae pale brown and rather longer than those in other species described in this article.

Wing: Hyaline and uniformly microtrichose, veins pale brown, distance between R_{2+3} to R_{4+5} on costal margin about 0.4 that between R_{4+5} and M_{1+2}, distance between crossveins about 1.3× length of posterior crossvein and length of apical section of Cu about 2.3× length of posterior crossvein. Haltere yellow.

Legs: Yellow and fine yellow setulose, tarsomere 5 of all legs brown.

Abdomen: Brown with narrow, pale yellow hind margins to all *tg*.

Postabdomen: Yellow with brown *ep* spot above and lateral to *cerc* and with distinctly visible large yellow trilobed *surs*.

Female.

As male, but without secondary sexual characters. Postabdomen: *tg* 7 divided, *st* 7 elongate oval with setulae only at apex; *tg* 8 and *st* 8 each divided into small sclerites laterally; *hypr* not identified.

Length: ♂ body 1.1 mm, wing 1.2 mm; ♀ body 1.5 mm, wing 1.6 mm.

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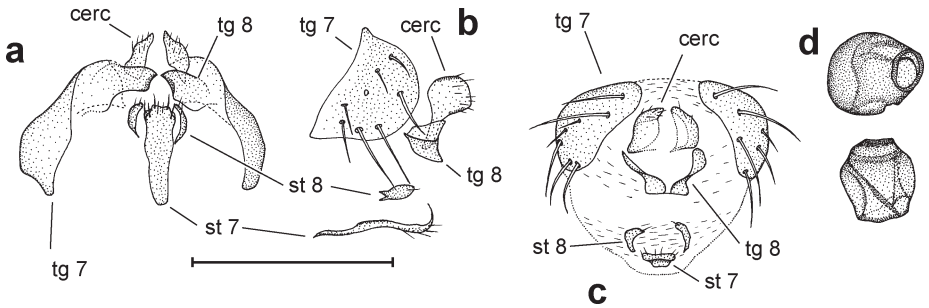

Fig. 54. *Aphaniosoma trilobatum* sp. n., ♀ postabdomen: (a) ventral, (b) lateral, (c) posterior, (d) spermathecae. Scale bar = 0.15 mm.

Holotype: ♂ NAMIBIA: Walvis Bay, alt. 5 m, 22°60'S:14°28'E, 6.ix.2003, A. Freidberg (TAUI).

Paratypes: NAMIBIA: 5♂ 7♀ same data as holotype (TAUI); 1♂ 1♀ Lüderitz, alt. 20 m, 14.ix.2003, A. Freidberg (TAUI); 1♀ Gobabeb, Kuseib R., 23°34'S:15°03'E, 5.ix.2003, attacked by Laboulbeniales, A. Freidberg (NMWC); SOUTH AFRICA: *Western Cape*: 1♂ De Hoop Nature Reserve, alt. 0–200 m, 34°27'S: 20°25'E, 10–13.x.1994, R. Danielsson (MZLU).

Aphaniosoma ugabensis sp. n.

Fig. 55

Etymology: The species name is derived from the type locality, Ugab River in Namibia.

Diagnosis: Almost entirely yellow species with 2 pairs of long setulae on *fr*, only dark areas are small rectangular patch at anterior end of scutum just above occipital foramen and on metanotum. There are no external features to help in the identification of this species. Male postabdomen with long narrow pointed *psg* and short truncate *prg*; *surs* reduced to an inconspicuous lobe; pregential *st* with distinct midline ventral projection.

Description:

Male

Head: Entirely yellow, only ocelli ringed with black, *fr* broad, converging anteriorly so that at level of antennae it is about 0.7 as wide as at level of anterior *oc*, face small, depressed (carinal area not visible), eye narrow, oval, lying oblique, gena yellow, shrivelled, probably about half height of eye and having numerous yellow setulae, setae at vibrissal corner not seen, mouthparts yellow, 4 setulae on *fr* with 2 pairs of longer setulae, one above lunule and one in front of *oc* triangle, 2 short *orb* and in front of these 2 very short fine setulae,1 *vti* and 1 *vte*, *pvt* distinct and convergent, *oc* long, divergent, antennal segment 3 yellow, arista dark brown on apical 2/3 of segment 2 of arista.

Thorax: Scutum and *scut* yellow with pale brown longitudinal stripes on posterior half of scutum and brown patch on extreme anterior scutum above neck, *mtn* dark brown, pleura yellow. Chaetotaxy: 1 *pprn*, 1 *posthu*, 1 *ihu*, 2 *ntpl*, 0+3 *ia*, 2+3 *acrs*, 3+4 *dc* only the posterior one well-developed, *prpl* not seen, 1 *pa*, 2 pairs of marginal *scut*, 1 katepisternal, 1 anepisternal, all setae pale, with shorter ones and setulae inconspicuous.
Wing: Hyaline and uniformly microtrichose, veins yellow, distance between R_{2+3} to R_{4+5} on costal margin about 0.5 that between R_{4+5} and M_{1+2}, distance between crossveins about equal to length of posterior crossvein and length of apical section of Cu about 3× length of posterior crossvein. Haltere yellow.

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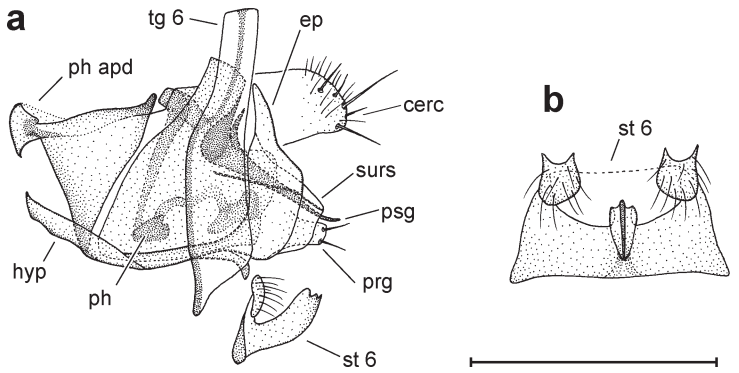

Fig. 55. *Aphaniosoma ugabensis* sp. n., ♂: (a) hypopygium, lateral; (b) *st* 6, ventral. Scale bar = 0.15 mm.

Legs: Yellow and fine yellow setulose, tarsomere 5 of anterior leg brown.

Abdomen: Yellow on all *tg*.

Postabdomen: Yellow with no distinctive external features.

Female.

As male, but several specimens have the middle third of femora diffusely infuscated dorsally. (Postabdomen not dissected.)

Length: ♂ and ♀ body 1.2 mm, wing 1.4 mm.

Holotype: ♂ NAMIBIA: Omaruru District, Ugab R., 2 km W Brandberg Wes, 20°58'05"S:14°06'36"E, 23.x.1998, sweeping, E. Marais (in glycerine, NMNW).

Paratypes: 2♂ 8♀ same data as holotypes (in alcohol, NMNW).

Remarks. The holotype is not in good condition due to some shrivelling and broken setae.

Genus **Krifomyia** gen. n.

Type species: *Rhicnoessa minutissima* Bezzi, 1908: 200, here designated.

Etymology: From Greek *krifos* (secret, secluded) and *myia* (fly), and refers to the genus being rare and unobtrusive.

Diagnosis: Well-developed, broad facial carina extending from lunule to just below antennae where it broadens laterally leaving antennae in deep pits; head short with rather inflated *fr* that has parallel margins and which, in profile, is visible all along eye margin from vertex to antenna, gena higher than height of eye which, in profile, is round to oval and small relative to head size, when compared to other genera; *pvt* present, *ihu* minute, *posthu* short, *sa* and katepisternal setae absent, veins R_{4+5} and M_{1+2} converging slightly towards apex, apicoventral seta on mid tibia present.

Description:

Head: Rectangular in profile and almost twice higher than long; *fr* broad and parallel-sided, protruding above and in front of eye margin when seen in profile; finely setulose; gena deep, at middle equal to or greater than height of eye and with wide post genal dilation; fine pale setulose, postgenal seta absent; face long with very broad carina extending from lunule to just below antennae, where it widens; thus, antennae lie in deep fossae, with segments 1 and 2 very short, segment 3 rounded except for shallow dorsal

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excavation near insertion of arista; arista with 3 segments and shorter than usual for the family; 2 short reclinate *orb*, 1 *vti* and 1 *vte*, both shorter than usual for this family, *oc* setae divergent, *pvt* minute and parallel, sometimes absent, few postocular setulae in one row; mouthparts all yellow, well-developed with long proboscis, geniculate labella and narrow elongated palp.

Thorax: A little shorter and broader than usual for the family. Chaetotaxy: 1 short *pprn* and 1 short *posthu*, a minute but distinctly incurved *ihu*, 2 *ntpl*, 1 *pa*, 1 short *post ia*, 1 *dc*, *acrs* very short and in more than 2 irregular rows, 1 anepisternal closer to upper margin; absent *sa* and katepisternal setae; *scut* with 1 pair basals and 1 pair subapicals, all about as long as *dc*.

Wing: Hyaline, veins very pale yellow, only Cu along discal vein a little darkened; RM stem vein thickened; anal cell pointed apically along anal vein; costal setulae all fine and pale; R_{2+3} and R_{4+5} very slightly divergent. Haltere yellow with creamy white knob.

Legs: Entirely dull yellow with short pale setulae, only claws darkened; apicoventral seta of mid tibia present and longer than diameter of tibia at apex; legs without dilated segments or special modifications.

Abdomen: All *tg* normally sclerotized and with a few very fine setulae scattered thinly on all segments, but on *tg* 6, which is as long as *tg* 5, stronger and more numerous setulae present.

Postabdomen: Male hypopygium very small with reduced appendages, short *ph apd* and markedly simplified *ph* compared to the rest of the family. Female abdomen with 8 segments, sclerotized *st* 8; 2 unpigmented *s*.

Remarks. This genus belongs to the Aphaniosominae because of the following combination of characters: absent incurved lower *orb*, concave *ocp*, long apicoventral seta on mid tibia, anepisternal seta above middle of posterior margin, incurved *ihu* setula, absent hemispherical *ep*. With *Paraphaniosoma* it shares the *post ia* seta and more than two rows of scutal setulae between *dc* lines. However, it differs in the much simplified hypopygial structures, absent *sa* and katepisternal setae, markedly different shaped head, well-developed proboscis and in the wing having the costal vein with spinescent setulae and a thickened *hu* crossvein.

Distribution: Atlantic coast of southern Africa (Namibia) (Fig. 70).

Ecology: *Krifomyia*, known from a single species so far, is rare and by all accounts a rather cryptic inhabitant of hot dry coastal regions.

Krifomyia minutissima (Bezzi, 1908), **comb. n.**

Figs 56, 57

Rhicnoessa minutissima: Bezzi 1908: 200.

The type material consists of 1♂ and 1♀ from Namibia, both in poor condition, preserved together in 70% alcohol. The male was partially dissected by Munari (Munari 1994) who was the first to recognize that this species did not belong to the Tethinidae (now a subfamily of the Canacidae), but to the Chyromyidae. The head of the male was separated from the body, as were a wing (the other missing) and the abdomen. The thorax has one of each of the fore, middle and hind legs, the rest are missing. The

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abdomen is squashed and partly macerated. The female is badly shrivelled, but retains most of its parts. Nevertheless, there are sufficient discernible characters to allow me to confidently assign to this species a number of specimens collected more recently, also from Namibia, which are better preserved. The descriptions and drawings are based on these specimens.

Redescription:

Male.

Head: All yellow; in profile rectangular and almost twice higher than long; *fr* broad and parallel-sided, about 3× width of eye viewed from in front, protruding above and in front of eye margin viewed in profile; with about 10 short and fine setulae scattered on it; eye oval, gena deep, at middle equal to or greater than height of eye and with wide postgenal dilation; several short fine pale setulae scattered over lower part, postgenal seta absent; face with very broad carina extending from lunule to below antennae, leaving from this level to buccal margin a relatively large rectangular sclerotized area; antenna in deep fossa, segments 1 and 2 not visible, segment 3 rounded except for shallow dorsal excavation near insertion of arista; arista with 3 segments, a little shorter than is usual for this family, first 2 segments and base of segment 3 pale; 2 short reclinate *orb* and one fine setula in front, 1 *vti* and 1 *vte*, both shorter than is usual in this family, *oc* setae divergent, *pvt* minute and parallel, sometimes absent, few postocular setulae in one row; mouthparts all yellow, well-developed with long proboscis, geniculate labella and narrow elongated palp.

Thorax: Yellow, often with longitudinal pale brown scutal stripes, pleura always yellow. Chaetotaxy: *scut* yellow dorsally but with dark spot laterally at base continuous with a dark brown line along entire lower border of *scut*; 1 short *pprn* and 1 short *posthu*, a minute but distinctly incurved *ihu*, 2 *ntpl*, 1 *pa*, 1 short *post ia*, 1 *dc*, scutal setulae very short and fine in 4–6 irregular rows, 1 anepisternal closer to upper margin; absent *sa*

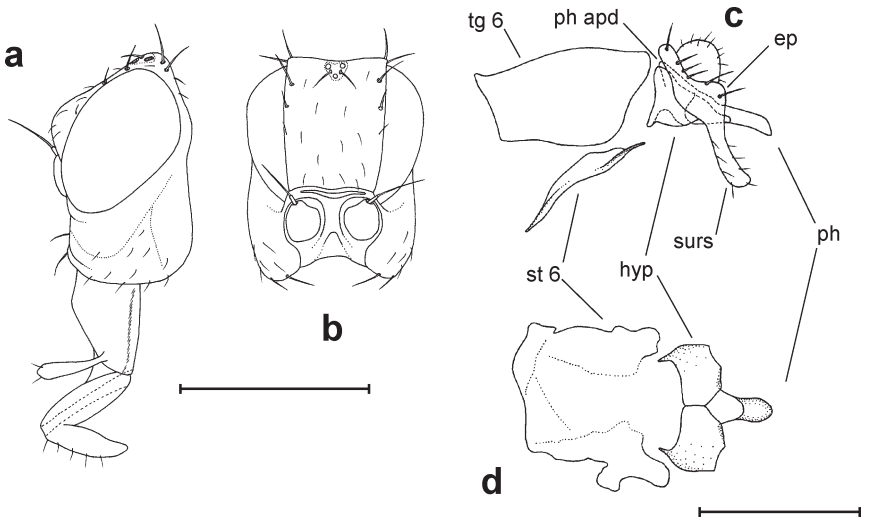

Fig. 56. *Krifomyia minutissima* (Bezzi), ♂: (a, b) head, lateral (a) and anterior (b), scale bar = 0.4 mm; (c, d) hypopygium, lateral (c) and ventral (d), scale bar = 0.05 mm.

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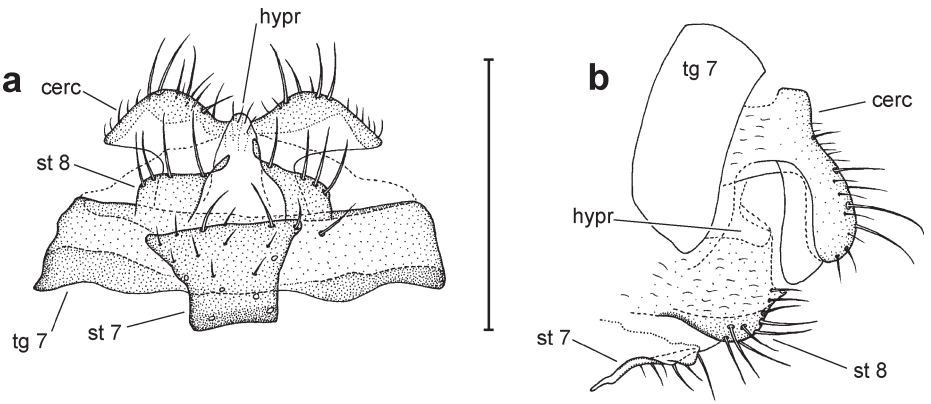

Fig. 57. *Krifomyia minutissima* (Bezzi), ♀ postabdomen: (a) ventral, (b) lateral. Scale bar = 0.15 mm.

and katepisternal setae; *scut* with 2 pairs of marginals, basals and subapicals all about as long as *dc*.

Wing: Hyaline; veins very pale yellow, only Cu along discal vein a little darkened; RM stem vein thickened, anal cell pointed apically along anal vein; costal setulae all fine and pale. Haltere yellow with creamy white knob.

Legs: Entirely dull yellow with short pale setulae, only claws darkened; apicoventral seta of mid tibia present and longer than diameter of tibia at apex; legs without dilated segments or special modifications.

Abdomen: All *tg* with brown dorsal bands, leaving hind and lateral margins pale yellowish white; a few very fine setulae scattered thinly on all segments, but segment 6, which is as long as segment 5, has stronger and more numerous setulae.

Postabdomen: Very small and poorly sclerotized except for margins of *hyp*; *ep* poorly developed, but complete dorsally; *cerc* minute, translucent and very finely setulose; *surs* elongate, fused with *ep* and finely setulose; *ph* sclerotized but simple, almost tubular; *ph apd* very small and indistinct, only anterior apex sclerotized, gonites and *ej apd* could not be identified.

Female.

Very similar to male. All abdominal segments with midline sclerites. Postabdomen: *tg* 7 complete; *st* 8 sclerotized with small posteromedial lobe and setae ventrally; *hypr* small oval with fine setulae apically; *cerc* in proportion to adjacent structures rather large and setose apically.

Length: ♂ and ♀ body 1.3 mm, wing 1.2 mm.

Variation: Presence and colour of scutal stripes variable, number of setulae on *fr* and *acrs* a little variable, otherwise all specimens examined are remarkably similar.

Type material examined: syntypes NAMIBIA: ♂ "Klein Namaland, SW Africa, leg. Shultz (Humbolt)" (ZMHB); 1♀ same data (ZMHB).

Other material examined: NAMIBIA: 1♀ Lüderitz District, Agate Beach, 10 km N Lüderitz, alt. 3 m, low coastal vegetated dunes, 18.ii.1974, M.E. & B.J. Irwin (NMSA); 6♀ Skeleton Coast Park, Unjab R. Delta, 20°11'S:13°13'E, 18–26.vii.1990, C.S. Roberts, pitfall traps (NMWC); 1♂ Lüderitz District, [missing locality] 27°34'S:15°28'E, 15–25.xi.1993, E. Marais, pitfall traps (in glycerine, NMWC); 1♂ 3♀ same data (in alcohol, NMNW); 1♀ Walvis Bay, alt. 5 m, 22°60'S:14°28'E, 6.ix.2003, A. Freidberg (TAUI).

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Genus **Paraphaniosoma** gen. n.

Type species: *Aphaniosoma sexvittata* Lamb, 1914, here designated.

Etymology: From Latin *par* (like) and *Aphaniosoma*, the genus which it resembles.

Diagnosis: Separation of genus from *Aphaniosoma* is easy on basis of well-developed *pra* and *post ia* setae, scutal setulae in six or more rows between *dc* lines, only one strong *dc* and reduced or absent *pvt*. As in *Aphaniosoma*, strong apicoventral seta present on mid tibia, longer than diameter of tibia at apex.

Description:

Head: Margins of *fr* converge anteriorly; *ocp* concave, gena much narrower than height of eye; 1–5 *orb* reducing in size from back to front, all reclinate; 1 strong *vti* and 1 strong *vte*, *pvt* absent or minute and inconsistently present within a species; mouthparts normal; antenna as for the rest of the family, but arista 2-segmented.

Thorax: Appears somewhat elongated, a little less arched and usually with distinct longitudinal stripes on scutum. Chaetotaxy: 1 to 2 *pprn*, 1 *ihu*, 1 *posthu*, 2 *ntpl*, 1 *pra*, 1 *sa*, 1 *pa*, 1 *post ia*, 0+1–2 *dc*, scutal setulae in 4–8 rows with long *prscut*, 1 anepisternal at top of posterior border, 1 katepisternal at upper hind corner, no *prpl*; scut with basal and subapical pair.

Wing: Hyaline; crossveins and vein separating discal from basal cell translucent; R_{4+5} and M_{1+2} parallel or nearly so. Haltere without special modifications.

Legs: Normal, with no special modifications, mid tibia ventrally at apex with strong seta.

Abdomen: 6 visible *tg* in male, 7 or 8 in female; in both sexes, *tg* more or less uniformly short setulose.

Male postabdomen of the *Aphaniosoma s. str.* type, i.e., a small, partly internalized *ep* and markedly modified gonites and pregenital *st*. Female postabdomen with large *tg* 7, *cerc* separated from segment 8, which has a pair of sclerotized *st* plates.

Distribution: East Palaearctic, Afrotropical (Fig. 70), Oriental, ?Australasian. Most species are undescribed.

Ecology: Little is known about this genus, but the few records for *Paraphaniosoma* seem to be mainly from coastal and estuarine localities in hot tropical and subtropical climates. As more species undoubtedly will be discovered, this postulation could change.

Paraphaniosoma sexvittatum (Lamb, 1914), **comb. n.**

Figs 58, 59

Aphaniosoma sexvittata: Lamb 1914: 356.

The original description of *P. sexvittatum*, although accurate, lacks detail and would not satisfactorily differentiate this species from other undescribed species I have seen from the East Palaearctic and Oriental regions (Papua New Guinea, Malaysia, Taiwan). Therefore, a more detailed redescription is provided with figures of the male and female postabdomen.

The detailed description of the characters given by Lamb (1914), and the characters given in the key to genera provided in this article, serve to identify this species with relative ease. Additional characters and illustrations are given below, based on more material of this species from Aldabra (Seychelles).

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Redescription:

Male.

Head: Yellow, *oc* triangle yellow, but ocelli ringed with black; *ocp* brown except for broad postocular margin; *fr* narrow, at level of anterior *oc* about 0.4 width of head and at level of antennae about 0.6 width of that at level of anterior *oc*; eye elongate oval, lying oblique. Chaetotaxy: 2 reclinate *orb* with 3 short pale setulae in front, 1 *vti* and 1 *vte*, minute *pvt* (absent in some specimens); ocellars long and divergent with pair of short setulae behind these in between posterior ocelli; 14 setulae scattered on *fr*, but 6 of these in front of *oc* triangle about as long and strong as anterior *orb*; postoculars in one row; gena pale yellow and very pale yellow setulose with stronger setulae on oral margin, gena at middle about 0.5 highest diameter of eye; mouthparts yellow, palpus narrow; face mostly membranous with a very thin and shallow facial carina; antenna yellow, second segment paler with very thin short and pale dorsal seta; arista all brown, bare.

Thorax: Yellow, paler on pleura, scutum with 6 longitudinal dark brown stripes all separated from each other and from a brown patch at anterior end of scutum; middle stripes run from just anterior to transverse suture to *scut*, lateral to these and from behind transverse suture, a stripe runs between *dc* and *ia* lines of setulae on each side and another between *sa* and *ia* rows; a brown tiangular spot lies medial to *pprn* and confluent or narrowly separated from anterior dark scutal patch; anepisternum with brown streak at its lower margin and anepimeron with brown streak at its anterior margin, *mtn* brown, *scut* mostly yellow except for broad pale brown patch on disc and dark brown spot on sides at base. Chaetotaxy: 2 *pprn*, 2 *ntpl*, 1 *posthu*, 1 short *ihu*, 1 *pra*, 0+2 *dc* (anterior one short), 1 short *sa*, 1 long *pa* and 1 long *post ia*, scutal setulae in 4–6 irregular rows between *dc* lines, with stronger *prscut* pair, *scut* with basal and subapical pair, 1 anepisternal at upper hind margin and 1 katepisternal at upper hind corner.

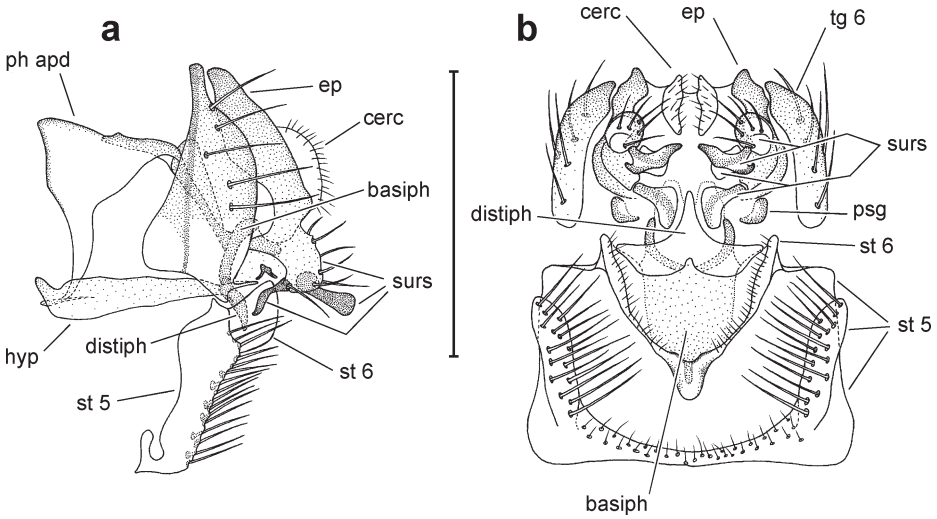

Fig. 58. *Paraphaniosoma sexvittatum* (Lamb), ♂ hypopygium, lateral (a) and ventral (b). Scale bar = 0.2 mm.

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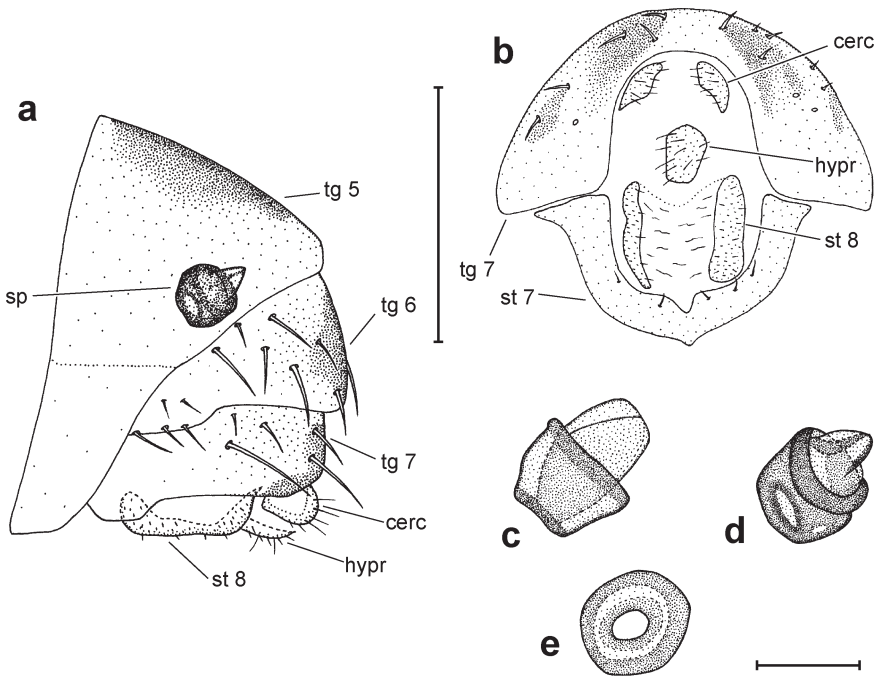

Fig. 59. *Paraphaniosoma sexvittatum* (Lamb): (a, b) ♀ postabdomen, lateral (a) and ventral (b), scale bar = 0.15 mm; (c–e) spermatheca, lateral (c), oblique (d), anterior (e), scale bar = 0.04 mm.

Wing: Hyaline with pale brown veins; R_{2+3} somewhat undulating at middle, R_{4+5} and M_{1+2} parallel and on costal margin separated by a distance equal to half distance between R_{4+5} and M_{1+2}; crossveins and vein between discal and basal cell translucent pale yellow, distance between crossveins equal to 1.2× length of posterior crossvein. Haltere yellow with paler knob.

Legs: Yellow and pale brown setulose, hind trochanter normal, claws and pulvilli normal, mid tibia with strong ventral seta at apex. I cannot make out any row of short spines on the top of the front femora as described by Lamb (1914).

Abdomen: *tg* dark brown, dull with brown dusting, *tg* 5 with dorsal elongated quadrate brown spots, otherwise yellow; setulae brown to black about half length of *tg*.

Postabdomen: *tg* 6 narrow and brown, *cerc* very small, narrow and pale, pregenital *st* broad with deep excavation fringed with dense long pale setulae, *surs* visible in this space as 2 short black sinuous projections.

Female.

As male, but *tg* 6–8 each with 2 brown almost triangular spots narrowly separated at middle. Postabdomen: *tg* 7 complete and *st* 7 thinly sclerotized; *tg* 8 in two small lateral sclerites; *st* 8 larger than *tg* 8 and microtrichose; *hypr* distinct, trapezoidal and of similar size to small *cerc*, both structures with fine setulae.

Length: ♂ and ♀ body 1.5 mm, wing 1.5 mm.

Type material examined: SEYCHELLES: ♂ (holotype) "Mahé 08-9, Seychelles Exp. / Prof. J.S. Gardiner 1914-537 / *A. sexvittata* Lamb [handwritten] / Type H.T." [on a red bordered label] (BMNH); 3♀ (paratypes)

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same data (1♀ BMNH, 2♀ CUMZ). Note: The holotype is in a reasonable condition: the pin damages only a part of the right half of the thorax. It has "spec 120" written on the mount.

Other material examined: MAURITIUS: 1♂ Wolmar, 1–2 km S, coast roadside, 1.vi.2000, J.W. Ismay (OXUM). SEYCHELLES: 1♀ Aldabra, West I., at light, nr settlement, 30–31.i.1968, B. Cogan & A. Hutson (NHML); 3♂ 3♀ Aldabra, West I., at light, nr settlement, 21–31.iii.1968, B. Cogan & A. Hutson (NHML); 1♀ Seychelles, North I., *Calophyllum* (Clusiaceae) woodland, 30.vii.2000, Malaise trap, J. Gerlach (NMWC).

Distribution: Mauritius, Seychelles.

Genus **Tethysimyia** gen. n.

Type species: *Aphaniosoma deemingi* Ebejer, 1996, here designated.

Etymology: From the Greek name *Tethys* (the sea goddess in mythology) and *myia* (fly), denoting the affinity of this genus with seashore habitats.

Diagnosis: Very small pale flies with rather large round head or head higher than long, very broad gena, well-developed, but narrow facial carina not reaching buccal margin, thus lower part of face between anterior eye margins flat, more or less square and carina therefore less conspicuous than in *Krifomyia*; recessed antenna, but not in deep fossa; chaetotaxy generally reduced and fine, 2 very short *orb* set high on *fr*, 1 *dc*, scutal setulae in 4–10 rows between *dc* lines, absent *pra* and *sa* setae, but *post ia*, *pa* and katepisternal present even though short; R_{4+5} and M_{1+2} slightly convergent; male postabdomen exceptionally small with dorsally narrow, complete epandrium; female with poorly sclerotized *s*, pigmented or unpigmented.

Description:

Head: More or less round and rather large in proportion to thorax, *fr* broad and moderately convex and protruding in front of eye margin, eye round or only slightly oval, gena broad, at least half height of eye, finely setulose, *ocp* concave though not quite as much as in *Aphaniosoma*, face poorly sclerotized with distinct carina in upper half between antennae, antennae small with third segment rounded, arista 2-segmented, about twice as long as rest of antenna, thickened at base, but rapidly becoming thinner, mouthparts small, palp minute oval and finely setulose, labella not elongated, setulae along buccal margin, including those at vibrissal corner, short and fine. Chaetotaxy: 0–3 very short *orb*, 1 *vti* and 1 *vte* both short, *pvt* minute or absent.

Thorax: Rather rounded, not elongated, *scut* of normal shape. Chaetotaxy: 1 *pprn*, 1 *posthu*, *ihu* present or absent, 2 *ntpl*, 1 *dc*, scutal setulae very fine and pale in 4–8 rows between *dc* lines, *pra* and *sa* absent, 1 *post ia*, 1 *pa*, 1 anepisternal, 1 katepisternal, anepisternal and katepisternal setulae scanty and extremely fine or minute, *scut* with usual 4 marginals.

Wing: Hyaline, relatively short and broad, veins very pale yellow, *hu* break present, subcosta merges with R_1 before latter joins costa, no erect spinose setulae on dorsal aspect of costa, R_{4+5} and M_{1+2} slightly convergent towards apex. Haltere short, pale with pale knob.

Legs: Slender, femora not dilated, segments of all legs pale and finely setulose, mid tibia with apicoventral seta longer than diameter of tibia at apex, hind metatarsus sometimes dilated, hind trochanter normal.

Abdomen: More or less oval and slightly dorsoventrally compressed, 6 segments in male and 7 in female, *tg* with fine setulae, *st* poorly sclerotized.

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Postabdomen: Atypical for Aphaniosominae and closer to that of *Krifomyia*, with reduced modification of hypopygial structures, which are simple and partially within small *ep*; *ep* distinct from *tg* 6 and *surs* fused to it, apparently formed of extension of inferior margin.

Distribution: Coasts and islands of the Gulf of Mexico, Red Sea (Fig. 70), Indian and Pacific oceans.

Ecology: Probably associated with saline marshes and mangroves in coastal localities, in hot, tropical and subtropical climates.

Tethysimyia deemingi (Ebejer, 1996), **comb. n.**

Figs 60, 61

Aphaniosoma deemingi: Ebejer 1996: 289.

This small species was described from a female taken in Oman. With additional specimens of both sexes now available, its distinctive characters may be better appreciated. The male is described and the postabdomen of both sexes is illustrated.

Description:

Male.

Head: Yellow, large and higher than long, *fr* broad with barely converging eye margins, antenna small and recessed, gena with numerous setulae and about as broad as height of eye, which is round, numerous *fr* setulae of equal length, 1 *orb* set far back and hardly longer than *fr* setulae, *pvt* minute.

Thorax: Yellow with faint deeper yellow longitudinal stripes on scutum. Chaetotaxy: numerous fine setulae over whole dorsal surface, 1 *pprn*, 1 short *posthu* which is a little less than twice length of adjacent setulae, 1 long *dc* and a shorter one in front, 1 short *prscut* pair of *acrs*, others not differentiated from general scutal setulae, *scut* with usual

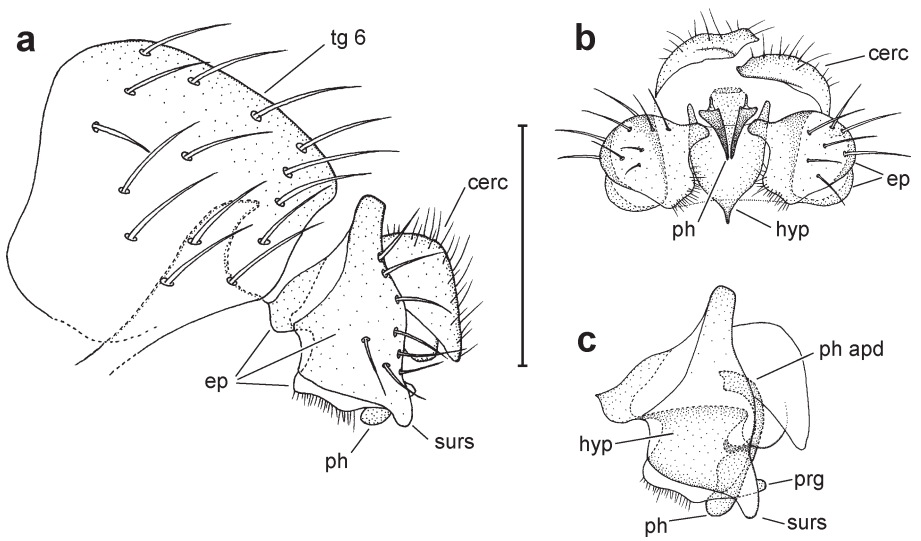

Fig. 60. *Tethysimyia deemingi* (Ebejer), ♂: (a) postabdomen, lateral; (b, c) hypopygium, ventral (b) and lateral (c). Scale bar = 0.15 mm.

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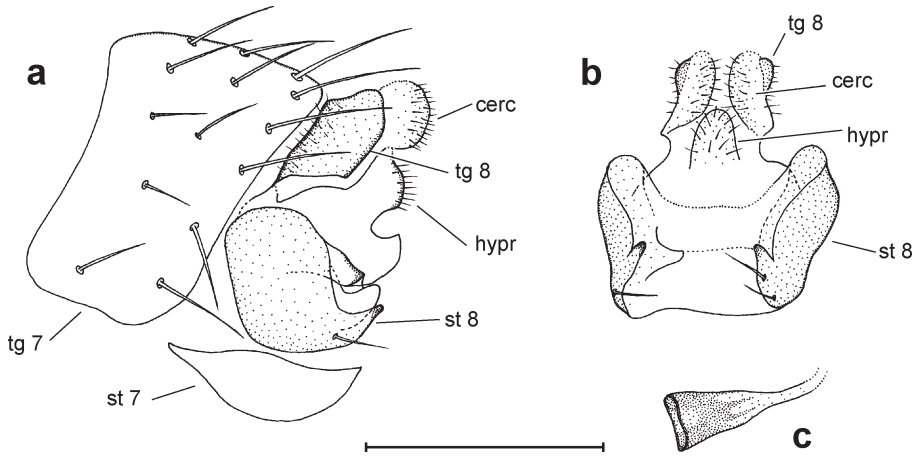

Fig 61. *Tethysimyia deemingi* (Ebejer), ♀ postabdomen: (a) lateral, (b) ventral, (c) spermatheca. Scale bar = 0.15 mm.

4 marginals, *prpl* setula absent (specimen pinned through sides, but in other specimens anepisternal seta present and katepisternal absent).

Wing: Translucent and slightly iridescent with broad anal margin; veins very pale yellow to white; R_{2+3} and R_{4+5} run more or less parallel to each other and distance between them on costa about 0.9 that between R_{4+5} and M_{1+2}, which converge towards apex; costa with stouter spine-like setulae and very few thin setulae; costa thinned out but not broken just beyond *hu* crossvein, subcosta vestigial, visible only as a fold. Haltere pale yellow.

Legs: Not dilated or modified, entirely pale yellow and short yellow setulose; tibia 2 with dark apicoventral seta.

Abdomen: Yellow with light brown bands on middle part of *tg* 2–5; very short setae on disc of *tg*, longer and stronger on *tg* 6; *st* largely membranous.

Postabdomen: Very small and inconspicuous in dry specimens; *tg* 6 longer than *tg* 5 when viewed from above, *ep* narrow dorsally, but broad laterally and ventrally such that most hypopygial structures lie within its boundaries; *cerc* relatively large and sclerotized with numerous and very fine setulae, *hyp* forming bridge between lower incurved margins of *ep*, *surs* in form of short lobe arising from posteromedial border of *ep*, *prg* very small, arising from posterior edge of *hyp*, *psg* not identified, *ph* simple with short narrow *ph apd*.

Female.

Similar to male in external characters. Postabdomen: *tg* 7 complete, *tg* 8 small and with minute setulae along anterior border; *st* 8 larger and with 2 setae at posterior border, ventrally; *hypr* distinct with fine setulae, *cerc* small and round; *s* poorly sclerotized, conical and with first part of duct thinly sclerotized.

Holotype (examined): OMAN: ♀ Dhofar, Khor Rouri [Khawr Rawri, 17°03'S:54°26'E], 12.xi.1992, J.C. Deeming (NMWC).

Other material examined: EGYPT: 1♂ Sinai, Taba, 1.v.1996, A. Freidberg (TAUI); 3♀ Sinai, Taba, 10 km S, 1.v.1996, I. Yarom (TAUI); 1♀ Sinai, Ras Umm Burqa', 1.v.1996, I. Yarom (TAUI). OMAN: 1♀ N Masirah Island, BERS Camp, 5–7.iii.1995, S.P. Dance (NMWC).

Distribution: Egypt, Oman.

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PHYLOGENY

The systematic position of the genera within the Chyromyidae is explored further with a cladistic analysis taking the Heleomyzinae as the outgroup taxon. D.K. McAlpine's proposal (McAlpine 2007) to categorize the Sphaeroceridae and Heleomyzidae into one family, the Hetermyzidae, and consequently alter their rank to subfamily, is not relevant to this analysis, for which I accepted the categorization of the Heleomyzinae as a subfamily. The Heteromyzidae (= Heleomyzidae and Sphaeroceridae) and the Chyromyidae share synapomorphic characters that justify retaining the latter family in closer phylogenetic proximity to the former rather than to any other acalyptrate family, but there are also characters that the Chyromyidae share with Ephydroidea and Opomyzoidea. However, the last two superfamilies have evolved autapomorphies (for example, several antennal characters, one proclinate *fr orb* seta, precoxal bridge present, short rigid *ph*) that distance them from the Chyromyidae. The few similarities have probably co-evolved, for example, spinose costa, absent pterostigma and reduction in spermathecae from three. At present, I find no reason to differ from the opinions of previous authors (D.K. McAlpine 1985; J.F. McAlpine 1989) that the Chyromyidae are closer to the Heteromyzidae.

This study of the African Chyromyidae uncovers more diversity than was hitherto appreciated, although many of the characters are not immediately obvious, particularly if low magnification microscopy is used. Some of these characters are present in the Heteromyzidae, though not uniformly so, and they may not all be homologous. For example, an incurved seta placed anteriorly on the *fr* vitta and not on the *orb* plate is found in *Elachisoma* Rondani, 1880 (Sphaerocerinae, Limosinini) and *Tapeigaster* Macquart, 1847 (Heteromyzidae, Tapeigastrinae), but this is not homologous with the incurved seta of Chyromyinae, which is inserted on the *orb* plate and therefore is a true *orb*. An anterior incurved seta on the scutum is present in *Thoracochaeta* Duda, 1918 (Sphaerocerinae, Limosinini) and in the Aphaniosominae, though it probably is not a homologous structure. I have called this the *ihu* seta and not a *dc* seta because it is not at all in line with the *dc* row. The anepisternal seta is always present in the Chyromyidae and it is found in *Fenwickia* Malloch, 1930 and *Waterhouseia* Malloch, 1936 (Heleomyzinae). The modified setulae of the anterodorsal aspect of the costa, found in many Heleomyzinae, are commonly also found in some Chyromyinae and rarely in Sphaerocerinae (*Elachisoma*). The costal break near the *hu* crossvein, though very rare in Heleomyzinae, is present in a number of species, e.g., *Diplogeomyza spinosa* McAlpine, 1967 (Australia), *Blaesochaetophora picticornis* Bigot, 1888 (Chile) and *Gephromyza* sp. (Chile). It is present in many Sphaerocerinae, and within the Chyromyidae, it is universally found in Aphaniosominae. Marshall and Richards (1987) state that the wing in Sphaerocerinae has costagial, *hu* and subcostal breaks. They illustrate examples. Rohácek (1998) repeats this statement and gives the same illustrations. I examined a number of species in a range of genera from all over the world and I find the *hu* vein is an unstable character (indeed, also so in the Chyromyidae), there being genera that include species with no break or with a complete break. Often there is a partial break, i.e., a narrowing and/or desclerotization, but no actual interruption. For example, *Lotobia moyoensi*s Vanschuytbroek, 1959 (Nigeria) has a complete break, *L. elegans* Vanschuytbroek, 1959 (Nigeria), a partial break, *L. elegans* Kim & Han, 1990 (Nigeria), no break. A break at the *hu* crossvein is absent also in *Copromyza fumipennis* Stenhammar, 1854

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(Pakistan), *C. kibokoensis* Vanschuytbroek, 1959 (Congo), *C. marginatis* Adams, 1905 (Oman), *Crumomyia glabrifrons* (Meigen, 1830) (France), and *C. nitida* (Meigen, 1830) (Sicily). A complete break is present in *Pterogramma* sp. (Malaysia) and *Sphaerocera* sp. (Yemen). A partial break is present in *Poecilosomella angulata* (Thomson, 1869) (Morocco).

I propose a closer affinity of the Chyromyidae with the Heteromyzidae than with the Ephydroidea. In this, I agree with J.F. McAlpine (1989). Since I found that many characters of the Chyromyidae are represented in one or other of the subfamilies of the Heteromyzidae, namely the Sphaerocerinae and Heleomyzinae, it was unclear to me which of these might be more closely related to the Chyromyidae. In a preliminary analysis, I used both as outgroup taxa and the Heleomyzinae consistently branched out closer to the Chyromyidae than did the Sphaerocerinae. The former was therefore chosen as the outgroup taxon for the cladistic analysis of the new subfamily and generic classification of the Chyromyidae proposed in this study.

The groundplan conditions of the Chyromyidae that I recognize are listed below:

(1) pale integument
(2) face desclerotized centrally below antennal foveae except for a linear vertical ridge
(3) true vibrissa absent
(4) *pvt* setae convergent
(5) two or more reclinate *orb* setae
(6) setulose *fr*
(7) second antennal segment not slit dorsally
(8) prosternum narrow with median groove
(9) one or more *dc* seta
(10) *posthu* seta well-developed
(11) two subequal pairs of *scut* setae
(12) one anepisternal and one katepisternal seta
(13) anepimeron and meron bare
(14) tibiae without preapical posterodorsal seta and without any developed setae along shaft
(15) metatarsus of anterior, middle and posterior legs of more or less equal length
(16) wing with costal break at R_1
(17) R_1 not dilated at junction with costa
(18) subcosta merging with R_1 close to junction with costa
(19) veins R_{2+3} and R_{4+5} convergent
(20) anal and posterior basal cells closed
(21) male abdomen with six and female abdomen with seven pregenital segments
(22) postabdomen symmetrical in both sexes
(23) female postabdominal segments barely extensile, *st* 8 divided and epiproct desclerotized
(24) two spermathecae
(25) male hypopygium with U-shaped *hyp*
(26) *surs*, *prg* and *psg* not fused with their respective basal hypopygial sclerites

The autapomorphies that characterize the Chyromyidae with respect to the Heteromyzidae are: a pale yellow integument; membranous face; vibrissa absent; wing with veins R_{2+3} and R_{4+5} convergent; dorsal preapical tibial seta absent; postabdomen symmetrical in both sexes; two spermathecae; articulated *surs*; *prg* and *psg*; and halophilous habits. Synapomorphies shared with the Heteromyzidae include: discoid third antennal segment; second antennal segment without dorsal slit; *orb* setae reduced to 2 or 3; subcosta

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reaching costa or merging with R_1 at junction with costa; subcostal break present; A_1 not reaching wing margin; *distiph* complex and enlarged; female postabdomen not or barely extensile.

The much greater diversity within the Heteromyzidae adds to the problem of interpreting the polarity of characters, although ultimately this would not affect the result of the cladistic analysis. For the purpose of this exercise, I have limited myself to relatively few and easily interpreted characters. I examined a limited number of species from a range of genera of Heleomyzinae and Sphaerocerinae from across the world, but for the Chyromyidae, I examined all the genera and, within each, a great majority of the species (several of them undescribed) from most zoogeographical regions (Table 2). Where I was unable to examine specimens, I did not rely on descriptions, as some of the chaetotaxic characters were either not mentioned or are subject to misinterpretation or at least to an interpretation different from mine.

The only genus, indeed the only species, of the Chyromyidae ever properly considered for phylogenetic study has been *Chyromya flava*. The other genera have not been considered in any detail and, with regard to the male and female postabdominal characters, have not been considered at all. At the very least, *Aphaniosoma* must now be taken into account as this significantly widens the concept of the Chyromyidae. *Aphaniosoma* B (Table 2) consists of those species with a strong presutural dorsocentral seta and other defining features that possibly justify raising this group to generic status. The cladistic analysis reported in this article lends support to this. However, this requires further investigation and is beyond the scope of the present study, as several more species awaiting description are known to me.

For each character assessed within the Chyromyidae, I accepted only 100 % concordance among all the species examined within each genus, with one exception. In *Gymnochiromyia*, a presutural *dc* seta is found in a minority of species. This being the only character state that I found to be at odds with the remaining characters of the genus, I considered it a reversal when present. The interpretations of the character states are listed below. The numbering starts at zero to match the first character as it appears on the cladogram generated by the program TNT. Cladistic analysis was performed using TNT version 1.1 (Goloboff *et al*. 2008). This program is made available for use by the Willi Hennig Society (http://www.zmuc.dk/public/phylogeny/TNT; downloaded 15.iii.2008).

Character 0. Concave *ocp*. Across the order, and particularly in the Heleomyzinae, a convex *ocp* is the usual form. Therefore, I consider a concave *ocp* an apomorphy within the Chyromyidae.

Character 1. Postgenal seta. This small seta or setula lies posteroventrally on the inferior aspect of the *ocp* region of the head. It is a subtle character in the Chyromyidae because of their small size. It is rarely mentioned in descriptions of other acalyptrates. Nevertheless, it is widespread and common in many families. I consider its loss in some Chyromyidae an apomorphy.

Character 2. Incurved lower *fr-orb*. A very few Sphaerocerinae exhibit this character state (seta on the *fr* vitta), but I consider it a homoplasy rather than a homology with the character state (seta on the *orb* plate) in the Chyromyinae (in which taxon it is universal). I consider it an apomorphy in the Chyromyidae, it being even more unusual in the other acalyptrates.

Character 3. *orb* reduced to setulae or absent. Having well-developed *orb* is the usual character state in the great majority of acalyptrates. Wherever a loss or reduction occurs, often with loss or reduction of other somatic setae, it is considered to be an apomorphic state.

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Character 4. Pair of long *fr* setae. This pair of usually divergent setae is placed in the middle of the *fr* in front of the *oc* triangle. It appears sporadically in a number of genera in several families of the acalyptrates. I consider it an apomorphy within the Chyromyidae as it appears in only one species group.

Character 5. Disc of *ocp* bare. Here, I refer to the space on the *ocp* between the postocular row(s) of setae or setulae and those situated strictly along the margin of the *ocp* foramen. This character is common in the Heleomyzinae and Sphaerocerinae, as well as in many other acalyptrates. I therefore consider this absence of setae within the Chyromyidae an apomorphy.

Character 6. *pvt* setae reduced to setulae or absent. Across the whole suborder, the usual character state is the presence of *pvt* setae. Their absence, being also uncommon within the Chyromyidae, confirms their apomorphic state.

Character 7. Well-developed facial carina. Although this character state appears in a number of genera within a range of families of the acalyptrates, it is not the norm. A tendency to form a shallow carina is common within the Chyromyidae, but its marked development in some cases suggests this is an apomorphy.

Character 8. Absent vibrissa. The loss of the vibrissa is uncommon in the Schizophora and in the Chyromyidae this is an apomorphy relative to the outgroup.

Character 9. Costa with a complete *hu* break. This character is often found in the Sphaerocerinae, but rarely in the Heleomyzinae. It is an apomorphic state in the Schizophora. Within the Chyromyidae, it occurs in the four genera of Aphaniosominae, but is rare and incomplete in the Chyromyinae. I consider it an apomorphy within the family.

Character 10. Spine-like setulae on costa. These are common in the Heleomyzinae and rare in the Sphaerocerinae. They are a feature of the Chyromyinae, but not the Aphaniosominae. I consider them to be synapomorphic for the Chyromyinae and Heleomyzinae.

Character 11. R_{2+3} and R_{4+5} convergent. The convergence of these two longitudinal veins is an apomorphy.

Character 12. R_{4+5} and M_{1+2} divergent. Although this is the norm in acalyptrates, I consider it to be possibly an apomorphy within the Chyromyidae (a reversal?).

Character 13. Absent presutural *dc* seta. This is an apomorphy among the higher Diptera. In *Gymnochiromyia* it is most often absent and I consider its presence in the minority of species a reversal.

Character 14. *prsut ia* seta. This is not the same seta referred to by Rohácek (1998) as synonymous with the *posthu* seta in the Sphaerocerinae. In the Chyromyidae, all species have a true *posthu*. The true *prsut ia*, when it occurs, is inserted medially and slightly posterior to the *posthu*. This is a reversal among the higher Diptera especially among the acalyptrates. Therefore, in the Chyromyidae it is likely an apomorphy.

Character 15. Lost or reduced *post ia* seta. A *post ia* seta is present in most Sphaerocerinae and Heleomyzinae. Its loss in the Chyromyidae is an apomorphy.

Character 16. Absent postsutural *pra* seta. This seta is very common in many higher Diptera. I consider its loss in most Chyromyidae an apomorphy, but equally it could be considered a reversal, given its presence in only two genera.

Character 17. Absent *sa* seta. A seta in this position is a very widespread character in the Diptera. I consider its loss within the Chyromyidae an apomorphy.

Character 18. *scut* setae reduced to 2 pairs of marginals is the plesiomorphic state in the acalyptrates. The increase in number in a few genera of the Chyromyinae, and also in a few genera of Heleomyzinae and Sphaerocerinae, suggests that the presence of more than two pairs is apomorphic.

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Character 19. Absent setulae on disc of *scut*. This is probably an apomorphy among the higher Diptera and within the Chyromyidae. These setulae are not of the same structure as very short setae.

Character 20. *acrs* setulae in 2 rows. While there is a very wide range of states among the acalyptrates, from a completely bare to a densely setulose scutum, at least in comparison to the outgroup taxa, reduction to two rows of setulae appears to be an apomorphy.

Character 21. Absent *prpl* seta/setula. An apomorphic state among the acalyptrates.

Character 22. Absent anepisternal seta. An apomorphic state among the acalyptrates; absent in most genera of the Heleomyzinae and in almost all Sphaerocerinae.

Character 23. Absent katepisternal seta. This seta is most often present in higher Diptera. I consider its loss among the acalyptrates and within the Chyromyidae an apomorphic state.

Character 24. Dilated femora. This feature occurs sporadically across a wide range of acalyptrates. I consider it an apomorphic state among the Chyromyidae.

Character 25. Mid tibia with reduced or absent apicoventral seta. A majority of Diptera in all families have one or more such setae. Their absence is an apomorphy.

Character 26. Tibia without dorsal preapical seta. The presence of this seta is generally considered to be an apomorphy among the Heteromyzidae. Its loss in the Chyromyidae is probably secondary (a reversal) and therefore an apomorphy relative to the chosen outgroups.

Character 27. Internalised *ep*. This highly complex development in *Aphaniosoma* is undoubtedly an apomorphic state.

Character 28. Modified *cerc* in males. This is an apomorphic state in acalyptrates and the Chyromyidae.

Character 29. Loss of *ej apd*. I consider this an apomorphic state within the Chyromyidae, given its presence in one subfamily and in the chosen outgroup taxa.

Character 30. *ph apd* extensively fused with *hyp*. The plesiomorphic state expecially in the outgoup taxon is a long and narrow *ph apd* that remains free from the *hyp* almost to its apex, where it articulates with the *basiph*.

Character 31. Two spermathecae. This is an apomorphic state in the Chyromyidae.

Character 32. Female postabdomen with well-developed fleshy lobes medial to, and attached to, sclerites of *st* 8. This subtle character is found in only one genus of Chyromyinae (*Somatiosoma*). I consider it an apomorphy.

The characters listed above are given in the matrix (Table 2) used for the analysis. Parsimony analysis using "Implicit enumeration" methodology in TNT generated three equally parsimonious trees (score 45) of identical topology with a different interpretation of only a small number of characters. The only "phylogenetic" difference between them was the placement of the genera *Oroschyromya*, *Notiochyromya* and *Somatiosoma* relative to each other. The strict consensus tree is depicted in Fig. 62. Tree 0 was one step shorter than the others and it was supported by the cladogram generated by the Majority Rule (Fig. 63). It was therefore selected and the synapomorphies were superimposed on the clades (Fig. 64). Bootstrap support was calculated using 1,000 replicate routines and the results superimposed on the strict consensus tree (Fig. 65). Manual calculations on tree 0 gave a length = 28; a consistency index, CI = 0.893; a retention index, R = 0.942; and a rescaled consistency index, RC = 0.841.

This analysis provides support for the proposed generic grouping into two subfamilies and gives an indication of the phylogenetic relationships of the genera of the Chyromyidae.

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TABLE 2

Character matrix for the cladistic analysis of the genera of the Chyromyidae. Outgroup: Heleomyzinae. Abbreviations: char – character number, Sph – Sphaeroceridae, Hel – Heleomyzidae, Chy – *Chyromya*, Not – *Notiochyromya*, Oro – *Oroschyromya*, Som – *Somatiosoma*, Gym – *Gymnochiromyia*, Aph A – *Aphaniosoma* A, Aph B – *Aphaniosoma* B, Par – *Paraphaniosoma*, Tet – *Tethysimyia*, Kri – *Krifomyia*. Character states: 0 – plesiomorphic, 1 – apomorphic; n – number of species examined (number known to the author in parenthesis).

		n	7(8)	12(14)	6(6)	7(7)	23(25)	92(107)	14(16)	2(3)	9(9)	1(1)
char	Sph	Hel	Chy	Not	Oro	Som	Gym	Aph A	Aph B	Par	Tet	Kri
0	0	0	0	0	0	0	1	1	1	1	1	1
1	0	0	0	0	0	0	0	1	1	1	1	1
2	0	0	1	1	1	1	1	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	1	1
4	0	0	0	0	0	0	0	1	0	0	0	0
5	0	0	0	1	1	1	1	1	1	1	1	1
6	0	0	0	0	0	0	0	0	0	1	1	1
7	0	0	0	0	0	0	0	0	0	0	1	1
8	0	0	1	1	1	1	1	1	1	1	1	1
9	0	0	0	0	0	0	0	1	1	1	1	1
10	0	1	1	1	1	1	1	0	0	0	0	0
11	0	0	1	1	1	1	1	1	1	1	1	1
12	1	1	0	0	0	0	0	1	1	0	0	0
13	0	0	0	1	0	1	1	1	0	1	1	1
14	1	0	0	0	0	0	0	0	1	0	0	0
15	0	0	1	1	0	1	1	1	1	0	0	0
16	1	1	1	0	1	1	1	1	1	0	1	1
17	0	0	0	0	0	0	0	1	1	0	1	1
18	1	1	1	1	0	0	0	0	0	0	0	0
19	0	0	0	1	1	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	0	0	0
21	0	0	1	1	1	1	1	0	0	1	1	1
22	1	1	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	1
24	0	0	1	0	0	0	0	0	0	0	0	0
25	0	0	1	1	1	1	1	0	0	0	0	0
26	0	0	1	1	1	1	1	1	1	1	1	1
27	0	0	0	0	0	0	0	1	1	1	1	1
28	0	0	0	0	1	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	1	1	1	1	1
30	0	0	0	0	0	0	0	1	1	1	0	0
31	0	0	1	1	1	1	1	1	1	1	1	1
32	0	0	0	0	0	1	0	0	0	0	0	0

The tree supports well the phylogenetic position of the genera within the Aphaniosominae, with bootstrap scores of 87 % or above, with the exception of *Paraphaniosoma*. I consider their relationship to each other, as well as to the subfamilies, to be well resolved. *Paraphaniosoma* presents at least two very strong characters that convince me

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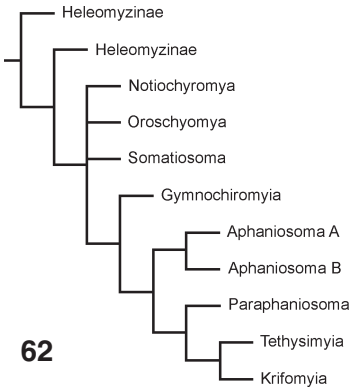
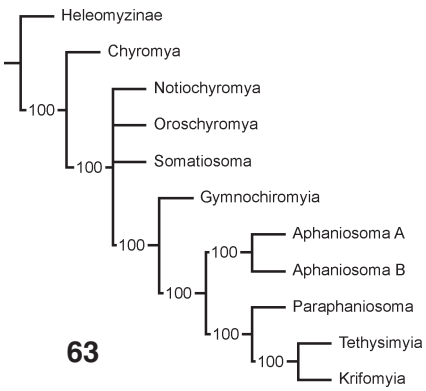
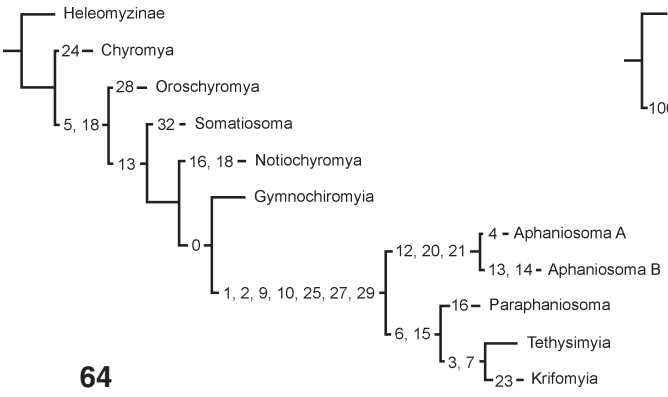
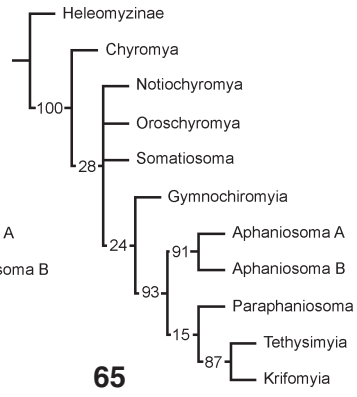




Figs 62, 63. (62) Cladogram of the genera of Chyromyidae showing Strict Concensus of 3 trees (0 taxa excluded), outgroup taxon: Heleomyzinae; (63) Cladogram of the genera of Chyromyidae showing result of Majority Rule (from 3 trees, cut 50), outgroup taxon: Heleomyzinae.





Figs 64, 65. (64) Phylogenetic tree (tree 0) of the genera of Chyromyidae with synapomorphies mapped on to the clades, outgroup taxon: Heleomyzinae; (65) Phylogenetic tree (tree 0) of the genera of Chyromyidae showing Standard Bootstrap (GC values, 1000 replicates, cut=1), resampling results (with percentages at each clade) that confirm the parent tree, outgroup taxon: Heleomyzinae.

it belongs to the Aphaniosominae close to *Aphaniosoma* A and *Aphaniosoma* B, rather than *Tethysimyia* or *Krifomyia*. These characters are the arrangement of structures of the hypopygium and those of the head. The presence of the *pra* seta is most probably a reversal or homoplasy. Support is weak for the genera *Gymnochiromyia*, *Oroschyromya*, *Notiochyromya* and *Somatiosoma*. On general appearance and detailed examination of the postabdomen of both sexes, it appears to me that *Notiochyromya* is closest to *Chyromya*, and *Oroschyromya* closest to *Gymnochiromyia*. The position of *Somatiosoma* is as yet unclear, although I suspect it will eventually turn out to be an offshoot of *Notiochyromya*. At this stage, I cannot consider that the relationship of these four genera to each other or within the Chyromyinae is resolved. This may be partly due to not using more characters of the male and female postabdomen and to an avoidance of other somatic characters where definition is difficult, for example, the relative head shape: prognathous versus opisthognathous, the degree of convergence of eye margins, and the

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subtle wing characters. These three genera are actually quite easy to separate (with a little practice and experience) in both sexes without dissection, relying only on somatic as opposed to hypopygial structures. To resolve the phylogenetic relationships within the Chyromyinae, a study of more species from other regions of the world may be helpful, but most of the species are undescribed. The choice of an outgroup taxon to perform such an analysis is not easy, as some somatic and hypopygial structures, though clearly very differently developed in the Aphaniosominae, are not easily defined in a categorical way across the family (i.e., present or absent) as is required to run a cladistic analysis. For example, the breadth and depth of the basal half of the phallapodeme is developed differently in the Chyromyinae. It may also be described as broad and deep in *Aphaniosoma*, but here it clearly presents a very different modification. The same applies to the modification of the ejaculatory apodeme in the genera of the Chyromyinae.

Support for the monophyly of the Chyromyidae is very good, with a supporting bootstrap value of 100 %. Similarly, the division into two subfamilies appears to be well supported, with a bootstrap value of 93 %. Based on the chosen characters and the interpretation of their polarity, the Chyromyidae appear to be closer to the Heleomyzinae rather than the Sphaerocerinae. However, a further cladistic analysis using a larger character set, may be needed to establish the relationships between these and other closely related taxa, such as the Ephydroidea.

ZOOGEOGRAPHY AND ECOLOGY

The family is known from all continents and zoogeographical regions except the Arctic and Antarctica (Cogan 1980; McAlpine 1965; Pitkin 1989; Soós 1984; Steyskal 1977). I have seen scanty material from mainland South America, but I know of much more collected material that awaits study. I am unaware of any published information

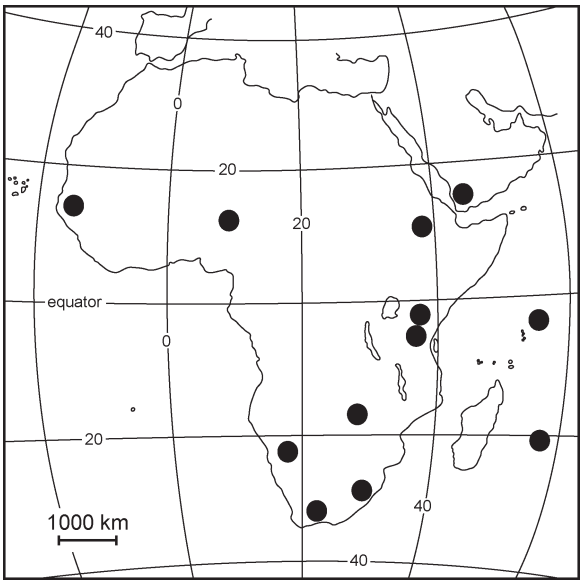

Fig. 66. Distribution of *Notiochyromya* gen. n.

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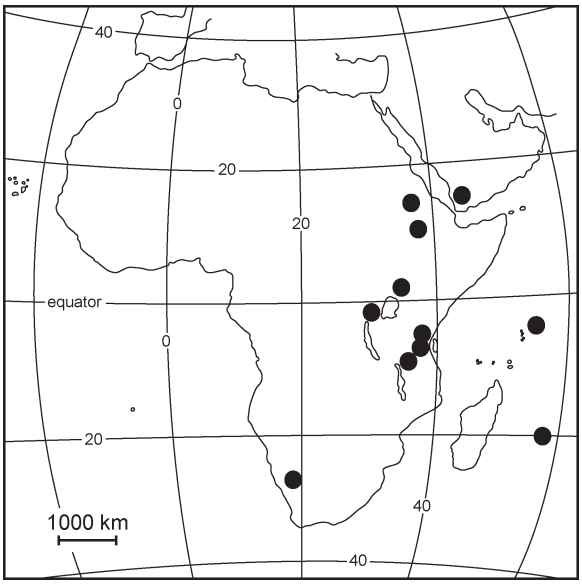

Fig. 67. Distribution of *Oroschyromya* gen. n.

other than a study on the Galapagos species (Wheeler & Sinclair 1994). Specimens have been collected on a number of remote Atlantic and Pacific islands (Frey 1945; Hardy & Delfinado 1980). Many are still undescribed and therefore zoogeographical affinities are speculative at best. The distribution of the genera of Chyromyidae in Africa is summarised in the maps given in Figs 66–70.

The genus *Aphaniosoma* is widespread in the Holarctic and Afrotropical regions, with most species diversity being in the Mediterranean (Carles-Tolrá 2001; Ebejer 1998; 2005; Ebejer & Baez 2001), Central Asia (Ebejer 2006) and southern Africa (this paper), in that order. There are some affinities between groups of species in the eastern Mediterranean and Africa and between other groups of species in Central Asia and the Mediterranean, but not between Africa and Asia. On current knowledge, therefore, it appears that perhaps most species radiation has occurred from the northern part of Africa (e.g., *A. approximatum* and *A. gallagheri*). The central Sahara and the tropical rainforests of central Africa may have been early separating factors for some species groups, whereas the Rift Valley and the savannah zone from southwest Africa to northeast Africa may still act as natural corridors facilitating the spread of species (e.g. *Aphaniosoma fissum*, *Somatiosoma eremicolum*, *S. nitescens* and *Oroschyromya affinis*). The countries between the Mediterranean part of the Middle East and the central Asian states of Mongolia and the former Soviet Union have not been investigated. For example, Iraq, Iran, Afghanistan and Pakistan may be rich in species of this genus.

The genera *Somatiosoma* and *Oroschyromya* appear to be typically Afrotropical, but the Indian subcontinent has not been investigated for Chyromyidae. If they were truly restricted to the Old World tropical and subtropical areas, both genera might still be expected to occur in the Indian subcontinent. *Somatiosoma* favours hot, arid habitats and such habitats occur in northwest and central India. The genus has been found in all parts of the Arabian Peninsula. *Oroschyromya*, with its apparent affinity for wetter

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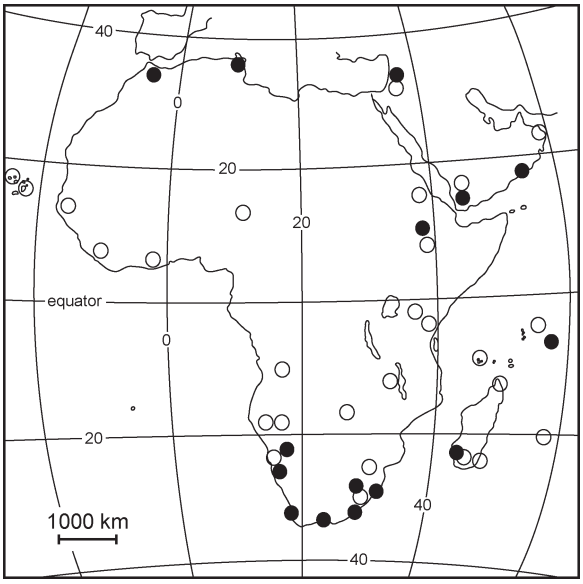

Fig. 68. Distribution of *Somatiosoma* Frey (○) and *Gymnochiromyia* Hendel (●) in Africa.

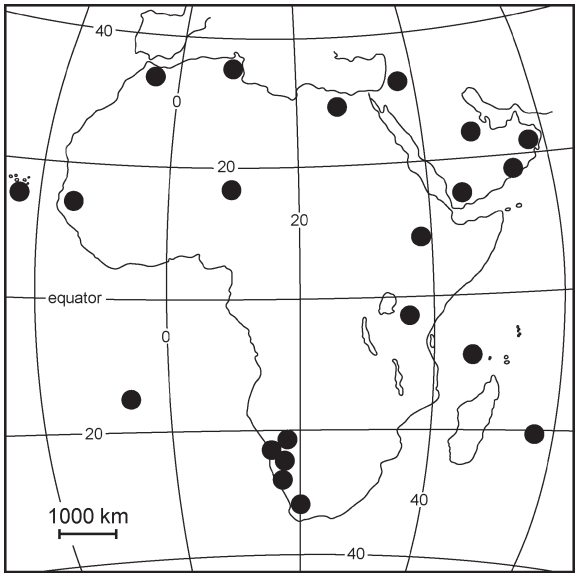

Fig. 69. Distribution of *Aphaniosoma* Becker in Africa.

regions, might occur in the Western Ghats. *Notiochyromya*, on the other hand, is represented in all geographical areas of the southern hemisphere and as studies continue and more species are discovered, this genus may turn out to be rich, diverse and inhabiting a wide range of habitats extending into Central America and the southern

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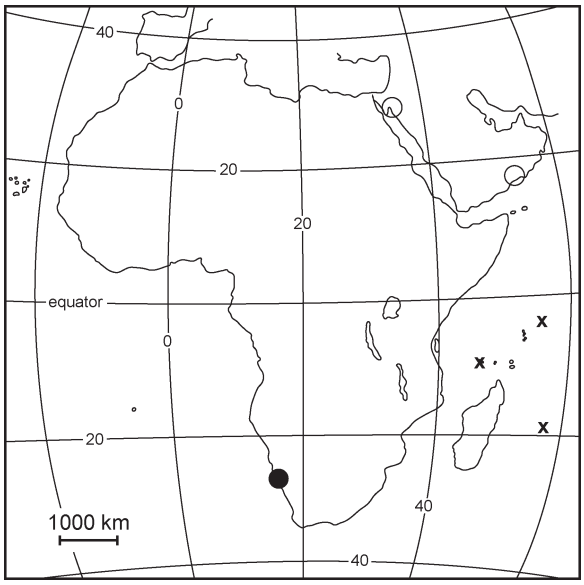

Fig. 70. Distribution of *Krifomyia* gen. n. (●), *Paraphaniosoma* gen. n. (**x**), and *Tethysimyia* gen. n. (○).

states of the USA. The Chyromyidae of the Oriental and Australasian regions (Steyskal 1977; Pitkin 1989) are too poorly known for further comments to be made at present.

As far as is known, most speciation in *Gymnochiromyia* appears to be in the Mediterranean (Ebejer 1998) and in southern Africa (Ebejer 2008*b*). This suggests a disjunction and lends support to the theory that the African fauna includes the Mediterranean, with the Sahara being only a recent barrier (Kirk-Spriggs & McGregor 2009). The genus, as originally interpreted, has been recorded from North America. I have seen limited material. Very little work has been done on Nearctic Chyromyidae (McAlpine 1965, 1987) and it is difficult to speculate as to the richness or otherwise of the fauna there, or even as to what affinities this might have with the fauna of Europe and Africa.

DISCUSSION

This paper gives descriptions of 32 new taxa consisting of five new genera and 27 new species. Thus, the total number of species of Chyromyidae described worldwide is now almost 180.

The African species of Chyromyidae provide further evidence of the remarkable diversity within the family and may offer a better understanding for the generic classification of species. This diversity provides a platform for a more detailed study of the large genus *Aphaniosoma*, wherein many more species known to the author await description and more species groups are apparent than has been given in the preliminary cladisitc analysis above. However, it is not yet clear how these species groups relate to each other and whether or not there will be significant grounds for further taxonomic subdivision.

Although it was not practicable to examine every known species worldwide for this study, many from all zoogeographical regions were examined, and the generic limits as defined in this article apply to all the specimens that I have seen.

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In general, Chyromyidae are most speciose, and populations are largest, in lowlands. The Afrotropical species occurring at a high altitude similar to that where *Aphaniosoma* species occur in central Asia (Ebejer 2006) belong to the new genera in the Chyromyinae and not to the Aphaniosominae. This is interesting in as much as it may suggest evolutionary divergence in the subfamily rather than these being relict species or species groups that became isolated in the African highlands. This is supported by the structural modifications in the Afrotropical species (e.g., species in the genera *Oroschyromya* and *Notiochyromya*), that have no counterparts in species from elsewhere. Species of *Aphaniosoma* from the Mediterranean and the Middle East appear to share characteristics with the Afrotropical species. A few species have distributions that extend from southern Africa to East Africa and to Arabia, supporting the view that dispersal has occurred along the Rift Valley and across the savannahs of Africa (Kirk-Spriggs & Stuckenberg 2009). However, little more can be deduced until the countries encompassing the Sahara are investigated. More isolated mountainous areas need to be sampled to ascertain the prevalence or otherwise of relict species. This is especially so for the Haggar mountains in Algeria, Tibesti in Chad, Darfur in Sudan and the mountains of Ethiopia.

This study was based on material from only 24 African countries, many of which have not been adequately sampled for Chyromyidae. Thus, most of the continent remains effectively unexplored. Some species are recorded from localities very far apart across the continent, suggesting that they might easily occur in the intervening regions where similar habitats occur. For example, species such as *Aphaniosoma aethiops*, *A. approximatum*, *A. fissum*, *A. gallagheri*, *Notiochyromya filigera*, *N. sexspinosa*, *Oroschyromya affinis*, *Somatiosoma eremicolum*, *S. grandicornis* and *S. nitescens* are likely to be much more widspread than records in this article suggest, and it is already apparent that *S. nitescens* probably occurs all over Africa.

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REFERENCES

BÄHRMANN, R. 2006. Zur kenntnis der Chyromyidae (Diptera) Mitteldeutschlands. *Studia dipterologica* **10**: 391–395.

BECKER, T. 1903. Aegyptische Dipteren (Fortsetzung und Schluss). *Mitteilungen aus dem Zoologischen Museum in Berlin* **2**: 67–195.

BEZZI, M. 1908. Simuliidae, Bombyliidae, Empididae, Syrphidae, Tachinidae, Muscidae, Phycodromidae, Borboridae, Trypetidae, Ephydridae, Drosophilidae, Geomyzidae, Agromyzidae, Conopidae. *In*: Schultze, L., *Zoologische und anthropologische Ergebnisse einer Forschungreise im westlichen und zentralen Südafrika ausgeführt in den Jahren 1903–1905*. Erster Band: Systematik und Tiergeographie. IV. Insecta (Erste Serie). D. Diptera (1). *Denkschriften der medizinisch-naturwissenschaftlichen Gesellschaft zu Jena* **13**: 179–201.

CARLES-TOLRÁ, M. 2001. Eight new chyromyid species from Spain (Diptera, Chyromyidae). *Boletín de la Asociación española de Entomología* **25** (3–4): 45–62.

CHANDLER, P. 1973. Some Diptera and other insects associated with decaying elms (*Ulmus procera* Salisbury) at Bromley, Kent, with some additional observations on these and related species. *Entomologist's Gazette* **24**: 324–346.

COGAN, B.H. 1978. Chapter 3, Sand dunes. *In*: Stubbs, A. & Chandler, P., eds, *A dipterist's handbook*, Vol. 15. Middlesex, UK: The Amateur Entomologists' Society, pp. 125–129.

———1980. Family Chyromyidae. *In*: Crosskey, R.W., ed., *Catalogue of the Diptera of the Afrotropical Region*. London: British Museum (Natural History), pp. 628–629.

COLLES, D.H. & MCALPINE, D.K. 1970. Chapter 34 Diptera (Flies). *The insects of Australia*. *A textbook for students and research workers*. Melbourne, Australia: Melbourne Univ. Press, xiii + 1029 pp.

COLLIN, J.E. 1933. Five new species of Diptera. *Entomologist's monthly Magazine* **69**: 272–275.

———1949. On Palaearctic species of the genus *Aphaniosoma*. *Annals and Magazine of Natural History* (12) **2**: 127–147.

DEEMING, J.C. 1998. A description of the puparium of *Gymnochiromyia inermis* (Collin, 1933) from England (Diptera: Chyromyidae). *Studia dipterologica* **5**: 30–32.

EBEJER, M.J. 1996. Chyromyidae (Diptera: Schizophora) from the Arabian Peninsula with descriptions of twelve new species. *Fauna of Saudi Arabia* **15**: 280–299.

———1998. A review of the Palaearctic species of *Aphaniosoma* Becker (Diptera, Chyromyidae), with descriptions of new species and a key for the identification of adults. *Mitteilungen Museum für Naturkunde Berliner Deutsche Entomologische Zeitschrift* **45**: 191–230.

———2000. Chyromyidae (Diptera: Heleomyzoidea). *In*: Kirk-Spriggs, A.H. & Marais, E., eds, *Dâures – Biodiversity of the Brandberg Massif, Namibia*. *Cimbebasia Memoir* **9**: 261–264.

———2005. A contribution to the knowledge of the Chyromyidae (Diptera) of Italy with a description of a new species of *Aphaniosoma* Becker. *Revue suisse de zoologie* **112**: 859–867.

———2006. New species of *Aphaniosoma* Becker (Diptera, Chyromyidae) from central Asia. *Studia dipterologica* **10**: 199–214.

———2008*a*. Order Diptera, Family Chyromyidae. *In*: van Harten, A., ed., *Arthropod fauna of the UAE*. Vol. 1. Abu Dhabi: Dar Al Ummah Publishing, pp. 683–695.

———2008*b*. New species of *Gymnochiromyia* Hendel, 1933 (Diptera: Schizophora: Chyromyidae) from Southern Africa. *African Invertebrates* **49** (1): 77–108.

EBEJER, M.J. & DEEMING, J.C. 1997. Chyromyidae (Dipt., Schizophora) new to Spain with descriptions of the adult and puparium of a new species of *Aphaniosoma*. *Entomologist's monthly Magazine* **133**: 157–160.

EBEJER, M.J. & BAÉZ, M. 2001. Chyromyidae (Diptera, Schizophora) from the Canary Islands and Madeira, with descriptions of new species. *Studia dipterologica* **8**: 289–301.

EBEJER, M.J., ROHÁCEK, J. & BARTAK, M. 2001. Chyromyidae. *In*: Bartak, M. & Vanhara, J., eds, *Diptera in an industrially affected region* (*North-Western Bohemia*, *Bilina and Duchov*) *environs II*. Brno: Masaryk University, pp. 411–414.

FERRAR, P. 1987. A guide to the breeding habits and immature stages of Diptera Cyclorrhapha (Part 1: text). *Entomonograph* **8** (1–2): 1–907.

FREY, R. 1945. Tiergeographische Studien über die Dipterenfauna der Azoren. I. Verzeichnis der bisher von den Azoren bekannten Dipteren. *Commentationes biologicae* **8**: 1–114.

———1958. Zur Kenntnis der Diptera brachycera p. p. der Kapverdischen Inseln. *Commentationes biologicae* **18**: 1–61.

GIBBS, D. 2007. The genus *Chyromya* Robineau-Desvoidy (Diptera, Chyromyidae) in Britain, with description of a new species. *Dipterist's Digest* **14**: 13–22.

GOLOBOFF, P.A., FARRIS, J.S. & NIXON, K.C. 2008. TNT, a free program for phylogenetic analysis. *Cladistics* **24**: 774–786.

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HARDY, D.E. & DELFINADO, M.D. 1980. Chyromyidae. *In*: Zimmerman, E.C., ed., *Insects of Hawaii*. *Vol. 13*. *Diptera*: *Cyclorrhapha III*, *Series Schizophora*, *Section Acalypterae*, *exclusive of Family Drosophilidae*. Honolulu: University Press of Hawaii, pp. 172–178.

HENDEL, F. 1933. Neue acalyptrate Musciden aus der paläarktischen Region (Dipt.). *Deutsche entomologische Zeitschrift* **1933**: 39–56.

KIRK-SPRIGGS, A.H. & MCGREGOR, G. 2009. Disjunctions in the Diptera (Insecta) fauna of the Mediterranean Province and southern Africa and a discussion of biogeographical considerations. *Transactions of the Royal Society of South Africa* **64** (1): 32–52.

KIRK-SPRIGGS, A.H. & STUCKENBERG, B.R. 2009. Afrotropical Diptera–Rich Savannas, Poor Rainforests. *In*: Bickel, D., Pape, T. & Meier, R., eds, *Diptera diversity*: *Status*, *challenges and tools*. Leiden: Brill, pp. 155–196.

KOTRBA, M. 2000. 1:3. Morphology and terminology of the female postabdomen. *In*: Papp, L. & Darvas, B., eds, *Contributions to a manual of Palaearctic Diptera*, Vol. 1. Budapest: Science Herald, pp. 75–84.

LAMB, C.G. 1914. The Percy Sladen Trust expedition to the Indian Ocean in 1905, under the leadership of Mr. J. Stanley Gardiner, M.A. Volume 5. No. XV. – Diptera Heteroneuridae, Ortalidae, Trypetidae, Sepsidae, Micropezidae, Drosophilidae, Geomyzidae, Milichiidae. *Transactions of the Linnaean Society of London* (2nd series, Zoology) **16**: 307–372.

MARSHALL, S.A. & RICHARDS, O.W. 1987. 93. Family Sphaeroceridae. *In*: McAlpine, J.F. *et al*., eds, *Manual of Nearctic Diptera*, Vol. 2. Monograph 28. Ottawa: Research Branch, Agriculture Canada, pp. 993–1006.

MCALPINE, D.K. 1985. The Australian genera of Heleomyzidae (Diptera: Schizophora) and a reclassification of the family into tribes. *Records of the Australian Museum* **36**: 203–251.

———2002. Some examples of reduced segmentation of the arista in Diptera-Cyclorrhapha, and some phylogenetic implications. *Studia dipterologica* **9**: 3–19.

———2007. Review of the Borboroidini or wombat flies (Diptera: Heteromyzidae), with reconsideration of the status of families Heleomyzidae and Sphaeroceridae, and descriptions of femoral gland-baskets. *Records of the Australian Museum* **59**: 143–219.

MCALPINE, J.F. 1965. Chyromyidae. *In*: Stone, A., Sabrosky, C.W., Wirth, W.W., Foote, R.H. & Coulson, J.R., eds, *A catalogue of the Diptera of America north of Mexico*. Washington, D.C.: USDA, pp. 821–822.

———1987. 91. Family Chyromyidae. *In*: McAlpine, J.F. *et al*., eds, *Manual of Nearctic Diptera*, Vol. 2. Monograph 28. Ottawa: Research Branch, Agriculture Canada, pp. 985–988.

———1989. 116. Phylogeny and Classification of the Muscomorpha. *In*: McAlpine, J.F. & Wood, D.M. eds, *Manual of Nearctic Diptera*, Vol. 3. Monograph 32. Ottawa: Research Branch, Agriculture Canada, pp. 1397–1518.

MUNARI, L. 1994. Contribution to the knowledge of Afrotropical Tethinidae. VII. New species and records, with a checklist of Afrotropical species (Diptera, Acalyptratae). *Lavori della Societá veneziana di Scienze naturali* **19**: 15–28.

PITKIN, B.R. 1989. 95 Family Chyromyidae. *In*: Evenhuis, N.L., ed., *Catalog of the Diptera of the Australasian and Oceanian Regions*. *Special publications of the Bernice P. Bishop Museum* **86**: 1–600.

ROHÁCEK, J. 1998. 3.43 Family Sphaeroceridae. *In*: Papp, L. & Darvas, B., eds, *Contributions to a manual of Palaearctic Diptera*, Vol. 3. Budapest: Science Herald, pp. 463–496.

ROTHERAY, G.E. 1989. E.B. Basdens's collection of Diptera from bird and mammalian nests, and mammal runs, burrows and droppings. *Entomologist's monthly Magazine* **125**: 5–8.

SINCLAIR, B.J. 2000. 1:2 Morphology and terminology of Diptera male terminalia. *In*: Papp, L. & Darvas, B., eds, *Contributions to a manual of Palaearctic Diptera*, Vol. 1. Budapest: Science Herald, pp. 53–74.

SMITH, K.G.V. 1989. An introduction to the immature stages of British flies. *Handbooks for the Identification of British Insects* **10** (14): 1–280.

SOÓS, A. 1984: Family Chyromyidae. *In*: Soós, A. & Papp, L., eds, *Catalogue of Palaearctic Diptera*. *Vol. 10*: *Clusiidae – Chloropidae*. Budapest: Akadémiai Kiadó, pp. 56–60.

STEYSKAL, G.C. 1977. Family Chyromyidae. *In*: Delfinado, M.D. & Hardy, D.E., eds, *A catalog of the Diptera of the Oriental Region*. *Volume III*. *Suborder Cyclorrhapha* (*excluding Division Aschiza*). Honolulu: University Press of Hawaii, p. 240.

WHEELER, T.A. 1998. 3.42 Family Chyromyidae. *In*: Papp, L. & Darvas, B., eds, *Contributions to a manual of Palaearctic Diptera*, Volume 3. Budapest: Science Herald, pp. 457–461.

WHEELER, T.A. & SINCLAIR, B.J. 1994. Chyromyidae (Diptera) from the Galapagos Islands, Ecuador: three new species of *Aphaniosoma* Becker. *Proceedings of the Entomological Society of Washington* **96** (3): 440–453.

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