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A new species of *Dolichophorus* Lichtwardt, 1902 (Diptera: Dolichopodidae) from Madagascar with a key to Afrotropical species

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Abstract. A new species of long-legged flies, *Dolichophorus manukyani* **sp. n.** from the Republic of Madagascar, is described and illustrated. The species is related to *D. friedmani* Grichanov, 2009 and *D. madagascariensis* Grichanov, 2009, differing in smaller size, brown postpedicel of antenna, male fore coxa without apical hook, fore basitarsus without apical process, wing and hypopygium structures. The following new combination is established: *Dolichophorus hamatus* (Parent, 1936), **comb. n.** (from *Medetera* Fischer von Waldheim, 1819). A key to five Afrotropical species of this genus is compiled.

Key words: Medeterinae, new taxon, new combination, tropical moist broadleaf forest.

Новый вид *Dolichophorus* Lichtwardt, 1902 (Diptera: Dolichopodidae) с Мадагаскара с определителем афротропических видов

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Резюме. Даны описание и иллюстрации нового вида мух-зеленушек, *Dolichophorus manukyani* **sp. n.**, из Республики Мадагаскар. Вид близок к *D. friedmani* Grichanov, 2009 и *D. madagascariensis* Grichanov, 2009, от которых отличается меньшими размерами, коричневым третьим члеником усика, отсутствием апикального крючка на переднем тазике самца и апикального отростка на первом членике передней лапки, строением крыла и гипопигия. Установлена новая комбинация: *Dolichophorus hamatus* (Parent, 1936), **comb. n.** (из *Medetera* Fischer von Waldheim, 1819). Составлена определительная таблица для пяти афротропических видов этого рода.

Ключевые слова: Medeterinae, новый таксон, новая комбинация, тропический влажный широколиственный лес.

Introduction

The medeterine genus *Dolichophorus* Lichtwardt, 1902 was considered a sister taxon of the *Medetera aberrans* (or *Saccopheronta* Becker, 1914) and *Medetera melanesiana* (or *Demetera* Grichanov, 2011) species groups [Bickel, 1987]. It was known from three Palaearctic and three Afrotropical species, and supposedly from Orient [Grichanov, 2009]. The last author compiled a key to all known species including two from Madagascar. A new species described here was collected from the same locality on Madagascar, as the other species; it was overlooked during the last revision, as its males had practically simple tarsi.

This paper aims to describe and illustrate a new *Dolichophorus* species from the Analamazaotra Forest, a protected area in Analamazaotra National Park in the Alaotra-Mangoro region of east-central Madagascar, to study the types of *Medetera hamata* Parent, 1936 collected from the Democratic Republic of the Congo, a possible member of this genus, and to provide a key to Afrotropical species of *Dolichophorus*.

Material and methods

The holotype and paratypes of the new species will be deposited in the Steinhardt Museum of Natural History, School of Zoology, Tel Aviv University (SMNHTAU, Israel). The other material is deposited in the Royal Belgian Institute of Natural Sciences (RBINS, Brussels, Belgium). Specimens were studied and photographed using a ZEISS Discovery.V12 modular stereo microscope and an AxioCam MRc5 camera. The preparation of the male genitalia was photographed with a ZEISS Axiostar stereo microscope and an AxioCam ICc3 camera. Morphological terminology and abbreviations follow Cumming and Wood [2017] and Grichanov and Brooks [2017]. The lengths of the antennomeres and podomeres are given in millimetres. Body length is measured from the base of the antenna to the tip of the abdominal segment 6. Wing length is measured from the base to the wing apex. Antenna length is measured from the base of the scape to tip of the arista-like stylus. The figures showing the hypopygium in lateral view are oriented as it appears on the intact specimens, with the morphologically ventral surface of the genitalia facing upwards, dorsal surface downwards.

Genus *Dolichophorus* Lichtwardt, 1902

Dolichophorus Lichtwardt, 1902: 199 (type species *Dolichophorus kerteszi* Lichtwardt, 1902 (monotypy)).

Note. See Grichanov [2009] for diagnosis of the genus and discussion, Grichanov [2018] for the list of Afrotropical species and synonymy.

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Key to Afrotropical *Dolichophorus* species

1. Antenna entirely black; hind femur at least partly black 2
– At least scape and pedicel yellow; femora entirely yellow 3
2. Legs entirely black; male fore tarsomeres slightly thickened, without processes; body length 1.75 mm (DR Congo) ..... *D. hamatus* (Parent, 1936)
– Legs mostly yellow; hind femur partly black; male fore tarsomeres 1 and 3 each with apical process; body length 2 mm (DR Congo, Gabon, Ivory Coast, Sierra Leone, Tanzania) ..... *D. luteoscutatus* (Parent, 1936)
3. Antenna with postpedicel brown; male fore basitarsus without apical process; body length 1.6 mm (Madagascar) ..... *D. manukyani* **sp. n.**
– Antenna with postpedicel yellow; male fore basitarsus with apical process 4
4. Hind femur without anterior seta; male fore basitarsus with short pointed apical process, about half as long as next segment; body length 2.9 mm (Madagascar) .... *D. friedmani* Grichanov, 2009
– Hind femur with anterior seta at middle; male fore basitarsus with long bandlike apical process, 1.5 times as long as next segment; body length 2.6 mm (Madagascar) .... *D. madagascariensis* Grichanov, 2009

Dolichophorus manukyani Grichanov, **sp. n.**
(Figs 1–8)

Material. Holotype, ♂ (SMNHTAU): Madagascar, Andasibe, 950 m, Analamazaotra Forest, 18°46′S / 48°24′E, 31.10–4.11.2007 (A. Freidberg). Paratypes: 2♂ (SMNHTAU), same data as for the holotype.

Diagnosis. The described here species is related to *D. friedmani* and *D. madagascariensis*, differing in smaller size, brown postpedicel of antenna, male fore coxa without apical hook, fore basitarsus without apical process, wing with rounded apex, and hypopygium (Fig. 8) with only simple and short branched setae on surstylus. *Dolichophorus friedmani* and *D. madagascariensis* males are larger, with entirely yellow antenna, fore coxa with apical hook, fore basitarsus bearing apical process, wing with angular apex, and hypopygium [Grichanov, 2009: figs 14–15] with a large penniform apical seta.

Description. Male (Fig. 1). Length (mm): body 1.6, antenna 0.7, wing 1.8/0.6. Head (Fig. 2): vertex, frons and face dark metallic bluish-black, grey pollinose; vertical bristle black, strong and long, positioned on anterior slope of head; short light postvertical seta as a linear continuation of postocular setal row; eyes with tiny hairs between facets; face under antenna 1.3 times as wide as postpedicel height, narrowing towards clypeus; clypeus very small, as wide as high, narrower than postpedicel height; palpus black, grey pollinose, pale haired, with strong black apical seta; proboscis brown, small; single row of strong dirty white simple postoculars decreasing in size upward; antenna (Fig. 3) distinctly longer than head height, scape and pedicel reddish-yellow; pedicel globular, with ring of apical setulae; postpedicel brown, as large as pedicel, short pubescent; stylus apical, black, long, short haired, with segment 1 very short; length (mm) of scape, pedicel, postpedicel, arista-like stylus (aristomeres 1 and 2), 0.04 : 0.05 : 0.06 : 0.05 : 0.57.

Thorax: with mostly white setae, metallic bluish-black, brown on humeri and underside of scutellum; posterior third of mesonotum distinctly concave; anterior half of mesonotum densely haired, 1 humeral, 1 posthumeral, 1 sutural, 1 long and 1 short notopleurals, 1 supraalar, 1 postalar setae; well developed acrostichals decreasing in length anteriorly in two regular rows gradually diverging posteriorly; 6–7 pairs of dorsocentrals greatly decreasing in length anteriorly, with posterior 2 pairs rather strong; 2 pairs of scutellars with lateral setae about 1/3 length of median setae; 1 yellow proepisternal seta just above fore coxa.

Legs including coxa yellow, with pale setae and setulae, tarsomere 5 brown; fore and mid coxae with simple white anterior cilia; fore coxa with 3–4 simple apical bristles including 1 that somewhat longer, 1/3 as long as coxa; hind coxa with 1 strong yellow lateral bristle just above mid length; fore femur (Fig. 4) simple, with ventral and posterior rows of white erect setae, longer at middle, about as long as width of femur; fore tibia narrow in basal 1/3, swollen distally, with ventral row of white erect setae in middle 1/3, about as long as width of tibia; fore tarsus slightly thickened, with ventral rows of short white erect cilia; mid femur with ventral row of short white setae, half as long as width of femur; mid tibia with 1 pale anterodorsal bristle at basal 1/3, with very short apicals; tarsomeres 1–4 with short apicals; hind femur (Figs 5, 6) with anterior, anteroventral and posteroventral rows of white erect setae, about as long as width of femur, with few dorsal setae at base; hind tibia with elongate setulae, without distinct setae, with short light apicals; basitarsus short, with 2 apicals and small posterior apical scale of setulae; tarsomeres 2–4 with short apicals; femur, tibia and tarsomere (from first to fifth) length (mm): fore leg: 0.57 : 0.43 : 0.24 : 0.09 : 0.07 : 0.06 : 0.07, mid leg: 0.57 : 0.52 : 0.27 : 0.13 : 0.09 : 0.08 : 0.07, hind leg: 0.58 : 0.71 : 0.11 : 0.23 : 0.16 : 0.07 : 0.08.

Wing (Fig. 7): hyaline, with yellow-brownish veins and rounded apex; R_{2+3} and R_{4+5} diverging to wing apex; R_{4+5} and M_{1+2} weakly convex anteriorly, gradually converging, subparallel at wing apex; M_{1+2} joining costa at wing apex; lengths of costa between R_{2+3} and R_{4+5} and between R_{4+5} and M_{1+2} (in mm), 0.31 : 0.06; crossvein dm-m almost straight, forming right angle with M_4 and with M_{1+2} longitudinal veins, half as long as maximum distance between R_{4+5} and M_{1+2} veins; length of dm-m versus apical part of M_4, 0.09 : 0.25; anal vein fold-like; narrow anal lobe present; alula absent; lower calypter brownish, with brownish setae; halter light yellow.

Abdomen: metallic, brown-black, with light cilia and dark setae along tergal margins; tergum 1 with long light setae laterally; segment 7 moderately long, black, with short setae; segment 8 large, black, setose; epandrium (Fig. 8) brown-black, surstylus, cercus and hypandrium entirely yellow; epandrium 1.4 times as long as high; hypandrium fused with epandrium, midventral, with distodorsal tooth; lateral lobes of phallosoma symmetrical, almost straight; phallus thick; epandrial lobe reduced to 2 long pedunculate setae; small epadrial seta at base of hypandrium; cercus small, suboval, with short dorsal setae and 2 long distodorsal setae; thin membrane connecting cerci; surstylus with strongly developed dorsal arm, about as long as epandrium, cleft apically, with simple and short branched setae, with distodorsal process bearing 1 long and 3 short setae at apex.

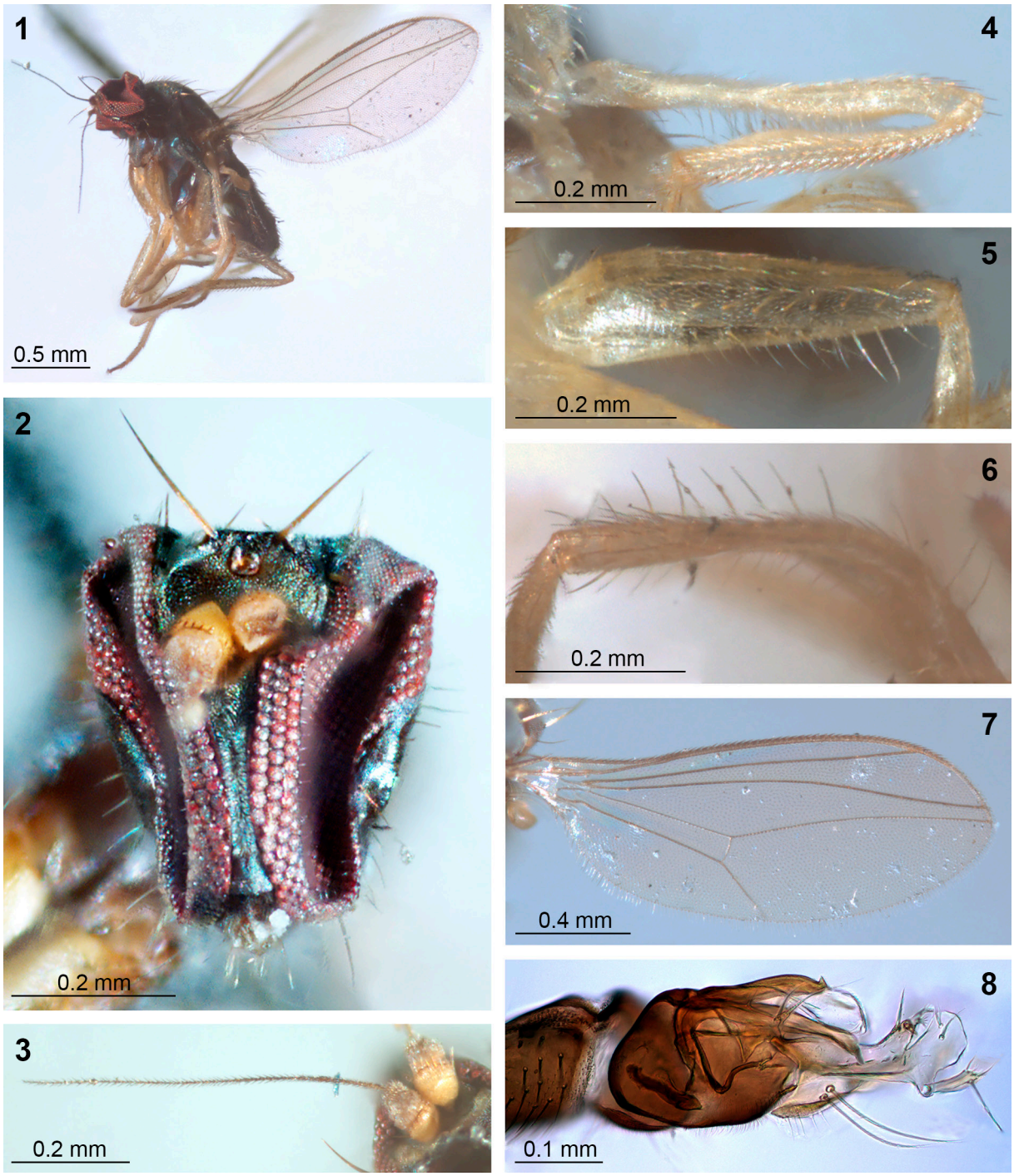
Female unknown.

Distribution. Madagascar.

Etymology. The name of the new species is dedicated to the Russian entomologist, Senior Research Scientist Dr Andranik R. Manukyan (Kaliningrad Amber Museum, Russia).

Dolichophorus hamatus (Parent, 1936), **comb. n.**
(Figs 9–15)

Medetera hamata Parent, 1936: 11 (type locality: "Congo Belge: Eala" (= Mbandaka, Équateur Province, Democratic Republic of the Congo).



Figs 1–8. *Dolichophorus manukyani* **sp. n.**, male, paratype, general view and details of structure.

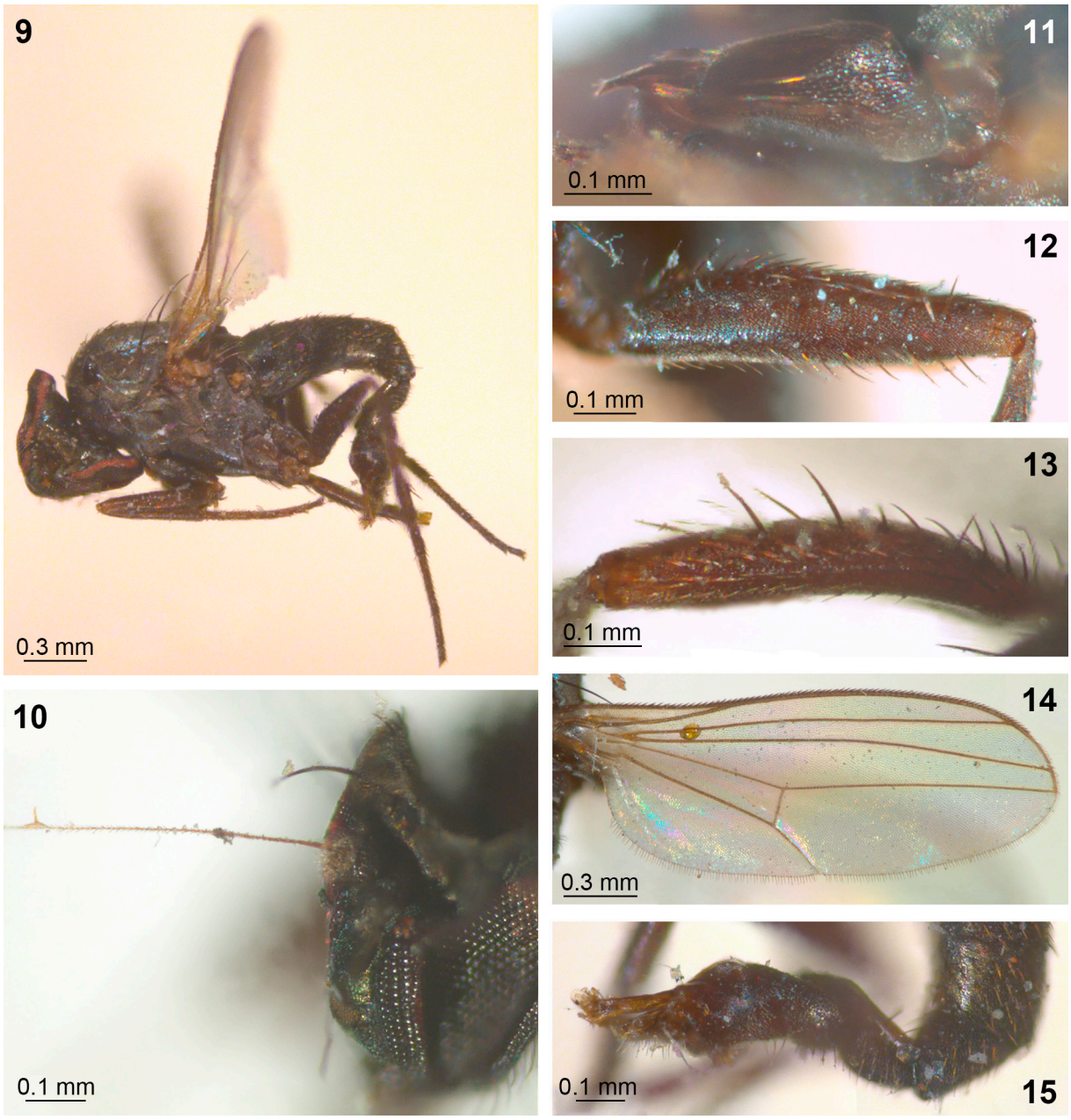
1 – habitus, lateral view; 2 – head, anterior view; 3 – left antenna, outer view; 4 – fore femur (somewhat squeezed) and tibia, anterior view; 5–6 – hind femur: 5 – anterior view, 6 – dorsal view; 7 – left wing, anterior view; 8 – hypopygium after maceration, right lateral view.

Рис. 1–8. *Dolichophorus manukyani* **sp. n.**, самец, паратип, общий вид и детали строения.

1 – внешний вид, сбоку; 2 – голова, спереди; 3 – левый усик, снаружи; 4 – переднее бедро (немного сдавлено) и голень, спереди; 5–6 – заднее бедро: 5 – спереди, 6 – сверху; 7 – левое крыло, спереди; 8 – гипопигий после размачивания, сбоку.

Material. 1♂, holotype (RBINS), "Congo Belge: Eala, 08.1935 (J. Ghesquière) R. Mus. Hist. Nat. Belg. I.G. 10.482 *Medetera hamata* n.sp. Type. O. Parent det., 1935 Type" (red label); 2♂, 1♀, paratypes (RBINS), same data as for the holotype, with additional red label "paratype".

Diagnosis. Male (Fig. 9). Body colouration metallic black, with only thin dusting of pruinosity. Head (Fig. 10): face and clypeus broad, metallic, greenish black, with weak pruinosity; clypeus as wide as high, 1.3 times wider than postpedicel height; proboscis relatively small; fore coxa (Fig. 11) with strong black anteroapical spine of several cilia in both sexes; hind femur (Figs 12, 13) with



Figs 9–15. *Dolichophorus hamatus*, male, holotype, general view and details of structure.

9 – habitus, lateral view; 10 – head, anterior-lateral view; 11 – left coxa, lateral view; 12–13 – hind femur: 12 – anterior view, 13 – dorsal view; 14 – left wing, anterior view; 15 – hypopygium, left lateral view.

Рис. 9–15. *Dolichophorus hamatus*, самец, голотип, общий вид и детали строения.

9 – внешний вид, сбоку; 10 – голова, спереди – сбоку; 11 – левый тазик, сбоку; 12–13 – заднее бедро: 12 – спереди, 13 – сверху; 14 – левое крыло, спереди; 15 – гипопигий, сбоку, левая сторона.

2–3 strong anterior bristles right behind middle in addition to elongate dorsal (at base) and anteroventral (at apex) setae; tibiae, mid and hind tarsi with rather short apicals; male fore tarsomeres slightly thickened from apex of basitarsus to tarsomere 4, without apical setae or processes; wing (Fig. 14) with M_{1+2} weakly arched anteriorly, almost subparallel to R_{4+5}; hypopygium (Fig. 15) is present in holotype only (not dissected), irregularly ovoid, elongate, with midventral swelling; hypandrium arising from approximately halfway along ventral margin, not extending distally beyond the position of surstylus; surstylus with strongly developed ventral arm and much thinner dorsal arm; ventral arm of surstylus bearing rather large leaflike apical lobe; male cercus without modified setae, but with 2 long apical and apicoventral thin processes.

Notes. The diagnosis [Grichanov, 1999] and picture of male genitalia [Grichanov, 2000: 413, fig. 11] provided for the *Medetera hamata* are incorrect; they were based mainly on additional material cited by Grichanov [1999], rather than on the type material, and may belong to an undescribed

species of *Medetera*. I re-examined the types received from RBINS and found characters (partly cited by Parent [1936]) that place the species in the genus *Dolichophorus* (as diagnosed by Grichanov [2009]). *Dolichophorus hamatus* is close in habitus to *D. luteoscutatus*, differing from the latter in entirely black legs, male fore tarsomeres without processes, in surstylus and cercus structure. *Dolichophorus luteoscutatus* males and females have mostly yellow legs, with partly black hind femur and usually mid femur, male fore tarsomeres 1 and 3 each with apical process (see also illustrations in Couturier [1986: figs 1–4] and Grichanov [1997: fig. 9]).

Distribution. Democratic Republic of the Congo.

Conclusion

As a result of the present study, a new species *Dolichophorus manukyani* **sp. n.** from Madagascar is described and illustrated. *Medetera hamata* is recombined with the genus *Dolichophorus*. Now five Afrotropical and three Palaearctic species are known. The new species is remarkable in absence of apical spine or hook on the male fore coxa and having distinctly modified male fore tibia. Nevertheless, the general morphology of its male hypopygium is the same as in other Madagascan species. *Dolichophorus manukyani* **sp. n.** along with *D. hamatus* and the Chinese *D. immaculatus* Parent, 1944 males are unusual in having slightly thickened fore tarsus, without distinct spines or processes. Generally, the modifications and armaments of the fore leg are rather rare in the tribe Medeterinae (e.g. Bickel [1987]). Only males of all species of the Pantropical genus *Saccopheronta* have tarsomeres 2 and 3 of fore leg thickened or enlarged and flattened (e.g. Grichanov and Brooks [2017]), but they have peculiar hypopygium with cylindrical epandrium and distoventral position of hypandrium. According to labels under the published material, Afrotropical species of *Dolichophorus* inhabit the tropical moist broadleaf forests. Little is known on their microhabitats and biology. Both *D. hamatus* and *D. luteoscutatus* were collected in lowland evergreen swamp and primary forests of DR Congo [Kirk-Spriggs, 2010; Grichanov et al., 2011]. The Madagascan species were also collected in rainforest, but at height 950 m above sea level.

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