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Fishermyia stuckenbergi, a new genus and species of Afrotropical robber fly from Madagascar (Diptera: Asilidae: Stenopogoninae)

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ABSTRACT

A new robber fly genus, *Fishermyia* gen. n., is described to accommodate *F. stuckenbergi* sp. n., collected in the Andohahela National Park in southern Madagascar. A revised key to the genera of Afrotropical Stenopogoninae possessing setose anatergites is provided. A brief résumé of Madagascan Asilidae is presented, together with comments on the genera of Oriental Stenopogoninae, which support the contention that this new discovery is of considerable interest.

KEY WORDS: Asilidae, *Fishermyia*, robber flies, Afrotropical, Madagascar, identification key, new genus, new species.

INTRODUCTION

The Afrotropical stenopogonine Asilidae have received a great deal of attention over the past thirty years and are now known to be the dominant subfamily within the region (Geller-Grimm 2004). A key to the genera of this subfamily was published by Londt (1999), part of which was updated by Dikow and Londt (2000) to include a new genus. Genera are conveniently separated into two groups based on the presence or absence of setose anatergites. Those with setose anatergites are segregated into two groups on the basis of antennal morphology. Two genera — *Microstylum* Macquart, 1838, which is the dominant representative of the subfamily in Madagascar (about 30 species confirmed), and *Daspletis* Loew, 1858, a genus of eight species known only from southern Africa (Londt 2010) — have the antennal postpedicel (third segment) tipped with a simple pit enclosing a "seta-like sensory element" while the remaining six genera possess a distinct terminal style and have not until now been recorded from Madagascar. The only other possible representative of this large and diverse subfamily to have been recorded from Madagascar is a single species of *Oligopogon* Loew, 1847, a genus for which the taxonomic position within the subfamily remains debatable (Dikow 2009).

It was, therefore, of considerable interest when representatives of a stenopogonine genus with setose anatergites and also a well developed antennal style were recently isolated from collections made at two localities in the southern parts of Madagascar by a team of scientists led by Dr Michael Irwin. The material was Malaise trapped in ethanol before being extracted and mounted by Dr Eric Fisher who then alerted me to its existence. Believing the specimens possibly to represent an undescribed species of *Dogonia* Oldroyd, 1970, a genus I had fairly recently reviewed (Londt 2008), Dr Fisher kindly sent the specimens to me for study. Not only is this species new to science, but it represents an undescribed genus. This paper is devoted to the description of this interesting asilid and brief comments on its position within both the Afrotropical and Oriental faunas.

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The material is housed in the collections of the California Academy of Sciences (CAS) and KwaZulu-Natal Museum (NMSA).

TAXONOMY

Genus **Fishermyia** gen. n.

Etymology: This genus is named for my much esteemed colleague Eric Fisher, whose knowledge of the Asilidae is legendary. Not only did he sort through many thousands of Malaise-trapped insects from Madagascar, but he immediately recognised the interest and importance of the material described in this paper. Feminine gender.

Type species: *Fishermyia stuckenbergi* sp. n.

Diagnosis: Stenopogoninae with the following combination of characters: postpedicel more than 1.5× longer than scape and pedicel combined and bearing a distinct style made up of three elements, including a terminal "seta-like" element; mystacal setation confined to the ventral third of face; proepisternum fine setose (a few moderately developed setae are present, but these are never as strong as mesonotal macrosetae); scutellum with a single pair of apical macrosetae; postmetacoxal area entirely membranous and asetose; only abdominal T1 with a group of strong macrosetae dorsolaterally; ♂ terminalia fairly slender, never bulbous.

Key to genera of Afrotropical Stenopogoninae with setose anatergites (modified from Dikow & Londt (2000) to include *Fishermyia*; it however excludes *Oligopogon* because of uncertainty of its subfamilial assignment)

1 Postpedicel (= third antennal segment) tipped with a small apical pit enclosing a "seta-like" sensory element 8

– Postpedicel with a distinct terminal style made up of two or three elements (including a terminal "seta-like" element) 2

2 Occiput with obvious macrosetae 4

– Occiput lacking macrosetae (i.e., with weak setae only) 3

3 Face relatively broad (eye : face-width ratio <1.1 : 1.0); scape clearly longer than pedicel; hypandrium less than half as long as epandrial lobes (western southern Africa) .... **Dioctobroma** Hull, 1962

– Face relatively narrow (eye : face-width ratio >1.3 : 1.0); scape and pedicel about equal in length; hypandrium about as long as epandrial lobes (D.R. Congo) .... **Dogonia** Oldroyd, 1970

4 Proepisternum with a few strong macrosetae as well as fine setae; pronotal and mesonotal macrosetae very strong (flies have bristly appearance) (western southern Africa) .... **Anasillomos** Londt, 1983

– Proepisternum with fine setae (some may be moderately developed, but never as strong as mesonotal macrosetae); pronotal and mesonotal macrosetae moderately developed 5

5 Abdominal T1–4 with groups of strong macrosetae dorsolaterally; antennal style consisting of two elements (one small basal segment and a "seta-like" sensory element); ♂ genitalia bulbous; ♀ T7 and T8 of nearly equal length (western southern Africa) .... **Ontomyia** Dikow & Londt, 2000

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– Only abdominal T1 with groups of strong macrosetae dorsolaterally; antennal style consisting of three elements (two basal segments and a "seta-like" sensory element); ♂ genitalia slender, never bulbous; ♀ T8 distinctly shorter than T7 (♀ of *Fishermyia* unknown)...6

6 Facial swelling pronounced both in lower and upper regions (southern Africa)..... .... **Oratostylum** Ricardo, 1925

– Facial swelling weak, only lower margin moderately pronounced.......................7

7 Two or more pairs of apical scutellar macrosetae; mystax occupying almost entire face although sometimes weak in dorsal part; antennal postpedicel usually somewhat clavate, <1.5× longer than scape and pedicel combined (western southern Africa)... **Remotomyia** Londt, 1983

– A single pair of apical scutellar macrosetae; mystax occupying ventral third of face only, dorsal part asetose; antennal postpedicel elongate, spindle shaped, >1.5× longer than scape and pedicel combined (Madagascar)........... **Fishermyia** gen. n.

8 Facial swelling occupying approx. three-quarters of face and entirely covered with macrosetae and setae; presutural dorsocentral setae well developed; M_1 not strongly arched anteriorly; postmetacoxal membrane covered with long setae (southern Africa)... **Daspletis** Loew, 1858

– Facial swelling occupying at most half of face and often with macrosetae only on lower half; dorsocentral setae present only on posterior part of mesonotum; M_1 usually strongly arched anteriorly; postmetacoxal membrane usually asetose (widespread throughout the afrotropics)................ **Microstylum** Macquart, 1838

Fishermyia stuckenbergi sp. n.

Figs 1–7

Etymology: This species is named in honour of the late Brian Roy Stuckenberg, dipterist, museologist, mentor and friend, whose entomological field trips to Madagascar stimulated much interest in the island's insect fauna.

Description:

Male.

Head (Fig. 2): Dark red-brown, white and black setose, silver to dull grey pruinose. Antenna (Fig. 7): Dark red-brown, scape and pedicel white setose (pedicel may have a single black seta distolaterally); segmental ratios 1.0:1.0:3.3:0.5, scape and pedicel of similar length, postpedicel more than 3× length of scape, style half length of scape. Style with 3 elements, short basal ring-like segment and longish central segment tipped by spine-like sensory element. Face dark red-brown ventrolaterally, brown-orange centrally (colour considerably masked by pruinescence); mystax white, confined to ventral third of face; pruinescence strong silvery, covering face, except for ventrolateral parts; face:eye-width ratio (measured anteriorly at widest level of head) 1.0:1.7 (*i.e.*, face a little more than half width of one eye); in profile, face gently protuberant ventrally. Frons and vertex (including ocellar tubercle) dark red-brown, longish black setose, entirely dull grey pruinose. Occipital region dark red-brown, white setose, silvery pruinose; setae both well developed (along eye margins and posterior of ocellar tubercle) and thin and wavy (mainly ventrally). Palpus: 2-segmented, dark red-brown,

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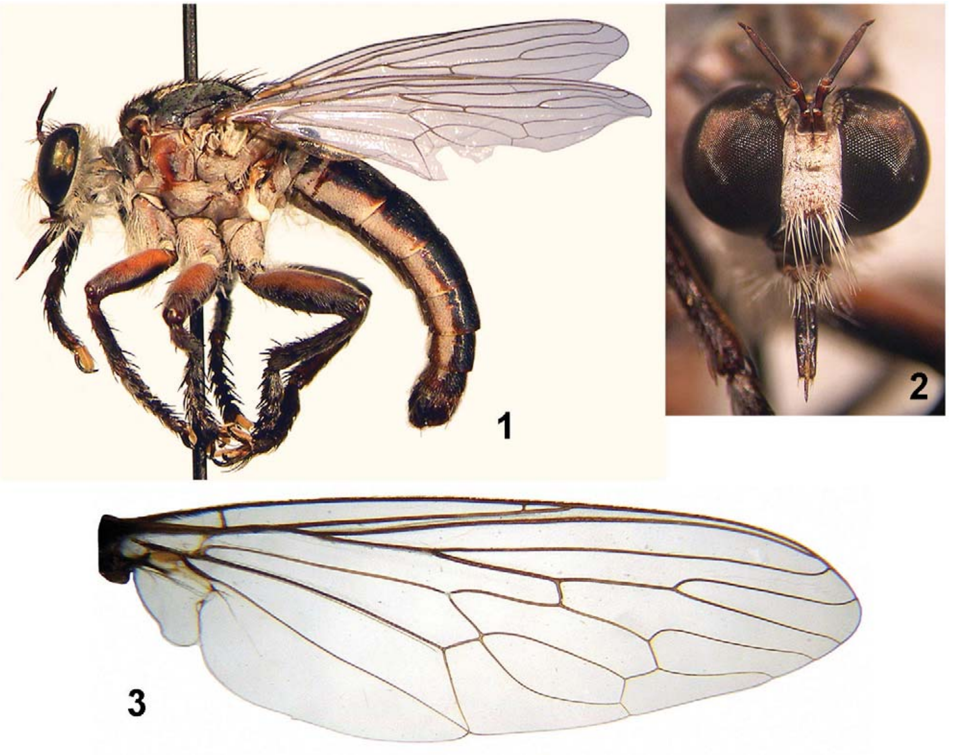

Figs 1–3. *Fishermyia stuckenbergi* sp. n., holotype ♂: (1) habitus, lateral aspect; (2) head, frontal aspect; (3) wing.

fairly longish white setose. Proboscis: dark red-brown, long, jutting out well beyond epistomal margin, fairly straight (slightly downwardly curved distally), white setose basoventrally.

Thorax: dark red-brown to black dorsally, mainly brown-orange laterally, black and white setose, strongly silver pruinose. Pronotum dark red-brown to black, white setose, antepronotum with row of moderately developed macrosetae, silver pruinose. Prosternum orange-brown asetose, silver pruinose. Mesonotum blackish, except for dark red-brown postpronotal lobes, short black setose (except for few white setae posterolaterally), strongly silver pruinose (except for pair of darkish longitudinal fasciae which appear more weakly pruinose, depending on angle of view); major macrosetae black, 2–3 postpronotals, 2 notopleurals, 1 supra-alar, 2 postalars, acrostichals undifferentiated, 3–5 pairs of dorsocentrals mostly posterior of transverse suture. Scutellum dark red-brown, weakly white setose anteriorly, a single pair of black apical macrosetae, silver pruinose. Pleura brown-orange, white setose, silver pruinose (except for small apruinose area joining anepisternum and katepisternum); setae generally fine, sparse, except for moderately developed katatergals. Mediotergite and anatergites orange-brown, silver pruinose; anatergites white setose posteriorly. Legs: Coxae orange-brown, longish white setose, silver pruinose. Trochanters red-brown, white setose, apruinose. Femora robust, dark red-brown, but broadly brown-orange dorsally, fine white setose, macrosetae shortish black. Tibiae red-brown, fine white setose, macrosetae black. Tarsi

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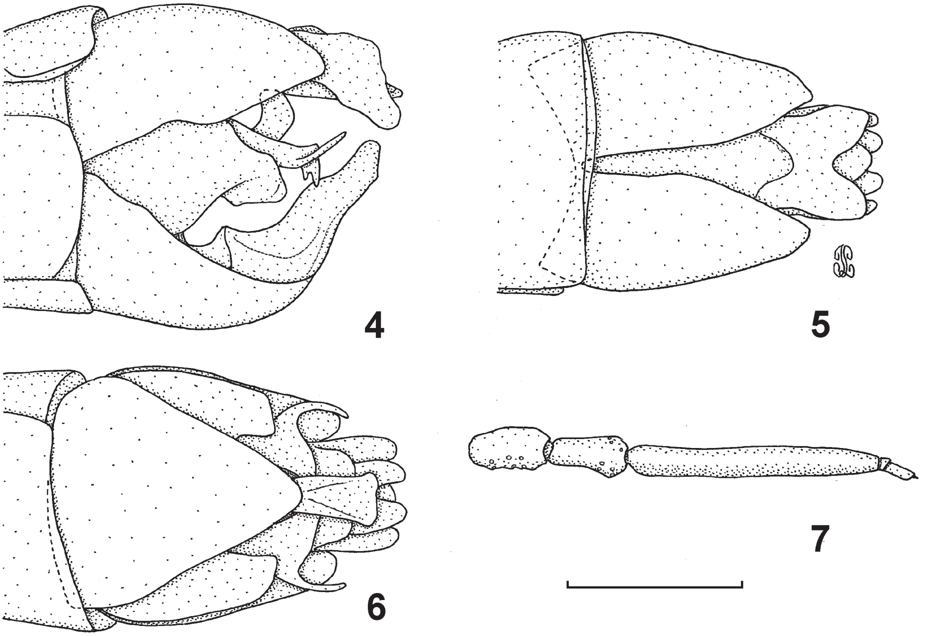

Figs 4–7. *Fishermyia stuckenbergi* sp. n.: (4–6) paratype male terminalia, lateral (4), dorsal (5), ventral (6); (7) antenna, lateral. Scale bar = 1 mm.

dark red-brown, fine white setose, macrosetae black. Claws robust, dark red-brown, but narrowly orange-brown proximally. Pulvilli pale cream. Empodia well-developed, orange. Wings (Fig. 3): 13.1×5.0 mm (paratype wing, removed and flattened), other specimens with wing lengths *ca* 9.5, 12.2 (holotype) and 12.3 mm (wings somewhat twisted). Membrane transparent, unstained and without microtrichia. Venational features: Costal cell sometimes with distal crossvein (in 2 specimens); all marginal cells open except for m_3 which is closed and stalked; veins CuA_2 and A_1 either narrowly separated or converging at wing margin (therefore cell m_3 open or closed). Haltere: Creamy white with pale brownish base.

Abdomen: Generally slightly broader than deep. Terga dark red-brown to black, lateral margins of T2–7 orange-brown, fine whitish setose; T1 with group of *ca* 5 pale yellowish macrosetae posterolaterally, entirely silver pruinose (weakly subapically). T2–7 lacking macrosetae, largely apruinose, except for strongly silver pruinose broad lateral margins. T8 largely obscured from view, uniformly dark red-brown. Sterna orange-brown, fine longish white setose, strongly silver pruinose, except for narrow apruinose lateral margins.

Terminalia (Figs 4–6, paratype): Rotated clockwise through 180°. S8 well developed, with broadly rounded hind margin. Epandrial lobes simple, in dorsal view (Fig. 5) deeply incised medially resulting in two lobes, weakly attached basally, in lateral view lobes projecting distally to fairly narrowly rounded tips. Proctiger well developed, cerci fused medially, projecting well beyond level achieved by epandrium. Gonocoxite well developed, outer lobe fairly broadly rounded distally and obscuring view of aedeagus; inner lobe complex in structure with prominent, laterally projecting, curved hook-like

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processes best seen in ventral view (Fig. 6) and medially directed downwardly pointing bifurcate tips best seen in lateral view (Fig. 4). Gonostylus, best viewed laterally (Fig. 4), moderately developed, laterally compressed, upwardly curved with rounded distal end. Hypandrium well developed; in ventral view (Fig. 6) broad proximally, tapering fairly rapidly to laterally compressed distal lobe terminating in an almost bilobed distal end.

Female. Unknown.

Holotype: 1♂ "MADAGASCAR: Tulear / Province, Andohahela Nat'l / Park, Ihazofotsy Parcelle 111 / 24°49.85'S, 46°32.17'E / 14 Feb–1 March 2004", "California Acad of Science / colls: M. Irwin, F. Parker, / R. Harin'Hala . elev 80m / Malaise trap – in dry spiny / forest, MA-02-21-47" (CAS).

Paratypes: 1♂ same data as holotype (CAS); 2♂ "MADAGASCAR: Tulear Prov. / Andohahela N.P., Tsimelahy, / Parc. 11; 6–16 Dec. 2002, 180m / 24°56.21'S, 46°37.60'E; CAS, / Irwin, Parker, Harin'Hala colls: / M.t., transit. For. MA-02-20-12" (CAS, NMSA).

Note: Type material is in good condition although mounted from alcohol, resulting in twisted wings.

Other material (not examined): MADAGASCAR: *Tulear Prov.*: 3♂ Andohahela National Park, Ihazofotsy Parcelle 111, 24°49.85'S 46°32.17'E, 80 m, 2–11.iv. 2004, M. Irwin, F. Parker, R. Harin'Hala, Malaise trap in dry spiny forest (CAS, MA-02-21-49).

Distribution, phenology and biology: Known from two localities in southern Madagascar (Fig. 8). Collected in December, February and April, it is assumed that this species is on the wing during summer. No biological information has been recorded, but see Discussion below.

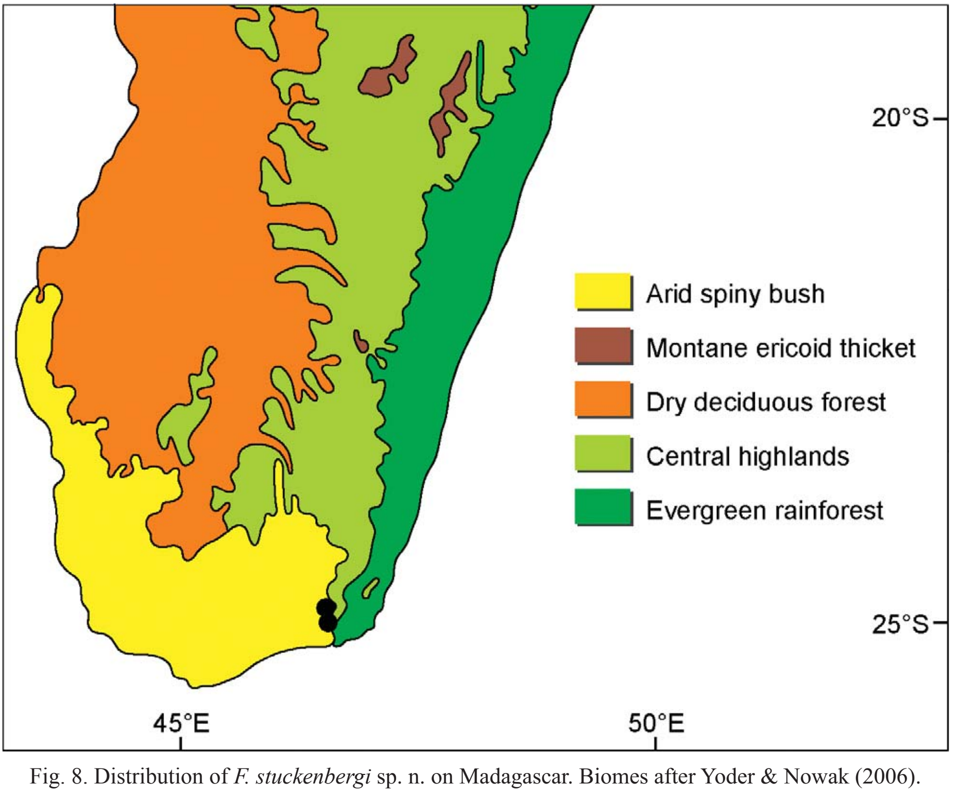

Fig. 8. Distribution of *F. stuckenbergi* sp. n. on Madagascar. Biomes after Yoder & Nowak (2006).

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DISCUSSION

A brief overview of the Madagascan asilid fauna within the context of the entire Afrotropical fauna is both appropriate and illuminating (Irwin *et al*. 2003). In some respects the asilid fauna of Madagascar has been better studied than that of the African mainland. There are currently 34 genera recorded for Madagascar (Table 1), eight of which are recorded only from the island (*Caroncoma*, *Cerdistus*, *Dichaetothyrea*, *Fishermyia*, *Katharma*, *Michotamia*, *Orthogonis* and *Schildia*) and not from elsewhere in the afrotropics. In addition there are two genera (*Lycoprosopa* and *Cophinopoda*) which are not known from the African mainland, but have been recorded from other Indian Ocean Islands within the afrotropics. Of the remaining 24 genera only three have species that have also been recorded from the African mainland (*Loewinella nigripes* Engel, 1929, *Storthyngomerus tridentatus* Fabricius, 1805 and *Clinopogon nicobarensis* Schiner, 1868); all their other species are Madagascan endemics. Of particular interest is the generic representation of subfamilies. While all the Afrotropical subfamilies are represented, some are far better represented than others. The Trigonomiminae is fully represented (*i.e*., 100 % representation) as both Afrotropical genera have been recorded on Madagascar. Three subfamilies (Dasypogoninae, Ommatiinae and Stichopogoninae) are well represented (67 % of genera), while others are relatively poorly represented, Leptogastrinae (50 %), Laphriinae (32 %), Asilinae (24 %). In stark contrast to the African mainland, the least represented subfamily is the Stenopogoninae (7 %). This is hardly surprising as members of this subfamily are adapted for oviposition directly into sand or soil and are therefore best represented in arid, sandy biomes which are relatively poorly represented in subtropical Madagascar which is, at least until fairly recently, dominated by forest biomes. The discovery of *Fishermyia* is therefore significant as it is only the second, or third genus (depending on where *Oligopogon* is placed), within the Stenopogoninae to be found in Madagascar. The other genera, *Microstylum* and *Oligopogon*, are far more widely distributed, *Microstylum* being a very large and almost cosmopolitan genus (Geller-Grimm 2004).

Because it is well known that the Madagascan fauna is a blend of both Afrotropical and Oriental elements, it is necessary to eliminate the possibility that the newly discovered species is a representative of an established Oriental genus. The writer is not an authority on Oriental Asilidae, and unfortunately the most recent Oriental Diptera Catalogue (*i.e*., Oldroyd 1975) is somewhat outdated and of limited value. The recent world catalogue of asilid genera published by Geller-Grimm (2004), however, allows a modern list of Oriental genera to be assembled. Only nine stenopogonine genera are listed for the region (*Ancylorhynchus* Berthold, 1827, *Connomyia* Londt, 1992, *Cyrtopogon* Loew, 1847, *Grypoctonus* Speiser, 1928, *Microstylum*, *Neoholopogon* Joseph & Parui, 1989, *Oldroydia* Hull, 1956, *Scylaticus* Loew, 1858 and *Stenopogon* Loew, 1847). As a student of Afrotropical Asilidae the author is well acquainted with five of these, *Ancylorhynchus*, *Connomyia*, *Microstylum*, *Scylaticus* and *Stenopogon*, as they are well represented in the afrotropics, and so can testify with certainty that the Madagascan species does not belong to any of these. The writer is also familiar with *Cyrtopogon*, having been instrumental in the transfer of species recorded for the afrotropics to *Afroholopogon* Londt, 1994 (Londt 1994) and is, therefore, certain that the Madagascan species described above does not belong to this genus. While not familiar with *Grypoctonus*, *Neoholopogon* and *Oldroydia*, having not examined

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TABLE 1
An overview of Madagascan Asilidae. This list is derived from an updated version of Oldroyd's (1980) catalogue.

Subfamily	No. Afrotropical genera (No. species)	Madagascan genera (No. Madagascan species, No. species of total Afrotropical fauna & Madagascan percentage of total fauna) + additional species confined to other Indian Ocean Islands (*) and species also found on continental Africa (**) **No. genera (% of Afrotropical fauna) / No. species (% of Afrotropical fauna)**
Apocleinae	20 (456)	*Lycoprosopa* Hull, 1962 (1 of 2, 50 %) + 1* *Promachus* Loew, 1849 (8 of 91, 9 %) **2 (10 %) / 9 (2 %)**
Asilinae	17 (96)	*Afromochtherus* Lehr, 1996 (1 of 14, 7 %) *Cerdistus* Loew, 1849 (1 of 1, 100 %) *Congomochtherus* Oldroyd, 1970 (1 of 8, 13 %) *Heligmonevra* Bigot, 1858 (13 of 24, 54 %) + 1* **4 (24 %) / 16 (17 %)**
Dasypogoninae	3 (54)	*Caroncoma* Londt, 1980 (1 of 1, 100 %) *Pegesimallus* Loew, 1858 (4 of 45, 9 %) **2 (67 %) / 5 (9 %)**
Laphriinae	31 (201)	*Dichaetothyrea* De Meijere, 1914 (1 of 1, 100 %) *Hyperechia* Schiner, 1866 (2 of 14, 14 %) *Katharma* Oldroyd, 1960 (2 of 2, 100 %) *Laphria* Meigen, 1803 (5 of 44, 11 %) + 4* *Loewinella* Hermann, 1912 (1 of 6, 17 %) + 1** *Notiolaphria* Londt, 1977 (1 of 2, 50 %) *Orthogonis* Hermann, 1914 (1 of 1, 100 %) *Proagonistes* Loew, 1857 (2 of 21, 10 %) *Smeryngolaphria* Hermann, 1912 (1 of 3, 33 %) *Storthyngomerus* Hermann, 1919 (1 of 5, 20 %) + 1** **10 (32 %) / 17 (9 %)**
Leptogastrinae	6 (154)	*Euscelidia* Westwood, 1850 (1 of 55, 2 %) *Leptogaster* Meigen, 1803 (34 of 74, 46 %) *Schildia* Aldrich, 1923 (1 of 1, 100 %) **3 (50 %) / 36 (23 %)**
Ommatiinae	9 (130)	*Afroestricus* Scarbrough, 2005 (1 of 20, 5 %) *Cophinopoda* Hull, 1958 (1 of 5, 20 %) + 4* *Emphysomera* Schiner, 1866 (1 of 4, 25 %) *Michotamia* Macquart, 1838 (1 of 1, 100 %) *Ommatius* Wiedemann, 1821 (28 of 69, 41 %) + 3* *Pygommatius* Scarbrough & Marascia, 2003 (1 of 25, 4 %) **6 (67 %) / 33 (25 %)**
Stenopogoninae	45 (419)	*Fishermyia* **gen. n.** (1 of 1, 100 %) *Microstylum* Macquart, 1838 (28 of 79, 35 %) + 2* *Oligopogon* Loew, 1849 (1 of 10, 10 %) **3 (7 %) / 30 (7 %)**
Stichopogoninae	3 (20)	*Clinopogon* Bezzi, 1910 (1 of 2, 50 %) + 1** *Stichopogon* Loew, 1847 (2 of 15, 13 %) **2 (67 %) / 3 (15 %)**
Trigonomiminae	2 (61)	*Damalis* Fabricius, 1804 (5 of 35, 14 %) *Rhipidocephala* Hermann, 1926 (1 of 26, 4 %) **2 (100 %) / 6 (10 %)**

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representatives of these genera, his interpretation of Hull's (1962) world generic study and more recent publications by Joseph and Parui (1989, 1999) and Parui *et al.* (1999), where representatives of these genera are described, illustrated and discussed, strongly suggests that this new Madagascan species cannot be assigned to any of these genera. It seems certain, therefore, that *Fishermyia* is indeed a new Madagascan endemic.

Having been Malaise-trapped, little is known regarding the biology of *Fishermyia stuckenbergi.* Both localities are within the Andohahela National Park. The habitats are described as "transit. For." (*i.e.*, transitional forest) and "dry spiny forest", which suggests that the habitat is of a more open woodland type. The fact that all the collected specimens are males may be significant. In the writer's experience, Asilidae are not usually adequately sampled using flight traps, and when reasonable numbers are found in traps, samples are often dominated my male specimens (*e.g*., *Ancylorhynchus*, see Londt 2011). This suggests that the males of some species have flight characteristics that differ from those of their female counterparts. Insects that have fairly sustained flying behaviour, similar to many Hymenoptera, appear to be far more prone to being collected in Malaise traps. It is, therefore, likely that the males of *F. stuckenbergi* fly in a more sustained manner than their female counterparts.

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Dr Eric Fisher is thanked for bringing my attention to this interesting species and for his meticulous handling of the material and for sending most of it to me for study. Mrs Heidi Snyman (Ezemvelo KZN Wildlife) is thanked for generating the distribution map. Both the National Research Foundation and the University of KwaZulu-Natal allocated funding in support of my research, while the KwaZulu-Natal Museum provided laboratory facilities and library services. I would like to thank E. Fisher, A. Scarbrough and T. Dikow for their valuable comments. Finally my wife Ann is thanked for her generous support as I continue to actively pursue my research in retirement.

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