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## Three new *Phaoniini* species collected in treetops in north-western Bulgaria (Diptera: Muscidae)

**Eberhard Zielke**DOI: <https://doi.org/10.22271/j.ento.2024.v12.i2a.9295>**Abstract**

Three new species, *Helina quercusa* spec. nov., *Phaonia canopya* spec. nov. and *Phaonia pinusa* spec. nov. are described new to science from Bulgaria. The *Helina* species originate from the treetop of an oak tree, and the *Phaonia* specimens were collected from a pine and a plum tree, respectively. It is also suggested how the three species can be integrated into the most current identification key available for *Helina* and *Phaonia* species from Europe.

**Keywords:** Palaearctic Region, Bulgaria, treetop habitat, Muscidae, *Helina*, *Phaonia*, new species, identification key

**Introduction**

As part of a study on the winter feeding habits of bats in Bulgaria (Toshkova *et al.* <sup>[1]</sup>), insect traps were used to obtain information about the composition of the existing flying insect fauna as possible food source for bats. The traps were positioned in treetops of different tree species and in different habitat types. Among a variety of known species, which will be dealt with in another contribution, the determination of the muscid material revealed also nine specimens of which one could be assigned to the genus *Helina* Robineau-Desvoidy, 1830 and the others to the genus *Phaonia* Robineau-Desvoidy, 1830. However, all specimens did neither match the species-characteristics of the available identification keys, nor the descriptions of recently introduced new species originating from the western part of the Palaearctic Region. Obviously, they are representatives of taxa not known yet to science. The species are described below as *Helina quercusa* spec. nov., *Phaonia canopya* spec. nov. and *Phaonia pinusa* spec. nov. and they are compared with taxonomically similar species. In addition it is proposed how they can be integrated in the current identification keys for European species (Gregor *et al.* 2016) <sup>[2]</sup>.

**Materials and Methods**

The flies originated from the Iskar Gorge of the Balkan Range in North West Bulgaria. As already described by Toshkova *et al.* <sup>[1]</sup> they were collected along with other insects by means of Flight Intercepting Traps (FIT), a slightly modified Wilkening *et al.* <sup>[3]</sup> model with propylene glycol as collecting fluid. The FITs were positioned about seven to nine meter above ground at the mid-section of the tops of trees, located in different habitat types. After each sampling period of about three to seven weeks the collected insects were identified to order and stored in ethanol until they were processed for identification. The Muscidae were identified at the Institute of Biodiversity and Ecosystem Research (IBER), Sofia, Bulgaria, primarily based on the keys provided by Hennig (1964) <sup>[4]</sup> for the Palaearctic Region and by Gregor *et al.* <sup>[2]</sup> for the Central European species. Additionally, publications <sup>[5-13]</sup> on new *Helina* and *Phaonia* species from Bulgaria and the western part of the Palaearctic Region were consulted for comparing the new species with taxa not included in the keys available. Morphological features of the specimens were examined using a Zeiss Stemi 2000-C stereomicroscope. Images were created by means of combination of a Zeiss Discovery 8 stereomicroscope and an AxioCam ERc5s camera. For further processing of the images Helicon Focus 6 and Adobe Photoshop CS2 were applied. Morphological terminology follows McAlpine (1981) <sup>[14]</sup>, however, postpedicel is used instead of "first flagellomere" <sup>[15]</sup> as proposed by McAlpine. The width of postpedicel of antenna seen from the side is called "depth", it refers to the greatest depth of the postpedicel and is used mainly for comparisons.

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The intra-alar setae of the presutural part of the mesonotum are named posthumeral and presutural seta respectively and the fronto-orbital setae, for the sake of simplicity, are frontal setae. If the length of setae or hairs of the femur is compared to the depth of femur, the depth always refers to the point of insertion of the seta or hair. The length of postpedicel is measured from the most anterior margin of pedicel to the apex of postpedicel. Information about the width of frons always refers to the shortest distance between the margins of the eyes. Body length was measured in millimetres (mm). The holotypes of the new species are deposited in the entomological collection of IBER.

## Results

### Descriptions of new species

#### *Helina quercusa* spec. nov. (Figs 1-5)

##### Material examined

♀ holotype, locality label reads "BG: Western Balkan Mts. Iskar Riv. Gorge, Milanovo VIII., road to Rezhishkata cave; FIT 9, 26.iii. - 26.iv.2021; leg. N. Simov, M. Langourov". According to Toshkova *et al.* [1] the trap was placed in the treetop of an oak tree (*Quercus* sp.) with the decimal geographic coordinates 43.08906N23.38168E and at the altitude of 530 m. The female is lacking the left fore leg, the tarsal segments 2-5 of the right hind leg and the labellum and there is a rupture in the left wing, otherwise the specimen is in fairly good condition.

##### Etymology

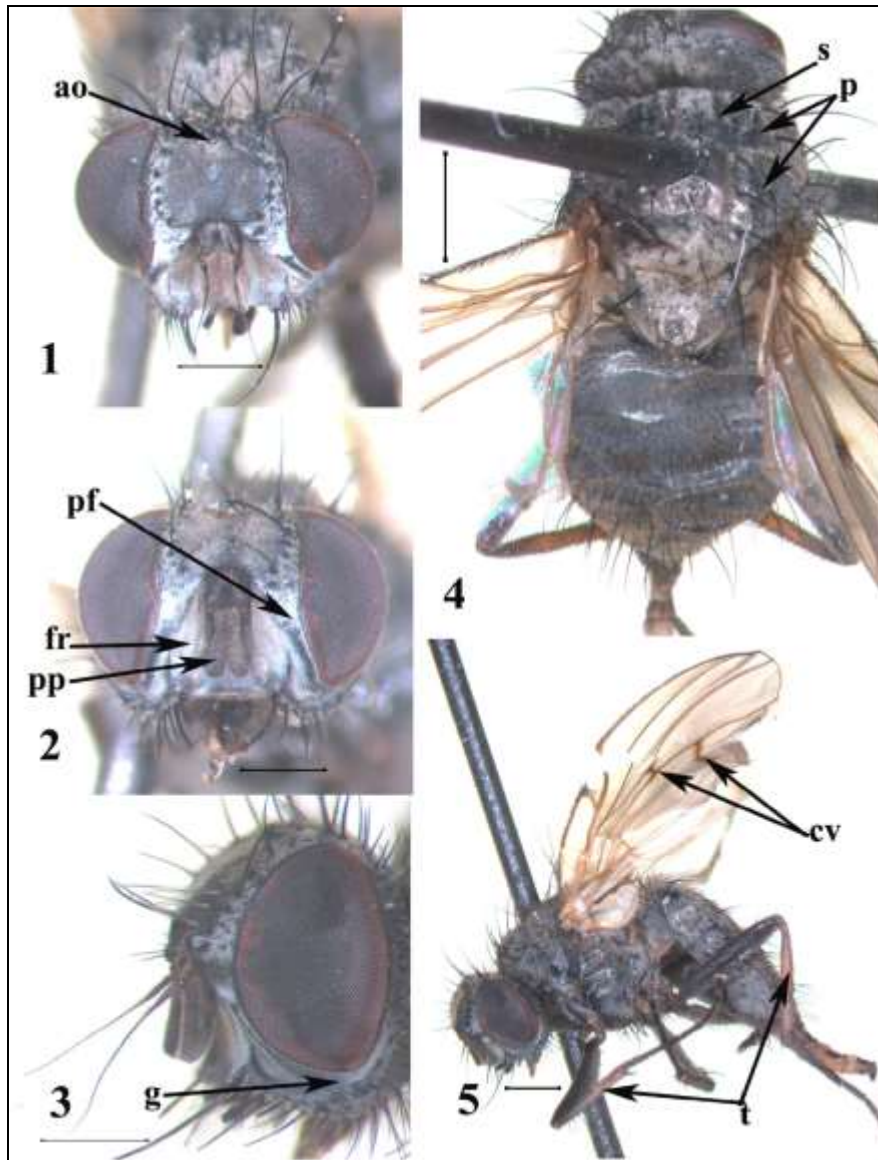
The new species' epithet "*quercusa*" is a modified feminine adjective that refers to the genus of the tree from which the specimen was collected.

##### Description (female)

Head. Ground-colour dark almost black, at certain incidence of light partly dusted greyish. Dichoptic; eyes practically bare, very few microscopic hairs on the lower half, facets of about equal size. Frons 1.7 times as wide as maximal width of an eye (Fig. 1), slightly dilated at midlength, at the level of vertex about 0.38 times as wide as the maximum width of the head; at the level of anterior ocellus about 3.9 times and at the anterior margin of the frons 4.4 times as wide as the distance between the outer margins of posterior ocelli. Fronto-orbital plate at midlength of frons about 1.5 times as wide as the anterior ocellus. Parafacial (Fig. 2) at the level of the antenna base almost 2.5 times as wide as the depth of the postpedicel, tapering sharply downwards and at the level where parafacial and facial ridge separate about as wide as depth of postpedicel. Facial ridge in lower half about as wide as parafacial. In profile (Fig. 3): upper mouth margin slightly behind profrons; parafacial visible throughout the entire length; genal depth below the lowest margin of the eye slightly wider than depth of postpedicel; antenna falling short to mouth margin by the depth of postpedicel. In anterodorsal view frontal vitta matt greyish-black, fronto-orbital plate black uniformly dusted whitish-grey, frontal triangle at certain viewing angle not demarcated, in anterodorsal view clearly recognizable, somewhat greyish reaching midlength of frons. Parafacial in anterior view densely dusted greyish, lower half at certain viewing angle partially blackish, face and facial ridge more or less uniformly dusted greyish; gena depending on incidence of light blackish or dusted greyish. Pedicel and postpedicel black, postpedicel in certain conditions of light slightly more dusted greyish than pedicel. Postpedicel about

three times as long as deep and twice as long as pedicel. Arista dark brown to blackish, at least twice as long as length of postpedicel, basal part somewhat dilated, arista pubescent longest hairs barely as long as basal diameter of arista. Inner vertical seta somewhat longer than the outer vertical seta. Ocellar seta longer than the outer vertical seta. Anterior half of fronto-orbital plate with four strong inclinate setae, the anterior one longer than the upper moderately long setae, upper half of frons with two strong reclinate setae, the upper reclinate seta somewhat longer, both setae about as long as the frontal setae. The surface between eye margin and exclusively the frontal setae is covered with numerous fairly long, proclinate setulae. Parafacial, face, facial ridge and lateral surface of gena bare. Lower margin of gena and subgena with black setae. Postgenal and occipital surface dark, densely dusted greyish. Proboscis rather short, somewhat bulbous, prementum dark brown, dusted greyish; palpus blackish, slightly clavate.

Thorax. Ground-colour almost black, depending on the viewing angle shiny or more or less densely dusted greyish, partially with a brownish tinge. In posterodorsal view (Fig. 4) the presutural part of mesonotum dusted densely whitish-grey, the postsutural part less densely dusted greyish with a weak brownish tinge, the presutural part with two narrow dark brownish to black paramedian stripes, each one inside and along the row of dorsocentral setae, continued in the postsutural part up to the third dorsocentral seta, but poorly demarcated and only visible at certain incidence of light. When viewed from lateral or anterior mesonotum partly with some brownish dusting. In addition, outside of dorsocentral rows on presutural mesonotum a dark elongate patch, interrupted at transverse suture and continued on postsutural part reaching about the level of second dorsocentral seta. At certain incidence of light scutellum and prescutellar area of postsutural mesonotum densely dusted greyish (Fig. 4). Pleura dark, depending on viewing angle more or less dusted grey with a distinct brownish tinge. Anterior and posterior spiracle dark brown. Mesonotum, scutellum and pleura moderately covered with dark hairs. Acrostichals 0+1, the posterior seta about half as long as the posterior dorsocentral seta, the presutural acrostichal hairs in two irregular median rows, the longest hairs about a quarter as long as the posterior presutural dorsocentral setae, the distance between the rows is approximately the length of the hair; dorsocentral setae 2 + 4, all strong and long; posthumeral 1; presutural 1; postpronotal setae 2, the outer one somewhat longer than the inner seta; notopleuron without setulae, anterior notopleural seta clearly longer than posterior one; prealar seta about half as long as posterior notopleural seta; intra-alar seta 2, the anterior one barely longer than the ground hair; supra-alar setae 2; postalar setae 3. Prosternum, proepisternal depression, anepimeron, meron, katepimeron suprasquamal ridge and postalar declivity bare. Proepisternal seta and proepimeral seta rather strong, adjacent setae about half as long and weaker. Katepisternal setae 2+2, all strong and long, the lower clearly shorter than the upper setae; anepisternal setae 1+4, the anterior seta very strong, the posterior row with 3 strong and long setae in the upper part and further down a strong fourth seta, several long interstitial hairs, however distinctly shorter than the setae. Scutellum with rather long apical and lateral setae, basal and preapical setae at most one third as long but clearly longer and distinguishable from ground-hair; lateral surfaces and ventral surface completely bare.



**Figs 1-5:** *Helina quercusa* spec. nov., female holotype: (1) anterodorsal view of frons, anterior ocellus (ao); (2) anterior view of face, facial ridge (fr), parafacial (pf), postpedicel (pp); (3) lateral view of head, gena (g); (4) dorsal view, dark paramedian stripe in presutural part of mesonotum (s), dark stripe-like lateral marking on presutural and postsutural part of mesonotum (p); (5) lateral view, wing cross-veins (cv) infuscate, legs with predominantly yellow tibiae (t). Scale bars: Figs 1-3, 0.5 mm; Figs 4-5, 1 mm.

Wing. Membrane hyaline with a distinct brownish tinge (Fig. 5), cross-veins clearly infuscate. Tegula dark brown, basicosta brown, wing veins predominantly brownish. Costal spine about as long as cross-vein r-m. Radial node and veins ventrally and dorsally bare. Vein M straight, diverging from vein R4+5. Cross-vein r-m about at the point where vein R1 enters costa, distal cross-vein dm-cu strongly sinuous and slightly oblique. Upper calypter whitish transparent, margin somewhat yellowish-orange, lower calypter whitish translucent, margin whitish, lower calypter about 1.5 times as long as upper calypter. Haltere stem brownish-yellow, knob dark yellow.

Legs. Femora predominantly greyish-black, at certain incidence of light sparsely dusted grey, all femora without yellowish apex; all tibia at least partially reddish-brown (Figs 4 & 5); tarsi dark brown to black. Pulvilli and claws distinctly shorter than the corresponding tarsomere. Fore femur with a row of long and strong anterodorsal setae and a row of anteroventral setae, the anterodorsal setae slightly and the anteroventrals distinctly longer than depth of femur. Fore tibia

without a posterior median seta. Mid femur in basal third with three to four blunt ventral setae, at most half as long as depth of femur, apical third with a row of anteroventral hairs and a row of posteroventral hairs on apical two thirds, the hairs not as long and strong as the longest ventral setae, preapically three strong and long bristles on the posterior surface and one anterior bristle, not as strong as the posterior ones. Mid tibia in basal third with one strong and in middle third with two strong posterior setae, all clearly longer than diameter of tibia. Hind coxa bare on the posterior inner surface. Hind femur with a complete dense row of strong anterodorsal setae, at least in basal three quarters clearly longer than depth of femur, in apical half a row of about five or six strong anteroventral setae, much longer than depth of femur and anterodorsal setae, in basal third about three rather short blunt ventral setae, apical fourth with a short row of posteroventral hairs, not longer than depth of femur, preapically two strong posterior to posterodorsal bristles. Hind tibia with two fairly strong anterodorsals in middle third, clearly longer than diameter of tibia, and three or four anteroventrals at most



slightly longer than the diameter of tibia, no distinct posterodorsal seta present.

Abdomen. Uniformly shiny dark greyish without any pattern (Fig. 4), in certain conditions of light with a very weak brownish tinge. Surface of tergites well covered with black ground hair. All tergites with distinct marginal setae, on syntergite 1+2 up to tergite 4 the central setae clearly shorter than the lateral ones; tergite 4 dorsolateral with some distinct but not very long discal setae; tergite 5 with a row of marginal setae and with three irregular rows of discal setae, the discals very strong and longer than the marginals. Ventral parts of tergites and sternites dark greyish, sternite 1 bare.

Female genitalia. Not investigated.

Measurements. Length of body about 6.5 mm; length of wing about 6 mm.

Male not known.

### Diagnosis and remarks

When using the identification key <sup>[2]</sup> for the *Helina* females, the specimen leads to *Helina laxifrons* (Zetterstedt, 1860). However, whereas *H. laxifrons* is characterized by 1+2 katapisternal setae and a median posterior seta on the anterior tibia, the new species has 2+2 katapisternals but no median posterior seta on the anterior tibia. In the corresponding identification table published by Hennig <sup>[4]</sup> several *Helina* females of the Palaearctic region are not differentiated up to species level. Thus, the female of *Helina quercusa* spec. nov. leads to a group of females of four species, *Helina reversio* (Harris, 1780), *Helina intermedia* (Villeneuve, 1899), *Helina arctata* Collin, 1953 and *Helina setiventris* Ringdahl, 1924. The latter two species have posteroventral setae in the apical third of the hind femur that are longer than the depth of the femur, and the females of *H. reversio* and *H. intermedia* are marked by a posterodorsal seta on the basal third of the hind tibia. *Helina quercusa* spec. nov. does not have any of these setae. The identification key for *Helina* females presented by D'Assis-Fonsecca <sup>[16]</sup> only takes into account the British muscid species. Using this key the female runs to *Helina pertusa* (Meigen, 1826). This species has only one anterodorsal seta on the hind tibia, and 1-2 posterior setae on the anterior tibia; whereas the new *Helina* species is marked by two anterodorsals on the hind tibia and has no posterior setae on the fore tibia.

To integrate *Helina quercusa* spec. nov. into the latest identification key for the females of *Helina* species <sup>[2]</sup> the following amendment of the key is suggested:

59. Abdomen without distinct dark spots.....60a  
 - Abdomen with 1-2 pairs of dark spots.....61  
 60a Three postsutural dorsocentrals.....*H. setigera* (Pokorny)  
 - Four postsutural dorsocentrals.....60b  
 60b Katapisternal setae 1+2, fore tibia usually with a median posterior seta.....*H. laxifrons* (Zetterstedt)  
 -Katapisternal setae 2+2, fore tibia without a median posterior seta.... *Helina quercusa* spec. nov.  
 61. Continue as indicated in the key <sup>[2]</sup>

### *Phaonia canopya* spec. nov. (Figs 6-18)

#### Material examined

♂ holotype, locality label reads: " BG: Western Balkan Mts. Iskar Riv. Gorge, Milanovo VIII., road to Rezhishkata cave; FIT 7, 26.iv. - 21.v.2021; leg. N. Simov, M. Langourov". The trap was placed <sup>[1]</sup> in the treetop of a pine (*Pinus sylvestris*)

with the decimal geographic coordinates 43.09120N 23.38520E and at an altitude of 671 m. Two male paratypes and the female paratype marked with a small label "A" are from the same locality and therefore have identical locality labels. Another male and two female paratypes originate from the same locality but were found in FIT 5 placed in a plum tree (*Prunus domestica*) with the coordinates 43.08858N 23.38500E and at an altitude of 406 m <sup>[1]</sup>. The male and the female marked with a "B" were trapped in the period from 26.iii.-26.iv.2021 and the other female "C" from 26.iv.-21.v.2021.

The holotype is lacking a few major setae, the thorax and abdomen are somewhat shrunk, but otherwise the specimen is in good condition. The three male and three female paratypes show some deficiencies as well, such as missing a few major setae or a leg, some shrinkages and a rupture of an abdominal segment, but in general they are as well in good condition and they also proved to be very useful for the species-description. All types are deposited in the entomological collection of IBER.

### Etymology

The name "*canopya*" of the new *Phaonia* species is a feminine adjective and refers somewhat modified to the canopy (treetops) where the specimens have been collected.

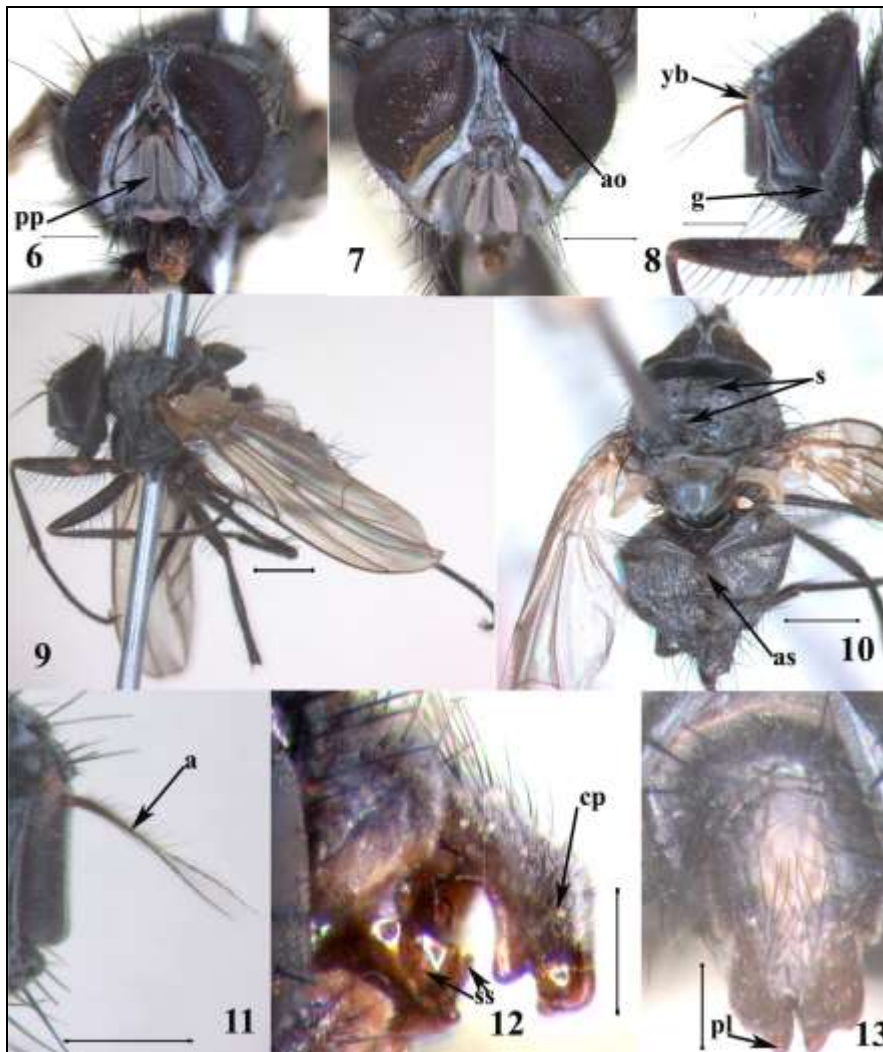
### Description (male)

Head. Depending on incidence of light predominantly dusted grey or dark grey. Eyes with facets in anterior area clearly enlarged, rather sparsely (holotype) or more densely (paratype) covered with hairs longer than twice as long as diameter of an enlarged facets. Shortest distance between eyes (Figs 6 & 7) twice the diameter of the anterior ocellus. Width of fronto-orbital plate at shortest distance between eyes about as broad as diameter of anterior ocellus; fronto-orbital plates touch each other, if at all, over a very short distance in the upper third of frons (Fig. 7); above the point of touching is a short, narrow frontal vitta below the ocellar tubercle and in the lower half of frons the fronto-orbital plates are separated by a frontal vitta which is still quite narrow in the middle of the frons, but is largely widened towards anterior margin. Parafacial at basis of antenna half as wide as depth of postpedicel, slightly narrowing in the upper third and further downwards somewhat dilated and almost parallel-sided, about two thirds as wide as depth of postpedicel (Fig. 6), facial ridge in lower half about 1.2 times as wide as parafacial. In profile (Fig. 8): upper mouth margin and profrons about in line, parafacial well visible along its entire length, genal depth below lowest eye margin about twice as wide as depth of postpedicel and 0.3 times as high as vertical diameter of eye; anterior tip of antenna slightly below of lowest eye margin. When viewed from anterior, parafacial, anterior gena surface, ocellar tubercle, frontal vitta and postpedicel of antenna uniformly dusted whitish-grey, the latter with a fairly narrow but distinct yellowish basis. Pedicel and fronto-orbital plate blackish, the latter, however, with a very narrow whitish-grey line along the eye margin; when viewed from dorsal, frontal vitta and ocellar triangle almost velvet black, fronto-orbital plate silver-grey; in lateral view depending on incidence of light fronto-orbital plate, parafacial, antenna and gena dusted greyish with more or less parts dusted sparsely which then appear dark. Antenna fairly long (Figs 6 & 8) but falling short of facial margin by less than half of its own depth, postpedicel at least 3.5 (3.5-4.0) times as long as its depth and about three

times as long as pedicel. Arista brown, at least 1.5 times as long as length of postpedicel and basal part somewhat dilated (Fig. 11), the longest hairs of arista about half as long as depth of postpedicel, only the dorsal hairs in the approximately basal two-fifths of the arista are long, the ventral hairs in this section not as long as the basal diameter of arista, the remaining distal part of arista with about equally long dorsal and ventral hairs, however shorter than in the basal part, in general the length and density of the hairs decreasing towards the arista tip. Fronto-orbital plate throughout its length almost up to the ocellar tubercle with about five to six inclinate frontal setae and one or two interstitial hairs in anterior half, the setae moderately long and distinct, the two most upper ones distinctly shorter and hair-like, at level of anterior tip of ocellar triangle one reclinate hair and somewhat above a shorter, but more curved, reclinate hair. Ocellar setae about as long as the anterior fronto-orbital setae. Parafacial and facial ridge bare. Vibrissal seta and surrounding peristomal setae strong, vibrissal about 1.3 times as long as the longest peristomal seta. Lateral surface of gena bare, the lower

margin with seta-like black hairs, postgenal and post-occipital surfaces densely covered with dark seta-like hairs. Proboscis short, barely as long as fore coxa, slightly bulbous and dark; length of labella slightly longer than largest depth of proboscis; prementum depending on viewing angle shiny dark brown or sparsely dusted greyish, palpus slender, dark and somewhat longer than prementum.

Thorax. Ground-colour uniformly grey to dark grey. Mesonotum and scutellum are uniformly greyish (Fig. 10), at certain viewing angle mesonotum with a faint, and scutellum with a distinct brownish tinge. Apart from - if present - two dark paramedian longitudinal stripes between the rows of dorsocentral setae, the mesonotum has no other clearly visible dark markings; the stripes are in two paratypes very poorly developed. Depending on the incidence of light, the stripes extend more or less clearly in the postsutural part of the mesonotum where they are wider and less clearly demarcated, only visible at certain incidence of light. Pleura (Fig. 9) uniformly grey, somewhat shiny at certain viewing angle.



**Figs 6-13:** *Phaonia canopy* spec. nov., male holotype: (6) anterior view of face, fairly long postpedicels (pp); (7) anterodorsal view of frons, anterior ocellus (ao); (8) lateral view of head, gena (g), postpedicel with narrow yellowish base (yb); (9) lateral view, legs all dark; (10) dorsal view, dark paramedian stripe in presutural part of mesonotum and depending on incidence of light continued on postsutural part of mesonotum (s); (11) postpedicel with arista (a), long hairs in basal half of arista only on dorsal surface and not much longer than half depth of postpedicel; (12) lateral view of hypopygium, cercal plate (cp), surstyli (ss); (13) dorsal view of cercal plate with a pair of projecting paramedian lobes (pl).

Scale bars: Figs 6-8 and 11, 0.5 mm; Figs 9 & 10, 1 mm; Figs 12-13, 0.2 mm.

Anterior spiracle brownish-grey, slightly contrasting to the dark grey surrounding at certain viewing angle, posterior

spiracle predominantly brownish. Mesonotum covered with fine moderately long hairs; dorsocentral setae 2 + 3;

acrostichals 0+1, the prescutellar acrostichal seta long and strong, however only about half as long as the very long most posterior dorsocentral seta; postpronotal setae 2, the outer seta only somewhat longer than the inner one; posthumeral seta 1 and presutural seta 1, both setae very long, however, the presutural seta almost twice as long as the posthumeral seta; anterior notopleural seta almost twice as long as posterior seta, no additional hairs on notopleuron or near to the basis of the notopleural setae, however in two males on one notopleuron each one setula was found near to the adjacent pleura; pre-alar seta distinctly longer than the posterior notopleural seta; two long intra-alar setae, two supra-alar setae and three postalar setae, all seta distinct although of different lengths. Prosternum, proepisternal depression, meron, anepimeron and katepimeron bare. Katepisternum and anepisternum covered with fairly long hair, katepisternal setae 1+2, the lower seta much closer to the posterior upper one than to the anterior seta, the posterior seta strikingly longer than the two other setae which are of about the same length; anepisternum with a posterior row of about six long setae and several well developed interstitial hairs, in general not reaching the length of the setae, anterior anepisternal seta long but not very strong. Scutellum with long apical and lateral setae, preapical and basal setae not as long as the major setae but clearly distinguishable from long discal setae found on scutellum in addition to long ground-hair, ventral and lateral surfaces bare.

Wing. Membrane hyaline with a brownish tinge (Figs 9 & 10), cross-veins not infuscate. Tegula and basicosta dark brown, strikingly contrasting to the yellow basis of costa, veins in general yellowish at certain viewing angle with a brownish tinge. Costal spine not conspicuous, about twice as long as the adjacent small bristles of costa. Radial node and basis of R4+5 bare. Vein M diverging from vein R4+5, in apical half almost parallel-sided. Cross-vein r-m basad of level where vein R1 enters costa, distal cross-vein dm-cu slightly oblique and almost completely straight. Upper calypter almost hyaline, margin predominantly white; lower calypter greyish translucent, margin whitish, lower calypter about 1.5 times as long as upper calypter. Haltere with stem and knob pale yellow.

Legs. All legs strikingly long and slender. Coxae dark densely dusted greyish; trochanters contrasting brownish, at certain viewing angle dusted grey or weakly shiny; all femora predominantly dark greyish-brown (Fig. 9), at certain incidence of light somewhat shiny, only the apical joint of femur somewhat yellow, tibiae uniformly brownish-grey, with a distinct paler brownish tinge at certain viewing angle; tarsi uniformly dark greyish-brown; pulvilli and claws about equally long but not as long as length of the apical tarsomere. Fore femur with complete rows of posteroventral, posterodorsal and posterior setae, the setae at least as long as depth of femur, the posteroventrals clearly longer, posterior surface of femur densely covered with fine long hair. Fore tibia without median posterior seta. Mid femur with a complete row of strong posteroventral setae, the setae in basal two thirds distinctly longer than depth of femur, setae in apical part about as long as depth of femur; a row of strong anterior setae, almost as long as depth of femur in middle third of femur; pre-apically one distinct anterior and three strong bristles on the posterior surface. Mid tibia with two strong posterior setae somewhat longer than diameter of tibia and rarely with an additional third one, distinctly shorter. Inner posterior margin of hind coxa bare. Hind femur with a

complete row of rather strong anterodorsal setae, in general slightly longer than depth of femur a more or less complete row of anteroventrals, the most apical setae very strong and longer than, the more basal setae almost as long as depth of femur; a complete row of posteroventrals with the longest setae, about as long as depth of femur, in basal third, the more distal ones about or barely as long as depth of femur; pre-apically two strong posterior or posterodorsal setae. Hind tibia with two anterodorsal and two anteroventral setae all usually somewhat longer than diameter of tibia, and in apical third one posterodorsal seta, about twice as long as diameter of tibia.

Abdomen. Uniformly pale grey dusted. Syntergite 1+2 and the two subsequent tergites with a narrow dark median stripe not clearly demarcated (Fig. 10); tergite 5 longer than tergite 4 and without dark markings. The ventral parts of the tergites similar to the surface of the abdomen, uniformly greyish. The tergites are densely covered with short, dark, seta-like hairs, each of which has a small dark spot on the abdominal surface around its base. Only tergite 4 with a row of very long marginals and with a few long lateral discal setae, tergite 5 with complete rows of marginals and discal setae, all fairly long but not as strong as the marginals of tergite 4. Sternites uniformly dark, dusted greyish, sternite 1 bare.

Male genitalia. Hypopygium not pronounced. Posterior lobes of sternite 5 rounded and framed with a yellowish margin. The species is clearly distinguished by morphological characters from other species of the genus. The identification does not depend on comparison of characters of male terminalia. In order to avoid damage to the available specimens of the new species, the genitals were not extracted, especially since the hypopygium of one of the males is unfolded, so that essential structures are clearly visible and could be documented photographically (Fig. 12 & 13).

Measurements. Length of body about 5.5 mm; length of wing about 5.6 mm.

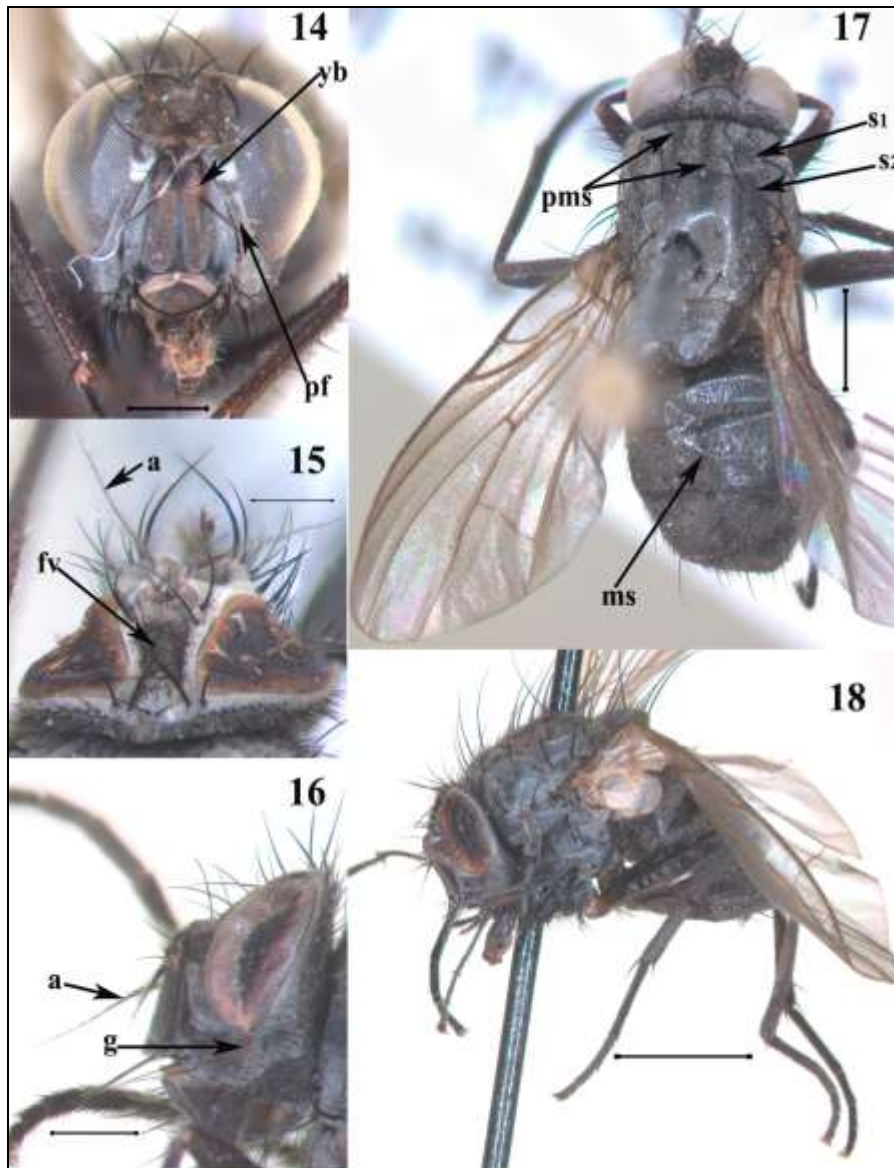
#### **Description (female)**

The female is very similar to the male, although some features of the head and other parts of the body differ more or less clearly from those of the male. The following description primarily lists the deviations from the male. Head. Frons slightly wider than maximal width of an eye (fig. 14), slightly dilated towards anterior margin, at level of vertex about 0.35 times as wide as maximal head width; at level of anterior ocellus about 3.2 times and at anterior margin of frons 3.5 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. Parafacial at level of antenna basis about as wide as depth of postpedicel, somewhat tapering downwards and at midlength of parafacial about two thirds as wide as depth of postpedicel. Facial ridge at level of tip of postpedicel slightly wider than half depth of postpedicel. Genal depth below lowest eye margin (Fig. 16) about 2.4 times as wide as depth of postpedicel and 0.3 times as wide as maximal height of eye. Apex of antenna and lowest eye margin usually at about the same level. In anterior view, fronto-orbital plate, parafacial, anterior gena surface and postpedicel dusted grey with a weak brownish tinge at certain incidence of light, frontal vitta (Fig. 15), ocellar tubercle and pedicel of antenna more brownish. In lateral view parafacial at level of pedicel with a dark brownish patch, appearing whitish in anterior view, the shape of the patch changes when viewing angle is changed. Antenna fairly long (Fig. 16),



reaching face margin in two of three females. Postpedicel at least 3.3 times as long as its depth and about three times as long as pedicel. Frons without interfrontal setae; fronto-orbital plate throughout to midlength with four strong inclinate frontal setae, in upper half with two strong slightly reclinate orbital setae, the lower reclinate seta slightly shorter. Ocellar

seta distinctly longer than frontal setae, about as long as vibrissal seta or outer vertical seta, inner vertical seta somewhat longer than the latter three setae. Surface between frontal setae and eye margin with an irregular row of short slightly proclinate setulae.



**Figs 14-18:** *Phaonia canopya* spec. nov., female paratypes: (14) anterior view of face, parafacial (pf) with conspicuous patch at basis, depending on incidence of light white or blackish, postpedicel with narrow yellowish base (yb); (15) dorsal view of frons, frontal vitta (fv) dark brown to velvet black, arista (a) similar to arista of male; (16) lateral view of head, arista (a) gena (g); (17) dorsal view, dark paramedian stripe in presutural part of mesonotum and depending on incidence of light continued on postsutural part of mesonotum (pms), dark stripe-like lateral markings on presutural (s1) and postsutural (s2) part of mesonotum, tergites with a very faint dark median stripe (ms); (18) anterolateral view. (Figs 14 & 17 are from female paratype "C", Figs 15 & 18 from "B" and Fig. 16 is from "A", the letters A-C refer to the section "Material examined"). Scale bars: Figs 14-16, 0.5 mm; Figs 17-18, 1 mm.

Thorax. Uniformly dusted grey (Fig. 18), similar as in male. Mesonotum and scutellum uniformly greyish but less intense than in male (Fig. 17). In dorsal view presutural part of mesonotum with two dark paramedian longitudinal stripes between the rows of dorsocentral setae and laterally between posthumeral and presutural setae a dark patch, more or less distinct depending on viewing angle. The dark paramedian stripes extend over the suture into the postsutural part of the mesonotum, where, depending on the incidence of light, they might reach midlength of the postsutural mesonotum either as individual stripes or merged into a broad, dark median vitta

that is not clearly demarcated and is sparsely dusted greyish. The lateral dark spots exceed to the posterior part of the mesonotum as a dark stripe between the intra-alar and the dorsocentral setae, not clearly demarcated and only visible at certain viewing angles. The mesonotum is less densely covered with fine, short hairs than in males. The individual anterior anepisternal seta and the interstitial hairs between the setae of the anepisternal row are shorter and weaker.

Wing with the costal spine longer than diameter of costa and more prominent than in male. Distal cross-vein dm-cu somewhat more sinuous than in male.

Legs with all femora predominantly shiny dark, almost blackish, at certain incidence of light somewhat greyish-brown (Figs 14 & 18); tibiae, in particular fore tibia, with a distinct paler brownish tinge at certain viewing angle. Posterior surface of fore femur only sparsely covered with fine long hair. Mid femur in basal fourth with two distinct posteroventral setae at least longer than half the depth of femur, and in apical half with a row of distinct but not very long posteroventral setae. Anterodorsal setae of hind femur about as long as depth of femur; three to five anteroventrals in apical third and only one or two of the setae about as long as depth of hind femur; about three posteroventrals almost as long as depth of femur in basal third. Posterodorsal seta of hind tibia only somewhat longer than the diameter of tibia.

Abdomen. The dark median stripe less distinct than in male and only at certain incidence of light visible (Fig. 17), one of the female paratypes also with a very weak longitudinal stripe on tergite 5.

Female genitalia. Not investigated.

Measurements: Length of body about 5.2 mm; length of wing about 4.8 mm.

### Diagnosis and remarks

Using the identification key for *Phaonia* males [4], the new species runs to *Phaonia palpata* (Stein, 1897) and the female in the corresponding key to *Phaonia mystica* (Meigen, 1826). The male of *P. palpata* is characterized by long hairy eyes, arista hairs as long as the depth of the postpedicel, four dark longitudinal stripes on the thorax, yellow tibiae and 1-2 posterior setae in the middle part of the fore tibia. On the other hand, the male of *Phaonia canopya* spec. nov. is marked by eyes which are short and sparsely haired, the longest hairs of the arista are about half as long as the depth of the postpedicel, the thorax has at most two fairly short dark paramedian stripes, the tibiae are predominantly dark brown, only in certain light a pale brownish tinge can be seen, and the fore tibia has no median posterior setae. The female of the new species is distinguished from *P. mystica* by the lack of a posterior seta on the fore tibia and by dark legs, which are predominantly yellow in *P. mystica*. In the corresponding identification tables by Gregor *et al.* [2] male and female of *Phaonia canopya* spec. nov. each lead to *Phaonia liliputa* Zinovjev, 1990. This species, which was described relatively late, is not included in the identification tables by Hennig [4] or D'Assis-Fonsecca [16]. Both species are fairly small and at first glance have some similarities. However, Gregor *et al.* [2] mentioned in the identification key and in the very short characterization of *P. liliputa* two characteristics that are different from *Phaonia canopya* spec. nov., the longest hairs of arista of *P. liliputa* are at least as long as the depth of postpedicel and the hind tibia has only one anterodorsal seta next to two anteroventral setae; whereas in *Phaonia canopya* spec. nov. The hairs of arista are at most about half as long as the depth of postpedicel and the posterior tibia always has two anterodorsal and at least two anteroventral setae. The comparison of *Phaonia canopya* spec. nov. with Zinovjev's original description [13] of *P. liliputa* revealed some further clear differences, which confirm that the specimens from Bulgaria belong to a separate species. The male of *P. liliputa* is characterized by: Fronto-orbital plates touching over a long section of frons; shortest distance between the eye margins about as wide as diameter of anterior ocellus; postpedicel barely three times (2.2-2.9) as long as deep; longest arisal hairs about one to one and a half times (1.1-1.6) as long as

depth of postpedicel; genal depth 0.18-0.22 times of height of eye; mesonotum with four distinct longitudinal stripes exceeding to midlength of postsutural part of mesonotum; wing veins brown; legs black; pulvilli and claws enlarged; hind tibia with one anterodorsal seta; mid femur with posteroventrals as long as depth of femur; abdomen black dusted grey, weakly shiny, tergites 1+2 and 3-4 with dark median longitudinal spots. Whereas males of *Phaonia canopya* spec. nov. are marked with: Fronto-orbital plates touching very shortly, if at all; the shortest distance between the eyes at least twice as wide as anterior ocellus; postpedicel 3.5 up to four times as long as deep, longest arisal hairs about half as long as depth of postpedicel, genal depth about 0.3 times of height of eye, mesonotum with two distinct longitudinal stripes in presutural part of mesonotum, wing veins predominantly yellowish-brown; legs dark brown, tibia at certain incidence with a paler brownish tinge; hind tibia with two anterodorsals, mid femur with a row of strong anterior setae, almost as long as depth of femur in middle third of femur (such anterior setae are not mentioned from *P. liliputa*); hind femur with a complete row of posteroventrals with the longest setae, about as long as depth of femur, in basal third, the more distal setae about or barely as long as depth of femur (posteroventral setae are also not described for *P. liliputa*); abdomen dark and dusted grey, weakly shiny; abdomen with a faint dark median longitudinal stripe extending from tergites 1+2 to tergite 4. Furthermore, the cercal plate of the hypopygium of the new species (Fig. 13) differs distinctly from the cercal plate of the *P. liliputa* male by having the median part of the apical margin extended by two projecting paramedian lobes, which are absent in *P. liliputa* where the apical margin is more or less straight (Gregor *et al.* [2], p. 167, Fig. 23b; Zinovjev [13], p. 494, Fig. 11).

The females of *P. liliputa* are similar to the males, and following Zinovjev's description the female differs from female *P. canopya* spec. nov. by the body densely dusted pale grey; frons dusted dark grey; postpedicel about slightly more than twice (2, 0-2.6) as long as deep; longest arisal hairs as long as or longer than depth of postpedicel; hind tibia with one anterodorsal seta; hind femur with apical posteroventral setae. The body of the female of *P. canopya* spec. nov., however, is predominantly dusted grey or dark grey; the frons is dark, dusted greyish with a weak brownish tinge; postpedicel more than three times as long as deep; longest arisal hairs about half as long as depth of postpedicel; hind tibia with two anterodorsal setae; hind femur with three to five anteroventrals in apical third and about three posteroventrals almost as long as depth of femur in basal third.

*Phaonia canopya* spec. nov. can be inserted as follows into the keys [2] currently used to identify *Phaonia* males and females. Different paths lead to the females of *P. liliputa* into different couplets [2], namely No. 51 or No. 77, where *P. liliputa* is compared with females of different but similar-looking species.

### Key to *Phaonia* males:

72. Three postsutural dorsocentrals.....73a  
 - Four postsutural dorsocentrals.....75  
 73a Fore tibia with a posterior seta, tibiae at least bright yellow....74  
 - Fore tibia without a posterior seta, legs predominantly dark brown to black.....73b



73b Fronto-orbital plates touching each other, if at all, only on a very short section of frons; shortest distance between eyes at least twice as wide as anterior ocellus; postpedicel between 3.5 and four times as long as deep; longest arisal hairs half as long as depth of postpedicel; posterior tibia with two anterodorsal setae.....*Phaonia canopya* spec. nov.

- Fronto-orbital plates are largely fused; shortest distance between margins of eyes as wide as anterior ocellus; postpedicel barely three times as long as deep; longest arisal hairs longer than depth of postpedicel; hind tibia with one anterodorsal seta only.....*P. liliputa* Zinovjev

74. Continue as indicated in the key <sup>[2]</sup>.

#### Key to *Phaonia* females (option 1)

50. Fore tibia at least with one posterior median seta.....51a

- Fore tibia without a median posterior seta .....51b

51a Base of postpedicel yellow.....*P. amabilis* (Meigen)

Postpedicel uniformly brown to black.....*P. mystica* (Meigen)

51b Postpedicel about 3.5 times as long as deep and with a very narrow yellowish marking at base; longest arisal hairs half as long as depth of postpedicel; posterior tibia with two anterodorsal setae.....*Phaonia canopya* spec. nov.

- Postpedicel barely three times as long as deep and uniformly brown to black; longest arisal hairs longer than depth of postpedicel; hind tibia with one anterodorsal seta only.....*P. liliputa* Zinovjev

#### *Phaonia* females (option 2)

77. Fore tibia with a posterior seta.....*P. siebecki* Schnabl

- Fore tibia without a posterior seta.....77a

77a Postpedicel about 3.5 times as long as deep and with a very narrow yellowish marking at base; longest arisal hairs half as long as depth of postpedicel; posterior tibia with two anterodorsal setae.....*Phaonia canopya* spec. nov.

- Postpedicel barely 3 times as long as deep and uniformly brown to black; longest arisal hairs longer than depth of postpedicel; hind tibia with one anterodorsal seta only.....*P. liliputa* Zinovjev

#### *Phaonia pinusa* spec. nov. (Figs 19-24)

##### Material examined

♀ holotype, from "BG: Western Balkan Mts. Iskar Riv. Gorge, Milanovo VIII., road to Rezhishkata cave; FIT 7, 26.iv. - 21.v.2021; leg. N. Simov, M. Langourov". The flight interceptive trap was placed <sup>[1]</sup> in the treetop of a pine tree (*Pinus sylvestris*) with the decimal geographic coordinates 43.09120N23.38520E and at the altitude of 671 m. The female is in fairly good condition, but missing several large setae and the abdomen is somewhat shrunk.

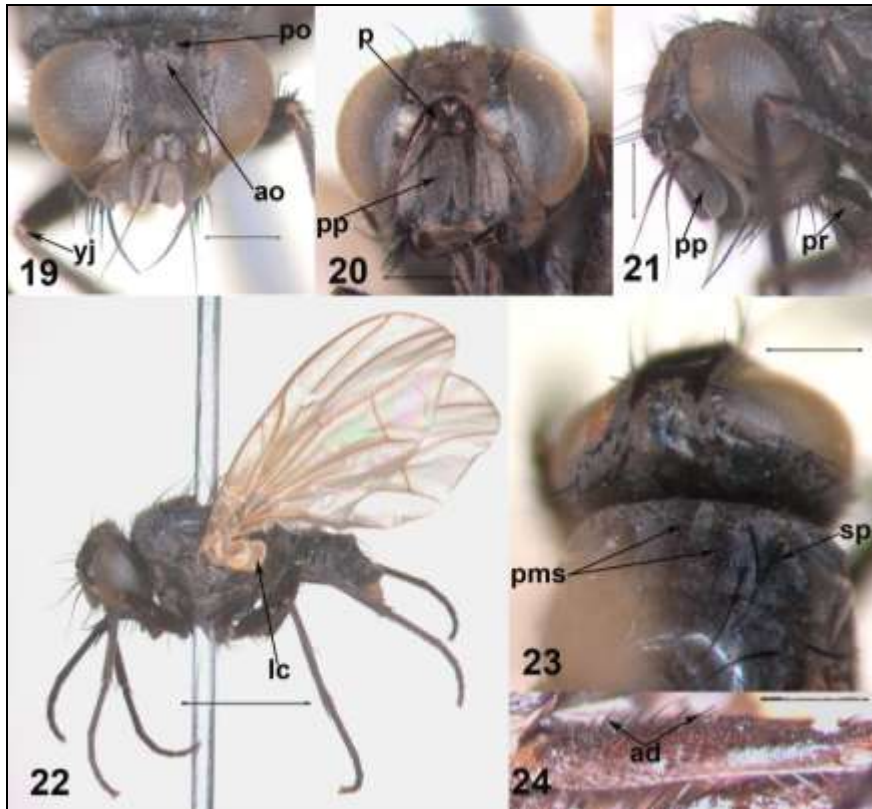
##### Etymology

The new species' epithet "*Pinusa*" is a modified feminine adjective that refers to the genus of the tree species where the holotype was collected.

##### Description (female)

Head. Ground-colour predominantly dark brown to almost blackish depending on incidence of light, at certain viewing angle partly dusted greyish (Figs 19 & 20). Dichoptic; eyes

not densely but distinctly covered with hairs, barely as long as diameter of anterior ocellus, facets of about equal size. Frons slightly towards its anterior margin (Fig. 19), at the level of vertex about 0.4 times as wide as the maximum width of the head; at the level of anterior ocellus about 3.5 times and at the anterior margin of the frons 4.3 times as wide as the distance between the outer margins of posterior ocelli. Fronto-orbital plate at midlength of frons about 1.5 times as wide as the anterior ocellus. Parafacial at the level of the antenna base about twice as wide as the depth of the postpedicel, tapering sharply downwards and at the level where parafacial and facial ridge separate about half as wide as depth of postpedicel. Facial ridge in lower half about as wide as parafacial. In profile (Fig. 21): profrons somewhat angular shaped, upper mouth margin in line with profrons; parafacial visible throughout the entire length; genal depth below the lowest margin of the eye slightly wider than depth of postpedicel; the base of the antenna lies well above the midlength of the head, postpedicel is falling short to facial margin by less than half its depth. In anterodorsal view frontal vitta matt blackish to brownish, depending on incidence of light, fronto-orbital plate black dusted dark greyish; frontal triangle depending on viewing angle dark and slightly shiny or greyish, almost oval, but not clearly defined, especially not the front tip, surrounds fairly closely the round, large blackish ocellar tubercle. Parafacial in anterior view densely dusted greyish-brown, about at level of pedicel a large patch dusted whitish-grey, face and facial ridge more or less uniformly dusted dark greyish (Fig. 20), in lateral view parafacial greyish with a brownish tinge, the patch at level of basis of antenna almost black contrasting with the greyish dusted fronto-orbital plate (Fig. 21); gena brownish depending on incidence of light sparsely dusted greyish or somewhat shiny. Pedicel and postpedicel dark, postpedicel predominantly dusted dark greyish with a brownish tinge (Figs 20 & 21), pedicel more brownish (Fig. 20). Postpedicel appears rather striking in both length and depth, at most about three times as long as deep and about 2.5 times as long as pedicel (Fig. 20). Arista pubescent, dark brown, almost twice as long as length of postpedicel, basal part somewhat dilated, the longest hairs of arista not half as long as basal diameter of arista. Anterior half of fronto-orbital plate with four strong inclinate setae, the anterior one somewhat longer than the upper setae, two strong reclinate orbital setae in upper half, one slightly below and the upper one slightly above the level of anterior ocellus, the scar of the upper seta somewhat stronger, the surface between eye margin and the frontal and orbital setae (Fig. 19) with an irregular row of strong setulae. Parafacial, face, facial ridge and the upper lateral surface of gena bare. Lower margin of gena with a row of black setae and slightly more upwards with a row of setulae. Postgenal and occipital surface dark brown, depending on incidence of light somewhat shiny or sparsely dusted greyish. Proboscis rather short, somewhat bulbous (Fig. 21), prementum dark brown, at certain viewing point shiny, labella about 1.5 times as long as depth of proboscis, palpus slender, upper half brown, lower half paler, clearly longer than prementum.



**Figs 19-24:** *Phaonia pinusa* spec. nov., female holotype: (19) anterodorsal view of frons, anterior ocellus (ao), posterior ocellus (po), yellow joint between femur and tibia (yj); (20) anterior view of face, postpedicel (pp), pedicel (p); (21) lateral view of head, postpedicel (pp), proboscis (pr); (22) lateral view, wing with yellow veins in basal half, lower calypter opaque with yellowish tinge and predominantly white margin, legs with predominantly shiny black femora and dark brownish tibiae (e.g. fore tibiae); (23) presutural part of mesonotum, dusted greyish, dark paramedian stripes (pms), dark stripe-like lateral patch (sp); (24) mid femur with row of anterodorsal setae in anterior half (ad). Scale bars: Figs 19-21, 23, 24, 0.5 mm; Fig. 22, 2 mm.

Thorax. Ground-colour almost blackish, uniformly moderately dusted greyish (Fig. 22). In posterodorsal view the presutural part of mesonotum with two narrow dark paramedian stripes, each one inside and along the row of dorsocentral setae and very sparsely dusted greyish (Fig. 23), continued distinctly weaker in the postsutural part up to the second dorsocentral seta, poorly defined and clearly visible only at certain viewing angles. In addition, outside of the dorsocentral rows on the presutural mesonotum a dark, elongated patch, which is interrupted at the transverse suture and continues in the postsutural part about up to the level of the second dorsocentral seta, also sparsely dusted greyish. Scutellum and prescutellar area of postsutural mesonotum at certain viewing angles densely dusted greyish. Lateral sides of scutellum more brownish and somewhat shiny. Pleura dark, depending on viewing angle more or less dusted greyish, at certain incidence of light somewhat shiny. Anterior and posterior spiracle grey. Mesonotum, scutellum and pleura relatively sparsely covered with dark hairs. Acrostichals 0+1, the posterior seta about one third as long as the posterior dorsocentral seta, the presutural surface between the rows of dorsocentrals covered with several small setulae, more or less along the median greyish stripe on each side 2-3 slightly elongated setae, at least twice as long as the ground setulae; dorsocentral setae 2 + 3, all strong and long; posthumeral 1; presutural 1 much stronger than the posthumeral seta; postpronotal setae 2, the outer one somewhat stronger than the inner seta; notopleuron without setulae, anterior notopleural seta clearly longer than posterior one; prealar seta at least twice as long as posterior notopleural seta; intra-alar seta 2 long ones, the anterior seta longer than posterior one; supra-

alar setae 2; postalar setae 2. Prosternum, proepisternal depression, anepimeron, meron, katepimeron suprasquamal ridge and postalar declivity bare. Proepisternal seta and proepimeral seta rather strong, adjacent setae about half as long and weaker. Katepisternal setae 1+2, the lower clearly weaker than the upper setae, the posterior very strong; anepisternal setae 1+4, the anterior seta very weak, the posterior row with 3 strong setae in the upper part and further down a strong fourth seta, several much shorter interstitial seta-like hairs present. Scutellum with rather long apical and lateral setae, basal and preapical setae much shorter, but clearly longer and distinguishable from the rather dense seta-like ground-hair restricted to the surface of the disc; lateral surfaces and ventral surface completely bare.

Wings. Rather wide, membrane with a yellowish-brownish tinge, cross-veins not infuscate. Tegula dark, basicosta centrally brown with a narrow contrasting yellow margin, stem-vein but also the veins in basal half of wing predominantly yellowish (Fig. 22), getting somewhat more brownish in distal half. Costal spine about twice as long as diameter of costa and clearly longer than neighbouring bristles of costa. Radial node and veins ventrally and dorsally bare. Vein M straight, diverging from vein R4+5. Cross-vein r-m about at the point where vein R1 enters costa, distal cross-vein dm-cu very weakly sinuous and almost rectangular on vein M. Upper calypter transparent with a whitish tinge, lower calypter whitish, almost opaque with a more or less strong yellow tinge depending on the incidence of light and the source of illumination, strongly projecting and about 1.5 times as long as upper calypter, margins of both calypters whitish, at certain incidence of light with a yellowish tinge. Haltere

stem and knob yellow.

Legs. Femora predominantly blackish and shiny; only the visible part of the joints connecting the femora and tibiae is yellowish (Fig. 19), but there is no narrow margin of either femora or tibia; tibiae dark as well, however at certain incidence of light dark brown and somewhat less shiny (Fig. 22); tarsi like tibiae dark brown to black. Pulvilli and claws extremely small, much shorter than the associated tarsomere. Fore femur with a row of long and strong anterodorsal setae and a row of anteroventral setae, the anterodorsal setae in basal half almost as long as depth of femur, the apical setae somewhat shorter, the anteroventrals in apical half distinctly longer than depth of femur, in basal half about as long as or slightly shorter than depth of femur. Fore tibia without a posterior median seta. Mid femur in basal half with a row of rather strong anterodorsal or almost anterior setae (Fig. 24), almost half as long as depth of femur, in apical half a row each of anteroventral and posteroventral setae, not as strong as the anterodorsals, but distinct, the posteroventrals somewhat stronger than the anteroventral setae, preapically two distinct but not very strong bristles on the posterior surface and one anterior bristle, not as strong as the posterior ones. Mid tibia in basal third with only one posterior seta slightly longer than diameter of tibia (no scar of a second seta detectable). Hind coxa bare on the posterior inner surface. Hind femur with a complete dense row of strong anterodorsal setae almost as long as depth of femur, in apical fourth three strong anteroventral setae, about as long as or slightly longer than depth of femur, and a row of seta-like posteroventral hairs about half as long as depth of femur, preapically two posterior to posterodorsal bristles, not very strongly developed. Hind tibia with an anterodorsal seta in middle third, about as long as diameter of tibia and an anteroventral seta shorter and weaker than the anterodorsal seta on one leg and no anteroventral seta on the other leg, in apical fourth a posterodorsal seta, somewhat longer than diameter of tibia.

Abdomen. Without any pattern predominantly black, partially greyish-black, the last three tergites strongly shiny, syntergite 1+2 mainly dusted greyish. Surface of tergites moderately covered with black seta-like ground hair. Tergite 4 with a complete row of strikingly long marginal setae, the longest ones almost as long as the length of the tergite; tergite 5 without distinct marginals but with an irregular row of discal setae, somewhat shorter than the marginals of tergite 4. Ventral parts of tergites black and more dusted greyish, less shiny. Sternites dark and densely dusted greyish, apart from sternite 1 and basal part of sternite 2, which are shiny black at certain incidence of light; sternite 1 has neither hairs nor setae. Female genitalia. Not investigated.

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

Male not known.

### Diagnosis and remarks

In the available identification keys <sup>[2, 4, 17]</sup> the female of *Phaonia pinusa* spec. nov. runs directly to *Phaonia longicornis* Stein, 1916. The latter species was described <sup>[17]</sup> from a male from Sweden and was considered known only from that country for about fifty years <sup>[4]</sup>. Thus, the species was also not taken into account in the identification key for Muscidae from Great Britain <sup>[16]</sup>. In the catalogue of Palearctic Muscidae species (Pont 1986) <sup>[18]</sup>, Norway and Denmark were also listed as countries of occurrence. Britain

then became the fourth country where *P. longicornis* occurs when Skidmore & Pont <sup>[19]</sup> reported a female from Scotland. In the subsequently published identification key for the Muscidae species of Central Europe by Gregor *et al.* (2001) <sup>[20]</sup> *P. longicornis* was already included with the note that the species is known from the four countries mentioned above, but not from Central Europe. Although the characteristics of *Phaonia pinusa* spec. nov. corresponded very well with the descriptions in the identification tables, doubts arose as to whether this female, collected at the western Balkan in the extreme southeast of Europe, actually belongs to the species that so far only occurs in northern and north-western Europe.

The original description of *P. longicornis* by Stein is based only on the male holotype. However, Ringdahl <sup>[21]</sup> and Hennig <sup>[4]</sup> also characterized the male, with Hennig also briefly discussing the characteristics of the female. Ringdahl, on the other hand, only describes the male, although he previously reported other males and a female that had been found <sup>[22]</sup>. However, since Skidmore & Pont <sup>[19]</sup> also characterize the female from Scotland, the female found in Bulgaria could be compared with the available descriptions, which revealed several differences. For example, the postpedicel of *Phaonia pinusa* spec. nov. is at most only three times as long as its depth and about 2.7 times as long as the pedicel, the fronto-orbital plates are dark and at certain viewing angles dusted greyish, parafacials are depending on incidence of light dusted greyish or brownish. The thorax is uniformly moderately dusted greyish, the prescutellar surface of the postsutural mesonotum and the scutellum is even densely dusted greyish at certain viewing angles; in posterodorsal and dorsal view the presutural part of the mesonotum is characterized by four dark stripes, the narrow dark paramedian stripes are clearly separated from each other and continue as such in the anterior postsutural part of the mesonotum. The wing veins are yellowish in basal half of wing, but wing base is not strikingly yellow (Fig. 22), the costal spine is about twice as long as diameter of costa and clearly longer than neighbouring bristles; the lower calypters is predominantly whitish, almost opaque with a more or less strong yellow tinge depending on the incidence of light and the source of illumination. The tibiae are dark, however at certain incidence of light dark brown and shiny, thus somewhat differing from the black shiny femora; the fore tibia has no posterior median seta; the mid femur has in basal half a row of rather strong anterodorsal setae, the longest ones almost half as long as depth of femur (Fig. 24), and in apical half a row each of anteroventral and posteroventral setae, not as strong and long as the anterodorsals, but distinct; mid tibia has in basal third only one posterior seta, slightly longer than diameter of tibia; hind tibia is marked by only one anterodorsal seta in middle third, about as long as diameter of tibia. The posterior three tergites of the abdomen are strongly shiny, but syntergite 1+2 is distinctly dusted greyish; tergite 4 has a complete row of strikingly long and strong marginal setae, the longest ones almost as long as the length of the tergite; tergite 5 is without distinct marginals but with an irregular row of discal setae, somewhat shorter than the marginal setae of tergite 4. According to the species description <sup>[17]</sup> of *P. longicornis* and further characterizations of the species <sup>[4, 19, 21]</sup>, the postpedicel is strikingly long, more than three times as long as its depth <sup>[4]</sup> or four times as long as pedicel <sup>[21]</sup>, respectively; the head varies with regard to the colour of the dusting between partly shiny whitish <sup>[4]</sup> and predominantly dusted brown from most angles <sup>[19]</sup>. The thorax



of *P. longicornis* is predominantly black, slightly shiny and very sparsely dusted greyish, the paramedian pair of dark stripes of mesonotum in posterodorsal view ill-defined and the two dark stripes barely separated from each other. Wing base and calypters are strikingly yellow, costal spine is absent. Legs are entirely black; fore tibia with a submedian posterior seta <sup>[19]</sup>, however, this appears to be a typographical error and should probably read "without", as used in the identification key of the same publication; mid femur only with a few slightly elongated posteroventral setae; mid tibia with two short posterior setae; hind tibia with two anterodorsal setae. Abdomen sparsely dusted greyish, posterior tergites moderately covered with fine erected bristles.

Since there is currently no identification key for the European *Phaonia* species, a proposal for the integration of *Phaonia pinusa* spec. nov. into the latest identification key for the Muscidae of Central Europe <sup>[2]</sup> is presented. This key also has the advantage that *P. longicornis* has already been included. To integrate the female *Phaonia pinusa* spec. nov. into the key the following amendment is suggested.

76. Arista pubescent.....76a

- Arista long plumose.....77

76a Thorax black slightly shiny and very sparsely dusted greyish, the paramedian pair of dark stripes of mesonotum in posterodorsal view poorly demarcated and barely separated from each other, mid tibia with two posterior median setae, hind tibia with two anterodorsal setae, wing base strikingly yellowish.....*Phaonia longicornis* Stein

- Thorax appears uniformly, moderately dusted greyish on a blackish ground colour, presutural part of mesonotum with two well separated black paramedian stripes; mid tibia with only one posterior median seta; hind tibia with one anterodorsal seta only; wing base not strikingly yellowish.....*Phaonia pinusa* spec. nov.

77. Continue as indicated in the key <sup>[2]</sup>.

The male of the new species is not yet known. Assuming that males and females of *Phaonia pinusa* spec. nov. are very similar to each other, as is the case with *P. longicornis*, the characterization of the male of the new species could be added to the corresponding key as suggested below:

8. Halteres yellow, prealar seta about 2/3 as long as or longer than anterior notopleural seta....8a

- Halteres darkened, prealar seta not distinct.....11

8a Thorax black slightly shiny and very sparsely dusted greyish, the paramedian pair of dark stripes of mesonotum in posterodorsal view poorly demarcated and barely separated from each other; mid tibia with two posterior median setae; hind tibia with two anterodorsal setae; wing base strikingly yellowish.....*Phaonia longicornis* Stein

- Thorax uniformly, moderately dusted greyish on a blackish ground colour, presutural part of mesonotum with two well separated black paramedian stripes; mid tibia with only one posterior median seta; hind tibia with one anterodorsal seta only; wing base not strikingly yellowish.....*Phaonia pinusa* spec. nov.

## Conclusions

No publication was found in literature dealing with Muscidae collected in treetops in Bulgaria. And the descriptions of the three Muscidae species in hand are ultimately based also on

flies which were merely "by-products" of investigations on a completely different scientific topic. The discovery of three new species from a not too large number of specimens collected in treetops in a country where the Muscidae fauna has been explored and observed for many years, is somewhat surprising. It could also be an indication that the habitat in the treetops plays also in Europe a distinctly greater role for the Muscidae fauna than hitherto assumed. The seven specimens of *Phaonia canopya* spec. nov., equally represented by gender, come from two different tree species and two different collecting periods. This circumstance, for example, gives rise to speculation as to whether the species is perhaps more widespread but is only very rarely found near the ground.

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