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Two new species of *Mascaromyia* Bickel, 1994 (Diptera: Dolichopodidae) from Mauritius Island

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Abstract. The material from Mauritius has been examined in the collection of the Natal Museum (Pietermaritzburg, KwaZulu-Natal, South Africa). Descriptions of *Mascaromyia courtoisi* Grichanov, **sp. n.** and *Mascaromyia rochati* Grichanov, **sp. n.** are provided. New species differ from other representatives of the genus in morphology of male genitalia and secondary sexual characters. Presently 31 species of *Mascaromyia* are known from western Indian Ocean islands, including 15 species from Mauritius. An identification key to males of known there species is firstly provided.

Key words: Sciapodinae, *Mascaromyia*, Mauritius, Afrotropical, new species.

Два новых вида *Mascaromyia* Bickel, 1994 (Diptera: Dolichopodidae) с острова Маврикий

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Резюме. Изучен материал с Маврикия из коллекции музея Наталь (Питермаритцбург, Квазулу-Натал, ЮАР). Приведены описания *Mascaromyia courtoisi* Grichanov, **sp. n.** и *Mascaromyia rochati* Grichanov, **sp. n.** Новые виды отличаются от других представителей рода морфологией гениталий и вторичных половых признаков самцов. В настоящее время известен 31 вид *Mascaromyia* с островов западного сектора Индийского океана, в том числе 15 видов с Маврикия. Впервые составлен ключ для идентификации самцов известных на острове видов.

Ключевые слова: Sciapodinae, *Mascaromyia*, Маврикий, Тропическая Африка, новые виды.

At present, the dolichopodid fauna of Mauritius comprises two species distributed widely in the Afrotropics and Western Orient, i.e. *Chaetogonopteron nectarophagum* (Curran, 1924) and *Chrysosoma snelli* Curran, 1927, two Mascarene species *Bickelia parallela* (Macquart, 1842) and *Mascaromyia leptogaster* (Thomson, 1869), and 15 species endemic to the Island, i.e., 13 species of *Mascaromyia* Bickel, 1994, *Telmaturgus triseta* (Grichanov, 2008) and *Sympycnus antiquus* Parent, 1935 [Grichanov, 2018].

The sciapodine genus *Mascaromyia* is an endemic of the western Indian Ocean islands, originated probably from the closely related *Bickelia* Grichanov, 1996, and *Sciapus constrictans* species group of *Sciapus* Zeller, 1842 [Grichanov, Negrobov, 2014]. Only *M. leptogaster* is widely distributed, and found on Mauritius, Réunion, Seychelles and Chagos Archipelago. The other *Mascaromyia* species are all endemic to individual islands. The fauna of Mauritius comprises 14 endemic species; Réunion numbers 10, and Seychelles (Mahé, Praslin, Silhouette) 5 species; only one species has been described from Rodriguez [Grichanov, 2018].

Most *Mascaromyia* species have been described and keyed by Grichanov [1996, 2003, 2017]. In this paper two new species of the genus from Mauritius are described, and an identification key to males of the 12 known there species is provided for the first time.

Material and methods

The paper is based on material I found in the collections of the Natal Museum (NMSA, Pietermaritzburg, KwaZulu-

Natal, South Africa). Deposition of types of the new species is mentioned under the new names.

Specimens have been studied and photographed with a ZEISS SteREO Discovery.V12 modular stereo microscope and an AxioCam MRc5 camera. Morphological terminology and abbreviations follow Cumming and Wood [2017] and Grichanov and Brooks [2017]. The lengths of the podomeres are given in millimetres. Body length is measured from the base of the antenna to the tip of abdominal segment 6. Wing length is measured from the base to the wing apex. The figures showing the hypopygium in lateral view are oriented as it appears on the intact specimen, with the morphologically ventral surface of the genitalia facing upwards, dorsal surface downwards, anterior end facing right and posterior end facing left.

Genus *Mascaromyia* Bickel, 1994

Diagnosis. See Bickel [1994], Grichanov [2017] and Grichanov and Brooks [2017] for diagnosis of the genus. An adaptive radiation of the generic group on the Mascarene islands is briefly discussed by Grichanov [2017]. Thirty one species of *Mascaromyia* are known from western Indian Ocean islands, including three species known only by females. The body length of flies occurring on the Island is 3 to 5 mm. Females of close species are practically indistinguishable.

Key to *Mascaromyia* species from Mauritius (males)

1. Thoracic pleura entirely yellow; lateral margins of mesonotum and basal segments of abdomen yellow-

- brownish (female of *M. rufiventris* (Macquart, 1842) belongs to this group) 2
- Thorax and abdomen metallic; at most metapleuron and first two abdominal segments partly yellow (females of *M. desjardinsi* (Macquart, 1842) and *M. mauritiensis* (Parent, 1939) belong to this group) 4
2. Vein M_2 and apical part of M_4 absent without fold or indication on membrane *M. bickeli* Grichanov, 1996
- Wing venation undistorted 3
3. Hind leg yellow; fore basitarsus shorter than fore tibia ...
..... *M. babichae* Grichanov, 1996
- Hind leg mostly brown; hind tibia white in basal 1/3; fore basitarsus 1.3 times as long as fore tibia
..... *M. makhotkini* Grichanov, 1996
4. Fore femur with ventral row of mainly black fine bristles decreasing in length distally, with basal bristle yellow-brown, 1.5 times longer than femur height; mid femur with ventral row of white hairs; segment 5 of fore tarsus black, enlarged and flattened dorsoventrally ...
..... *M. courtoisi* sp. n.
- Fore femur without long bristles, at most with 1–2 fine setae at base; mid femur usually bare; other features various 5
5. Fore basitarsus about as long as rest tarsomeres; posterior margin of wing in apical half foggy
..... *M. leptogaster* (Thomson, 1869)
- Fore basitarsus long and thin, more than twice as long as rest tarsomeres; wing evenly darkened or hyaline 6
6. Face nearly as wide as postpedicel 7
- Eyes nearly contiguous in the middle of face 8
7. Last segment of fore tarsus strongly enlarged, black
..... *M. shabuninae* Grichanov, 1996
- Last tarsomere simple, short, darkened
..... *M. hutsoni* Grichanov, 1996
8. Hind tarsus white *M. albitarsis* Parent, 1935
- Hind tarsus dark-brown 9
9. Antenna yellow, legs yellow, tarsi brownish; fore basitarsus 10 times longer than 2nd–5th tarsomeres combined
..... *M. dytei* Grichanov, 1996
- Antenna black, hind femur progressively brown towards apex, hind tibia brown; fore basitarsus at most 3 times longer than 2nd–5th tarsomeres combined 10
10. Fore tarsus white, with basitarsus 3 times as long as rest tarsomeres
..... *M. kalinkini* Grichanov, 1996
- Fore tarsus dark, with basitarsus either 2 or 3 times as long as rest tarsomeres 11
11. Fore basitarsus 3 times as long as rest tarsomeres
..... *M. rochati* sp. n.
- Fore basitarsus 2 times as long as rest tarsomeres
..... *M. frolovi* Grichanov, 1996

Mascaromyia courtoisi sp. n.
(Figs 1–7)

Material. Holotype, ♂ (NMSA): Mauritius, Le Pouce Mnt., UV light trap, 17.09.1963 (C.M. Courtois). Paratype: 1♂ (NMSA), same data.

Description. Male (Fig. 1). Head (Fig. 2). Hair-like front vertical seta bends forward; face silvery white; eyes contiguous in middle of face; antenna (Fig. 3) slightly shorter than height of head, black; scape simple, elongated; pedicel with ring of short setulae and 1 dorsal seta longer than pedicel; postpedicel slightly longer than high at base (13/10), triangular, with acute apex, pubescent; stylus basodorsal, short haired; length (mm) of scape, pedicel, postpedicel, stylus (segments 1 and 2), 0.11 : 0.06 : 0.13 : 0.12 : 0.94.

Thorax. Mesonotum dark bluish-green, grey pollinose, pleura brown-black with bronze-blue reflection, densely grey pollinose; metaepimeron black; five strong dorsocentral setae with a stiff hair in front of the 1st one; scutellum with two strong setae and two very short lateral marginal hairs.

Legs mostly yellow; mid and hind coxae brown; 5th segment of fore tarsus deep black; mid tarsus brown from tip of basitarsus; hind femur brown dorsally in distal half, hind tibia progressively brown distally; hind tarsus black; fore coxa anteriorly with yellow hairs, one short black and one long golden apical setae, ending with a long thick whitish yellow worm-like thorn; mid coxa with two yellow apical setae anteriorly; hind coxa with one long black outer seta; legs thin, with weak setae; fore femur (Fig. 4) with ventral row of mainly black fine bristles decreasing in length distally, with basal bristle yellow-brown, 1.5–2 times longer than femur height, 2nd and 3rd bristles slightly longer than femur height; fore tibia and basitarsus with regular ventral pectination; 5th tarsomere widened and dorsoventrally flattened, slightly longer than wide; mid femur with ventral row of white hairs; mid tibia with one anterodorsal and two posterodorsal setae, with few small ventrals; tarsus simple; hind tibia with one anterodorsal at basal 1/4, three dorsal and three rather small ventral setae; tarsus simple; basitarsus with short basoventral seta; femur, tibia and tarsomere (from first to fifth) length ratio (mm): fore leg: 1.25 : 1.34 : 1.35 : 0.47 : 0.51 : 0.33 : 0.14, mid leg: 1.4 : 2.24 : 1.81 : 0.52 : 0.44 : 0.21 : 0.17, hind leg: 1.84 : 2.82 : 1.01 : 0.66 : 0.44 : 0.28 : 0.14.

Wing (Fig. 5) long and narrow, almost hyaline; veins brown; right wing of holotype with posterior stump vein on elbow of M_1 ; ratio of costal section between R_{2+3} and R_{4+5} to that between R_{4+5} and M_{1+2} , 0.4 : 0.1; ratio of crossvein dm-cu to apical part of M_{1+2} (fork-handle) to apical part of M_4 , 0.41 : 0.77 : 0.32; lower calypter dark-yellow, with black edging and yellow cilia; halter dirty yellow.

Abdomen thin, greenish black, weakly shining; 1st tergite black; unmodified segments combined about 2.5 times as long as mesonotum; sternites with short sparse light hairs, brown; 1st tergite with long light hairs and 2 pairs of black marginal setae; other tergites with short light and dark hairs and short black setae; 7th abdominal segment and hypopygium (Figs 6, 7) black; 7th segment short, as long as 6th segment, with short sparse hairs; 8th segment with several long setae; epandrium rounded, as long as 7th segment, strongly sclerotized, projected distally; phallus with dorsal tooth; cercus swollen in basal 1/3, with long and narrow distal part covered with short hairs, numerous dorsal and ventral setae and two long apical setae, with two large basoventral projections of unequal length; distal projection rounded, bearing two very long setae distally and long process having three spatulate setae; basal projection bifurcated, with shorter distal arm and long and strongly curved proximal arm reaching ventral side of epandrium; distal arm of basal projection bearing long thick seta and ovate process at apex; proximal arm of basal projection leaf-like in apical half; surstylus black, subquadrate, with several short apical setae; epandrial lobe small, subtriangular, bearing three short setae.

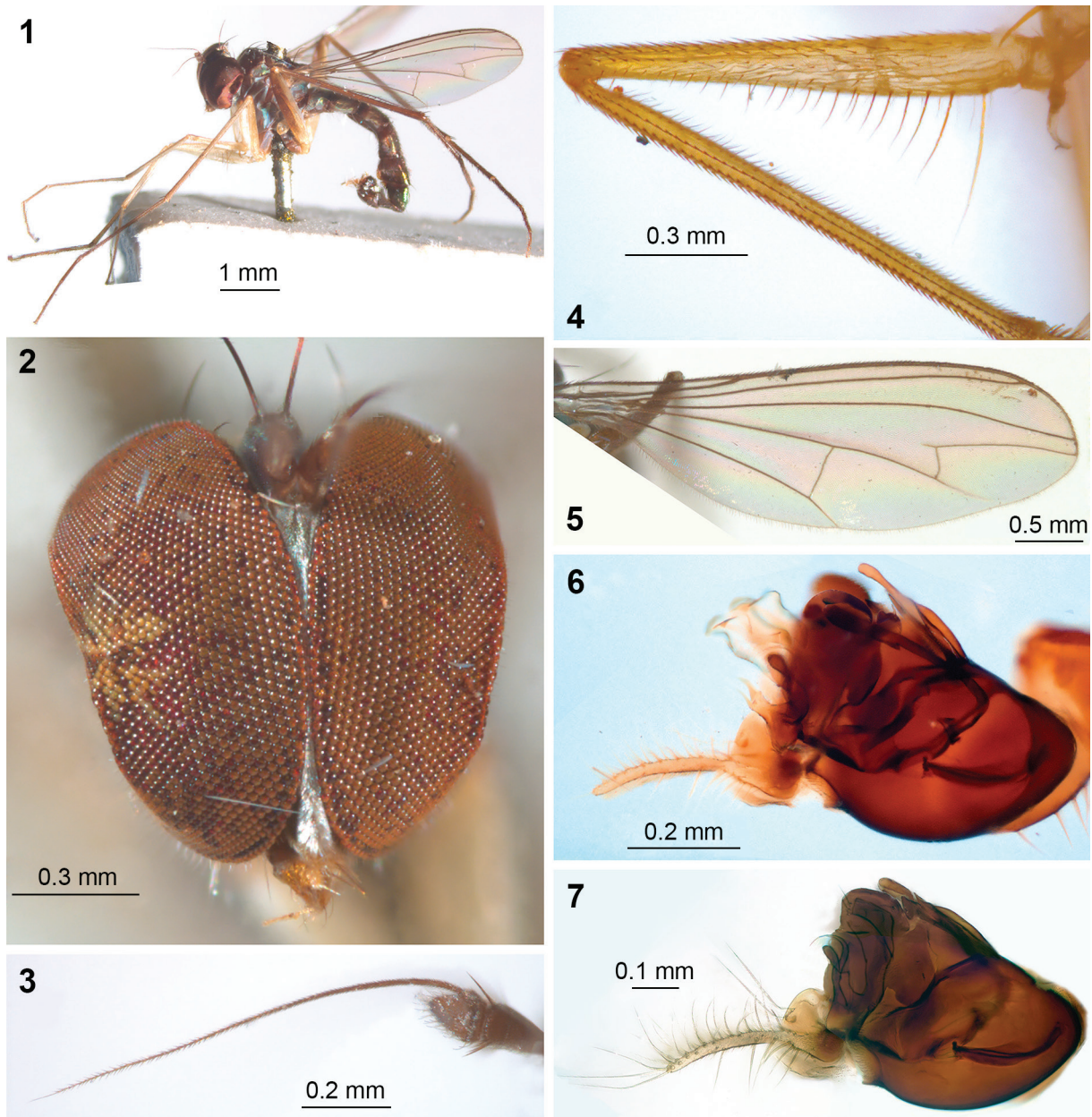
Measurements (mm). Body length 4.9; antenna length 1.1; wing length 4.1; wing width 1.2.

Female unknown.

Diagnosis. *Mascaromyia courtoisi* sp. n. belongs to the *leptogaster* group of species [Grichanov, 2017], being close to *M. loici* Grichanov, 2003 from Réunion, which differs from the new species in fore tarsus with yellow 5th segment; fore femur with 1–2 fine ventral setae at base; cercus shorter than epandrium, semiglobular, strongly swollen, with short, nearly right-angular apex [Grichanov, 2003].

Distribution. Mauritius.

Etymology. The species name is dedicated to its collector, C.M. Courtois.



Figs 1–7. *Mascaromyia courtoisi* sp. n., male.

1 – habitus; 2 – head; 3 – antenna; 4 – fore femur and tibia; 5 – wing; 6 – hypopygium after maceration, lateral view, reflected light; 7 – hypopygium after maceration, lateral view, transmitted light.

Рис. 1–7. *Mascaromyia courtoisi* sp. n., самец.

1 – общий вид; 2 – голова; 3 – усик; 4 – переднее бедро и голень; 5 – крыло; 6 – гипопигий после размачивания, вид сбоку, отраженный свет; 7 – гипопигий после размачивания, вид сбоку, проходящий свет.

Mascaromyia rochati sp. n.

(Figs 8–14)

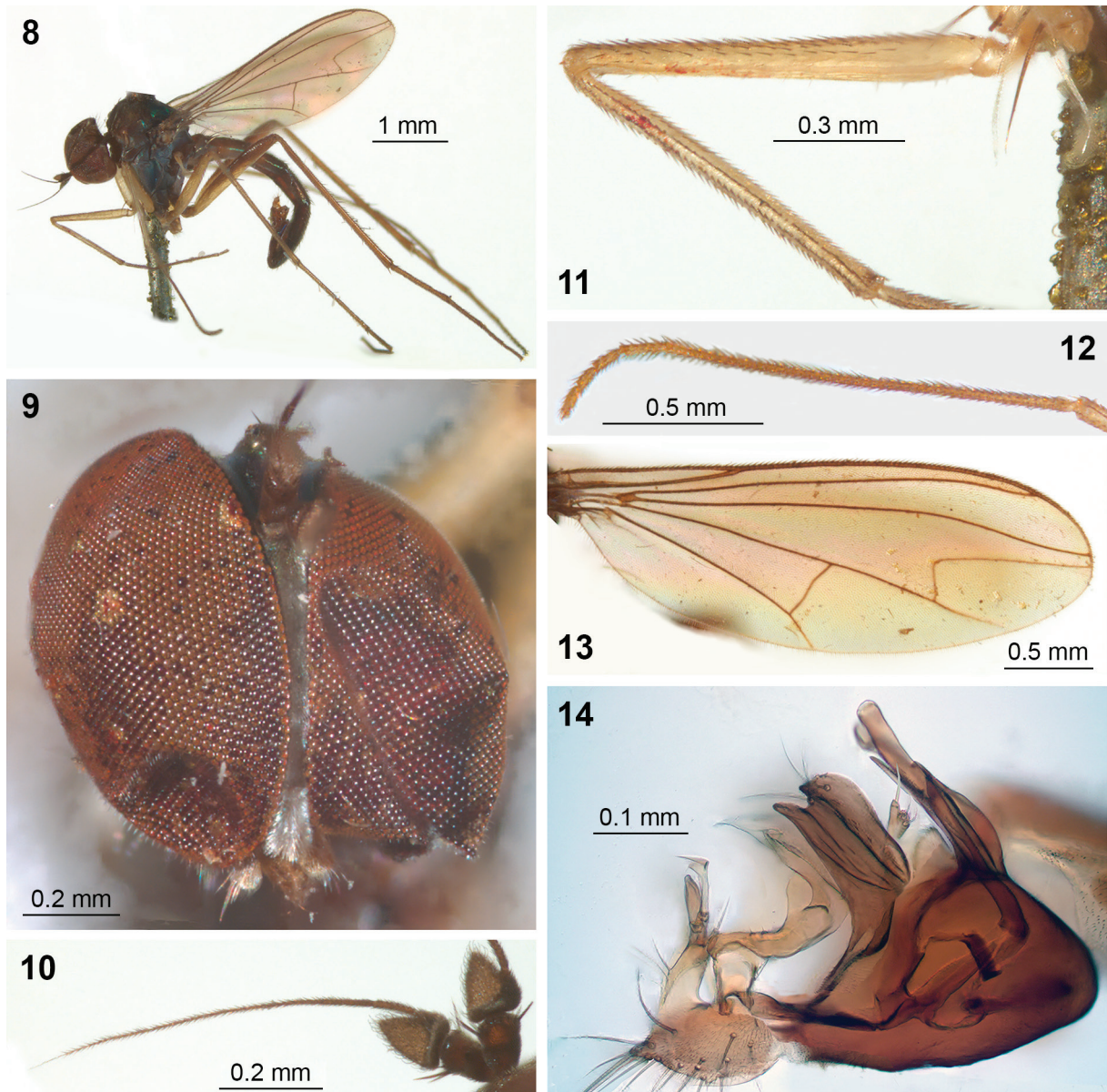
Material. Holotype, ♂ (NMSA): Mauritius, Le Pouce Mnt., UV light trap, 17.09.1963 (C.M. Courtois).

Description. Male (Fig. 8). Head (Fig. 9). Hair-like front vertical seta bends forward; face silvery white; eyes nearly contiguous in middle of face; antenna (Fig. 10) slightly shorter than height of head, black; scape simple; pedicel with ring of short setulae and one dorsal seta longer than pedicel; postpedicel slightly longer than high at base (13/11), triangular, with acute apex, pubescent; stylus basodorsal, short haired; length (mm) of

scape, pedicel, postpedicel, stylus (segments 1 and 2), 0.8 : 0.06 : 0.13 : 0.1 : 0.68.

Thorax. Mesonotum dark bluish-green, grey pollinose, pleura brown-black with bronze-blue reflection, densely grey pollinose; metaepimeron black; five strong dorsocentral setae with a stiff hair in front of the 1st one; scutellum with two strong setae and two very short lateral marginal hairs.

Legs mostly dirty yellow; mid and hind coxae black; fore tarsus brownish from middle of basitarsus; mid tarsus brown from tip of basitarsus; hind femur brown in distal third and dorsally in middle third, hind tibia progressively brown distally; hind tarsus brown-black; fore coxa anteriorly with yellow hairs, one short and



Figs 8–14. *Mascaromyia rochati* sp. n., male.

8 – habitus; 9 – head; 10 – antenna; 11 – fore femur and tibia; 12 – fore tarsus; 13 – wing; 14 – hypopygium after maceration, lateral view, transmitted light.

Рис. 8–14. *Mascaromyia rochati* sp. n., самец.

8 – общий вид; 9 – голова; 10 – усик; 11 – переднее бедро и голень; 12 – передняя лапка; 13 – крыло; 14 – гипопигий после размачивания, вид сбоку, проходящий свет.

one long black apical setae, ending with a long thin whitish yellow thorn; mid coxa with yellow outer hairs and small brush of yellow hairs at tip anteriorly; hind coxa with one long black external seta; legs thin, with weak setae; femora without remarkable ciliation ventrally; fore tarsus (Fig. 12) simple, with basitarsus thin and long, rest segments shortened; mid tibia with one anterodorsal and two posterodorsal setae; tarsus simple; hind tibia with 4–5 dorsals in middle and few rather small ventral setae; tarsus simple; basitarsus with short basoventral seta; femur, tibia and tarsomere (from first to fifth) length ratio (mm): fore leg: 1.05 : 1.12 : 1.29 : 0.13 : 0.1 : 0.08 : 0.1, mid leg: 1.23 : 1.99 : 1.3 : 0.38 : 0.3 : 0.18 : 0.11, hind leg: 1.73 : 2.37 : 0.84 : 0.5 : 0.34 : 0.21 : 0.13.

Wing (Fig. 13) long and narrow, evenly grey; veins brown; ratio of costal section between R_{2+3} and R_{4+5} to that between R_{4+5}

and M_1 , 0.35 : 0.05; ratio of crossvein dm-cu to apical part of M_{1+2} (fork-handle) to apical part of M_4 , 0.37 : 0.62 : 0.25; lower calypter dark-yellow, with black edging and yellow cilia; halter dirty yellow.

Abdomen thin, greenish black, weakly shining; 1st tergite black; unmodified segments combined about 2.5 times as long as mesonotum; sternites with short sparse light hairs, brown; 1st tergite with long light hairs, 1 pair of yellow and 2 pairs of black long marginal setae; other tergites with short dark hairs and short black setae; 7th abdominal segment and hypopygium (Fig. 14) black; 7th segment with short sparse hairs; 8th segment with several long setae; phallus simple; cercus brown-black, swollen at middle, with acute apex, dorsally and laterally setose, with light hairs and two dirty yellow ventral projections of equal length; distal projection bearing two long setae at middle, three apical seta,

i.e. long hooked flattened seta, long simple flattened seta and short simple pedunculate seta; basal projection strongly curved, broad, bifurcated, with two leaf-like lobes in apical half; surstylus black, with short narrow subapical process and three long apical setae; epandrial lobe finger-like, with three apical setae.

Measurements (mm): body length 4.5; antenna length 0.9; wing length 3.3; wing width 1.1.

Female unknown.

Diagnosis. *Mascaromyia rochati* sp. n. belongs to the *leptogaster* group of species [Grichanov, 2017], being close to *M. frolovi* from Mauritius, which differs from the new species in fore basitarsus 2 times as long as rest tarsomeres; cercus with acute apex, with long thin basoventral projection, and with apicoventral appendix directed basally and bearing a long basal outer seta, two apical spatulate bristles [Grichanov, 1996].

Distribution. Mauritius.

Etymology. The species name is dedicated to Dr J. Rochat (the Museum of Natural History of La Réunion, Réunion Island, France).

Conclusion

The Island of Mauritius is the oldest of the existing Mascarene Islands (or Mascarenhas Archipelago) (7–10 mya), created along with the undersea Rodrigues ridge. The islands of Rodrigues and Réunion were created in the last two million years. The Seychelles (in the northern part of the Mascarene Plateau) are much older [McDougall, 1971; Oehler et al., 2008]. Grichanov [2017] has separated the endemic species of Seychelles as *M. pollicifera* species group having plesiomorphic characters in males. *Mascaromyia leptogaster* is a possible founder of radiated species complexes on Mauritius and Réunion, colonizing recently the Chagos Archipelago also.

All or most of known species from Mauritius and Réunion (including new species described here) form the *M. leptogaster* species group [Grichanov, 2017] defined by the frequent presence of remarkable ornamentations on tarsi, sometimes on tibiae and wings. It means that these two nearby islands were colonized by an ancestor of extant species at about the same time despite difference in their age. Nevertheless, species with relatively broad male face and unusually curved male cercus (such as *M. hutsoni* and *M. shabuninae*) are absent on Réunion, forming probably a somewhat older subgroup of species inhabiting Mauritius.

Little is known on ecology of *Mascaromyia* species. According to labels under the published material, Mauritius and Réunion species inhabit humid forests in the mountainous areas [Grichanov, 1996, 2003], being

commonly collected along roads and rivers at 500–1350 m a.s.l. Seychelles species also inhabit forests up to highest peaks [Lamb, 1922].

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