Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2016; 4(4): 626-632

Received: 24-05-2016
Accepted: 23-06-2016

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Update of distribution records of *Phaonia* Robineau-Desvoidy (Diptera: Muscidae) from Bulgaria with the description of a new species

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Abstract
Records from Bulgaria are given for 29 species of the genus *Phaonia* Robineau-Desvoidy, 1830. Of these, two species are newly recorded and one new species, *Phaonia lavcievi* sp. nov., is described. Including the present contribution, there are now 38 species of *Phaonia* fauna reported from Bulgaria.

Keywords: Bulgaria, Muscidae, *Phaonia*, new records, new species

Introduction

The first comprehensive overview on the muscid fauna of Bulgaria was published by Lavčiev [1] in 2003 when he summarized results from earlier published reports on Muscidae from Bulgaria and his own observations. The compilation contains primarily general information such as from which areas of Bulgaria the species have been reported and regarding flight activities of the Muscidae, e.g. seasons of the year and height above sea level, whereas information on numbers and sex of collected specimens and on localities and dates of collecting is little. However, the documentation does not only list the species reported from Bulgaria until that time, it also contains a bibliography which comprises the large majority of earlier publications dealing with the musicd fauna of the country. Therefore this catalogue has been chosen as basis to which the results of the present update on the distribution records of *Phaonia* species in Bulgaria are compared.

The genus *Phaonia* Robineau-Desvoidy, 1830 with more than 800 species all over the world is one of the largest genera in the family of Muscidae [2]. From Europe 81 species are reported by Fauna Europaea (Pont [3]) of which Pont [3, 4] listed in total 25 and Lavčiev [1] 32 species as known from Bulgaria. The present update records 29 species collected in Bulgaria in the period between 1911 and 2015. Of these species *Phaonia lavcievi* sp. nov. is described as new species and *Phaonia impura* Zinoviev, 1987 and *Phaonia zugmayeriae* (Schnabl, 1888) are newly reported for the country. In total the number of *Phaonia* species recorded from Bulgaria is raised now to 38 species.

Material and Methods

Regrettably no information is given by Lavčiev [1] where the specimens of the species listed in the catalogue were deposited. The present update is largely based on the Muscidae collection of the Institute of Biodiversity and Ecosystem Research, Sofia (IBER) of the Bulgarian Academy of Sciences, Sofia. Additionally the Diptera collections of the National Museum of Natural History, Sofia of the Bulgarian Academy of Sciences (NMNHS) and of the Regional Natural History Museum of Plovdiv (RNHMP) have been screened for *Phaonia* specimens. The study has been conducted from March 2015 to May 2016.

External morphological features were examined using a Zeiss Stemi 2000-C stereomicroscope. Morphological terminology follows that of McAlpine [5], but postpedicel [6] is used instead of "first flagellomere" as proposed by McAlpine [5]. Body length was measured in millimeters (mm).

For examination of the material primarily the keys to the Muscidae of the Palaearctic Region provided by Hennig [7] and additionally the keys to "The Muscidae of Central Europe" by Gregor *et al.* [8] were used. The examined species are listed alphabetically and their localities chronologically. If not indicated differently the examined specimens are located at the

entomological collection of IBER. Available information at the catalogue [1] on collecting of species is compared with present findings. Comments are also added when pertinent. The initials V.L. stand for the late Valentin Lavčiev, who has collected the majority of the muscid specimens and who also determined several of them.
The holotype of the newly described species is located in the entomological collection of IBER, Sofia.

Results

Phaonia alpicola (Zetterstedt, 1845): Material examined: RNHMP**:** 1♂ Sredna Gora Mts., peak Bogdan, 10.6.1964, Bassamakov. Lavčiev [1] reported 2♀ from Rodopi Mts., on the foot of peak Siutka, 1.500 m, 21.6.1965, on human excrements. Specimens from this locality were not found among the studied material of the different collections.

Phaonia angelicae (Scopoli, 1763) (= *Phaonia basalis* Zetterstedt,1838): Material examined: 1♀ Rila Mts., Tcham Kuria (= Borovetz), 7.9.1926, P. Drenski; 1♀ Rila Mts., 25.7.1934, P. Drenski; 1♀ Rila Mts., Tcham Kuria (= Borovetz), 25.7.1934, P. Drenski; 3♂ Rila Mts., between Soleno dere and Sitnyakovo, 4.8.1936, P. Drenski; 1♀ Vitosha Mts., hut Aleko, 25.7.1949, P. Drenski; 1♀ Stara Planina Mts., Murgash hut, 19.6.1950, P. Drenski; 1♂ Vitosha Mts., River Bistritsa, 1.300 m, 25.6.1950, P. Drenski; 1♀ Sofia distr., Kniajevo, 11.4.1965, V.L.; 1♀ Pamporovo, 28.7.1965, V.L., det. V.L.; 1♂ Rodopi Mts., Kara Bair, 29.7.1965, V.L.; 1♂ Rodopi Mts., Matan dere, 23.7.1966, V.L.; 1♂ Elenska Mts., forest, 6.6.1968, V.L.; 1♂1♀ Rodopi Mts., Mandritsa, 19.6.1969, V.L.; 3♂ Sofia distr., Dragalevtsi, 26.7.1970. V.L.; 1♂ Kalofer, 16.5.1972, V.L.; 1♀ Stara Planina Mts., near to Vezhen (hut) peak, 22.6.1972, V.L.; 2♂ Teteven distr., Vasilovo, 22.7.1972, V.L., det. V.L.; 2♂2♀ Rodopi Mts., road to Tchairite near Trigrad, 1.100 - 1.300 m; 41°37'26"N;24°21'43"E, T. Ljubomirov & E. Zielke.

Phaonia errans (Meigen, 1826): Material examined: 1♀ Rila Mts., Tcham Kuria (= Borovetz), 7.9.1926, P. Drenski; 1♀ Rila Mts., Borovetz, 7.9.1952, P. Drenski; 1♀ Rodopi Mts., Selishte, 24.8.1965, V.L.; 1♀ Rodopi Mts., Yundola, 22.7.1966, V.L., det. V.L..

Phaonia exoleta (Meigen, 1826): Material examined: 1♂ Bialata Voda, 14.8.1966, V.L., det. V.L..Lavčiev [1] reported 1♂ from Rodopi Mts., Rojen, 1.200 m, 19.6.1968. The specimen was not found among the examined material.

Phaonia fuscata (Fallén, 1825): Material examined: 1♀ Sofia, 15.5.1934, P. Drenski; 1♀ Pirin Mts., Popina Laka, 1.300 m, 29.7.1966, V.L.; 1♂ Rodopi Mts., Smolianski Ezera, 25.6.1969, V..L., det. V.L.; 1♀ Stara Planina Mts., Glozhene,13.5. 1972, V.L..

Phaonia hybrida (Schnabl, 1888): Material examined: 1♀ Rila Mts., Musala peak, 29.7.1936, P. Drenski; 1♀ Rila Mts., between Soleno dere and Sitnyakovo, 4.8.1936, P. Drenski; 1♀ Central Stara Planina Mts., Maragedik peak, 2.166 m, 20.7.1941, P. Drenski, det. V.L.; 4♀ Vitosha Mts., hut Aleko, 1.800 m, 25.7.1949, P. Drenski, det. V.L..

Phaonia impura Zinoviev, 1987 (= *Phaonia pura* auct. nec Loew, 1873): Material examined: 1♀ Ropotamo, 15.6.1965, V.L.. This specimen has been assigned to *P. impura* due to yellow tibiae and yellow apical third of femora of mid and hind legs. Having only 1-2 hairs instead of "several" hairs on the meron below the posterior spiracle this specimen also could lead at the identification keys to *Phaonia gobertii* (Mik, 1881), which however is characterized by predominantly dark legs.

Phaonia incana (Wiedemann, 1817): Material examined: 1♂ Central Rodopi, Srebren Peak, 21.6.1926, P. Drenski; 1♀ Central Rodopi, Tschechlywo, 23.6.1926, P. Drenski; 1♀ Vitosha Mts., Aleko hut, 1.800 m, 13.7.1948, P. Drenski, det. V.L.; 1♀ Rodopi Mts., Perelik, 2.000 m, 30.7.1969, V.L.; 3♂ Sofia distr., Dragalevtsi, 26.7.1970, V.L..

Phaonia laeta (Fallén, 1823) (= *Phaonia trigonalis* Meigen, 1826): Material examined: 1♂ Zlatograd, 6.8.1963, V.L., det V.L.. Lavčiev [1] reported 1♂ from Eastern Rodopi Mts., Zlatograd 400 m, 6.8.1962. This male seems to be identical with the specimen found among the examined material. The difference regarding the years of collecting might be due to a transmission error.

Phaonia lavcievi sp. nov.**:** Type material examined**:** Male holotype, Rodopi Mts., Momchilgrad, 22.6.1970, leg. V. Lavčiev. The specimen is slightly damaged, a tear in the anterior part of the costa of the right wing, mid tarsomeres 1-5 and 2-5 are missing and signs of a contusion on the left side of the head. Irrespective of these shortcomings the specimen is distinctly differentiated from known *Phaonia* species due to its specific combination of morphological characters.
Diagnosis. In both keys [7, 8] the species runs to *Phaonia czernyi* Hennig, 1963. The two species are distinguished by following characters: Legs of *P. czernyi* are black, postpedicel is short, only about twice as long as broad and pre-alar seta is almost as long as posterior notopleural seta; whereas legs of *P. lavcievi* are predominantly yellow, postpedicel is conspicuously five times as long as broad and pre-alar seta is barely distinguishable from surrounding hairs. Additionally *P. lavcievi* is characterized by having the mouthedge behind profrons.
Description. Male: Head. Ground-colour black. Eyes densely haired, the yellowish hairs about three times as long as diameter of anterior ocellus. Shortest distance between eye margins about three times the width of postpedicel. Fronto-orbital plate at level of anterior ocellus almost three times as wide as diameter of anterior ocellus and at anterior margin about twice as wide as width of postpedicel. Fronto-orbital plates separated throughout by a vitta which is at least slightly broader than distance between external margins of posterior ocelli. Parafacial at middle about as broad as width of postpedicel. In profile upper mouth margin behind profrons. Genal depth below lowest eye margin almost equal to 1.5 times the width of postpedicel. Viewed from dorsal, ocellar tubercle and frontal vitta dull black, fronto-orbital plates silver-grey pruinose like parafacials from anterior point of view; anterior and upper bare part of gena depending on point of view silver-grey pruinose or dark brown, haired surface of gena and occipital surface grey. Antenna with conspicuously long postpedicel, five times as long as broad and almost five times as long as pedicel (Fig. 1). Basal antennal segments light brown, postpedicel dark brown, at base of inner surface slightly yellowish. Arista almost twice as long as length of postpedicel, pubescent, the longer hairs barely half as long as width of postpedicel and restricted to

basal half of arista. Ocellar setae strong. Anterior half of fronto-orbital plate with about 4 strong, inclinate frontal setae and with few distinctly shorter interstitial hairs between and above the frontal setae, short ones reaching about level of anterior ocellus. Parafacial bare. Vibrissal setae long and strong, length of longest surrounding peristomal setae at most three quarters the length of vibrissals. Lower half of gena, post-genal and post-occipital surfaces with dark hair-like setae, the longer ones on post-genal surface. Proboscis short with broad labella. Palpi slender and dark brown.

Thorax ground-colour black with grey dust. When viewed from behind presutural part of scutum with four weakly developed darker longitudinal vittae, postsuturally only with poorly defined darker vitta between dorsocentral and intra-alar setae, scutellum black with grey dust. Anterior spiracle yellow, posterior one more brownish. Scutum and some parts of pleurae with some fine hairs. Dorsocentrals 2+4; acrostichals 0+1; presutural acrostichal hairs in 4 to 6 irregular rows with few hairs slightly longer than the average; notopleuron with 2 strong almost equally long notopleural setae, otherwise bare; prealar seta barely distinguishable from surrounding hairs; 2 intra-alar setae. Prosternum, proepimeral area, anepimeron, katepimeron and meron bare. Katepisternals 1+2, the posterior one conspicuously long, the lower one distinctly closer to the posterior seta than to the anterior one. Anepisternum in particular on posterior surface with long fine hairs, long setae of varying length at posterior margin. Scutellum with four marginal setae, the apical and lateral ones somewhat longer and stronger than the pre-apical and basal ones; lateral and ventral surfaces bare.

Wing. Membrane hyaline, not infuscated at cross-veins. Basicosta and tegula yellow, veins at basis of wing yellow, otherwise brown or dark brown. Costal spine short, not much 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 slightly basal of the point where vein R1 enters costa, distal cross-vein dm-cu slightly oblique and almost straight. Calypters predominantly whitish transparent, margin and fringe white with weak yellowish tinge, lower calypter nearly 1.5 times as long as upper calypter. Haltere entirely yellow.

Legs including trochanters predominantly yellow. Pulvilli and claws small and of about equal size. Coxae all brownish or brown, hind coxa bare on posterior surface. Fore femur yellowish on anterior surface, posteriorly predominantly dark and grey dusted, at apex yellow; with complete rows of strong posteroventral, posterodorsals and almost dorsally located setae, all setae about as long as or even longer than depth of femur, surface between posteroventral and posterodorsal setae covered with hairs not quite as long as setae of the rows. Fore tibia yellow; at middle with a posterior seta distinctly longer than diameter of tibia. Fore tarsomeres ground-colour yellow; each tarsomere apically with a fine posteroventral and anteroventral hair about twice as long as diameter of corresponding tarsomere. Mid femur yellow; a row of anterior setae longer than the ground hair at basal half; a complete but irregular row of short posteroventral setae all over the length, more hair-like apically; at apical half a row of posterior setulose hairs almost as long as depth of femur, pre-apically three or four strong and long posterodorsal setae. Mid tibia yellow; three strong posterior setae longer than diameter of tibia. Mid tarsomere 1 (only one present) yellow without elongate apical hairs. Hind femur yellow; a complete row of strong anterodorsal setae and in apical half a row of anteroventral setae, the longer setae of both rows longer than depth of femur; two short posteroventral setae in basal half; at apical fourth few posteroventral setulose hairs about half as long as anteroventral setae, pre-apically two strong posterodorsal /dorsal setae. Hind tibia yellow; three anterodorsal setae slightly longer than diameter of tibia, three or four anteroventral not longer than diameter; a posterodorsal seta at apical quarter about twice as long as diameter of tibia and without additional shorter posterodorsal seta at basal half. Hind tarsomeres ground-colour dark, without elongate apical hairs.

Abdomen. Ground-colour dark, uniformly with intense grey dusting. Depending on point of view tergites grey or dark, when viewed from behind all tergites light grey with a narrow, longitudinal, black median vitta. All tergites with well-developed marginal setae, tergites 4 and 5 additionally with dorsal discals. Sternites dark and grey dusted, sternite 1 bare; sternite 2 densely covered with hairs almost as long as width of sternite, apically with about 4 setae almost as long as length of sternite; sternites 3-5 with shorter hairs, sternites 3 and 4 each one with two apical setae not longer than the corresponding sternite.

Male genitalia. The holotype is the only hitherto available specimen of this species. Therefore it has been refrained from extracting the genitalia to avoid inflicting further damage on the fragile specimen. The species is distinctly distinguished from similar species of the genus by morphological characters, the identification does not depend on a comparison of characters of the terminalia.

Measurements. Length of body about 8 mm; length of wing about 7 mm.

Female not known.

Etymology. The name of the new species derives from the name of the late Professor Valentin Lavčiev, Ph. D. to acknowledge his contributions to the knowledge of the Bulgarian muscid fauna.

Fig 1: *Phaonia lavcievi* sp. nov.; lateral view of head (bar = 1mm).

Phaonia mediterranea Hennig, 1963: Material examined: 1♀ Belogradchik, 3.7.1964, V.L.; 1♀ W. Stara Planina Mts., Berkovitsa, 25.10.1965 V.L., det. V.L.; 1♀ Blagoevgrad distr., Simitli, 31.10.1965, V.L.; 1♀ Sandanski, 3.11.1965, V.L.; 1 ♂ Ivailovgrad, 20.6.1969, V.L., det. V.L.. Lavčiev [1] reported 1♀ from W. Stara Planina Mts., Berkovitsa, 25.10.1962. This specimen is very likely identical with that one listed from the examined material of the collection of IBER. The difference regarding the years of collection is probably due to a transmission error.

Phaonia meigeni Pont, 1986 (= *Phaonia lugubris* auct. nec Meigen, 1826)**:** Material examined: 1♀ Vitosha Mts., shelter Bai Krustyo (chair lift), 26.5.1949, N. Atanassov; 1♀ Rodopi Mts., Smolianski Ezera, 25.6.1959, V.L.; 1♀ W. Stara Planina Mts., Bialata Voda, 21.5.1966, V.L.; 1♀ Pamporovo, 23.6.1970, V.L., det. V.L.; 1♂3♀ Rodopi, Trigrad Tchairite, 24.6.1970, V.L.; 1♂ Vitosha Mts. (V13), 2.100-2.100 m, 6.7.1976, V. Guéorguiev.

Phaonia pallida (Fabricius, 1787): Material examined: 1♂ Vitosha Mts., Dragalevtsi Monastir, 24.6.1917, I. Buresch; 1♀ Sofia, 25.8.1936, P. Drenski; 1♀ Trojanski Balkan, Steneto, 24.7.1941, P. Drenski; 1♂4♀ Rodopi, Ivailovgrad, 20.6.1960, V.L., det. V.L.; 3♂ Ropotamo, 26.6.1963, V.L.; 6♂ W. Stara Planina Mts., Haydushki Vodopadi, 9.7.1963, V.L.; 1♂1♀ Stara Planina Mts., hut Kom, 11.7.1963, V.L.; 2♀ Berkovski Mts., 11.7.1963, V.L.; 1♂3♀ Sofia distr., Tserovo, 27.7.1963, V.L.; 3♀ Ropotamo, 28.8.1963, V.L.; 2♀ Rakovski Monastery, 27.7.1964, V.L.; 10♀ Vrashka Chuka, 17.9.1964, V.L.; 1♂ Ropotamo, 15.6.65, V. L., det. V.L.; 5♀ Ropotamo, 7.7.1965, V.L.; 4♀ Sofia distr., Pancharevo,1.8.1965, V.L; 1♂ Vitosha Mts, 9.8.65, V.L.; 2♀ Lyulin, 12.8.65, V.L; 2♀ Ropotamo, 7.10.1965, V.L; 1♂1♀ Lyulin, 25.6.1966, V.L.; 3♂6♀ Ropotamo, 9.7.1966, V.L.; 1♂1♀ W. Stara Planina, Klisurski Monastery, 15.8.1966, V.L.; 1♀ Ropotamo 27.6.1967, V.L.; 1♀ Smolian distr., Stoykite, 27.6.1967, V.L.; 5♀ Ropotamo, 7.7.1967, V.L.; 5♀ Zheravna under Rasboyna peak, June 1968, V.L.; 1♂ Rodopi Mts., Lyubimets, 18.6.1969, V.L.; 3♂ Rodopi Mts., Dabovets, 18.6.1969, V.L., det. V.L.; 6♂26♀ Rodopi Mts., Krumovgrad, 20.6.1970, V.L.; 2♀ Panagyurishte Banya, 8.8.1971, V.L.; 1♂ Teteven, Ribaritsa, 22.6.1972. V.L.; 1♀ Shumensko Plato, 22.4.1977, V.L.; 1♀ Stara Planina Mts., Diva Slatina, 14.8.2015, E. Zielke.

Phaonia palpata (Stein, 1897): Material examined: 2♂ Klisurski Monastery, 25.9.1963, V.L.; 1♀ W. Stara Planina Mts., Berkovitsa, 25.10.1965, V.L.; 2♂ Stara Planina Mts., Diva Slatina, 14.8.2015, E. Zielke.

Phaonia perdita (Meigen, 1830): Material examined: 1♂ Smolian distr., Stoykite, 26.7.1965, V.L., det V.L.; 1♂ Lyulin, 12.8.65, V.L 1♂ Rodopi Mts., Matan dere, 27.7.1966, V.L., det V.L.; 1♂ Sofia distr., Dragalevtsi, 26.7.1970, V. L.. Lavčiev[1] listed 1♀ from Western Rodopi Mts., 30.7.1961 and 1♂1♀ from Western Rodopi Mts., 18.6.1978. Specimens from these localities were not found among the examined material.

Phaonia pratensis (Robineau-Desvoidy, 1830): Material examined: 1♀ Zheravna, oak tree forest, 18.5.1972, V.L., det. V.L. Lavčiev [1] reported 1♀ from Central Stara Planina Mts., above town Sliven, 18.5.1972. The collecting date is identical with that one of a female found among the examined material. As Zheravna is located about 4-5 km north of Sliven, it is very likely that it is the same specimen.

Phaonia *pura* (Loew, 1873) (= *Phaonia candicans* Pandellé, 1998): Material examined: 1♀ Tcham Kuria = Borovetz, 25.-30.7.1921, I. Buresch; 5♀ Rodopi Mts., Smolianski Ezera, 25.6.1969, V.L., det. V.L. Although *Phaonia candicans* (Pandellé, 1898) was synonymized with *Phaonia pura* (Loew, 1873) by Zinoviev [9] in 1987, *P. candicans* is listed by Lavčiev[1] still as a good species.

Phaonia regalis (Stein, 1900): Material examined: 2♀ Kostenets, 25.6.-10.7.1950, P. Drenski; 1♀ Vrashka chuka, 17.9.1965, V.L.; 1♂ Rodopi Mts., Ivailovgrad, 4.6.1967, V.L.; 1♂12♀ Rodopi Mts., Ivailovgrad, 20.6.1970, V.L.; 1♂2♀ Rodopi Mts., Krumovgrad, 20.6.1970, V.L.; 8♂7♀ Rodopi Mts., Momchilgrad, 22.6.1970, V.L., det. V.L..

Phaonia rufipalpis (Macquart, 1835): Material examined: 1♂ Kozhuh vulcano, 24.6.1981, V.L. Lavčiev [1] reported 3♀ from Ropotamo, nature reserve, 6.7.1966. He assigned this species to (Robineau-Desvoidy, 1830), probably erroneously as there is no Muscidae species described by Robineau-Desvoidy as "*rufipalpis*". The specimens were not found among the studied material.

Phaonia rufiventris (Scopoli, 1763): Material examined: 1♀ Stara Planina Mts., hut Kom, 1.7.1963, V.L.; 1♀ Rakovski Monastery, 17.9.1964, V.L.; 1♂ Tvardishka Mts., Sheshkingrad, 3.6.1968, V.L.; 2♀ peak Tshumerna, 1.000 m, 5.6.1968, V.L.; 2♂1♀ Elena Mts., forest, 6.6.1968, V.L.; 3 ♀ Stara Planina Mts., Panitsite 3 km from Kalofer, 18.3.1969, V.L.; 1♂ W. Milanovo, 523 m, 5.5.2015, T. Ljubomirov.

Phaonia scutellata (Zetterstedt, 1845): Material examined: 1♂ Rila Mts., Tcham Kuria = Borovetz, 4.9.1926, P. Drenski; 1♂ Rila Mts., Tcham Kuria = Borovetz, 20.8.1933, P. Drenski; 1♀ Belogradchik distr., Chuprene, 20.9.1963, V.L.; 1♀ W. Stara Planina Mts., Varshets, 25.5.1965, V.L.; 1♀ Ropotamo, 7.10.1965, V.L.; 3♀ Petrochan, 24.10.1965, V.L.; 4♀ W. Stara Planina Mts., Berkovitsa, 25.10.1965, V.L.; 1♀ Rila Monastery to Rilska river, 26.10.1965, V.L.; 2♂ W. Stara Planina Mts., Parchovitsa, 1.300 m, 13.7.1966, V.L.; 1♀ Ropotamo, 26.7.1967, V.L.; 1♀ Sliven distr., near Sliven towards Byala, 2.6.1968, V.L. Lavčiev[1] mentioned 1♂ from Western Stara Planina Mts., hut Purshovitsa, on human excrements without date of collection; 1♂ Rodopi Mts., Yundola, 22.7.1965; 1♀ Ropotamo river, on human excrements, 24.7.1965. None of these specimens were found among the studied material.

Phaonia serva (Meigen, 1826): Material examined: 1♀ Sofia, 7.6.1934, P. Drenski; 1♀ Rila Mts., between Soleno dere and Sitnyakovo, 4.8.1936, P. Drenski; 2♂2♀ Rila Mts., Tcham Kuria = Borovetz, 30.8.1936, P. Drenski; 9♀ Vitosha Mts., Aleko hut, 8.6.1949, P. Drenski; 1 ♂ Vitosha Mts., above Boyana, 4.6.1950, P. Drenski; 2♂1♀ Vitosha Mts., above Sredets hut, 1.650 m, 4.6.1950, P. Drenski; 2♀ Stara Planina Mts., Murgash hut, 19.6.1950, P. Drenski; 1 ♂ Vitosha Mts., above Sredets hut, 1.500 m, 11.6.1954, P. Drenski; 1♀ Vitosha Mts., hut Gorski dom, 1.400 - 1.600 m, 11.6.1954, P. Drenski; 1♂ Belogradchik distr., Izvor, 5.7.1963, V.L.; 1♀ Rodopi Mts., Pamporovo, 28.7.1965, V.L.; 4♀ Pirin Mts., Begovitsa, 1.800 m, 13.7.1966, V.L.; 1♂1♀ Pirin Mts., Popina Laka,1.300 m, 29.7.1966, V.L.; 1♀ Rodopi Mts., Smolian, 600 - 700 m, 23.6.1970, V.L.; 1 ♂ Rodopi Mts., Trigrad Tchairite, 24.6.1970, V.L.; 1♂1♀ Kalofer, 16.5.1972, V.L.; 1♀ Stara Planina Mts., near to Vezhen peak (hut), 22.6.1972, V.L.. NMNH**:** 2♀ Rila Mts., Tcham Kuria = Borovetz, 30.8.1936, P. Drenski.

Phaonia siebecki Schnabl, 1911: Material examined: 1♂ W. Stara Planina Mts., Berkovitsa, 20.5.1966, V.L.; 1♂ Stara Planina Mts., Troyan Monastery, 15.5.1972, V.L.; 1♂ Kotlenski Mts., State Forestry Zelenich, 18.5.1972, V.L.

Phaonia subventa (Harris, 1780): Material examined: 1♀ Sofia, July 1934, P. Drenski; 1♂1♀ Stargach Mts.,12.6.1938, P. Drenski; 6♂3♀ Stargach Mts., 1.250 m, 15.6.1938, P. Drenski; 1♀ Stargach Mts., Nevrokop, 15.6.1938, P. Drenski; 1♀ Burgas distr., Rezovo, 27.6.1963, V.L.; 1♀ W. Stara Planina Mts., Haydushki Vodopadi, 9.7.1963, V.L.; 1♂ Stara Planina Mts., hut Kom,11.7.1963, V.L.; 1♂ Rodopi Mts., Dospat, 12.8.1963, V.L.; 2♀ W. Stara Planina Mts., m. Lekla, 20.9.1963, V.L.; 2♀ Klisurski Monastery, 25.9.1963, V.L.; 1♀ Primorsko, 9.7.1965, V.L.; 1♂ Rodopi Mts., Trigrad Tchairite, 25.7.1965, V.L.; 1♂ Rodopi Mts., Trigrad Tchairite, 28.7.1965, V.L.; 1♂ Lyulin, 12.8.65, V.L; 1♂ W. Stara Planina, Bialata Voda; 11.9.1965, V.L.; 1♂ Gubesh, 18.5.1966, V.L.; 1♂ Sandanski near Bistritsa River, 3.7.1966, V.L.; 1♀ Pirin Mts., Popina Laka, 1.300 m, 29.7.1966, V.L.; 1♂1♀ W. Stara Planina, Bialata Voda; 13.8.1966, V.L.; 3♀ W. Stara Planina Mts., Sveti Nikola, 14.8.1966, V.L.; 1♀ Rodopi Mts., Er Kiupria, 30.8.1967, V.L.; 4♀ Rila Mts., Cemkovo 1.800 m, 16.6.1968, V.L.; 1♀ Rodopi Mts., peak Studenec, 24.6.1969, V.L.; 1♀ Sandanski, 3.11.1969, V.L.; 3♀ Stara Planina Mts., Troyan Monastery, 15.5.1972, V.L.; 1♀ Stara Planina Mts., Beklemeto Pass, 1.000 m, 16.5.1972, V.L.; 1♀ Zheravna, oak tree forest, 18.5.1972, V.L.; 1♂2♀ Shumensko Plato, 22.4.1977; 1♀ Parangalitsa, 1.700 m, 21.7.1981, V.L.; 1♂ Trakia, 30.4.1992, V.L.; 1♀ Rodopi Mts., Krastava village, 41°56´24"N; 23°51'53"E; 1191 m, 27.6. - 27.7.2015, T. Ljubomirov.

Phaonia tiefii (Schnabl, 1888): Material examined: 1♀ Rodopi Mts., Perelik, 9.8.1963, V.L.; 1♀ Elena Mts., forest, 6.6.1968, V.L.; 2♂ Teteven, Ribaritsa, 22.6.1972, V.L., det V.L. Lavčiev [1] reported 1♂ from Central Stara Planina Mts., near the village Ribaritsa 700m, 22.06.1972. A male of this species with almost identical data on the locality label was found together with a still unidentified male of the same species among the examined material of the collection of IBER (see above under "Teteven, Ribaritsa").

Phaonia trimaculata (Bouché, 1834): Material examined: 1♂ Lyulin, 12.8.65, V.L; 1♀ Sofia distr., Samakov, 7.5.1976, V.L.; 4♂1♀ Paranglitsa reserve, 1.700 m, 26.7.1981, V.L.; 1♀ Sofia, ul. Elin Pelin, 2.9.2014, E. Zielke. Lavčiev [1] reported 1♂ from Western Rodopi Mts. on vegetation, 1.500 m, 24.7.1965. This specimen was not found among the examined material.

Phaonia tuguriorum (Scopoli, 1763): Material examined: 1♀ Lyulin, 12.8.65, V.L; 1♀ Belogradchik distr., Bialata Voda, 15.8.1966, V.L.; 1♀ Sofia, 24.2.2015, T. Ljubomirov. RNHMP: 1♂ Plovdiv, the island, 11.5.1964, Subeva.

Phaonia valida (Harris, 1780): Material examined: 1♂1♀ Sredna Gora Mts., Panagyurski Kolonii, 1.8.1911, D. Iltcheff; 1♀ Varna distr., Euxinograd, 20.10.1924, I. Buresch; 1♀ Varna distr., Euxinograd, 6.9.1925, I. Buresch; 1♀ Sofia, August 1929, P. Drenski; 1♀ Sofia, 26.6.1931, P. Drenski; 1♀ Sofia, July 1934, P. Drenski; 1♀ Sofia, 25.8.1936, P. Drenski; 5♀ Sofia, 1.9.1936, P. Drenski; 1♀ Sofia, 25.8.1937, P. Drenski; 1♂ Harmanli, 23.8.1938, P. Drenski; 1♀ Kostenets, 25.6.-10.7.1950, P. Drenski; 1♀ Samakov distr., Prodanov ridge, 25.7.1952, P. Drenski; 1♀ Vrashka Chuka, 17.9.1964, V.L.; 1♀ Sofia distr., Boyana, 11.4.1965, V.L.; 1♀ Sofia distr., Pancharevo, 1.8.1965, V.L.; 1♀ W. Stara Planina Mts., Buchin prohod, 21.9.1965, M. Witanova; 1♂ W. Stara Planina Mts., Parshevitsa, 13.7.1966, V.L.; 1♂1♀ Rodopi Mts., Ivailovgrad, 20.6.1969, V.L.; 1♂1♀ Rodopi Mts., Momchilgrad, 22.6.1970, V.L.; 1♀ Shumensko Plato, 22.4.1977; V.L.; 1♂ Sofia, ul. Elin Pelin, 25.6.2014, E.Zielke; 1♂ Petrich, 42°36'09"N; 24°00'06"E, 20.5.2016, T. Ljubimirov.

Phaonia zugmayeriae (Schnabl, 1888): Material examined: 1♀ Rodopi Mts., Siutka,14.8.1963, V.L.; 1♀ Smolian distr.., Stoykite, 26.7.1965, V.L.; 1♂ Rodopi Mts., Pamporovo, 24.6.1969, V.L.; 3♀ Parangalitsa, 21.7.1981, V.L..

Additional species reported from Bulgaria: The following species have been recorded by Lavčiev [1] and/or by Pont [3, 4], but they were not found among the 414 examined *Phaonia* specimens of the three collections.

Phaonia bitincta (Rondani, 1866): Lavčiev[1] listed Stara Planina Mts., Rodopi Mts. and Rila Mts. as areas of distribution. Among the examined material of the collection of IBER two *Phaonia* females from Stara Planina Mts., Panitsite 3 km from Kalofer, 18.3.1969 leg. V.L. were found marked with temporary identification labels with the species name *P. bitincta*. However, the two females belong to *Phaonia rufiventris* (Scopoli) and are registered as such in the present update. *P. bitincta* is also reported for Bulgaria by Pont [3, 4].

Phaonia boleticola (Rondani, 1866): Two reports from Lavčiev [1]: 1♀ Stara Planina Mts., 500 m, around the Shumensko plato on human excrements, 21.6.1965 and 1 ♀ at the same locality on 14.6.1969.

Phaonia consobrina (Zetterstedt, 1838): 1♀ of *Phaonia consobrina* (Zetterstedt, 1838) is listed by Lavčiev [1] from Rodopi Mts. "under Chenghene chal, August" without naming the year of collection.

Phaonia erronea (Schnabl, 1887): Lavčiev [1] reported 1♂1♀ from Western Stara Planina Mts., above Berkovitsa 800m, 9.7.1963. The species is also reported for Bulgaria by Pont [3, 4].

Phaonia falleni Michelsen, 1977**:** According to Lavčiev [1] this species is known from following areas: Sofia, Vitosha Mts., Western Rodopi Mts (hut Perelik) and from Stara Zagora.

Phaonia gobertii (Mik, 1881): LAVČIEV (2003) reported 2♀ from Dobrich, 300 m, in an oak forest, on human excrements, the date of collection is not mentioned.

Phaonia lugubris (Meigen, 1826) (= *Phaonia morio* Zetterstedt, 1845): Lavčiev[1] named for *P. lugubris* Pancharevo, Vitosha Mts., Rila Mts., Rodopi Mts and Stara Planina Mts. as areas of distribution. And, although *Phaonia morio* (Zetterstedt, 1845) was synonymized by Pont[10] (1986 a) with *P. lugubris* (Meigen, 1826), Lavčiev[1] still listed separately for *P. morio* areas of distribution such as Stara Planina Mts., Maragedik peak; Rila Mts., Borovetz, and Vitosha Mts, hut Aleko. *P. lugubris* has also been reported by Pont [3, 4].

Phaonia mystica (Meigen, 1826**)** (= *Phaonia vittifera* Zetterstedt, 1845): Lavčiev [1] reported 1♀ Rodopi Mts., under peak Perelik 2.000 m, 9.8.1963. *P. mystica* has not

been listed for Bulgaria by Pont [3, 4] and it is also questionable whether the report of Lavčiev is correct (see also at *P. villana*.**)**

Phaonia villana Robineau-Desvoidy, 1830 (= *P. mystica* auct. nec Meigen, 1826) has been named for Bulgaria by Pont [3, 4]. The species is not mentioned for Bulgaria by Lavčiev [1]. However, if he should have erroneously ignored the changes of nomenclature for *P. mystica* and *P. villana*, then the female, which he reported as *P. mystica* would be *P. mystica* auct. nec Meigen and should be assigned to *P. villana*. Regrettably this female has not been found among the examined material, thus presently it cannot finally be decided whether only *P. villana* or both species are known from Bulgaria.

Discussion

The Muscidae species of the Palaearctic Region were listed 1986 by Pont [4] and he recorded 24 species of the genus *Phaonia* as known from Bulgaria. Although Lavčiev [1] reported 2003 a total of 32 *Phaonia* species from Bulgaria, the actualized version of Fauna Europaea (Pont [3]) for Muscidae from 2013 comprises only 25 *Phaonia*-species from Bulgaria. The present investigation revealed 29 species. In Table 1 all *Phaonia*-species are listed which have been recorded from Bulgaria either by Lavčiev [1], by Pont [3] or which have been identified by the present update. In total 38 species are now reported, of which 29 species are listed at least in two of the three compilations of the Bulgarian *Phaonia* fauna. Additionally one new species is described. Eight of the species reported by Lavčiev [1] were not found among the material screened for *Phaonia*, but three of these species, *P. bitincta*, *P. erronea and P. lugubris*, are also recorded for Bulgaria by Pont [3]. For comparison the *Phaonia*-species reported by Pont [3] for Greece and Romania with 20 and 26 species respectively are added to the list. The knowledge on *Phaonia* of the other neighbouring countries of Bulgaria, such as Serbia, Macedonia and the European part of Turkey, is poor. According to Pont [3] from Macedonia *P. pallida* and *P. pratensis* and from Serbia *P. rufiventris* are known, for the European part of Turkey there seems to be no information on *Phaonia* yet. In total there are seven species in Greece and/or Romania which are not recorded from Bulgaria. Only one of these species, *Phaonia cincta* (Zetterstedt, 1846), has been reported from Greece and from Romania. As Bulgaria is situated between these two countries there is a good chance that this rare species [8] is also part of the Bulgarian fauna, but has not been collected yet.

Among the examined material *P. pallida* was the most common species with 121 specimens collected at 32 different dates and 25 different localities. More than 20 specimens were found from *P. subventa* (52 specimens/ collected at 31 different days/ 27 different localities), *P. serva* (38 /17 /17), *P. regalis* (35/6/5), *P. valida* (29/22/15) and *P. angelicae* (27/18/17) respectively. From all other recorded species significantly less specimens were identified. Although collecting was conducted over a period of about 100 years, of some species only very few specimens have been found, and for example from *P. alpicola*, *P. exoleta*, *P. impura*, *P. pratensis*, *P. rufipalpis* and from the newly described species, *P. lavcievi* there was only one specimen each detected among the examined material.

Table 1: *Phaonia* species from Bulgaria (BG), Greece (GR) and Romania (RO) reported by Lavčiev [1] or Pont [3] in comparison with the present update (BG 2016).

Phaonia species	BG 2016	BG 2003 (Lavčiev)	BG 2013 (Pont)	GR 2013 (Pont)	RO 2013 (Pont)
P. alpicola (Zett., 1845)	+	+			+
P. amicula Villeneuve, 1922				+	
P. angelicae (Scopoli, 1763)	+	+	+		+
P. atriceps (Loew, 1858)					+
P. bitincta (Rondani, 1866)		+	+		
P. boleticola (Rondani, 1866)		+			+
P. cincta (Zett., 1846)				+	+
P. consobrina (Zett., 1838)		+			
P. errans (Meigen, 1826)	+	+	+		+
P. erronea (Schnabl, 1887)		+	+		+
P. exoleta (Meigen, 1826)	+	+		+	
P. falleni Michelsen, 1977		+			
P. fuscata (Fallén, 1825)	+	+	+	+	
P. gobertii (Mik, 1881)		+			
P. halterata (Stein, 1893)					+
P. hellinia Lyneburg, 1965				+	
P. hybrida (Schnabl, 1888)	+		+		+
P. impura Zinoviev, 1987	+				
P. incana (Wiedemann, 1817)	+	+	+		+
P. laeta (Fallén, 1823)	+	+		+	
P. lavcievi sp. nov.	+				
P. lugubris (Meigen, 1826)		+	+		+
P. mediterranea Hennig, 1963	+	+	+	+	
P. meigeni Pont 1986	+	+	+		
P. mystica (Meigen, 1826)		+			+
P. nymphaearum (R.-D., 1830)					+
P. pallida (Fabricius, 1787)	+	+	+	+	+
P. palpata (Stein, 1897)	+	+	+	+	+
P. perdita (Meigen, 1830)	+	+		+	+
P. pratensis (R.-D., 1830)	+	+	+	+	+
P. profugax (Pandellé, 1899)					+

P. pura (Loew, 1873)	+	+	+		+
P. regalis (Stein, 1900)	+	+	+		
P. rufipalpis (Macquart, 1835)	+	+	+	+	+
P. rufiventris (Scopoli, 1763)	+	+	+		+
P. scutellata (Zett., 1845)	+	+	+	+	
P. serva (Meigen, 1826)	+	+	+	+	+
P. siebecki (Schnabl, 1911)	+	+	+	+	
P. subventa (Harris, 1780)	+	+	+	+	+
P. tiefii (Schnabl, 1888)	+	+	+	+	
P. trimaculata (Bouché, 1834)	+	+		+	
P. tuguriorum (Scopoli, 1763)	+	+	+	+	+
P. valida (Harris, 1780)	+		+	+	+
P. villana (R.-D., 1830)			+		
P. zugmayeriae (Schnabl, 1888)	+				+
Number of species	29	32	25	20	26

Describing a new species from only one male or female is always done with hesitation and in particular, when the type material is in fragile condition. However, it has to be distinguished, whether the new species is characterized by an unique taxonomic character or a combination of diagnostic markings which permit a clear separation from similar species, or whether the separation is based on differences of characters as for example the number of posterodorsal setae or the presence of posterior setae on fore tibia, which in some species of the genus might be subject to intra-specific variations. Sorokina [11] has pointed recently to the fact, that the European *Phaonia* fauna is well known compared with other areas of the Palaeartic Region as for example Central Asia and West Asia. Very likely the large majority of *Phaonia* species inhabiting Europe has been identified and described, at least those species which are both common and widely distributed or which are at least common in their specific biotopes. However, not all areas in Europe have been investigated with the same intensity. In some countries the muscid fauna got only little attention and numbers of reported muscid species for these countries are low in Fauna Europaea [3]. This is also partially valid for Bulgaria with its special geographic situation and the great variety of biotopes. It is not by chance that Lavčiev [1] expected at least about one third more species for Bulgaria than listed in his compilation. Species, which are limited in their geographical distribution and which are not common in the biotopes they inhabit, are usually only detected by chance. If such a rare species is collected, very probably there will be only one specimen of it in the catch. The likelihood to get another specimen of this species in the foreseeable future is usually rather low. To keep a specimen of a new species with clearly distinguishing characters in the collection and postpone the publication of the description until more specimens are available means also that this species remains unknown and inaccessible to science for further investigations. Probably the better contribution to science is the description of the new species, even if it is based on one specimen only. But the species is known and accessible for further examinations and considerations.

Acknowledgements

I am very grateful to Toshko Ljubomirov Ph.D., Associate Professor and curator of the entomological collection of the Institute of Biodiversity and Ecosystem Research, Sofia for supporting my research on Muscidae by giving me generous access to the Diptera collection, and for providing all facilities needed for the examination of the material. In particular I have to thank him for his substantial contribution to deciphering, translating and transcribing the numerous locality labels which were hand-written in Cyrillic letters. I also have to thank Mario Longourov Ph.D. from the National Museum of Natural History, Sofia and Ognyan Todorov Ph.D., head of the Regional Natural History Museum of Plovdiv, for access to the Diptera collections of the corresponding Museums.

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