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## Four new species of the subfamily Phaoniinae (Diptera: Muscidae) from Bulgaria

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### Abstract

Four new species of the subfamily Phaoniinae, *Helina dabovetsa* spec. nov., *Helina rilae* spec. nov., *Helina siutkae* spec. nov. and *Phaonia sandanskii* spec. nov., are described. All specimens originate from Bulgaria and were collected between 1963 and 1969. All four species are distinguished from similar species of the corresponding genus by a unique combination of characteristic morphological markings.

**Keywords:** Bulgaria, Muscidae, *Helina*, *Phaonia*, new species, comparison, similar species

### Introduction

Investigation of non-identified material in the Muscidae collection of the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences in Sofia conducted since April 2014, revealed three new species of the genus *Helina* Robineau-Desvoidy 1830 and one new species of *Phaonia* Robineau-Desvoidy 1830. The specimens were collected in Bulgaria between 1963 and 1969 by the late Valentin Lavčiev. Two species originate from the large area of the Rhodope Mountains and one each from the Pirin Mountains and Rila Mountains respectively. Each one of the species differs unambiguously from other similar species by a typical combination of several taxonomic characters. The species are described below as *Helina dabovetsa* spec. nov., *Helina rilae* spec. nov., *Helina siutkae* spec. nov. and *Phaonia sandanskii* spec. nov. respectively.

### Material and Methods

For identification of the flies primarily the keys to the Muscidae of the Palaearctic Region by Hennig<sup>[1]</sup> and additionally the keys to the Muscidae of Central Europe published by Gregor et al.<sup>[2, 3]</sup> were used.

External morphological features of the specimens were examined using a ZEISS Stemi 2000-C stereomicroscope. For the investigation of male terminalia the end of the abdomen was removed and placed in 10% KOH solution for about three hours at room temperature. It was washed, transferred to glycerine and dissected. After examination the terminalia were stored in a microvial containing glycerine. The microvial was pinned directly underneath the associated specimen. For illustrations an AxioCam ERc5s camera and for further processing Helicon Focus 6 and Adobe Photoshop CS2 were applied. Standard terminologies are used for the description. Body length was measured in millimeters (mm).

The type material of the described species is located in the entomological collection of the Institute of Biodiversity and Ecosystem Research, Sofia.

### Results

*Helina dabovetsa* spec. nov. (Fig. 1 + 2)

**Material examined:** Male holotype, the specimen is lacking the left mid leg and some major setae, however determination and description of the species was not impaired. Three major paratypes, each one with one or two absent legs and some lacking setae. The locality labels of all types read: "Rodopi Mts., Dabovez, 18.6.1969, leg. W. Lavtschiev". Two other males from the same locality with their heads separately mounted on the staging pin. One of the two specimens was marked with a small piece of paper which contained the handwritten note "*H. punctata*" without naming identifier and date of identification.

**Description:** Head. Ground-colour dark, densely dusted. Eyes virtually bare, only with very few scattered tiny hairs.

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Shortest distance between eyes slightly broader than twice the diameter of anterior ocellus. Fronto-orbital plate at level of anterior ocellus about as wide as diameter of anterior ocellus, at anterior margin about half width of postpedicel. Fronto-orbital plates touching above midway of frons; upper part of frontal vitta below anterior ocellus narrowly, and lower half broadly triangular shaped. Parafacial midway slightly broader than half the width of postpedicel. In profile upper mouth margin about in line with profrons. Genal depth below lowest eye-margin barely half the width of postpedicel. When viewed from the anterior, frontal vitta dark with little grey dust, fronto-orbital plate predominantly shining silvery white, face whitish-grey with shining silvery-white parafacial, gena and post-occipital surface greyish-white. Basal antennal segments and basal part of postpedicel up to insertion of arista yellow, distal part of postpedicel dark brown. Postpedicel about 2.5 times as long as broad and barely twice as long as pedicel. Arista slightly longer than twice the length of postpedicel; longest aristal hairs about as long as width of postpedicel. Lower half of fronto-orbital plate with about eight inclinate frontal setae, the posterior ones somewhat shorter, at most one or two interstitial hairs between the frontal setae. Parafacial bare. Vibrissal setae long and strong, longest surrounding peristomal setae barely half as long as vibrissals. Lower margin of gena and post-occipital surface covered with short dark setulose hairs. Proboscis short, labella not very broad, mentum brown, somewhat shining with little grey dust. Palpus brown with the extreme basis yellowish, slender and about as long as mentum.



**Fig 1:** *Helina dabovetsa* spec. nov.: male holotype, lateral view (bar = 1 mm).

Thorax. Ground-colour predominantly dark, depending on point of view more or less densely dusted. When viewed from behind, presutural part of scutum densely greyish-white dusted with an irregularly shaped dark patch behind the posthumeral seta at level of presutural dorsocentral seta and a pair of paramedian dark longitudinal vittae inside the rows of dorsocentral setae not reaching transverse suture. Postpronotal calli with strong yellowish tinge and greyish dust. Postsuturally, anterior part of scutum with a broad, brown or dark transverse band, covering approximately the surface between suture and intra-alar setae of each side, the posterior margin of the brown band runs - depending on the point of view- between the first and third post-dorsocentral setae. The dark transverse band at certain points of view with a median

and a pair of paramedian longitudinal stripes, darker than the surrounding dark area and depending on point of view reaching up to the third dorsocentral setae. Lateral surface between supra-alar setae and basis of wing with a large dark brown patch. The narrow area between the lateral brown patch and the transversal band and the dorsal surface of posterior part of scutum uniformly grey dusted, thus -when viewing from behind- the scutum is divided in three differently coloured areas: a whitish-grey presutural part, a brown or dark middle part and a dull grey posterior part. Scutellum laterally with a large brown or dark patch on each side, both patches usually connected by a brownish basal transverse band not as broad as length of patches, remaining posterior surface of scutellum dull grey except the yellowish-grey apex and lateral sides. Pleura predominantly dark and uniformly greyish dusted. Anterior and posterior spiracle yellowish. Scutum with setulose ground-hair about as long as width of postpedicel, pleura partly with longer hairs. Dorsocentrals 2+3, anterior presutural dorsocentral barely half as long as the posterior one; acrostichals 0 + 1; anterior notopleural setae stronger than posterior one, notopleuron with some setulose hairs close to posterior notopleural seta; prealar seta barely distinguishable from surrounding hairs; 2 intra-alar setae. Prosternum, proepimeral area, anepimeron, katepimeron and meron bare. Katepisternals 2+2; anepisternum with about 3 long setae at upper half of posterior margin and 1 strong seta near to lower posterior margin, between upper and lower setae shorter interstitial hairs. Scutellum with a strong apical and a strong lateral seta, basal seta distinctly shorter, subapical seta weak, lateral and ventral surfaces bare.

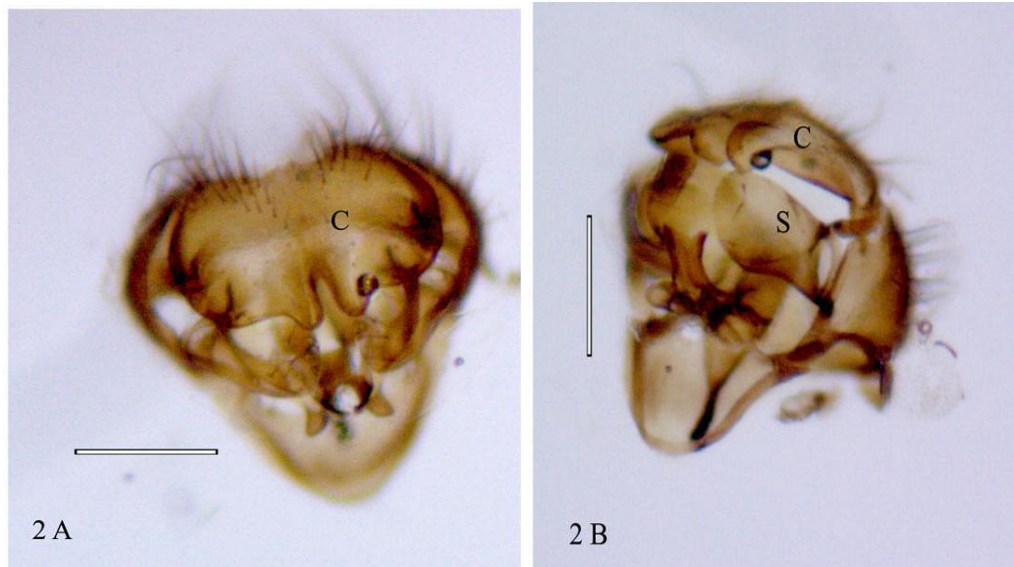
Wing. Membrane hyaline with a yellowish-brownish tinge; cross-veins very weakly infuscated. Tegula and basicosta yellow, veins brownish; costal spine not conspicuous. Radial node and vein R4+5 dorsally and ventrally bare. Vein M1 straight, slightly diverging from vein R4+5. Cross-vein r-m slightly basal from the point where vein R1 enters costa; distal cross-vein dm-cu slightly oblique and sinuous. Calypters predominantly whitish transparent with yellowish tinge and margin, lower calypter about 1.5 times as long as upper calypter. Haltere entirely yellow.

Legs including coxae and trochanters yellow, except femora which might be more or less brownish darkened, tarsomeres contrasting black. Pulvilli and claws of fore legs at least twice as long as those of mid and hind legs and longer than the tarsomere they are inserted on. Fore femur with complete rows of strong posterodorsal and posteroventral setae, about as long as depth of femur. Fore tibia without median posterior seta. Mid femur at basal half with a row of anterior setae about half as long as depth of femur and with three or four distinct ventral setae slightly longer than the anterior setae, preapically one weak anterodorsal seta and two to three strong posteriors or posterodorsals. Mid tibia with two or three posterior setae about as long as diameter of tibia. Hind coxa bare on posterior surface. Hind femur with a complete row of strong anterodorsals and a complete row of anteroventrals, the distal setae long and the basal ones very short but distinct; preapically two or three stronger posterodorsal setae. Hind tibia with one or two anterodorsal setae about as long as diameter of tibia and more distally one anteroventral seta, no posterodorsal seta at basal half.

Abdomen. Ground-colour predominantly translucent yellow, tergite 5 and in some specimens also distal half of tergite 4 darkened. When viewed from behind abdomen densely white dusted. Tergites 1+2 to 4 with a median brown stripe not

reaching the distal margin of the corresponding tergite. Tergites 3 and 4 each one with a submedian pair of large brownish, usually somehow trapeziform patches, the patches of tergite 3 larger than those of tergite 4. Tergite 5 more greyish dusted and if the tergite is not strongly darkened, with a submedian pair of small brown round spots near to the distal

margin. Syntergite 1+2 and tergite 3 with strong marginal setae laterally; sternite 4 and 5 each one with complete rows of strong discal and marginal setae. Sternite 1 small and bare; sternites 1 to 4 yellow, sternite 5 predominantly brownish. Male genitalia. See Figure 2.



**Fig 2:** *Helina dabovetsa* spec. nov.: male terminalia ( 2 A: cercal plate (= C), 2 B: surstylus (= S), bar = 0.2 mm).

**Measurements.** Length of body about 7.2 mm; length of wing about 8 mm. Female not known.

**Etymology.** The name of the new species "*dabovetsa*" is a female adjective and derives from "Dabovez" (=Dabovets), the locality where the species was collected.

**Diagnosis.** *H. dabovetsa* runs in the keys of Hennig<sup>[1]</sup> and of Gregor *et al.*<sup>[2, 3]</sup> to *Helina clara* (Meigen, 1826) and *Helina sexmaculata* (Preyssl, 1791) (= *Helina punctata* Robineau-Desvoidy, 1830)<sup>[4]</sup>. The morphological characters of both species are very similar to those of *Helina almeriensis* (Strobl, 1906) recorded from few European countries only and which is not considered in the keys mentioned above. The scutum of each of the three species is predominantly greyish dusted and not conspicuously divided into differently coloured areas. *H. sexmaculata* and *H. almeriensis* are marked with two and *H. clara* has three well separated brown patches behind the transverse suture, and they all have usually an isolated brown patch on each side of scutellum. The fronto-orbital plates are separated at least by a line-shaped frontal vitta; notopleura of *H. clara* and *H. almeriensis* are bare, *H. sexmaculata* has occasionally a small setula close to the posterior notopleural seta, more often only on one side of the thorax. The dorsal surface of scutum of *H. dabovetsa* is conspicuously divided into three differently coloured transverse areas of which the section at middle corresponds to the dark transverse band behind the suture. The dark lateral patches of scutellum are usually connected by a brownish transverse band at the basis of scutellum. Fronto-orbital plates of *H. dabovetsa* are touching and all specimens examined had on both sides close to the posterior notopleural setae some small setulae.

***Helina rilae* spec. nov.** (Fig. 3 +4)

**Material examined:** Male holotype, left fore tarsomeres and right mid leg as well as few strong setae are lacking. The locality label of the specimen contains following information: "BG: Cemkovo, 1.800 m, 16.6.1968, Lavchiev".

**Description:** Head. Ground-colour dark. Eyes with scattered tiny hairs. Shortest distance between eyes about equal to diameter of anterior ocellus. Fronto-orbital plate at narrowest distance between eyes about half as broad as anterior ocellus. Fronto-orbital plates touching midway over a length of about one third of frons, lower and upper third of frons with triangular frontal vitta. Parafacial at middle barely half as broad as width of postpedicel. In profile upper mouth margin about in line with profrons. Genal depth below lowest eye-margin about the width of postpedicel. In dorsal view ocellar tubercle and frontal vitta black, fronto-orbital plate brownish-grey dusted; when viewed from the anterior, fronto-orbital plate and parafacial depending on angle of light silvery-white pruinose or dark brown, gena greyish-white pruinose; from lateral view gena and occipital surface dull dark grey. Postpedicel 2.5 times as long as broad and about twice as long as pedicel. All antennal segments dark. Arista 2.2 times as long as length of postpedicel; at basal third dorsal hairs of arista more than twice as long as the ventral ones, length of longest hairs about half the width of postpedicel. Ocellar setae strong. Fronto-orbital plate all over the length with inclinate frontal setae, anterior ones distinctly stronger than posterior setae, last posterior setae small, reclinate and not far from ocellar triangle. Parafacial bare. Vibrissal setae well developed, longest surrounding peristomal setae about half as long as vibrissals. Lower margin of gena, post-genal and post-occipital surfaces covered with dark setulose hairs. Proboscis brown, short and stout with broad labella, mentum greyish dusted. Palpus brown slightly dilated at tip and at least as long as mentum.

Thorax. Ground-colour shining dark with some dust. When viewed from very behind scutum grey dusted with a weak brownish tinge, a pair of narrow dark brown paramedian vittae inside along the dorsocentral setae from neck reaching almost the third postsutural dorsocentral setae; outside the row of presutural dorsocentrals a nearly triangular-shaped dark patch between dorsocentrals, posthumeral and presutural setae, continued postsuturally as dark stripe between

dorsocentral and intra-alar setae, reaching fourth dorsocentral seta. Scutellum shining dark and greyish dusted without fixed pattern but with shifting dark spots. Pleura dark, grey dusted. Anterior and posterior spiracles yellowish-brown. Scutum uniformly and some pleura densely covered with hairs, almost as long as length of postpedicel on scutum and partly longer on pleura. Dorsocentral setae 2 + 4; acrostichals 0+1; notopleuron with few setulose hairs surrounding posterior notopleural seta, anterior notopleural seta slightly longer than posterior one; prealar seta at least as long as anterior notopleural seta; two intra-alar setae. Prosternum, proepimeral area, anepimeron, meron and katepimeron bare. Katepisternum covered with some fine long hairs and with 2+2 katepisternal setae, the lower anterior one only slightly stronger than the ground hair. Anepisternum with fine hairs, at posterior margin with a row of long setae varying in length and strength and with several interstitial hairs. Scutellum with long apical and lateral setae, basal and preapical setae distinctly shorter; lateral surface and ventral surface bare.



**Fig 3:** *Helina rilae* spec. nov.: male holotype, dorsal view of thorax and yellowish base of wing-veins (bar = 1 mm).



**Fig 4:** *Helina rilae* spec. nov.: male holotype, abdomen in posterior view (bar = 1 mm).

Wing. Membrane hyaline with a brownish tinge, crossveins not infuscated. Tegula and basicosta dark brown to black,

veins directly at basis conspicuously yellowish (Fig. 3), otherwise brown. Costal spine not conspicuous, barely three times as long as surrounding bristles. Radial node ventrally haired. Vein M1 straight, diverging from vein R4+5. Crossvein r-m basal from the point where vein R1 enters costa, distal crossvein dm-cu slightly oblique and sinuous. Calypters distinctively yellow transparent, lower calypter almost 1.5 times as long as upper calypter. Halter entirely yellow.

Legs predominantly dark, at certain light angle mid and hind tibiae brighter, almost yellowish-brown. Pulvilli and claws well developed but shorter than length of the tarsomeres they are inserted on. Hind coxa bare on the posterior surface. Fore femur with complete rows of strong posteroventrals and posterodorsals, all setae about as long as or longer than depth of femur. Fore tibia without median posterior seta. Mid femur at basal half densely covered on anterior and ventral surface with setulose hairs and with almost complete but irregular rows of anterodorsal, anteroventral and posteroventral setae, with elongated setae in basal half and distinctly shorter ones at distal half, preapically three strong posterior or posterodorsal setae and two shorter anterodorsals. Mid tibia with three strong posterior setae longer than the diameter of tibia. Hind femur with complete rows of anterodorsal, anteroventral and posteroventral setae, anterodorsals longer than and anteroventrals about as long as depth of femur, posteroventrals in basal half almost as long as and in distal half much shorter than depth of femur; preapically two posterior or posterodorsal setae and one anterior seta. Hind tibia without posterodorsal seta but with two strong anterodorsal and two or three anteroventral setae.

Abdomen broad and parallel-sided. Ground-colour dark, shining, depending on light angle more or less greyish dusted with a yellowish tinge, but without patches. When viewed from behind tergites with a densely dusted dorsal surface and a narrow median black stripe (Fig. 4), slightly dilated at the posterior margin of tergite 3 and only weakly developed on tergite 5. Posterior half of syntergite 1+2 and tergite 3 laterally with some long marginal setae, 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 dark with little greyish dust; sternite 1 bare.

Male genitalia. Hypopygium not very pronounced. The species is distinctly 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 refrained from extracting the genitalia to avoid inflicting damage on the only hitherto available specimen of this new species.

Measurements. Length of body about 8.2 mm; length of wing about 8 mm.

Female not known.

**Etymology.** The name of the new species "*rilae*" is a noun in the genitive case and derives, from "Rila Mts.", where the fly had been collected.

**Diagnosis.** The male of *Helina rilae* does not run in Hennig's key <sup>[1]</sup> to *Helina* males to a certain species but it leads to couplet 16: "Arista pubescent; katepisternals 1+2; usually 3 postsutural dorsocentrals" or alternatively to couplet 25: "Arista plumose; katepisternals 2+2; usually 4 postsutural dorsocentrals", and similarly in the keys of Gregor et al. <sup>[3]</sup> to couplet 15:

" Arista pubescent; katepisternals 1+2.....16  
 - Arista plumose; katepisternals 2+2.....19".  
*H. rilae* with a pubescent arista, 2+2 katepisternals and 4 postsutural dorsocentrals does not match with one of these combinations. Consequently it does also not match with one of the species which are marked with a combination of characters as described in the couplets of the keys. However, *H. rilae* can be incorporated for example in the latest key <sup>[3]</sup> to *Helina* males as follows:

15. Arista pubescent.....15a  
 - Arista plumose;.....19  
 (see Gregor *et al.* <sup>[3]</sup> to continue)

15a) Katepisternals 2+2; notopleuron posteriorly with few setulae; pre-alar seta distinctly longer than posterior notopleuron; abdomen without paired patches, at most with a median vitta; calypter predominantly yellowish.....*Helina rilae* spec. nov.

- Katepisternals 1+2; notopleuron without setulae; pre-alar seta shorter than posterior seta; abdomen with distinct paired patches; calypter predominantly whitish.....(see Gregor *et al.* <sup>[3]</sup> to continue).

In case that the lower anterior katepisternal seta is not recognized as such due to its rather short length *H. rilae* runs for example in the keys of Gregor *et al.* <sup>[3]</sup> to *Helina vicina* (Czerny, 1900). This species has predominantly yellow legs and is characterized by paired spots on the abdominal tergites. The base of wing veins is not conspicuously yellow. *H. rilae* however is marked by predominantly dark legs, a median stripe on the tergites and yellow base of wing veins.

*Helina siutkae* spec. nov. (Fig. 5 + 6)

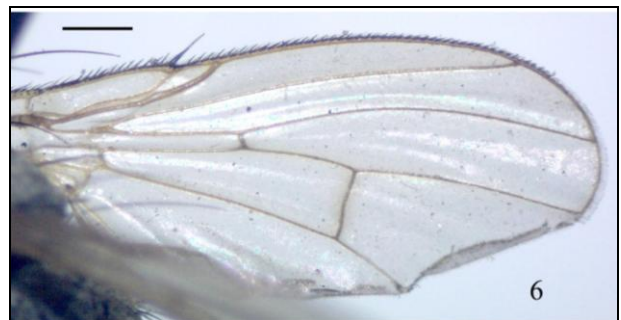
**Material examined:** Male holotype with the locality label: "Rodopi Mts., x. Siutka, 14.8.1963, W. Lavtschiev".

**Description.** Head. Ground-colour blackish-grey. Eyes bare. Shortest distance between eye-margins about 3.3 times the width of postpedicel. Width of fronto-orbital plate at level of anterior orbital seta about as broad as diameter of anterior ocellus. Frontal vitta almost parallel shaped and nearly twice as broad as the distance between outer margins of posterior ocelli. Frontal triangle reaching anterior orbital seta. Parafacial at middle about half as broad as width of postpedicel. In profile facial edge in level of profrons. Genal depth below lowest eye-margin approximately twice the width of postpedicel. When viewed from the anterior, frontal vitta, fronto-orbital plate, parafacial and gena dull black and depending on light angle more or less greyish dusted, parafacial slightly white pruinose; from the dorsal point of view fronto-orbital plate grey dusted, frontal vitta dark black. Basal antennal segments predominantly brownish, distal third of pedicel yellowish, in conspicuous contrast to blackish postpedicel. Postpedicel about 2.5 times as long as broad and twice as long as pedicel. Arista approximately twice as long as length of postpedicel, longest arista-hairs about 1.3 times as long as width of postpedicel. Ocellar setae strong and long. Fronto-orbital plate with two distinct reclinate orbital setae and about two pairs of strong frontal setae and with two pairs of weaker interstitial setae on the lower half of frons, additionally on lower third one or two very small setulae. Parafacial bare. Vibrissal setae more than twice as long as longest peristomal setae. Haired part of gena, post-genal and post-occipital surface covered with black setulose hair. Proboscis slender, but not very long, labella not very broad. Mentum brown and slightly dusted. Palpus slender, brown, about as long as mentum.

Thorax. Ground-colour predominantly dark grey. Scutum and scutellum densely greyish dusted without dark pattern. Pleura predominantly grey. Anterior spiracle greyish-white, conspicuously small; posterior spiracles brownish. Ground hair of scutum short setulose about as long as width of postpedicel, some parts of pleura with longer hairs. Dorsocentral setae 2 + 3; acrostichals 0 + 0, the longest postsutural acrostichal hairs about twice as long as ground hair; notopleuron without additional small hairs, 2 notopleural setae, anterior one slightly longer than posterior seta; prealar seta not much longer than ground hair; 2 intra-alar setae. Prosternum, proepimeral area, anepimeron, meron and katepimeron bare. Katepisternum covered with some fine ground-hair and with 2+2 katepisternal setae, surface between fore coxa and mid coxa with a median vertical row of about three strong setae. Anepisternum at posterior margin with a row of approximately five long setae varying in length and strength. Scutellum with long apical and long lateral seta only, preapical and basal lateral seta not distinguishable from surrounding hairs; lateral surface with setulae; ventral surface bare.



**Fig 5:** *Helina siutkae* spec. nov.: male holotype, lateral view (bar = 1 mm).



**Fig 6:** *Helina siutkae* spec. nov.: male holotype, costal spine and veins of wing (bar = 0.5 mm)

Wing. Membrane greyish hyaline, surrounding membrane of cross-veins very weakly infuscated. Tegula and basicosta yellowish, veins of basal third of wing yellowish getting more brownish distally. Costal spine conspicuously long, longer than half the length of cross-vein dm-cu (Fig. 6). Radial node dorsally and ventrally bare. Vein M straight, almost parallel with vein R4+5. Cross-vein r-m slightly apical of the point where vein R1 enters costa, distal cross-vein dm-cu almost

straight and in a right angle to vein M. Calypters whitish transparent with a very weak yellowish tinge, lower calypter about 1,5 times as long as upper calypter. Haltere entirely yellow.

Legs. Coxae, trochanters and femora predominantly dark, tibiae all yellow, tarsomeres dark (Fig. 5). Claws and pulvilli about as long as the tarsomeres they are inserted on. Posterior surface of hind coxa bare. Fore femur dark with contrasting narrow yellow apex, rows of posterodorsals and posteroventrals complete, setae at least as long as depth of femur. Fore tibia halfway with one anterodorsal seta, not longer than diameter of tibia at level of insertion, and one long posteroventral seta, at least twice as long as diameter of tibia. Mid femur at distal fourth or third yellow, with a complete row of ventral setae of which those of basal half at least as long as depth of femur, setae of distal half distinctly shorter than depth of femur, preapically one anterior and two posterior or posterodorsal setae. Mid tibia with two posterior setae, distinctly longer than diameter of tibia. Hind femur at about distal fifth or sixth yellow, with complete rows of anterodorsals about equal in length, and anteroventrals of varying length with the strongest setae apically, apical third with a row of short, posteroventral setulose hairs, preapically one anterior and two posterior or dorsal setae. Hind tibia with two anterodorsals longer than twice the diameter of tibia and two anteroventrals, of which one at least as long as twice and the other one only about as long as the diameter of tibia, posterodorsal setae absent.

Abdomen. Ground-colour grey, slightly shining. Tergite 3 with a pair of small round brown patches, weakly developed; tergite 4 only at certain points of view with a barely visible tinge of small patches. Tergites 3 laterally with long marginal setae, tergite 4 with a complete row of long marginals and tergite 5 with transverse rows of long discals and long marginals. All long marginal and discal setae on dorsal surface of tergites with dark dots at bases. Sternites grey; sternite 1 bare, sternite 5 apically on each side of margin with one conspicuous seta, strong, stout and slightly curved.

Male genitalia: Hypopygium and sternite 5 distinctly pronounced. To avoid damage of the only available specimen of this new species, extraction of the genitalia has not been undertaken. The species is clearly distinguished by morphological characters from similar species. The identification does not depend on comparison of characters of male terminalia.

Measurements. Length of body about 4.4 mm, length of wing 4.3 mm. Female unknown.

**Etymology.** The species is named after Mount Siutka from the Rhodope Mountains, the locality where the specimen was collected.

**Diagnosis.** The species runs in the keys to the Muscidae of the Palearctic Region <sup>[1]</sup> (p. 151 and 1075) to couplet 55a with *Helina atlantica* (Tiensuu, 1939), which is recorded from Madeira <sup>[5]</sup> only. Both species have some characters in common but they are distinguished by following markings:

The frons of *H. atlantica* is about as broad as an eye, antennae are uniformly dark. Scutum is dusted and distinctly marked with four longitudinal dark stripes. There is one pair of prescutellar acrostichal setae, about half as long as the dorsocentral setae and the pre-alar seta is longer than half the length of posterior notopleural seta. Hind femur on middle third at least with one posteroventral seta almost as long as the depth of femur. Each one of abdominal tergites 3 to 5

marked with a pair of very large brown patches and a brown median stripe. Sternite 5 apically haired and with two or three rather long setae on each side.

The frons of *H. siutkae* is not as broad as an eye and pedicel is distally marked with a contrasting yellow margin. Scutum is uniformly grey dusted without any dark markings, acrostichal and pre-alar setae are barely distinguishable from short ground hair. Hind femur without posteroventrals at middle and there is no pattern on abdominal tergites. Sternite 5 conspicuously marked with one dominating strong seta on each side of the apical margin.

Using the very recently published keys <sup>[3]</sup> to muscid species, which however are limited to the species of Central Europe only and therefore do not include *H. atlantica*, the characters of *H. siutkae* lead to *Helina obtusipennis* (Fallén, 1823). Among other markings the two species are distinguished by the black tibiae and two or three anterodorsal setae of the mid tibia of *H. obtusipennis* whereas *H. siutkae* is characterized by yellow tibiae and anterodorsal setae of mid tibia are lacking.

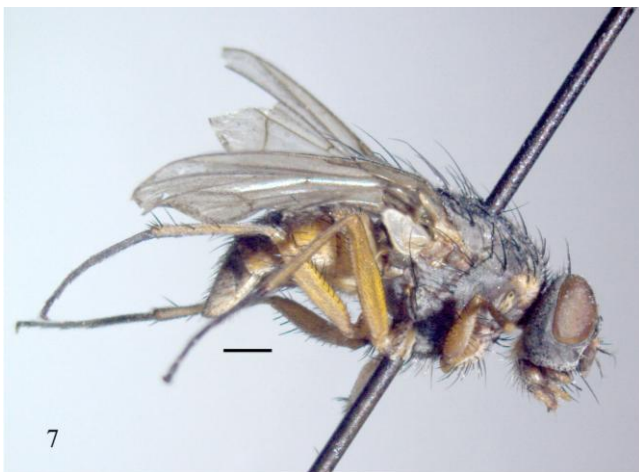
***Phaonia sandanskii* spec. nov.** (Fig. 7)

**Material examined:** Female holotype, left tip of wing, left front leg, right fore tarsomeres and left mid tarsomeres 3-5 are absent, some setae and some arisal hairs are lacking. Irrespective of these shortcomings the specimen is distinctly differentiated from the hitherto known species of *Phaonia*. The locality label reads: "BG: Sandanski 3.11.1965, leg. W. Lavchiev".

**Description:** Head. Ground-colour dark. Eyes sparsely but distinctly short-haired. Shortest distance between eye-margins more than four times the width of postpedicel. Fronto-orbital plate at narrowest part barely as wide as distance between outer margins of posterior ocelli. Frontal vitta with two short crossed interfrontal setae, width of vitta at level of interfrontals about three times the distance between outer margins of posterior ocelli. Parafacial midway barely as broad as width of postpedicel. In profile facial edge in level of profrons. Genal depth below lowest eye-margin about twice the width of postpedicel. From the anterior point of view frontal vitta dark and weakly greyish dusted, fronto-orbital plate, parafacial and anterior part of gena dark with dense greyish-white pruinosity, haired areas such as the lower half of gena, post-genal and post-occipital surface more grey. Basal antennal segments yellow, postpedicel with a narrow, yellow basal ring and yellow inner surface of basal half, remaining surface dark brown with some grey dust, about 2.5 times as long as broad and almost twice as long as pedicel. Arista about twice as long as length of postpedicel, longest arista-hairs about as long as width of postpedicel. Fronto-orbital plate with one pair of strong reclinate orbital setae at the level of anterior ocellus, about five pairs of strong frontal setae and few weaker interstitial setae almost all over the length of fronto-orbital plate, and surface of fronto-orbital plate from orbital seta down to the anterior frontal seta with small setulae. Parafacial bare. Vibrissal setae distinctly stronger and longer than the strongest ones of the surrounding setae. Lower half of gena covered with short setulose hairs, post-genal and post-occipital surface with longer hairs. Proboscis short and very stout with broad labella. Mentum brown and pale dusted. Palpus yellow, slender, about as long as mentum.

Thorax. Ground-colour dark with some grey dust. Scutum from the dorsal point of view black, densely dusted anteriorly, a pair of short dark paramedian vittae inside the rows of

presutural dorsocentrals, not reaching transverse suture, outside the row of presutural dorsocentrals a triangular-shaped dark patch between dorsocentrals, posthumeral and presutural setae. Postsutural part of scutum with two weak paramedian dark stripes inside the rows of dorsocentrals and on each side between intra-alar setae and dorsocentrals another dark stripe not extending the fourth dorsocentral seta. Scutellum ground colour dark and grey dusted, at basis with a weak median dark patch, at distal third of the dorsal surface and laterally dull yellow. Postpronotal calli conspicuously yellow, at some angles of light densely grey dusted. Pleura predominantly blackish and grey dusted, meron and partly the katepimeron brownish to dark brown with some grey dust. Anterior and posterior spiracles yellowish. Ground hair of scutum dark and about as long as width of postpedicel, some parts of pleurae with longer hairs. Dorsocentral setae 2 + 4; acrostichals 2+2; notopleuron with 2 notopleural setae, anterior one distinctly longer than posterior seta, no additional small hairs; prealar seta equally long as posterior notopleural seta; 2 intra-alar setae. Prosternum-margin with setulose hairs. Meron below spiracle with few short hairs. Proepimeral area, anepimeron and katepimeron bare. Katepisternum covered with some fine hair and with 1+2 katepisternal setae, the lower one distinctly closer to the posterior seta than to the anterior one, surface between front coxa and mid coxa with a median vertical row of about five strong setae. Anepisternum with fine hairs, at posterior margin with a row of about six long setae varying in length and strength. Scutellum with one long apical and one long lateral seta, preapical and basal seta about half as long as the two stronger setae; lateral and ventral surfaces bare.



**Fig 7:** *Helina sandanskii* spec. nov.: female holotype, lateral view (bar = 1 mm).

Wing. Membrane greyish hyaline, surrounding membrane of cross-veins very weakly infuscated. Tegula and basicosta yellow, veins brown. Costal spine not longer than twice the length of surrounding bristles. Radial node and vein R4+5 dorsally and ventrally bare. Vein M straight, diverging slightly from vein R4+5. Cross-vein r-m somewhat basal of the point where vein R1 enters costa, distal cross-vein dm-cu slightly sinuous. Calypters whitish transparent with white margin and fringe, lower calypter about 1.5 times as long as upper calypter. Haltere entirely yellow.

Legs including coxae and trochanters all yellow, tarsomeres all dark. Pulvilli and claws short. Posterior surface of hind coxa bare. Fore femur with a row of posterodorsal setae, about as long as depth of femur, below a row of posterior setae, barely half as long as the upper ones, ventrally a

complete row of posterior bristles, the distal ones stronger than the basal setae. Fore tibia at middle with a posterior seta longer than the diameter of tibia, at about same level a significantly weaker anterior seta. Mid femur at basal half with some ventral setae and some short anterodorsals not longer than one third of depth of femur, preapically three strong posterodorsal setae and few posteroventral setulose hairs. Mid tibia with two or three strong posterior setae. Hind femur with a complete row of strong anterodorsals, longest ones almost as long as width of femur, additionally a row of anteroventrals, setae of distal half significantly longer than basal setae, at basal half a row of short posteroventrals, preapically few posteroventral setulose hairs and two strong posterodorsal or dorsal setae. Hind tibia with two anterodorsals longer than, and three anteroventrals at most as long as diameter of tibia, one posterodorsal seta on distal fourth of tibia, about twice as long as diameter of tibia.

Abdomen. Ground-colour yellow, whitish dusted of varying intensity depending on point of view, when viewed from behind all tergites with an indistinct, weakly developed brown median longitudinal vitta. Tergites 1+2, 3 and 4 with marginal setae, the lateral ones longer than the dorsal ones, tergites 3, 4 and 5 dorsally also with few discals. Sternites all yellow; sternite 1 bare; sternites 2-5 with short black setulose hairs, sternite 2 at basal half additionally with fine elongate, apically curved hairs, sternites 2 to 4 each one at distal margin with two black setae barely as long as the following sternite.

Measurements. Length of body about 8.2 mm; length of wing about 7 mm.

Male not known

**Etymology.** The name of the new species derives from the town Sandanski, where the fly was collected.

**Diagnosis.** In Hennig's key <sup>[1]</sup> (page 1080) the rare combination of haired prosternum and plumose arista leads to couplet 5a with *Phaonia asiatica* Hennig, 1963, a species described from Tajikistan. The species is distinguished from *Phaonia sandanskii* by following markings: Antennae and palpi of *P. asiatica* predominantly black, postpronotal calli concolorous with scutum, coxae and femora predominantly dark, hind tibia with an additional short posterodorsal seta in basal half, abdomen dark, densely covered with grey-white dust. *P. sandanskii* is characterized by yellow palpi and basal segments of antennae, postpronotal calli are yellow and in contrast to dark scutum, legs including coxae and trochanters are yellow and hind tibia is without an additional short posterodorsal seta, the ground colour of abdomen is yellow.

There are only two more *Phaonia*-species with haired prosternum and plumose arista known from the western area of the Palaearctic Region, but they have not been considered as such in the keys provided <sup>[1, 2, 3]</sup>. Lyneborg <sup>[6]</sup> determined only in 1965 a *Phaonia*-male from Israel with haired prosternum as a new species and named it *Phaonia kugleri*, and Hennig <sup>[1]</sup> did not consider in the keys that *Phaonia fusca* (Meade, 1897), which is recorded from Great Britain <sup>[5]</sup>, The Netherlands <sup>[5]</sup> and Belgium <sup>[7]</sup>, has a distinctly haired prosternum. Hennig <sup>[1]</sup> and later Gregor *et al.* <sup>[2, 3]</sup> differentiated *H. fusca* from similar species by other morphological characters. Both species differ from *P. sandanskii* by following characters:

*H. fusca* is marked by black antennae and palpi, three postsutural dorsocentral setae and predominantly dark legs with yellow tibiae. *P. sandanskii*, however, is characterized by yellow palpi and yellowish basal antennal segments, four

postsutural dorsocentral setae and predominantly yellow legs. *P. sandanskii* is distinguished from *H. kugleri* by a predominantly yellow abdomen and yellowish-grey postpronotal calli, which are dark and more or less densely dusted in *H. kugleri*. Additionally, the fore tibia of *H. sandanskii* is armed with a posterior seta and the prealar seta is about as long as the posterior notopleural seta, whereas a posterior seta of fore tibia and prealar seta are absent with *P. kugleri*.

### Discussion

Since 1986, when Pont <sup>[8]</sup> compiled the Palaearctic Muscidae, only few new species of the subfamily Phaoniinae were described from European countries (e.g. Pont <sup>[9]</sup>, Zielke <sup>[10, 11]</sup>). From the data published by Xue & Sun <sup>[12]</sup> and Yu & Xue <sup>[13]</sup> it can be calculated that at the same period some 200 new species were described from China for each of the two genera *Helina* and *Phaonia*. Whilst approximately a total of 161 species of *Helina* and *Phaonia* are known from the European part of the Palaearctic Region <sup>[5]</sup> there is a total of about 550 species of the two genera recorded from China <sup>[12, 13]</sup>, where the muscid fauna has been subject of intense investigations over the last 30 years. Although the European fauna is considered as well known (e.g. Pont <sup>[14]</sup>, Sorokina <sup>[15]</sup>) compared with areas such as Central and West Asia, it cannot be excluded that there are still muscid species thriving in Europe, which have not been detected and described yet. There is a large variety of biotopes in various parts of Europe of which the Muscidae fauna has been investigated only poorly. And species which are limited in their geographical distribution and which are also not common in the biotopes which they inhabit, will be easily missed if there are only sporadic investigations. Three of the presented four descriptions of new species are based on one specimen only. Each specimen was collected from a locality where several captures were conducted over the years, before and/or after the date of collecting the species. In spite of repeated captures at different times each species was found only once.

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