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Taxonomic revision of the Afrotropical *Phytomia* Guérin-Méneville (Diptera: Syrphidae)

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Abstract

The Afrotropical representatives of the hoverfly genus *Phytomia* Guérin-Méneville (Diptera) are revised. In total, 19 species are recognized of which three are new to science: *Phytomia austeni* **sp. nov.**, *P. memnon* **sp. nov.**, and *P. pallida* **sp. nov.** *Phytomia neavei* Bezzi is considered a junior synonym of *P. kroeberi* (Bezzi), *P. noctilio* Speiser a junior synonym of *P. pubipennis* Bezzi, and *P. ephippium* Bezzi a junior synonym of *P. melas* (Bezzi). Lectotypes are designated for the following species: *Megaspis bulligera* Austen, *Megaspis erratica* Bezzi, and *Megaspis poensis* Bezzi. In addition, unpublished lectotype designations are hereby formally published for the following species: *Megaspis bullata* Loew, *Megaspis curta* Loew, and *Megaspis capito* Loew. *Phytomia curta* (Loew) is considered a valid species, and differentiated from *P. natalensis* (Macquart). *Phytomia fronto* Loew is tentatively considered to belong to the genus *Simoides* Loew. The relationship between the different *Phytomia* species, as well as the relationship between *Phytomia* and *Simoides*, is briefly discussed based on morphological and DNA data.

Key words: Eristalinae, Africa, DNA barcoding, flower fly, hoverfly

Introduction

Hoverflies (Diptera, Syrphidae) constitute a diverse family of true flies, comprising about 6,200 species (Pape *et al.* 2013). The group is poorly represented in the Afrotropical Region with slightly over 600 species known (Ssymank *et al.* in press). However, this could be a reflection of the limited surveying and studies conducted on this group in the region (Dirickx 1998). Nevertheless, syrphids most likely play an equally important role such as pollinators, predators or decomposers, in a number of ecosystem services, as they do in other biogeographical regions (Inouye *et al.* 2015), and there is a need to improve the general knowledge on this group. Reviews on the current state are provided by Dirickx (1998), Whittington (2003) and Ssymank *et al.* (in press).

Among the elements hampering an improved knowledge of the Afrotropical syrphid diversity is the lack of identification tools for most genera (Ssymank *et al.* in press). Eristalines are no exception to this with relatively recent keys (*i.e.* published over the last 30 years) available only for the genera *Ceriana* Rafinesque (Thompson 2013), *Chasmomma* Bezzi (Kassebeer 2000), *Graptomyza* Wiedemann (Whittington 1992, 1994), *Megatrigon* Johnson (Doczkal *et al.* 2016), and *Syritta* Le Peletier & Serville (Lyneborg & Barkemeyer 2005). Currently, the African fauna of a number of eristaline genera is under revision, aiming to improve our knowledge for this group. This paper presents a taxonomic revision for the Afrotropical representatives of the genus *Phytomia* Guérin-Méneville.

Phytomia was described by Guérin-Méneville in 1834, with type species *Eristalis chrysopygus* Wiedemann, 1819, an Oriental species. The genus is reported from the Eastern Palaearctic, Afrotropical and Oriental regions. It comprises 25 species, of which 18 are reported from the Afrotropical region (Dirickx 1998, Whittington 2003). Several species are found in a wide range of habitats, and often associated with water bodies because of the (semi)aquatic saprophagous life history of the larvae. Adults of some species are conspicuous and are often observed as pollinators (Njoroge *et al.* 2004). The genus is closely related to the genus *Simoides* Loew from which it is usually differentiated by a number of characteristics: the presence of a well developed rugose area on the frons, just above the antennae and usually devoid of long pile (rugose area absent or reduced in *Simoides*) and the males being holoptic (dichoptic in *Simoides*); a poorly developed facial tubercle or absent (well developed facial tubercle in *Simoides*), and the absence of microtrichosity in the apical part of the wing (present in *Simoides*). However, these characteristics are not entirely exclusive and there is a certain amount of overlap to be noticed between both groups. Their interrelationship is further reviewed in the Discussion part of this paper.

Recent expeditions by staff members of the Royal Museum for Central Africa and the International Institute of Tropical Agriculture, as well as specimens collected independently by other research groups, have expanded the material available, including specimens suitable for DNA extraction. The main objectives of this manuscript are, therefore, to provide a taxonomic revision of the Afrotropical representatives of the genus, present an identification key and discuss the interrelationships based on morphological and DNA data.

Material and methods

Material for study was obtained from the following institutions and individuals:

AMNH: American Museum of Natural History, New York USA
ANSP: Academy of Natural Sciences, Philadelphia USA
BMNH: Natural History Museum, London UK
BMSA: Bloemfontein Museum of South Africa, Bloemfontein South Africa
CAS: California Academy of Sciences, San Francisco USA
CNC: Canadian National Collections of Insects, Arachnids and Nematodes, Ottawa Canada
DNSM: Durban National Science Museum, Durban South Africa
ICIPE: International Centre of Insect Physiology and Ecology, Nairobi Kenya
IITA: International Institute of Tropical Agriculture, Cotonou Benin
KBIN: Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussel Belgium
KMMA: Koninklijk Museum voor Midden Afrika, Tervuren Belgium
MAPC: Michelson Azo'o Ela private collection, University of Maroua, Maroua Cameroon
MCSNG: Museo Civico di Storia Naturale "Giacomo Doria", Genoa Italy
MNB: Museum für Naturkunde, Berlin Germany
MNHN: Muséum National d'Histoire Naturelle, Paris France
NMK: National Museums of Kenya, Nairobi Kenya
NMSA: KwaZulu-Natal Museum, Pietermaritzburg South Africa
NMW: Naturhistorisches Museum Wien, Wien Austria
NRMS: Naturhistoriska Riksmuseet, Stockholm Sweden
MZH: Finnish Museum of Natural History, Zoology unit, Helsinki Finland
OBPE: Office Burundais pour la Protection de l'Environnement, Bujumbura Burundi
OXUM: Oxford University Museum, Oxford UK
SCPC: Simon Cavaillès private collection, France

In particular members of the IITA and KMMA conducted field work in Ghana, Togo, Benin, Malawi, Nigeria and Uganda between May 1994 and December 2018. This field work consisted of general collecting by sweepnetting and targeted net collections. Generally, hoverfly material was obtained from agricultural land and its adjacent environment. Private grounds were never accessed without prior consent by the owners and were visited with national recruited staff and as part of the ongoing projects on pest control and biodiversity of the institutions. IITA is a non-profit making international organization and a member of the Consultative Group on International Agricultural Research (CGIAR) Consortium. Research work in Ghana, Benin, and Nigeria is based on bilateral agreements in form of memorandums of understanding (MoU) signed by the ministeries of agriculture of all respective governments (more information can be found on http://www.iita.org/). In these MoU's research work in the field is an integral part of the IITA's contracted mandate. In Togo, IITA maintains a close partnership with the National Plant Protection Service and the University of Lomé through which material was obtained. Therefore, no specific permissions were required for the collected hoverfly material. For collecting in Uganda by KMMA staff member, permits were obtained from the Uganda Wildlife Authority (UWA/COD/96/05) and the Uganda National Council for Science and Technology (UNCST) (NS642). Permits for collecting in Malawi were obtained from the Forestry Research Institute of Malawi (FRIM). None of the collected species figure in any red list, or are considered to be endangered or threatened in the involved countries. Similarly, no species collected in the present study are ranked in any IUCN list or protected by CITES.

Morphological observations were made with a Leica MZ8 stereomicroscope. Morphological terminology largely followed Thompson (1999). Because original descriptions were often very brief, omitting a number of diagnostic characters, written in different languages and using different terminology, all species previously recognized as valid species were redescribed according to a standardized format (identical to the descriptive parts of new species) in order to allow comparison for all character states. Measurements of wing length and body length were taken by use of a calibrated ocular through the stereomicroscope, and are based on 10 specimens (whenever available) randomly chosen, from which minimum and maximum length were selected. Body measurements were taken between the frons and the posterior end of tergum 4; wing measurements between the tegula and the apex of the wing. Digital images were obtained using the set-up as outlined in Brecko *et al.* (2014). Stacking was done using the software Zerene Stacker (zerenesystems.com/cms/home). Male genitalia were dissected using forceps and soaked 24–48 hours (depending on time required for sufficient clearance) in a cold 10% KOH solution after which they were transferred

to acetic acid for 24 hours. Once sufficiently cleared, they were transferred to glycerine. Digital images were taken with a Leica MZ16 microscope and mounted Leica DFC500 digital camera, using Leica Application Suite (LAS) automontage software (version 3.8). Literature references are given for original taxon descriptions under each species. For full bibliographic references, we refer to Dirickx (1998).

Procedures for DNA barcoding followed Jordaens *et al.* (2015). Briefly, genomic DNA was extracted from a single leg using the NucleoSpin Tissue Kit (Macherey-Nagel, Düren), following the manufacturer's instructions. PCR reactions were undertaken in 25 µl reaction volumes, that contained 1.5 mM $MgCl_2$ in 1x PCR buffer (Invitrogen), 0.2 mM of each dNTP, 0.2 µM of each primer and 0.5 units of Taq polymerase (Invitrogen). The DNA barcode fragment of the mitochondrial cytochrome *c* oxidase subunit I (COI) gene was amplified using primer pair LCO1490 and HCO2198 (Folmer *et al.* 1994). The PCR profile was an initial denaturation step of 5 min at 95 °C, followed by 35 cycles of 45 s at 95 °C, 45 s at an annealing temperature of 45 °C and 1.5 min at 72 °C, and ending with a final extension step of 5 min at 72 °C. PCR products were purified using the GFX PCR DNA Purification Kit (GE Healthcare) and diluted in 15 µl of sterile water or using the ExoSap protocol (Invitrogen) following the manufacturer's instructions. PCR-products were bidirectionally sequenced using the ABI PRISM BigDye ® Terminator v3.1 Cycle Sequencing Kit and run on an ABI3130xl Genetic Analyzer. Sequences were assembled in SeqScape v2.5 (Life Technologies) and inconsistencies were checked by eye on the chromatogram.

A Neighbour-Joining (NJ) tree (Saitou & Nei 1987) was constructed using K2P distances in MEGA v7 (Kumar *et al*. 2016) (see Supplementary Materials Figure) and pairwise p-distances (*i.e*., the proportion of sites at which two sequences differ) within and among species were calculated. Moreover, a NJ and a maximum likelihood (ML) tree (Guindon & Gascuel 2003) were constructed after removing identical sequences with DAMBE v.7 (Xia 2018) (Fig. 101). Branch support in the NJ-analysis was evaluated using 1,000 bootstrap replicates. For the ML analysis, the dataset was partitioned according to codon position and the Akaike Information criterion in jModelTest v.2 (Guindon & Gascuel 2003, Darriba *et al*. 2012) was used to select the most appropriate model of evolution. These were the F81+I+G (first position), GTR+I+G (second position), and GTR+G (third position) model, respectively. Then, Garli v.2.01 (Zwickl 2006) was used to perform the ML analysis (two replicates; 500 bootstrap pseudoreplicates) taken into account the most appropriate models of evolution for each of the three codon positions. In each analysis, *Eristalis tenax* (Linnaeus) was used as outgroup. Bootstrap values were considered to be meaningful if ≥ 70% (Hillis & Bull 1993). Specific results of the DNA barcode and phylogenetic analysis are discussed in the Comments parts under each taxon of the Taxonomy and Systematics section when relevant and in the Discussion.

Results

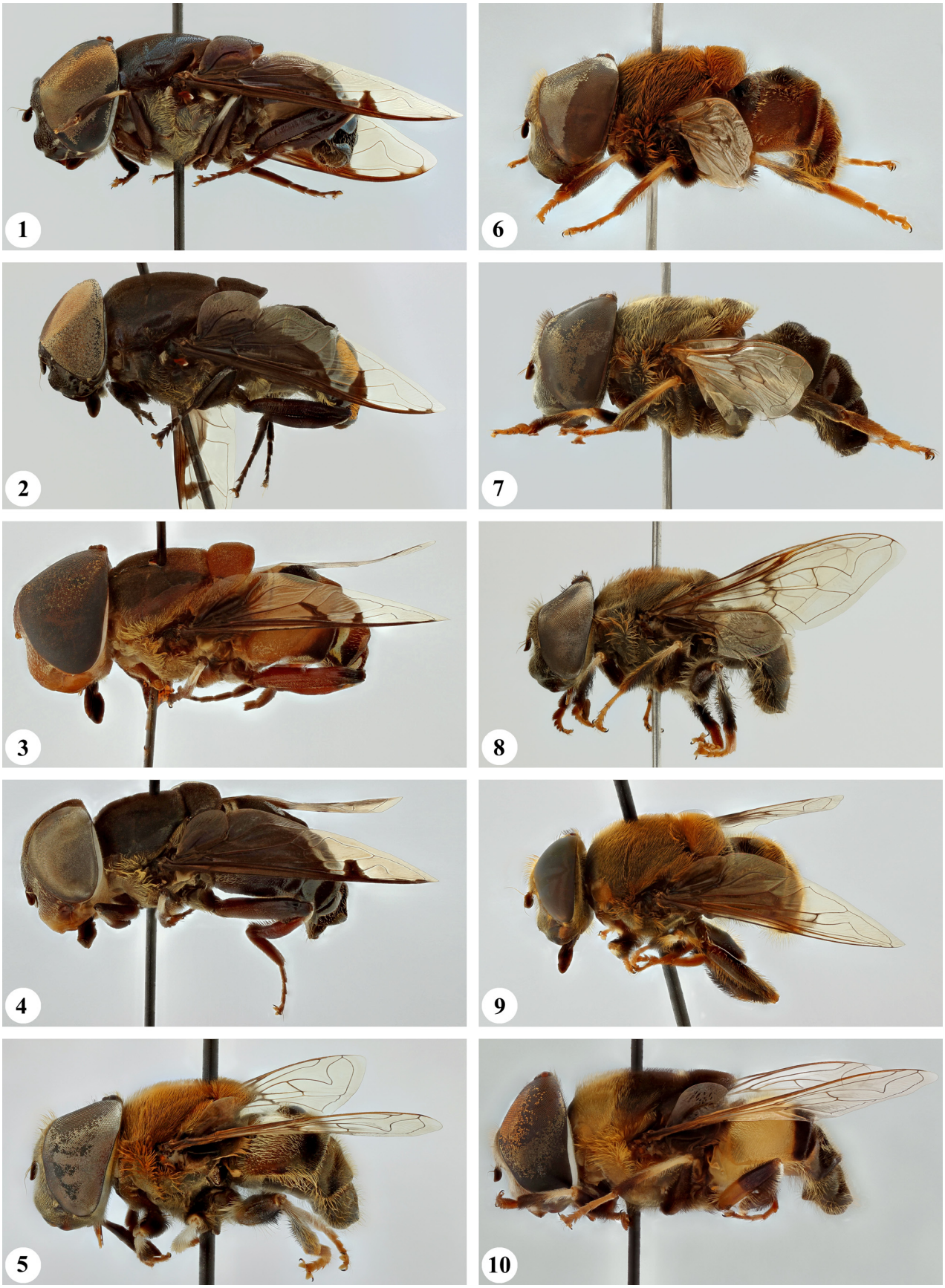
Taxonomy and systematics of the Afrotropical *Phytomia* hoverflies

Phytomia Guérin-Méneville, 1834: 509

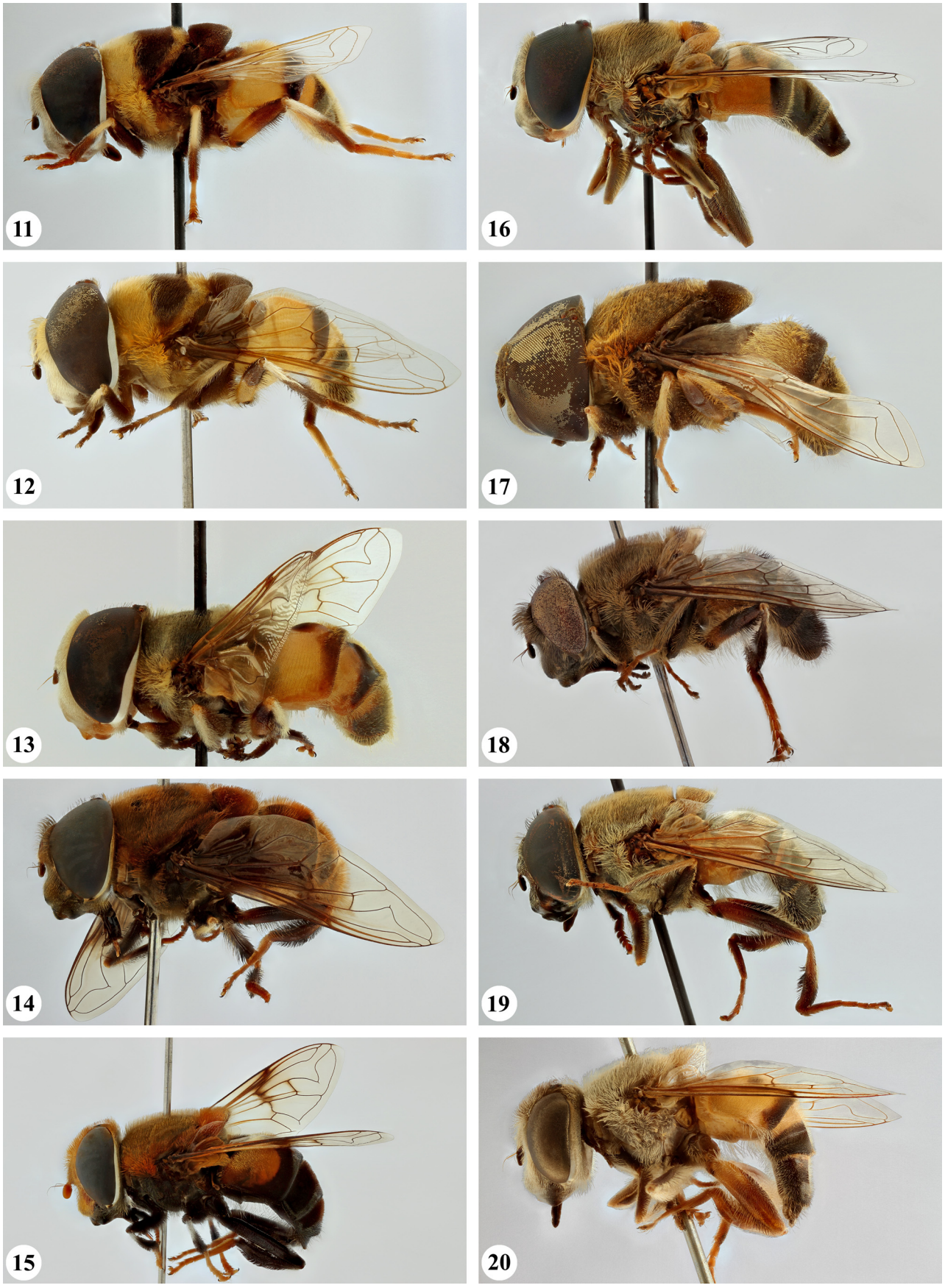
Type species: *Eristalis chrysopygus* Wiedemann, 1819 (by monotypy)

Pachycephalus Wiedemann, 1830: 152 [unavailable name]
Megaspis Macquart, 1842: 27
Dolichomerus Macquart, 1850: 435
Streblia Enderlein, 1938: 237

Generic diagnosis. *Phytomia* species are morphologically characterized by a combination of the following characters: eyes bare; antennal arista pubescent (except for *Phytomia erratica* (Bezzi, 1912)); frons with pronounced rugose area dorsal of antennae; wing with cell r_1 closed and petiolate and vein R_{4+5} strongly sinuate; thorax with setulose katepimeron and with triangular part of anepimeron bare or with setulae much shorter than that on anterior part of anepimeron.



FIGURES 1–10. *Phytomia* spp., habitus, lateral view. 1. *P. bullata* (Loew) ♂ 2. *P. aurigera* Bezzi ♂ 3. *P. kroeberi* (Bezzi) ♂ 4. *P. serena* (Curran) ♀ 5. *P. bulligera* (Austen) ♂ 6. *P. austeni* **sp. nov.** ♂ 7. *P. bezzii* Curran ♂ 8. *P. memnon* **sp. nov.** ♂ 9. *P. pubipennis* Bezzi ♂ 10. *P. natalensis* (Macquart) ♂



FIGURES 11–20. *Phytomia* spp., habitus, lateral view. 11. *P. curta* (Loew) ♂ 12. *P. pallida* **sp. nov.** ♂ 13. *P. erratica* (Bezzi) ♂ 14. *P. fucoides* Bezzi ♂ 15. *P. fusca* Hull ♀ 16. *P. incisa* (Wiedemann) ♂ 17. *P. varians* Curran ♂ 18. *P. melas* (Bezzi) ♂ 19. *P. poensis* (Bezzi) ♂ 20 (copyright NRMS). *P. fronto* (Loew) ♀

Key to the Afrotropical species of *Phytomia*

1 Wing with distinct and well demarcated dark macula running from anterior margin, posteriorly through part of cell r_{2+3} and covering cross-vein *r-m*, usually combined with dark marking along anterior part of wing to a variable extent (Figs 37–41). Thorax, pilosity on scutum and scutellum hardly visible (Figs 1–4) (bullata group) 2

- Wing without distinct and well demarcated dark marking over cross-vein *r-m*, at most darker streak or coloration not connected to anterior wing margin; anterior part of wing either hyaline or darker coloured (Figs 42–60). Thorax with distinct short or long pilosity on scutum and scutellum (Figs 5–20) 5

2 Scutellum orange to rufous, paler than anterior medial part of scutum (Fig. 3) . . . . . *P. kroeberi*

- Scutum and scutellum concolorous, black (Figs 1–2, 4) 3

3 Male abdomen, terga 3 and 4 with pair of maculae of golden pilosity (Fig. 62). Female head, medial part of frons with fascia of golden pilosity (Fig. 22) . . . . . *P. aurigera*

- Male abdomen, terga 3 and 4 without golden pilosity, with pale yellow pilosity only (Figs 61, 63–66). Female head, frons with short dispersed black pile dorsally, palish pile ventrally, without golden pilosity (Figs 21, 23) 4

4 Legs, femora red-brown, apical fifth black; hind femur with distinct apical protuberance ventrally (Fig. 30). Head, face largely yellow-brown (Fig. 23). . . . . *P. serena*

- Legs, femora uniformly black; hind femur without distinct apical protuberance, at most with weak swelling (Fig. 29). Head, face black (Fig. 21). . . . . *P. bullata*

5 Abdomen, second tergum with continuous yellow fascia occupying at least half of entire length, reaching anterior tergum margin, without medial dark macula (Figs 72–74, 79). Wing with basal part, including cell *bc* and alula at least in basal part dark, remainder of wing hyaline (Figs 50–52, 57) 6

- Abdomen, second tergum either completely black, dark with pair of paler maculae anterolaterally, or with broad yellow fascia and medial dark macula (Figs 67–71, 75–78, 80–84). Wing colour variable, either completely hyaline (Fig. 53, 56) or darker in parts (Figs 42–49, 54–55, 58–60). 9

6 Thorax, scutum with concolorous orange-brown pilosity (Fig. 17). . . . . *P. varians*

- Thorax, scutum with yellow to yellow-grey pilosity and pollinosity on anterior third, strongly contrasting with black posterior part (Figs 10–12); posterior margin yellow or darker pollinose. (natalensis group) 7

7 Thorax, without distinct yellow fascia along posterior margin; at most paler brown pollinosity and pale pilosity (Figs 10, 72); if yellow pollinosity present then only medially and not extending along lateral margins dorsally of postalar callus . . . . . *P. natalensis*

- Thorax, scutum with distinct yellow fascia along posterior margin consisting of extensive yellow pollinosity and yellow pilosity, strongly contrasting with black colour of scutellum and black part of scutum (Figs 11–12, 73–74); fascia continued along lateral margin dorsally of postalar callus and largely connected to anterior yellow scutal fascia 8

8 Thorax, anepimeron pilosity uniformly pale yellow; scutum posterior fascia large, about half to one-third as long as black part (Fig. 12). Abdomen, third tergum with yellow anterior fascia continuous, not interrupted in medial part (Fig. 74). . . . . *P. pallida* **sp. nov.**

- Thorax, anterior anepimeron in dorsal part at margin with dorsomedial anepimeron at least partially black pilose; scutum yellow posterior fascia small, at most one-fourth as long as black part (Fig. 11). Abdomen, third tergum usually with yellow anterior fascia interrupted (Fig. 73) . . . . . *P. curta*

9 Abdomen, terga 2–4 without clear medial swelling (bulla) (Figs 77–78, 80–84) 10

- Abdomen, terga 2–4 with at least trace of medial swelling present (Figs 67–71, 75) 15
[*P. fucoides* (Fig. 76) keys out both ways]

10 Head, basoflagellomere bright orange (Fig. 24), frons orange ground colour, with orange pilosity (Fig. 24). Hind leg, femur and tibia black, tarsi orange (Fig. 15). Abdomen black, second tergum with pair of large anterolateral orange maculae (Fig. 77) . . . . . *P. fusca*

- Head, basoflagellomere black to brown-black (Figs 14, 16, 18–20), frons brown-black ground colour, with pale or dark pilosity but never orange. Hind leg, femur orange brown to dark brown; if black, then tarsi never bright orange. Abdomen colour and markings different (Figs 76, 78, 80–84). 11

11 Wing in basal half extensively microtrichose, more hyaline distally (Fig. 54). Thorax and scutellum with rufous to dark brown pollinosity (Fig. 14); anepimeron with distinct long black pile contrasting with paler pile on other pleural sclerites. Abdomen unicolorous dark brown (Fig. 76). . . . . *P. fucoides*

- Wing either completely hyaline (Fig. 56), slightly darker coloured along wing venation (Fig. 60) or weak microtrichose in apical part of cells r_1, r_{2+3} and r_{4+5} (Fig. 59) Thorax and scutellum with predominantly pale pilosity, interspersed with few darker pile (Figs 18–20); anepimeron with long pale pile, of same colour as pile on other pleural sclerites. Abdomen either unicolorous (Figs 82–83) or with yellow-orange to orange-brown markings on at least the second tergum (Figs 78, 80–81, 84). 12

12 Head, area between antennal insertion and facial tubercle weakly concave, and with poorly developed facial tubercle (Fig. 27). Male, eyes touching for distance equal to 2–3 times length of ocellar triangle; dorsal ommatidia distinctly larger (at least three times) than ventral ommatidia (Fig. 25). Male genitalia, surstyli club like with row of strong setulae along apex and large part of inner margin (Fig. 98) . . . . . *P. incisa*

- Head, area between antennal insertion and facial tubercle strongly concave, and with well developed facial tubercle (Fig. 28). Male, eyes not touching or touching for distance only slightly longer than ocellar triangle; dorsal ommatidia of same size or slightly larger than ventral ommatidia (Fig. 26). Male genitalia, surstyli different (Figs 99–100) 13

13 Hind leg, femur swollen, in lateral view at least 1.5x as broad as tibia. Wing, apical part often with weak microtrichia coverage, in particular in cells r_1, r_{2+3} and r_{4+5}. Male, eyes dichoptic. Female, head with rugose area at most as high as length of antenna,

usually smaller and reduced to small smooth bare area just dorsal of antennal insertion; often partially covered by long pale pilosity . . . . . genus *Simoides*

- Hind leg, femur slender, in lateral view about as broad as tibia. Wing either completely hyaline or with slightly darker coloration along wing venation (but not caused by microtrichia). Male, eyes holoptic, touching for short distance. Female, head with rugose area well developed, longer than length of antenna and distinctly rugose; bare 14

14 Head, frons dorsal of rugose area with long pile, equal to length of or longer than third antennal segment (Fig. 18); eyes in male touching for distance at most equal to length of ocellar triangle. Thorax, apical margin of scutellum with long pile equal in length to at least half the depth of the scutellum (Fig. 35). . . . . *P. melas*

- Head, frons dorsal of rugose area with short pile, less than length of third antennal segment (Fig. 19); eyes in male touching for distance slightly to distinctly longer than length of ocellar triangle. Thorax, apical margin of scutellum with short pile, at most one-fourth of the depth of the scutellum (Fig. 36) . . . . . *P. poensis*

15 Thorax, anepimeron with distinct long black pile contrasting with paler pile on other pleural sclerites. Abdomen, bulla hardly discernible, present as small swelling at most; pollinosity uniform (Fig. 76) . . . . . *P. fucoides*

- Thorax, anepimeron with long pale pile, of same colour as pile on other pleural sclerites. Abdomen, medial bulla very distinct, at least on tergum 2; bulla weakly shining, less pollinose than remainder of tergum (Figs 75, 67–71) 16

16 Head, antenna with arista bare. Abdomen, second tergum predominantly yellow with black medial fascia (Fig. 75). Male genitalia, surstyli stub like, with distinct row of strong setulae along apical and inner margin (Fig. 96). . . . . *P. erratica*

- Head, antenna with arista pubescent in basal half, pile at least one-third the width of pedicel. Abdomen, second tergum largely brown to brown-black ground colour (Figs 67–71). Male genitalia, surstyli curved club like, setulae only present at apical part (Figs 89–92) (bulligera group) 17

17 Thorax, scutum and scutellum orange to rufous pilose (Figs 5–6, 9) 18

- Thorax, scutum and scutellum greyish to pale yellowish pilose (Fig. 7). . . . . 21 (*P. memnon* **sp. nov.** (Fig. 8) keys out both ways)

18 Hind leg, tibia pale to golden yellow pilose dorsally (Figs 31–32); if partially black, then ventral calypter with fringe of pale pile 19

- Hind leg, tibia partially (at least apical third) or completely black pilose dorsally (Figs 33–34) 20

19 Wing, ventral calypter with fringe of pale pile (Fig. 42); female wing with microtrichosity restricted to base, anterior margin and a weakly developed patch in the middle (Fig. 42). Abdomen, viewed from behind, second tergum along anterior margin with conspicuous long white pile, widened anterolaterally (Fig. 67). . . . . *P. bulligera*

- Wing, ventral calypter with fringe of black pile (Fig. 43); female wing microtrichosity very extensive, covering most of wing surface except along posterior margin (Fig. 44). Abdomen, viewed from behind, second tergum without conspicuous long white pile, at most with dispersed short white pile anterolaterally (Fig. 68) . . . . . *P. austeni* **sp. nov.**

20 Hind leg, tibia with dorsal pilosity only partially black for at most one-third of entire length distally (as in Fig. 33). Female, wing extensively microtrichose, covering most of wing surface except along posterior margin (Fig. 49) . . . . . *P. pubipennis*

- Hind leg, tibia with dorsal pilosity largely black over entire length, at most one-fifth of basal part with silvery pile (Fig. 34). Female, wing only microtrichose at base, anterior margin and weakly developed patch in the middle (Fig. 47). . . . . *P. memnon* **sp. nov.**

21 Legs, mid tibia pilosity partially black (Fig. 8); hind tibia, ventral black pile at least as long as width of tibia (Fig. 34) . . . . . *P. memnon* **sp. nov.**

- Legs, mid tibia pilosity pale, without black pile (Fig. 7); hind tibia, ventral black pile shorter than width of tibia (Fig. 33). . . . . *P. bezzii*

Species accounts: descriptions, redescriptions and comments

Phytomia bullata group

Phytomia bullata (Loew)

(Figs 1, 21, 29, 37, 61, 85)

Megaspis bullata Loew, 1858: 381
Eristalis (*Megaspis*) *bullatus* Loew, 1860: 319

Material examined. LECTOTYPE (hereby formally designated and published; see comments): ♀, SOUTH AFRICA, "Caffraria", J.A. Wahlberg (NRMS) (digital images of type examined; lectotype label by Barkemeyer 2002). Other material: BURUNDI, Rugege, 1♀, 16.VI.1955; 1♀, 26.VIII.1955, all P. Elsen (KMMA). CONGO (DR), 1♀, Bambesa, February 1934, H.J. Brédo (KMMA); 1♀, 10.II.1939, J. Vrijdagh (KBIN); 5♂ 8♀, August 1935–November 1936 (different dates), J. Ghesquière (KBIN); 1♂, August 1935, J. Ghesquière (KMMA); 8♀, Moma, Equateur, June 1925, J. Ghesquière (KMMA); Stanleyville [=Kisangani], 1♀, Lang & Chapin (AMNH); 1♀, Bequaert (KMMA); 1♀, Yangangu River, Libenge, October–November 1945, C. Herard (KMMA). KENYA, 1♀, Kitale,

July–August 1932, V.G.L. van Someren (BMNH); 1♀, Mt Kenya SE slope, 3–12.II.1911, 1♀, Mt Kenya W side Meru–Nyeri Road, 20.II.1911, both S.A. Neave (BMNH), 1♂ 1♀, Nyeri, March–April 1948, M. Steele (BMNH); 1♀, Yala River, south edge of Kakumga [=Kakamega] Forest, 21–28.V.1911, S.A. Neave (BMNH). UGANDA, 1♂ 1♀, Kalinzu Forest, T.H.E. Jackson (BMNH); 1♂, Kanaba, Kigezi, November 1934; 2♀, Kayonza Forest, Kigezi District, September 1972, H. Falke (CNC); 1♀, Mpanga Forest, December 1934–January 1935; 1♂, Namwamba Valley, December 1934–January 1935, all F.W. Edwards (BMNH).

Body size. Body length (n=10): 11.4–16.3 mm. Wing length (n=10): 8.7–12.1 mm.

Redescription. **MALE** (Fig. 1). ***Head***. Eye bare; holoptic, touching for at least 4 times length of ocellar triangle, facets enlarged in dorsal half. Frons shining black; with black-brown pollinosity; dispersed pilosity of short pale pile, along dorsal margin longer black pile; rugose area shining black, occupying half of entire width and at least three-fourths of height of frons. Face shining black; with greyish pollinosity dorsally and ventrally of facial tubercle; dispersed pilosity of short pale pile; facial tubercle elongated, moderately pronounced. Three tiny silvery maculae present along inner margin of eye. Occiput dorsal third shining black; ventral two-thirds with conspicuous silvery pollinosity, ventrally with dispersed pale pile. Antennal segments black to black-brown; arista yellow-brown, in basal half with long pile equal to width of pedicel.

Thorax. Scutum and scutellum mainly shining black, at most with weakly developed black-brown pollinosity. Devoid of pilosity except for tiny dark pile which are hardly visible, along anterior margin slightly longer; lateral margins dorsally of anepisternum with long black pile. Pleural sclerites (except meron, and anterior anepisternum) covered with long whitish or pale yellowish pile, black along dorsal part of posterior anepisternum.

Legs. Predominantly black to black-brown. Fore and mid leg with tibia silvery in basal third dorsally, ventrally less so; with short black pilosity, except in silvery part where pale. Hind leg (Fig. 29), silvery part on tibia restricted to dorsal side and for basal fifth to sixth; hind femur ventrally with few longer pale pile, poorly developed protuberance and tuft of dense black pilosity in apical fifth.

Wing (Fig. 37). Hyaline, sometimes slightly fumose. With narrow black-brown marking, consisting of microtrichia, along anterior margin from base to junction of vein R_{4+5} with wing margin; extending posteriorly in basal half of wing for almost entire width, and with a marking covering crossvein *r-m*. Calypters black, except basal part where paler; with fringe of black pile.

Abdomen (Fig. 61). Mainly shining black; terga 2–4 partly with black-brown pollinosity except for bullae, lateral plates and narrowly along posterior margin. Tergum 2 with one medial bulla, and two slightly rugose lateral plates. Terga 3–4 with one medial and two lateral bullae. Dispersed pale yellow pilosity on terga 3–4; more densely but short pilosity along lateral margins of tergum 2. Sterna black to black-brown; with widely dispersed short pale and darkish pile. Male genitalia as in Fig. 85.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons (Fig. 21) black; with brownish pollinosity and short dispersed black pile dorsally, palish pile ventrally; medially near antennal insertion with small greyish fascia reaching eye margin; rugose area equal in height to 2–3 times length of ocellar triangle. Facial tubercle strongly pronounced.

Distribution. Burundi, Congo (DR), Kenya, South Africa, Uganda. Also reported from Tanzania [Kilimanjaro, by Speiser; see Bezzi (1915)].

Comments. The type specimen is labelled as 'holotypus' by Kassebeer in 1999, but has a separate label indicating this is a lectotype by Barkemeyer in 2002. The lectotype designation does not seem to have been published.

Phytomia aurigera Bezzi

(Figs 2, 22, 38, 62, 86)

Phytomia aurigera Bezzi, 1915: 68

Material examined. HOLOTYPE: ♂, UGANDA, Toro Forest, SE Buddu, 26–30.IX.1911, S.A. Neave (BMNH). Other material: CONGO (DR), 1♀, Dingila, Uele, 15.VII.1933, J.V. Leroy (KMMA); Eala, 1♀, June 1932, A. Corbisier (KMMA); 3 ♂, 3♀, January–November 1935, J. Ghesquière (KMMA); 1♂, 22.VIII.1935, J. Ghesquière (CNC); 1♂, August 1935, J. Ghesquière (KBIN); Itunda, Dekese, Kasai, 1♀, 4.II.1960; 1♀, 15.IV.1960, both F.J. François (KBIN); 1♀, Kondu, Sankuru, January 1925, J. Ghesquière (KMMA); 1♀, Luputa, Lomami, May 1935, Bouvier (KMMA); Medje, Ituri, 1♀, 1–7.IX.1910, Lang & Chapin (KMMA); 1♀, September 1910, Lang & Chapin

(AMNH); Moma, Equateur, 1♀, June 1925, J. Ghesquière (CNC); 5♀, May–June.1925, J. Ghesquière (one ♀ also indicating Prince Leopold as collector) (KMMA); 1♀, Uele River, J. Rodhain (KMMA). TANZANIA, 1♂, Juani Est., nr Kilosa, 19.V.1968, D.J. Greathead (BMNH). UGANDA, 1♂, Kalinza Forest, February 1972, H. Falke (CNC).

Body size. Body length (n=10): 12.7–15.7 mm. Wing length (n=10): 9.2–11.6 mm.

Redescription. **MALE** (Fig. 2). ***Head***. Eye bare; holoptic, touching for at least 4 times length of ocellar triangle, facets enlarged in dorsal half. Frons black; with black-brown pollinosity; dispersed pilosity of short pale pile, along dorsal margin longer dark pile; rugose area shining black, occupying most of frons. Face shining black; with greyish pollinosity dorsally and ventrally of facial tubercle; dispersed pilosity of short pale pile; facial tubercle elongated, moderately pronounced. Three tiny silvery maculae present along inner margin of eye. Occiput dorsal third shining black; ventral two-thirds with conspicuous silvery pollinosity, ventrally with dispersed pale pile. Antennal segments black to black-brown; arista yellow-brown, in basal half with long pile equal to width of pedicel.

Thorax. Scutum and scutellum mainly shining black, at most with weakly developed black-brown pollinosity. Devoid of pilosity except for tiny dark pile which are hardly visible, rarely somewhat more extensive towards medial part of scutum; lateral margins dorsally of anepisternum with long black pile. Pleural sclerites (except meron, and anterior anepisternum) covered with long whitish or pale yellowish pile, more extensively black along dorsal and ventral parts.

Legs. Predominantly black to black-brown. Fore and mid leg with tibia silvery in basal third to fourth dorsally, ventrally less so; with short black pilosity, except in silvery part where pale. Hind leg, silvery part on tibia restricted to dorsal side and for basal sixth at most; hind femur ventrally with few longer pale pile, with poorly developed protuberance and tuft of dense black pilosity in apical fifth.

Wing (Fig. 38). Hyaline, sometimes slightly fumose. With narrow black-brown marking of microtrichia, along anterior margin from base to junction of vein R_{4+5} with wing margin; extending posteriorly in basal half of wing for almost entire width, and with a marking covering crossvein *r-m*. Calypters black, except basal part where paler; with fringe of black pile.

Abdomen (Fig. 62). Mainly shining black; terga 2–4 partly with black-brown pollinosity except for bullae and lateral plates. Tergum 2 with one medial bulla, and two slightly rugose lateral plates, distal from lateral plate with macula of silvery pile. Terga 3–4 with one medial and two lateral and poorly developed bullae; macula of dense golden pile between medial and lateral bullae. Lateral margin of tergum 2 in posterior half, and tergum 3 over entire length with long pale yellowish pile. Sterna black to black-brown; with conspicuous long pale yellowish pile, except sternum 4 where black. Male genitalia as in Fig. 86.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons (Fig. 22) black; with brownish pollinosity and short dispersed black pile; medially with fascia of longer golden pile over entire width, for height subequal to twice length of ocellar triangle; rugose area equal in height to 2–3 times length of ocellar triangle; near antennal insertion with small greyish transverse maculae reaching eye margin but not forming a complete transverse fascia. Facial tubercle strongly pronounced. Abdomen, bullae on terga 3–4 more pronounced; maculae on terga 3–4 less developed, with dispersed pale yellowish pile; pile along lateral margin of terga 2–3 less developed, shorter; sterna with widely dispersed short pale and dark pile.

Distribution. Congo (DR), Tanzania, Uganda.

Comments. This species is very similar to *P. bullata* but can be readily differentiated by the maculae of golden pile on abdominal terga 3–4 in the male, and the golden patch on the frons in the female. Both species occur sympatrically in a number of locations and have largely overlapping distributional ranges. The mean p-distance between both species is 7.9 % and much larger than the 0.2 % mean intraspecific p-distance for *P. bullata* (we had only one DNA barcode for *P. aurigera*).

Phytomia kroeberi **(Bezzi)**

(Figs 3, 39–40, 63–65, 87)

Megaspis kroeberi Bezzi, 1912: 423
Phytomia kroeberi Bezzi, 1915: 69
Phytomia neavei Bezzi, 1915: 70 **syn. nov.**
Dolichomerus kroeberi abdominalis Curran, 1927b: 364

Material examined. HOLOTYPE (*kroeberi*): ♀, TANZANIA, Nguelo, Usambara, H. Rolle (BMNH). HOLOTYPE (*neavei*): ♀, UGANDA, Entebbe, 1–11.IX.1911, S.A. Neave (BMNH). HOLOTYPE (var. *abdominalis*): ♀, CONGO (DR), Moma, Equateur, June 1925, J. Ghesquière (KMMA). PARATYPE (var. *abdominalis*): CONGO (DR), same as holotype 1♀ (AMNH); 1♀ (KMMA). Other material: ANGOLA, 1♀, 30km N Quiculungo, September–October 1957, G.H. Heinrich (CNC). CAMEROON, 1♂, Eloumden, 15.XI.1965, B. de Miré (MNHN); 2♀, Lolodorf, 17.XI.1913, A.I. Good (CNC). CONGO (DR), Eala, 1♀, September 1935; 1♀, October 1935; 1♀, August 1936; 1♀, 21.XI.1936, all J. Ghesquière (KBIN); 1♂, Manyema, R. Mayné (KMMA) (labelled as type but not part of type series, *cf.* Comments); Moma, Equateur, 1♀, June 1925, J. Ghesquière (CNC); 2♂ 49♀, J. Ghesquière (3♀ specimens also labelled Prince Leopold as co-collector); 1♀, Stanleyville [=Kisangani], September 1913, Lang & Chapin (KMMA). KENYA, S. Masai, January 1933, Lewis, 1♀ (BMNH); 1♀ (NMK). MALAWI, Cholo, 1♀, 11.XI.1920; 1♀, 8.I.1928, both R.C. Wood (BMNH); 1♀, Mt Mlanji, 26.VII.1913, S.A. Neave (BMNH). SOUTH AFRICA, Upper Tongaat, Durban, Natal 2♀, XI.1919, C.N. Barker (DNSM). UGANDA, 1♀, nr Entebbe, 1–14.II.1973, H. Falke (CNC); 1♀, Kemirondwa Valley, NE Kanyanchu, Kabarole Distr., 14.III.2012, M. von Tschirnhaus (MZH); 1♀, Mabira Forest, Chagwe, 16–25.VII.1911, S.A. Neave (BMNH); 1♀ [no locality], Chellanshal (BMNH). ZAMBIA, 1♀, N. Lake Bangweolo, Luwingu, 9.VI.1908, S.A. Neave (OXUM). ZIMBABWE, 1♀, Bomponi, 5.VI.1963, D.M. Cookson (NMSA). Under *kroeberi* variety *abdominalis*: CONGO (DR), 1♀, Kapanga, November 1932, G.F Overlaet (KMMA); 2♀, Moma, June 1925, J. Ghesquière (KMMA); 1♀, Stanleyville [=Kisangani], April 1915, Lang & Chapin (AMNH). Related to var. *abdominalis* (see Comments): TOGO, Kloto, 1♀, December 1999; 1♂, January 2016, both G. Goergen (IITA).

Body size. Body length (n=10): 11.7–13.5 mm. Wing length (n=10): 8.4–9.7 mm.

Redescription. **MALE** (Fig. 3). ***Head***. Eye bare; holoptic, touching for at least 3–4 times length of ocellar triangle, facets enlarged in dorsal half. Frons red-brown to black-brown; with brown pollinosity; dispersed pilosity of short pale pile, along dorsal margin somewhat longer dark pile; rugose area shining red-brown to black-brown, occupying half of entire width and at least three-fourths of height of frons. Face shining red-brown to brown, along facial tubercle and oral margin and gena yellow-brown to pale yellow or more orange; with greyish pollinosity dorsally and ventrally of facial tubercle; dispersed pilosity of short pale pile; facial tubercle oval shaped, hardly discernible. Three inconspicuous maculae present along inner margin of eye. Occiput dorsal third shining black to red-brown; ventral two-thirds with conspicuous silvery pollinosity, ventrally with dispersed pale pile. Antennal segments brown to orange-brown; arista yellow, in basal half with long pile equal to width of pedicel.

Thorax. Scutum brown to black-brown, along lateral margins somewhat paler or more orange; with brown pollinosity; pilosity of dispersed short dark pile, except along lateral margins dorsally of anepisternum where long pale or orange pile. Scutellum yellow-brown to rufous, with dispersed short pale orange pile. Pleural sclerites yellow-brown or orange-brown; covered (except meron, and anterior anepisternum) with long pale yellowish or orange pile.

Legs. Predominantly orange-red to reddish brown. Fore and mid leg with femur basally reddish to reddish brown, darkening towards apex where brown or black-brown, with short black pilosity except basally where paler; tibia brown, silvery in basal half dorsally, ventrally less so; with short black pilosity, except in silvery part where pale. Hind leg, femur orange-red to reddish brown, apex darker, ventrally with pronounced protuberance and tuft of dense black pilosity in apical fifth, otherwise with dispersed short dark and pale pilosity; tibia reddish to reddish brown, silvery part restricted to dorsal side and for basal sixth at most; with dark pilosity, except in silvery part where pale.

Wing (Figs 39–40). Hyaline, sometimes more fumose. With variable brownish markings, consisting of microtrichia; usually as narrow marking along anterior margin from base to junction of vein R_{4+5} with wing margin, sometimes less conspicuous in cell *c*; extending posteriorly in basal half of wing and almost reaching posterior margin, sometimes less extensively and partially hyaline. In all cases pronounced marking covering base of cell r_{2+3}, and extending posteriorly along medial part of cell *r*, and crossvein *bm-cu*. Second marking along basal third of cell r_{2+3} and continued posteriorly over crossvein *r-m*. Calypters dark, except basal part where paler; with fringe of dark pile.

Abdomen (Figs 63–65). Mainly shining yellow-brown to orange-red, lateral and posterior margins darker coloured to variable extent; terga 2–4 partly with dark orange pollinosity. Tergum 2 with one medial bulla, and two slightly rugose lateral plates; bulla entirely or partially dark. Terga 3–4 with one medial and two lateral bullae; medial bulla sometimes partially or completely dark. Sometimes (var. *abdominalis*) abdominal terga predominantly

dark brown. Dispersed pale yellow pilosity on terga 3–4; more densely but short pilosity along lateral margins of tergum 2. Sterna yellow-brown; with widely dispersed short pale pile. Male genitalia as in Fig. 87.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons reddish; with brownish pollinosity; dispersed pilosity of short pale pile in ventral third, dorsally darkish; rugose area darker reddish brown, occupying half of entire width and equal in height to twice length of ocellar triangle. Tiny silvery macula present along inner margin of eye at height of antennal insertion, extended narrowly medially; two additional inconspicuous maculae present along inner margin of eye.

Distribution. Angola, Cameroon, Congo (DR), Kenya, Malawi, South Africa, Tanzania, Uganda, Zambia, Zimbabwe. Probably also Togo (*cf.* Comments). Séguy (1953) mentions the species from Guinea.

Comments. *Phytomia kroeberi* and *P. neavei* were mainly differentiated by the coloration of the medial bullae on the abdomen, and the extent of the markings on the wing. However, these characters have proven to be very variable in the material studied, without clear correlation. The only differentiating character appears to be the coloration of the tibiae which is darker orange-brown in *P. kroeberi* while orange to red in *P. neavei*. *Phytomia kroeberi* specimens are recorded from Tanzania, Malawi and Zimbabwe while *P. neavei* material was found in Angola, Cameroon, Congo (DR), Kenya, Uganda and Zambia. We currently consider *P. kroeberi* and *P. neavei* to be synonymous, pending more extensive sampling throughout the entire distributional range. The variety *abdominalis* agrees with the above description except scutum, legs and abdomen are darker coloured with scutum and abdominal terga largely black-brown; dark markings on basal part of wing more pronounced and slightly smaller in size. *Phytomia kroeberi* var. *abdominalis* remains as a mere morphological variety. Two specimens from Togo are similar with the above, but the abdominal terga are less dark and bullae on abdominal terga 3–4 paler in colour. We place them tentatively here.

One specimen in the KMMA collection is labelled as type specimen of *P. kroeberi*, but does not belong to the type series. It was identified by Hervé-Bazin and the material was received in 1926 according to the collection registrar at KMMA. The erroneous labelling is most likely based on the publication by Hervé-Bazin (1914) where he mentions (p. 279) that this specimen belongs to a new species that will be described by Bezzi. There is no indication, however, that Bezzi studied the specimen nor was it included in the original type series as listed in Bezzi (1915).

Phytomia serena **(Curran)**
(Figs 4, 23, 30, 41, 66)

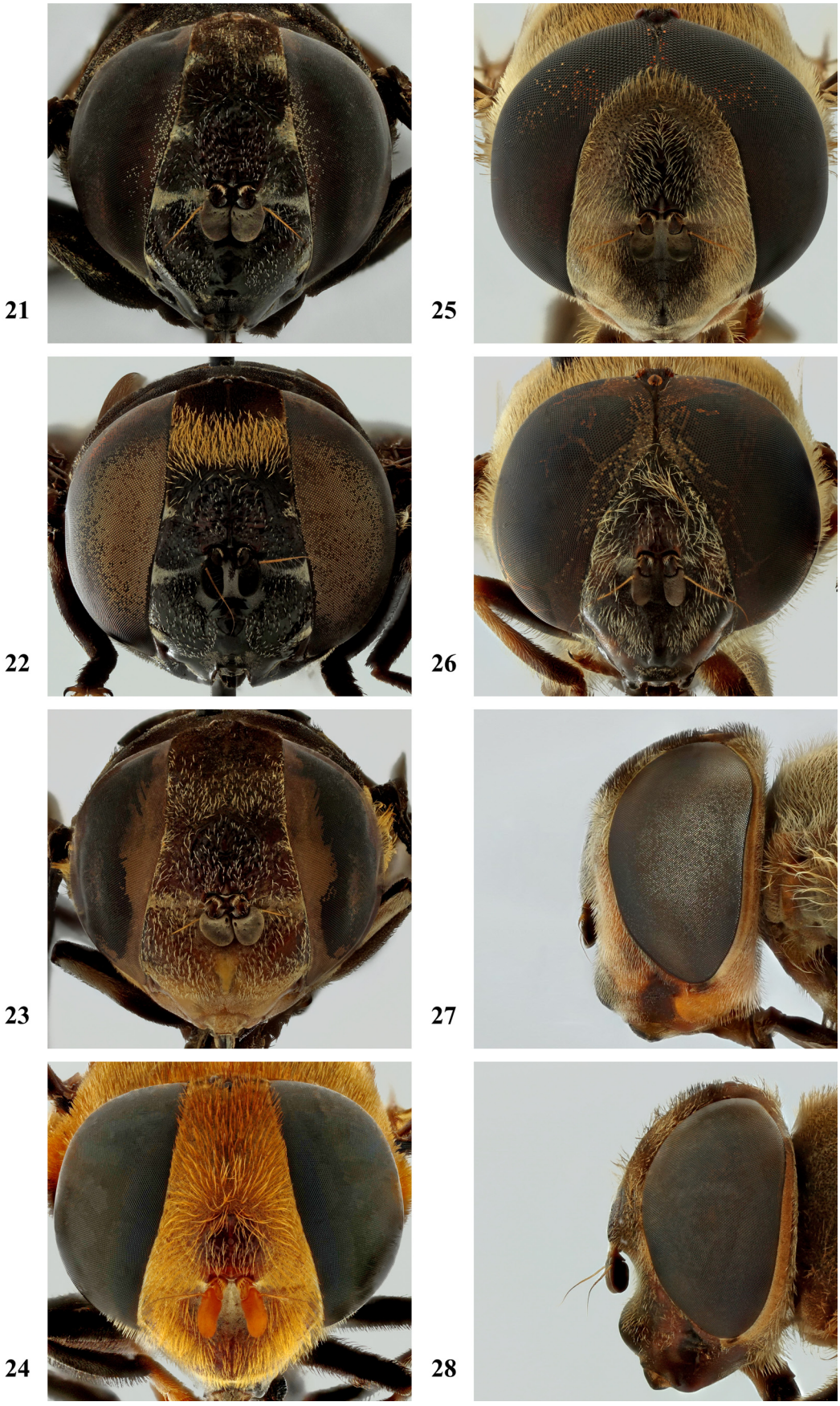
Dolichomerus serena Curran, 1927b: 363

Material examined. HOLOTYPE: ♀, CONGO (DR), Moma, Equateur, June 1925, J. Ghesquière (KMMA). PARATYPES: same as holotype, 1♀ (KMMA), 1♀ (AMNH). Other material: CONGO (DR), 11♀, Moma, Equateur, June 1925, J. Ghesquière (KMMA).

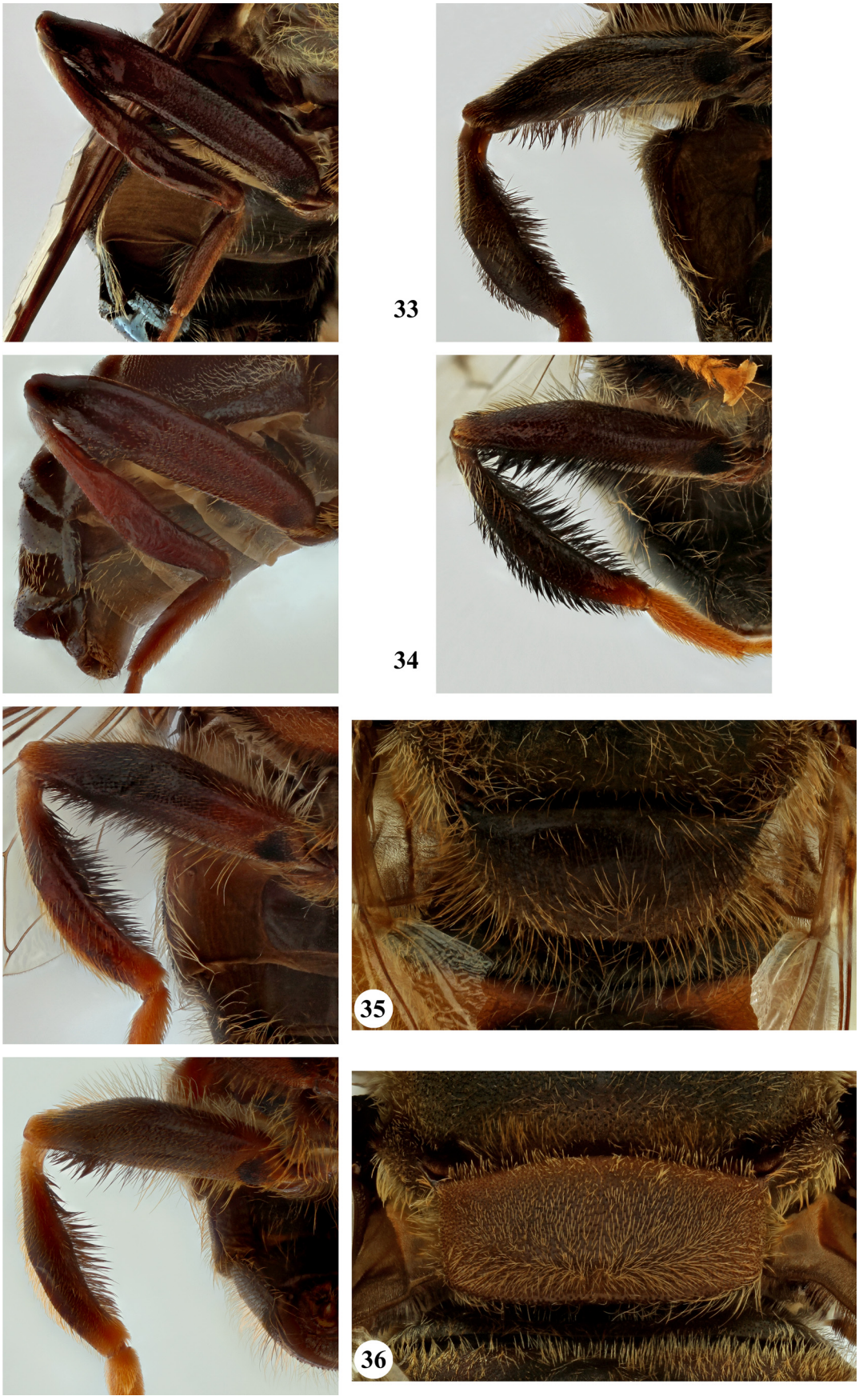
Body size. Body length (n=10): 13.2–14.6 mm. Wing length (n=10): 9.5–10.0 mm.

Redescription. **FEMALE** (Fig. 4). ***Head*** (Fig. 23). Eye bare; dichoptic, facets equal size. Frons black-brown; with brown to black-brown pollinosity; dispersed pilosity of short pale pile in ventral part, medially pile more yellow-brown, dorsally darkish in central part; rugose area shining black, occupying half of entire width and equal in height to twice length of ocellar triangle. Face brown, around facial tubercle and oral margin and gena yellow-brown to pale yellow; with greyish pollinosity dorsally and ventrally of facial tubercle; dispersed pilosity of short pale pile; facial tubercle oval shaped, hardly discernible. Tiny silvery macula present along inner margin of eye at height of antennal insertion, extended narrowly medially; two additional inconspicuous maculae present along inner margin of eye. Occiput dorsal third shining black; ventral two-thirds with conspicuous silvery pollinosity, ventrally with dispersed pale pile. Antennal segments black to black-brown; arista yellow, in basal two-thirds with long pile equal to width of pedicel.

Thorax. Scutum and scutellum mainly shining black, at most with weakly developed black-brown pollinosity. Devoid of pilosity except for tiny dark pile which are hardly visible, along anterior margin slightly longer; along lateral margins dorsally of anepisternum with long pale pile. Pleural sclerites (except meron, and anterior anepisternum) covered with long whitish or pale yellowish pile.



FIGURES 21–28. Figs 21–26. *Phytomia* spp., head, dorsal view. 21. *P. bullata* (Loew) ♀ 22. *P. aurigera* Bezzi ♀ 23. *P. serena* (Curran) ♀ 24. *P. fusca* Hull ♀ 25. *P. incisa* (Wiedemann) ♂ 27. *P. poensis* (Bezzi) ♂ Figs 27–28. *Phytomia* spp., head, lateral view. 27. *P. incisa* (Wiedemann) ♀ 28. *P. poensis* (Bezzi) ♀



FIGURES 29–36. Figs 29–34. *Phytomia* spp., hind leg, anterior view. 29. *P. bullata* (Loew) ♂ 30. *P. serena* (Curran) ♀ 31. *P. bulligera* (Austen) ♂ 32. *P. austeni* **sp. nov.** ♂ 33. *P. bezzii* Curran ♂ 34. *P. memnon* **sp. nov.** ♂ Figs 35–36: *Phytomia* spp., scutellum, dorsal view. 35. *P. melas* (Bezzi) ♂ 36. *P. poensis* (Bezzi) ♀

Legs. Predominantly reddish brown to black-brown. Fore and mid leg with tibia silvery in basal half dorsally, ventrally less so; with short black pilosity, except in silvery part and basally where pale. Hind leg (Fig. 30), silvery part on tibia restricted to dorsal side and for basal fifth at most; hind femur ventrally with pronounced protuberance and tuft of dense black pilosity in apical fifth.

Wing (Fig. 41). Hyaline, sometimes slightly fumose. With narrow black-brown marking, consisting of microtrichia, along anterior margin from base to junction of vein R_{4+5} with wing margin; extending posteriorly in basal half of wing for almost entire width, and with a marking covering crossvein *r-m*. Calypters black, except basal part where paler; with fringe of black pile.

Abdomen (Fig. 66). Mainly shining black; terga 2–4 partly with black-brown pollinosity except for bullae and lateral plates. Tergum 2 with one medial bulla, and two slightly rugose lateral plates. Terga 3–4 with one medial and two lateral bullae. Dispersed pale yellow pilosity on terga 3–4. Sterna black to black-brown; with widely dispersed short pale and darkish pile.

MALE. Unknown.

Distribution. Congo (DR).

Comments. This species is related to both *P. aurigera* and *P. bullata* but differs in the presence of a clear protuberance on the distal part of the hind femur, and the paler coloration of face and legs. It is only known from a small series collected at the type locality.

Phytomia bulligera group

Phytomia bulligera (Austen)

(Figs 5, 31, 42, 67, 88)

Megaspis bulligera Austen, 1909: 91

Material examined. SYNTYPES: 1♀, SIERRA LEONE, [no locality; ex Bigot collection], 1891; 1♂, UGANDA, E. Ruwenzori, Mubuku Valley, 17.I.1906, G. Legge & A.F.R. Wollaston (BMNH), indicated as, respectively female and male type by Austen (1909). The male syntype is hereby designated as lectotype. GHANA, Obuasi, 1♂, 8.I.1907; 1♂, 12.VI.1907, 1♂, 18.VIII.1907, all W.M. Graham (BMNH). UGANDA, 1♀, Salt Lake to Wawamba, G.F. Scott Elliot (BMNH). Other material: BENIN, 1♂, Ahozon, 6.XI.2008; 1♀, Alfa Kouara, August 2004; 1♀, Pénéssoulou, February 2003; Sérou, 4♂, September 2005; 1♂ 1♀, 29.IV.2015, all G. Goergen (IITA). BURUNDI, Bururi, 1♂, 14.V.1949; 1♂, 29.V.1949, all F.J. François (KBIN); 1♂, Rumongo, May 1949, F.J. François (KBIN); 1♂, Rutana, 25.XII.1951, F.J. François (KBIN). CONGO (DR), Bambesa, Uele, 1♂, 20.IX.1933, H.J. Brédo; 1♂, 30.X.1933, H.J. Brédo; 1♂, 30.X.1933, J. Leroy; 1♂, 9.V.1938, P. Henrard (all KMMA); 1♂, Blukwa, Ituri, 28.XI.1928, A. Collart (KMMA); Elisabethville [=Lubumbashi]; 1♀, 14.III.1912, Bequaert (KMMA); 1♂, 15.III.1912, Bequaert (KMMA); 1♂, 9.III.1929, M. Bequaert (KMMA); 1♀, March 1929, M. Bequaert (KMMA); 2♀, 9.XII.1929, M. Bequaert (KMMA); 1♀, April 1930, M. Bequaert (KMMA); 1♂, 1.IV.1934, M. Bequaert (KBIN); 1♂, 21.II.1965, E. Coussement (KBIN); 2♂ 3♀, Ibanda, W. Kivu, 1935, Vandelannoite (KMMA); 1♂, Kando, Katanga, April 1931, G.F. de Witte (KMMA); 1♀, Lac Vert, Kivu, 16.IX.1951, A.E. Bertrand (KMMA); 1♀, Leopoldville [=Kinshasa] (KBIN); Medje, 1♀, 11–14.VI.1910, Lang & Chapin (AMNH) [labelled as paratype of *P. bezzii*]; 1♀, 25–30.VIII.1910, Lang & Chapin (KMMA) [labelled as paratype of *P. bezzii*]; 1♀, Lubutu, 6.II.1915, J. Bequaert (KMMA); 1♂, P.N. Albert, Kataknuda, SL Edouard, 5.III.1936, L. Lippens (KMMA); 1♂, P.N. Albert, riv May ya Moto, affl G. Taiya, 6.V.1957, P. Vanschuytbroeck (KBIN); 1♂, Rwankwi, N. Lac Kivu, October 1951, J.V. Leroy (KMMA); Stanleyville [=Kisangani], 1♂, March 1915, Lang & Chapin (KMMA); 1♀, May 1928, A. Collart (KMMA); 1♀, Walikale, 7.I.1915, J. Bequaert (KMMA). ETHIOPIA, 1♂ 1♀, Bira Sidamo, 9.IV.1934 (NRMS); 1♂, Embuli, near Dembecha, Amhara, 14.X.2011, A. Pauly (KMMA); 6♂ 6♀, Gima, Jimma, 19–24.II.2016, L. Geeraert (KMMA); Irga Alem, 1♂, 18.IX.1935; 1♂, 25.IX.1935, all Saska (KMMA); 1♂, Lima–Kosa, Jimma, 9.II.2016, L. Geeraert (KMMA); 1♂, Holeta, Oromia, 5.X.2010, A. Pauly (KMMA). GHANA, 1♀, Kintampo, 30.V.1913, J.J. Simpson (BMNH); 1♂, Wati Waterfalls, February 2003, G. Goergen (IITA). GUINEA CONAKRY, 1♀, Diambessé Lalila, 13.VII.2017, S. Cavaillès (SCPC). KENYA, 1♂, Kakamega Forest, 20.XII.1970, A.E. Stubbs (BMNH); 4♂ 5♀, Nyangori, N. Kavirondo, 18–19.V.1911, S.A. Neave (BMNH); 3♂ 1♀, trail to Iyale, Taita Hills, 27.XII.2017,

G. Ståhls (MZH); 1♀, Yala River, South edge Kakumga [=Kakamega] Forest, 21–28.V.1911, S.A. Neave (BMNH). MALAWI, Mlanje, 1♀, 28.IV.1913; 1♀, 2.V.1913, both S.A. Neave (BMNH); 1♀, Mt Mlanje, 27.VIII.1913, S.A. Neave (BMNH). RWANDA, 1♂, Astrida [=Butare], 4.III.1955, P. Elsen (KMMA); 1♀, Rwankuba, Kisenyi, 28.VIII.1953, A.E. Bertrand (KMMA). TANZANIA, 3♂ 1♀, Mt Meru, 10.VI.1962 (CNC). TOGO, 4♂, Dzogbégan, 24–25.I.2016, G. Goergen (KMMA); Kloto, 1♂, February 2004; 1♀, October 2007; 1♂, 21–24.VI.2015; 1♂, August 2015; 2♂, November 2015; 1♂, May 2016; 1♂, December 2016, all G. Goergen (IITA); 4♂ 2♀, January 2016, G. Goergen (KMMA); 1♂, Plateaux, Kloto Kamp, 21–24.I.2016, K. Jordaens (KMMA); Kuma–Tokpli, 2♂ 1♀, 21–24.I.2016, G. Goergen (KMMA). UGANDA, 1♂, Ankole District, W. Uganda, 30.XII.1975, M.K. Paulus (CNC); 1♀, Bwamba, July–August 1946, V.G.L. van Someren (CNC); Bwamba Valley, 1♀, July 1945; 2♂ 3♀, May 1954, all V.G.L. van Someren (CNC); Entebbe, 1♀, 1–11.IX.1911, S.A. Neave (CNC); 1♂, 20.XI.1972; 1♂, March 1973; 1♀, April 1973, all H. Falke (CNC); Ibanda, 1♀, 23–28.XII.1972; 1♀, August 1973, all H. Falke (CNC); 1♂ 2♀, North Ankole, 21.I.1975, P. Mugabi (CNC); 1♀, Rwashamaire, 1–15.I.1973, H. Falke (CNC); 2♂ 2♀, Kasese District, Rwenzori, 4.XII.2018, K. Jordaens (KMMA).

Related to *P. bulligera*: SOUTH AFRICA, 1♂, Umfiza Nature Reserve, East London, Eastern Cape, 4.XII.2015, K. Jere (MZH) (see Comments).

Body size. Body length (n=10): 8.6–11.4 mm. Wing length (n=10): 8.1–9.7 mm.

Redescription. **MALE** (Fig. 5). ***Head***. Eye bare; holoptic, touching for about twice length of ocellar triangle, facets enlarged in dorsal half. Frons brown to black; with greyish brown pollinosity; dispersed pilosity of medium long pale pile; rugose area shining black, occupying one-third of entire width and half of entire height; with shorter dispersed pale pile. Face ground colour black; with dispersed greyish to greyish brown pollinosity, in parts weakly shining black; dispersed pilosity of short pale pile; facial tubercle elongated, moderately to strongly pronounced. Gena colour and pollinosity as face; with long pale pilosity. Occiput dorsal third black, with greyish pollinosity; ventrally more densely yellow-white, with dispersed pale pile. Antennal segments brown to black-brown, apical margin of basoflagellomere narrowly orange; arista yellow-brown, in basal half with medium long pile equal to width of pedicel.

Thorax. Scutum and scutellum black ground colour, with dense orange-brown pollinosity; covered with dense pile of long orange to orange-brown pilosity. Pleural sclerites ground colour black, with greyish brown pollinosity; covered with dispersed pile of long yellow to orange pile except meron, anterior part of katepisternum and anterior anepisternum.

Legs. Yellow-orange to black-brown. Fore leg, femur orange-brown to black brown, apical margin narrowly paler; with dense short black pilosity, anteriorly and posteriorly longer; tibia pale in basal third, otherwise orange to orange-brown; with short black pilosity, except in basal third where pale; tarsal segments yellow-orange. Mid leg as in fore leg, except tibia pale for basal half, and pilosity pale over entire length; sometimes pilosity on femur more golden yellow basally, especially along posterior part. Hind leg (Fig. 31), femur slightly thickened; black-brown, in basal third and at apical tip paler; dorsally with long pale pilosity, ventrally with long dark pilosity, otherwise short dark pilosity; tibia orange-brown to black brown, pale in basal third dorsally; with short silvery to golden yellow pilosity (very rarely, in one syntype specimen from Uganda, partially black pilosity in apical third), ventrally with short to medium-long dense black pilosity; tarsal segments yellow-orange.

Wing (Fig. 42). Mainly hyaline. Microtrichia along base; also weakly developed patch in medial part of wing anteriorly from apex of vein *Sc*, posteriorly along medial part of cell r_1, basal part of cell r_{2+3}, and into cell *r* where it reaches the junction of vein *M* with crossvein *bm-cu*. Dorsal calypter dark with fringe of dark pile, ventral calypter paler in basal part and fringe of pale pile.

Abdomen (Fig. 67). Mainly black-brown ground colour. Terga 2–4 to variable extent with anterior margin more orange-brown, anterolaterally more extensively so; with brownish pollinosity and shining medial bulla; pilosity with dispersed short to medium long pale pile, longer along margins; anterolateral part of tergum 2 with patch of more conspicuous dense short white pile, joined narrowly along anterior margin. Sterna black-brown, with widely dispersed long pale pile. Male genitalia as in Fig. 88.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons black ground colour; with greyish to greyish brown pollinosity, except in dorsal third where orange-brown; covered with short dispersed pale pile, except in dorsal third where predominantly black; rugose area shining brown; small, occupying one-fourth of entire width and equal in height to ocellar triangle. Facial pollinosity slightly denser, except on gena. Thorax, pilosity scutum less distinct orange. Legs, mid femur with pilosity more extensively pale.

Distribution. Benin, Burundi, Congo (DR), Ethiopia, Ghana, Guinea Conakry, Kenya, Malawi, Rwanda, Sierra Leone, Tanzania, Togo, Uganda. Possibly also Cameroon (see Speiser 1910) and South Africa (*cf.* Comments).

Comments. One syntype specimen of the series at BMNH, and one syntype specimen of the series at CNC (both originating from Sierra Leone) are aberrant from the other syntypes. Morphological differences of the male syntype were already observed by Austen (1909), in particular on the coloration of the abdominal terga. They show all characteristics of *P. austeni* **sp. nov.** and are included in the type series of the latter. Two paratypes of *P. bezzii* (originating from DR Congo), on the other hand, belong to this species and are listed here under material examined. One specimen from South Africa (GV43164) corresponds in all aspects with typical *P. bulligera* except that the scutal pilosity is more rufous (more orange to orange-brown in *P. bulligera*) and the hind tibia dorsally largely with dense black pilosity except in basal third (completely pale pilosity in *bulligera,* but see also comment on Ugandan specimen in redescription). DNA barcode places it within the cluster of *P. bulligera* (*i.e*., the mean p-distance between specimen GV43164 and the other *P. bulligera* barcodes (1.3 %) is well below the mean interspecific p-distance among *Phytomia* species (6.6 %), and phylogenetic analysis supported the monophyly of all *P. bulligera*. No other material from South Africa, or southern Africa, could be studied. We, therefore, tentatively place it here until more extensive sampling in southern Africa can be conducted.

***Phytomia austeni* sp. nov.**
(Figs 6, 32, 43–44, 68, 89)
urn:lsid:zoobank.org:act:E7389C49-209A-453B-8913-12A1DDA0ABA6

Material examined. HOLOTYPE: ♂, TOGO, Kloto, March 2002, G. Goergen (KMMA). PARATYPES: BENIN, 1♀, Aplaoué, February 2006; 1♀, Pénéssoulou, November 2003, all G. Goergen (IITA). GHANA, 1♂, Cape Coast, December 2004, G. Goergen (IITA); 1♀, Wati Waterfalls, February 2003, G. Goergen (IITA). SIERRA LEONE, 1♀, 1858, J. Foxcroft (CNC); 1♂, Clements (BMNH) (both as syntypes of *P. bulligera*). TOGO, Kloto, 1♀, August 2003; 1♂, October 2003; 3♂ 1♀, January 2004; 2♂ 3♀, February 2004; 2♂ 4♀, March 2004; 7♂ 2♀, April 2004; 1♂, November 2004; 2♂ 1♀, December 2004; 2♂, February 2005; 1♂ 1♀, March 2005; 1♀, November 2005; 2♂, May 2006; 2♂ 4♀, October 2007; 1♂, January 2008; 1♂, July 2008; 1♂, August 2015; 1♀, December 2016, all G. Goergen (IITA). Holotype deposited in KMMA, paratypes in collections of AMNH, BMNH, CNC, IITA, and KMMA. Associated material (not included in type series; females only) CONGO (DR), 1♀, Bambesa, 1.X.1938, J. Vrydagh (KMMA); 1♀, Dekese, Itunda, Kasai, 3.II.1960, F.J. François (KBIN); 1♀, Flandria, Tshuapa, 18.X.1945, P. Hulstaert (KMMA); 1♀, Gamangui, February 1910, Lang & Chapin (AMNH); 1♀, Manyema, R. Mayné (KMMA); 1♀, Medje, Ituri, September 1910, Lang & Chapin (KMMA); 1♀, Nyangwe, 20.XII.1910, Bequaert (KMMA) (labelled as holotype of *P. pubipennis* but see Comments under *P. pubipennis*).

Body size. Body length (n=10): 22.4–13.2 mm. Wing length (n=10): 8.9–10.0 mm.

Description. **MALE** (Fig. 6). ***Head***. Eye bare; holoptic, touching for 2–3 times length of ocellar triangle, facets enlarged in dorsal half. Frons brown to black; with greyish brown pollinosity; dispersed pilosity of medium long pale pile; rugose area shining black, occupying one-third of entire width and two-fifths of entire height; with shorter dispersed pale pile. Face ground colour black; with dispersed greyish to greyish brown pollinosity, in parts weakly shining black; dispersed pilosity of short pale pile; facial tubercle elongated, strongly pronounced. Gena colour and pollinosity as face; with long pale pilosity. Occiput dorsal third black, with greyish pollinosity; ventrally more densely yellow-white, with dispersed pale pile. Antennal segments brown to black-brown; arista yellow-brown, in basal half with medium long pile equal to width of pedicel.

Thorax. Scutum and scutellum black ground colour, with dense orange-brown pollinosity; covered with dense pile of long orange to orange-brown pilosity. Pleural sclerites ground colour black, with greyish brown pollinosity; covered with dispersed pile of long golden yellow to orange pile except meron, anterior part of katepisternum and anterior anepisternum.

Legs. Yellow-orange to black-brown. Fore leg, femur black brown, apical margin narrowly paler; with dense short black pilosity, anteriorly and posteriorly longer, in few specimens also partially paler at base; tibia pale in basal third, otherwise orange-brown; with short black pilosity, except in basal third where pale; tarsal segments yellow-orange. Mid leg as in fore leg, except tibia pale for basal half, and pilosity pale over entire length; sometimes pilosity on femur more golden yellow basally, especially along posterior part. Hind leg (Fig. 32), femur slightly thickened;

black-brown, at extremities narrowly paler; dorsally with long pale pilosity, ventrally with long dark pilosity, towards base paler; tibia orange-brown to black brown, pale at basal tip; dorsally with short pale to golden yellow pilosity, ventrally with short to medium-long dense black pilosity; tarsal segments yellow-orange.

Wing (fig. 43). Mainly hyaline. Microtrichia along base; also patch in medial part of wing anteriorly from apex of vein *Sc*, posteriorly along medial part of cell r_1, basal part of cell r_{2+3}, and into cell *r* where it reaches the junction of vein *M* with crossvein *bm-cu*; otherwise with faint streaks of microtrichia in cells *c*, *bm*, *cup*, r_1 and r_{2+3}. Calypters dark with fringe of dark pile.

Abdomen (Fig. 68). Mainly orange-brown to brown ground colour. Terga 2–4 with darker medial bulla; pilosity with dispersed short to medium long pale pile, longer along margins. Sterna black-brown, with widely dispersed long pale pile. Male genitalia as in Fig. 89.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons black ground colour; with greyish brown pollinosity, except in dorsal third where dark brown; covered with short dispersed pale to yellow-orange pilosity; rugose area shining black-brown; occupying one-third of entire width and equal in height to at most twice length of ocellar triangle. Face near antennal insertion more orange-brown. Wing (Fig. 44) more extensively covered with microtrichia, covering most of wing surface except along posterior margin; giving wing a darker appearance, medial patch along cross-vein *r-m* more densely covered.

Diagnosis. Recognizable by the black fringe on the ventral calypter in both sexes and the extensive mictrotrichose covering in the female wing.

Distribution. Benin, Congo (DR), Ghana, Sierra Leone, Togo.

Etymology. Named after the dipterist Ernest E. Austen (1867–1938) who, when describing *P. bulligera*, already indicated that some specimens where deviant in morphological characters, which led to the description of this new species. The specific epithet should be treated as a noun in the genitive case.

Comments. When describing *P. bulligera*, Austen (1909) already indicated that the male specimen collected in Sierra Leone deviated in abdominal coloration from the male type specimen from Uganda. After morphological examination of long series, the former specimen turned out to belong to a different species described here and that differs from *P. bulligera* by the following main characteristics: ventral calypter with fringe of black pile (fringe of pale pile in *P. bulligera*), abdominal tergum 2 along anterior margin at most with dispersed short white pile anterolaterally (with conspicuous long white pile along whole anterior margin, distinctly widened anterolaterally in *P. bulligera*), and female with microtrichosity very extensive covering most of the wing surface except along posterior margin (microtrichosity restricted to base, anterior margin and weakly developed medial patch in *P. bulligera*). DNA barcoding showed that specimens of both species clustered into different groups. The mean p-distance between both species is 9.6 % and much higher than both mean intraspecific p-distances (0.2 % for *P. bulligera*; 0.1 % for *P. austeni*) and well above the mean interspecific p-distance for *Phytomia* (6.6 %), confirming the morphological differentiation. A number of females are not included in the type series. They originate from Congo (DR), geographically distinct from the main series which originates from western Africa. As this material is relatively old and the majority in poor condition, no DNA could be extracted to verify whether they would group in the *P. austeni* clade.

Phytomia bezzii **Curran**

(Figs 7, 33, 45–46, 69, 90)

Phytomia bezzii Curran, 1927a: 78

Material examined. HOLOTYPE: ♀, CONGO (DR), Stanleyville [=Kisangani], March 1915, Lang & Chapin (AMNH). PARATYPE: CONGO (DR), Stanleyville [=Kisangani], 1♀, 7.IV.1915, Lang & Chapin (AMNH); 1♀, 9.IV.1915, Lang & Chapin (KMMA). (Two paratypes (CONGO (DR), Medje, 1♀, 25–30.VIII.1910 (KMMA); 1♀, 11–14.VI.1910 (AMNH), both Lang & Chapin) do not belong to *P. bezzii* but are specimens of *P. bulligera*). Other material: CAMEROON, 1♂, Lolodorf, 8.III.1911, A.I. Good (CNC). CENTRAL AFRICAN REPUBLIC, 1♀, La Maboke, 31.III.1970, M. Boulard (MNHN). CONGO (DR), Eala, 1♀, November 1935 (KMMA); 1♂, 24.VI.1935 (KBIN); 1♂, October 1935 (KBIN), all J. Ghesquière. GHANA, 1♀, Obuasi, 2.VII.1907, W.H. Graham (BMNH). TOGO, 1♂, Dzogbégan, 17.V.2015, G. Goergen (IITA); Kloto, 1♂, November 2007; 1♀, January 2016; 1♂, December 2016, all G. Goergen (IITA); 3♂ 1♀, January 2016, G. Goergen (KMMA).

Body size. Body length (n=10): 12.4–13.5 mm. Wing length (n=10): 9.0–10.3 mm.

Redescription. **MALE** (Fig. 7). ***Head***. Eye bare; holoptic, touching for about twice length of ocellar triangle, facets enlarged in dorsal half. Frons brown to black; with greyish brown pollinosity; dispersed pilosity of medium long pale pile, dorsally longer and darker; rugose area shining black–brown, occupying one-third of entire width and two–fifths of entire height; with shorter dispersed pale pile. Face ground colour black; with dispersed greyish to greyish brown pollinosity, in parts weakly shining black; dispersed pilosity of short pale pile; facial tubercle elongated, moderately to strongly pronounced. Gena colour and pollinosity as face; with long pale pilosity. Occiput dorsal third black, with greyish pollinosity; ventrally more densely yellow-white, with dispersed pale pile. Antennal segments brown to black-brown; arista yellow-brown, in basal half with medium long pile equal to width of pedicel.

Thorax. Scutum and scutellum black ground colour, with dense greyish to greyish-brown pollinosity in anterior half of scutum, posterior part weakly shining black; covered with dense pile of long pale yellowish to greyish pilosity. Pleural sclerites ground colour black, with greyish brown pollinosity; covered with dispersed pile of pale yellow to yellow-orange pile except meron, anterior part of katepisternum and anterior anepisternum.

Legs. Yellow-orange to black-brown. Fore leg, femur black brown, apical margin narrowly paler; with dense short black pilosity, anteriorly and posteriorly longer and pale in basal third; tibia pale in basal third, otherwise orange-brown; with short black pilosity, except in basal third where pale; tarsal segments yellow-orange. Mid leg as in fore leg, except tibia pale for basal half, and pilosity pale over entire length. Hind leg (Fig. 33), femur slightly thickened; black-brown; dorsally with long pale pilosity, ventrally with long pilosity pale in basal half and dark in apical half, otherwise short dark pilosity; tibia orange-brown to black brown, sometimes pale at basal tip; dorsally with short pale pilosity in basal third, distally black, ventrally with short to medium-long dense black pilosity; tarsal segments yellow-orange to dark orange.

Wing (Fig. 45). Mainly hyaline. Microtrichia along base; also patch in medial part of wing anteriorly from apex of vein *Sc*, posteriorly along medial part of cell r_1, basal part of cell r_{2+3}, and into cell *r* where it reaches the junction of vein *M* with crossvein *bm-cu*. Calypters dark with fringe of dark pile.

Abdomen (Fig. 69). Mainly black-brown ground colour, sometimes partly more dark rufous. Terga 2–4 with black-brown pollinosity and shining medial bulla; pilosity with dispersed short to medium long pale to yellowish pile, longer along margins. Sterna black-brown, with widely dispersed long pale pile. Male genitalia as in Fig. 90.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons black ground colour; with greyish brown pollinosity, except in dorsal third where dark brown; covered with short dispersed pale to yellowish pile, except in dorsal third where predominantly black; rugose area shining brown; occupying one-third of entire width and equal in height to at most twice length of ocellar triangle. Wing (Fig. 46) more extensively covered with microtrichia, covering anterior half to two-thirds of wing surface, in addition to medial patch along cross-vein *r-m* more densely, sometimes covering most of wing surface except for posterior margin.

Distribution. Cameroon, Central African Republic, Congo (DR), Ghana, Togo.

Comments. When describing *P. pubipennis*, based on a specimen from Uganda, Bezzi (1915) already pointed out that an additional specimen (collected in Obuasi, Ghana) was related but differed in a number of morphological characters, considering it a melanic form. Curran (1927a) described *P. bezzii*, based on a series of specimens collected in Congo (DR) but explicitly refers to the melanic form of *P. pubipennis*, as recognized by Bezzi, and states that this is the same species. He, however, did not include the specimen from Ghana in the type series.

Phytomia memnon **sp. nov.**

(Figs 8, 34, 47, 70, 91)

urn:lsid:zoobank.org:act:A6028878-8BC9-4FEF-8AD8-1AD0CA438A4C

Material examined. HOLOTYPE: ETHIOPIA, ♂, Jimma, Gimo, 11.II.2016, L. Geeraert (KMMA). PARATYPES: ETHIOPIA, 2♀, Irga-Alem, 25.IX.1935, Saska (KMMA); Jimma, Gimo, 1♂, 24.II.2016, L. Geeraert (KMMA); 1♀, Mulata Mts, Harrar Prov., 22.X.1925 (AMNH). KENYA, Marsabit Forest, 20.IV.2016, R.S. Copeland, 2♀ (ICIPE); 1♀ (NMK).

Body size. Body length (n=7): 10.5–11.4 mm. Wing length (n=7): 8.6–10.6 mm.

Description. **MALE** (Fig. 8). ***Head***. Eye bare; holoptic, touching for at most 1.5 times length of ocellar triangle, facets enlarged in dorsal half. Frons brown to black; with greyish brown pollinosity; dispersed pilosity of

medium long to long pale pile; rugose area shining black, occupying slightly less than one-third of entire width and half of entire height; with shorter dispersed pale pile. Face ground colour black; with dispersed greyish to greyish brown pollinosity, in parts weakly shining black; dispersed pilosity of short pale pile; facial tubercle elongated, strongly pronounced. Gena colour and pollinosity as face; with long pale pilosity. Occiput dorsal third black, with greyish pollinosity; ventrally more densely yellow-white, with dispersed pale pile. Antennal segments brown to black-brown, apical margin of basoflagellomere narrowly orange; arista yellow-brown, in basal half with medium long pile equal to width of pedicel.

Thorax. Scutum and scutellum black ground colour; with greyish pollinosity, in centre of scutum more greyish-brown; covered with dense pile of long pale brown pilosity, along lateral margins and on scutellum paler pile, medial part of scutellum mixed with darker pile. Pleural sclerites ground colour black, with greyish brown pollinosity; covered with dispersed pile of long pale pile except meron, anterior part of katepisternum and anterior anepisternum.

Legs. Yellow-orange to black-brown. Fore leg, femur orange-brown to black-brown, apical margin narrowly paler; with dense short black pilosity, anteriorly and posteriorly longer and basally with pale pile; tibia pale in basal fourth to fifth, otherwise orange-brown to brown; with short black pilosity, except in basal part where pale; tarsal segments yellow-orange. Mid leg as in fore leg, except tibia pale for basal third. Hind leg (Fig. 34), femur slightly thickened; black-brown, in basal third and at apical tip sometimes paler; dorsally with long pale pilosity, ventrally predominantly with long dark pilosity, otherwise short dark pilosity; tibia orange-brown to black-brown, narrowly pale at base; dorsally and ventrally with short to medium-long dense black pilosity, except at basal fifth dorsally where pale; tarsal segments yellow-orange. Male genitalia as in Fig. 91.

Wing. Mainly hyaline (as in *P. bezzii*, *cf.* Fig. 45). Microtrichia along base; also weakly developed patch in medial part of wing anteriorly from apex of vein *Sc*, posteriorly along medial part of cell r_1, basal part of cell r_{2+3}, and into cell *r* where it reaches the junction of vein *M* with crossvein *bm-cu*. Calypters dark with fringe of dark pile.

Abdomen (Fig. 70). Mainly orange-brown to black-brown ground colour. Terga 2–4 with brownish pollinosity and darker shining medial bulla; pilosity with dispersed short to medium long pale pile, longer along margins; anterolateral part of tergum 2 with patch of more conspicuous dense short white pile, joined narrowly along anterior margin. Sterna black-brown, with widely dispersed long pale pile. Male genitalia as in Fig. 91.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons black ground colour; with greyish to greyish brown pollinosity, except in dorsal third where dark brown; covered with short dispersed pale pile, except in dorsal third where extensively black; rugose area shining brown; occupying one-third of entire width and equal in height to 1.5 times ocellar triangle. Thorax, pilosity scutum and scutellum more greyish, except in medial part where black. Legs, mid and hind femur with pilosity more extensively pale in basal part. Wing (Fig. 47), microtrichia coverage slightly more extensive, medial patch more densely so.

Diagnosis. Recognizable by the completely black pilosity along the dorsal margin of the hind tibia.

Distribution. Ethiopia, Kenya.

Etymology. Named after the Greek mythological figure Memnon, referring to the type locality. The specific epithet should be treated as a noun in apposition.

Comments. This species belongs to the bulligera group and shares the characteristics of distinct medial bulla on terga 2–4, tergum 2 without continuous yellow fascia, and wings hyaline with microtrichial patches basally and in medial part. It differs from other species within this group by the completely black pilosity along the dorsal margin of the hind tibia (at most one-fifth of the basal part with silvery pile) and the medial patch of microtrichia on the wing weakly developed. Geographically all specimens encountered so far originate from Ethiopia and the northern adjacent parts of Kenya. DNA barcoding showed that the mean p-distance between *P. memnon* **sp. nov.** and its closest relatives is 2.6 % (with *P. pubipennis*) and 6.3 % (with *P. bulligera*) while mean intraspecific p-distances are much lower (0.2 and 1.1 % for *P. bulligera* and *P. memnon* **sp. nov.**, respectively; we had only one barcode for *P. pubipennis*).

***Phytomia pubipennis* Bezzi**

(Figs 9, 48–49, 71, 92)

Phytomia pubipennis Bezzi, 1915: 71
Eristalis (*Phytomia*) *noctilio* Speiser, 1924: 46 **syn. nov.**

Material examined. HOLOTYPE (*pubipennis*): ♀, UGANDA, Daro Forest, Toro, 25–29.X.1911, S.A. Neave

(BMNH). SYNTYPES (*noctilio*): 1♂ 1♀, CONGO (DR), Urwald Moëra, 1910, Grauer (NMW). Other material: CONGO (DR), Akenge, Stanleyville [=Kisangani], September 1913, Lang & Chapin, 1♀ (AMNH); 1♀ (KMMA); 1♂, Eala, June 1932, A. Corbisier (KMMA); 1♀, Masua, Lubutu, 9.IX.1929, A. Collart (KMMA); 1♂, Stanleyville [=Kisangani], 5.IV.1915, Lang & Chapin (AMNH). GHANA, 1♀, Obuasi, 1.IX.1907, W.H. Graham (BMNH). IVORY COAST, 1♀, Maraoué Nat. Park, 19.IV.1989, J. Londt (NMSA). LIBERIA, 1♀, Banga, October 1926, J. Bequaert (KMMA). UGANDA, 1♀, Budongo Forest nr Lake Albert, April 1972, E. Babyetagara (CNC); 1♂, Impenetrable Forest, 1–10.VI.1972, E. Babyetagara (CNC); 3♂ 2♀, Kalinzu Forest, February 1972, H. Falke (CNC); 1♂, Kayonza Forest, Kigezi Distr., May 1972, E. Babyetagara (CNC).

Body size. Body length (n=10): 8.3–12.5 mm. Wing length (n=10): 7.6–9.4 mm.

Redescription. **MALE** (Fig. 9). ***Head***. Eye bare; holoptic, touching for about twice length of ocellar triangle, facets enlarged in dorsal half. Frons brown to black; with golden brown pollinosity; dispersed pilosity of medium long yellowish to orange pile; rugose area shining black, occupying one-third of entire width and about two-fifths of entire height; with shorter dispersed yellowish to orange pile. Face ground colour black; mainly weakly shining with dispersed golden brown pollinosity, in parts more densely golden pollinosity; dispersed pilosity of short pale pile; facial tubercle elongated, strongly pronounced. Gena colour and pollinosity as face except for orange patch; with long pale pilosity. Occiput dorsal third black, with greyish pollinosity; ventrally more densely golden, with dispersed pale pile. Antennal segments brown to black; arista orange-brown, in basal two-thirds with medium long pile equal to width of pedicel.

Thorax. Scutum black ground colour, with dense orange-brown pollinosity anteriorly, posteriorly weakly shining; covered with dense pile of long orange to orange-brown pilosity. Scutellum as scutum except along anterior and posterior margins more rufous ground colour, extending towards centre in medial part. Pleural sclerites ground colour black, with greyish brown pollinosity; covered with dispersed pile of long golden yellow to orange pile except meron, anterior part of katepisternum and anterior anepisternum.

Legs. Fore leg, femur orange-brown to black-brown, apical margin narrowly paler; with dense short black pilosity, anteriorly and posteriorly longer and partially paler at base; tibia pale in basal fourth, otherwise dark brown; with short black pilosity, except in basal pale area where pale to yellow-orange pile; tarsal segments yellow-orange. Mid leg as in fore leg, except tibia pale for more extended part, at least to basal half, pale to yellow-orange pilosity extending half-way. Hind leg femur orange-brown to black-brown, at extremities narrowly paler; dorsally with long pale to golden yellow pilosity, ventrally with long dark pilosity except in basal part where pale, otherwise short pale pilosity; tibia orange-brown to black-brown; dorsally with short pale to yellow-orange pilosity in basal two-fifths to two-thirds, changing to black distally, ventrally with short to medium-long dense black pilosity; tarsal segments yellow-orange.

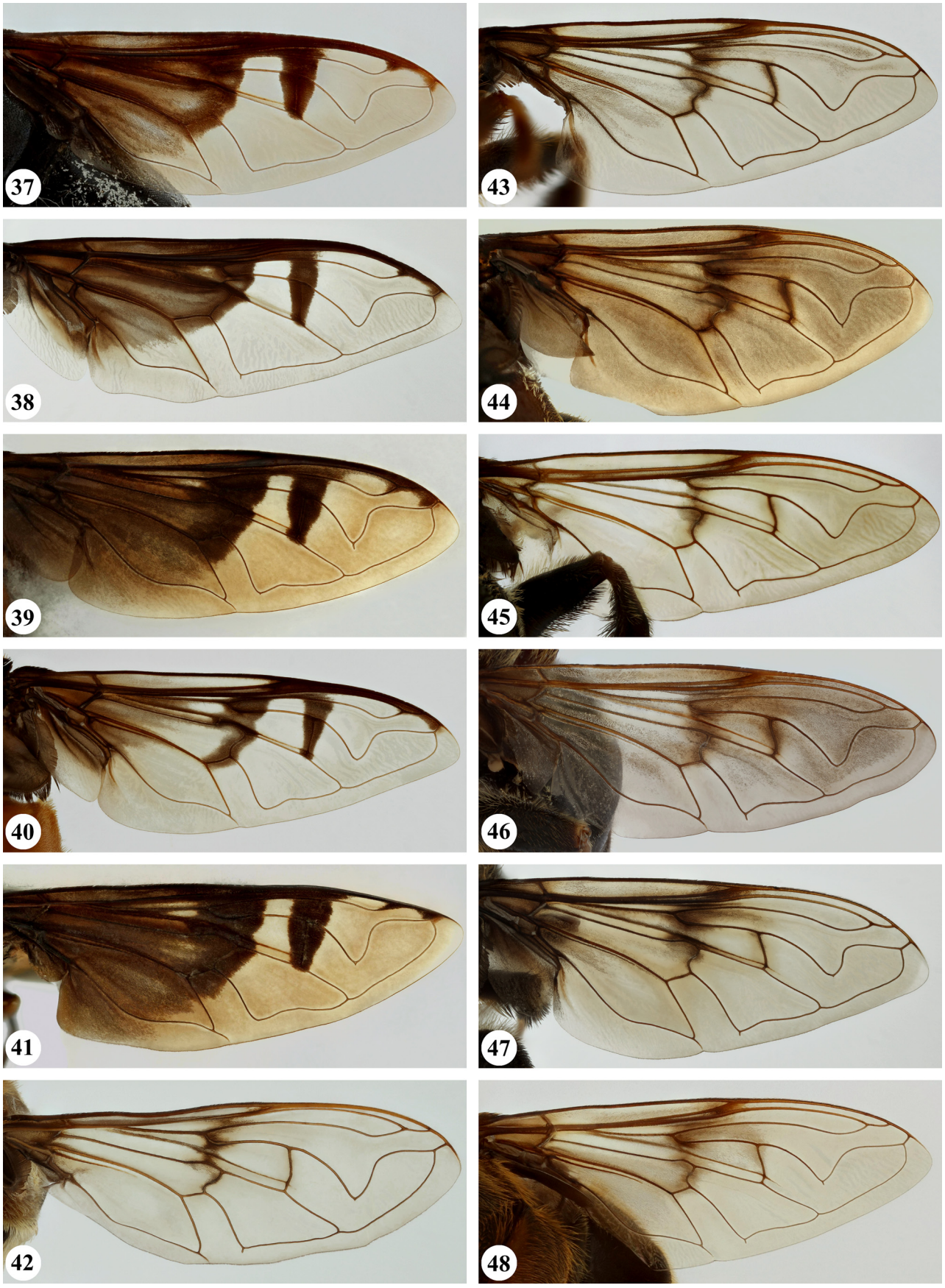
Wing (Fig. 48). Mainly hyaline to slightly fumose, with dispersed microtrichia covering large or entire parts of cells *bc*, *c*, *sc*, *r*, *bm* and *cup* as well as basal third of cell r_{2+3} and basal margin of r_{4+5} near crossvein *r-m*; more densely so at base and in patch at medial part of wing anteriorly from apex of vein *Sc*, posteriorly along medial part of cell r_1, basal part of cell r_{2+3}, and into cell *r* where it reaches the junction of vein *M* with crossvein *bm-cu*. Calypters dark with fringe of dark pile.

Abdomen (Fig. 71). Mainly black-brown ground colour. Terga 2–4 to variable extent more orange-brown; with shining medial bulla; pilosity with dispersed short to medium long pale to yellow-orange pile, longer along margins. Sterna black-brown, with widely dispersed long pale pile. Male genitalia as in Fig. 92.

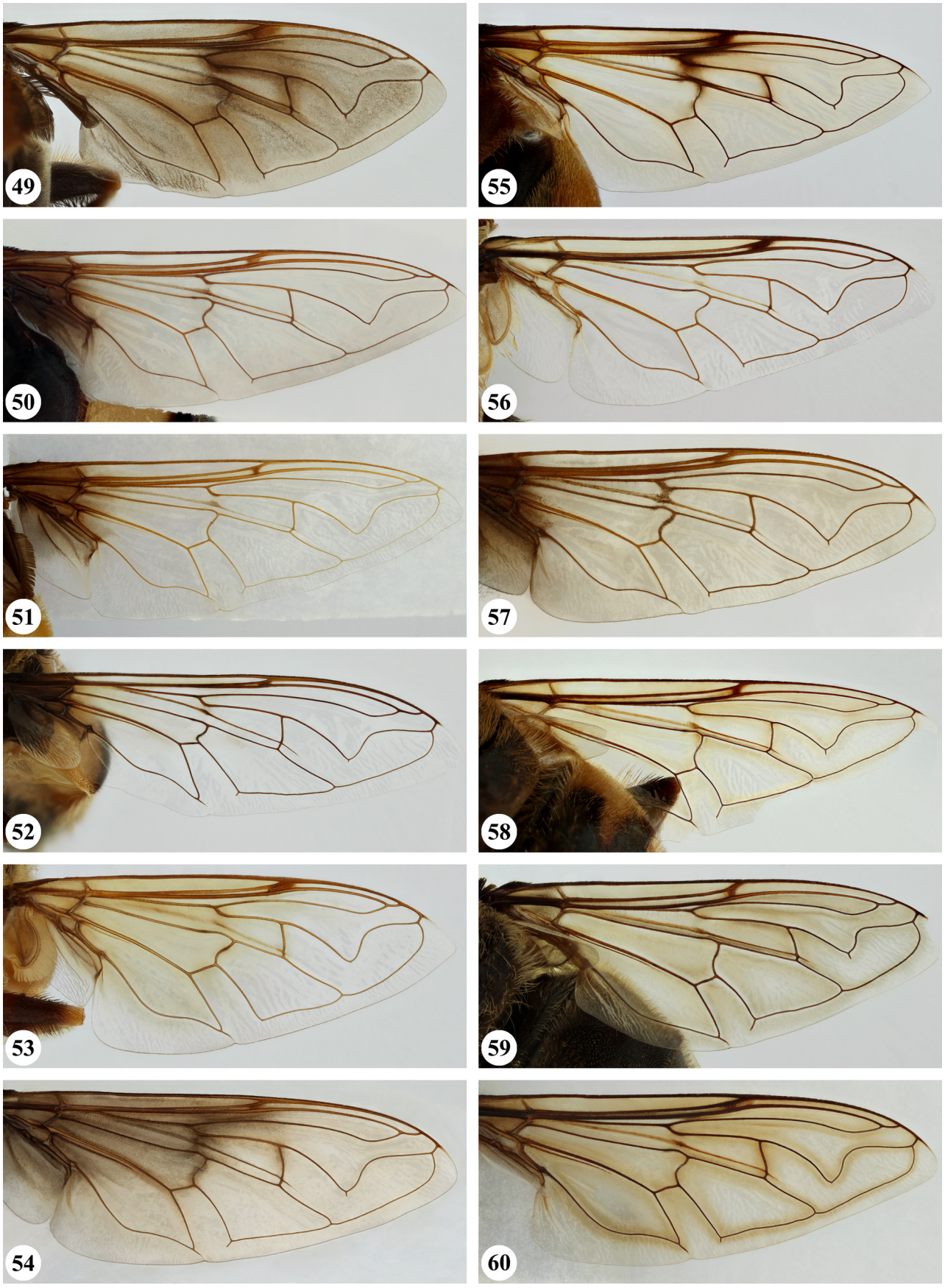
FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons black ground colour; with golden brown pollinosity; covered with short dispersed yellow-orange pile; rugose area shining brown; occupying one-third of entire width and slightly longer in height than length of ocellar triangle. Legs, fore and mid tibiae with basal pale area more extensive. Wing (Fig. 49) more extensively covered with microtrichia, covering most of wing surface except along posterior margin; medial patch also along cross-vein *r-m* more densely covered. Margins bordering veins somewhat more fumose.

Distribution. Congo (DR), Ghana, Ivory Coast, Liberia, Uganda.

Comments. Syntype specimens of *P. noctilio* are identical to *P. pubipennis* except for that the microtichia coverage on the wing is more extensive, in particular in the male, and that the mid and fore tibia has the pale pilosity over the entire length. Other differences outlined in Speiser (1924) appear to be variable and do not enable differentiation between both species. The differences observed do not warrant specific status and we, therefore, consider



FIGURES 37–48. *Phytomia* spp., right wing. 37. *P. bullata* (Loew) ♀ 38. *P. aurigera* Bezzi ♂ 39–40. *P. kroeberi* (Bezzi) ♀ 41. *P. serena* (Curran) ♀ 42. *P. bulligera* (Austen) ♀ 43. *P. austeni* **sp. nov.** ♂ 44. *P. austeni* **sp. nov.** ♀ 45. *P. bezzii* Curran ♂ 46. *P. bezzii* Curran ♀ 47. *P. memnon* **sp. nov.** ♀ 48. *P. pubipennis* Bezzi ♂



FIGURES 49–60. *Phytomia* spp., right wing. 49. *P. pubipennis* Bezzi ♀ 50. *P. natalensis* (Macquart) ♂ 51. *P. curta* (Loew) ♂ 52. *P. pallida* **sp. nov.** ♂ 53. *P. erratica* (Bezzi) ♂ 54. *P. fucoides* Bezzi ♂ 55. *P. fusca* Hull ♀ 56. *P. incisa* (Wiedemann) ♂ 57. *P. varians* Curran ♂ 58. *P. melas* (Bezzi) ♂ 59. *P. melas* (Bezzi) ♀ 60. *P. poensis* (Bezzi) ♀

P. noctilio to be synonymous to *P. pubipennis*. One specimen in KMMA is labelled as type but is not included in type series. The erroneous labelling is based on the publication by Hervé-Bazin (1914) where he mentions that this specimen belongs to a new species that will be described by Bezzi. There is no indication, however, that Bezzi studied the specimen nor was it included in the original type series as listed in Bezzi (1915). In addition, the specimen belongs to the newly described *Phytomia austeni*.

Phytomia natalensis group

Phytomia natalensis (Macquart)
(Figs 10, 50, 72, 93)

Eristalis natalensis Macquart, 1850: 438
Megaspis natalensis var. *rufifacies* Doesburg, 1955: 3
Megaspis natalensis var. *varipes* Doesburg, 1955: 3

Material examined. HOLOTYPE (*natalensis*): ♀, SOUTH AFRICA, Port-Natal [= Durban area] (MNHN) (head missing in holotype). HOLOTYPE (var. *rufifacies*): ♂, CONGO (DR), Eala, January 1936 [not 1935 as in original description], J. Ghesquière (KBIN). PARATYPES (var. *rufifacies*): CONGO (DR), Eala, 1♀, March 1936; 1♂, August 1936; 1♂, Bombutu, S. Salonga, June 1936; 1♀, Bolingo, rives Busira, 23.VI.1936, all J. Ghesquière (KBIN). HOLOTYPE (var. *varipes*): ♂, CONGO (DR), Eala, March 1936, J. Ghesquière (KBIN). PARATYPES (var. *varipes*): Eala, 1♂, March 1936; 1♂, 22.V.1935; 1♀, February 1936, all J. Ghesquière (KBIN). Other material: ANGOLA, 1♂, 50km N Quiculongo, September–October 1957, G.H. Heinrich (CNC). BENIN, 1♀, Aplaoué, February 2006, G. Goergen (IITA). CAMEROON, 1♀, Lolodorf, A.I. Good (CNC). CONGO (DR), 1♂, Abimva, Uele, 1925, L. Burgeon (KMMA); Bambesa, 1♂, 15.IX.1933; 1♂ 1♀, December 1933; 1♀, February 1934, all H.J. Brédo (KMMA); 5♀, Dakwa, Uele, 9.VII.1933, J.V. Leroy (KMMA); 1♀, Irumu (Penge), 1.III.1914, J. Bequaert (KMMA); Kapanga, Lulua, 1♀, November 1928, Walker (KMMA); 1♂, August 1932; 1♂, April 1933; 1♀, May 1933; 1♀, October 1933, all G.F. Overlaet (KMMA); 1♀, Kere–Kere, Kilo, 1949, Turco (KMMA); 1♀, Keshero (Goma), N Kivu, 10.II.1952, A.E. Bertrand (KMMA); 1♀, Kivu, September–October 1925, Prince Leopold (KMMA); 2♀, Luputa, Lomami, May 1935, Bouvier (KMMA); 1♀, Lusuku, Lomami, December 1930, P. Quarré (KMMA); 1♀, Mongati, E of Kinshasa, 26.VII.1968, P. Elsen (KMMA); 1♀, Poko, Uele, August 1913, Lang&Chapin (KMMA); 4♀, Sandoa, Kapanga, September 1928, Walker (KMMA); 1♀, Uele River, J. Rodhain (KMMA); 1♀, Yakoma, February 1932, H.J. Brédo (KMMA). GABON, 1♀, Lambaréné, Ogooué, 1911, R. Ellenberger (MNHN). GHANA, 1♂, Kumasi, May 2008, G. Goergen (IITA); 1♀, N of Kibi, Atewa Range forest reserve, 14.VI.2006, K.D.B. Dijkstra (MZH). KENYA, 1♀, Malindi, May 1973, H. Falke (CNC). NIGER, 1♀, Dosso, October 2006, G. Goergen (IITA). NIGERIA, 1♂, Ile-Ife, 31.XII.1969, J.T. Medler (CNC). TOGO, Kloto, 1♀, December 2002, 3♂, January 2004; 1♂ 2♀, March 2004; 2♀, December 2004; 1♀, February 2005; 1♂, March 2005; 1♂, November 2005; 1♀, November 2006; 7♀, December 2008; 1♂, November 2015; 1♂, December 2016, all G. Goergen (IITA); 1♂, Mt Agou, February 2002, G. Goergen (IITA). UGANDA, 1♀, Budongo Forest, April 1972, E.B. Babyetagara (CNC); 1♂, Bwamba, July–August 1946, V.G.L. van Someren (CNC); 2♀, Entebbe, April 1973, H. Falke (CNC); nr Entebbe, 3♀, 23–31.I.1973; 5♀, 1–14.II.1973, all H. Falke (CNC); 1♂, Ibanda, 23–28.XII.1972, H. Falke (CNC). *P. natalensis* var. *rufifacies*: CONGO (DR), 1♀, Bambesa, February 1934, J. Brédo (KMMA); 1♀, Dima, 15.IX.1908, A. Koller (KMMA); Eala, 1♀, September 1930, P. Staner (KMMA); 1♂, July 1935; 1♂, August 1935, 1♀, September 1935, all J. Ghesquière (KMMA); 1♂, Kapanga, Lulua, April 1933, F.G. Overlaet (KMMA); Medje, 1♀, April–May 1910, Lang&Chapin (KMMA); 1♀, 25–30.VIII.1910, Lang&Chapin (AMNH); Moma, Equateur, June 1925, J. Ghesquière, 6♂ (KMMA); 1♂ (AMNH). *P. natalensis* var. *varipes*: CONGO (DR), 1♂, Eala, August 1935, J. Ghesquière (KMMA); 1♀, Yakoma, 5–17.II.1932, H.J. Brédo (KMMA).

Body size. Body length (n=10): 12.5–17.5 mm. Wing length (n=10): 9.7–12.9 mm.

Redescription. **MALE** (Fig. 10). ***Head***. Eye bare; holoptic, touching for 3–5 times length of ocellar triangle, facets enlarged in dorsal half. Frons ground colour brownish; completely obscured by dense grey pollinosity except dorsally where weakly shining; dispersed pilosity of medium long pale pile (in var. *varipes* and *rufifacies* darker pile dorsally); rugose area shining black-brown, occupying about one-fourth to one-third of entire width and two-thirds to three-fourths of entire height; with shorter and more dispersed pale pile. Face ground colour black-brown (yellow

in var. *rufifacies*); in upper half with dense whitish pollinosity, except below antennae where weakly shining; pilosity of short pale pile, along eye margins medium long pile; lower half to third weakly shining with more dispersed and very short pilosity; facial tubercle shining and bare, well developed. Gena dark brown to black-brown, largely shining, dispersed white pollinosity and long pale pilosity only in posterior part. Occiput dorsal third black, with greyish pollinosity; ventrally more densely yellow-white, with dispersed pale pile. Antennal segments brown to black-brown; arista yellow-brown, in basal half with medium long pile equal to width of pedicel.

Thorax. Scutum and scutellum black-brown ground colour, scutum with anterior third with dense yellowish pollinosity and medium long pale pilosity which is extending posteriorly along lateral margin to above the wing base (in var. *varipes* and *rufifacies* sometimes more greyish appearance); posteriorly with black-brown pollinosity and short black pilosity reaching all the way to posterior margin except for narrow fascia of variable length with more brownish pollinosity and yellow pilosity, sometimes the latter fascia with weak yellow pollinosity but then only in medial part anteriorly of scutellum; scutellum brownish pollinosity and very short black pilosity, along posterior margin somewhat longer. Pleural sclerites ground colour black, weakly shining with dense yellowish pollinosity, ventrally weaker greyish to greyish-brown pollinosity; covered with dispersed pile of long white pile, dorsal part of anepisternum more densely pilose, rarely anepimeron dorsally with partial black pilosity; meron, anterior part of katepisternum and anterior anepisternum bare.

Legs. Yellow-orange to brown. Fore leg, femur brown, apical margin narrowly paler; with dense short dark pilosity, anteriorly and posteriorly longer; tibia pale in basal two-fifths to half, otherwise brownish; with short black pilosity, except in basal part where pale; tarsal segments orange-brown. Mid leg as in fore leg, except tibia pale for basal half to three-fifths (in var. *varipes* tibia over entire length pale, apical part only darker yellow; with pale pilosity throughout). Hind leg, femur yellow-orange and with long pale pilosity in basal half, apically black-brown, with long black and more densely pilosity; tibia orange-brown to brown, pale in basal third; dorsally with short to medium long pale pilosity in basal part, black in apical part, ventrally with short to medium-long black pilosity (in var. *varipes* pale pilosity over entire length dorsally and ventrally); tarsal segments orange-brown.

Wing (Fig. 50). Mainly hyaline, base for short part brownish. Calypters black-brown, with fringe of dark pile, rarely fringe at extremities paler.

Abdomen (Fig. 72). Mainly yellow and black patterned. Terga 2–4 without distinct bullae but with small medial swelling. Tergum 2 yellow for entire length except posterior fourth (medially) to fifth (at lateral margin) where black; with short to medium long pale pile except in black part where short dark pile. Tergum 3 with posterior black fascia broadening medially, reaching anterior margin in the middle, laterally reaching lateral margin, anterolaterally slightly paler brown, sometimes well-defined small yellow maculae, reaching at most to halfway along lateral margin, sometimes also predominantly brown throughout; with short to medium long pilosity throughout, along lateral margins somewhat longer. Tergum 4 predominantly brown except occasionally anterolaterally with narrowly brownish patch; pilosity as in tergum 3 except pile longer. Terga 3 and 4 mainly with sparse black pollinosity except on medial swelling, anterolateral maculae and narrowly along posterior margin where shining. Sterna pale yellow, with widely dispersed long pale pile. Male genitalia as in Fig. 93.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons in lower half more orange-brown; with greyish pollinosity, except in dorsal third where brown; covered with short dispersed pale pile, except in dorsal third where predominantly black (in var. *rufifacies* more extensively so); rugose area shining brown; occupying one-fourth of entire width and equal in height to at most 2 times length of ocellar triangle.

Distribution. Angola, Benin, Cameroon, Congo (DR), Gabon, Ghana, Kenya, Niger, Nigeria, South Africa, Togo, Uganda.

Comments. The specific status of *P. natalensis* and *P. curta* has been confusing over time. *Phytomia natalensis* was originally described by Macquart from a female specimen collected in South Africa ("Port Natal" corresponding with present Durban area). In his original description Macquart indicated on the coloration of the scutum "un peu de fauve au bord postérieur" (a bit of yellow at the posterior margin). Loew described *P. curta*, based on a female specimen also collected somewhere in South Africa ("Caffrerei" probably corresponding with present Eastern Cape area) by J.A. Wahlberg. From the same locality, Loew also studied a female specimen that he identified as *P. natalensis*. He pointed out the resemblance between both taxa but listed some morphological differences, in particular the coloration of the posterior margin of the scutum (black with yellow pile in *P. natalensis*; yellow with yellow pile in *P. curta*), and the extent of pollinosity on the third and fourth abdominal terga (more extensive in *P.*

natalensis, largely weakly shining in *P. curta*). Subsequent authors (see for example Karsch 1887; Speiser 1910; Bezzi 1912; Hervé-Bazin 1914) considered both as synonymous with varietal status at most. Bezzi (1915), however, considered them two distinct species after study of long series. This was followed by subsequent authors (Curran 1927a; Doesburg 1955) but then revoked again and *P. curta* listed as synonym of *P. natalensis* (Smith & Vockeroth 1980; Dirickx 1998). Representative specimens of both morphotypes were DNA barcoded. The DNA barcodes clustered in two well-differentiated (mean p-distance of 4.4 %) groups that correspond to the two morphotypes (*i.e. curta* and *natalensis*). The type of *P. natalensis* was compared with representatives of the two clusters, as well as with images of the type of *P. curta* and the differences in extent of yellow pilosity and pollinosity of the scutum, as given in the respective redescriptions of both species, were considered consistent. To a lesser extent also the density of black pollinosity of abdominal terga 3 and 4 correspond with the descriptions. We, therefore, consider them as two separate taxa with specific status. In addition, a third entity with specific status was recognized: *P. pallida*, differentiated both on morphological grounds and DNA barcodes (see further).

Doesburg (1955) recognized two varieties within *P. natalenis*, based upon material from Congo (DR): *P. natalensis* var. *rufifacies* (differentiated by the medial part of the face wholly yellow) and *P. natalensis* var. *varipes* (differentiated by the hind tibia with dorsal pilosity wholly pale). Type material, as well as additional specimens examined (*cf.* list of material examined) were found to be consistent in these morphological differences. Some additional morphological differences were observed, in particular with regard to the distance the eyes are touching in the males and the thoracic pollinosity and pilosity. These morphological differences are indicated in the description above, and the material is listed separately. However, as no recent material could be obtained for these varieties, and thus not incorporated in the genetic analysis, we take a conservative approach and consider them currently as varieties and not of distinct specific status pending further research.

***Phytomia curta* (Loew)**
(Figs 11, 51, 73, 94)

Megaspis curta Loew, 1858: 381
Eristalis (*Megaspis*) *curtus* Loew, 1860: 319

Material examined. LECTOTYPE (hereby formally designated and published; see comments): ♀, SOUTH AFRICA, 'Caffraria', Wahlberg (NRMS) (images examined, lectotype label by Kassebeer 1999). Other material: BENIN, 1♂, Aplaoué, February 2006; Calavi, 1♀, 24.X.2000; 1♂, October 2001; 1♂, November 2015; 8♀, Lokoli, 21.I.2005; 1♀, Malanville, February 1997; Ouidah, 2♂ 7♀, November 2004; 1♀, September 2004; 1♂, Lokossa, January 2007; 1♂, Parakou, April 2003; Pénéssoulou, 1♂, 10.XI.2004; 1♂, May 2005; 1♂, Porto Novo, December 2005; 1♂, Sémé, 7.II.2016; Sèrou, 1♂, October 2003; 1♂ April 2004; 1♂, December 2006, 1♀, November 2007, all G. Goergen (IITA). BOTSWANA, 1♀, Kasane, 29–31.XII.1984, P. Forchhammer (NMSA). BURKINA FASO, 2♀, Djibo, 5-7.XI.2002, S. Somé (IITA). BURUNDI, Kigwena, 1♂, 18.V.2010, F. Ninganza; 1♂, 6.II.2011, D. Ntakarutimana; 1♀, 2.IV.2011, B. Nzigidahera (all OBPE); 1♀, Kigwena Forest, 7.I.2010, L. Ndayikeza (OBPE); 1♀, Lac Nyanza, 23.X.2013, L. Ndayikeza (OBPE); Rumonge, 2♀, June 1948, 1♀, May 1949, all F. François (KBIN); 1♂ 1♀, 23.III.2011; 2♀, 9.XII.2012, all L. Ndayikeza (OBPE); 1♂, PNRusizi, secteur Delta, 19.V.2018, E. Sinzinkayo (OBPE). CAMEROON, 1♂ 5♀, Meskine (agricultural site), 23.V.2018, M. Azo'o Ela (MAPC). CONGO, 1♂, env. Brazzaville, 1907, E. Roubaud & A. Weiss (MNHN). CONGO (DR), Albertville [=Kalemie], 1♀, December 1918; 1♀, 1–20.I.1919, all R. Mayné (KMMA); Bukama, 1♀, 19.III.1911, Bequaert (KMMA); 1♂, 1.V.1911, Bequaert (KMMA); 1♀, 3.VII.1923, C. Seydel (KMMA); Elisabethville [=Lubumbashi], 1♂, 29.II.1912, Bequaert (KMMA); 1♀, 5.I.1921, M. Bequaert (KMMA); 1♀, 17.III.1921, M. Bequaert (KMMA); 1♀, 15.III.1922, M. Bequaert (KMMA); 1♀, 31.I.1924, C. Seydel (KMMA); 1♂, 19.II.1924, C. Seydel (KMMA); 1♀, 17.I.1928 (KBIN); 1♀, 3.X.1928 (KBIN); 1♀, January 1930, Walravens (KMMA); 1♀, 20.XI.1930 (KBIN); 1♀, 1–6.IX.1932, De Loose (KMMA); 1♀, March 1933, M. Bequaert (KBIN); 1♀, February 1935, M. Bequaert (KBIN); 1♀, 11.II.1956, M. Lips (KMMA); 1♀, Faradje, Uele, November 1912, Lang & Chapin (KMMA); 1♂, Garamba, July 1912, Lang & Chapin (AMNH); 1♂, Parc National Garamba, II/gd/8, 9.V.1951, H. De Saeger (KMMA); 1♀, Kambaye, Lomami, October 1930, P. Quarré, KMMA; 1♂, Kando, Katanga, 2.V.1931, G.F. de Witte (KMMA); Kapanga, Lulua, 1♂, December 1931; 1♀, October 1933, all F.G. Overlaet (KMMA); Kasenyi, Ituri, 1♀, 5.IV.1935; 1♀, 22.VIII.1935; 1♀, July 1937, all. H.J. Brédo (KMMA); 10♀, Katofio, Katanga, February 1931, H.J. Brédo (KMMA); 1♀,

Kibimbi, 3.II.1911, Bequaert (KMMA); 1♀, Kinda, 4.XI.1911, Bequaert (Rodhain) (KMMA); 1♀, Kinda Kangé, 26.VIII.1914, L. Charliers (KMMA); 1♀, Kolwezi, Lualaba, 1.II.1953, L. Gilbert (KMMA); 1♀, Kufu-Mwanza, Katanga, May 1927, A. Bayet (KMMA); 1♂, Leopoldville [=Kinshasa]-Kalima, October–November 1929, Van Delft (KMMA); 1♀, Mato, Katanga, 8.XII.1925, C. Seydel (KMMA); 1♀, Masomhwe s. Grde Kafwe, Parc National Upemba, 16.IV.1948, G.F de Witte (KMMA); 1♀, Sandoa, 18.IX.1918, F.G. Overlaet (KMMA). GHANA, 1♀, Laura, 18.IX.1930 (CNC). KENYA: 1♀, Nairobi, Ngang [sic = Ngong] Forest (KBIN). MALAWI, 2♂ 2♀, Mulanje Mountain Forest Reserve (lodge); 12–15.XI.2016, K. Jordaens (KMMA). MOZAMBIQUE, 1♂ 1♀, Luabo, Lower Zambezi river, June–July 1957, U. Stuckenberg (CNC); 1♀, Nova Chupanga, 1928, J. Surcouf (MNHN); 1♂, Riclata, Delagoa Bay [=Maputo], P. Janson (AMNH). NAMIBIA, 1♀, Otjiwarongo, May 1949, Koch (AMNH). NIGER, 1♀, Dosso, October 2006, G. Goergen (IITA). NIGERIA, 1♂, Abuja, January 2004, G. Goergen (IITA); 1♂, Lobetti, W. State, 7.II.1971, J.T. Medler (CNC). RWANDA, 1♀, Astrida [= Butare], 28.V.1955, P. Elsen (KMMA). SAO TOME AND PRINCIPE, São Tomé, 1♂ 1♀, H. De Saeger & Prince Leopold (KMMA). SOUTH AFRICA, 1♀, Mposa, Lower Umfolozi distr., 27.II.1949, J.C. Bradley & J.H. Leigh (CNC); 1♀, Mariepskop National Park, Mpumulanga, 23–24.I.2017, K. Jordaens (KMMA); 1♀, Pretoria, 15.II.1926, H.K. Munro (CNC). TANZANIA, 1♀, Bwawa Mbili, Tarangire National Park, 21.III.1995, Lesio & Liseki (AMNH). TOGO, Dzogbégan (monastery), 24–25.I.2016, G. Goergen 1♂ (IITA); 1♂ (KMMA); 1♀, Kuma-Tokpli, 21–24.I.2016, G. Goergen (KMMA). UGANDA, 1♂, Budongo Forest nr Lake Albert, April 1972, E.B. Bayetagara (CNC); 1♀, Entebbe, 1906, M. de Rotschild (MNHN); 1♂, Lower Ruwenzori Mts, August 1973, H. Falke (CNC). ZAMBIA, 1♂, Fringila, 14.X.2017, G. Goergen (IITA). ZIMBABWE, 1♀, Gota Gota Urungwe, 23.IX.1938, W.L. Williams (AMNH); 1♀, Salisbury [=Harare], January 1901, F.I. Snow (AMNH).

Body size. Body length (n=10): 11.3–15.9 mm. Wing length (n=10): 9.2–12.2 mm.

Redescription. **MALE** (Fig. 11). ***Head***. Eye bare; holoptic, touching for 3–4 times length of ocellar triangle, facets enlarged in dorsal half. Frons ground colour brownish; completely obscured by dense grey pollinosity; dispersed pilosity of medium long pale pile; rugose area shining black-brown, occupying about one-fourth to one-third of entire width and two-thirds of entire height; with shorter and more dispersed pale pile. Face ground colour black-brown; in upper half with dense greyish pollinosity except below antennae where weakly shining; pilosity of short pale pile, along eye margins longer pile; lower half to third weakly shining with more dispersed and very short pilosity; facial tubercle shining and bare, well developed. Gena dark brown to black-brown, largely shining, dispersed white pollinosity and long pale pilosity only in posterior part. Occiput dorsal third black, with greyish pollinosity; ventrally more densely yellow-white, with dispersed pale pile. Antennal segments brown to black-brown; arista yellow-brown, in basal half with medium long pile equal to width of pedicel.

Thorax. Scutum and scutellum black-brown ground colour, scutum with anterior third with dense yellowish pollinosity and medium long pale pilosity; middle with fascia of dark pollinosity and short black pilosity; posterior fifth with dense yellowish pollinosity and short pale pilosity, pollinosity extending laterally to above postalar callus; along lateral margin pale pilosity of anterior and posterior bands extended and largely touching; scutellum brownish pollinosity and very short black pilosity, along posterior margin somewhat longer. Pleural sclerites ground colour black, with weak greying to greyish brown pollinosity, anepisternum more densely yellow-orange pollinose; covered with dispersed pile of long white pile, dorsal part of anepisternum more pilose, anterior anepimeron dorsally with variable degree of black pilosity, near margin with dorsomedial anepimeron; meron, anterior part of katepisternum and anterior anepisternum bare.

Legs. Yellow-orange to brown. Fore leg, femur brown, apical margin narrowly paler; with dense short dark pilosity, anteriorly and posteriorly longer; tibia pale in basal two-fifths to half, otherwise brownish; with short black pilosity, except in basal part where pale; tarsal segments orange-brown. Mid leg as in fore leg, except tibia pale for basal three-fifths. Hind leg, femur yellow-orange and with long pale pilosity in basal half, apically black-brown, with long black and more densely pilosity; tibia orange-brown to brown, pale in basal third; dorsally with short to medium long pale pilosity in basal part, black in apical part, ventrally with short to medium-long black pilosity; tarsal segments orange-brown.

Wing (Fig. 51). Mainly hyaline, base for short part brownish. Calypters black-brown, with fringe of black pile; lower calypter fringe sometimes more brownish or palish apically.

Abdomen (Fig. 73). Mainly yellow and black patterned. Terga 2–4 without distinct bullae but with small medial swelling. Tergum 2 yellow for entire length except posterior fourth to fifth where black; with short to medium long pale pile except in black part where short dark pile. Tergum 3 with posterior black fascia broadening medially, usu-

ally reaching anterior margin in the middle, laterally not or narrowly reaching lateral margin, with anterolaterally well defined yellow macula; with short to medium long pilosity throughout, along lateral margins somewhat longer, pale throughout except narrowly along posterior margin where pile are slightly darker. Tergum 4 predominantly brown except with anterolaterally narrowly dark yellow patches; pilosity as in tergum 3 except pile longer. Terga 3 and 4 mainly weakly shining, dark pollinosity limited to isolated areas between medial swelling and anterolateral maculae, posterior margin broadly weakly shining. Sterna pale yellow, with widely dispersed long pale pile. Male genitalia as in Fig. 94.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons in lower half more orange-brown; with greyish pollinosity, except in dorsal third where brown; covered with short dispersed pale pile, except in dorsal third where predominantly black; rugose area shining brown; occupying one-fourth of entire width and equal in height to at most 2 times length of ocellar triangle.

Distribution. Benin, Botswana, Burkina Faso, Burundi, Cameroon, Congo (Brazzaville), Congo (DR), Ghana, Kenya, Malawi, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé and Príncipe, South Africa, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

Comments. The type specimen in the NRMS is labeled as 'lectotypus' by Kassebeer in 1999 but the lectotype designation does not seem to have been published. Also see under *P. natalensis.*

***Phytomia pallida* sp. nov.**
(Figs 12, 52, 74, 95)
urn:lsid:zoobank.org:act:921A48D4-F4CA-4B76-8248-B7A107ACA27B

Material examined. HOLOTYPE: ETHIOPIA, ♂, nr Mago National Park, Southern Province, 23.IX.2012, A. Pauly (KMMA). PARATYPES: BURUNDI, 1♂, Mumirwa, Nyakibande, 27.I.2018; 1♀, Mumirwa, Nyambuye, 29.I.2018, all E. Sinzinkayo (OBPE). CAMEROON, 1♀, Meskine (agricultural site), 23.V.2018, M. Azo'o Ela (MAPC). CONGO (DR), Faradje, Uele, November 1912, Lang & Chapin, 1♂ (KMMA); 1♂ (AMNH); Garamba, Uele, 2♂, June–July 1912, Lang&Chapin (AMNH); July 1912, Lang & Chapin, 3♂ (AMNH); 5♂ 1♀ (KMMA); 1♀, Kisenyi, N Kivu, February 1928, C. Seydel (KMMA); 1♀, plaine Lac Edouard, Parc National Albert, November 1932, Hoier (KMMA); 1♀, Lubumbashi, 9.IV.1923, M. Bequaert (KMMA). ETHIOPIA, 2♂ 3♀, nr Mago National Park, Southern Province, 23.IX.2012, A. Pauly (KMMA). KENYA, 1♂, Kasaala area, Eastern Province, 19.XI.2015, R.S. Copeland (ICIPE); 1♂, Mbita Point, Nyanza, 17.V.2006, R.S. Copeland (ICIPE); nr Ukazi Hill, Eastern Province, 1♂, 21.XI.2011; 1♂, 27.XII.2011, all R.S. Copeland (ICIPE). SOUTH AFRICA, 1♀, Royal Natal National Park, the Crack path, 8.XII.2012, M.N. Morales (MZH). TANZANIA, 1♂, Bwawa Mbili, Tarangire National Park, 21.III.1995, Lesio & Liseki (AMNH); 1♂ 2♀, Lemiyon, Tarangire National Park, 23.III.1995, Lesio & Liseki (AMNH); 2♀, nr Morogoro, Uluguru Mts, January 1962 (CNC); 1♀, Sausage Camp, Tarangire National Park, 22.III.1995, Lesio & Liseki (AMNH). UGANDA, 1♀, Entebbe, 26.X.1971, H. Falke (CNC); 1♀, Kalinzu Forest, Ankole, June 1972, H. Falke (CNC); 1♀, Mabamba Swamps, Wakiso District, Nansubuga Hill, 16.XII.2018, K. Jordaens (KMMA). ZAMBIA, 1♂, Abercorn, 11.XII.1962 (CNC); N. Lake Bangweolo, 1♀, 25.V.1908; 1♀, 1.VI.1908; 3♀, 8.VI.1908; 1♀, 13.VI.1908, all S.A. Neave (OXUM).

Material at NRMS, collected at Kilimandjaro (Tanzania) during the 1905-1906 Sjöstedt expedition and identified by Speiser (1910) as *Eristalis* (*Phytomia*) *natalensis* var. *curta* appear to also belong to this new species. They were not studied by the authors but the identification is based on images and information provided by the curator (courtesy of Y. Brodin). They are not included in the type series.

Body size. Body length (n=10): 10.0–15.1 mm. Wing length (n=10): 8.4–12.4 mm.

Description. **MALE** (Fig. 12). ***Head***. Eye bare; holoptic, touching for about 3 times length of ocellar triangle, facets enlarged in dorsal half. Frons ground colour brownish; completely obscured by yellowish to yellowish grey pollinosity; dispersed pilosity of medium long pale pile; rugose area shining black-brown, occupying about one-fourth to one-third of entire width and two-thirds of entire height; with shorter and more dispersed pale pile. Face ground colour black-brown; in upper half to two-thirds with dense whitish pollinosity except below antennae where weakly shining; pilosity of short pale pile, along eye margins medium long pile; lower half to third weakly shining with more dispersed and very short pilosity; facial tubercle shining and bare, well developed. Gena dark brown to black-brown, largely shining, dispersed white pollinosity and long pale pilosity only in posterior part. Occiput

dorsal third black, with greyish pollinosity; ventrally more densely yellow-white, with dispersed pale pile. Antennal segments brown to black-brown; arista yellow-brown, in basal half with medium long pile equal to width of pedicel.

Thorax. Scutum and scutellum black-brown ground colour, scutum with anterior two-fifths with dense yellowish pollinosity and medium long pale pilosity; middle with fascia of dark pollinosity and short black pilosity; posterior fourth with dense yellowish pollinosity and short pale pilosity; along lateral margin pale pilosity of anterior and posterior bands extended and touching; scutellum brownish pollinosity and very short black pilosity, along posterior margin somewhat longer. Pleural sclerites ground colour black, mainly weakly shining with weak greyish to greyish-brown pollinosity except dorsal part of anepisternum where more densely and yellowish; covered with dispersed pile of long white pile except meron, anterior part of katepisternum and anterior anepisternum; dorsal part of anepisternum more densely pilose.

Legs. Yellow-orange to brown. Fore leg, femur brown, apical margin narrowly paler; with dense short dark pilosity, anteriorly and posteriorly longer; tibia pale in basal half, otherwise brownish; with short black pilosity, except in basal part where pale; tarsal segments orange-brown. Mid leg as in fore leg, except tibia pale for basal half to three-fifths. Hind leg, femur yellow-orange and with long pale pilosity in basal half to two-thirds, apically black-brown, with long black and denser pilosity; tibia orange-brown to brown, pale in basal third; dorsally with short to medium long pale pilosity in basal part, black in apical part, ventrally with short to medium-long black pilosity; tarsal segments orange-brown.

Wing (Fig. 52). Mainly hyaline, base for short part brownish. Upper calypter black-brown, with fringe of dark pile; lower calypter partially pale, with fringe of pale pile, sometimes fringe more brownish at base.

Abdomen (Fig.74). Mainly yellow and black patterned. Terga 2–4 without distinct bullae but with small medial swelling. Tergum 2 yellow for entire length except posterior fifth (medially) to seventh (at lateral margin) where black, sometimes not reaching lateral margin; with short to medium long pale pile except in black part where short dark pile. Tergum 3 anteriorly yellow to orange-yellow; with posterior black fascia broadening medially but not reaching anterior margin, laterally often not reaching lateral margin; with short to medium long pilosity throughout, along lateral margins somewhat longer. Tergum 4 predominantly brown except occasionally anterolaterally narrowly paler brownish, sometimes well-defined small yellow maculae or continuous fascia, reaching at most to halfway along lateral margin; pilosity as in tergum 3 except pile longer. Terga 3 and 4 mainly weakly shining, dark pollinosity limited to isolated areas between medial swelling and anterolateral maculae, posterior margin broadly weakly shining. Sterna pale yellow, with widely dispersed long pale pile. Male genitalia as in Fig. 95.

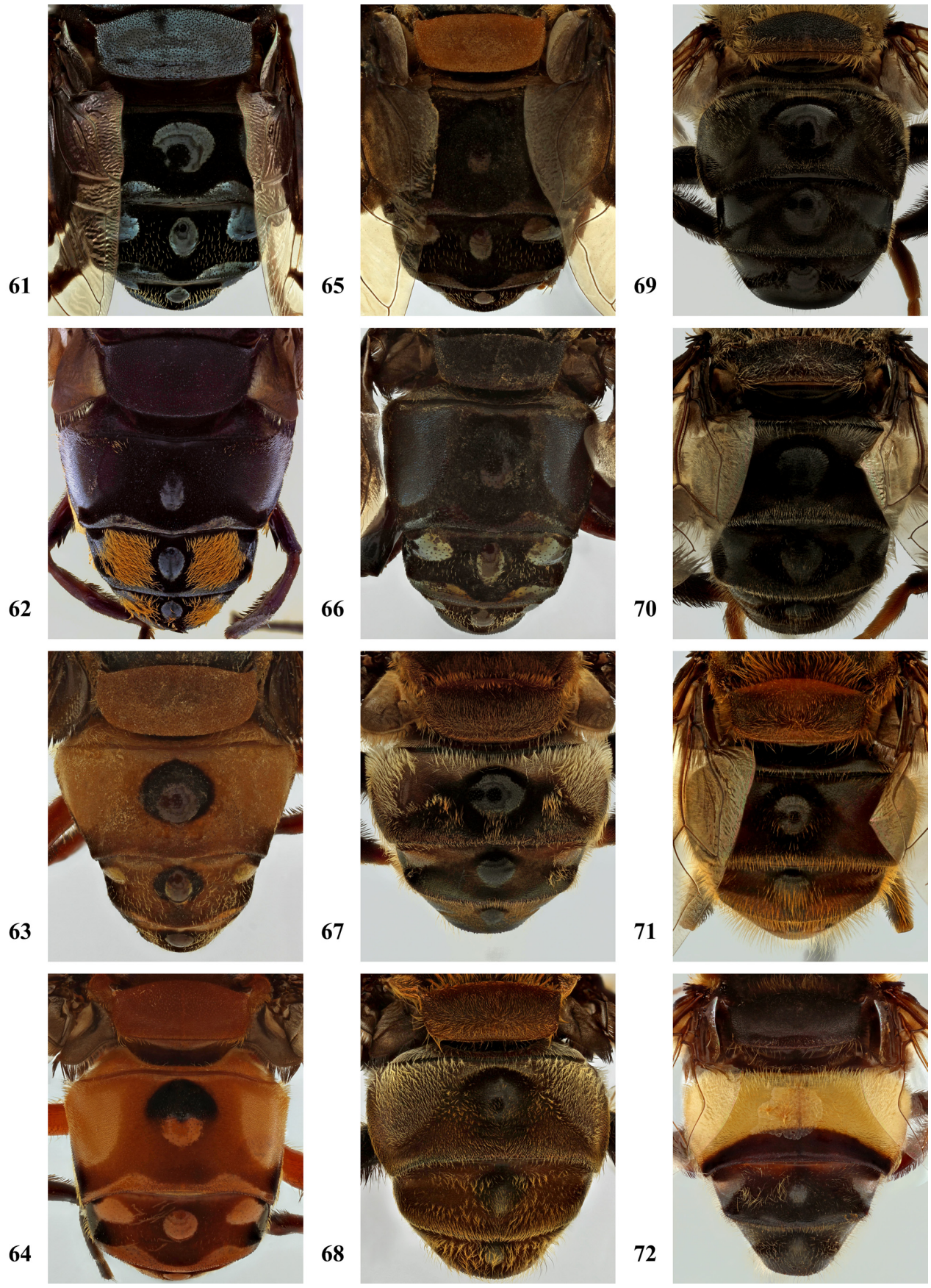
FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons in lower half more orange-brown; with greyish pollinosity, except in dorsal third where brown; covered with short dispersed pale pile, except in dorsal third where predominantly black; rugose area shining brown; occupying one-fourth to one-third of entire width and equal in height to at most 2 times length of ocellar triangle.

Diagnosis. Recognizable by the more extensive yellow fascia on both thorax and abdomen.

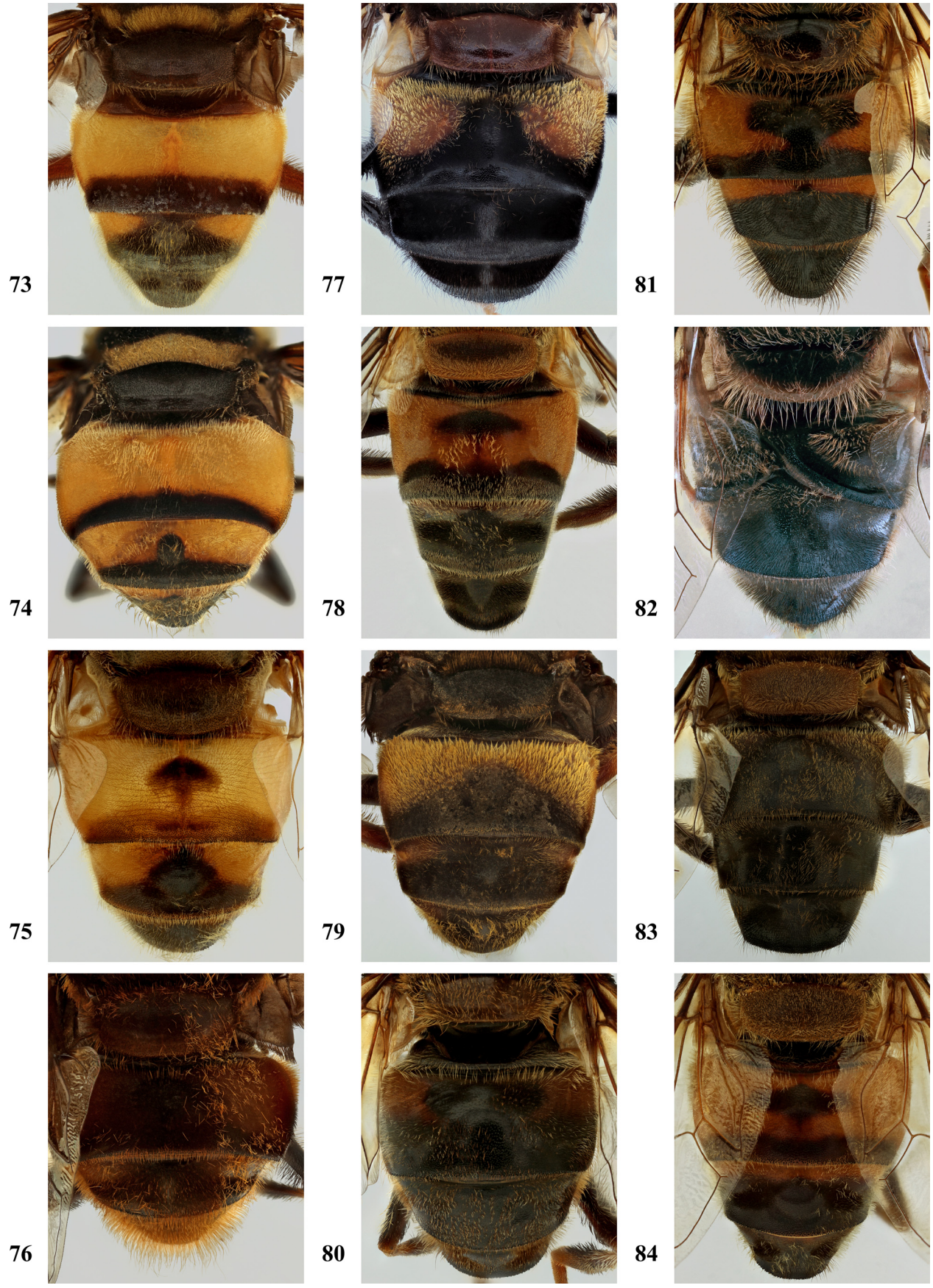
Distribution. Burundi, Cameroon, Congo (DR), Ethiopia, Kenya, South Africa, Tanzania, Uganda, Zambia.

Etymology. After the Latin word ‘pallidus’, meaning pale and referring to the more extensive yellow coloration. The specific epithet should be treated as an adjective (nominative singular feminine).

Comments. *Phytomia pallida* is closely related to *P. natalensis* and *P. curta*. It differs mainly from both by the more extensive posterior fascia on the thorax (absent in *P. natalensis*, narrower in *P. curta*) and the presence of a continuous fascia along the anterior margin of the third abdominal terga (anterolateral maculae in the other species). The latter was observed in a few specimens of *P. curta* from Cameroon (in sympatric occurrence). However, they could be differentiated by the completely pale pilosity of the anterior anepimeron in *P. pallida* (partially black in *P. curta*). DNA barcodes, obtained from specimens from Cameroon, Ethiopia, Kenya and South Africa showed that the species presents a well-differentiated cluster from *P. curta* (mean p-distance of 4.7 %) and *P. natalensis* (mean p-distance of 4.5 %) while the mean intraspecific p-distance is much lower (*P. pallida* and *P. curta*: 0.6 %, *P. natalensis*: 0.4 %). *Phytomia pallida* is widely distributed and its range largely overlaps with the other two entities, except that there are no records from western Africa.



FIGURES 61–72. *Phytomia* spp., abdomen, dorsal view. 61. *P. bullata* (Loew) ♂ 62. *P. aurigera* Bezzi ♂ 63. *P. kroeberi* (Bezzi) ♂ 64–65. *P. kroeberi* (Bezzi) ♀ 66. *P. serena* (Curran) ♀ 67. *P. bulligera* (Austen) ♂ 68. *P. austeni* **sp. nov.** ♂ 69. *P. bezzii* Curran ♀ 70. *P. memnon* **sp. nov.** ♀ 71. *P. pubipennis* Bezzi ♂ 72. *P. natalensis* (Macquart) (M).



FIGURES 73–84. *Phytomia* spp., abdomen, dorsal view. 73. *P. curta* (Loew) ♂ 74. *P. pallida* **sp. nov.** ♂ 75. *P. erratica* (Bezzi) ♂ 76. *P. fucoides* Bezzi ♀ 77. *P. fusca* Hull ♀ 78. *P. incisa* (Wiedemann) ♂ 79. *P. varians* Curran ♀ 80. *P. melas* (Bezzi) ♂ 81-82. *P. melas* (Bezzi) ♀; 83. *P. poensis* (Bezzi) ♂ 84. *P. poensis* (Bezzi) ♀

Species unrelated to any putative morphospecies group

***Phytomia erratica* (Bezzi)**
(Figs 13, 53, 75, 96)

Megaspis erratica Bezzi, 1912: 424

Material examined. SYNTYPES: GUINEA-BISSAU, 2♂, Bolama, June–December 1899, L. Fea (MCSNG); MADAGASCAR, 1♀, Betsileo (BMNH). Possible syntype: MALAWI, 1♂, Zomba, H.S. Stannus (BMNH) (see Comments below). The male specimen from Bolama, with additional printed label "Typus" and handwritten label by Bezzi 'Megaspis erratica n.sp.' is hereby designated as lectotype and labelled accordingly. Other material: ANGOLA, 1♀, 30km NE Duque de Braganza [=Kalandula], November–December 1957 (CNC). BENIN, 1♂, Calavi IITA, 1.XII.2000, G. Goergen (IITA); 1♀, Cotonou, January 2003, G. Goergen (IITA). BURUNDI, 1♂, Rutana, colline Kiofi Moso, 10.XI.1951, F. François (KBIN). CAMEROON, 1♂, West Cameroon, 1939, Villiers & Paulian (MNHN). CONGO (DR), 1♀, Bambesa, February 1934, H.J. Brédo (KMMA); 1♂, Bomokandi, 26.XI–6.XII.1925, Prince Leopold (KMMA); Elisabethville [=Lubumbashi], 1♂, 23.V.1920, M. Bequaert (BMNH); 3♂ 1♀, May 1920–April 1923 (different dates), M. Bequaert (KMMA); Faradje, Uele, November 1912, Lang & Chapin, 1♀ (AMNH); 2♂ (KMMA); Garamba, Uele, June–July 1912, Lang & Chapin 1♂ 1♀ (AMNH); 2♂ 1♀ (KMMA); July 1912, Lang & Chapin, 1♂ 1♀ (AMNH); 3♂ 2♀ (KMMA); 4♂, Kasenyi, Lake Albert, May–December 1935 (different dates), H.J. Brédo (KMMA); 1♂ 1♀, Kasonsero, 17.VII.1914, J. Bequaert (KMMA); 1♂, Motenge-Bma, Ubangi, 14.XII.1931, H.J. Brédo (KMMA); 1♂, Parc National Garamba, II/gc/8, 10.VII.1952, H. De Saeger (KMMA); 1♀, Wombali, July 1913, P. Vanderijst (KMMA). KENYA, 1♂, Makueni, May 1947, V.G.L. van Someren (CNC); Marsabit, 1♀, 25.IX.1911, B.J. Stordy; 1♂, 30.IX.1911, G. Chell (both BMNH); 2♀, near Marsabit, October 1911, C.A. Neave (BMNH); 1♂, Marsabit Lake, 4.X.1911, G. Chell (BMNH); 1♀, pool nr S.S. Camp, 20.VII.1911, G. Pugh (BMNH). MADAGASCAR, 1♂, Ambodivoangy, August 1961, J. Vadon (KMMA); 2♀, Ampitavananima Forest, Fianarantsoa, 17–24.III.2007, M. Irwin et al. (CAS); 1♀, Fampanambo, March 1961, J. Vadon (KMMA); 2♂ 6♀, Fizono, September 1959, J. Vadon (KMMA); 1♀, Fort Dauphin [=Tôlanaro], Mandena, 14–18.IV.1968, K.M.G. & P.D. (BMNH); 1♀, Lac Froid, 11–15.XII.1957, B. Stuckenberg (NMSA); 1♀, Mailaka, January 1952, N.L.H. Krauss (BMNH); 1♂, Mandritsara, Wulsin (CNC); 1♂, route d'Anosibe, 13–21.XII.1957, B. Stuckenberg (NMSA) ; 1♀, Maroantsetra, J. Vadon (MNHN); 2♂, Tananarive [=Antananarivo], 28–30.I.1968, K.M. Guichard (BMNH). MALAWI, 1♀, 30km NW Dedza, 15.III.1987, J.G.H. & A. Londt (NMSA). MOZAMBIQUE, Luabo, June–July 1957, U. Stuckenberg, 1♀ (CNC); 1♂ (NMSA). SOUTH AFRICA, 1♀, Durban, 24.IV.1908, G.F Leigh (NMSA); 1♂, Mazithi Dam, Kruger Park, 6.I.1974; 1♀, Nwamuriwa Mt, Kruger Park, 6.I.1974; 1♂ 2♀, Pundo Milla, Kruger Park, 11.I.1974, all B.&P. Stuckenberg (NMSA); 1♂, Ngoye Forest, Natal, May 1979, P. Reavell (NMSA). SUDAN, 1♀, Yali, 7.V.1954, S.V.S. (BMNH). TANZANIA, 1♂, Tarangire Nat. Park, December 1994, D. Grimaldi (AMNH); 1♂, Ukerewe Island, F. Conrads (NMK). UGANDA, Bwamba Valley, May 1954, V.G.L. van Someren, 1♂ 1♀ (CNC); 1♀ (BMNH); Entebbe, 2♂, 25–28.I. 1973, H. Falke (CNC); 1♀, February 1912, C.A. Wiggins (BMNH); 1♂, nr Entebbe, 23–31.I.1973, H. Falke (CNC); 1♀, Mabamba Swamps, Wakiso District, Nansubuga Hill, 16.XII.2018, K. Jordaens (KMMA). ZAMBIA: 1♀, Up. Luangwa Valley, 5–7.III.1908, S.A. Neave (OXUM). ZIMBABWE, 1♂, Wedea, 7.IV.1985 (NMSA).

Body size. Body length (n=10): 10.8–14.0 mm. Wing length (n=10): 7.9–10.6 mm.

Redescription. **MALE** (Fig. 13). ***Head***. Eye bare; holoptic, touching for 2–3 times length of ocellar triangle, facets enlarged in dorsal half. Frons pale yellowish; with yellow-white pollinosity; dispersed pilosity of medium long pale pile; rugose area shining yellow-white, occupying at least half of entire width and three-fourths of entire height; with shorter dispersed pale pile. Face ground colour pale yellow, oral margin slightly darker yellow; with dense whitish pollinosity, pilosity of short pale pile; facial tubercle hardly discernible. Gena yellow, largely weakly shining, dispersed white pollinosity only in posterior part; with long pale pilosity. Occiput dorsal third black, with greyish pollinosity; ventrally more densely yellow-white, with dispersed pale pile. Antennal segments brown to black-brown; arista yellow-brown, bare.

Thorax. Scutum and scutellum black-brown ground colour, scutum with greyish to greyish brown pollinosity, except in medial part where weakly shining black-brown, scutellum more dark reddish brown; covered with dense pile of long pale yellowish pilosity, along lateral margins of scutum more whitish. Pleural sclerites ground colour

black, with greyish brown pollinosity; covered with dispersed pile of long white pile except meron, anterior part of katepisternum and anterior anepisternum.

Legs. Yellow-orange to brown. Fore leg, femur brown, apical margin paler; with dense short mixed pale and dark pilosity, anteriorly and posteriorly longer, anterior pile predominantly dark; tibia pale in basal half, otherwise brownish; with short black pilosity, except in basal half where pale; tarsal segments brownish. Mid leg as in fore leg, except tibia pale for basal half, apically yellow-orange; pilosity pale over entire length; tarsal segments orange-brown. Hind leg, femur yellow-orange and with long pale pilosity in basal half, apically black-brown except for pale apex, with long black pilosity; tibia orange-brown to brown, pale in basal two-fifths; dorsally with short to medium long pale pilosity except apical fifth where dark, ventrally with short to medium-long black pilosity; tarsal segments brownish.

Wing (Fig. 53). Mainly hyaline, base to variable extent darker yellow, sometimes reaching to basal half of wing. Calypters dark yellowish and with fringe of yellowish pile.

Abdomen (Fig. 75). Mainly yellow to yellow-range, with variable darker markings. Terga 2–4 to with shining medial bulla; pilosity with dispersed short to medium long pale pile, longer along margins. Tergum 2 with anterior half of bulla black-brown, posterior margin darker yellow-brown to brown. Tergum 3 marking more extensively and darker, posterior fascia broadening medially, covering bulla and sometimes reaching anterior margin. Tergum 4 predominantly brown to black except along anterior margin where narrowly yellow-brown, more so anterolaterally. Sterna pale yellow, with widely dispersed long pale pile. Male genitalia as in Fig. 96.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons pale yellowish except in medial part where dark; with yellow-white pollinosity, except in dorsal third where brown; covered with short dispersed pale pile, except in dorsal third where predominantly black; rugose area shining brown; occupying one-third of entire width and equal in height to 2–3 times length of ocellar triangle. Legs, mid femur with pilosity sometimes more extensively pale. Abdomen, usually dark marking more extensively and darker brown to black.

Distribution. Angola, Benin, Burundi, Cameroon, Congo (DR), Guinea-Bissau, Kenya, Madagascar, Malawi, Mozambique, South Africa, Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

Comments. Bezzi (1912) described the male but in his list of material examined he mentions "Guinea portoghese: Bolama, giugno–dicembre 1899, tre maschi; nel British Museum si trova del Nyasa e di Madagascar, anche la femmina". He subsequently described the female in his treaty on Syrphidae from the BMNH (Bezzi 1915) and lists it as "type of [female symbol]" Betsileo, Madagascar. In the additional specimens he lists a male from Zomba, Nyasaland (Dr. H.S. Stannus). In the BMNH collection there is a single male specimen from Zomba that correspond to the above description. It is not labelled as syntype but as it is mentioned in the original description by Bezzi (1912), it should also be included in the original type series. In order to avoid confusion and to assure stability, a male specimen from the series of Bolama is herewith designated as lectotype.

Phytomia fucoides Bezzi

(Figs 14, 54, 76, 97)

Phytomia fucoides Bezzi, 1915: 74

Material examined. HOLOTYPE: ♀, UGANDA, Daro forest, Toro, 25–29.IX.1911, S.A. Neave (BMNH). Other material: KENYA, 1♀, North Nandi Forest, November–December 1979, Cunningham-van Someren (NMK); 1♂ 1♀, North Nandi Forest, nr Chemisia, December 1979, N Nandi Exp (NMK). UGANDA, 2♂, Bwindi Impenetrable N.P., 14.XII.2018, K. Jordaens (KMMA); 1♀, Mobuku Valley, December 1934–January 1935, F.W. Edwards (BMNH); 8♂ 2♀, Mpanga Forest Toro, 13–23.XI.1911, S.A. Neave (BMNH).

Body size. Body length (n=10): 13.5–14.9 mm. Wing length (n=10): 11.1–11.9 mm.

Redescription. **MALE** (Fig. 14). ***Head***. Eye bare; holoptic, touching for about 3 times length of ocellar triangle, facets enlarged in dorsal half. Frons black-brown; with brown pollinosity; dispersed mixed pilosity of long darkish and pale yellow pile; rugose area shining brown, occupying one-third of entire width and half of entire height; with shorter dispersed pale pile. Face ground colour black; with dispersed greyish to greyish brown pollinosity, in parts weakly shining black; dispersed pilosity of short pale pile; facial tubercle elongated, strongly pronounced. Gena

colour and pollinosity as face; with long pale pilosity. Occiput dorsal third black, with greyish pollinosity; ventrally more densely yellow-white, with dispersed pale pile. Antennal segments brown, apical margin of basoflagellomere narrowly orange-brown; arista yellow-brown, in basal half with medium long pile equal to slightly more than half width of pedicel.

Thorax. Scutum and scutellum black ground colour, with dense orange-brown pollinosity; covered with dense pile of long orange to orange-brown pilosity, except in medial part of scutum where black pile; lateral margins of scutum and whole of scutellum more dark rufous. Pleural sclerites ground colour black, with brownish pollinosity; covered with dispersed pile of long golden yellow to orange pile except posterior part of katepisternum dorsally and anepimeron with black pile; meron, anterior part of katepisternum and anterior anepisternum bare.

Legs. Black to orange-brown. Fore leg, femur mainly black, apical margin narrowly paler; with dense short black pilosity, anteriorly and posteriorly longer; tibia pale in basal third, otherwise dark brown; with short black pilosity, except in basal third where pale; tarsal segments orange-brown. Mid leg as in fore leg, except tibia pale for basal half. Hind leg, femur dark brown, in basal third and at apical tip paler; dorsally with long pale pilosity, ventrally with long dark pilosity except near base where paler pile, otherwise short dark pilosity; tibia dark brown, pale in basal fifth dorsally; with short to medium-long dense black pilosity except in dorsal fifth where pale pile; tarsal segments orange-brown.

Wing (Fig. 54). Mainly with brownish tinge, more hyaline towards apical and posterior margins. Microtrichia over extensive part, covering wing from base to largely or completely cells *c*, *sc*, anterior half of r_1, base of r_{2+3}, *r*, *bm*, and anterobasal part of *cup*. Calypters dark with fringe of dark pile.

Abdomen (Fig. 76). Mainly black-brown to dark rufous ground colour. Terga 2–4 mainly weakly shining, with dispersed brownish pollinosity; no distinct bullae but slight medial swelling, especially on tergum 2; with dense orange to orange-brown pilosity, towards posterior end pilosity longer and more golden yellow. Sterna black-brown, with widely dispersed long pale pile. Male genitalia as in Fig. 97.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons brown to black ground colour; with greyish to greyish brown pollinosity, except in dorsal third where black-brown; covered with short dispersed mixed darkish and pale pile; rugose area shining brown; occupying slightly more than one-fourth of entire width and equal in height to ocellar triangle.

Distribution. Kenya, Uganda.

Phytomia fusca **Hull**
(Figs 15, 24, 55, 77)

Phytomia fusca Hull, 1941: 329

Material examined. HOLOTYPE: ♀, MADAGASCAR, Tananarive Dist., Moramanga, Oriental Forest, May-September 1938, C. Lamberton (ANSP). PARATYPES: MADAGASCAR, same as holotype, 3♀ (ANSP); 5♀ (CNC). Other material: MADAGASCAR, 1♀, 22km NW Andasibe, Perinet, Torotorofotsy, 23–25.X.2014, A.H. Kirk-Spriggs & R. Harin'Hala (BMSA); 2♀, Andringitra, Ambalavao, Anjavidilava, 17–21.I.1958, B. Stuckenberg (NMSA); 3♀, Marojejy, 11km NW Manantenina, Antsiranana, 25.X–3.XI.1996, E. Quinter (AMNH); 2♀, Marojejy, tributary Manantenina River, 10km NW Manantenina, Antsiranana, 15–22.X.1996, E. Quinter & Nguyen (AMNH); 1♀ [no locality] (KBIN).

Body size. Body length (n=10): 12.2–16.2 mm. Wing length (n=10): 9.7–12.5 mm.

Redescription. **FEMALE** (Fig. 15). ***Head*** (Fig. 24). Eye bare; dichoptic, facets equal size. Frons dark ground colour, with dense golden yellow pollinosity; covered with dense pile of medium long golden yellow pile; rugose area shining yellow-orange to dark orange, occupying one-third of entire width and equal in height to 1.5 times length of ocellar triangle. Face as frons, ventral part around oral margin and on gena shining black with dispersed greyish pollinosity and without distinct pile; facial tubercle oval shaped, weakly developed. Vertex with orange-brown pubescence and dark yellow medium long pile; continued along occiput, anterior margin in ventral two-thirds conspicuously silvery pollinosity, ventrally with dispersed pale pile. Antennal segments golden yellow to orange; arista dark yellow, in basal two-thirds with medium long pile equal to half the width of pedicel.

Thorax. Scutum black ground colour, with dense greyish brown pollinosity, anteriorly more greyish; covered

with dense pile of long golden yellow to orange pilosity. Scutellum rufous, with long orange to rufous pilosity. Pleural sclerites black, covered with dense pile of long black pile except meron, anterior part of katepisternum and anterior anepisternum; dorsal margin of posterior anepisternum broadly with orange pilosity.

Legs. Predominantly black, except tarsal segment where yellow-orange. Fore and mid leg, femora with dense short black pilosity, posteriorly longer; tibia silvery in basal half dorsally, ventrally less so; with short black pilosity, except in silvery part where pale. Hind leg, femur dorsally and ventrally conspicuous dense black pilosity, in basal ventral two-thirds longer and more dispersed; silvery part on tibia restricted to dorsal side and for basal fifth at most, dorsally and ventrally with conspicuous dense black pilosity over entire length, except in silvery part where pale.

Wing (Fig. 55). Mainly hyaline; slightly fumose at base and in apical part of cell *c*. More distinct brownish patch, consisting of microtrichia, in medial part of wing anteriorly from apex of vein *Sc*, posteriorly along medial part of cell r_1, basal part of cell r_{2+3}, and into cell *r* where it reaches the junction of vein *M* with crossvein *bm-cu*. Calypters pale yellowish; with fringe of pale orange pile.

Abdomen (Fig. 77). Mainly shining black, partially with black pollinosity; with pair of large semi-circular orange maculae on tergum 2; no distinct bullae. Pilosity short to medium long dispersed black ; pilosity on maculae and along anterior margin of tergum 2 denser golden-yellow. Sterna shining black; with widely dispersed long black pile.

MALE. Unknown.

Distribution. Madagascar.

Phytomia incisa (Wiedemann)

(Figs 16, 25, 27, 56, 78, 98)

Eristalis incisus Wiedemann, 1830: 155
Eristalis assimilis Walker, 1849: 611 [junior homonym, preocc. *assimilis* Macquart, 1846]
Megaspis capito Loew, 1858: 381
Eristalis (*Megaspis*) *capito* Loew, 1860: 393

Material examined. SYNTYPE (*incisa*): ♀, SOUTH AFRICA, Capland [Cape Province?], S. Krebs (MNB). ?SYNTYPE (*incisa*): ♂, SOUTH AFRICA, as ♀ syntype (MNB) (see Comments). LECTOTYPE (*capito*) (hereby formally designated and published; see comments): ♀, SOUTH AFRICA, "Caffrerei" [Eastern Cape], Wahlberg (NRMS) (images examined; lectotype label by Barkemeyer 2002). Other material: ANGOLA, 1♀, Congulu, April 1934, K. Jordan (BMNH). BENIN, 1♂, Pénéssoulou, 10.XI.2004; Sérou, 1♀, December 2005; 1♂, December 2006; 1♂ 1♀, December 2016, all G. Goergen (IITA); 1♂, Togbin, October 2004, G. Goergen (IITA). BOTSWANA, 1♂, Mongalatsila, Ghanzi, 5.V.1925, J. Maurice (BMNH). BURUNDI, 1♀, Bururi, 26.V.1925, F.J. François (KBIN); 1♀, Cankuzo, Parc de Ruvubu, 5.IV.2010, B. Nzigidahera (OBPE); 1♀, Kgamba, 17.V.2011 (OBPE); 1♂, Kibira, 29.I.2012, B. Nzigidahera (OBPE); 1♀, Kitega, 15.V.1955, F.J. François (KBIN); 1♂, Lac Nyanza, 24.X.2013, L. Ndayikeza (OBPE); 1♀, Musenyi, 28.I.2011, A. Mpawenimana (OBPE); 1♂ 5♀, Rumonge, 9.XI–10.XII.2010; 1♀, 13.IV.2011, all L. Ndayikeza (OBPE). CAMEROON, 1♂ 1♀, Meskine (agricultural site), 23.V.2018, M. Azo'o Ela (MAPC). COMOROS, 1♀, Grande Comore, Moroni suburbs, 10.VIII.1983, R. Jocqué & L. Janssens (KMMA); 1♂ 1♀, Moroni, 14.VII.2019, G. G. Goergen (IITA). CONGO (DR), Bambesa, 1♀, 15.IX.1933, H.J. Brédo (KMMA); 1♀, 20.X.1933, H.J. Brédo (KMMA); 1♀, 20.X.1933, J. Leroy (KMMA); 1♂, Baudouinville [=Boma/Kirungu], December 1953, H. Bomans (KMMA); 1♂, Baye, Bondo, Uele, August 1956, L. Rooyakkers (KMMA); 1♂, Blukwa, Ituri, 28.IX.1928, A. Collart (KMMA); 1♀, Boswenda, 22.X.1914, J. Bequaert (KMMA); 1♀, Blukwa, Ituri, 14.XI.1928, A. Collart (KMMA); 1♂, Bunia, Ituri, 1938, P. Lefèvre (KMMA); Elisabethville [= Lubumbashi], 1♀, 3.IV.1912, M. Bequaert (KMMA); 1♂, 30.I.1913, Daldoniof (KMMA); 3♂, 1–5.I.1921, M. Bequaert (KMMA); 1♂, 8.IV.1921, M. Bequaert (KMMA); 1♂, 15.IV.1928, M. Bequaert (KMMA); 1♀, 11.XII.1928, M. Bequaert (KMMA); 2♀, 1928–1929, P. Quarré (KMMA); 1♀, April 1930, M. Bequaert (KMMA); 1♀, January 1933, M. Bequaert (KBIN); Elisabethville [= Lubumbashi], 1♀, R. Lubumbashi, 2.IV.1923, M. Bequaert (KMMA); 1♀, December 1959, Ch. Seydel (KMMA); Gandajika, Sankuru, 1♀, 7.XI.1950; 1♂, 18.XII.1950; 1♀, 1.II.1951, all P. de Francquen (KMMA); Garamba, July 1912, Lang & Chapin, 2♀ (AMNH); 1♀ (KMMA); 1♀, Parc National Garamba, II/fd/18, H. de Saeger (KMMA); 1♀, Goma, 10–15.V.1953, J. Verbeke (KBIN); 1♂, Ishwa, Lac Albert, September 1935, H.J. Brédo (KMMA); 1♂, Kabinda, Lomami, M. Bequaert (KBIN); 1♂, Kabukwa, Lomami,

March–April. 1932, P. Quarré (KMMA); 2♀, Kambaye, Lomami, October 1930, P. Quarré (KMMA); 1♂, Kambaye-Lupula, Lomami, 1930, R. Collart (KBIN); 1♀, Kishinde, Lomami, October 1931, P. Quarré (KMMA); 1♀, Kissenyi, N. Kivu, February 1928, Ch. Seydel (KMMA); 1♂, Kolwezi, Lualaba, 2.II.1953, L. Gilbert (KMMA); 1♀, Lac Vert, route Goma-Sake, Kivu, 6.I.1953, J. Verbeke (KBIN); 1♀, Likonzolwa, 7.I.1912, Bequaert (KMMA); 1♂, Lualabourg [=?Kananga (as Luluabourg)], June 1919, Carpentier (KMMA); 1♂, Nyagwe, April–May 1918, R. Mayné (KMMA); 1♀, Sandoa, September 1928, Walker (KMMA). ERITREA, 1♀, Dongollo Basso, 2.III.1957, D.J. Greathead (BMNH). ETHIOPIA, 18♂ 32♀, Abijata Shala Nat. Park, Oromia, 15.IX–10.X.2012 (different dates), A. Pauly (three specimens J.L. Boevé as co-collector) (KMMA); Addis Abbaba,1♀, 5–20.VII.1920; 1♀, 31.VIII.1920; 1♂, 30.VIII.1920 (all AMNH); 1♀, Arba-Minch, Lake Chano, 19.X.2012, A. Pauly (KMMA);1♂, Debre Sina, Tamaber Pass, Amhara, 25.X.2011, A. Ketema (KBIN); 1♀, Denssa, Amhara, 23.X.2011 (KMMA); 1♂, Dire Daoua (KMMA); 1♂, Djibuti to Addis Ababa Railroad, 14–17.IX.1920 (AMNH); 2♂, Goba, Bale, 21.X.2010, A. Pauly (KMMA); Holeta, Oromia, 5.X.2010, A. Pauly (KMMA); 4♀, Irga Alem, 13.IX.1935, Sska (KMMA); Jimma, Gimo, 1♂ 1♀, 11.II.2016; 2♀, 24.II.2016, all L. Geeraert (KMMA); 1♂ 2♀, Lake Koka, 27.IX.2012, A. Pauly (KMMA); 2♂, Waliso, 13–14.IX.1958, S. Chojnacki (MNHN); 1♂ 1♀, Lake Ziway, 14.IX.2012, A. Pauly (KMMA); 3♂ 4♀, Senkele Nat. Park, Oromia, 17.IX.2012, A. Pauly (KMMA). GHANA, 1♂, Cape Coast, December 2004, G. Goergen (IITA); 3♂, Wati Waterfalls, February 2003, G. Goergen (IITA). KENYA, 1♀, Kasaala area, Eastern Province, 19.XI–3.XII.2015, R. Copeland (NMK); 2♀, Kasigau Mt, Coast Province, 2–16.XI.2011, R. Copeland (NMK); 1♂ 2♀, Mucagara Farm, Kirinyaga, Central Province, 16–18.XII.2016, R. Copeland & K. Jordaens (NMK); 1♀, Kamwana Forest, Kirinyaga, Central Province, 17.XII.2016, R. Copeland & K. Jordaens (NMK); 1♀, Nairobi, 14.VI.1919, Loveridge (CNC); 1♀, Simisi area, Eastern Province, 29.XI.2013, J. Bukhebi (NMK); 1♂, Sokorte Dika Forest, Marsabit N.P., 12–13.XII.1972, M. Boulard (MNHN); 1♀, Mwatate, Taita Hills, 19.X–2.XI.2011, R. Copeland (NMK); trail to Lyale, Taita Hills, 3♂ 3♀, 27.XII.2017; 1♀, 27.I.2017, all G. Ståhls (MZH); 1♂ 2♀, Wesu Peak, Taita Hills, 18.I.2017, G. Ståhls (MZH); 2♀, Yatta, 64km E Thika, 10.XII.1972, I. Bampton (NMSA). LESOTHO, 1♂, Basutoland, P. Janson (AMNH); 2♀, Roma, 22.XII.1974, J.W. Boyes (CNC); 1♀, no locality, Lindblom (NRMS). MADAGASCAR, 1♂, Ambodinoangy, Maroantsetra distr., March 19XX, J Vadon (MNHN); 8♀, 10km N Ambositra, 7.III.2016, G. Goergen (IITA); 1♂, Antananarivo, 8.III.2016, G. Goergen (IITA); Didy, 1♂, March 1992; 1♂, 10.IV.1992, all A. Pauly (KMMA); 10♂ 1♀, Foulpointe Forest, May 1995, A. Pauly (KMMA); 1♂, 67km W Ihosy, 16.III.1994, A. Pauly (KMMA); 6♂, 25km W Morarano-Chrome, April 1992, A. Pauly (KMMA); 1♀, env. Tananarive, Plasson (KMMA); 2♂, Tanovana, between Tamatave & Tanarive, January–May 1937, C. Lamberton (CNC). MALAWI, 2♂ 2♀, Mulanje Mountain Forest Reserve (lodge), 12–15.XI.2016, K. Jordaens (KMMA); 1♀, Mulanje Mountain, Likhubula, 12–14.XI.2016, K. Jordaens (KMMA), 1♂, Zomba, H.S. Stannus (BMNH); 1♀, Zomba Plateau (Kuchawe trout farm), 8–11.XI.2016, K. Jordaens (KMMA). NAMIBIA, 1♂, Rietfontein, 23mi SW Grootfontein, 3.IV.1972, Southern African exp. (BMNH). NIGERIA, Ibadan (IITA), 1♂, 26.I.1998; 1♂, 5.XII.2000, all G. Goergen (IITA); Jos, 1♀, October–December 1965; 1♀, 1967; 2♀, 1968, all Bot-Gwong (KMMA). RWANDA, 1♂, Gatsibu, Biumba, 6.II.1953, P. Basilewsky (KMMA). SOUTH AFRICA, 1♀, Bergville Hillside Farm, KwaZulu Natal, 10.XII.2012, M.N. Morales (MZH); 1♀, Boshoek, Transvaal (KMMA); 1♂, Giants Castle, 22.IV.1962, K. Tinley (CNC); Johannesburg, 1♀, January 1950, Zumpt (AMNH); 1♂, Johannesburg, 10.IV.1950, Zumpt (AMNH); 1♀, Langkloof Berg (house cottages), 6.XII.2012, G. Ståhls (MZH); 2♀, Mariepskop National Park, Mpumalanga, 23–24.I.2017, K. Jordaens (KMMA); 1♀, 23mi NW Naboomspruit, 20.II.1949 (AMNH); 2♂, Otto's Bluff (Kwela Lodge), Pietermaritzburg, 14.XII.2012, G. Ståhls (MZH); Royal Natal National Park, the Crack path, 8.XII.2012, 1♀, G. Ståhls; 1♂, M.N. Morales (all MZH); 2♂ 1♀, Rustenburg, Transvaal, 23.IV.1950, Zumpt (AMNH); 1♂, 4mi SW Ubombo, Natal, 6.XII.1966, J.G. Rozen & D.J. Brothers (AMNH). SWAZILAND, 1♂, Mbabane, Enselweni Valley, 2-7.IV.1978, J. Londt & B. Stuckenberg (NMSA). TANZANIA, 1♀, Dar es Salaam, 14.IX.1961, G. Heinrich (CNC); 1♀, Katesh, Contref. S du Mt Hanang, 18–31.V.1957, P. Basilewsky & N. Leleup (KMMA); 3♀, Kilimanjaro, 26.XI.2008, G. Goergen (IITA); 1♀, Nwanza, 30.XI.2008, G. Goergen (IITA);1♀, Songeakyeia, 26.XI.2008, G. Goergen (IITA); 1♀, Tarangire National Park, Matete Pond, 20.III.1995, Lesio&Liseki (AMNH); 1♀, Victoria Njansa (KMMA). TOGO, 2♂ 4♀, Dzogbégan, 24–25.I.2016, K. Jordaens (KMMA); 1♂, Dzogbégan (Monastery), 24-25.I.2016, G. Goergen (KMMA); Kloto, 1♂, November 2006, G. Goergen (IITA); 1♂ 1♀, November 2015, G. Goergen (IITA); 1♂ 4♀, January 2016 (KMMA); 1♂, 21–24.VI.2015, G. Goergen (KMMA); 1♂, December 2016, G. Goergen (KMMA); 1♂ 1♀, Kuma-Tokpli, 21–24.I.2016, G. Goergen (KMMA). UGANDA, 1♂, N. Ankole, 21.I.1975, P. Mugabi (CNC); 2♂, nr Entebbe, 23–31.I.1973, H. Falke (CNC); 1♀, Entebbe, forest 4mi near Kitabi Hill, October 1913, C.A. Wiggins (OXUM). ZAMBIA, 1♀, Fort Jameson [=Chipata], 24.I.1908,

S.A. Neave (OXUM); 1♀, Lake Bangwelu, October–November 1946 (BMNH). ZIMBABWE, 1♀, Bulawayo, 7. II.1910, E.C. Chull (BMNH); 1♂, Salisbury [=Harare], January 1901, F.I. Snow (AMNH).

Body size. Body length (n=10): 13.3–17.1 mm. Wing length (n=10): 10.3–12.2 mm.

Redescription. **MALE** (Fig. 16). ***Head*** (Fig. 25). Eye bare; holoptic, touching for about 3 times length of ocellar triangle, facets enlarged in dorsal half. Frons brown to black; with greyish brown pollinosity, along eye margin more brownish; dispersed pilosity of medium long pale pile interspersed with few dark pile; rugose area shining black, occupying slightly more than one-third of entire width and at about two-thirds of height of frons; with shorter dispersed pale pile. Face ground colour black; with dense greyish to pale brown pollinosity, in medial part and along eye margin at places weakly shining black; dispersed pilosity of short pale pile; facial tubercle elongated, poorly pronounced. Sometimes lateral margins of face and frons more yellow-orange with more or less extensive darker patches. Gena yellow-orange; with long pale pilosity. Occiput dorsal third black, with greyish pollinosity; ventrally more densely yellow to yellow-white, with dispersed pale pile. Antennal segments black to black-brown; arista yellow-brown, in basal half with medium long pile equal to half width of pedicel.

Thorax. Scutum ground colour black; with dispersed greyish brown pollinosity, along margin more densely greyish; covered with pile of medium long pale greyish pile. Scutellum more yellow-orange, covered with medium long pale greyish to yellowish pile except for fascia of dark pile, occupying one-third of scutellum. Pleural sclerites ground colour black, with greyish pollinosity. Covered (except meron, anterior part of katepisternum, and anterior anepisternum) with long whitish or pale yellowish pile.

Legs. Predominantly brown. Fore and mid leg, femur with medium long pale pilosity, posteriorly longer; tibia silvery in basal half dorsally, ventrally less so, with short pale pilosity. Hind leg, femur medium long to long pale pilosity except ventrally in apical fourth to fifth where black; tibia with silvery part restricted to dorsal side and for basal third at most, pale pilosity except ventrally where black.

Wing (Fig. 56). Completely hyaline, no microtrichia. At most weakly fumose along anterior margin. Calypters pale; with fringe of pale pile.

Abdomen (Fig. 78). Mainly brown-black, tergum 2 orange-brown along anterior two-thirds except for brown rectangular transverse macula in medial part, macula isolated or narrowly connected with posterior brown fascia; tergum 3 slightly paler narrowly along anterior margin. Terga covered with dispersed short pale pile except posterior part of tergum 4 where black, along lateral and posterior margins pile longer. No bullae. Sterna brown to black-brown; with widely dispersed long pale pile. Male genitalia as in Fig. 98.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons black ground colour; with greyish brown pollinosity, except in dorsal third where black; covered with short dispersed black pile, on and along rugose area with pale pilosity; rugose area shining black, occupying half of entire width and equal in height to 2–3 times the ocellar triangle. Facial tubercle moderately developed (Fig. 27).

Distribution. Angola, Benin, Botswana, Burundi, Comoros, Congo (DR), Eritrea, Ethiopia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Namibia, Nigeria, Rwanda, South Africa, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe. Smith & Vockeroth (1980) also mention this species from Sierra Leone.

Comments. In the collection of MNB, two specimens (1 male, 1 female) are labelled as types. Both bear the same blue printed label "Capland Krebs S." as well as a red printed type label. The male specimen, in addition, carries two pale blue handwritten labels one: "C. [or "Gr"] b.sp. Krebs", and a second: "incisus Wied.*", as well as a white printed label "1070". From the original description it appears that Wiedemann had more than one specimen of this species in front of him as he mentions that material is deposited "Im Berliner Museum und in meiner Sammlung" [in the Berlin museum and in my collection]. However, the description only makes reference to the female, so it is uncertain whether the male specimen is part of the syntype series. An additional female syntype (not examined), originally from the Winthem collection, is deposited in the NMW (Denner, 2017). The type specimen of *M. capito* in the NRMS collection, is labelled as 'holotypus' by Kassebeer in 1999 but has a separate label indicating this is a lectotype by Barkemeyer in 2002. The lectotype designation does not seem to have been published.

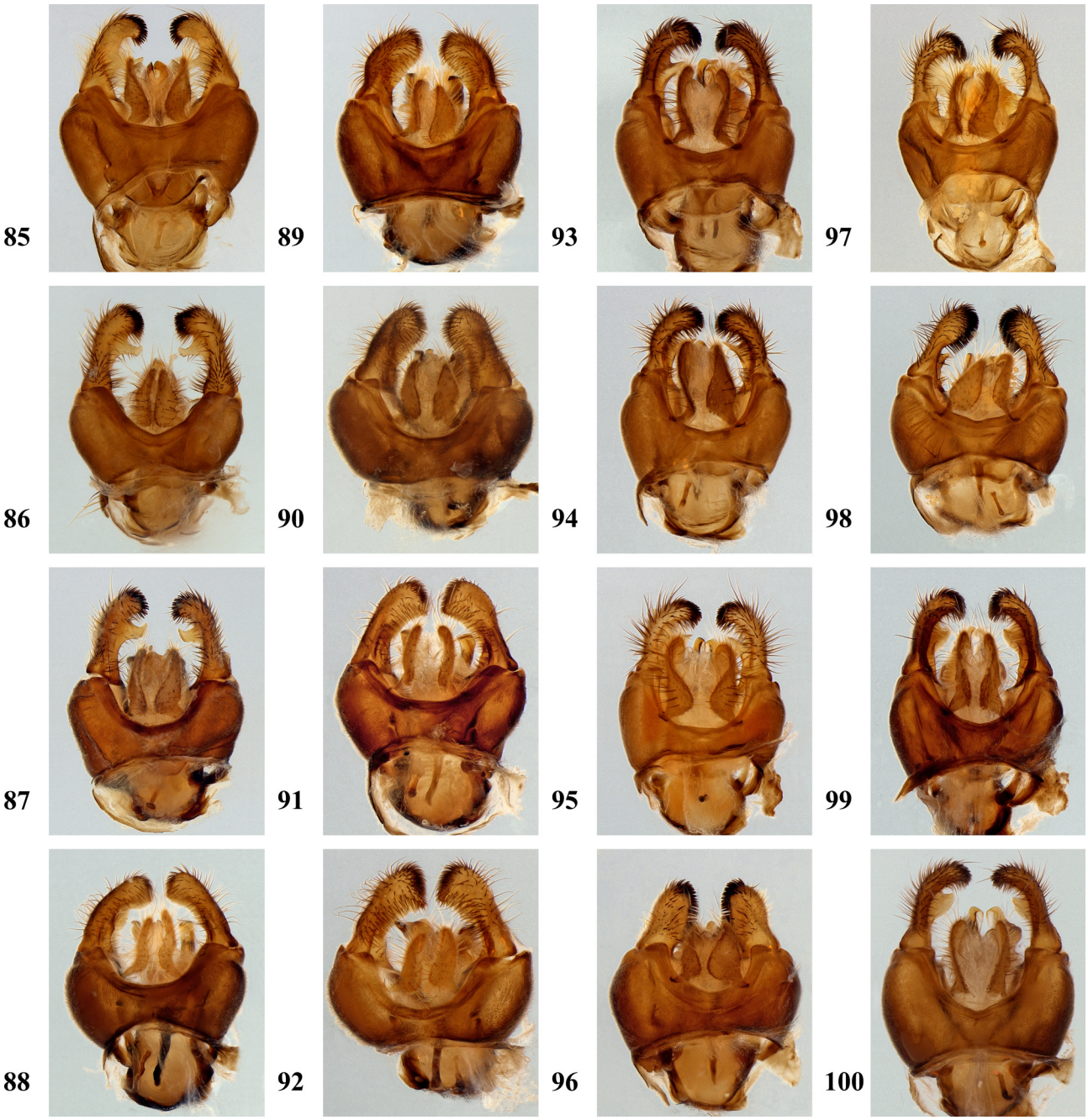
Phytomia varians **Curran**

(Figs 17, 57, 79)

Phytomia varians Curran, 1927b: 361

Material examined. HOLOTYPE: ♀, CONGO (DR), Moma, Equateur, June 1925, J. Ghesquière (KMMA). PARATYPES: CONGO (DR), 1♂ (labelled allotype) 1♀, same as holotype (KMMA); 1♀, Moto, Haute-Uele, October–November 1923, L. Burgeon (AMNH). Other material: CONGO (DR), 2♀, Moma, Equateur, June 1925, J. Ghesquière (1 F labelled Prince Leopold as co-collector) (KMMA); 1♀, Medje, 1–7.IX.1910, Lang & Chapin (AMNH).

Body size. Body length (n=7): 13.0–15.1 mm. Wing length (n=7): 10.0–11.0 mm.



FIGURES 85–100. *Phytomia* spp., male terminalia, dorsal view. 85. *P. bullata* (Loew). 86. *P. aurigera* Bezzi. 87. *P. kroeberi* (Bezzi). 88. *P. bulligera* (Austen). 89. *P. austeni* **sp. nov.** 90. *P. bezzii* Curran. 91. *P. memnon* **sp. nov.** 92. *P. pubipennis* Bezzi. 93. *P. natalensis* (Macquart). 94. *P. curta* (Loew). 95. *P. pallida* **sp. nov**. 96. *P. erratica* (Bezzi). 97. *P. fucoides* Bezzi. 98. *P. incisa* (Wiedemann). 99. *P. melas* (Bezzi). 100. *P. poensis* (Bezzi).

Redescription. **MALE** (Fig. 17). ***Head***. Eye bare; holoptic, touching for 3–4 times length of ocellar triangle, facets enlarged in dorsal half. Frons black-brown; with brown pollinosity; dispersed pilosity of short to medium long pale yellow pile; rugose area shining brown, occupying one-third of entire width and more than half of entire height; with shorter dispersed pale pile. Face ground colour brown; with dispersed greyish brown pollinosity, in

parts weakly shining black; dispersed pilosity of short pale pile; facial tubercle elongated, strongly pronounced. Gena colour and pollinosity as face; with long pale pilosity. Occiput dorsal third black, with greyish pollinosity; ventrally more densely yellow-white, with dispersed pale pile. Antennal segments orange-brown to brown; arista yellowish, in basal half with medium long pile equal to width of pedicel.

Thorax. Scutum and scutellum black ground colour, with brown pollinosity; covered with dense pile of short yellow to orange-brown pile, anteriorly somewhat longer; scutellum mostly with black pile except along posterior margin where pale. Pleural sclerites ground colour black, with brownish pollinosity; covered with dispersed pile of long golden yellow to orange pile except anepimeron with black pile; meron, anterior part of katepisternum and anterior anepisternum bare.

Legs. Brown to yellow-orange. Fore leg, femur mainly brown, apical margin narrowly paler; with dense short black pilosity, anteriorly and posteriorly longer; tibia pale in basal half, otherwise orange-brown; with short black pilosity, except in basal half where pale; tarsal segments yellow-orange. Mid leg as in fore leg, except tibia pale for more than basal half, distally darker yellow, over entire length with short pale pilosity. Hind leg, femur brown, in basal fourth and at apical tip paler; dorsally and ventrally with medium long to long pale pilosity, ventrally in apical fourth with dense row of long dark bristly pile, otherwise short pale pilosity; tibia brown, pale in basal two-fifths; with short to medium-long dense pale pilosity; tarsal segments yellow-orange.

Wing (Fig. 57). Hyaline. Microtrichia only narrowly at base and with small patch in medial part cell *r*. Calypters dark with fringe of dark pile.

Abdomen (Fig. 79). Mainly black-brown except anterior third to half of tergum 2 where yellowish to orange, anterolaterally more extensively so. Terga 3–4 with anterolateral pair of orange maculae. Terga 2–4 densely pollinose; no distinct bullae but slight medial swelling, especially on tergum 2; pilosity with dense short to medium-long golden yellow pilosity, tergum 2 with pilosity more densely so anterolaterally, along posterior margin short black, in medial part reaching swelling. Sterna brown, with widely dispersed long pale pile.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons with greyish to greyish brown pollinosity rugose area shining brown; occupying slightly more than one-fourth of entire width and equal in height to ocellar triangle. Face more orange-brown. Wing more fumose and microtrichia area more pronounced.

Distribution. Congo (DR).

Incertae sedis

The following species are placed under *Phytomia* but their exact generic position has to be reconsidered once the revision of *Simoides* [currently under preparation by A. Ssymansk and M. Morales (Ssymank pers. comm.)] is finalized (see Comments below and Discussion).

Phytomia melas group

Phytomia melas (Bezzi)

(Figs 18, 35, 58–59, 80–82, 99)

Megaspis fronto var. *melas* Bezzi, 1912: 424 (in key only)
Megaspis ephippium Bezzi, 1912: 424 (in key only)
Phytomia (*Eristalis*) *fronto* var. *melas* Bezzi 1915: 75
Phytomia ephippium Bezzi, 1915: 75 **syn. nov.**

Material examined. HOLOTYPE (*fronto* var. *melas*): ♀, KENYA, Abderdares E side, 24.II.1911, T.J. Anderson (BMNH). PARATYPES (*fronto* var. *melas*): 1♀, KENYA, same data as holotype (BMNH); 1♀, KENYA, W side Meru-Nyeri Road, Mt Kenya, 20.II.1911, S.A. Neave (BMNH). HOLOTYPE (*ephippium*): ♀, KENYA, Kenia Forest, nr Luchi River, 9.II.1911, T.J. Anderson (BMNH). Other material: BURUNDI, 1♂, Bururi, 8.V.1949, F.J. François (KBIN); 1♀, Kibira Forest, 25.XI.2010, University of Burundi. CONGO (DR), 1♀, Itombwe N riv Isale, Kivu, July 1955, G. Marlier (KMMA); 1♂, Mt Ruwenzori, 18.V.1914 (AMNH); Parc National Albert, 1♀, Ihunga,

riv. Ruanoli, 17.IV. 1957, P. Vanschuytbroek, (KMMA); 1♀, S. Kahuzi, km27, Kivu, 28.III.1953, P. Basilewsky (KMMA); 1♀, pied du Mont Wago, 24.XI.1928, A. Collart (KMMA). KENYA, 1♂, 37mi SE Eldoret, 26.I.1968, J.W. Boyes (CNC); 1♀, Elgon, Loven (NRMS); 1♀, Jonct Camp E. Elgon, April–May 1914, Bayer (KMMA); Kathita river, Mt Kenya, 1♀, 8.VIII.1949; 1♂, 12.VIII.1949, all J.A. Riley (BMNH); 1♀, SE edge Kenia Forest, 7.II.1911, T.J. Anderson (BMNH); 1♀, Kilolo R. N of Mt Kenia, Feburary 1911 (CNC); 1♂, Kijabe, July 1930, van Someren (BMNH); 1♀, W. Side Meru–Nyeri Rd, Mt. Kenia, 20.II.1911, S.A. Neave (BMNH); 1♀, Molo side Mau Forest, June 1991, R. Bagine & Mugambi (NMK); 1♀, Mt Elgon, February 1935, F.W. Edwards (BMNH); 2♀, Kinotton For. Sta. nr Kitale, Mt Elgon, 25.I.1965, J.W. Boyes (CNC); 2♂, Mt Elgon camp III, P.A. Chappuis & R. Jeannel (MNHN); 2♂, NW Mau, January–February 1946 (CNC); 1♂, 10mi N Karatima, Ragatan Forest, 4.II.1968, J.W. Boyes (CNC). RWANDA, 1♂, Mt Tamira, 11.III.1935, G.F. de Witte (KBIN); Vallée Rwebeya, Volc Sabinyo, 1♂, 22.IX.1934; 1♂, 26.IX.1934, all G.F. de Witte (KMMA). SOUTH AFRICA: 1♀, E. Cape, 37km NE Maclear. 3.II.1992, Natal Museum Expedition (NMSA); 1♀, Imbezana River, 5.I.1918, E.C. Chubb (NMSA). TANZANIA, 7♀, Rungve Mt, 20mi SSE Mboya, 1962, H. Heinrich (NRMS); 1♂, Mt Meru, 21.VI.1962, H. Falke (CNC); 1♂, 30mi S Njombe, Mdando Forest, 8.X.1962 (CNC). UGANDA, 3♂ 2♀, Bwindi Impenetrable N.P., 13-14.XII.2018, K. Jordaens (KMMA); 2♀, Namwamba Valley, Ruwenzori Range, December 1934 – January 1935, F.W. Edwards (BMNH); 1♂, Nyamgassani Valley, Ruwenzori Range, December 1934 – January 1935, D.R. Buxton (BMNH); 1♂, Ruenzori, 17.II.1912, J. Fraser (BMNH); 3♀, Ruenzori Mts, 16-20.IV.1972, H. Falke (CNC). ZIMBABWE, 1♀, Vumba, Umtali, 7.II.1932, P.A. Sheppard (NMSA).

Body size. Body length (n=10): 11.9-15.6 mm. Wing length (n=10): 9.8-12.1 mm.

Redescription. **MALE** (Fig. 18). ***Head***. Eye bare; holoptic, touching for distance at most equal to length of ocellar triangle, facets subequal, only moderately enlarged in dorsal half. Frons brown to black; with greyish brown pollinosity, along eye margin more brownish; dispersed pilosity of long pale pile interspersed with few dark pile, dorsally longer pile; rugose area shining brown, occupying about one-third of entire width and at about two-fifths of height of frons; with shorter dispersed pale pile. Face ground colour black; mainly weakly shining with sparse greyish brown pollinosity, below antennae more densely greyish pollinose; pilosity of short pale pile; strongly concave with facial tubercle rounded, strongly pronounced. Gena black, brownish pollinose narrowly along eye margin; with long pale pilosity. Occiput dorsal third black, with greyish pollinosity; ventrally more silvery to brown, with dispersed pale pile. Antennal segments black to black-brown; arista yellow-brown, in basal half with short pile equal to about one-third of pedicel.

Thorax. Scutum ground colour black; with dispersed greyish-brown pollinosity, along anterior margin slightly more densely so; covered with dense pile of long pale brownish pile interspersed with few darker pile. Scutellum (Fig. 35) as scutum except more brownish, at least along posterior margin; in medial part with more pronounced darker pilosity. Pleural sclerites ground colour black, with greyish pollinosity. Covered (except meron, anterior part of katepisternum, and anterior anepisternum) with long whitish or pale yellowish pile.

Legs. Black-brown to orange-brown, tarsal segments more orange. Fore leg, femur with medium long pale pilosity, posteriorly longer and very dense, mixed with darker pile in apical third, ventrally with more dispersed pale pilosity; tibia pale in basal half dorsally, ventrally less so, with short pale pilosity. Mid leg, as fore leg except posterior pilosity on femur less dark. Sometimes fore and mid femora with more extensive black pilosity anteriorly and posteriorly. Hind leg, femur medium long to long pale pilosity except ventrally in apical fourth to fifth where black; tibia with silvery part restricted to dorsal side and for basal fourth at most, black pilosity except dorsally in basal part where pale.

Wing (Fig. 58). Completely hyaline, no microtrichia. At most slightly fumose along anterior margin and around venation. Calypters pale brown, basally more whitish; with fringe of pale pile.

Abdomen (Figs 80–82). Mainly black-brown, tergum 2 orange-brown along anterior two-thirds to three-fourths except for brown rectangular transverse macula in medial part, macula isolated or narrowly connected with posterior brown fascia; tergum 3 orange-brown along anterior margin for at most one-fourth of entire depth, sometimes interrupted medially; tergum 4 weakly shining black-brown, sometimes with narrow orange-brown fascia along anterior margin. Extension and coloration of orange-brown markings variable, sometimes terga 2 and 3 completely black-brown. Terga covered with dispersed short dark pile except at orange-brown markings where pale, along lateral margins with longer and predominantly pale pilosity. No bullae. Sterna brown to black-brown; with widely dispersed long pale pile. Male genitalia as in Fig. 99.

FEMALE. As male except for the following character states. Eye, facets of equal size; dichoptic. Frons black

ground colour; with greyish brown pollinosity, except in dorsal third where dark brown; covered with long intermixed pale and dark pile, in dorsal part more dark pile; rugose area shining brown to yellow-brown, occupying less than one-third width and equal in height to at most twice the ocellar triangle. Wing (Fig. 59), fumose area sometimes more extensive.

Distribution. Burundi, Congo (DR), Kenya, Rwanda, South Africa, Tanzania, Uganda, Zimbabwe.

Comments. *Phytomia melas* was originally described as a variety of *P. fronto* by Bezzi. However, study of images of the female holotype of the latter (Fig. 20), have shown that both are distinctly different, based on the shape of the hind femur (thickened in *P. fronto*, slender in *P. melas*), and the rugose area above the antennal insertion (small and largely smooth in *P. fronto*, well developed and distinctly rugose in *P. melas*). Actually, characters states observed in *P. fronto* correspond more with those considered characteristic of the genus *Simoides*, rather than *Phytomia*. This was already observed by Loew (1860) who placed *P. fronto* tentatively under *Megaspis* (now synonym of *Phytomia*) but pointed out the similarities with other *Simoides* species. Given the ambiguity in differentiating *Phytomia* from *Simoides* (*cf.* Discussion) we prefer not to propose a new generic combination for *P. fronto* but await the revision of the genus *Simoides* and further molecular and morphological analysis. We do exclude, however, *P. fronto* as such from this revision but specimens of this species will key out under *Simoides* of the key here provided (couplet 13).

It is not clear whether Bezzi actually studied the type of *P. fronto* but the specimens listed by him under *fronto* in Bezzi (1915) originate from the same area as the type material listed for *P. melas*. Among the series studied by us, there is a distinct variability in the coloration of the abdominal terga as described above but specimens correspond in other aspects. We, therefore, consider them to be conspecific and list them all here under *P. melas*.

Phytomia ephippium was described based on a single specimen from largely the same area in Kenya as the type specimens of *P. melas*. It was differentiated based on a assymetric shape of the second abdominal tergum (Fig. 82). Bezzi (1915) already pointed out that could be just an aberrant specimen of *P. melas*. We did not find any other specimens among the material studied with the same shape of the abdominal tergum and consider this to be deformation, caused by error in development rather than a specific character. We, therefore, consider *P. ephippium* to be conspecific with *P. melas*.

Phytomia melas shows a number of transitional characteristics between *Phytomia* and *Simoides*, which are discussed in the general Discussion.

***Phytomia poensis* (Bezzi)**

(Figs 19, 26, 28, 36, 60, 83–84, 100)

Megaspis poensis Bezzi, 1912: 427

Material examined. SYNTYPES: 3♀, EQUATORIAL GUINEA, Moka, Fernando Po [=Bioko Island], February 1902, L. Fea (MCSNG). One specimen, bearing an additional printed label 'Typus' and a handwritten label by Bezzi 'Megaspis poensis n.sp.' is hereby designated as lectotype and labelled accordingly. Other material: CAMEROON, 2♀, SW Mt Kupé, 19–22.V.2008, B.D. Gill (CNC). CONGO (DR), Beni, 1♂, February 1931; 1♀, 17.XI.1931, all L. Lebrun (KMMA); 1♀, Bitshumbi, S L Edouard, Parc National Albert, 15.IV.1936, L. Lippens (KMMA); 1♀, Faradje, Uele, November 1912, Lang & Chapin (KMMA); 1♀, Kapanga, Lulua, November 1918, Walker (KMMA); 1♂, Manyema, R. Mayné (KMMA). UGANDA: 1♂, N Ankole, 21.I.1975, P. Mugambi (CNC); 1♂, Budongo Forest, Lake Albert, April 1972, E.B. Babyetagara (CNC); 1♀, Ibanda, 23–28.XII.1972, H. Falke (CNC); 1♂, East Toro, 29.I.1912, J. Fraser (BMNH).

Body size. Body length (n=10): 10.6–14.6 mm. Wing length (n=10): 9.2–11.1 mm.

Redescription. **MALE** (Fig. 19). ***Head*** (Fig. 26). Eye bare; holoptic, touching for distance slightly longer than length of ocellar triangle, facets subequal, only moderately enlarged in dorsal half. Frons brown to black; with greyish brown pollinosity, along eye margin more brownish; dispersed pilosity of short to medium long pale pile interspersed with few dark pile; rugose area shining brown, occupying about one-third of entire width and at about half of height of frons; with shorter dispersed pale pile. Face ground colour black; mainly weakly shining with sparse greyish brown pollinosity, below antennae more densely greyish pollinose; pilosity of short pale pile; strongly concave with facial tubercle rounded, strongly pronounced. Gena black, brownish pollinose narrowly along

eye margin; with long pale pilosity. Occiput dorsal third black, with greyish pollinosity; ventrally more silvery to brown, with dispersed pale pile. Antennal segments black to black-brown; arista yellow-brown, in basal half with short pile equal to about one-third of pedicel.

Thorax. Scutum ground colour black; with dispersed greyish brown to brown pollinosity; covered with dense pile of short pale brownish pile interspersed with few darker pile, along lateral margin more whitish pile. Scutellum (Fig. 36) as scutum except more orange-brown, at least along posterior margin. Pleural sclerites ground colour black, with greyish pollinosity. Covered (except meron, anterior part of katepisternum, and anterior anepisternum) with long whitish or pale yellowish pile.

Legs. Black-brown to orange-brown, tarsal segments more orange. Fore leg, femur with short pale pilosity, anteriorly and posteriorly longer, and mixed with darker pile to variable extent, rarely predominantly black; tibia pale in basal half, apically black-brown, with short pale pilosity except in apical darker part where black pile. Mid leg, as fore leg except pilosity on femur and tibia entirely pale. Hind leg, femur more orange-brown; medium long pale pilosity except ventrally in apical fourth to fifth where black; tibia with basal third pale dorsally, otherwise orange-brown to dark brown; black pilosity except dorsally in basal part where pale.

Wing. Largely hyaline (as in *P. melas*, *cf.* Fig. 58), no microtrichia. At most fumose along anterior margin and surrounding venation. Calypters yellow brown; with fringe of pale pile.

Abdomen (Figs 83–84). Mainly black-brown, tergum 2 yellow-brown to orange-brown along anterior three-fourths except for isolated brown rectangular transverse macula in medial part; tergum 3 yellow-brown to orange-brown along anterior margin for at most one-fourth of entire depth, sometimes interrupted medially; tergum 4 weakly shining black-brown, sometimes with narrow orange-brown fascia along anterior margin. Terga covered with dispersed short pale pile except posterior part of tergum 4 where some darker pile, along lateral margins with longer pale pilosity. No bullae. Sterna brown to black-brown; with widely dispersed long pale pile. Male genitalia as in Fig. 100.

FEMALE. As male except for the following character states. Eye, facets of equal size (Fig. 28); dichoptic. Frons black ground colour; with greyish brown pollinosity, except in dorsal third where dark brown; covered with short intermixed pale and dark pile, in dorsal part more dark pile; rugose area shining brown to yellow-brown, occupying less than one-third width and equal in height to at most twice the ocellar triangle. Face with orange-brown patches. Wing (Fig. 60), fumose area sometimes more extensive. Extension and coloration of orange-brown markings variable, sometimes terga 2 and 3 completely black-brown.

Distribution. Cameroon, Congo (DR), Equatorial Guinea, Uganda.

Comments. *Phytomia poensis* in most aspects corresponds largely with *P. melas*. It shows the same transitional characters between *Phytomia* and *Simoides* (see Discussion) and the few specimens from which DNA could be extracted (+ 40yrs old) and a DNA barcode sequenced, are grouped together with recent specimens of *P. melas*. Together they form a cluster related to *Simoides* species. Specimens of *P. poensis* also display the large variability in abdominal coloration as observed in *P. melas*. The main differences between both species is the length of the pilosity on frons, and thorax as outlined in the identification and shown in Figs 18-19, and 35-36. While there is some overlap in geographic distribution between *P. melas* and *P. poensis*, it is remarkable that *P. melas* is predominantly found at higher elevation sites, while *P. poensis* shows a more varied range including several low altitude sites. DNA barcoding shows that the 3.5 % mean interspecific p-distance is within the range of interspecific p-distances in Afrotropical *Phytomia*, and much higher than the mean intraspecific p-distances of 0.2 % and 0.6 % for *P. poensis* and *P. melas*, respectively.

Discussion

In total, 19 valid *Phytomia* species occurring in Africa are recognized. For the molecular analysis, we obtained 96 DNA barcodes which were submitted to GenBank. This dataset was complemented with 13 DNA barcodes of Jordaens *et al*. (2015), one barcode of Mengual *et al*. 2015 (voucher MZH_Y1727), 19 unpublished barcodes obtained by CNC, and five unpublished barcodes from MZH. Hence, the total *Phytomia* DNA barcode dataset comprised 134 sequences. To these, we added five DNA barcodes of *Simoides* and one barcode of *Eristalis tenax* as outgroup for the analysis. No DNA barcodes could be obtained for *P. fusca*, *P. serena* or *P. varians*. Collecting information, GenBank accession numbers and/or Barcode of Life Data System accession numbers of all material used can be found in Supplementary Materials Table.

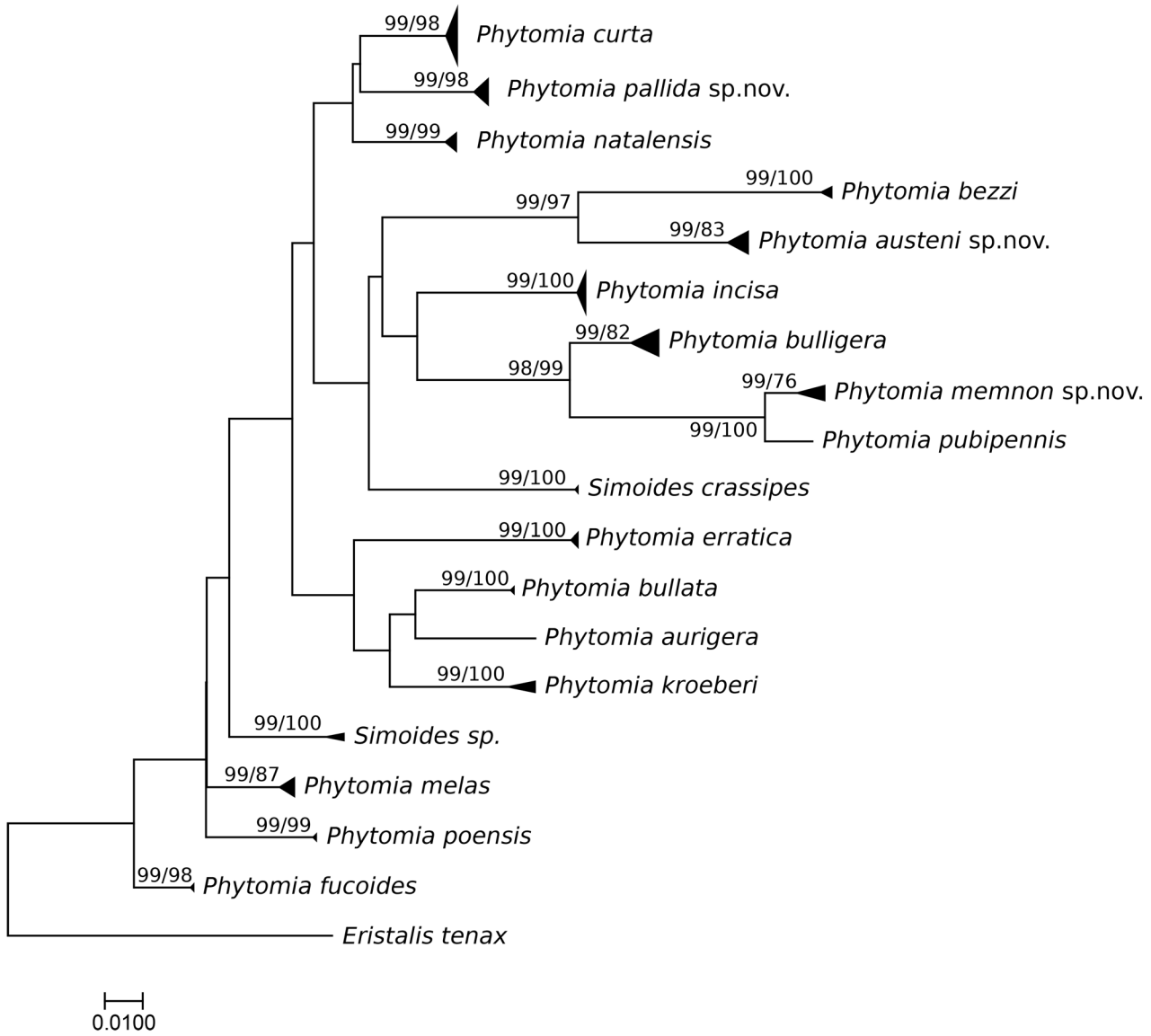


FIGURE 101. Phylogenetic tree of 16 Afrotropical *Phytomia* and two *Simoides* species and with *Eristalis tenax* as outgroup. Bootstrap values ≥70 % are presented at the nodes as (NJ/ML).

The DNA barcode analysis showed very low intraspecific variation in all species (Supplementary Material Figure) (range p-distances: 0 – 1.1 %) and a mean interspecific p-distance range of 2.6 % (*P. pubipennis – P. memnon* **sp. nov.**) to 10.8 % (*P. bezzii – P. bulligera*). The overall mean interspecific p-distance was 6.6 %. Hence, all Afrotropical *Phytomia* species for which DNA barcodes could be obtained, can be confidentially identified using DNA barcodes.

We can recognize a number of species groups, based on morphological similarities between taxa. Taxonomic treatment above, was ordered along these species groups. Yet, preliminary phylogenetic analysis of the COI barcode region results, in general, in low support for nodes deeper than the species nodes (except for the ones mentioned below). Hence, the phylogenetic relationships among the species, and among the putative morphospecies groups requires further study. The grouping, as presented, is thus solely based on morphology and should be considered as preliminary. Four groups can be recognized, comprising 14 of the 19 species.

The *P. bullata* group comprises four species: *P. aurigera*, *P. bullata, P. serena* and *P. kroeberi*. They can be readily differentiated from the other *Phytomia* species by the distinct and well demarcated dark wing marking (Figs 37–41). In addition, the hind femur has a poorly or well developed protuberance and ventrally in apical fifth and the abdominal terga 2–4 have well developed bullae as well as rugose lateral plates on the second tergum. Small silvery maculae are present along inner margin of eye (less conspicuous in *P. kroeberi*) while the scutum and scutellum are

largely devoid of pilosity (Figs 1–4; more conspicuous in *P. kroeberi*). Male genitalia (for those species for which male sex is known) have, in dorsal view, strongly curved surstyli with a strongly pronounced slender medial protuberance at the inner margin (Figs 85–87).

Phytomia erratica clusters with the above group in the NJ and phylogenetic trees but this relationship is not supported, neither does the species have any morphological similarities. It is superficially similar to members of the *P. natalensis* group, but has very distinct male surstyli (Fig. 96: stub like with long row of strong setulae) and it is the only species with bare arista.

The *P. bulligera* group comprises five species: *P. bulligera*, *P. memnon* **sp. nov.**, *P. austeni* **sp. nov.**, *P. bezzii*, and *P. pubipennis*. They can be readily differentiated from the other *Phytomia* species by the combination of the following characteristics: presence of well-developed medial bullae on the abdominal second, third and fourth terga (Figs 67–71), distinct greyish to rufous pilosity on scutum and scutellum (Figs 5–9); and wings with more or less developed microtrichosity at least in basal and medial part (Figs 42–43, 45, 47–48) which can be more extensively in females (Figs 44, 46, 49). Male genitalia have surstyli broad and moderately curved, with strong setulae restricted to apex (Figs 88–92). Phylogenetic analysis suggests a sister-species relationship between *P. bezzii* and *P. austeni* **sp. nov.**, and a clade of *P. bulligera* and the sister species *P. pubipennis* and *P. memnon* **sp. nov.** A sister-group relationship between both groups is, however, unsupported.

The *P. natalensis* group comprises three species: *P. natalensis*, *P. curta*, and *P. pallida* **sp. nov.** They can be readily differentiated from the other *Phytomia* species by the scutum having the anterior third covered by a yellow to yellow-grey pilosity and pollinosity, strongly contrasting with the black posterior part (Figs 10–12), and hyaline wing (apart from some microtrichosity at the base of the wing) (Figs 50–52). The second abdominal tergum is largely yellow, with a posterior black fascia covering at most the posterior fourth of the segment (Figs 72–74). The male genitalia have surstyli resembling those of the *bullata* group with a slender medial protuberance on the inner margin (Figs 93–95). While the three morphospecies cluster together in the phylogenetic analysis, the monophyly of this morphospecies-group is not supported.

The *P. melas* group comprises two species: *P. poensis* and *P. melas*. The group takes a peculiar position. Male specimens are slightly deviant from males of other *Phytomia* species such as eyes touching for a short distance only, and dorsal ommatidia only moderately enlarged compared to the ventral ommatidia. In the NJ tree, the group clusters together with representatives of the genus *Simoides*. As mentioned in the introduction, both genera are closely related and unambiguous characters to fully separate both sexes of all species are absent. In generic keys, *Phytomia* and *Simoides* are differentiated mainly on the male character in being dichoptic in *Simoides* and holoptic in *Phytomia*. The rugose frontal area is prominent in *Phytomia* and bears short pilosity. In *Simoides* it is less conspicuous and sometimes only present as a small bare but smooth area just dorsal of the antennal insertion. In some cases, it is to a greater or lesser extent covered by longer setae. *Phytomia poensis* and *P. melas* appear to take a transition position between *Phytomia* and *Simoides*, but are grouped here under *Phytomia*.

The female holotype of *P. fronto* was studied through high resolution images sent by NRMS. The species shows a number of *Simoides* characteristics such as absence of a distinct rugose area but small (less than length of antenna) and smooth area, dorsal of antennal insertion; hind femur moderately swollen (about 1.5x as broad as tibia). The apical part of the wing, however, does not have any microtrichose coverage although this is also absent in some *Simoides* species. Therefore, we did not include this species in this *Phytomia* revision. It should be considered whether the genera *Phytomia* and *Simoides* should be treated as being synonymous. No decision is being made at this stage since the representatives of the genus *Simoides* were not studied in detail, as this genus is currently under revision by A. Ssymank and M. Morales (Ssymank pers. comm.). We prefer to await the outcome of this revision before proposing any taxonomic changes. Likewise, the phylogenetic analysis so far does not shed light on the phylogenetic relationships between *Phytomia* and *Simoides*. For clarity, we included a couplet in the identification key to show where *Simoides* should key out, compared to *Phytomia* species.

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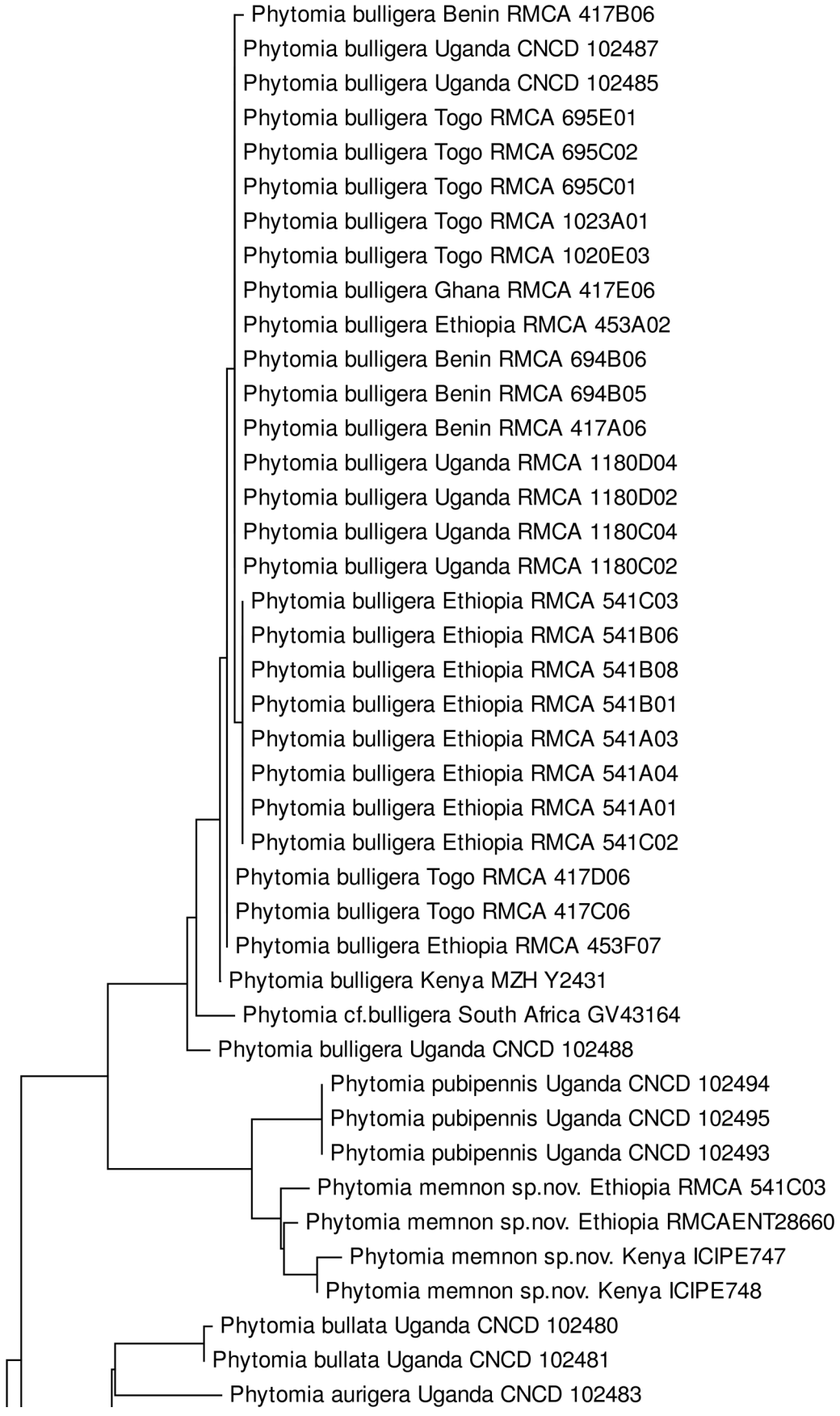
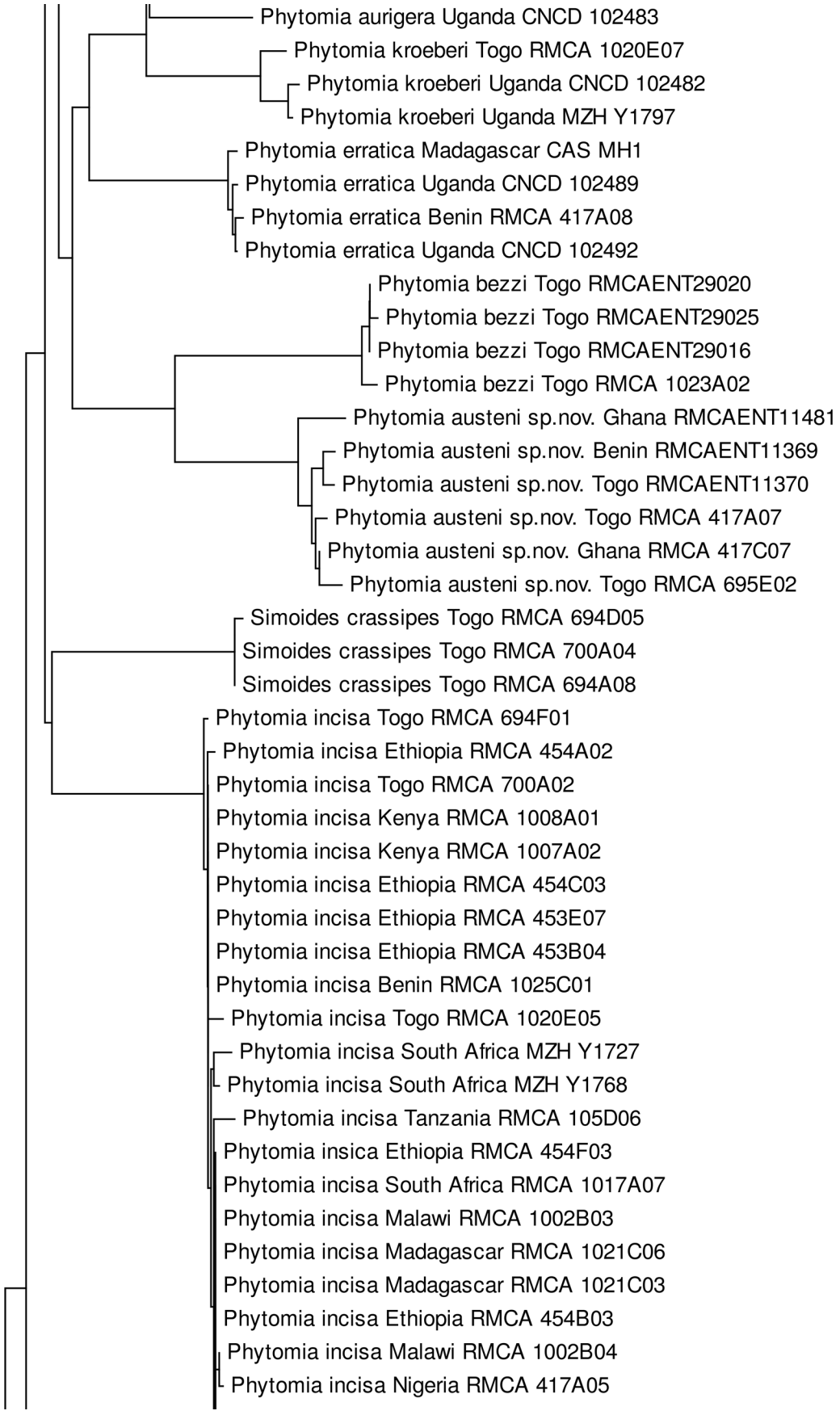
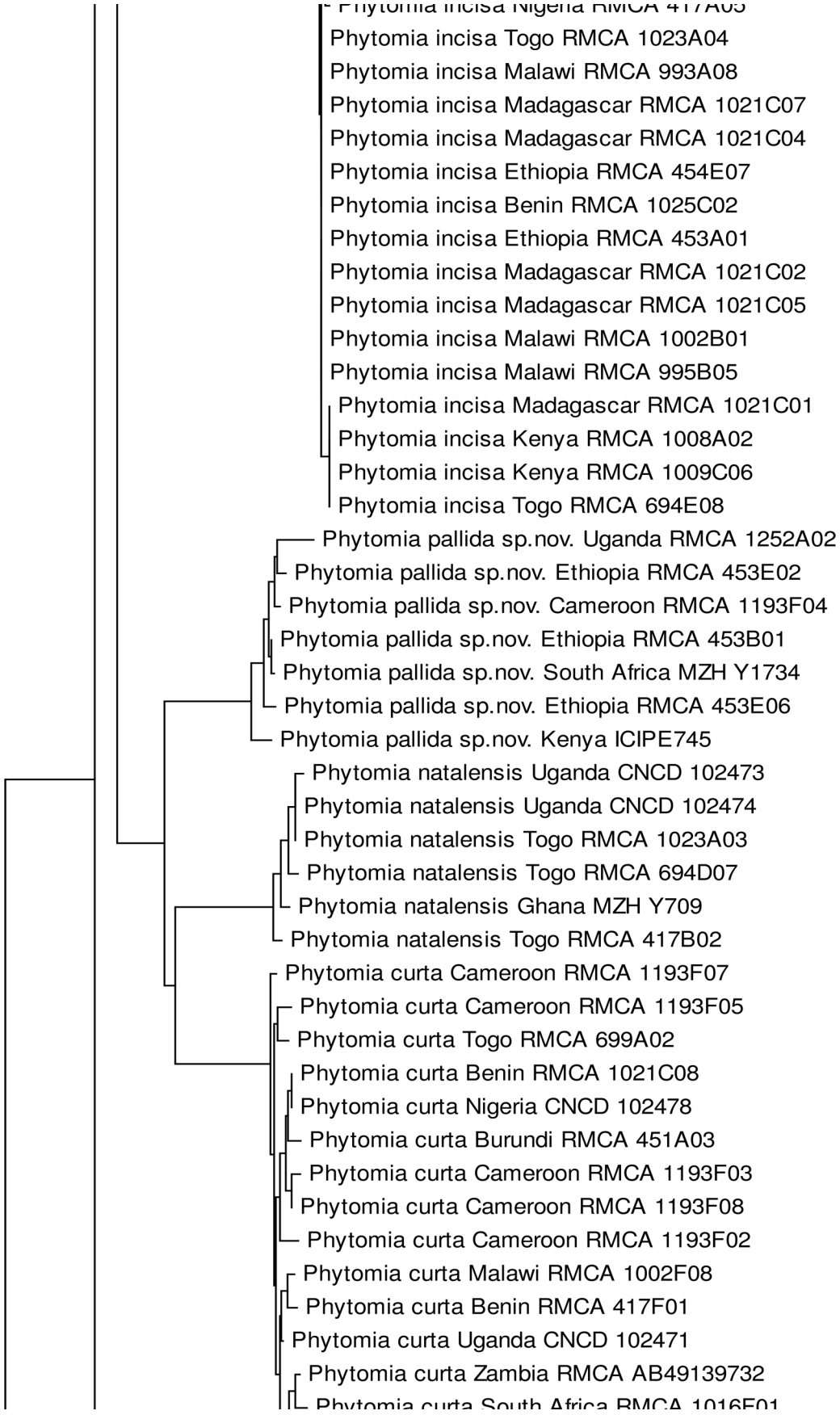


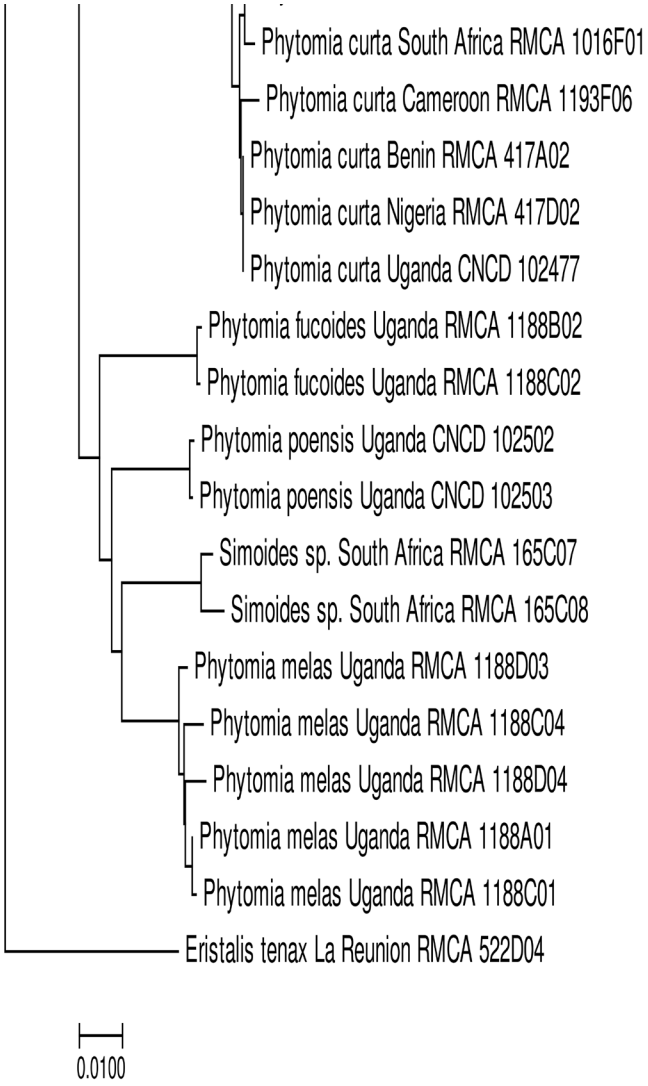
SUPPLEMENTARY FIGURE 1. Neighbour-Joining tree (K2P distances) of 134 DNA barcodes of 16 Afrotropical *Phytomia* species and five DNA barcodes of two *Simoides* species. *Eristalis tenax* was used as outgroup.



SUPPLEMENTARY FIGURE 2. Neighbour-Joining tree (K2P distances) of 134 DNA barcodes of 16 Afrotropical *Phytomia* species and five DNA barcodes of two *Simoides* species. *Eristalis tenax* was used as outgroup.



SUPPLEMENTARY FIGURE 3. Neighbour-Joining tree (K2P distances) of 134 DNA barcodes of 16 Afrotropical *Phytomia* species and five DNA barcodes of two *Simoides* species. *Eristalis tenax* was used as outgroup.



SUPPLEMENTARY FIGURE 4. Neighbour-Joining tree (K2P distances) of 134 DNA barcodes of 16 Afrotropical *Phytomia* species and five DNA barcodes of two *Simoides* species. *Eristalis tenax* was used as outgroup.