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A second species of *Manicomyia* Hancock (Diptera: Tephritidae: Tephrellini)

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ABSTRACT

Manicomyia Hancock and its type species, *Afreutreta chirindana* Munro, are redescribed, including the first description of the female. A new species, *M. stuckenbergi* sp. n., is described from Malawi based on both sexes. The two species are sexually dimorphic in their wing pattern. An identification key to both species based on male and female characters is provided. Putative relationships between *Manicomyia* and other genera are discussed.

KEY WORDS: Tephritidae, Tephrellini, *Manicomyia*, Afrotropical, Malawi, fruit flies, new species, sexual dimorphism.

INTRODUCTION

This paper is dedicated to the memory of the late Brian R. Stuckenberg, a friend and eminent entomologist, who contributed much to Afrotropical and general dipterology.

The taxonomic status of the Tephrellini Hendel, 1927 (Tephritidae: Tephritinae) is unsettled, including the concepts and limits of the tribe as well as its generic and possible subtribal composition. Host-plant relationships in the Tephrellini are exceptional among the ten tribes of the large subfamily Tephritinae. The host plants comprise Acanthaceae, Lamiaceae and Verbenaceae, *versus* Asteraceae in all other tribes (although a few other species of Tephritidae breed in Verbenaceae). Han *et al*. (2010) conducted a DNA analysis, attempting to improve understanding of the volume and composition of the tribe. They studied 27 of about 40 included genera and found some support for their hypothesis that there are three groups, each associated with a different host family. The largest group of genera within the tribe is that associated with the Acanthaceae (at least 18 genera). Phylogenetic relationships among these genera have, however, not been further investigated.

Manicomyia Hancock, 1986, belongs to the Tephrellini *sensu* Han *et al*. (2010), although it was originally described (Hancock 1986) in the *Afreutreta*-group (Tephritini Newman, 1834) and was not included in Hancock's (1990) key to genera of Tephrellini, in which it would run to *Pterope* Munro, 1957. Both *Manicomyia* and *Pterope* were included in the tribe Pliomelaenini Hancock, 2003 by Hancock *et al*. (2003). This classification is not adopted here, however. The following taxonomic treatment of *Manicomyia* is composite and non-repetitive, with the extensive generic redescription serving both the needs of distinguishing *Manicomyia* from other genera and summarising the common characters of both included species.

MATERIAL AND METHODS

Photographs were taken in layers using a Canon Power Shot G9 camera mounted on a Zeiss, Discovery V20 stereomicroscope, then composed with the use of Combine

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ZM software (Hadley 2007). Illustrations were prepared using a Wild 20 compound microscope equipped with a *camera lucida*.

Terminology essentially follows McAlpine (1981) and White *et al*. (1999). 'Crossvein proportion' is defined as the distance between crossveins *r–m* and *dm–cu* divided by the length of *r–m*. 'Tergal-oviscapal measure' is defined as the number of tergites immediately preceding the oviscape, with combined length equal to length of oviscape. '*T*' is used as an abbreviation of 'tergite/s'. As morphometric characters show very little intra-specific variation, measurements are provided as means based on three specimens, unless otherwise stated.

Most of the specimens, on which this study was based, are deposited in the National Collection of Insects, Department of Zoology, Tel Aviv University, Israel (TAU). Other institutions from which specimens were loaned, or where paratypes will be distributed to, are as follows (with names of curators in brackets):

BMNH – Natural History Museum, London, UK (N. Wyatt);
NMSA – KwaZulu-Natal Museum, Pietermaritzburg, South Africa (D.A. Barraclough, M. Mostovski);
SANC – Plant Protection Research Institute, Queenswood, South Africa (R. Urban);
USNM – National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (A.L. Norrbom);
YSUW – Division of Biological Science and Technology, Yonsei University, Seoul, Korea.

TAXONOMY

Genus *Manicomyia* Hancock, 1986

Manicomyia: Hancock 1986: 18 (Type species: *Afreutreta chirindana* Munro, by original designation); Norrbom *et al*. 1999: 165 [Tephritidae catalogue].

Diagnosis: Within the group of Acanthaceae-feeding genera, *Manicomyia* is particularly similar to *Elaphromyia* Bigot, 1859, *Platensina* Enderlein, 1911, and *Pterope*, differing from these by the relatively high face (*e.g*., antenna only about 0.5× as long as face height, distinctly longer in the other genera). The wing pattern of *Elaphromyia* is probably the most similar to that of *Manicomyia*, but unlike the other genera, *Elaphromyia* is not sexually dimorphic in the wing pattern. *Platensina* differs from the other three genera, including *Manicomyia*, by a unusually wide wing. *Pterope* differs from *Manicomyia* by the primarily yellow body and unique wing pattern. This entire group requires a revision employing cladistic and molecular evidence before more definite conclusions about its taxonomy can be stated.

Manicomyia includes two sexually dimorphic species (Figs 1–4).

Redescription:

Male.

Head (Figs 5, 6): *Structure*: Head *ca* 1.4× as high as long; eye 1.61–1.73× as high as long; frontofacial angle *ca* 135°, only slightly protuberant; face high, *ca* 0.95× as high as frons length; ventral facial margin slightly or not protuberant; antenna 0.5–0.6× as long as face height; flagellomere 1 1.9–2.1× as long as high and 1.6–1.8× as long as pedicel, rounded apically; arista with rays *ca* as long as width of arista at base; frons

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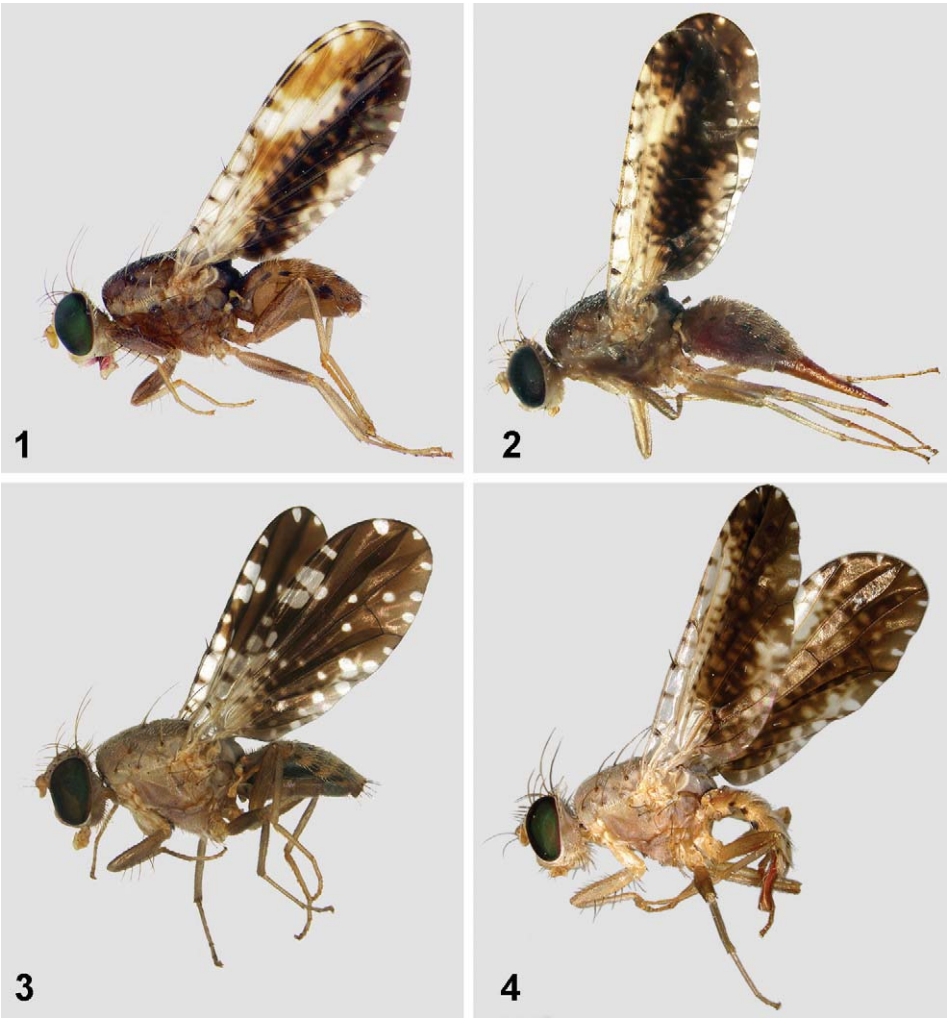
1.0–1.1× as long as wide; face 1.7–1.9× as high as wide at narrowest point; parafacial *ca* as wide as arista at base; gena 2–3× as wide as parafacial; proboscis capitate; palpus wide, length:width proportion *ca* 2.5. *Chaetotaxy*: Complete set of setae present; medial vertical, ocellar, orbital (2), frontal (3 or 4) and genal setae acuminate and dark (yellowish brown to blackish brown); lateral vertical seta acuminate and whitish; postocellar and paravertical setae lanceolate and yellowish; postoculars comprising 4–7 unequal, relatively long yellowish lanceolate setae, evenly or not evenly spaced, with 0–7 small, mostly brown, nearly acuminate setulae interspersed between each two yellowish setae, sometimes also with few short yellowish lanceolate setulae; setae on postgena and occiput slightly lanceolate; anterior orbital seta longer than ocellar seta, situated at mid-length of frons, slightly posteriad to and almost aligned with posterior



Figs 1–4. *Manicomyia* spp., habitus: (1, 2) *M. chirindana*, male (1) and female (2); (3, 4) *M. stuckenbergi* sp. n., male (3) and female (4). Not to scale.

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Figs 5, 6. *Manicomyia* spp., head: (5) *M. chirindana*, lateral view; (6) *M. stuckenbergi* sp. n., sublateral view. Not to scale.

frontal seta; posterior orbital seta about as long as posterior or middle frontal setae; frontal setae generally decreased in size anteriorly; anterior frontal seta often 0.3× as long as posterior frontal seta, sometimes setula-like; small fourth frontal seta rarely present; frons with fine yellow to brown setulae; gena with two irregular rows of short fine brown setulae extending to vibrissal corner; row of fine whitish setulae ascending along parafacial to about height of tip of antenna. *Colouration and vestiture*: Yellow to reddish yellow with fine whitish microtrichia.

Thorax: *Structure*: Scutum length:width proportion 1.08–1.23 (mean 1.15; $n=8$); scutellum flat, triangular. *Colouration and vestiture*: Ground colour of scutum brownish, sometimes paler anteriorly; postpronotum, notopleural area and scutellum yellow, last mentioned with some darker spots; pleura irregularly brownish and yellow; subscutellum and mediotergite brown to black; ground colour obscured by generally homogenous delicate, whitish microtrichia (more conspicuous on katepisternum) and pale setulae; sockets of major setae, especially dorsocentral, acrostichal and scutellar, dark brown to blackish; dark colouration sometimes extends beyond sockets especially around base of apical scutellar seta; larger subshiny black spot present posterior to wing base (best observed when wing oriented ventrally). Setulae predominantly fine and yellow, somewhat sparse, on mesonotum arranged uniformly or in 4 or 5 partly merged longitudinal patches. *Chaetotaxy*: Normal: No distinguishable scapular setae; 1 dorsocentral seta (aligned halfway between transverse suture and anterior supra-alar seta), 1 acrostichal, 1 postpronotal, 1 presutural supra-alar, 1 postsutural supra-alar, 1 postalar, 1 intra-alar, 2 notopleural, posterior shorter and lanceolate, 2 anepisternal, ventral shorter, 1 katepisternal, 1 anepimeral, 2 scutellar setae, apical seta about 0.8× as long as basal seta. All setae acuminate and yellow to brown, except posterior notopleural slightly lanceolate and yellow.

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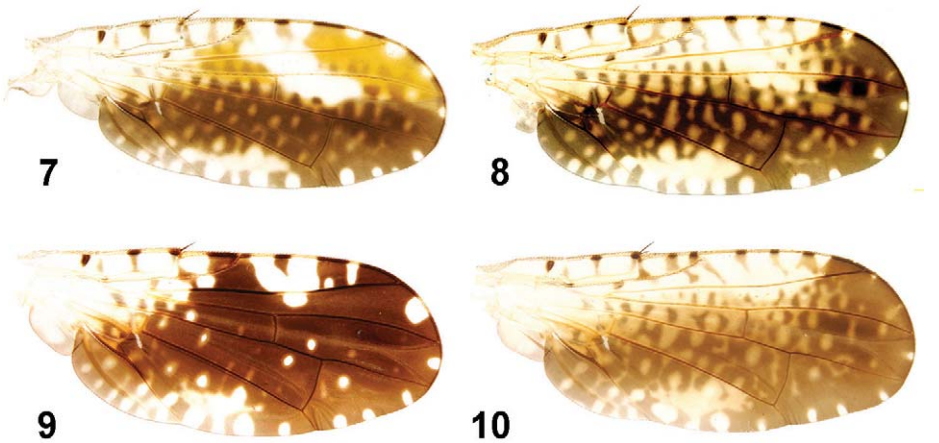

Figs 7–10. *Manicomyia* spp., wing: (7, 8) *M. chirindana*, male (7) and female (8); (9, 10) *M. stuckenbergi* sp. n., male (9) and female (10). Not to scale.

Legs: Without overt features, entirely yellow, with yellow or brownish setae and setulae; femora, especially fore femur, sometimes blackish, discoloured; setation normal, although setae mostly small, except row of 4–6 posteroventral setae on fore femur and mid-tibial spine large and conspicuous.

Wing (Figs 7, 9): *Pattern*: Complex, but with only little intraspecific and intrasexual variation; clearly dimorphic, albeit differently in the two species (females of both species (Figs 8, 10), briefly compared here to males, but described in detail in the female section below, are similar and characterised by elongate dark area or band along posterior part of wing, dotted with numerous subhyaline spots, and broadened apically, filling entire apical third of wing). Male of *M. stuckenbergi* sp. n. (Fig. 9) differs from conspecific female in the much smaller number of subhyaline spots and in more extensive dark pattern, reaching costa also in middle of wing, thus having *Platensina*-type of pattern. Conversely, male of *M. chirindana* (Munro) (Fig. 7) with more discrete blackish band (not broadened apically) than in conspecific female and in both sexes of *M. stuckenbergi* (*Elaphromyia*-type of pattern), combined with two striking yellow or orange patches in anterior half of wing. *Venation and setulae*: Pterostigma about 2.5× as long as wide; longitudinal veins mostly straight; vein R_{2+3} slightly sinuous; veins R_{4+5} and M generally parallel, their distal sections slightly curved posteriorly; crossvein proportion 1.5–2.4; posterodistal lobe of cell *bcu* short, but conspicuous. Subcostal break with two costal spines, ventral spine *ca* 2× as long as dorsal spine and about as long as apical (bent) section of subcostal vein; vein R_1 with uninterrupted row of setulae dorsally and 1–7 ($n=10$) setulae near apex ventrally; vein R_{4+5} dorsally with 10–24 setulae basal to crossvein *r–m* and 10–18 setulae distal to this crossvein, ventrally with 6–17 setulae basal to crossvein *r–m* and 0–3 setulae distal to this crossvein ($n=20$). Wing length:width proportion 2.2–2.4 ($n=16$). Haltere stem yellow, knob black or blackish; calypteres more-or-less equally wide, hyaline, with margin of dorsal calypter partly blackened.

Abdomen: *Structure*: Oval. *Colouration and vestiture*: Pattern comprised of blackish spots on yellow background, virtually the same in both species. Pattern obscured in discoloured specimens in which larger areas appear dark. Pairs of blackish spots include:

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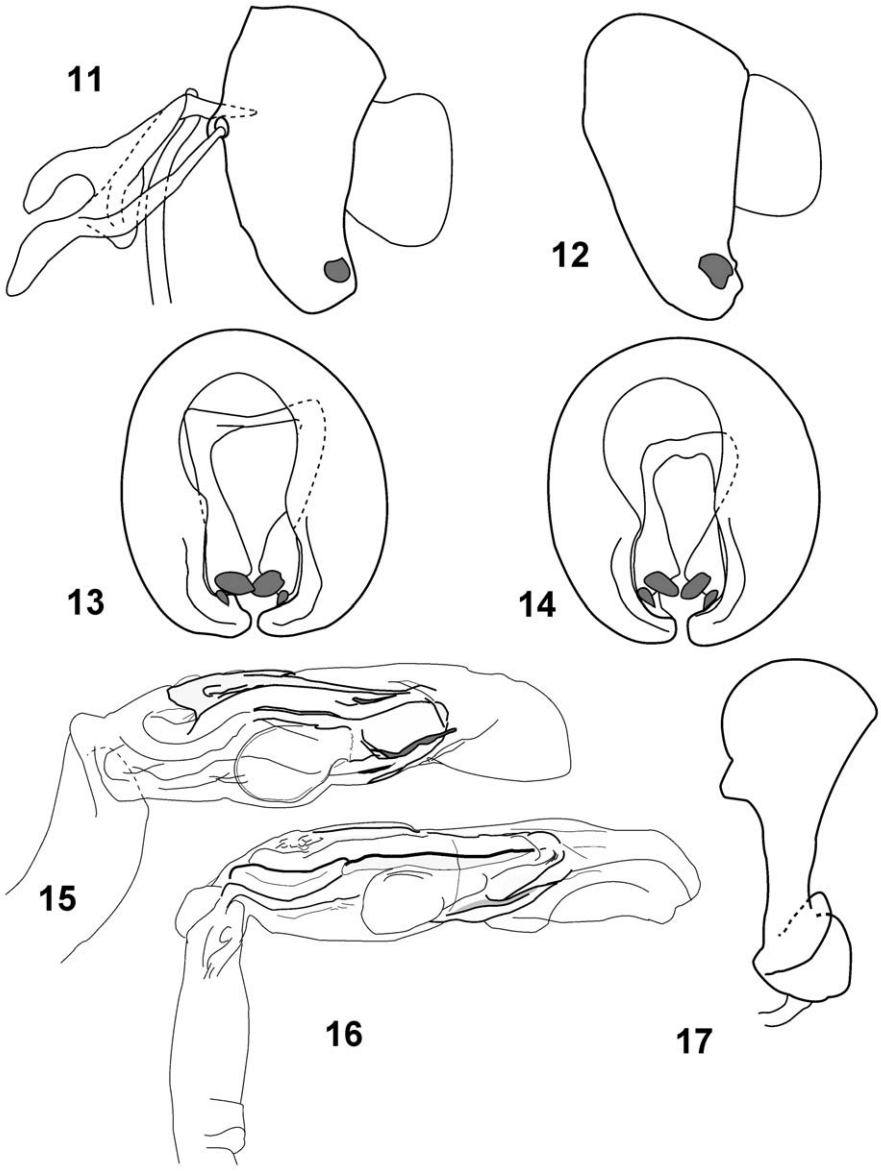
(a) submedial spots including: (1) larger, but slightly less discrete spots on *T1* and *T2* (these tergites clearly separated by yellow suture), those on *T1* extending almost over entire length of tergite, those on *T2* extending only over anterior 0.3 of tergite; and (2) two (pairs) of smaller and more discrete sub-circular spots on *T4* and *T5*, extending over 0.4–0.7 of tergal length, not reaching posterior margin of tergites; and (b) smaller,



Figs 11–17. *Manicomyia* spp., male terminalia: (11, 13, 15, 17) *M. chirindana*: (11) epandrium and hypandrium, lateral view; (13) epandrium, posterior view; (15) phallus; (17) ejaculatory apodeme; (12, 14, 16) *M. stuckenbergi* sp. n.: (12) epandrium, lateral view; (14) epandrium, posterior view; (16) phallus. Not to scale.

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elongate, more discrete and anterolateral spots on *T2–T5*, extending over 0.4–0.7 of tergal length, not reaching posterior margin of tergites. *Chaetotaxy*: *T5* posteriorly with 4–6 (pairs) of brown, acuminate marginal setae. Setulae mostly yellowish, more-or-less lanceolate, laterally and anterolaterally on tergites brown; setulae at posterior margin of tergites slightly longer.

Terminalia (11–17): Typical of Tephrellini, including rounded or oval epandrium and small moderately sclerotised glans; sclerotisation in form of two hoods, one inside the other; vesica distinct, 0.25–0.30× as long as glans.

Female.

Thorax. Wing (Figs 8, 10): *Pattern*: Different from male pattern both in general look and in distribution of hues: general pattern comprises more-or-less discrete dark longitudinal band extending along entire wing, from posterobasal part to apex, considerably widened in distal half, first posteriorly, then anteriorly, virtually filling entire wing surface beyond level of crossvein *dm–cu*; this dark area usually extends anteriorly clearly to, or almost to, vein R_{4+5} and is bordered by faintly reticulate or hyaline areas, except distal to level of crossvein *dm–cu*. Dark band blackish and brown with numerous small to medium-sized sub-hyaline (= yellowish) spots mostly arranged somewhat irregularly in 1 or 2 longitudinal rows along each longitudinal cell. Posterior part of large anterior hyaline area (in cell r_{2+3}) mostly sub-hyaline, comprised of grey spots partly over yellowish background.

Abdomen: Essentially similar to male, with following differences: *T6* with blackish lateral spots as in preceding tergites, but no submedial spots, and with three pairs of conspicuous brownish setae, as large as those on *T5* of male; setae on *T5* of female distinct, but shorter than setae on *T5* of male.

Terminalia (Figs 18–22): Oviscape (Figs 2, 4): Yellow, subshiny, conical in living specimens, flattened in dried specimens, with fine brown setulae; tergal-oviscapal measure 2–3. Aculeus (Figs 18–21) typical for Tephrellini, elongate, with narrow needle-like distal part. Spermathecae 2 (Fig. 22), oval, *ca* 2× as long as wide; distal broadened membranous part of spermathecal duct about as long as spermatheca, distally connected to heavily sclerotised, curved tube (base of spermatheca?) about as long as spermathecal width; spermathecal sculpture comprised of numerous transverse, more-or-less shallow ridges, mostly ending as tubercle.

Biology and ecology: Both species were consistently collected on, but were not reared from, plants known, or assumed, to be *Brillantaisia* spp. (Acanthaceae).

Key to species of *Manicomyia* Hancock

1 Males 2
– Females 3

2 Wing (Fig. 9) more extensively black or blackish, dark pattern more-or-less uniformly black, *Platensina*-type, not banded, without yellow areas ..... **stuckenbergi** sp. n.
– Wing (Fig. 7) less extensively black or blackish, black area in form of longitudinal band on posterior half of wing, two yellow areas at anterior half of wing ..... **chirindana** (Munro)

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3 Wing with large hyaline area from central section of cell r_1, just beyond pterostigma, extending to crossvein *r–m* and to, or almost to, crossvein *dm–cu* (at least half distance across cell r_{4+5}) (Fig. 8); tergal-oviscapal measure about 3.... **chirindana** (Munro)

– Wing with hyaline area not extending posteriorly beyond vein R_{4+5} to these crossveins (Fig. 10); tergal-oviscapal measure about 2 ..... **stuckenbergi** sp. n.

Manicomyia chirindana (Munro, 1935)

Figs 1, 2, 5, 7, 8, 11, 13, 15, 17–19

Afreutreta chirindana Munro, 1935: 4.
Manicomyia chirindana: Hancock 1986: 18 [new genus and new combination]; Norrbom *et al*. 1999: 165 [Tephritidae catalogue].

Redescription:

Munro's description is generally adequate, although the only specimen he studied, the male holotype, appears to be atypical in some respects. Although the authors have not personally studied the holotype, it was kindly examined by I.M. White (BMNH). The current redescription, indicating discrepancies between the original description and the specimens cited here, is based on White's examination of the holotype (HT) and on study of 50 additional recently-collected specimens.

The main discrepancies are (Munro's statements in quotation marks):

"… bristles [cephalic and thoracic] blackish." – In the HT these are mainly brown with shorter ones white; in the recently-collected specimens these are pale brownish.

"… 4 i.or." – In the holotype there are indeed 4; in all recently-collected specimens, however, there are 3 frontal setae, except one female with a single fourth, apparently supernumerary, setula-like seta at level of anterior orbital seta.

"… third [antennal segment] small, barely larger than second" – Both in the HT and in the recently-collected specimens flagellomere 1 is *ca* 1.5× as long as the pedicel in lateral view.

"Scutellum brown" – In the HT the scutellum is brown with shiny spots at seta bases; in the recently-collected specimens the scutellum is brownish yellow, with blackish spots around the bases of the setae.

"Wing (fig. 1), large, elongate but rather broad" – Based on this figure, which appears to be accurate, the wing ratio is 2.32:1.00. Ratios measured here are: 2.26–2.40. The holotype was not re-measured.

"… third vein with six … and seven small setulae" [13 in total] – In the HT 6+0 setulae ventrally and 7+10 setulae dorsally were counted on the left wing [17 total] and 5+0 ventrally and 7+7 dorsally were counted on the right wing. In recently-collected specimens setulae on vein R_{4+5} are much more variable than noted for the holotype, *e.g.*, with some specimens having 13–17 and 11–13 setulae dorsally on vein R_{4+5}, proximal and distal to crossvein *r–m*, respectively. Munro probably only counted on the dorsal aspect and he may have missed some due to their small size.

The most significant discrepancies lie in the wing and abdominal colour patterns: The hyaline and sub-hyaline spots around the wing margin are not described clearly. In addition, based on some available specimens with abdominal colour patterns similar to the one described by Munro and other specimens which are different, it is concluded that the holotype is discoloured and the pattern is not diagnostic for this species. In view

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of these discrepancies, the wing and abdominal pattern is redescribed in detail here and the terminalia is described for the first time. All these parts are described below for the first time for the female.

Head (Fig. 5): *Structure*: Head *ca* 1.36× as high as long; eye *ca* 1.61× as high as long; face *ca* 0.93× as long as frons; antenna *ca* 0.6× as long as face height; flagellomere 1 *ca* 2.13× as long as high and 1.6× as long as pedicel; frons about as long as wide (length : width ratio about 1.05:1.00); face *ca* 1.68× as high as wide at narrowest place; palpus length to width proportion mean 2.3 (range 2.1–2.5; $n=3$).

Thorax: Scutum length:width ratio 1.16:1.23 (mean 1.19; $n=3$). Subscutellum and mediotergite black or blackish.

Wing (Figs 7, 8): Wing proportion 2.26–2.40 ($n=6$); crossvein proportion: *ca* 2.38. Wing venation as in Munro (1935) and figures included here; R_{4+5} with setulae varying as follows: dorsally with 13–17 proximal to crossvein *r–m*, 11–13 distal to this crossvein; ventrally with 6–13 proximal to crossvein *r–m*, 0–3 setulae distal to this crossvein ($n=10$). *Pattern*: Dimorphic: Male pattern (Fig. 7) described and illustrated by Munro (1935), including broad blackish band extending from posterobasal edge of anal lobe to wing tip, over most of posterior half of wing, reaching vein R_{4+5} only in cell *br*, and interrupted by hyaline area in posterior half of cell cu_1 and apex of anal lobe. Munro also noted that the pattern is yellowish anterior to vein R_{4+5} and that there is a conspicuous oblique hyaline area from apex of pterostigma to basal half of cell r_{4+5}. This yellow area is actually divided into two areas: an anteroapical patch distal to the hyaline incision, and a patch proximal to the hyaline incision, between the pterostigma and vein R_{4+5}, or slightly anterior or posterior to it. Female pattern (Fig. 8): Similar to male with following differences: dark band broadened distal to level of crossvein *dm–cu*, more-or-less extending over entire apical part of cells r_{4+5}, r_{2+3}, and also over small area at apex of cell r_1. Figuratively, the anteroapical part of the dark area corresponds to the apical yellow area of the male pattern and the proximal yellow area of the male pattern is 'replaced' in the female by faint grey reticulation. Anterior border of basal ⅔ of dark band extends more-or-less along vein R_{4+5}. Resulting female pattern characterised by larger blackish band than in male, no yellow areas and presence of large anterior hyaline area from anterobasal edge of wing to level of crossvein *dm–cu*.

Abdomen. As described for genus.

Male terminalia (Figs 11, 13, 15, 17): Epandrium (Fig. 13) oval; medial prensiseta much larger than lateral prensiseta. Epandrium in lateral view (Fig. 11) concave posteriorly, not strongly narrowed ventrally, without distinct posteroventral protuberance. Hypandrium, phallus and ejaculatory apodeme as in Figs 11, 15 and 17, respectively.

Female terminalia: Oviscape: Tergal-oviscapal measure about 3; oviscape orange-yellow (black in discoloured specimens), subshiny, with dense brown setulae; aculeus elongate (*ca* 11× as long as wide) (Figs 18, 19). Spermatheca as in *M. stuckenbergi* sp. n. (compare with Fig. 22).

Holotype (examined by I.M. White, BMNH): ♂ ZIMBABWE: "S. Rhodesia: Chirinda Forest, Oct. 1926 (Dr. G. Arnold), in British Museum".

Material examined: MALAWI: *South*: 1♂ Zomba Plateau, Emperor's View, 22–23.x.1983, A. Freidberg (TAU); 1♂ 1♀ Zomba, 12.viii.1973, E.O. Dudley (TAU); 12♂ 4♀ Zomba Plateau 2–6.x.1998, F. Kaplan & A. Freidberg, divided as follows: Trout Farm (6♂ 1♀), Forestry Office (2♂ 1♀), Mandala Falls (2♂), Changwa Dam (1♂ 2♀), Mountain Road, 1200 m (1♂) (TAU); 13♂ 12♀ Chiradzulu Forest, 15°41.8'S:35°11.2'E,

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1130 m, 8.i.2010, A. Freidberg, L. Friedman and H.-Y. Han (TAU & YSUW). ZIMBABWE: 1♀ "Mt. Selinda, xii.1935, G. van Son / *Afreutreta chirindana* Mro, det HKMunro 1936" (NMSA); 4♂ 1♀ "N[orthern] Vumba, 8.ix–30.x.1964, D. Cookson / '*Afreutreta*' *chirindana* Munro det. D.L. Hancock, 1983" (NMSA).

Biology: The specimens from Chiradzulu Forest were collected on an unidentified Acanthaceae, assumed to be *Brillantaisia* sp.

Manicomyia stuckenbergi sp. n.

Figs 3, 4, 6, 9, 10, 12, 14, 16, 20–22

Etymology: This species is named after the late Brian R. Stuckenberg, a friend, fine individual and biologist, who encouraged and assisted A.F. in specialising in the Afrotropical Tephritidae and who collected the first specimens of this species.

Description:

Male.

Head (Fig. 6): *Structure*: Head *ca* 1.44× as high as long; eye *ca* 1.73× as high as long; face *ca* 0.98× as long as frons; antenna *ca* 0.5× as long as face height; flagellomere 1 *ca* 1.89× as long as high and 1.79× as long as pedicel; frons about as long as wide (length:width *ca* 1:1); face *ca* 1.87× as high as wide at narrowest point; palpus length:width proportion mean 2.8 (range: 2.7–2.9; $n=3$). *Chaetotaxy*, *colouration and vestiture*: As for genus.

Thorax: As for genus. *Structure*: Scutum length:width proportion 1.08–1.16 (mean 1.11; $n=4$). *Chaetotaxy*: As for genus. *Colouration*: Subscutellum and mediotergite brown or blackish.

Wing (Fig. 9): *Pattern*: Essentially *Platensina*-like, with only few small sub-hyaline spots irregularly scattered within blackish area. Wing predominantly black, or blackish, with small discrete round hyaline spots, both along wing margin and within dark area and with relatively large, mostly discrete, hyaline areas basally in cells r_1 (extending also into cell r_{2+3}) and cu_1 and in anal lobe. Border between basal hyaline area and dark pattern extends obliquely and sinuously from hind margin of wing at base of anal lobe *via* crossvein *bm–cu* to costa at middle of pterostigma, leaving hyaline basal area with few small grey markings in costal cells and near fork of veins R_{2+3} and R_{4+5}; distal half of pterostigma mostly blackish, with hyaline mark centrally; cell r_1 beyond pterostigma with two large quadrangular hyaline spots, almost always united posteriorly and more-or-less clearly united also with smaller oval spot in cell r_{2+3}, forming hyaline 'V', cell r_1, slightly more distal, with transversely aligned pair of small round hyaline spots, one near costa and another near vein R_{2+3}, rarely forming one larger spot; one or both sometimes lacking or united with distal quadrangular spot; further distally narrow hyaline spot across cell, sometimes lacking; cell r_{2+3} with three round equally-spaced hyaline spots: basal spot aligned with costal spine, medial spot part of hyaline 'V', and distal spot at middle of costal section; remaining dark area of wing mostly with small number (*ca* 10) of small round hyaline spots, especially beyond level of crossvein *r–m*, and similar number of even smaller sub-hyaline spots in remaining, basal, dark area; anal lobe and cell cu_1 jointly with irregular group of *ca* 13 hyaline spots, resulting in grey-hyaline posterior area of wing. *Venation and setulae*: Wing proportion 2.23, crossvein proportion 1.55–1.75. R_{4+5} with setulae varying as follows: dorsally with 15–24 proximal to crossvein *r–m*, 10–18 distal to this crossvein; ventrally with 10–17 proximal to crossvein *r–m*, 0–1 setulae distal to this crossvein ($n=10$).

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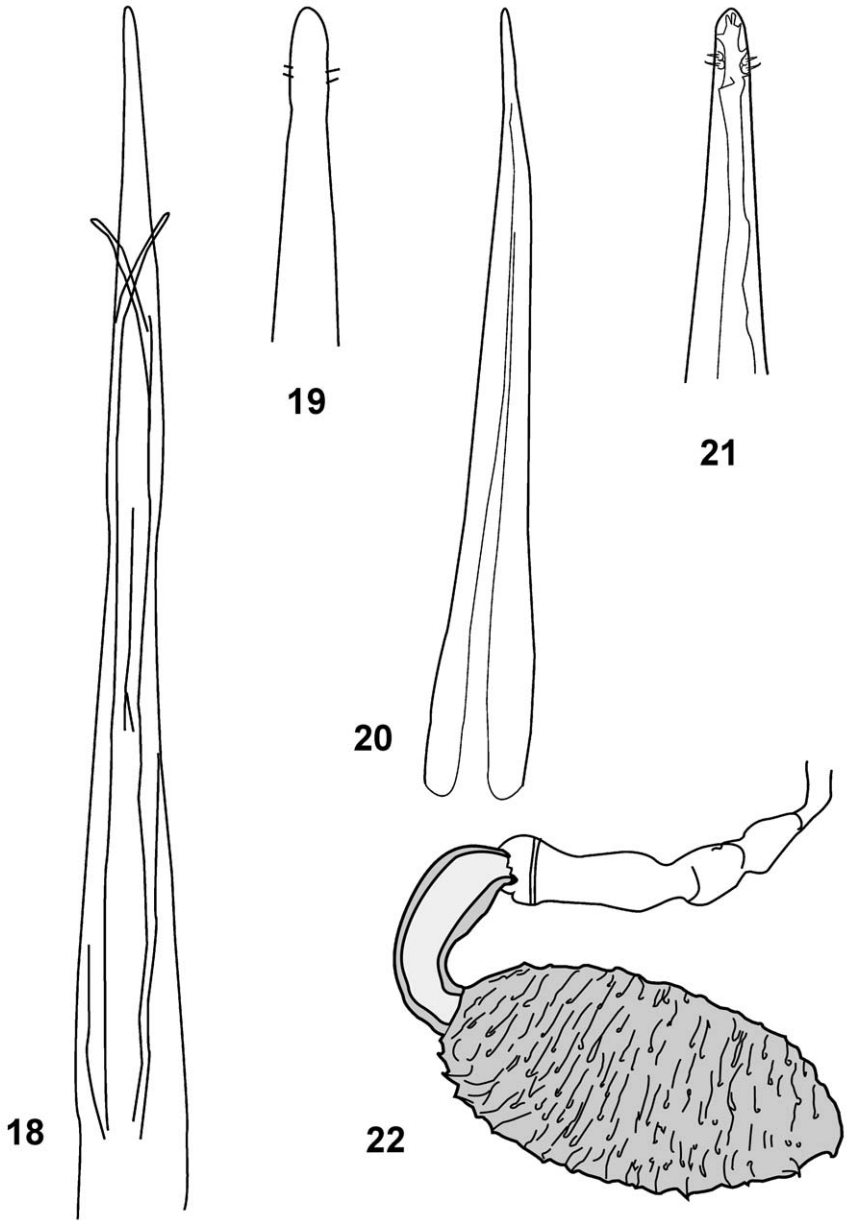
Abdomen. *Terminalia* (Figs 12, 14, 16): As for *M. chirindana* with the following differences: epandrium in posterior view (Fig. 14) more rounded, and prensisetae more equal in size; epandrium in lateral view (Fig. 12) more triangular and pointed ventrally, with more-or-less distinct posteroventral protuberance; phallus as in Fig. 16.



Figs 18–22. *Manicomyia* spp., female terminalia: (18, 19) *M. chirindana*, aculeus and enlarged aculeus tip; (20–22) *M. stuckenbergi* sp. n.: (20) aculeus, (21) enlarged aculeus tip, (22) spermatheca. Not to scale.

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Female.

Thorax. Wing: *Pattern* (Fig. 10): As for genus, and similar to pattern of female *M. chirindana*. Main differences from conspecific male pattern: female pattern mostly paler, brownish, less extensive, not extending to costa at pterostigma and mostly comprising sub-hyaline spots, generally of *Elaphromyia*-type. Main differences from female *M. chirindana* pattern: dark band more extensive, especially along cells *br* (brown background with blackish spots also at level of pterostigma; only blackish spots at level of pterostigma in *M. chirindana*) and r_{4+5} (brown background with blackish spots also between levels of crossveins *r–m* and *dm–cu*; only blackish spots at this area in *M. chirindana*).

Abdomen. *Terminalia* (Figs 20–22): Oviscape yellow, subshiny; flattened in dry specimens, with fine brown setulae; tergal-oviscapal measure 2. Aculeus (Figs 20, 21) shorter than in *M. chirindana* and relatively less elongate (*ca* 7× as long as wide). Spermatheca as in Fig. 22.

Holotype: ♂ MALAWI: *Center*: Ntchisi Forest [13.32°S 34.05°E], 1500–1700 m, 17–18.ix.1998, F. Kaplan & A. Freidberg (TAU). The holotype is pinned directly and is in excellent condition.

Paratypes: MALAWI: 62♂ 40♀ same data as holotype (most of them in TAU, some in BMNH, NMSA, SANC, USNM, YSUW); 2♂ 3♀ same locality, [SE]1334Ac, 1500 m, 3–4.xii.1980, J. Londt & B. Stuckenberg, montane forest & woodland (NMSA). *North*: 2♀ Nyika National Park, Zovo-Chipolo Forest, 25–26.ix.1998, F. Kaplan & A. Freidberg (TAU). ZAMBIA: 1♀ Nyika National Park, Chowo Forest, 28.ix.1998, F. Kaplan & A. Freidberg (TAU). Some paratypes were damaged by pest beetles.

Biology: The majority of the specimens were swept from a roadside plant, *Brillantaisia oligantha* Milne-Redhead (Acanthaceae) abundant in Ntchisi Forest. This blue-flowered plant was colleted for rearing purposes, but only smaller specimens of a related genus, *Pseudafreutreta* Hering, 1942, emerged and the flowers appear to be too small for *Manicomyia*. Another potential host species, *B. cicatricosa* Lindau, grew in one spot in the same forest, but no other indication for possible association between this plant and *Manicomyia* was obtained.

Remarks: This species is similar to *M. chirindana*, especially in the female sex, and the two are probably sister-species. The main differences between the females of both species are the slight difference in the wing pattern and the proportions of all three main parts of the ovipositor (oviscape, inversion membrane and aculeus), which together are in *M. chirindana* about 1.5× as long as in *M. stuckenbergi*. The males are more distinct, although they differ readily from each other only in the wing pattern. The wing pattern of the male of *M. chirindana* primarily comprises a dark longitudinal band, as well as two yellow anterior patches separated by a hyaline incision and it has numerous small subhyaline spots. It thus closely resembles species of *Elaphromyia*. The wing pattern of the male of *M. stuckenbergi* is more extensively and uniformly dark, with a few, rather indistinct sub-hyaline spots, and thus resembles wing patterns of *Platensina* spp. The two species differ also in details of the male terminalia. The known distribution is central and northern Malawi and north-east Zambia.

DISCUSSION

The Tephrellini is a moderately large tribe of about 40 genera with 200 species (Norrbom *et al*. 1999). Morphologically and biologically this tribe is rather heterogenous with a few and non-decisive synapomorphies. Consequently, the higher classification

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within the group is not well understood. One of the most consistent synapomorphies is a biological one, *viz*. the association of all genera and species, for which host-plant relationships are known, with one of three plant families: Acanthaceae, Lamiaceae or Verbenaceae. Host-plants, however, are known for only 70% of genera. Hence, in many cases the assignment to the tribe relies entirely on morphology, and several possibly misplaced taxa have been overlooked over the years due to convergence (*e.g*., *Perirhithrum* Bezzi, 1920 previously placed in the Schistopterini (Cogan & Munro, 1980) or Eutretini (Hancock *et al*. 2003)). Han *et al*. (2010) provided some evidence that the three tephrelline groups of genera associated with the three host families represent three steps of host shifting (probably from Asteraceae to Acanthaceae, Acanthaceae to Lamiaceae, and finally Lamiaceae to Verbenaceae). Therefore, the former two groups appear paraphyletic and only the Verbenaceae-feeders represent a monophyletic group.

Most of the genera with known hosts belong to the group associated with Acanthaceae. Acanthaceae hosts have been recorded for 18 of the genera to date and at least eight additional genera are suspected of having Acanthaceae hosts (Han *et al*. 2010). Having no confirmed hosts, *Manicomyia* is one of these suspected genera. The body colouration and wing pattern vary among the Tephrellini between one extreme, which is a mostly or entirely shiny black body with black wing pattern (characteristic of practically all the Lamiaceae- and Verbenaceae-feeders and of some Acanthaceae-feeders), and another extreme, which is a mostly yellow, reddish or brownish body with pale (*e.g*., brownish) or dark (black or blackish) wing pattern (characteristic of some Acanthaceae-feeders). Based on this general division, *Manicomyia* would fit best with other genera of the paler extremity. These genera are *Elaphromyia*, *Ghentia* Munro, 1947, and *Pterope*, and perhaps *Pliomelaena* Bezzi, 1918, and *Perirhithrum* Bezzi. The hosts of *Manicomyia* are suspected to be *Brillantaisia* spp. (see above). No hosts among *Brillantaisia* are known for the other four or five supposedly related genera. However, *Brillantaisia* hosts are known for *Pseudafreutreta* Hering (see above) and *Platensina* (Freidberg, unpubl. data). These latter two genera, although fitting closer to the dark extremity of the Tephrellini, are therefore also considered closely related to *Manicomyia*.

A detailed analysis of the above-mentioned group (tentatively named the *Elaphromyia*-group) is beyond the scope of this paper and only a brief characterization is provided here, in order to facilitate recognition of *Manicomyia*. *Manicomyia* is similar to *Elaphromyia* in the elongate wing with an elongate, band-like dark longitudinal band or pattern (the male of *M. stuckenbergi* is somewhat different), although the wing and dark band are generally more elongate in *Elaphromyia*. The head and face are higher in *Manicomyia*, and the antenna is about half as high as the face (higher in the other genera). Perhaps the most similar head structure is that of *Pterope*, which is also sexually dimorphic in wing pattern, a character common also to *Platensina*. Most *Platensina* spp., however, have a greatly broadened wing which is similar also to *Pseudafreutreta* and reaches an extreme in *Ghentia* and *Perirhithrum*. *Elaphromyia*, *Ghentia* and *Manicomyia* also share the presence of numerous small hyaline or sub-hyaline spots on the wing, a character lacking in the other related genera, although these two kinds of spots may have evolved independently.

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