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Description of four new *Helina* species from Madagascar (Diptera: Muscidae)

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Abstract

Four new species of the genus *Helina* Robineau-Desvoidy are described from Madagascar as *Helina andasiba* spec. nov., *Helina mantada* spec. nov., *Helina ranoma* spec. nov. and *Helina fianara* spec. nov. The latter was previously incorrectly identified as *Helina insignis*. The species *H. insignis* is only known from Madagascar and it is recommended, that it is synonymized with *Helina cyanea*, another species endemic to Madagascar. There are now nine species of the genus that occur in Madagascar. They are compared in a revised identification key to the Madagascan *Helina* species.

Keywords: *Helina*, new species, new synonym, diagnosis, identification key, Madagascar

Introduction

The faunistic-taxonomic studies on Malagasy muscids, which have been carried out at the Institute for Biodiversity and Ecosystem Research (IBER), Sofia, Bulgaria, since 2015, did not only reveal new species for the genus *Dichaetomyia* Malloch, 1921^[1,2]. A few new species of the genus *Helina* Robineau-Desvoidy, 1830 were also identified. Although *Helina* is the most species-rich genus of the Muscidae family in the Afrotropical mainland, the genus seems to be little represented in Madagascar. In the 1980 catalogue of the Afrotropical Muscidae^[3], 99 *Helina* species including subspecies are named, but only two *Helina* species come from the Malagasy region. On the other hand, about ten species of *Dichaetomyia*, the most species-rich genus of the Muscidae in the Malagasy region, are listed from the same geographical region. Since then, several more species of *Dichaetomyia* from Madagascar have been described, while only four other *Helina* species have been assigned to the Madagascan fauna by Couri et al. 2006^[4], three of which were described as new taxa. The total of six Madagascan *Helina* species is compared in an identification key created by the authors^[4].

Three of the six *Helina* species are endemic to the Malagasy region, the other three occur also in countries of the African mainland. Therefore, each *Helina* specimen found among the Madagascan material had to be checked not only by using the key to the Madagascan species^[4] but also by the keys to the Afrotropical species by van Emden^[5]. Moreover, the specimens were compared with the species not listed in the aforementioned identification keys on the basis of the original species descriptions.

Twenty specimens of the material examined proved to belong to the genus *Helina*. Three of the six species reported from Madagascar^[4] were also found among the material examined. They are recorded as addendum. Eight flies belonging to the genus did not match the combinations of characters described for the known species in the keys^[4,5] or in the original species descriptions. Therefore, they were considered as representatives of three new *Helina* species and are described below as *Helina andasiba* spec. nov., *Helina mantada* spec. nov. and *Helina ranoma* spec. nov. In addition, two females from Madagascar, identified by Couri et al.^[4] as *Helina insignis* (Séguy, 1935) and made available by the Californian Academy of Sciences for comparison to other specimens, proved to be incorrectly identified. Since the females could also not be assigned to any other species due to the combination of their taxonomic characteristics, they were classified as members of a new species that is also described below as *Helina fianara* spec. nov.

Materials and Methods

The origin of the muscid material and the methods of species identification have already been described in detail in an article on *Dichaetomyia* species that was recently published in this journal^[1].

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Since much of this also applies to the handling of *Helina* species, the corresponding passages have been taken over verbatim into this chapter of the publication in hand.

The majority of the Muscidae studied had been collected in the last 25 years in different regions of Madagascar. They were loaned by various entomological institutions to IBER for the current investigations. The unidentified muscid specimens were isolated from the in ethanol preserved remains of insect traps, stored in the Moravian Museum, Brno, CZ. Most of the insects detected among the remains were in very poor condition, only a small portion of the Muscidae found were suitable for processing and identification. The flies were cleaned and mounted on a pin as recently described [2].

The vials with the remains contained locality labels, the inscriptions of the locality labels are reproduced verbatim. Since information about the collectors were not found or could not be deciphered, they are not mentioned in the descriptions.

The identification of the Muscidae is based on the keys to the Madagascan Muscidae [4] and on the keys to African species of *Helina* [5] and its subgenera. In addition, specimens of species that were not included in the available keys were compared with original descriptions of species [6-19] that were identified for the first time after the keys were published.

Morphological terminology follows McAlpine [20] but postpedicel is used [21] instead of "first flagellomere" as proposed by McAlpine. The lateral width of the postpedicel of antenna is called "depth" [1], and it usually 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. When the length of hairs or setae of the femur is compared with the depth of the femur, the depth, if not stated otherwise, always refers to the point of insertion of the hair or seta on the femur, if not stated otherwise. Body length was measured in millimetres (mm). The specimens were studied using a Zeiss Stemi SV6 stereomicroscope and images were created by means of a Zeiss Discovery 8 stereomicroscope combined with an Axio-Cam ERc5s camera as already mentioned previously [1, 2]. For identification and comparison of specimens the article by Couri et al. [4] on Malagasy flies is cited frequently. For the sake of simplicity, the paper is sometimes referred to mentioning only "Couri" in the text instead of "Couri et al. 2006".

The undetermined material identified for the paper in hand was compared with identified *Helina* specimens. The specimens including paratypes were kindly loaned for examination to IBER by the Entomological Departments of: Moravian Museum, Brno, CZ; California Academy of Sciences (= CAS), San Francisco, CA/USA and the Museum für Naturkunde, Berlin, D.

Results

Helina andasiba spec. nov. (Figs 1-3)

Material examined: Male holotype; head clearly shrunk, thorax somewhat soiled, especially the anterior and posterior spiracles, some strong setae missing. The locality label on the specimen bears the following information: "C Madagascar, Andasibe-Mantadia N.P., Mantadia circuit "Eulophia", 958 m S18°48'16" E48°25'43", 22-23.I.2017". The holotype will be deposited in the entomological collection of the Moravian Museum, Brno, CZ.

Description (Male): Head. Ground-colour dark grey.

Holoptic, eyes bare. Shortest distance between eyes about twice as wide as the diameter of anterior ocellus. Fronto-orbital plate at narrowest distance between eyes almost as wide as anterior ocellus. Fronto-orbital plates separated by a frontal vitta, at midway about as wide as anterior ocellus. Parafacial at middle about as wide as depth of postpedicel. In profile upper mouth margin about in line with profrons. Genal depth below lowest eye-margin about twice as wide as depth of postpedicel. In anterodorsal view fronto-orbital plate silvery-white, ocellar tubercle brown, slightly greyish-white dusted, frontal vitta greyish-white, parafacial silvery-white at certain angle of light, face whitish. Gena and occipital surface grey. Postpedicel about three times as long as deep and about twice as long as pedicel. Pedicel brown with sparse greyish dusting at some angles of viewing, postpedicel grey. Arista brown, twice as long as length of postpedicel; longest arista hairs at least 1.3 times as long as depth of postpedicel. Inner and outer vertical setae not as long as ocellar setae. Fronto-orbital plate without interstitial hairs or setulae but with three or four conspicuously strong and long inclinate fronto-orbital setae, the longest seta, the most anterior one, about as long as the length of arista, the third seta, the shortest one, longer than the ocellar setae; at level of anterior part of ocellar triangle one reclinate seta, somewhat shorter than ocellar seta and more downwards a very long and strong reclinate seta on the left fronto-orbital plate, there is no corresponding seta or scar on the right side of the frons. Parafacial bare. Vibrissal setae very strong and about twice as long as the longest surrounding peristomal setae. Lower margin of gena with some setae of different length. Proboscis brown, short with broad labella, prementum slightly greyish dusted. Palpus slender and yellow.

Thorax. Ground-colour dark, densely dusted (Fig. 1). Mesonotum without a distinct dark pattern. In posterior view postpronotal lobes and notopleura whitish-grey and mesonotum predominantly rust-brown dusted (Fig. 2), the presutural part of mesonotum, the surface between the rows of postsutural dorsocentral setae and the dorsal and lateral surfaces of scutellum very densely dusted, the lateral area outside the postsutural dorsocentrals less dusted, in certain light conditions the black ground colour shimmers more or less through the sparse rust-brown pollination. Pleura dark, densely grey dusted (Fig. 1) with a brownish tinge at certain angle of light. Mesonotum, scutellum and some pleura very poorly hairy (Fig. 2). Acrostichals 0+1, the posterior seta barely half as long as the posterior dorsocentral seta and much weaker, the presutural acrostichal hairs in two median rows, the distance between the rows shorter than the length of the hairs; dorsocentral setae 2 + 3, the anterior presutural seta much shorter than the other dorsocentrals; postpronotal setae 2, the outer one almost twice as long as the inner weaker seta; posthumeral seta short and weak; presutural seta at least twice as long as posthumeral seta and much stronger; notopleuron without setulae, anterior notopleural seta slightly longer than posterior one; prealar seta only slightly longer than the ground hair; intra-alar seta 1, anterior seta is not recognizable, supra-alar setae 2; postalar setae 3. Prosternum, proepimeral area, anepimeron, meron and katepimeron bare. Katepisternal setae 2+2, the lower posterior seta clearly closer to the posterior upper one than to the anterior upper seta; anepisternal setae 1+5, all posterior setae rather strong, interstitial hairs seta-like, but much shorter and weaker than the anepisternal setae. Scutellum with long apical and lateral setae, basal and preapical setae distinctly shorter; surface with about three

setulae only, lateral surface and ventral surface bare.

Wing. Membrane hyaline with a weak yellowish tinge, crossveins not infuscate. Tegula grey, basicosta brown, basal parts and subsequent parts of veins uniformly brownish coloured. Costal spine practically not distinguishable from surrounding bristles. Radial node and veins ventrally and dorsally bare. Vein M straight, diverging from vein R4+5 (Fig. 1). Crossvein r-m basad from the point where vein R1 enters costa, distal crossvein dm-cu almost straight and in a right angle to vein M. Calypters whitish transparent with a weak yellowish tinge, margins whitish, lower calypter almost twice as long as upper calypter. Halter yellowish.

Legs predominantly dark and grey dusted, fore tibia somewhat yellowish, mid tibia depending on angle of light yellowish or dark with grey dusting, posterior tibia dark, at certain angle distal half yellowish-brown. Pulvilli and claws well developed almost as long as the corresponding tarsomere. Hind coxa bare on posterior surface. Fore femur with complete rows of strong posteroventrals and posterodorsals, all posterodorsal setae about as long as and the posteroventrals distinctly longer than depth of femur. Fore tibia with a conspicuously strong median posterior seta, about one third as long as length of tibia. Mid femur in basal third with about three stronger setae, preapically with two strong posterior to posterodorsal setae, anterodorsal seta not recognisable. Mid tibia in middle third with two strong posterior setae distinctly longer than twice the diameter of tibia, at level of the proximal posterior seta a posteroventral seta distinctly shorter than the posterior seta. Hind femur with a complete row of anterodorsal setae about as long as depth of femur, distal half with a row of about five strong anteroventral setae, almost twice as long as depth of femur, basal half with about four anteroventral seta-like hairs about half as long as the distal setae, a row of posteroventral seta-like hairs in the distal half, the hairs barely half as long as depth of femur, preapically one well developed posterodorsal seta. Hind tibia with two anterodorsal setae about twice as long as diameter of tibia, and two anteroventrals about as long as depth of tibia, no distinct posterodorsal seta present.

Abdomen. Ground-colour yellowish-brown, anterior part of syntergite 1+2 grey, tergites including posterior part of syntergite 1+2 brownish (Fig. 3), with an ill-defined narrow grey band along the basal and apical margin of tergites 3 to 5 (Figs 1, 3), without any other pattern on the tergites independent of viewing angles, however, stronger setae with a dark dot at the base. Tergite 3 with some very long marginal setae, only the median ones somewhat shorter, tergite 4 with a complete row of long marginals and laterally with few long discal setae, tergite 5 with complete rows of long discals and marginals. Sternites greyish; sternite 1 bare.

Male genitalia. Hypopygium slightly pronounced. The species is clearly distinguished from similar species of the genus by morphological characters, the identification does not depend on comparison of characters of terminalia. Therefore, it has been deemed wiser to refrain from extracting the genitalia to avoid inflicting damage to the only currently available specimen of this new species.

Measurements. Length of body about 5.3 mm; length of wing about 5.1 mm.

Female not known.

Etymology: The name of the new species "*andasiba*" is a feminine adjective and refers to the Andasibe-Mantadia National Park, where the fly had been collected.

Diagnosis: The male of *Helina andasiba* spec. nov. runs in the key of van Emden^[5] to *Helina lenta* Curran, 1938 but it does not match the characters of *H. lenta* listed in the couplet. For example the new species is not marked by a greyish brown dusted abdomen with dark spots on second and third segment, the mesonotum has not three broad black vittae and the postpronotal lobe is not black but conspicuously whitish dusted, the hind tibia has not three but only two anterodorsal setae. Using the key to Madagascan *Helina* species^[4] the new species leads to couplet 5, but differs distinctly from the two species listed in the couplet by the colour and pattern of the mesonotum. In addition the fore tibia of *H. andasiba* is marked by a very long posterior seta in the middle third of fore tibia, whereas the fore tibia is without a posterior seta in *Helina caripae* Couri et al., 2006; and from *Helina grisella* Couri et al., 2006 with yellow legs the new species differs, among other features, in its predominantly dark legs (Fig. 1).

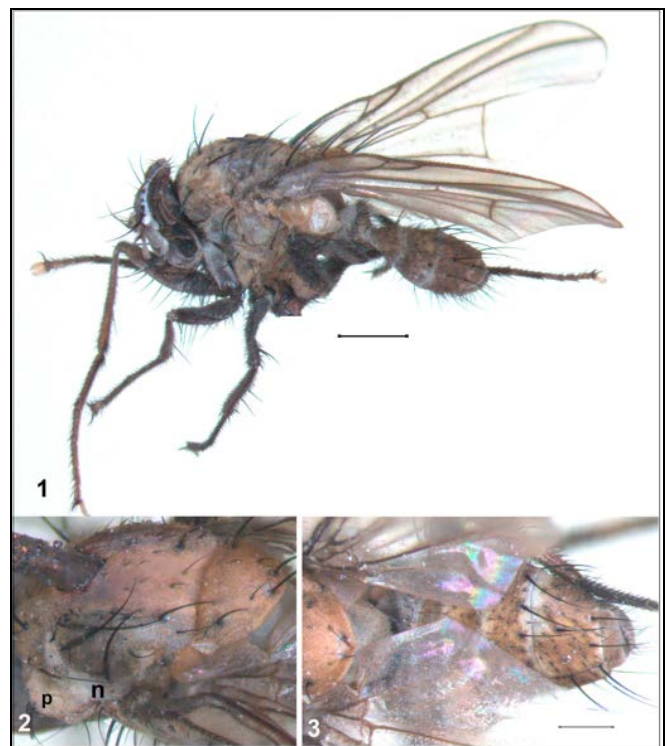


Fig 1-3: *Helina andasiba* spec. nov., male holotype; 1) lateral view; 2) dorso-lateral view of mesonotum and scutellum, little hairy (p = postpronotum, n = notopleuron, both pleura densely whitish dusted); 3) dorsal view of abdomen.

Scale bars; Figs: 1, 1 mm; 3, 0.5 mm.

***Helina fianara* spec. nov.** (Figs 4-8)

Material examined: Female holotype; the locality labels read: "Madagascar, Province Fianarantsoa, Parc National Ranomafana, Vohiparara, at broken bridge, el. 1110 m 16 Oct - 8 Nov 2001" and "21°13,57' S, 47°22,19' E collector: R. Harin'Hala California Academia of Sciences, malaise trap in high attitude rainforest, MA-02-09A-01" and a small label with a specimen registration number "CASENT 3010419". The specimen is missing both fore legs and the right mid leg. The left mid leg is broken and only little connected with the

basis of femur. The female paratype bears a similar locality label showing a different date of collecting and a different collecting number:: "Madagascar, Province Fianarantsoa, Parc National Ranomafana, Vohiparara, at broken bridge, el. 1110 m 31 March - 8 April 2002" and "21°13,57' S, 47°22,19' E collector: R. Harin'Hala California Academia of Sciences, malaise trap in high attitude rainforest, MA-02-09A-23". The specimen registration number is "CASENT 3010570". The female only has the right hind leg. Both specimens had been incorrectly identified by previous investigators as *Helina insignis* (Séguy) ^[4] and were listed as such in their revision of the Malagasy Muscidae.

Both type specimens will be returned to the entomological collection of Californian Academy of Sciences, San Francisco. The female holotype is labelled now with the additional registration number CASTYPE 20298, provided by California Academy of Sciences.

Description (female): Head. Ground-colour dark almost black (Fig. 8). Dichoptic; eyes with short scattered hairs, facets of about equal size. Frons practically parallel sided, at level of vertex about 0.36 times as wide as maximal head width; at level of anterior ocellus about 3.5 times and at anterior margin of frons 3.9 times as wide as the distance between the outer margins of posterior ocelli. Fronto-orbital plate at middle of frons about 1.5 times as wide as anterior ocellus; below the anterior ocellus, the frontal triangle becomes conspicuously narrower, anterior tip reaching anterior margin of frons (Fig. 7). Parafacial at level of antenna basis almost twice as wide as depth of postpedicel, at midway about as wide as and at the lower end slightly wider than depth of postpedicel. Facial ridge at lower end almost as wide as parafacial. In profile upper mouth margin in line with profrons. Genal depth below lowest eye margin about 1.6 times as wide as depth of postpedicel. In anterodorsal view frontal vita matt black, fronto-orbital plate black with sparse whitish dusting, ocellar triangle dark somewhat shiny; parafacial weakly silver-grey dusted with a distinct large dark patch at basis of postpedicel, face somewhat greyish-white dusted and facial ridge contrasting brownish-grey. Pedicel and postpedicel dark brown, pedicel in certain conditions of light grey dusted. Postpedicel about three times as long as deep and twice as long as pedicel. Arista brown, more than twice as long as length of postpedicel, longest hairs of arista as long as depth of postpedicel. Inner vertical seta about twice as long as outer vertical seta. Ocellar setae missing, but corresponding scars distinctly stronger than the base of inner verticals. Anterior half of fronto-orbital plate with three or four long inclinate setae, the anterior one longer than the upper setae, upper half of frons with scars of strong setae, very likely of reclinate orbital setae. Only a few small proclinate setulae between eye margin and fronto-orbital and orbital setae. Parafacial and face bare. Lateral surface of gena bare, lower margin with black setae. Proboscis rather short, somewhat bulbous, prementum dark brown, greyish dusted, labella at least 1.5 times as long as widest depth of bulbous proboscis; palpus dark brown, slender slightly clavate, about as long as prementum.

Thorax. Ground-colour deep dark brown, almost black, shiny or, depending on viewing angle, clearly greyish-brownish dusted. In posterodorsal view the mesonotum including lateral pleura and scutellum uniformly shiny blackish, at certain angle with a dark brownish tinge, the presutural part of mesonotum with two narrow greyish-white dusted

paramedian stripes each one surrounding a row of dorsocentral setae (Fig. 5), the stripes anteriorly somewhat broader and tapering along its length, continued in the postsutural part up to the anterior dorsocentral seta as a very faint thin whitish line, only visible in certain conditions of light. When viewed from lateral or anterior mesonotum partly with some brownish dusting. Pleura shiny dark brown, from anterior view posterior pleura partly brownish dusted. Anterior and posterior spiracle dark brown. Mesonotum, scutellum and pleura sparsely covered with short dark setulose hairs. Acrostichals 0+1, the posterior seta barely half as long as the posterior dorsocentral seta, the presutural acrostichal hairs in two median rows the distance between the rows shorter than the length of the hairs; dorsocentral setae 2 +3, all strong and long; posthumeral 1; presutural 1; postpronotal setae 2, the outer one clearly longer than the inner seta; notopleuron without setulae, anterior notopleural seta slightly longer than posterior one; prealar seta not recognizable; intra-alar seta 2; supra-alar setae 2; postalar setae 3, the most posterior seta very small. Prosternum, proepimeral area, anepimeron and katepimeron bare, meron with a few fine hairs below the posterior spiracle. Katepisternal setae 2+2, the lower posterior seta closer to the posterior than to the anterior upper seta; anepisternal setae 1+6-7 all rather strong, only a few very short interstitial hairs. Scutellum with long apical and lateral setae, basal and preapical setae distinctly shorter, but clearly distinguishable from ground-hair; lateral surfaces and ventral surface completely bare.

Wing. Membrane hyaline with a brownish tinge (Fig. 4), crossveins not infuscate. Tegula and basicosta dark brown, wing veins yellowish to brown. Costal spine about as long as crossvein r-m. Radial node and veins ventrally and dorsally bare. Vein M straight, diverging from vein R4+5. Crossvein r-m basad from the point where vein R1 enters costa, distal crossvein dm-cu weakly sinuous and slightly oblique. Upper calypter transparent, margin white and at certain incidence of light dark framed, lower calypter yellowish to brownish transparent, margin yellowish-brown, darker than the calypter, lower calypter about 1.5 times as long as upper calypter. Haltere stem yellow, knob white contrasting to the dark surrounding (Fig. 4).

Legs dark brown. Pulvilli and claws small. Hind coxa bare on the posterior surface. Fore legs are missing. Mid femur in basal two thirds with a row of strong setae in the upper half of the anterior surface and about four anteroventral and three posteroventral setae in the basal half, the setae barely as long as the depth of femur apart from one posteroventral almost spine-like seta, in distal half a row each of short anteroventral and posteroventral seta-like hairs, almost half as long as depth of femur, preapically three strong posterior to posterodorsal setae and a distinct anterodorsal seta. Mid tibia in middle third two strong posterior setae about twice as long as diameter of tibia. Hind femur with a complete row of strong anterodorsal setae barely as long as depth of femur, a row of about five or six strong anteroventral setae along the length of femur, the apical setae clearly longer than the basal ones, pre-apically two well developed posterodorsal to almost dorsal setae. Hind tibia with two strong anterodorsals in middle third, about twice as long as diameter of tibia and two anteroventrals somewhat longer than the diameter, no distinct posterodorsal seta present.

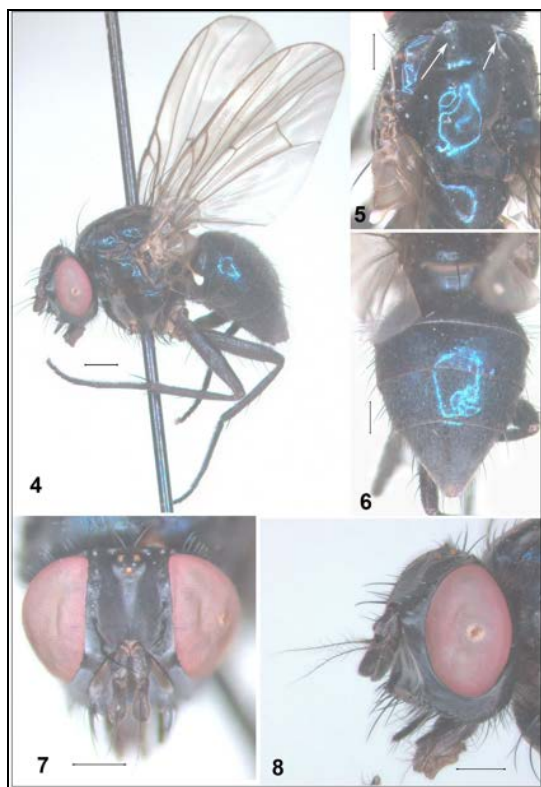
Abdomen. Ground-colour uniformly shiny dark brown to black, in certain conditions of light with a very dark bluish

tinge or with distinct greyish-white dusting. Tergites (Fig. 6) without any pattern, at some viewing angles with greyish-brownish dusting, apical margin of tergite 5 with a weak diffuse reddish-brown tinge. Tergite 3 laterally with some distinct marginal setae, tergite 4 with a complete row of long marginals and tergite 5 with several discals and with a row of hair-like marginals, distinctly shorter than the discals. Sternites dark; sternite 1 bare.

Female genitalia not investigated.

Measurements: Length of body about 7.7 mm; length of wing about 8 mm.

Male not known.



Figs 4-8: *Helina fianara* spec. nov., female holotype; 4) lateral view; 5) dorsal view of thorax, white arrows point to the white paramedian stripes of the presutural part of mesonotum; 6) dorsal view of abdomen; 7) head, anterior view of frons; 8) head, lateral view.

The indentations on the thorax and abdominal surface (Figs 4-6) that emerged mainly when preparing the flies obviously cause a strong bluish reflection of the photographic lighting, which makes the body colour appear clearly more blue than it actually is. Areas of the thorax and abdomen that are not indented are more naturally coloured in the images, but due to the photographic lighting they still appear more colourful than in normal lighting conditions.

Scale bars; Figs: 4, 1 mm; 5-8, 0.5 mm

Etymology: The epithet "*fianara*" is a feminine adjective referring somewhat modified to the province Fianarantsoa, where the flies were found.

Diagnosis: Depending on whether the fore tibia is marked with or without a posterior seta the female of *Helina fianara* spec. nov. runs either to *H. lenta* or *Helina juxtamedialis* van Emden, 1951 respectively. However, the ground-colour of both known species is not shiny dark as in *H. fianara* and in both species the abdomen is marked by dark patches, which are absent in the newly described species.

***Helina mantada* spec. nov.** (Figs 9-12)

Material examined: Female holotype; the left fore leg is missing. The locality label on the specimen reads: "MTD/Jan.2017/2/II-FIT C Madagascar Andasibe-Mantadia N.P.; 19-22.i.2017, Mantadia circuit "*Eulophia*", 958 m S18°48'16" E48°25'43". The holotype will be deposited in the entomological collection of the Moravian Museum, Brno, CZ.

Description (female): Head. Ground-colour brown, not dark brown, depending on incidence of light more or less greyish-white dusted. Dichoptic; eyes with some scattered very short hairs, facets of about equal size. Frons dilating towards anterior margin. At level of vertex about 0.27 times as wide as maximal head width; at level of anterior ocellus about 3.2 times and at anterior margin of frons 4.4 times as wide as the distance between the outer margins of posterior ocelli. Fronto-orbital plate at middle of frons slightly broader than anterior ocellus; anterior tip of frontal triangle reaching about the level of second pair of fronto-orbital setae. Parafacial at level of antenna basis 1.3 times as wide as depth of postpedicel, at midway almost as wide as and at the lower end slightly wider than depth of postpedicel. Facial ridge at lower end almost half as wide as parafacial. In profile upper mouth margin in line with profrons. Genal depth below lowest eye margin about as broad as depth of postpedicel. Colour of frons and lower part of head varying between dark and greyish-white dusted, depending on the light conditions. In anterodorsal view frontal vitta matt brown, fronto-orbital plate with a very thin whitish line along the eye margin (Fig. 9), ocellar triangle greyish-white; basis of parafacial down to the level of basis of postpedicel with a white dusted patch, followed by a brown section reaching midway of postpedicel, the lower part of parafacial and gena greyish-white, face and facial ridge whitish dusted (Fig. 10). Basal segments of antenna matt yellow, postpedicel light greyish with a yellowish tinge at certain viewing angle. Postpedicel about 3.2 times as long as deep and barely twice as long as pedicel. Arista brownish, approximately 1.5 times as long as length of postpedicel, longest hairs of arista about 1.7 times as long as depth of postpedicel. Inner vertical seta about twice as long as outer vertical seta. Ocellar setae very long, reaching anterior margin of frons (Fig. 10). Anterior half of fronto-orbital plate with three strong inclinate setae, the anterior one almost as long as the ocellar seta, the third one slightly shorter and the middle one about half as long as the anterior seta, the upper half of frons with two strong reclinate orbital setae about equally long but only half as long as the third fronto-orbital seta. An irregular row of small proclinate setulae between eye margin and fronto-orbital setae on the anterior half of frons. Parafacial and face bare. Vibrissal setae stronger and somewhat longer than the anterior fronto-orbital seta, the longest surrounding peristomal setae barely half as long. Lateral surface of gena bare, lower margin with a row of small black setae and more ventrally with a row of long and strong bristle-like setae. Proboscis not conspicuously long somewhat bulbous, prementum brown, somewhat greyish dusted but slightly shiny in certain conditions of light, labella about as long as widest depth of bulbous proboscis; palpus yellow, slender, about as long as prementum.

Thorax. Ground-colour dark with greyish dusting, postpronotal lobes with a distinct yellowish shine and densely white dusted. Mesonotum without a distinct dark pattern. In dorsal view postpronotal lobes and the suture between mesonotum and notopleuron strikingly white dusted contrasting to the predominantly black mesonotum, the

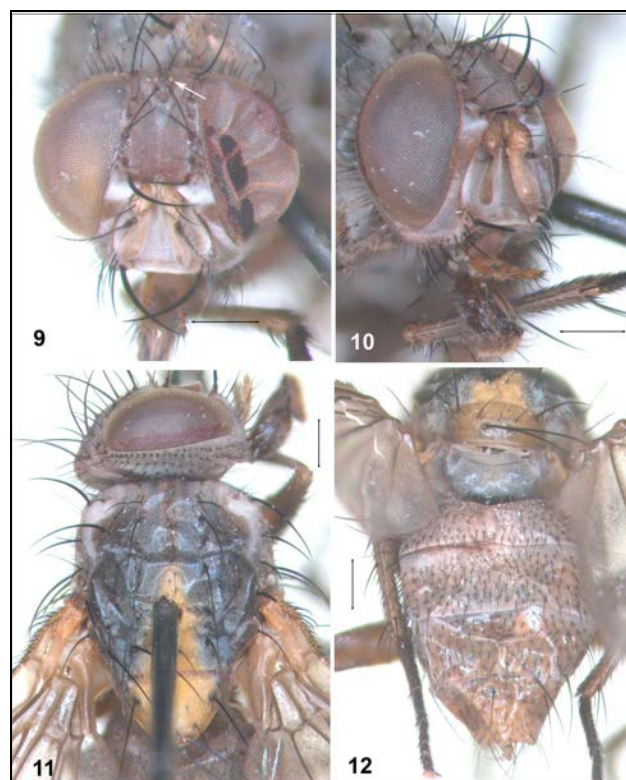
surface laterally outside of the rows of dorsocentral setae somewhat shiny; the surface between the rows of dorsocentrals slightly greyish dusted, presutural part of mesonotum with a faint ill-defined narrow median yellowish stripe reaching the transverse suture and continued in the postsutural part of mesonotum, where the stripe spreads over the entire length to the almost entire width of the scutellar suture, thus forming a golden-yellowish triangular-shaped patch over the entire length of the postsutural mesonotum (Fig. 11). The dorsal and lateral surfaces of the scutellum, with the exception of the blackish base of the side, evenly densely yellowish dusted. Pleura dark, greyish dusted. Anterior and posterior spiracle yellowish-white. Mesonotum, scutellum and pleura hardly hairy. Acrostichals 0+1, the posterior seta about one third as long as the posterior dorsocentral seta, the presutural acrostichal hairs in two median rows, the distance between the rows shorter than the length of the hairs; dorsocentral setae 2 + 3, the anterior presutural seta much shorter than the other dorsocentrals; postpronotal setae 2, the outer one almost three times as long as the inner weaker seta; posthumeral seta 1; presutural 1, about three times as long as the posthumeral seta; notopleuron without setulae, anterior notopleural seta slightly longer than posterior one; prealar seta slightly longer than the ground hair; intra-alar seta 1, supra-alar setae 2; postalar setae 3. Prosternum, proepimeral area, anepimeron, meron and katepimeron bare. Katepisternal setae 2+2, the lower posterior seta about equally distant to the posterior and to the anterior upper seta, the anterior lower seta very close to the anterior upper seta; anepisternal setae 1+5 all strong, only a few very short interstitial hairs present. Scutellum with long apical and lateral setae, basal and preapical setae distinctly shorter, apart from one discal setula no ground hair on the scutellum.

Wing. Membrane hyaline with a weak yellowish-brownish tinge, crossveins not infuscate. Tegula and basicosta yellow, veins at basis of wing strikingly yellowish and in contrast to the subsequent brownish parts of the veins (Fig. 11). Costal spine about twice as long as surrounding bristles. Radial node and veins ventrally and dorsally bare. Vein M straight, diverging from vein R4+5. Crossvein r-m slightly basad from the point where vein R1 enters costa, distal crossvein dm-cu slightly bent inwards and somewhat oblique. Calypters yellowish transparent, margins yellowish, lower calypter 1.5 times as long as upper calypter. Halter entirely yellow. Legs predominantly brown, tibiae yellowish, posterior tibia somewhat darker yellow. Pulvilli and claws well developed, shorter than the tarsomeres on which they are located. Hind coxa bare on the posterior surface. Fore femur with complete rows of strong posteroventrals and posterodorsals, all posterodorsal setae about as long as and the posteroventrals distinctly longer than depth of femur. Fore tibia with a conspicuously strong median posterior seta, almost half as long as length of tibia. Mid femur with an irregular row of short anteroventral seta-like hairs, about one third as long as depth of femur, in basal half with three long almost spine-like posteroventral setae, somewhat longer than the depth of femur, in distal half a row of posteroventral seta-like hairs barely half as long as depth of femur, preapically two strong posterior to posterodorsal setae, anterodorsal seta not recognisable. Mid tibia with two strong posterior setae in middle third, distinctly longer than twice the diameter of tibia, slightly below the level of the proximal posterior seta a posteroventral seta about half as long as the posterior seta.

Hind femur with a complete row of anterodorsal setae about as long as depth of femur, distal half with a row of about five strong anteroventral setae, somewhat longer than depth of femur, in the basal half about three posteroventral seta-like hairs about half as long as depth of femur and one long posteroventral seta in middle third, pre-apically a short row of short posteroventral setae and one well developed posterodorsal seta. Hind tibia with two anterodorsals, the distal seta about twice as long as diameter of tibia, the more basad inserted seta and the two anteroventral setae about as long as depth of femur, no distinct posterodorsal seta present. Abdomen. Ground-colour greyish-ochre to pale brownish, somewhat shiny, anterior part of syntergite 1+2 grey, tergites including posterior part of syntergite 1+2 depending on viewing angle ochre to brownish grey, somewhat yellowish at certain angles, the apical part of tergite 5 distinctly more yellowish (Fig. 12). Tergites densely covered with small setae, all of which with a small dark dot at base. Tergite 3 laterally with some distinct marginal setae, tergite 4 with a complete row of long marginals and tergite 5 with complete rows of discals and marginals, all distinctly shorter than the marginals of tergite 4. Sternites greyish; sternite 1 bare. Female genitalia not investigated.

Measurements. Length of body about 5 mm; length of wing about 5.5 mm.

Male not known.



Figs 9-12: *Helina mantada* spec. nov., female holotype; 9) head, anterior view of frons, white arrow points to the left posterior ocellus; 10) head, antero-lateral view; 11) thorax and yellow basis of wing veins, dorsal view; 12) abdomen, dorsal view. Scale bars; Figs: 9-12, 0.5 mm.

Etymology: The name of the new species "*mantada*" is a feminine adjective and refers slightly modified to the Andasibe-Mantadia National Park, where the fly had been collected.

Diagnosis: The species runs in the key ^[5] to Afrotropical

Helina species to couplet 50(55) to *Helina mediorufa* van Emden, 1951. However, *Helina mantada* spec. nov. differs from this species by several taxonomic features, for example by having a distinct posteroventral seta in the middle of the mid tibia in addition to the two long posterior setae, and only one clearly recognizable intra-alar seta on the postsutural part of mesonotum. In addition, *H. mantada* is marked by a large conspicuous yellow triangular-shaped patch on the posterior part of mesonotum and an almost completely yellow coloured scutellum whereas the mesonotum of *H. mediorufa* is characterized by a pair of rather narrow paramedian vittae and a differently coloured scutellum. Using the key to the Madagascan species ^[4] *H. mantada* is nearest to *H. carpiæ* since both species are marked by a striking yellow triangle-shaped patch on the postsutural part of the mesonotum and a yellow scutellum. However, they differ by several characteristics. *H. mantada* has in contrast to *H. carpiæ* a long median posterior seta on the fore tibiae and a distinct posteroventral seta on the mid tibia, the veins at the basis of the wing are strikingly yellow and contrasting to the subsequent parts of the veins, and the abdomen is greyish-ochre coloured whereas it is dark brown in *H. carpiæ*.

***Helina ranoma* spec. nov.** (Figs 13-18)

Material examined: Female holotype; the locality label of the holotype reads: "Madagascar, Ranomafana N. P. S21°15'47''E47°25'13'' 987m, 11.-14.i.2017, FIT". Two female paratypes with a similar locality label: "Madagascar, Ranomafana N. P. S21°15'46''E47°25'14'' 987m, 10.-14.i.2017, FIT 2". Another female paratype with the label "N. Madagascar, Ankarana N. P. S12°57'E49°07' 987 m, 23.-25.i.2016, FIT in dark forest". At the preparation process the female lost the left front leg and the right mid tibia and tarsomeres, which were processed for DNA analysis. The DNA sample was registered as D94, the paratype specimen is marked with an additional label "D94". The only male paratype is missing the right front leg, both mid legs and several major setae. These deficiencies are the reason a female was chosen as holotype. The label on the male and a further female paratype from the same locality reads: "E. Madagascar official entrance Ranomafana N. P., S21.25629°-.26323°E47.42216°-.42142° 915-996 m, 09.i.2017, sweeping forest", an additional label "M95" on the male bears the registration no of the DNA sample obtained from the front leg fallen off during the preparation process.

Two females, one with several lost legs and the other with worn thoracic patterns, were also examined but not selected as paratypes. One female has the same collection data as the female paratype from Ankarana, the other specimen comes from the same locality as the male and female paratype.

The holotype and two paratypes will be deposited in the entomological collection of the Moravian Museum, Brno, CZ, three paratypes remain in the entomological collection of IBER.

Description (female): Head. Ground-colour dark. Dichoptic; eyes bare, facets of about equal size. Frons almost parallel sided only slightly dilating towards anterior margin (Fig 14). At level of vertex about 0.39 times as wide as maximal head width; at level of anterior ocellus about 3.6 times and at anterior margin of frons 4.2 times as wide as the distance between the outer margins of posterior ocelli. Fronto-orbital plate at middle of frons about twice as wide as anterior ocellus; anterior tip of the frontal triangle almost or

completely reaches the anterior margin of frons. Parafacial at level of antenna basis about 1.5 times as wide as depth of postpedicel, at midway about two thirds and at the lower end about as wide as depth of postpedicel. Facial ridge at lower end about half as wide as parafacial. In profile upper mouth margin in line with profrons. Genal depth below lowest eye margin at least as wide as depth of postpedicel. Colour of frons and lower part of head varying between dark and greyish-white dusted, depending on incidence of light. In anterodorsal view frontal vitta matt blackish, fronto-orbital plate in upper half greyish with a weak brownish tinge and in lower half greyish-white dusted, ocellar tubercle dark; frontal triangle depending on viewing angle dark or somewhat greyish-white dusted, parafacial in basal half with a shifting dark patch more or less framed by greyish-white dusting (Fig. 15), lower half of parafacial and gena predominantly dark with a greyish tinge, face and facial ridge depending on angle of light dark or slightly greyish-white dusted. Pedicel of antenna black, densely greyish-white dusted, postpedicel greyish-brown. Postpedicel about 2.3 times as long as deep and about twice as long as pedicel. Arista brown, at least twice as long as length of postpedicel, longest hairs of arista about 1.5 times as long as depth of postpedicel. Inner vertical seta slightly shorter than outer vertical seta. Ocellar setae about twice as long as verticals. Anterior half of fronto-orbital plate with three or four inclinate setae, the anterior one about twice as long as the upper setae, one or two very small interstitial hairs are present, upper half of frons with two strong reclinate orbital setae, the upper one somewhat longer and about as long as the upper fronto-orbital seta (Figs 14, 15). Several small proclinate setulae between eye margin and fronto-orbital and orbital setae. Parafacial and face bare. Vibrissal setae strong and about twice as long as the longest surrounding peristomal setae. Lateral surface of gena bare, lower margin with black setae. Proboscis not conspicuously long, somewhat bulbous, prementum dark brown, somewhat greyish dusted but slightly shiny at certain conditions of light, labella slightly longer than widest depth of the bulbous proboscis; palpus black, slender slightly clavate, at least as long as prementum.

Thorax. Ground-colour dark, dorsally partly densely dusted. In dorsal view (Fig. 13) the presutural part of mesonotum with broad greyish-white dusted paramedian stripes each one surrounding a row of dorsocentral setae and a slightly narrower median stripe, the latter separated from the paramedian stripe by a brown stripe barely as broad as the median stripe. All stripes usually end at the transverse suture or before. Postpronotal lobes whitish-grey dusted, lateral parts of presutural mesonotum matt dark brown, depending on viewing angle either slightly shiny or thinly dusted. In dorsal view the surface of the postsutural mesonotum within the rows of dorsocentral setae densely yellowish dusted, the area outside the row is less densely dusted up to the level of the intra-alar bristles, the lateral part of the postsutural mesonotum matt dark brown like the corresponding presutural part. The brown stripes of the presutural part are in some specimens, depending on condition of light, more or less distinct continued in the postsutural part reaching about the level of the anterior postsutural dorsocentral seta. Scutellum including the lateral surfaces uniformly yellowish dusted. Pleura dark brown, in posterior and anterior view more or less densely brownish dusted. Anterior and posterior spiracle dark brown. Mesonotum and scutellum uniformly but not very densely covered with dark setula-like hairs, pleura less hairy.

Acrostichals 0+1, the posterior seta barely one third as long as the posterior dorsocentral seta, the presutural acrostichal hairs in three to four median rows. Dorsocentral setae 2 + 3, the anterior presutural dorsocentral seta approximately half as long as the other dorsocentrals; posthumeral 1; presutural 1; postpronotal setae 2, the outer one clearly longer than the inner seta; notopleuron without setulae, anterior notopleural seta longer than the posterior one; prealar seta slightly longer than the ground hair; intra-alar seta 2, the anterior one small, not much longer than the ground hair; supra-alar setae 2; postalar setae 3, the most posterior seta very small, hardly longer than the ground hair. Prosternum, proepimeral area, anepimeron and katepimeron bare, meron with a few fine short hairs below the posterior spiracle. Katepisternal setae 2+2, the lower posterior seta closer to the upper posterior than to the upper anterior seta, the anterior lower seta distinctly weaker and shorter; anepisternal setae 1+6 all strong, only a few very short interstitial hairs present. Scutellum with long apical and lateral setae, basal and preapical setae only slightly longer than the longest surrounding setae; lateral surfaces and ventral surface bare.

Wing Membrane hyaline with a brownish-yellow tinge, the area between costa and vein R4+5 clearly stronger tinged than the other part of the wing (Fig. 13), this, however, is very differently distinct developed in the examined females. Crossveins not infusate. Tegula and, basicosta dark brown, wing veins brown. Costal spine about as long as crossvein r-m. Radial node and veins ventrally and dorsally bare. Vein M straight, diverging from vein R4+5. Crossvein r-m basad from the point where vein R1 enters costa, distal crossvein dm-cu weakly sinuous and slightly oblique. Upper calypter transparent, margin at certain angle dark framed, lower calypter weakly yellowish transparent, margin yellowish, lower calypter about 1.5 times as long as upper calypter. Haltere knob and upper half of stem brown, lower half of stem yellow.

Legs predominantly dark brown (Fig. 13). Pulvilli and claws well developed but significantly shorter than the associated tarsomeres. Hind coxa bare on the posterior surface. Fore femur with complete rows of strong posteroventrals and posterodorsals, all posterodorsal setae about as long as and the posteroventrals distinctly longer than depth of femur. Fore tibia without a conspicuously strong median posterior seta, a short but distinct anterodorsal seta at midway and three or four anterodorsals of about the same length in distal third of tibia. Mid femur in basal half with a row of strong bristle-like setae in the upper half of the anterior surface, the setae about one third as long as depth of femur, in addition usually three posteroventral setae not as long as depth of femur; in distal half a row each of short anteroventral and posteroventral seta-like hairs, about one third as long as depth of femur, preapically usually three strong posterior to posterodorsal setae and a distinct anterodorsal seta. Mid tibia in middle third with two strong posterior setae somewhat longer than the diameter of tibia. Hind femur with a complete row of strong anterodorsal setae barely as long as depth of femur, distal half with about two or three strong anteroventral setae, the two most distal setae longer than depth of femur, in the basal half one or two anteroventral setae about half as long as depth of femur, pre-apically two well-developed posterior to posterodorsal setae. Hind tibia, about in middle third two anterodorsal setae, slightly longer than diameter of tibia, somewhat distal to the anterodorsals one anteroventral seta as long as the anterodorsals, no distinct posterodorsal seta

present.

Abdomen. Ground-colour uniformly grey, shiny at some viewing angles, without any dark pattern, the basis of strong setae of tergites with dark brown dots. Tergite 3 laterally with some distinct marginal setae, tergite 4 with a complete row of long marginals and tergite 5 with a complete row of discals distinctly shorter than the marginals of tergite 4, no strong marginals recognisable. Sternites grey; sternite 1 bare. Female genitalia not investigated.

Measurements: Length of body about 5.6 mm; length of wing about 5 mm.

Description (Male): Head. Ground-colour dark grey. Eyes with a few scattered very short hairs, facets of about equal size. Shortest distance between eyes twice as wide as diameter of anterior ocellus, fronto-orbital plate at middle of frons about half as wide as anterior ocellus (Fig. 16). Fronto-orbital plates separated by a frontal vitta, at middle of frons slightly wider than anterior ocellus, towards ocellar triangle and to anterior margin clearly dilated. Parafacial almost parallel sided, about as wide as depth of postpedicel (Fig. 17). In profile upper mouth margin in line with profrons. Genal depth below lowest eye-margin almost twice as wide as depth of postpedicel. In anterodorsal view the very narrow fronto-orbital plate with a greyish dusted line along the eye margin somewhat dilating in lower third, ocellar tubercle slightly greyish and frontal vitta black, the latter in certain light conditions matt brownish, parafacial in upper half depending on incidence of light greyish-white or with a dark patch, the lower part greyish-white dusted or matt dark grey; face whitish, facial ridge white, gena matt grey to dark; in lateral view gena and occipital surface greyish. Pedicel of antenna black, densely greyish-white dusted, postpedicel greyish-brownish. Postpedicel 3.4 times as long as deep and about 2.8 times as long as pedicel. Arista brown, barely twice as long as length of postpedicel, longest hairs of arista at most twice as long as depth of postpedicel. Inner and outer vertical setae about equally long, not much longer than the post ocular setae. Fronto-orbital plate in anterior half with four distinct inclinate fronto-orbital setae, the most anterior one the longest seta, the upper ones decreasing in length, two small interstitial hairs, upper part of fronto-orbital plate bare, orbital setae or scars where they could had been inserted not recognisable. Parafacial bare. Vibrissal setae lacking, their remaining scars not very wide, the surrounding peristomal setae rather short. Lateral surface of gena bare, lower margin with some setae of different length. Proboscis not conspicuously long and less bulbous than in female, prementum dark brown, somewhat greyish dusted, but slightly shiny in certain light conditions, labella about twice as long as widest depth of proboscis; palpus darker than prementum, slender, slightly clavate and curved, at least as long as prementum.

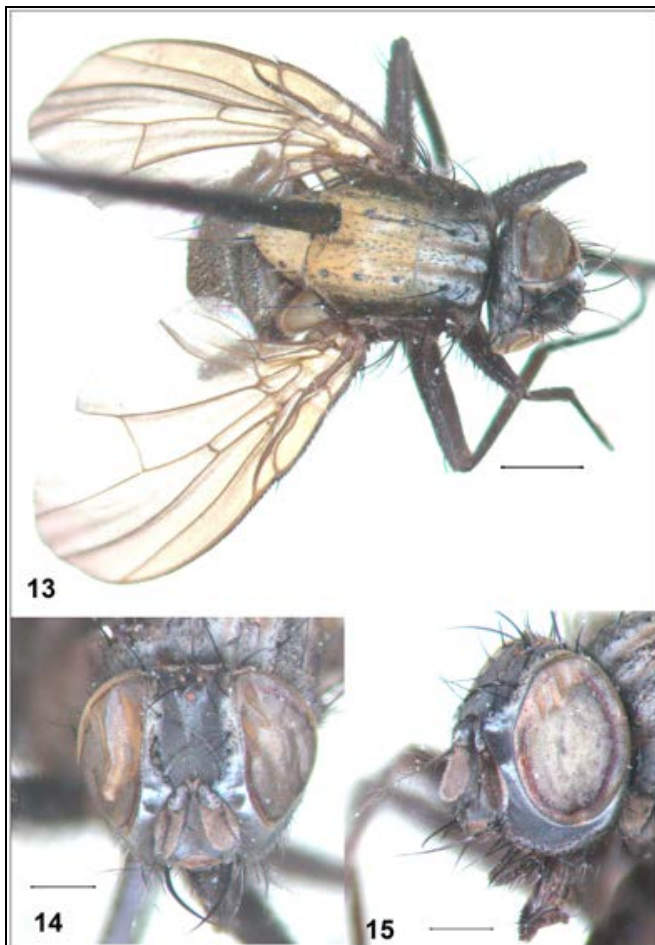
Thorax. Similar to the female, but the dark stripes of presutural part of mesonotum continued in postsutural part of mesonotum, reaching at least the level of second or even the most posterior postsutural dorsocentral seta (Fig. 18). Postpronotal lobes not whitish-grey dusted but uniformly dark brown like the adjacent pleura, more or less shiny. Prealar seta more distinct than in female; both intra-alar setae small, not much longer than the ground hair, supra-alar setae 2; postalar setae 3, the most posterior seta very small, only somewhat longer than the ground hair. Meron below the posterior spiracle with a few hairs more than in female. The preapical seta of scutellum practically not distinguishable

from ground hair.

Wing very similar to female. Membrane appears to have a stronger brownish tinge, particularly the area between costa and vein M. Upper calypter transparent, margin at certain viewing angle dark framed, lower calypter brownish transparent with a weak yellowish tinge depending on conditions of light, margin as in upper calypter, lower calypter more than 1.5 times as long as upper calypter.

Legs (mid legs are missing) similar as in female, however pulvilli and claws almost as long as the corresponding tarsomeres; fore femur in basal third with a row of anteroventrals, about one third as long as depth of femur; hind femur in basal half with a row of anteroventrals about one third as long as depth of femur.

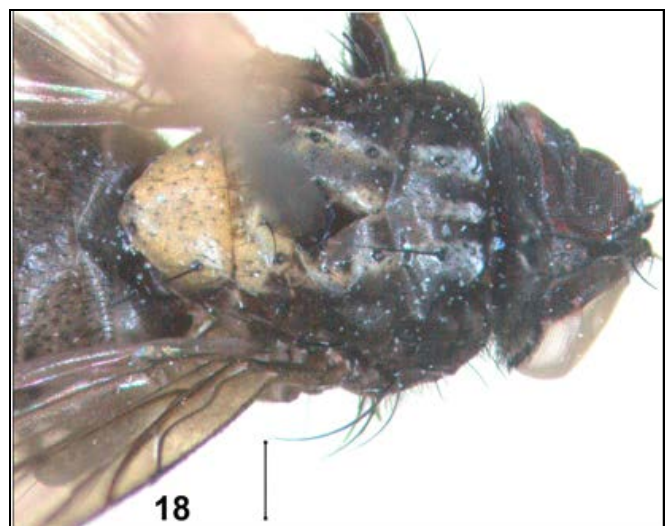
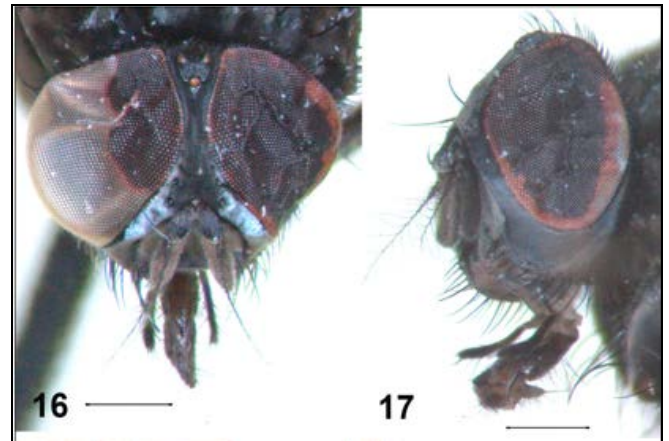
Abdomen as in female uniformly greyish coloured, not shiny but dusted, at certain incidence of light with weak brownish tinge. When viewed from a certain angle a shifting weak brownish patch-like area on one side of tergite 3. Posterior part of syntergite 1+2 dorsally densely covered with erected black setae; tergite 3 with almost a complete row of strong marginals, apart from the median setae longer than the length of the tergite; tergite 4 with complete row of discal and marginal setae, the marginals about as long as those of tergite 3 but distinctly stronger, the discals weaker and somewhat shorter; tergite 5 with a complete row of discals, equally strong and long as the marginals of tergite 4, and a row of much shorter and weaker almost hair-like marginals. Ventral surfaces of tergites and sternites appear predominantly brownish.



Figs 13-15: *Helina ranoma* spec. nov., female holotype; 13) dorsal view; 14) head, anterior view of frons; 15) head, antero-lateral view. Scale bars; Figs: 13, 1 mm; 14-15, 0.5 mm.

Male genitalia. The species is clearly distinguished from similar species of the genus by morphological characters, the identification does not depend on comparison of characters of genitalia. Therefore, it has been deemed wiser to refrain from extracting the genitalia to avoid inflicting damage on the only hitherto available male of this new species.

Measurements: Length of body about 6 mm; length of wing about 5.5 mm



Figs 16-18: *Helina ranoma* spec. nov., male paratype; 16) head, antero-dorsal view of frons; 17) head, lateral view; 18) dorsal view of thorax and head. Scale bars; Figs: 16-18, 0.5 mm.

Etymology: The name of the new species "*ranoma*" is a feminine adjective referring to the somewhat shortened name of the Ranomafana National Park, where the flies were collected.

Diagnosis: Due to the body colour *Helina ranoma* spec. nov. leads in the key to the Madagascan^[4] species to couplet 5 where it is closer to *H. grisella* than to *H. carpiæ*. However, it is easily distinguished by the uniformly predominantly dark legs and the dark grey abdomen without dark patches on tergite 3. In the second key^[5] the species runs to *H. juxtamedialis* of which it is distinguished by the abdomen without distinct dark patches on tergites 3 and 4 and the differently dusted parts of the mesonotum, white in the presutural and yellow in the postsutural part. In addition, the wing membrane of some specimens is stronger yellowish-brownish tinged in the area between costa and vein R4+5 than

in the other part of the wing. Pont^[10] described three species of the genus from the Comoros Islands which also run in the key^[5] to the African mainland species *H. juxtamedialis*. These species differ from *H. ranoma* which is marked by brown to dark brown halteres not only by predominantly yellow halteres but also in several other respects. *Helina moheli* Pont, 1979 is characterized by entirely yellow femora and a yellow postpedicel. The femora of *H. ranoma* are dark brown to black and the postpedicel is dark greyish-brown. *Helina matilei* Pont, 1979 is a very dark species, the dusting on mesonotum is almost suppressed by dark brown markings, scutellum with a dark brown patch at base. The new species is marked by predominantly yellowish dusted mesonotum and scutellum, both without striking dark pattern. *Helina speculosa* Pont, 1979 differs from *H. ranoma* by a cinereous dusted mesonotum that is marked by large dark spots at the base of the large setae, the scutellum is completely cinereous dusted, abdominal tergites 3 and 4 with small dark patches and the wing is very weakly yellowish tinged. *H. ranoma* however, is characterized by a predominantly yellowish dusted postsutural part of mesonotum and a scutellum without strikingly dark spots at the basis of the larger setae, abdominal tergites are without pairs of patches and the wing membrane is strongly yellowish-brownish tinged, at least in the area between costa and vein R4+5.

Remarks

The results of the current investigation on *Helina* species of the Malagasy sub-region, which is about 500 km from the African mainland in the Indian Ocean, and the studies of Pont^[10] on indeterminate muscids from the Comoros Archipelago, which is found approximately midway between Madagascar and the mainland, share a few interesting similarities. For example, *Dichaetomyia* seems to be the most species-rich muscid genus on both island regions, with significantly more species reported than from *Helina*, although the latter is the most species-rich genus of the Muscidae in the Afrotropical Region. So far 40 *Dichaetomyia* species and nine *Helina* species are known from Madagascar and 11 *Dichaetomyia* and three *Helina* species from Comoros Islands. However, a total of almost 130 *Helina* species and only 50 *Dichaetomyia* species are registered from the Afrotropical mainland including other islands. Both genera belong to the subfamily Phaoniinae and are similar to each other in regard to certain taxonomic features. One is tempted, to speculate that *Dichaetomyia* species are replacing *Helina* in the Madagascar Island region. However, practically nothing is known about the biology of the species of both genera, and therefore such thoughts are just a conjecture.

The key to the *Helina* species of the Afrotropical Region by van Emden^[5] comprises 50 couplets. The species *Helina juxtamedialis* described by van Emden in the same publication can be identified very quickly due to its taxonomic characteristics and is already defined in couplet 10/5. The species is only known from Kenya and was described on the basis of one female only. There are no other *Helina* species from the African mainland that lead to this species in the identification table. However, Pont found three new *Helina* species among a collection of Muscidae from the Comoros islands, and all three ran in van Emden's key to *H. juxtamedialis* but they were clearly differentiated from this species by other taxonomic characteristics. Also of the new species from Madagascar described in the current contribution, one species runs in van Emden's key to *H.*

juxtamedialis. This new species also differs clearly from *H. juxtamedialis*. However, there is now a group of four additional species, which have a certain basic similarity with this East African *H. juxtamedialis* and they all originate from the very eastern part of the Afrotropical Region.

Couri^[4] listed among others also *Helina cyanea* (Stein, 1906) and *Helina insignis* (Séguy) as endemic species from Madagascar and reported two females of *H. insignis* in the compilation of identified species. However, when examining these two specimens they did not match at all the original description of *H. insignis* created by Séguy^[23], in addition, they could also not be identified by the keys and species descriptions used for the determination. Therefore, they were described above as *Helina fianara* n. sp. But when studying type material of *H. cyanea* the specimens corresponded very well to Séguy's description of *H. insignis*. Since the two species are obviously identical, *Helina insignis* (Séguy, 1935) is proposed as a new synonym of *Helina cyanea* (Stein, 1906). A distinction between *H. insignis* and *H. cyanea* is therefore no longer necessary. However, four other species are added to the remaining five species. Thus, nine *Helina* species are listed so far from Madagascar, six of which are endemic to the region. The nine species occurring in the Malagasy subregion are compared below in a new identification table.

Key to the Madagascan *Helina* species

1. Mesonotum with an *Anthomyia* pattern.....*H. lucida* (Stein)
Mesonotum differently marked2
2. Fore tibia with a median posterior seta3
Fore tibia without a posterior median seta5
3. Posterior lower sternopleural seta about equally distant from anterior upper and posterior upper setae; basal parts of wing vein strikingly yellowish and contrasting to the brown subsequent part of veins*H. mantada* spec. nov.
Posterior lower sternopleural seta distinctly closer to the posterior upper than to the anterior upper seta; basal parts of wing veins not strikingly differently coloured but concolorous with subsequent parts.....4
4. Thorax densely greyish-white and rust-brown dusted, mid tibia with 1 posteroventral and 2 posterior setae*H. andasiba* spec. nov.
Ground-colour predominantly shiny dark brown to black, only in certain conditions of light partially slightly brownish dusted, mid tibia without a posteroventral seta...*H. fianara* spec. nov*.
5. Trochanters, femora and tibiae predominantly yellow.....*H. grisella* Couri, Pont & Penny
Legs usually brownish or darker, at most apex of trochanters and/or small parts of femora yellow.....6
6. Thorax and scutellum uniformly dark coloured.....7
Scutellum predominantly yellowish.....8
7. Ground colour of thorax and abdomen metallic dark bluish, at certain angles of viewing more or less greyish-white to greyish-pale brownish dusted, calypters and margins white, margins with a yellowish tinge..... *H. cyanea* (Stein)
Ground-colour deeply dark brown to black, usually shiny, however, at certain angle partially slightly brownish dusted, upper calypter hyaline transparent, margin whitish with a very narrow blackish frame, lower calypter yellowish brown transparent, margin darker yellowish

brown.....*H. fianara* spec. nov*.

8. Abdomen metallic greenish-blue, anterior spiracle yellow, haltere yellow with very pale knob.....*H. flavomaculata* Couri, Pont & Penny
Abdomen brown or grey, but not metallic green or blue, anterior spiracle brown and knob of haltere brown to dark brown.....9
9. Presutural part of mesonotum greyish-white dusted with a pair of dark paramedian stripes, postsutural part of mesonotum predominantly yellowish dusted without clear dark stripes, at least the area between costa and vein R4+5 of wing membrane strongly yellowish-brownish tinged, abdomen dark grey with dark dots at the basis of strong setae.....*H. ranoma* spec. nov.
Mesonotum predominantly dark brown, somewhat shiny, with three grey dusted vitta, wing membrane clear, abdomen dark brown without differentiated markings.....*H. carpiæ* Couri, Pont & Penny

[* = since it is not yet known whether the fore tibia of *H. fianara* has a posterior seta, both options are considered in the proposed identification key.]

Addendum

The following additional *Helina* specimens were found among the examined material:

Helina carpiæ Couri, Pont & Penny, 2006: Madagascar; 1♂ 1♀, Andasibe, Anamalazaotra S. R., Perinet, circuit Indri, S18.935882°-938042° E48.419051°-419332°, ca. 950 m; 16.1.2017; 1♂ 2♀ Maromizana prot. area, 1.100 m; S18.96547°-962674°E48.45478°-453146°; screen sweeping, 18.01.2017; 1♀ Ranomafana N. P., 989 m; S21°15'46"E47°25'15"; YPT, 11.-14.01.2017.

Helina cyanea (Stein, 1906): Madagascar; 3♂2♀ Ambohitantely Spec. Res., 1.530 m.

Helina flavomaculata Couri, Pont & Penny, 2006: Madagascar; 1♀ Andasibe, Anamalazaotra S. R., Perinet, circuit Indri, ca. 950 m; S18.935882°-938042°E48.419051°-419332°; screen sweeping.

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References

- Zielke E. Four new *Dichaetomyia* species from Madagascar (Diptera: Muscidae). Journal of Entomology and Zoology Studies 2021;9(3):105-114.
- Zielke E. Descriptions of five new shiny *Dichaetomyia* species from Madagascar (Diptera: Muscidae). Entomologist's Monthly Magazine 2021;157:81-103.
- Pont AC. Family Muscidae. In: Crosskey R.W. (ed.) Catalogue of the Diptera of the Afrotropical Region. British Museum (Natural History), London, UK 1980, 721-761.
- Couri SC, Pont AC, Penny ND. Muscidae (Diptera) from Madagascar: Identification keys, descriptions of new species, and new records. Proceedings of the Californian Academy of Sciences 2006;57:799-923.
- Van Emden FI. Muscidae C. –Scatophaginae, Anthomyiinae, Lisperinae, Fanniinae and Phaoniinae. Ruwenzori Expedition 1934–5 1951;2:325-710.
- Couri M, Pont AC. New species of Afrotropical Muscidae (Diptera: Muscoidea). Zootaxa 2014;3852(3):301-320.
- Couri M, Pont A. New African species of *Helina* Robineau-Desvoidy (Diptera, Muscidae). Zootaxa 2016;4103(3):374-382.
- Paterson HE. East African Muscidae (Diptera) (Ergebnisse der Deutschen Zoologischen Ostafrika-Expedition 1951/1952, Gruppe Lindner, Stuttgart, Nr. 20). Beiträge zur Entomologie 1956;6:154-179.
- Pont AC. Afrikanische Musciden (Dipt.) (Ergebnisse der Forschungsreise Lindner 1958/59 – Nr. 22). Stuttgarter Beiträge zur Naturkunde aus dem Staatlichen Museum für Naturkunde in Stuttgart 1969;201:1-27.
- Pont AC. Diptera Muscidae and Anthomyiidae from the Comoros Archipelago. Faune Entomologique de l'Archipel des Comores. Memoires du Muséum National D'Histoire Naturelle. N.S. Série A, Zoologie 1978;109:333-365
- Snyder FM. Notes and descriptions of some Ethiopian Muscidae (Diptera). American Museum Novitates 1953;1608:1-21.
- Van Emden FI. Contributions à l'étude de la faune entomologique du Ruanda-Urundi (Mission P. Basilewsky 1953). CVIII. Diptera Muscidae. Annales du Musée Royal du Congo belge Ser. 8 (Zool.) 1956;51:506-531.
- Zielke E. Einige neue afrikanische Musciden-Arten (Diptera, Muscidae). Entomologische Zeitschrift 1970;80:69-77.
- Zielke E. Descriptions of five new *Helina* species from South Africa (Diptera: Muscidae, Phaoniinae). Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin (N. F.) 1970;10:150-157.
- Zielke E. Descriptions of eight new Phaoniinae species from the Ethiopian region. Beiträge zur Entomologie 1971;21:71-77.
- Zielke E. Descriptions of new Phaoniinae species from the Ethiopian region (Diptera; Muscidae). Zeitschrift für angewandte Zoologie 1971;58:177-184.
- Zielke E. New species of Muscidae from the Ethiopian Region (Diptera). The Journal of the Entomological Society of Southern Africa 1971;34:289-304.
- Zielke E. Beitrag zur Kenntnis der Verbreitung afrikanischer Musciden (Muscidae: Diptera). Teil III: Sammlung California Academy of Sciences. Zeitschrift für angewandte Zoologie 1974;61 (1):1-44.
- Zielke E. Revalidation of an erroneously synonymized *Helina* species and reminder of a forgotten *Lispe* species from the Afrotropical Region. Contributions to Entomology 2018;68:371-372.
- McAlpine JF. Morphology and terminology – adults. In: McAlpine JF, Peterson BV, Shewell GE, Teskey HJ, Vockeroth JR, Wood DM (eds). Manual of Nearctic Diptera. Agriculture Canada Monograph 1981;1(27):9-63.

21. Stuckenberg BR. Antennal evolution in the Brachycera (Diptera), with a reassessment of terminology relating to the flagellum. *Studia Dipterologica* 1999;6:33-48.
22. Séguy E. Etudes sur les Anthomyiides. 9e,10e et 11e notes. *Encyclopédie Entomologique (BII), Diptera* 1935;8:97-116.