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On Madagascan *Dichaetomyia* species (Diptera: Muscidae): Descriptions of four new species

Eberhard ZielkeDOI: <https://doi.org/10.22271/j.ento.2022.v10.i4a.9022>**Abstract**

Four new species of the genus *Dichaetomyia* are described from Madagascar as *Dichaetomyia bohita* sp. n., *Dichaetomyia mikeana* sp. n., *Dichaetomyia paranigra* sp. n., and *Dichaetomyia vohimana* sp. n. The species belong to the subgenus *Dichaetomyia* sensu strictu. The body of two species is at least partially metallicly shiny bluish, green or violet coloured the two other species are predominantly greyish and brown to blackish-brown.

Keywords: Muscidae, *Dichaetomyia*, new species, descriptions, diagnosis, Madagascar**Introduction**

When the first Madagascan flies were examined in 2015 at the Institute for Biodiversity and Ecosystem Research (IBER), Sofia, Bulgaria, it was not foreseeable that the processing of the *Dichaetomyia* species of the Madagascan subregion would be so extensive. But various specimens of the genus that had been misidentified in the past^[1], had to be assigned to the correct species^[2, 3] before several other *Dichaetomyia* species from Madagascar could be described^[4-6] as new to science.

Another four new species are presented in this contribution. Either their identification required several additional comparisons with similar species to confirm the status of a new species, or their taxonomic characters had not been properly recognized previously, and they were initially misclassified. More than forty *Dichaetomyia* species are known now from Madagascar. Most taxa belong to the subgenus *Dichaetomyia* s. str. Species of this subgenus are found practically worldwide. Further nine species are members of the subgenus *Panaga* Malloch, 1921, which appears to be restricted to the Afrotropical Region. Apart from two *Panaga* species, which have also been recorded in other areas of Africa, all other species of the genus that have been described from Madagascar have been found only in this zoographic subregion. However, since research into the Afrotropical muscid fauna is progressing very slowly, it will only become clear over the years whether the species described from Madagascar are actually endemic to this area or whether they also occur on the African mainland or other island regions of the continent. However, for the time being, it cannot be ruled out that their habitat is limited to the typical biotopes of the country. This also is true to the new species introduced below.

Materials and Methods

The origin of the unidentified Muscidae and the preparation of the flies that were preserved in at least 70% ethanol have been described in detail recently^[6] and unfortunately a few specimens of this group also originate from the specimens that were contaminated during the drying process with microscopic, electrostatically charged polystyrene particles^[4].

The identification of the new species is largely based on the key to Malagasy *Dichaetomyia* species^[1]. Since this is the only comprehensive key to the Muscidae of the country, reference is made to "the key" or to "Couri" several times, without naming the co-authors and the year of publication each time. In addition, the identification keys of Van Emden^[7, 8] for the African *Dichaetomyia* species and of Pont^[9] for the species of the Comoro Islands were also consulted before a species was described as new to science. However, this only applies to species that did not have a metallic coloured body. Strikingly metallicly colorful markings are not found in the identification keys from Pont and Van Emden, since these markings are only known

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from Madagascan species. The newly defined species were also compared with descriptions of those Afrotropical *Dichaetomyia* species^[10, 11] that are not included in the before-mentioned identification tables.

Attempts have also been made to compare the DNA of similar looking *Dichaetomyia* species using methods from previous studies^[12, 13]. Unfortunately, no reliable results were obtained from similar species. The samples were either not sufficiently preserved over the years (ethanol concentration probably too low) or the DNA of some flies did not react at all or did not react clearly to the primers used. Due to limited resources, it was refrained from developing formulations for DNA determination of Afrotropical *Dichaetomyia* species, especially as the number of flies available was too small to sacrifice the specimens for appropriate experiments.

Morphological terminology follows McAlpine^[14], but postpedicel^[15] is used instead of "first flagellomere" as proposed by McAlpine. The lateral width of the postpedicel of antenna is called "depth" and refers to the greatest depth of the postpedicel. Information about the width of frons always refer, if not stated otherwise, to the shortest distance between the margins of the eyes. The intra-alar setae of the presutural part of the mesonotum are referred to as posthumeral setae and presutural seta. If the length of setae or hairs of the femur are compared to the depth of femur, the depth always refers to the point of insertion of the seta or hair. The anterior width of frons is measured directly at the upper margin of the lunule. Body length was measured in millimeters (mm).

The flies were studied using a Zeiss Stemi SV6 stereomicroscope and images were created by means of a Zeiss Discovery 8 stereomicroscope combined with an AxioCam ERc5s camera as described previously^[3, 4].

Apart from the undetermined material from the Moravian Museum, Brno, identified specimens were studied and used for comparison. Specimens including type material were loaned for examination to IBER by the Entomological Department of the California Academy of Sciences (CAS), San Francisco. All specimens on loan will go back to the collections that kindly made them available. However, with the consent of the Moravian Museum some of the originally undetermined specimens will remain in IBER's collection.

Results

Common characteristics

Males and females of the four new *Dichaetomyia* species from Madagascar described below have several taxonomic features in common, which practically do not differ. Therefore, they are of no diagnostic value for distinguishing these species from each other. When describing a new species, however, all current taxonomic criteria should be included for the sake of completeness, even if they appear to be of little importance for the species differentiation at the time of the description. The importance of characteristics may change when comparisons with other species become necessary. In order to avoid redundant listings of criteria without diagnostic value, the taxonomic features common of the four species are compiled in this chapter, which is therefore an elementary part of each subsequent species description. If a taxonomic characteristic of a species differs significantly from this general characterization, it is described differently from this compilation in the section of the species concerned.

Head. Parafacial bare. In profile upper mouth margin about in line with profrons. Upper half of lateral surface of gena bare.

Palpus slender and somewhat longer than prementum.

Thorax. Acrostichal setae 0 + 1, seta not half as long as posterior dorsocentral seta; two postpronotal setae; two notopleural setae, notopleuron with few small hairs; two intra-alar setae, two supra-alar setae and three postalar setae. Greater ampulla without setulae, postalar declivity and suprasquamal ridge bare. Prosternum haired. Anepimeron with a tuft of setulae above and some scattered seta-like hairs on posterior surface; proepimeral area, katepimeron and meron bare. Posterior spiracle with black setae at lower margin. Katepisternal setae 1+2, the lower one distinctly closer to the posterior seta than to the anterior one. Scutellum with a pair each of strong apical and strong lateral setae, lateral surface and margin to the ventral surface with setulae. Wing. Membrane hyaline with a brownish tinge, cross-veins and surrounding membrane not infuscate. Vein M somewhat diverging from vein R4+5, very slightly curved forward to R4+5 before reaching wing margin.

Legs. Fore femur with complete rows of posterodorsal, posterior and posteroventral setae. Mid tibia with two strong posterior setae, about twice as long as diameter of tibia. Posterior margin of hind coxa bare. Hind femur preapically with two strong posterodorsal to dorsal setae. Hind tibia without a long distinct posterodorsal seta.

Abdomen without specific pattern. Sternite 1 laterally with few setulose hairs.

Descriptions of new species

Dichaetomyia bohita spec. nov. (Figs 1-4)

Material examined: Female holotype; Madagascar, Ambohitantely Spec. Res., S18°11'54, 9" E47°16'52,6", 1580 m, 20.-25.xi.2011, local coll. The holotype lacks some large setae; however, the scars of the lost setae are clearly visible. One additional female (no type specimen) with the same locality label as the holotype. The specimen is somewhat smaller, lacks the right fore leg and the mesonotum is badly worn, the pattern is barely recognizable. The holotype and the female will be returned to the Moravian Museum.

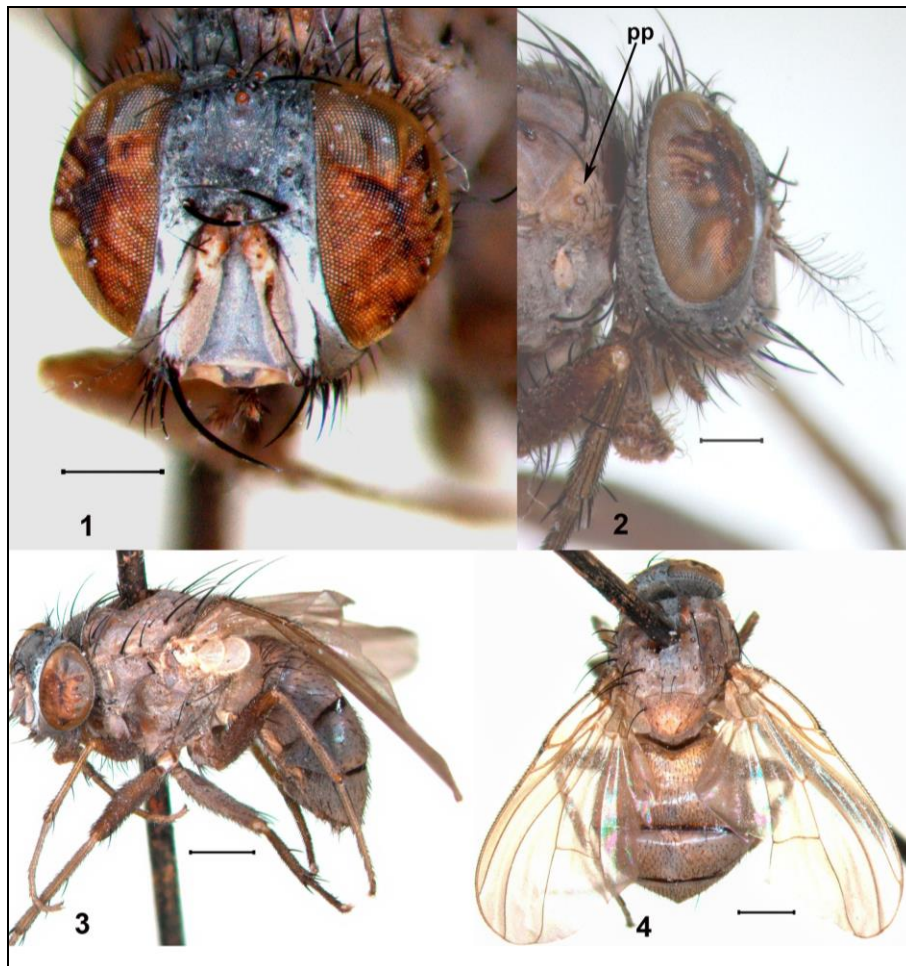
Etymology: The species name "*bohita*" is a feminine adjective referring to part of the name Ambohitantely, the area where the specimens were collected.

Description (female) [see also 'Common characteristics', first section of chapter Results]. Head. Ground colour dark, in certain light conditions greyish-white dusted. Dichoptic; eyes with very few small microscopic hairs, facets of about equal size. Frons at vertex (Fig. 1) about 0.33 times as wide as maximum width of head, almost parallel-sided, at level of anterior ocellus about 3.5 times and at anterior margin about 4.1 times as wide as the distance between the outer margins of posterior ocelli. Fronto-orbital plate at level of anterior ocellus about half as wide as distance between outer margins of posterior ocelli. Anterior tip of the faintly demarcated frontal triangle reaching the level slightly below of second fronto-orbital seta. Parafacial tapering throughout its entire length, at the level of antenna basis almost twice as wide as depth of postpedicel and at the level where parafacial and facial ridge separate not much wider than anterior ocellus. Genal depth below lowest eye margin slightly wider than depth of postpedicel (Fig. 2). In anterior view frons, parafacial, facial ridge, face, peristomal area and anterior surface of gena dusted greyish to greyish-white. Postpedicel of antenna brown, densely dusted greyish, pedicel orange,

somewhat shiny, at certain viewing angle slightly dusted. Postpedicel four times as long as deep and about three times as long as pedicel. Arista brown, about twice as long as length of postpedicel, longest hairs of arista about twice as long as depth of postpedicel. Anterior half of fronto-orbital plate with two setae not very long, the anterior seta clearly stronger than the upper one, in addition one or two very small interstitial setulae present; in the upper half of frons about at level of anterior ocellus a strong reclinate orbital seta, another, somewhat shorter orbital seta somewhat below; inner vertical seta clearly longer than outer vertical seta and ocellar setae; an irregular row of setulae between eye margin and orbital and frontal setae. Facial ridge without tiny setulae visible. Vibrissal setae strong and about 1.5 times as long as the longest surrounding peristomal setae. Lower surface of gena and post-occipital surface dark, somewhat greyish dusted and with some dark seta-like hairs. Proboscis short and strong, prementum brown, dusted, labella somewhat longer than depth of proboscis; palpus clavate, basal half brown, upper half more yellowish.

Thorax. Ground-colour predominantly greyish dusted (Fig. 3). Mesonotum brownish-grey, in dorsal view (Fig. 4)

mesonotum predominantly greyish dusted; presutural part with two paramedian brown stripes each one along inside the row of dorsocentral setae almost reaching the anterior postsutural dorsocentral seta, lateral part of mesonotum with a brownish stripe starting from posthumeral seta and reaching about the posterior intra-alar seta, poorly demarcated and, depending on viewing angle, varying from a narrow brown line barely visible to a broad patch-like stripe. Postpronotum greyish dusted (Fig. 4), in certain light conditions yellowish (Figs 2, 3). Scutellum depending on incidence of light yellow (Fig. 4) or greyish or yellowish-grey. Pleura densely greyish dusted (Fig. 3). Anterior spiracle whitish, posterior spiracle light brownish. Prosternum brown. Dorsocentrals 2+2; outer postpronotal seta almost twice as long as inner seta; anterior notopleural seta much longer than the posterior; pre-alar seta about half as long as posterior notopleural seta. Anepisternal setae 1+5, posterior setae of varying length, only few interstitial hairs, some of which almost as long as shortest setae. Scutellum with preapical and basal seta about one fourth as long as apical seta, but clearly distinguishable from ground-hair. All major setae on dorsal surface of thorax with a very narrow dark dot at base.



Scale bars; Figs: 1-2, 0.5 mm, 3-4, 1 mm

Figs 1-4: *Dichaetomyia bohita* spec. nov., female holotype; 1) Anterior view and width of frons, yellowish-ochre pedicel of antenna; 2) lateral view of head and yellowish postpronotum (pp); 3) habitus, lateral view, strikingly white calypters; 4) dorsal view of thorax and abdomen, scutellum and median part of abdominal sytergite 1+2 predominantly yellowish.

Wing. Tegula and basicosta yellowish, veins predominantly yellowish with a brown tinge. Costal spine prominent, about three times as long as adjacent bristles. Radial node and basal part of vein R4+5 dorsally with few setulae, ventrally with a row of distinct setae reaching almost cross-vein r-m. Cross-

vein r-m about at level where vein R1 enters costa; distal cross-vein somewhat sinuous and almost in a right angle with vein M. Both calypters including margins purely white (Fig. 3), lower calypter about 1.5 times as long as upper calypter. Haltere completely pale yellow.

Legs. Coxae, trochanters and femora predominantly yellowish-brown, tibiae and tarsi in certain light conditions yellow. Pulvilli and claws rather small. The posterodorsal and posterior setae of fore femur distinctly shorter than the setae of the posteroventral row, the latter are clearly longer than depth of femur. Fore tibia with a median posterior seta somewhat longer than diameter of tibia. Mid femur in apical third with a row each of anteroventral and posteroventral setae, about one third as long as depth of femur, preapically with a short anterodorsal and three distinctly longer posterior to posterodorsal setae. Hind femur with complete row of anterodorsal setae clearly shorter than depth of femur, apical third with four anteroventral setae, only one seta almost as long as depth of femur, basal third with some posteroventral hairs barely half as long as depth of femur. Hind tibia without a long posterodorsal seta, in middle third one strong anterodorsal seta slightly longer than diameter of tibia and one shorter anteroventral seta.

Abdomen. In dorsal view surface of tergites predominantly greyish, in certain light condition syntergite 1+2 and tergite 3 in middle part with distinct yellowish shimmer (Fig. 4), the yellowish colouration somewhat diffuse on tergite 4, in posterior view all tergites with greyish ground-colour and depending on the incidence of light with shifting yellowish tinge. Lateral and ventral parts of tergites darker greyish (Fig. 3). Tergite 3 with a row of short marginal setae, tergite 4 with a row of long and strong marginals and some discals laterally, tergite 5 with a row of long discals, marginals not recognizable. The base of discals and marginals on tergite 4 and 5 marked by a dark dot. Sternites depending on condition of light yellowish or grey, somewhat shiny.

Female genitalia. Not investigated.

Measurements. Length of body about 6.2 mm; length of wing about 5.2 mm.

Male. Not known.

Diagnosis

Dichaetomyia bohita sp. n. runs in the key to Madagascar *Dichaetomyia* species^[1] to *Dichaetomyia nigra* Couri, Pont & Penny, 2006. However, the two species are distinguished by the colour of the mesonotum, scutellum and the abdomen, which are predominantly somewhat shiny brown to dark brown in *D. nigra*. Whereas mesonotum and abdomen are primarily matt grey with a distinct yellow tinge in certain light conditions in *Dichaetomyia bohita* sp. n. and the scutellum is even clearly yellowish to yellow in most light conditions. *D. bohita* also resembles *Dichaetomyia tantelya* Zielke, 2021. However, a yellow to ochre pedicel and yellowish-brown palpi distinguishes the new species, whereas these body parts are dark brown in *D. tantelya*. In addition, the abdomen is practically uniformly matt yellowish-grey in *D. bohita*, whereas it is somewhat shiny brownish in the median parts of the tergites and depending on light incidence shiny dark brown to almost olive-green in the lateral parts of dorsal surface of tergites in *D. tantelya*. Using the keys to the African *Dichaetomyia* species^[7, 8], the characteristics of the new species did neither match the features of one of the listed species nor did the combination of characteristics lead to a specific couplet.

Dichaetomyia mikeana spec. nov. (Figs 5-7)

Material examined: Male holotype, Madagascar, Tulear Province, Mikea Forest, NW of Manombo, el 30 m, 17.-28. January 2002, S22°54.22'E43°58.52', in deciduous dry forest,

malaise trap MA-02-18A-11, coll. R. Harin'Hala, California Acad. of Sciences. The holotype is lacking the left fore leg and several of the long setae are lost, the head was only loosely attached to the thorax. The scars of the lost setae are visible and allow an assessment of the chaetotaxy. To avoid uncontrolled dropping off and loss of the head when handling the specimen, the head was placed in a gelatine capsule, labeled and mounted on a pin. The holotype, originally registered by CAS as a male *Dichaetomyia rangeri* (Zielke, 1973)) with the registration number CASENT3010107, is listed now by CAS as holotype of *Dichaetomyia mikeana* with the number CASTYPE20343. The type specimen will be returned to the Entomological Department of CAS, San Francisco, USA.

Etymology: The epithet “*mikeana*” is a feminine adjective and refers to Mikea Forest, the name of the locality where the specimen was collected.

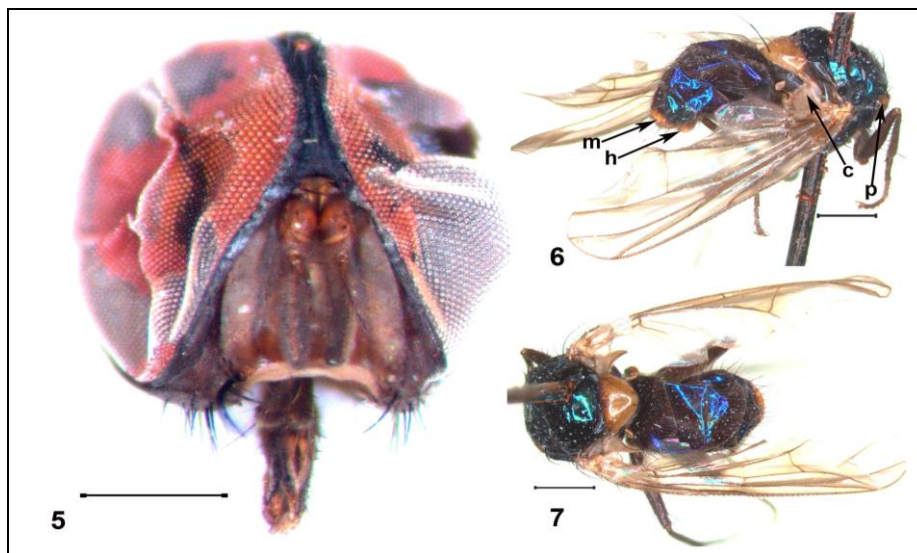
History: As reported in previous contributions^[2, 3], Couri *et al.*^[1] initially synonymized *Dichaetomyia scutellaris* (Zielke, 1974) with *Dichaetomyia rangeri* (Zielke, 1973) in 2006, apparently without having compared the two very different species. Consequently, the specimens that actually belonged to *D. scutellaris* were assigned to *D. rangeri*. In 2016 *D. scutellaris* was reinstated as a discrete species^[2], however, the name was replaced by *Dichaetomyia perineta* Zielke, 2016, since “*scutellaris*” was already preoccupied by *Dichaetomyia scutellaris* Malloch, 1928. The male holotype of *D. mikeana* spec. nov. was originally also identified as *D. rangeri* by Couri *et al.*^[1] and recorded as such (number: CASENT3010107) along with a heterogeneous group of similar looking specimens. Most, but not all, of the misnamed *D. rangeri* specimens, belonged to *D. perineta* (formerly *scutellaris*) based on their taxonomic characteristics, and were in no way *D. rangeri*. Unfortunately, for some inexplicable reason, the male of *D. mikeana* was listed in the compilation^[3] of recommended corrections to Couri's publication as *D. perineta* without having this assignment verified, as it was the case with the other available *Dichaetomyia* species that were wrongly identified by Couri years ago. Only recently, upon inspection before the updated final nametag was affixed, it was found that the male differed from the other *D. perineta* specimens in some distinct taxonomic characters. When comparing the listed localities^[1] of the *D. perineta* specimens it was noted that all but two specimens were from a rain forest area of East Madagascar with an altitude of 600 to 1.200 m above sea level. Whereas the male of *Dichaetomyia mikeana* spec. nov. was collected in Southwest Madagascar in a completely different biotope, a deciduous forest in the coastal area, altitude below 50 m asl. A female (number: CASENT3010106) also listed by Couri *et al.*^[1] and associated with the male at that biotope is the second specimen originating not from the rain forest. Unfortunately, this specimen was not readily available for investigation. However, based on the location it cannot be ruled out that it belongs as well to *Dichaetomyia mikeana* spec. nov.

Description (male) [see also ‘Common characteristics’, first section of chapter Results]. Head. Ground-colour dark brown to blackish (Fig. 5), partially somewhat greyish-white dusted. Holoptic, eyes large with very few scattered microscopic hairs, facets near to frons somewhat enlarged; shortest distance between eyes about twice as wide as the diameter of

the anterior ocellus. Fronto-orbital plates separated by a line-shaped frontal vitta about half as wide as the diameter of anterior ocellus, narrowest width of fronto-orbital plate slightly wider than the frontal vitta. Parafacial at level of base of antenna 1.5 times as wide as diameter of anterior ocellus, further downwards parallel-sided throughout its length and about as wide as anterior ocellus. Facial ridge in lower third about as wide as depth of postpedicel. Due to the large size of the eyes genal depth below lowest eye margin narrow barely twice as wide as the anterior ocellus. In anterior view fronto-orbital plate and parafacial dark, depending on incidence of light more or less whitish-grey dusted, frontal vitta and ocellar tubercle strikingly black, face thinly dusted whitish-grey, gena and peristomal area dark brown, depending on viewing angle somewhat shiny or matt, not dusted. Antennae brown and dusted greyish, pedicel more reddish brown, less densely dusted. Postpedicel about 3.6 times as long as deep and three times as long as pedicel. Arista brownish, at least 1.5 times as long as length of postpedicel, longest dorsal hairs of arista somewhat longer than depth of postpedicel. Fronto-orbital plate in anterior third with three distinct setae and one or two short interstitial hairs, in middle third two other short interstitial hairs and on the upper third at the level of the anterior tip of the ocellar triangle a stronger reclinate seta and smaller one closely below, the latter not distinctly longer than the interstitial hairs. Anterior surface of gena bare. Facial ridge with one or two small setulae, barely visible. Vibrissal setae strong and more than twice as long as the longest surrounding peristomal setae. Lateral surface of gena and post-occipital surfaces brown, practically not dusted, ventral part of gena and post-occipital surface with long dark seta-like hairs of different length. Proboscis short and slender,

brown, prementum brown somewhat shiny; length of labella almost twice as long as depth of proboscis; palpus brown, very weakly clavate.

Thorax. Ground-colour predominantly shiny dark green with strong bluish reflections (Figs 6, 7). Mesonotum in posterior view shiny dark green, in postero-dorsal view presutural part with a broad median longitudinal stripe dusted greyish-white, tapering towards and ending at the transverse suture, a paramedian white dusted almost triangular-shaped patch outside of the row of dorsocentrals and extending between anterior margin of mesonotum and the level between anterior and posterior presutural dorsocentral setae. Postsutural part of mesonotum in direct posterior view sparsely dusted greyish-white. Scutellum uniformly yellow, contrasting to mesonotum. Only the postpronotum strikingly yellow, the adjacent area including the surface around the anterior spiracle concolourous with mesonotum (Fig. 6). The pleura predominantly shiny dark green or bluish to violet depending on incidence of light. At certain viewing angles the pleura sparsely greyish-white dusted. Anterior spiracle greyish-white, posterior spiracle greyish. Dorsocentrals 2+2; outer postpronotal seta distinctly stronger than the inner seta; posthumeral seta 1, presutural seta 1, distinctly stronger than the posthumeral seta; anterior notopleural seta stronger; prealar seta distinct but not half as long as posterior notopleural seta; the anterior intra-alar seta clearly weaker. Prosternum dark. Anepisternal setae 1+5, the anterior seta weak, the posterior setae varying in strength, some interstitial seta-like hairs, distinctly shorter than the anepisternals. Scutellum with basal seta and preapical seta short but distinguishable from the seta-like ground-hair.



Scale bars; Figs: 5, 0.5 mm, 6-7, 1 mm

Figs 5-7: *Dichaetomyia mikeana* spec. nov., male holotype; 5) anterior view of separated head, somewhat shrunk, predominantly shiny pedicel; 6) latero-dorsal view of shiny thorax and abdomen, with strikingly yellow scutellum, apical margin of tergite 5 (m), hypopygium (h) and the yellow colouration limited to the postpronotum (p) only, lower calypter (c) matt greyish transparent with brownish margin; 7) dorsal view of thorax and abdomen.

Wing. Tegula pale brown, somewhat yellowish, basicosta yellow, stem vein and veins brown to dark brown (Fig. 6). Costal spine not prominent but distinct, about twice as long as neighbouring bristles. Vein R4+5 dorsally with one or two small setulae on radial node and basis of R4+5, ventrally with about three distinctly bigger setulae in basal part of the section between radial node and cross-vein r-m. Cross-vein r-

m basad of the point where vein R1 enters costa; distal cross-vein weakly curved and oblique. Both calypters greyish matt transparent, margins distinctly darker than calypters (Fig. 6), lower calypter almost twice as long as upper calypter. Knob and stem of haltere predominantly brownish (Figs 6, 7), basis of stem somewhat yellowish.

Legs. Coxae, trochanters and femora dark brown, the latter at

certain incidence of light with bluish-violet reflections, tibiae brown and tarsi yellowish-brown. Pulvilli and claws not as long as the corresponding tarsomere. In fore femur posterodorsals and posteriors about as long as the depth of femur, the posteroventral setae distinctly longer. Fore tibia with a distinct median posterior seta. Mid femur in basal half about three seta-like posteroventral hairs, two of which barely as long as and the more basal one longer than depth of femur, a more or less complete row of anteroventral hairs along the femur, the hairs about as long as depth of femur, preapically a distinct anterodorsal and two posterior to posterodorsal setae. Hind femur with complete row of strong anterodorsals about as long as depth of femur and a complete row of anteroventral setae, the most apical ones somewhat longer than the anteroventrals, and all anteroventrals slightly longer than the anterodorsals, in apical third a short row of posteroventral hairs about half as long as depth of femur. Hind tibia in middle third with a strong anterodorsal and an equally long anteroventral seta, both distinctly longer than diameter of tibia, more basad a second anteroventral seta much weaker and shorter.

Abdomen. Tergites predominantly shiny bluish-violet (Figs 6, 7) with distinct reflections in certain conditions of light, in posterior view only sparsely dusted, anterior part of syntergite 1+2 grey or bluish depending on incidence of light, tergite 5 with a broad yellow apical margin (Fig. 6) contrasting to the blue-violet ground-colour of the tergite; tergites laterally and ventrally concolorous with corresponding dorsal surface. All tergites with well-developed long marginal setae, tergite 4 laterally with two long discal setae and tergite 5 with a complete row of long discals. Sternites brownish, hypopygium contrasting yellow (Fig. 6); sternite 1 with some longer seta-like hairs on posterior margin.

Male genitalia. The determination of the species is not based on characters of genitalia. Therefore, the genitalia were not extracted to avoid damage of the only available specimen of this species.

Measurements. Length of body about 5.5 mm; length of wing about 5.4 mm. Female. Not known.

Diagnosis: *Dichaetomyia mikeana* spec. nov. runs in Couri's key ^[1] to the couplet with *Dichaetomyia scutellata* (Séguy, 1935) and *Dichaetomyia perineta* Zielke (= *D. rangeri* (Zielke) according to Couri). However, the new species is clearly distinguished from both species by brown veins at the basis of the wing, which are in no contrast to the subsequent parts of the veins, whereas the basal parts of the wing-veins are strikingly yellow and contrasting to the subsequent brownish parts of the veins in *D. perineta* and *D. scutellata*. In addition, the knob of haltere is brown in *Dichaetomyia mikeana*, whereas the halteres are predominantly yellow in the two other species.

***Dichaetomyia paranigra* spec. nov. (Figs 8-15)**

Material examined: Male holotype; Madagascar Ambohitantely Spec. Res. S18°11'54, 9" E47°16'52,6" 1580 m 20.-25.xi.2011, loc. coll. The holotype is missing both mid legs and the left hind leg. The latter fell off during preparation and was preserved in ethanol (vial no. M21). Five female paratypes; bearing the same locality label as holotype. One female paratype is lacking the left mid leg, another lost during preparation the left mid leg that was also preserved in ethanol (vial no. M23). The male holotype and two female paratypes will be returned to the Moravian Museum. Three female

paratypes will stay in the collection of IBER.

Etymology: The epithet "*paranigra*" is a feminine adjective and refers to the fact that the first specimen of this species ran in Couri's key directly to *D. nigra* Couri, Pont & Penny, 2006.

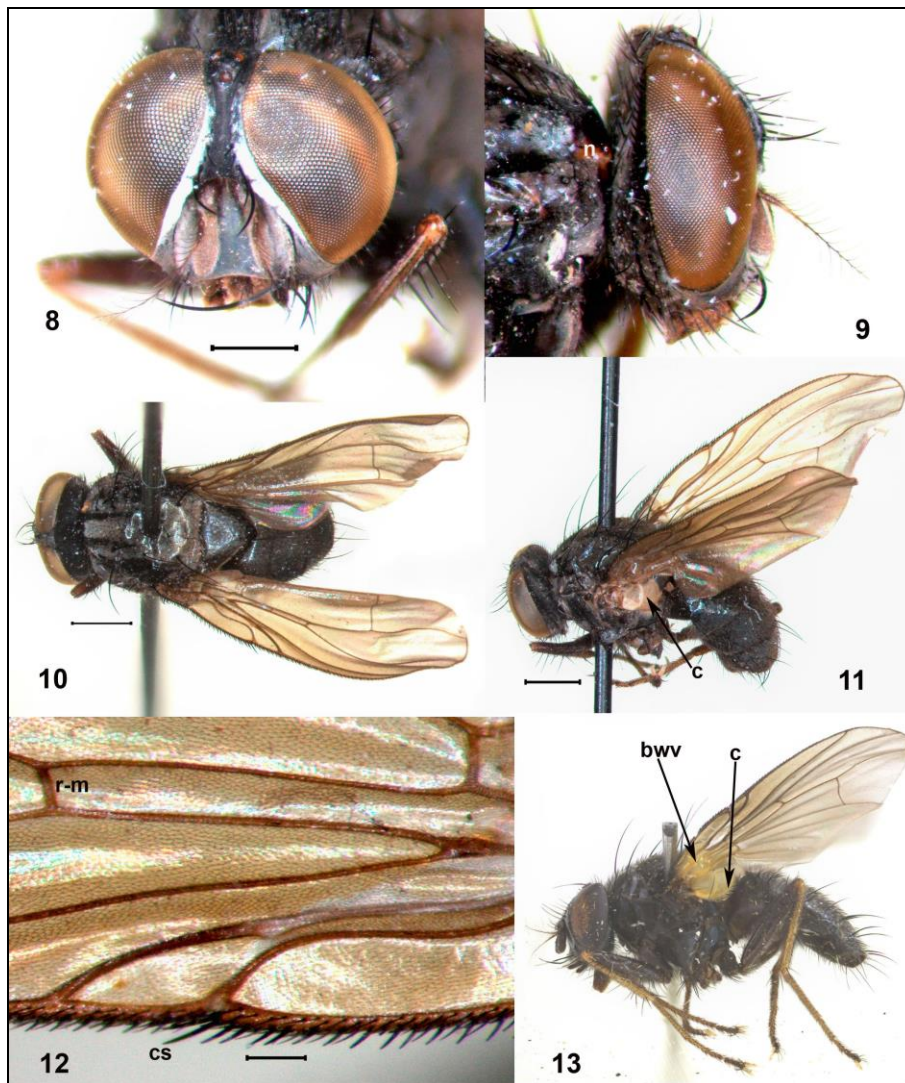
Description (male) [see also 'Common characteristics', first section of chapter Results]. Head. Ground-colour dark, partially dusted silver-white (Fig. 8). Eyes large with few scattered short hairs, facets next to frons slightly larger than those on the outer side of eye. Shortest width of frons 1.2 times as wide as the distance between the outer margins of posterior ocelli. Fronto-orbital plates at shortest width of frons slightly shorter than diameter of anterior ocellus and separated by a frontal vitta as wide as anterior ocellus. Parafacial narrowing along its length, at level of antenna basis 1.5 times as wide as anterior ocellus and at lower end about half as wide. Genal depth below lowest eye margin barely as broad as depth of postpedicel (Fig. 9). When viewed from anterior fronto-orbital plate and parafacial predominantly dusted silver-white, frontal vitta and ocellar tubercle contrasting black, face, peristomal area and anterior part of gena dusted greyish. Antennal segments uniformly brown, depending on viewing angle pedicel and postpedicel more or less dusted brownish-grey. Postpedicel about 3.5 times as long as deep and about 2.7 times as long as pedicel. Arista brown, more than twice as long as length of postpedicel, longest dorsal hairs of arista at most 1.5 times as long as depth of postpedicel. Anterior half of fronto-orbital plate with about five setae, the two most anterior setae strong and long, the more upper ones decreasing significantly in length, upper half of fronto-orbital plate only with one small setula, at level of anterior ocellus one distinct reclinate orbital seta and slightly below a very small reclinate hair-like seta. Facial ridge with few small setulae, only recognizable at certain viewing angle. Vibrissal setae strong and at least 2.5 times as long as the longest surrounding peristomal setae. Lower surface of gena and post-occipital surface dark, greyish dusted and with dark seta-like hairs. Proboscis short, prementum somewhat bulbous, brown, dusted, length of labella approximately twice as long as depth proboscis; palpus dark brown and weakly clavate.

Thorax. Ground-colour very dark brown, almost black (Figs 10, 11). Mesonotum dark and depending on incidence of light somewhat shiny or dusted brownish or brownish-grey. When viewed from postero-dorsal the surface between the rows of dorsocentral setae densely dusted brownish-greyish with two dark longitudinal stripes along inside of the dorsocentrals (Fig. 10) almost reaching the scutellar suture. Scutellum usually uniformly dusted greyish-brown. All pleura dark (Fig. 11), depending on viewing angle shiny or densely dusted brownish-grey. Anterior spiracle greyish, posterior spiracle dark. Dorsocentrals 2+2 all setae rather long and strong; outer postpronotal seta longer; anterior notopleural seta significantly longer than posterior one, pre-alar seta distinct, shorter than half the length of posterior notopleural seta. Prosternum brown. Anepisternals 1+8, the scars of the posterior setae very strong, surrounded by numerous seta-like interstitial hairs. Basal seta of scutellum hair-like, distinctly longer than ground-hair, preapical setae barely distinguishable from the longer seta-like hairs at apical part of scutellum.

Wing. Depending on incidence of light membrane with a distinct brownish tinge (Figs 10 - 12). Tegula and basicosta

brown, veins brown. Costal spine slightly longer than cross-vein r-m (Fig. 12), costal bristles basad of costal spine distinctly stronger than the bristles distal of the spine. Radial node dorsally and ventrally with about two setulae, basal part of vein R4+5 dorsally usually bare and ventrally with a row of few setae, the most distal seta about at midway to cross-vein r-m. Cross-vein almost at same level where vein R1 enters costa; distal cross-vein weakly sinuous and slightly oblique. Upper calypter predominantly hyaline transparent with white margin, lower calypter whitish matt transparent at certain light conditions with a weak brownish tinge, margin whitish with a weak yellowish tinge (Fig. 11), lower calypter almost twice as long as upper calypter. Haltere with a dark brown knob, basis of stem yellowish. Legs. Coxae, trochanters and femora dark brown (Fig. 11),

tibiae and tarsi at certain points of viewing predominantly more yellowish. Pulvilli and claws well developed almost as long as the associated fifth tarsomere. Posterodorsal setae of fore femur about as long as depth of femur, posterior setae usually shorter, posteroventrals clearly longer than depth of femur. Fore tibia with a median posterior seta almost twice as long as diameter of tibia. Mid legs missing. Hind femur with a complete row of strong anterodorsal setae, at apical third four anteroventral setae, the two most apical ones stronger than the two proximal setae, in basal third one distinct anteroventral seta and close to basis a slightly longer anteroventral and several irregularly distributed short ventral and posteroventral hairs. Hind tibia in middle third with one strong anterodorsal seta longer than diameter of tibia and one anteroventral seta somewhat weaker.



Scale bars; Figs 8–9, 0.5 mm; 10–11, 1 mm; 12, 0.2 mm

Figs 8-13: *Dichaetomyia paranigra* spec. nov., male holotype; 8) Anterior view and width of frons; 9) lateral view of head with fragile neck (marked with white n); 10) dorsal view of thorax and abdomen; 11) lateral view, calypters (c) matt whitish transparent without any yellow; 12) costal spine (cs) longer than cross-vein (r-m), bristles basad of cs distinctly stronger than those distal of cs. *Dichaetomyia ugandana* van Emden, 1942, male lectotype 13); lateral view, strikingly yellow calypters (c) and the basal parts of wing veins (bwv) conspicuous yellow, tibiae and tarsi significantly more yellow than the legs of *D. paranigra* spec. nov. (Figs 8, 11), lateral shape of head different from Fig. 9. The photograph (Fig. 13) of the male lectotype of *D. ugandana* was kindly produced and provided for comparison and further processing by Nigel Wyatt from The Natural History Museum, London.

Abdomen. Predominantly shiny dark brown (Figs 10, 11), at certain viewing angle partially sparsely dusted greyish-brown. Tergite 3 with a row of distinct but not very long marginals, tergite 4 with a row of long and strong marginal setae about as

long as in tergite 5, tergite 5 with a row of long marginals and an irregular row of discals, the setae somewhat shorter than the marginals of the tergite. Sternites brown, somewhat shiny. Male genitalia. Hypopygium somewhat pronounced (Fig. 11).

The species is distinguished from similar species by several taxonomic characters. Therefore, the genitalia were not extracted from the only available male specimen of this species.

Measurements. Length of body about 5.2 mm; length of wing about 5.4 mm.

Description (female). Head. Differs from male as follows: Eyes without clearly enlarged facets. Frons at vertex about 0.32 times as wide as largest width of head and only slightly dilated towards anterior margin, at level of anterior ocellus about 3.9 times and at anterior margin of frons about 4.5 times the distance between the outer margins of posterior ocelli (Fig. 14). Fronto-orbital plate at narrowest point about 0.7 times as wide as distance between outer margins of posterior ocelli. Anterior tip of ocellar triangle reaching anterior margin of frons. Anterior half of fronto-orbital plate with one strong and long anterior frontal seta usually followed by about two much smaller setae, the second anterior seta sometimes longer than the third one; upper half with two distinct reclinate orbital setae, the longer one about at level of anterior ocellus, the smaller one, slightly more anterior, in the middle part of fronto-orbital plates between frontal and orbital setae one or two small interstitial hairs; the surface between eye margin and the frontal and orbital setae with small proclinate setulae almost throughout the fronto-orbital plate.

Parafacial at level of antenna basis 1.5 times as wide as depth of postpedicel and at the lower end not much wider than anterior ocellus. Facial ridge with several fine setulae, not striking but well visible in certain light conditions. Genal depth below lowest eye margin slightly wider than depth of postpedicel.

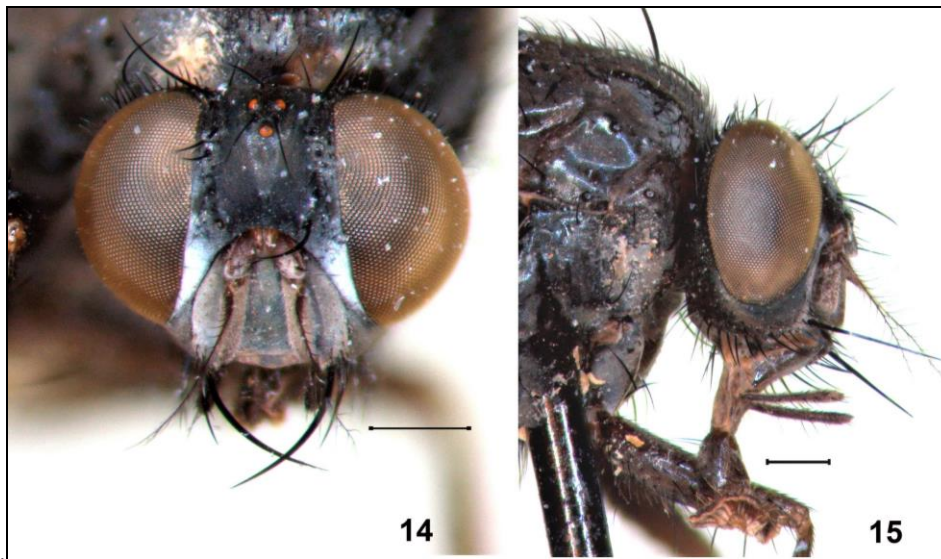
Thorax. Ground-colour very similar to male. Mesonotum dark brown (Fig. 15), when viewed from posterodorsal with three greyish dusted stripes reaching scutellar suture. The median stripe on the presutural part of mesonotum as broad as the area with acrostichal hairs, and strongly tapering in the postsutural posterior half; the two paramedian stripes broad in the anterior part of presutural mesonotum, strongly tapering towards the transverse suture and continued as a narrow grey stripe on the postsutural part of mesonotum.

Wing. Vein R4+5 dorsally and ventrally with a few more and bigger setulae.

Legs. Mid femur with a complete row of anteroventral hairs, barely half as long as depth of femur, and an irregular row of posteroventrals, shorter than the anteroventrals; preapically with a short anterodorsal, a short posterodorsal and two distinctly longer posterior setae. Mid tibia with two strong posterior setae somewhat longer than the diameter of tibia.

Abdomen. Colour similar to male.

Measurements. Length of body about 5 mm; length of wing about 4.8 mm.



Scale bars; Figs 14-15, 0.5 mm

Figs 14-15: *Dichaetomyia paranigra* spec. nov., female paratype; 14) Anterior view and width of frons; 15) lateral view of head and anterior part of mesonotum with dark postpronotum, antenna predominantly brown.

Diagnosis

Using the key to the Madagascan *Dichaetomyia* species ^[1] *Dichaetomyia paranigra* spec. nov. is closest to *Dichaetomyia nigra*. However, both species differ clearly from each other. *Dichaetomyia nigra* is marked by a reddish-yellow pedicel contrasting to the brown postpedicel, a yellowish postpronotum and by yellowish-brown femora and yellow trochanters, in addition, the costal bristles of the basal part of the wing are not distinctly longer than those of the distal part and the costal spine is not strikingly long, and the calypters are brown with a dark margin. Pedicel and postpronotum of *D. paranigra* are dark brown and not contrasting to the surroundings, trochanters and femora are dark brown; and bristles on basal costal section are somewhat enlarged and the costal spine is slightly longer than cross-vein r-m; the

calypters are whitish to greyish matt transparent with white margins with a weak yellowish shimmer.

Using Van Emden's key ^[7] to the Afrotropical species of the genus the new species runs to *Dichaetomyia ugandana* van Emden, 1942 known from Uganda and The Democratic Republic of Congo. In spite of a very short characterization of the species by its author ^[7, 16] the two species are separated clearly. *D. ugandana* is characterized by a very short anterior presutural dorsocentral seta and a distinct prescutellar acrostichal seta is lacking, whereas the corresponding dorsocentral seta in *Dichaetomyia paranigra* is very strong and long and the prescutellar acrostichal seta is about one third as long as the neighbouring very long posterior dorsocentral seta. In addition, when comparing images of the type specimens of *D. ugandana* kindly made and provided by

Nigel Wyatt from The Natural History Museum, London with the the type material of *Dichaetomyia paranigra* it was noted that apart from other differences also the calypters and the basis of the wing of *D. ugandana* are strikingly yellowish (Fig. 13). Wing and calypter in *Dichaetomyia paranigra*, however, are greyish transparent without any conspicuous yellow colouring.

***Dichaetomyia vohimana spec. nov.* (Figs 16-20)**

Material examined: Male holotype; the locality label reads "Madagascar, Rés. Expérim. de Vohimana "Circuit 2 PK 19"; 949 m, S18°55'09,1"E48°29'48,7", 21.viii. 2012, local collectors." One female paratype with the locality label "Madagascar, Réserv. Expérimentale de Vohimana "Circuit 5"; 885 m, S18°55'48,6"E48°30'28,8", 30. viii. 2012, local collectors." Both specimens are in good condition, however several of the long setae are missing. The corresponding scars of the setae are clearly visible. The male holotype will be returned to the Moravian Museum, the female paratype will be deposited in the Entomological collection of IBER.

Etymology: The name of the new species "*vohimana*" is a feminine adjective referring to the Vohimana Reservation in Madagascar, where the flies were collected.

Description (male) [see also 'Common characteristics', first section of chapter Results]. Head. Ground-colour brownish to dark brown (Figs 16, 17), depending on point of viewing more or less dusted greyish-whitish. Eyes very large with a few scattered microscopic hairs, facets near to frons slightly enlarged; shortest distance between eyes at least as wide as the diameter of the anterior ocellus. Fronto-orbital plates at shortest distance between eyes separated by a line-shaped frontal vitta dilating towards the ocellar tubercle and to the anterior margin of frons, narrowest width of fronto-orbital plate one third as wide as diameter of anterior ocellus. Parafacial at level of base of antenna about two thirds as wide as depth of postpedicel, parallel-sided downwards along its length, slightly wider than anterior ocellus. Facial ridge in lower third at least half as wide as depth of postpedicel. Due to the large size of the eyes genal depth below lowest eye margin very narrow, about as wide as anterior ocellus. Depending on incidence of light fronto-orbital plate, frontal vitta and parafacial dark or dusted greyish-white, ocellar tubercle contrasting black, face whitish-grey at certain incidence of light with slightly ochre shimmer, gena reddish-brown, not dusted. Antenna brown and dusted whitish-grey, pedicel with a pale narrow anterior margin, only at certain viewing angle sparsely dusted greyish. Postpedicel three times as long as deep and 2.3 times as long as pedicel. Arista brownish, approximately 2.3 times as long as length of postpedicel, longest dorsal hairs of arista almost twice as long as depth of postpedicel. Fronto-orbital plate with four strong setae in the anterior third, in middle third of frons about two small setae and in the upper third at the level of the anterior tip of the ocellar triangle a strong reclinate seta and closely below a smaller one, about half as long. Anterior surface of gena bare. Facial ridge without clearly recognizable small setulae. Vibrissal setae strong and at least twice as long as the longest surrounding peristomal setae. Lateral surface of gena and post-occipital surface reddish-brown somewhat dusted greyish and with long dark seta-like hairs. Proboscis neither strikingly stout nor conspicuously long, brown, prementum brown somewhat shiny and sparsely dusted; length of labella about twice as long as depth of proboscis; palpus depending

on conditions of light yellow or pale brown, predominantly slender and somewhat longer than prementum.

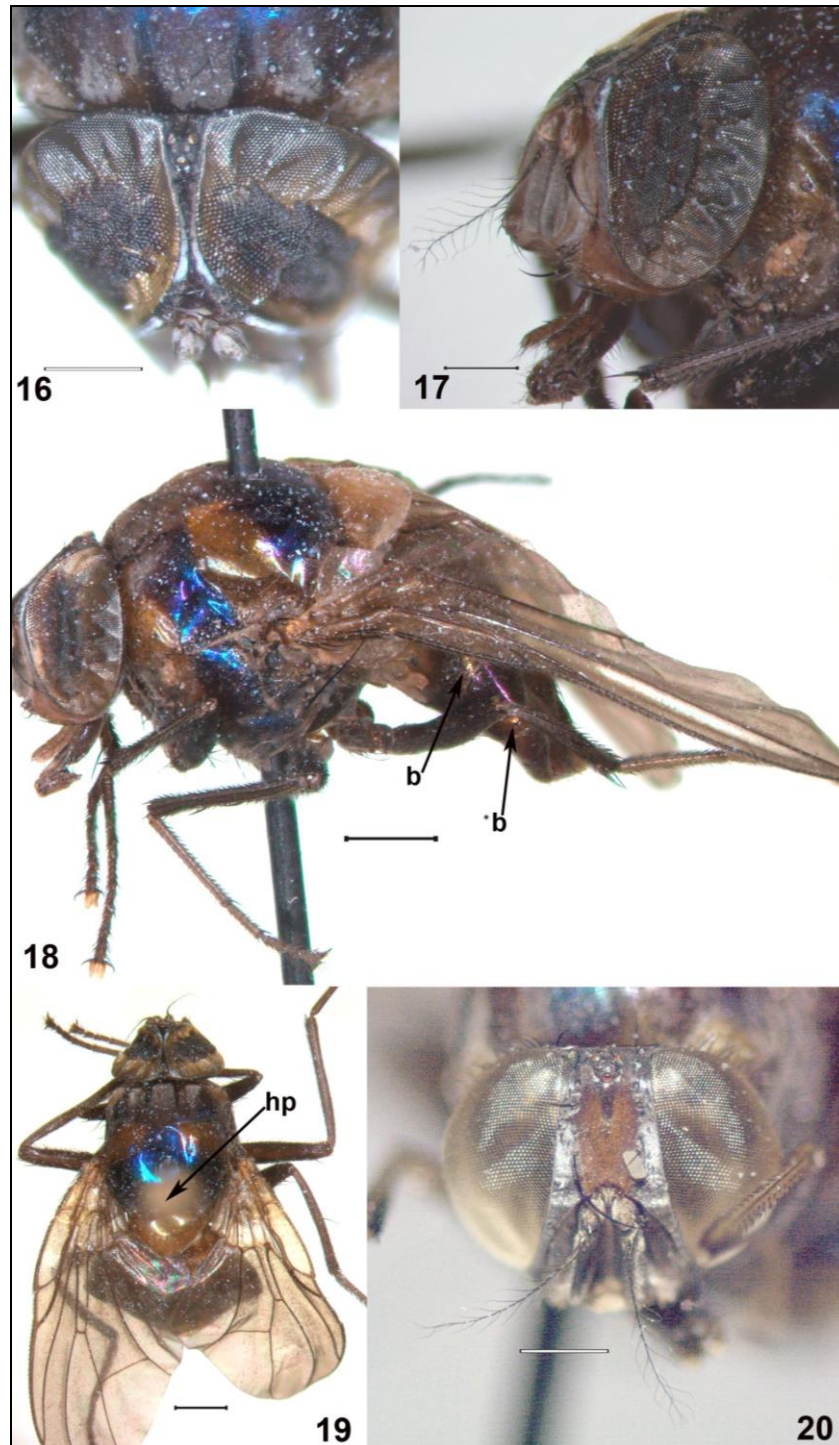
Thorax. Ground-colour dark violet and partly yellow, the violet body parts at certain incidence of light with metallic and strong bluish reflections (Fig. 18). In direct posterior view the anterior half of mesonotum densely dusted greyish (Fig. 19). In dorsal view mesonotum predominantly shiny dark violet with some bluish reflections, in postero-dorsal view presutural with a broad longitudinal stripe densely dusted greyish-white dilating towards the transverse suture and fusing with the paramedian stripes, dusted greyish and tapering slightly behind the level of second presutural dorsocentral seta. Postsutural part of mesonotum sparsely dusted and predominantly shiny violet or bluish apart from the strikingly yellow surface extending between the transverse suture to the level of the first postsutural dorsocentral seta and from there straight down to the wing basis and the area around the supra-alar setae (Fig. 18). Scutellum uniformly yellow, contrasting to mesonotum. Postpronotum and the area around the anterior spiracle strikingly yellow, in contrast to the adjacent dark bluish anterior part of mesopleuron and the surrounding pleura. The pleura depending on conditions of light predominantly bluish or violet and partly reflecting with the exception of the brown coloured meron. At certain angle of viewing the pleura more or less dusted greyish. Anterior spiracle yellow, posterior spiracle brownish. Dorsocentrals 2+2; outer postpronotal seta distinctly stronger; posthumeral seta 1, presutural seta 1, distinctly stronger than the posthumeral seta; anterior notopleural seta stronger; pre-alar seta distinct, about half as long as posterior notopleural seta; the anterior intra-alar seta clearly shorter. Prosternum dark. Anepisternal setae 1+5, the anterior seta weak, the posterior setae varying in strength, some extremely strong, interstitial seta-like hairs much weaker. Basal seta of scutellum and preapical seta much weaker but distinguishable from the longer seta-like ground-hair.

Wing. Membrane with a distinct brown tinge (Figs 18, 19). Tegula and basicosta brown, veins dark brown. Costal spine distinct, about twice as long as neighbouring bristles. Vein R4+5 dorsally at most with about two to four setulae on radial node and basis of R4+5, ventrally with a row of distinctly bigger setulae almost reaching cross-vein r-m. Cross-vein r-m slightly basad of the point where vein R1 enters costa; distal cross-vein weakly curved and almost in right angle to vein Cu1. Both calypters brownish transparent, margins depending on incidence of light slightly darker or paler than calypters, lower calypter almost twice as long as upper calypter. Knob and stem of haltere brown.

Legs. Coxae, trochanters and femora dark brown (Figs 18, 19), femora at certain viewing angle somewhat shiny, tibiae clearly brown and tarsi somewhat yellowish-brown. Pulvilli and claws well developed but not as long as the associated tarsomere. Posterodorsals and posteriors of fore femur shorter than the posteroventral setae, in addition in basal half of fore femur several fine ventral hairs about half as long as or slightly longer than the depth of femur. Fore tibia with a median posterior seta more than twice as long as diameter of tibia. Mid femur along its length with irregular rows of antero- and posteroventral hairs about half as long as depth of femur, in addition a few single very thin hairs between the hairs of the antero- and posteroventral rows, the longest hair about twice as long as the depth of femur, preapically of mid femur a short anterodorsal, one almost dorsal and two posterior to posterodorsal setae. Hind femur with a complete

row of strong anterodorsal setae and a complete row of long anteroventral hairs, the most apical ones more seta-like, an irregular row of somewhat shorter posteroventral hairs throughout the length of femur. Hind tibia at middle third

with a strong anterodorsal seta slightly longer than diameter of tibia and two weaker anteroventral setae about as long as the diameter, a third anteroventral seta shorter than the width of tibia might be present as well.



Scale bars; Figs 16 -17, 20, 0.5 mm; 18-19, 1 mm

Figs 16-20: *Dichaetomyia vohimana* spec. nov., male holotype; 16) Anterior view with a very narrow frons; 17) lateral view of head with conspicuously large eyes; 18) lateral view of thorax and abdomen with some brass reflections (b) at violet coloured parts; 19) dorsal view of thorax and wings (light patch marked as hp = reflections of the head of the pin). Female paratype; 20) anterior view and width of frons.

Abdomen. Tergites predominantly violet and shiny, at certain conditions of light with a more or less distinct brownish shimmer or a brass shine (Fig. 18), only sparsely dusted, anterior part of syntergite 1+2 brown and apical third of tergite 5 yellow, all tergites laterally and ventrally about concolorous with corresponding dorsal surface. Marginal setae of tergite 4 stronger than the marginals of tergite 5 and

discal setae not strongly developed. Sternites brownish with a contrasting yellow hypopygium; sternite 1 laterally with some longer seta-like hairs.

Male genitalia. The determination of the species is not based on characters of genitalia. Therefore, the genitalia were not extracted to avoid damage of the only available male specimen.

Measurements. Length of body about 7.3 mm; length of wing about 6.8 mm.

Description (female). Head. Ground-colour similar to male, but somewhat more reddish-brown. Dichoptic; eyes with few scattered tiny hairs. Frons at vertex about 0.25 times as wide as largest width of head and dilating slightly downwards (Fig. 20). At level of anterior ocellus about 2.8 times and at anterior margin 3.6 times as wide as the distance between the outer margins of posterior ocelli. Fronto-orbital plate at level of anterior ocellus about twice as wide as diameter of anterior ocellus; frontal vitta slightly oval-shaped, at midway about three times as wide as the fronto-orbital plate at that point. The anterior tip of the rather narrow frontal triangle reaching almost the level of the insertion of the most upper fronto-orbital seta. Parafacial at level of base of antenna about as wide as depth of postpedicel, at midway about as wide as anterior ocellus and at the point where parafacial and facial edge separate almost twice as broad as anterior ocellus. Facial ridge in lower half somewhat wider than half the depth of postpedicel. Genal depth below lowest eye margin barely as broad as depth of postpedicel. In anterodorsal view fronto-orbital plate and at least upper half of parafacial densely dusted greyish-white, at certain viewing angle less dusted and more brownish, frontal vitta matt reddish brown, ocellar tubercle and frontal triangle dark brown, the latter somewhat shiny. Face and facial ridge predominantly ochre to reddish-brown, at certain incidence of light sparsely greyish-white dusted, peristome and adjacent area of gena reddish-brown to brown with sparse whitish-grey dusting. Antennal segments predominantly brown, depending on angle of viewing more or less whitish-grey dusted, pedicel at certain angle of viewing slightly light brown. Postpedicel about 3.3 times as long as deep and 2.7 times as long as pedicel. Arista and setae as in male. Between eye margin and frontal and orbital setae a few small setulae. Facial ridge with a few tiny setulae, not striking, barely recognizable. Scars of vibrissal setae strong. Proboscis conspicuously stout, strong, labella not much longer than largest depth of proboscis; prementum brown, somewhat shiny, at certain angle dusted greyish; palpus predominantly brown and darker than in male, clearly longer than prementum.

Thorax. Similar to male, however, bluish-greenish reflections stronger; the three presutural greyish-white longitudinal stripes not fusing before transverse suture but tapering towards the suture, at certain viewing angle somewhat exceeding the suture; the postsutural yellow area of the mesonotum somewhat larger than in male.

Wings. As in male, calypters barely brownish more matt transparent, margin of upper calypter with a brown frame, of lower calypter depending on incidence of light yellowish to yellow with a brownish tinge.

Legs. Broadly similar to male legs. However, femora brown, tibiae and tarsi mainly yellowish; fore femur without hairs in basal half; mid femur with an irregular row of fine posteroventral hairs shorter than half the depth of femur predominantly in distal half and at most one or two stronger posteroventral hairs almost as long as depth of femur in basal half; hind femur with about four strong anteroventral setae in apical third.

Abdomen. Similar to male, the ground colour at certain incidence of light metallic shiny greenish blue, in particular the lateral and ventral parts of tergites. Marginals and discals not strikingly strong. Sternites predominantly yellowish with

a brown tinge.

Female genitalia. Not investigated.

Measurements. Body length about 7 mm.

Diagnosis: Male and female of *Dichaetomyia vohimana* spec. nov. run in Couri's key ^[1] to couplet 14 with *Dichaetomyia perineta* and *Dichaetomyia scutellata*. Both sexes differ clearly from the two similar species by the brownish coloured veins at the base of the wing and by a large yellow area on the postsutural mesonotum above the wing base. The latter is absent in *D. perineta* and *D. scutellata*, and the veins at the wing base are strikingly yellow in colour, contrasting with the brown subsequent parts of the veins.

The species *Dichaetomyia mikeana* spec. nov., described above, also resembles the species mentioned in couplet 14, but like *Dichaetomyia vohimana* it has predominantly brown coloured veins at the base of the wings. These two new species with brown veins at the wing basis are easily distinguished by the presence (*Dichaetomyia vohimana*) or absence (*Dichaetomyia mikeana*) of the large lateral postsutural yellow area of the mesonotum.

Discussion

The larger number of *Dichaetomyia* species that have been described from Madagascar in recent years is certainly viewed with some skepticism. However, there are a number of metallic coloured Malagasy *Dichaetomyia* species that at first glance appear almost identical due to body size and the same glossy body colour. When using the currently available identification keys with the poorly differentiating criteria, the different specimens of these similar species are only assigned to a few species. As reported in a previous contribution ^[3] specimens identified as belonging to a certain species did not form a homogeneous group of individuals. Closer examination of the flies revealed that they differed in taxonomic features, such as size of eyes and facets, chaetotaxy of forehead, thorax, middle and posterior femora, or in colour of palpi, antennal segments, calypters, tegula, basicosta, halteres, anterior stigma, legs, scutellum, postpronotum or base of the wing veins. These are all taxonomic characters known and used to distinguish species in other muscid genera. However, they have not been applied for separating the similar looking colourful *Dichaetomyia* species. These characters are also in *Dichaetomyia* in general rather constant and subject to about the same variation as known from the other genera. In order to avoid that the deviation of a character triggers a "new species description", new taxa are usually only described if they are clearly distinguished from the most similar species by two or more taxonomic characteristics. A distinctly different head shape, the absence of larger main setae, or a distinctly yellow coloured wing base are features that could justify a new species without having additional different taxonomic markings. But the new species described previously and in the current publication are usually characterized by several different characters when compared to similar species.

The four new species described above belong to the subgenus *Dichaetomyia*, the subgenus *Panaga* is not represented in this group of specimens. Significantly fewer species of the latter subgenus than of *Dichaetomyia* s. str. have been found on the African mainland, as well as on Madagascar and the Comoro Islands. Too little is known about the biology and preferred biotopes of the species to speculate about reasons of this difference. The same applies also to the distribution of the

metallically shiny, colourful species of *Dichaetomyia* sensu strictu, which apparently only occur in Madagascar. Two of the four species described above have completely metallically shiny body colour. A total of 27 metallically shiny species of the subgenus have now been described from Madagascar, significantly more than the nine Malagasy species belonging to the same subgenus but which are coloured like the members from African mainland, namely grey, yellow to reddish-brown, brown and black. No shiny metallically coloured *Panaga* species are known from the Madagascar subregion. They are coloured similar to the species of the subgenus *Dichaetomyia* occurring in Africa and worldwide.

The similarity of *Dichaetomyia paranigra* with *Dichaetomyia ugandana* and also *Dichaetomyia emdeni* Pont, 1969 has already been discussed in detail recently [5]. Due to too little information on the taxonomic features, it could not be decided whether the undetermined specimens belonged to one of the two taxa, or whether they are representatives of another species. In the meantime, however, the type specimens from *Dichaetomyia paranigra* were compared with image material made from the holotype of *D. emdeni* and specimens including the lectotypes of *D. ugandana*. It is now evident that due to the very dark legs *Dichaetomyia paranigra* is clearly distinguished from *D. emdeni* with bright yellow legs. And the new species also differs from both species by a long anterior presutural dorsocentral seta, which is either absent or only rudimentarily present in *D. emdeni* and *D. ugandana*, respectively. Further differences are described in the section "Diagnosis". With the description of *Dichaetomyia paranigra* spec. nov., the previously discussed possibility that these specimens could be representatives of a third species, which is not only known from Madagascar but also occurs in other areas of Africa, is also superfluous for the time being.

The two newly described species with a metallically coloured thorax and abdomen, *Dichaetomyia mikeana* spec. nov. and *Dichaetomyia vohimana* spec. nov., do not belong to the group of monochromatic greenish species that are similar to *Dichaetomyia tristis* (Zielke, 1972), as was often the case in earlier described taxa. They are distinguished by a conspicuous yellow scutellum that is in contrast with the adjacent greenish-blue or violet mesonotum. The male of *Dichaetomyia mikeana* was incorrectly assigned to the group of *D. perineta* specimens, all of which originated in the rainforest of central Madagascar. Even the holotype of *Dichaetomyia perineta* Zielke 2016, described years ago as *Annaria scutellaris* Zielke, 1974, comes from the rainforest region of central Madagascar. The male of *Dichaetomyia mikeana*, on the other hand, comes from a completely different biotope, namely the deciduous forest region on the south-west coast of Madagascar. It is therefore not surprising that the specimen belongs to different taxa, despite a certain similarity to *D. perineta*.

Dichaetomyia vohimana is not only characterized by a yellow scutellum and yellow postpronotal lobes, but also by a conspicuous postsutural large yellow area of the supra-alar surface. A similar pattern was also found in four *Dichaetomyia* females of the muscid collection kindly loaned by CAS [3]. Unfortunately, all four flies were badly damaged and a reliable determination seemed not possible due to the poor condition of the specimens and the state of knowledge about the Malagasy *Dichaetomyia* species at that time. However, the specimens had been identified by Couri [1] as *Dichaetomyia scutellata*, although the description of the species given by Séguy [17] does not mention the

conspicuously large yellow postsutural yellow marking. After having studied a larger number of shiny species of the genus from this subregion and having identified the new taxa *Dichaetomyia vohimana* that is somewhat similar to the four females with the questionable identification, the damaged females were re-examined and compared with the female paratype of *Dichaetomyia vohimana*. The females were addressed in the former article [3] in detail in the section "Discrepant Identifications". In addition they were listed with the individual registration numbers in the overview of specimens wrongly assigned to species as follows:

3010479 *Dichaetomyia scutellata* > *Dich. (Panaga)* spec.3?

3010573 *Dichaetomyia scutellata* > *Dichaetomyia* spec.4?

8019793 *Dichaetomyia scutellata* > *Dichaetomyia* spec.4?

8019810 *Dichaetomyia scutellata* > *Dichaetomyia* spec.4?

The re-examination confirmed the earlier finding that the specimen 3010479 belongs to the subgenus *Panaga*. The female is lacking the head and front legs, however based on the current state of knowledge it is very close to *Dichaetomyia (Panaga) necolorata* Zielke 2020 and it has been collected in Parc Nationale Ranomafana in July 2002. The holotype of *D. necolorata* was found in the same area and the same year and the male paratype was captured in November 2001 in Ranomafana Parc. The female differs from the males slightly in weak bluish reflections of the abdomen but only in very certain light conditions, and the ochre halteres are more yellow in the males. However, since there is no other female known that is more similar to *Dichaetomyia (Panaga) necolorata* it cannot be completely excluded that this formerly named "*Dichaetomyia scutellata*" female belongs to this species of the subgenus *Panaga*. The females with the registration number 3010573 and 8019810 are both close to the female of the newly described *Dichaetomyia vohimana*. They both come from the Ranomafana National Park, collected in 2002 at the Vohiparara River and in 1998 at Talataky respectively. One female is distinctly smaller and lacking the fore legs and the right mid leg, the other one has only the left fore leg and the right femur and tibia left. However, it is evident that both originally as "*scutellata*" identified specimens are distinguished from each other and also each one from the *Dichaetomyia vohimana* female by differently shaped proboscis and clearly differently coloured body parts such as legs, halteres, calypters, anterior spiracle, occiput, postgena and mediotergite. The absence of the proboscis, antennae and all legs, a dropped off abdomen and only half a wing prevent even an estimated assignment of the female 8019810 to a species. But here too the marking of the thorax is close to that of the *D. vohimana* female.

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