

Fanniidae (Diptera) of the Jizerské hory Mts, Frýdlant region and Liberec environs (northern Bohemia, Czech Republic)

Vířilkovití (Diptera: Fanniidae) Jizerských hor, Frýdlantska a okolí Liberce (severní Čechy, Česká republika)

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Abstract. Altogether 52 species of the family Fanniidae are reported from the Jizerské hory Mts, Frýdlant region and vicinity of the Liberec city, representing 73.2% of all species known from the Czech Republic and 76.5% of all species known from Bohemia. *Fannia collini* and *F. melania* were previously recorded in the study area as new species for the Czech Republic, together with other two rare species (*F. nidica* and *F. verrallii*). Five species found are listed in the Red List of Invertebrates of the Czech Republic: *Fannia limbata* and *F. nidica* as endangered species, *F. alpina*, *F. atripes* and *F. verrallii* as vulnerable species.

Key words: Diptera, Fanniidae, Jizerské hory Mts, Frýdlantská pahorkatina Hills, Liberecká kotlina Basin, Ještědský hřbet Ridge, Czech Republic, faunistics, threatened species

INTRODUCTION

The Fanniidae is a small family of Calyptratae distributed worldwide, comprising more than 360 extant species (Pape et al. 2011) in 5 genera (*Euryomma*, *Fannia*, *Piezura*, *Australofannia* and *Zaelandofannia*). In Europe, 85 species have been recorded (Pont 2007; Rudzinski 2003; Gregor & Rozkošný 2005). Some representatives are known for their forensic, medical and hygienic importance. Several species have a tendency to synanthropy. Females are attracted to decaying organic matter, often in great numbers. In addition, males are attracted to the same substrate but much less frequently.

Adults may be distinguished from representatives of all other families of calyptrates by an asetose meron, the second anal vein strongly bent towards the first anal vein, so that a prolongation of it will cross the first anal vein at most at the wing margin, the scutellum without setulae on the lower surface, and the Sc vein having only one (basal) bend. Moreover, females lack crossed interfrontals and proclinate orbitals.

Larvae are aquatic to terrestrial, often living in semi-aquatic media. Larvae and puparium of fanniids are readily identifiable by sharing a dorso-ventrally flattened body, characterized by conspicuous feathery, forked, tufted, or button-like processes distributed over most of the dorsal and lateral surface of segments (and in reduced form also on ventral surface). An interesting character known at least in *Fannia canicularis* (Linnaeus, 1761) is a trichoid

sensillum on the posterior spiracular plate, representing a sensory organ otherwise unknown in the Calypttratae (Grzywacz et al. 2012; Domínguez & Pont 2014). For more details about morphology, biology, and zoogeography of the family see Chillcott (1961), Rozkošný et al. (1997), Pont (2000) or Domínguez & Pont (2014).

From the Czech Republic, 71 species are known; 68 species from Bohemia and 63 species from Moravia (Barták et al. 2016).

Records of three species – *F. fuscula* (Fallén, 1825), *F. polychaeta* (Stein, 1895) and *F. scalaris* (Fabricius, 1794) – were previously published from the Jizerské hory Mts (locality Bílý Potok) by Čepelák (1983). Barták et al. (2016) published records of *F. collini* (d'Assis-Fonseca, 1966) and *F. melania* (Dufour, 1839) from the Frýdlant region and Jizerské hory Mts as the first records for the Czech Republic. The same authors previously reported records of other rare species from the study area: *F. nidica* Collin, 1939 and *F. verrallii* (Stein, 1895).

In this paper we present records of all species collected during the faunistic survey in the Jizerské hory Mts, Frýdlant region and the vicinity of the Liberec city in 2005–2016.

DESCRIPTION OF THE STUDY AREA

The study area includes the Jizerské hory Protected Landscape Area, in the north neighbored by a smaller territory of the Frýdlant region and extending south to the Liberec city and its environs. Geographically, it is a part of the Krkonoše-Jeseníky Mts system and Krkonoše Mts subsystem (Demek 1987). Particular areas are parts of the geomorphological complexes and subcomplexes of the Jizerské hory Mts, Frýdlantská pahorkatina Hills, Žitavská kotlina Basin (as a subcomplex of the Liberecká kotlina Basin) and Ještědsko-Kozákovský hřbet Ridge (as a subcomplex of the Ještědský hřbet Ridge). The surveyed area covers a wide range of altitudes; the highest elevations include the top of Smrk Mt. (1124 m a.s.l.) in the Jizerské hory Mts, and the top of Ještěd Mt. (1012 m a.s.l.) in the Ještědský hřbet Ridge; the lowest elevation is the water level of the Smědá river on the Polish state border in the Frýdlant region (208 m a.s.l.).

Geologically, the study area belongs to the Lugicum area, which forms the north-eastern part of the Bohemian Massif. The Jizerské hory Mts are a part of the Krkonoše-Jizerské hory crystalline complex, which has been divided into six sections; in the surveyed area there are two sections: the Jizera gneiss complex and the Variscan Krkonoše-Jizerské hory granite massif (Chaloupský 1989). The Frýdlantská pahorkatina Hills is a part of the Lužice Massif, built of Cadomian granitoids. The prevailing part of the Ještědský hřbet Ridge belongs to the Ještěd crystalline complex. Along the Smědá river in the Frýdlant region and in the Liberecká kotlina basin, Tertiary fresh-water sediments have been preserved. In the south-western part of the Frýdlantská pahorkatina Hills and sporadically in the Jizerské hory Mts, solitary Tertiary basaltic knobs protrude. In the Frýdlant region, Quaternary sediments are significantly represented: loess earth and glacial sediments (gravels and pits). At higher altitudes in the Jizerské hory Mts, organic sediments (peat) occur.

The climate of the study area is significantly affected by the fact that the Jizerské hory Mts are situated on the windward side towards the prevailing western winds. They create a barrier to the moist and cold air currents from the Atlantic ocean, which results in high rainfall and snow cover. The average annual precipitation in the period between 1900 and

1950 ranged from 1000 to 1705 mm (the meteorological station U Studánky, locality Bílý Potok). The total amount of precipitation in the Frýdlantská pahorkatina Hills and Liberecká kotlina basin was about 900 mm, in the warmer western part of the Frýdlant region 800 mm only and in the eastern moist part almost 1000 mm. The Jizerské hory Mts are situated in a cold climatic region. The average annual temperature falls below 5 °C, in higher altitudes below 4 °C. The average annual temperature in the Frýdlant region ranges from 7 to 8.5 °C, in the Liberecká kotlina basin it is about 7 °C (Quitt 1971).

The rivers of the study area flow to the North and Baltic Seas. Many watercourses rise in the Jizerské hory Mts. The Lužická Nisa drains waters from the northern and western parts of the Jizerské hory Mts to the Odra (Oder) river and to the Baltic Sea; the most important tributary of the Lužická Nisa is the Smědá which drains waters from the Frýdlant region. The Jizera is the most significant river which drains waters from the southern and eastern parts of the Jizerské hory Mts to the Labe (Elbe) river and the North Sea; an important tributary of the Jizera is the Kamenice. In the Jizerské hory Mts there are several water reservoirs. In the Frýdlant region, several ponds can be found; the largest of them is the Dubák pond near Černousy. Natural water bodies occur in the Jizerské hory Mts too: small peat lakes in the peat bogs.

From the phytogeographical point of view, the study area belongs predominantly to Oreophyticum, district no. 92. Jizerské hory Mts, in the southeastern part district no. 93. Krkonoše Mts. The lower altitudes belong to Mesophyticum, districts nos. 48. Lužická kotlina Basin, 49. Frýdlantská pahorkatina Hills and 54. Ještědský hřbet Ridge (Skalický 1988).

Except for the southern foothills, the whole territory of the Jizerské hory Mts is almost continuously covered by forest ecosystems. Forests are significantly modified by forest management, the originally predominant beech was substituted by spruce in the past. Continuous beechwoods remain preserved on the northern and northwestern slopes of the Jizerské hory Mts only. Originally mixed forests were significantly changed, silver fir became almost extinct and even the native spruce declined markedly. Except for small fragments, mountain spruce beechwoods were not preserved. The forests in the central part of the mountains were destroyed during the ecological disaster resulting from high air pollution load and larch tortrix and bark beetle outbreaks in the 1970-90s. Damaged spruce stands were preserved in protected areas (nature reserves) only. Extensive clearcuts were reforested mostly with spruce (*Picea excelsa*), partly with introduced exotic species of spruce and pine (*Picea pungens*, *Pinus* spp.). At present, the central part of the mountains is covered by young spruce stands under 40 years of age. Peat ecosystems are the most valuable natural sites in the central part of the Jizerské hory Mts. They are represented by many peat bogs differing in size and quality. Mesophilic and hydrophilic meadows are present near the southern border of the mountains; the most valuable of them are developed in the Malá Strana and Bukovec Nature Reserves and in the Tichá říčka Natural Monument.

A major part of the Frýdlant region is covered by farmland. Besides arable land there are large areas of cultural meadows and pastures. Near-natural grasslands are found mostly in the floodplain of the Smědá river. Diverse aquatic and wetland plant communities are developed near ponds in the whole area, most significantly near the Dubák pond. Cultural meadows and pastures occur throughout the region. The forests in the Frýdlant region are mostly cultivated. Spruce (*Picea abies*) and Scots pine (*Pinus sylvestris*) predominate in the

species composition, near-natural components include the sessile oak (*Quercus petraea*) and pedunculate oak (*Q. robur*), beech (*Fagus sylvatica*), littleleaf linden (*Tilia cordata*) and hornbeam (*Carpinus betulus*).

Much of the Liberecká kotlina basin is urbanized, other large areas are arable lands and cultural grasslands. Relatively near-natural vegetation is preserved in small areas. Forests are notably modified by forest management; small near-natural stands are preserved on the slopes in the valleys. Mesophilic and hydrophilic meadows and wetlands are important non-forest communities.

MATERIAL AND METHODS

List of localities

Data are presented in the following order: locality name (grid mapping square code); abbreviation of the geomorphological complex: FP – Frýdlantská pahorkatina Hills, JE – Ještědský hřbet Ridge, JH – Jizerské hory Mts, LK – Liberecká kotlina Basin; nearest village, city or its part (where appropriate); coordinates; altitude; specified location, habitat type (where appropriate). The localities are listed alphabetically.

Other abbreviations used: NM – Natural Monument, NR – Nature Reserve, NNR – National Nature Reserve.

- Bedřichov** (5256); JH; 50°48'01"N, 15°08'50"E; 770 m; spruce forest.
Bílý Potok (5157); JH; 50°52'49"N, 15°13'03"E; 450 m; ponds and wetland northeast of railway station.
Bukovec NR (5158); JH; Kořenov-Jizerka; 50°48'40"N, 15°21'21"E; 900 m; damp meadow, mixed forest.
Černousy-Boleslav (5056); FP; 50°59'51"N, 15°01'41"E; 230 m; meadow.
Černousy-V Poli (5056); FP; 50°59'46"N, 15°02'49"E; 210 m; alder groves.
Ferdinandov (5157); JH; Hejnice; 50°51'40"N, 15°10'43"E; 500 m; beech forest.
Hamrštejn NR (5255); JE; Liberec-Machnín; 50°46'48"N, 14°58'06"E; 400 m; mixed forest.
Holubník Mt. (5157); JH; Hejnice; 50°49'57"N, 15°10'51"E; 900 m; Bílé bukoví beech forest.
Horní Maxov (5257); JH; Lučany nad Nisou; 50°45'32"N, 15°13'03"E; 700 m; Smržovský potok valley.
Horní Řasnice (5057); FP; 50°58'26"N, 15°12'45"E; 400 m; deserted sand pit.
Jablonec nad Nisou-Mšeno (5256–5257); JH; 50°44'27"N, 15°10'57"E; 580 m.
Janov nad Nisou (5256); JH; 50°46'41"N, 15°08'48"E; 750 m; peatbog north of Hašlerova chata.
Jedlový důl NR (5257); JH; Josefův Důl; 50°47'22"N, 15°14'28"E; 700 m; mixed forest.
Jizerka (5158); JH; Kořenov; 50°49'09"N, 15°20'51"E; 850 m; meadows, spruce forest.
Karlovské bučiny NNR (5255); JE; Liberec-Karlovy; 50°46'22"N, 14°58'37"E; 450 m; deciduous forest.
Kořenov (5258); JH; 50°46'17"N, 15°22'49"E; 650 m; Jizera river valley.
Liberec-Broumovská (5256); LK; 50°45'38"N, 15°04'23"E; 400 m; wetland in the Broumovská housing estate.
Liberec-Kateřinky (5256); JH; 50°48'25"N, 15°06'15"E; 650–700 m; Javorový vrch Mt., skála Krabice (rock), mixed forest.
Liberec-Krásná Studánka (5256); LK; 50°48'52"N, 15°03'03"E; 400 m; meadow, wetland.
Liberec-Lidové sady (5256); LK; 50°46'43"N, 15°05'04"E; 450 m; Lesní koupaliště (former aquapark); mixed forest.
Liberec-Perštýn (5256); LK; 50°45'53"N, 15°04'05"E; 350 m.
Liberec-Rudolfov (5256); JH; 50°48'17"N, 15°06'34"E; 650–700 m; mixed forest around the Černá Nisa valley.
Liberec-Růžodol I (5256); LK; 50°46'19"N, 15°01'30"E; 380 m; Opičák, deciduous forest, wetland.
Liberec-Staré Město (5256); LK; 50°46'29"N, 15°04'14"E; 375 m; lime-tree alley.
Liberec-Starý Harcov (5256); JH; 50°45'45"N, 15°07'10"E; 400 m.
Liberec-Vesec (5256); LK; 50°44'07"N, 15°04'33"E; 380 m; wetlands in the Vesecké údolí valley.
Liberec-Vratislavice nad Nisou (5256); LK; 50°44'49"N, 15°06'50"E; 500 m; Prosečský hřeben ridge, mixed forest.
Lučany nad Nisou (5257); JH; 50°45'20"N, 15°13'54"E; 675 m; Kříšák pond, wetland.
Ludvíkov pod Smrkem (5057); FP; Nové Město pod Smrkem; 50°55'14"N, 15°11'01"E; 400 m; wetland, alder grove.
Malá Strana NR (5257); JH; Lučany nad Nisou-Horní Maxov; 50°45'58"N, 15°12'09"E; 700 m; damp meadow, wetland, pond.

Meandry Smědé NR (5056); FP; Černousy; 50°59'54"N, 15°02'21"E; 210m; Smědá valley, Dubák pond.
Nová louka NR (5156); JH; Bedřichov; 50°48'50"N, 15°09'40"E; 760m; peatbog, spruce forest.
Nové Město pod Smrkem (5058); JH; 50°54'33"N, 15°14'16"E; 600m; U Kyselky, wetland, spruce forest.
Oldřichov v Hájích (5156); JH; 50°51'51"N, 15°06'19"E; 500m; Oldřichovské sedlo (pass); beech forest.
Panský lom NM (5256); JE; Liberec-Horní Hanychov; 50°43'28"N, 15°00'54"E; 600m; mixed forest.
Poustecká obora (game reserve) (5056); FP; Višňová-Poustka; 50°57'34"N, 15°03'51"E; 270m; mixed forest.
Poustka (5056); 50°56'44"N, 15°03'10"E; FP; Višňová; 300m; meadow ca. 2 km southeast of the village.
Rašelinisté Jizerky NNR (5158); JH; Kořenov-Jizerka; 50°49'40"N, 15°20'13"E; 870m; Klugeho louka peatbog.
Rejdice (5258); JH; Kořenov; 50°44'12"N, 15°21'29"E; 650m; Ješkrabec brook, spring area, wetland.
Smrk Mt. (5157); JH; Nové Město pod Smrkem; 50°53'14"N, 15°15'55"E; 1050m; young spruce trees.
Šolcův rybník (pond) (5156); JH; Raspenava; 50°52'49"N, 15°06'51"E; 350m; alder groves, wetland.
Špičák Mt. (5156); JH; Jizerskohorské bučiny NNR; Oldřichov v Hájích; 50°51'56"N, 15°04'43"E; 600m; beech forest.
Tichá říčka NM (5257); JH; Janov nad Nisou-Hrabětice; 50°47'02"N, 15°11'29"E; 750m; damp meadow.
Velký Vápenný NR (5255); JE; Rynoltice-Jítrava; 50°47'25"N, 14°53'06"E; 650m; deciduous forest.
Višňová (5056); FP; 50°59'50"N, 15°01'44"E; 230m; meadow.
Výpřež (pass) (5256); JE; Liberec-Horní Hanychov; 50°44'40"N, 14°58'44"E; 780m; mixed forest.

Collecting methods and material

The material was obtained using the following collecting methods (abbreviations used in the list of species): vegetation sweeping, J. Preisler lgt. (SW); Malaise traps, J. Preisler & P. Vonička lgt. (MT); beer traps, J. Preisler lgt. (BT); protein (meat) traps, J. Preisler lgt. (PT); yellow pan traps, J. Preisler & P. Vonička lgt. (YPT); wine traps, P. Vonička lgt. (WT). All methods are described in detail e. g. by Vonička (2008).

All the material was collected by J. Preisler and P. Vonička between 2005 and 2016 (altogether 6296 specimens). Selection of the material from the traps and their preparation were done by the first author of this paper (J. Preisler). A major part of the selected material was identified by J. Preisler and some specimens were revised by M. Barták. A smaller part of the selected material was identified by R. Rozkošný (collected in 2005–2006). Voucher specimens are deposited in private collections of the first author, in the North Bohemian Museum in Liberec and at the Department of Zoology and Fisheries of the Czech University of Life Sciences in Prague.

The species nomenclature was taken from Barták et al. (2016).

RESULTS

List of species

Fannia aequilineata Ringdahl, 1945

Palearctic species, which is distributed in western and Central Europe from Ireland, Great Britain and Sweden to Spain and Malta. Not recorded from the Balkan Peninsula and the European part of Russia, but ranging to North Africa and Asia (Preisler et al. 2013).

New data: **Karlové bučiny NNR**, 15.v.–8.vi.2013, 1 ♂ (PT). **Liberec-Staré Město**, 14.vii.–14.viii.2014, 24 ♂♂ (WT). **Liberec-Vesec**, 13.viii.–9.ix.2015, 1 ♂ (BT). **Šolcův rybník**, 1.vii.–3.viii.2011, 1 ♂ (MT, baited with meat). [total 27 specimens]

Fannia alpina Pont, 1970

Broadly distributed (Palearctic and Oriental region) but uncommon species, in Europe known from Austria, Czech Republic, Finland and Slovak Republic (Barták et al. 2016). Listed in the national Red List as a vulnerable species (Gregor et al. 2005a).

New data: **Bukovec NR**, 30.viii.2015, 1 ♂; 1.ix.2015, 1 ♂ (both SW). [total 2 specimens]

Fannia armata (Meigen, 1826)

Eurosiberian species, in Europe distributed from Ireland, Great Britain, Fennoscandia and Northwestern Russia to Spain, Corsica, Italy and Greece, in mountains up to 1000 m a.s.l. Also in the Near East and Siberia (Preisler et al. 2013). Common species in the studied area. New data: **Bedřichov**, 3.vii.2014, 1 ♂ (SW). **Bukovec NR**, 23.vi.2016, 1 ♂ (SW). **Hamrštejn NR**, 9.vii.2013, 1 ♂ (SW). **Jablonec nad Nisou-Mšeno**, 8.vii.2013, 11 ♂♂ (SW). **Janov nad Nisou**, 11.vii.2014, 1 ♂ (SW). **Karlové bučiny NR**, 9.vii.2013, 4 ♂♂ (SW). **Liberec-Broumovská**, 25.iv.2014, 1 ♂; 5.v.2014, 1 ♂; 10.vi.2014, 1 ♂ (all SW). **Liberec-Rudolfov**, 16.vii.2013, 31 ♂♂ (SW). **Liberec-Starý Harcov**, 10.vii.2013, 1 ♂; 15.viii.2013, 1 ♂ (both SW). **Liberec-Vesec**, 19.v.2012, 1 ♂; 20.v.2013, 1 ♂; 6.v.2014, 3 ♂♂; 18.v.2015, 1 ♂; 28.v.2015, 2 ♂♂; 20.vi.2015, 10 ♂♂ (all SW). **Ludvíkov pod Smrkem**, 10.–31.v.2016, 1 ♂ (MT). **Malá Strana NR**, 7.v.–12.vi.2015, 1 ♂; 12.vi.–9.vii.2015, 1 ♂; 9.vii.–5.viii.2015, 2 ♂♂ (all MT). **Meandry Smědé NR**, 12.vi.2012, 3 ♂♂ (SW). **Poustecká obora**, 16.v.–12.vi.2012, 1 ♂ (MT). **Rejdice**, 30.v.2016, 9 ♂♂ (SW). **Šolcův rybník**, 11.–26.v.2011, 1 ♂; 26.v.–13.vi.2011, 1 ♂ (both MT). **Tichá říčka NM**, 21.v.2014, 1 ♂ (SW). **Višňová**, 30.v.2014, 2 ♂♂ (SW). [total 96 specimens]

Fannia atra (Stein, 1895)

Holarctic species, in Europe recorded in the range from Great Britain, Scandinavia, Denmark and Central Europe (Germany, Poland, Switzerland, Czech Republic, Slovakia, Austria and Hungary) to Romania (Preisler et al. 2013).

New data: **Jablonec nad Nisou-Mšeno**, 1.viii.2012, 1 ♂ (SW). **Malá Strana NR**, 7.v.–12.vi.2015, 1 ♂; 12.vi.–9.vii.2015, 1 ♂ (both MT). [total 3 specimens]

Fannia atripes Stein, 1916

Holarctic species, in Europe distributed from Great Britain to Poland and from Sweden to Italy (Preisler et al. 2013). Listed in the national Red List as a vulnerable species (Gregor et al. 2005a).

New data: **Liberec-Perštýn**, 26.iv.2015, 1 ♂ (SW). [total 1 specimen]

Fannia barbata (Stein, 1892)

Eurasian species, mainly in deciduous forests and forest steppes. Only in continental Europe from Finland to Corsica and Bulgaria (Preisler et al. 2013).

New data: **Černousy-V Poli**, 27.iv.–16.v.2012, 1 ♂ (MT). **Liberec-Vesec**, 19.v.2012, 1 ♂ (SW). **Malá Strana NR**, 7.v.–12.vi.2015, 2 ♂♂ (MT). **Šolcův rybník**, 11.–26.v.2011, 1 ♂ (MT). [total 5 specimens]

Fannia canicularis (Linnaeus, 1761)

Cosmopolitan and chiefly eusynanthropic species, in Europe also frequent exoanthropic populations (Preisler et al. 2013).

New data: **Bílý Potok**, 19.v.–3.vi.2005, 1 ♀ (YPT). **Bukovec NR**, 30.v.–26.vi.2016, 1 ♂ (PT). **Černousy-Boleslav**, 8.viii.2012, 1 ♂ (SW). **Jizerka**, 13.vii.2015, 3 ♂♂ (SW). **Liberec-Broumovská**, 1.–31.vii.2013, 28 ♂♂; 27.ix.2014, 5 ♂♂ (all SW). **Liberec-Staré Město**, 14.vii.–14.viii.2014, 7 ♂♂ (WT). **Liberec-Vesec**, 19.v.2012, 1 ♂; 17.viii.2013, 1 ♂; 18.v.2015, 4 ♂♂ (all SW). **Lučany nad Nisou**, 23.v.2012, 1 ♂ (SW). **Meandry Smědé NR**, 4.vi.2010,

1 ♂; 30.v.2014, 1 ♂ (both SW). **Nové Město pod Smrkem**, 30.iii.–3.v.2007, 1 ♂ (PT). **Šolcův rybník**, 26.v.–13.vi.2011, 1 ♂ (MT, baited with meat). **Tichá říčka NM**, 11.vii.2014, 1 ♂ (SW). [total 58 specimens].

Fannia carbonaria (Meigen, 1826)

Broadly distributed Holarctic species (also in Taiwan), but apparently rare in all parts of the range (Barták et al. 2016).

New data: **Holubník Mt.**, 11.v.–16.vi.2011, 1 ♂ (MT, baited with meat). [total 1 specimen]

Fannia carbonella (Meigen, 1824)

Probably subboreal in Europe, occurring mainly in northern Europe and rarely in central parts of the continent (Rozkošný et al. 1997).

New data: **Bukovec NR**, 13.vi.2013, 12 ♂♂; 7.vi.2014, 2 ♂♂; 13.vii.2015, 1 ♂; 23.vi.2016, 2 ♂♂ (all SW). **Jizerka**, 12.vi.2012, 2 ♂♂; 22.vii.2013, 5 ♂♂ (all SW). **Karlové bučiny NNR**, 16.v.–4.vi.2013, 1 ♂ (MT). **Liberec- Broumovská**, 21.v.2014, 1 ♂ (SW). **Liberec-Rudolfov**, 13.vi.2015, 3 ♂♂ (SW). **Malá Strana NR**, 7.v.–12.vi.2015, 1 ♂; 5.viii.–10.ix.2015, 1 ♂ (all MT). **Tichá říčka NM**, 21.v.2014, 1 ♂ (SW). [total 32 specimens]

Fannia clara Collin, 1939

Known from Great Britain, Sweden, Denmark, Czech Republic, Switzerland and Austria (Preisler et al. 2013). Common species in the studied area. Often recorded using the protein (meat) traps.

New data: **Bílý Potok**, 3.–16.vi.2005, 1 ♂ (PT). **Bukovec NR**, 27.v.–19.vi.2006, 3 ♂♂; 30.v.–26.vi.2016, 10 ♂♂, 5 ♀♀ (all PT). **Černousy-V Poli**, 27.iv.–16.v.2012, 1 ♂ (MT). **Holubník Mt.**, 11.v.–16.vi.2011, 1 ♂ (MT, baited with meat). **Karlové bučiny NNR**, 15.v.–8.vi.2013, 4 ♂♂, 2 ♀♀; 8.–19.vi.2013, 15 ♂♂ (all PT). **Liberec-Rudolfov**, 21.v.–4.vi.2011, 4 ♂♂; 4.–18.vi.2011, 1 ♂; 1.–30.v.2012, 10 ♂♂, 3 ♀♀; 1.–20.v.2013, 1 ♂; 2.–15.v.2015, 1 ♂, 1 ♀; 15.–31.v.2015, 10 ♂♂, 18 ♀♀; 13.vi.–19.vii.2015, 5 ♂♂, 2 ♀♀ (all PT); 19.vii.–3.viii.2015, 1 ♂, 1 ♀; 11.–22.viii.2015, 1 ♂, 1 ♀ (all BT). **Liberec-Staré Město**, 14.vii.–14.viii.2014, 1 ♂ (WT). **Liberec-Starý Harcov**, 9.v.–16.vi.2016, 22 ♂♂, 21 ♀♀ (PT). **Nové Město pod Smrkem**, 2.–20.vi.2006, 1 ♂ (PT). **Šolcův rybník**, 1.vii.–3.viii.2011, 1 ♀ (MT, baited with meat). **Špičák Mt.**, 13.vi.–15.vii.2006, 1 ♂ (PT). [total 149 specimens]

Fannia collini d'Assis-Fonseca, 1966

The species had been previously known only from Great Britain. Finding of one male from the study area was published by Barták et al. (2016) as the first record for the Czech Republic and in Central Europe.

Published data only: **Poustecká obora**, 18.vii.–8.viii.2012, 1 ♂ (MT) (Barták et al. 2016). [total 1 specimen]

Fannia coracina (Loew, 1873).

Holarctic species, found throughout Europe from Ireland, Great Britain and Fennoscandia to Spain, Corsica and Croatia, also in the Near East and East Palearctic (Preisler et al. 2013). Very common species in the studied area.

New data: **Bílý Potok**, 15.vi.2012, 1 ♂ (SW). **Bukovec NR**, 26.v.2014, 1 ♂; 6.vi.2015, 2 ♂♂; 13.vii.2015, 4 ♂♂; 30.viii.2015, 1 ♂ (all SW). **Ferdinandov**, 15.vi.2012, 1 ♂ (SW). **Hamrštejn NR**, 16.v.2013, 3 ♂♂ (SW). **Holubník Mt.**, 14.vii.–24.viii.2011, 1 ♂ (MT, baited with meat). **Horní Maxov**, 23.v.2012, 5 ♂♂ (SW). **Jablonec nad Nisou-Mšeno**, 8.vii.2013, 12 ♂♂ (SW). **Janov nad Nisou**, 20.v.2014, 3 ♂♂ (SW). **Karlovské bučiny NNR**, 15.v.–8.vi.2013, 9 ♂♂; 8.–19.vi.2013, 1 ♂ (all PT); 8.vi.2013, 3 ♂♂ (SW). **Liberec-Broumovská**, 19.v.2014, 3 ♂♂; 21.v.2014, 1 ♂; 1.vii.2014, 1 ♂ (all SW). **Liberec-Rudolfov**, 4.–18.vi.2011, 1 ♂; 23.vii.–11.viii.2011, 1 ♂; 2.–16.ix.2012, 2 ♂♂ (all PT); 30.v.2012, 2 ♂♂; 5.vii.2013, 1 ♂; 16.vii.2013, 4 ♂♂; 13.vi.2015, 1 ♂ (all SW). **Liberec-Růžodol I**, 3.vii.2015, 1 ♂ (SW). **Liberec-Starý Harcov**, 10.vii.2013, 1 ♂ (SW); 9.v.–16.vi.2016, 1 ♂ (PT). **Liberec-Vesec**, 16.v.2012, 1 ♂; 20.v.2013, 9 ♂♂; 6.vi.2013, 1 ♂; 17.viii.2013, 3 ♂♂; 6.v.2014, 4 ♂♂; 18.v.2015, 37 ♂♂; 28.v.2015, 10 ♂♂; 20.vi.2015, 27 ♂♂; 24.vii.2015, 1 ♂ (all SW). **Lučany nad Nisou**, 23.v.2012, 1 ♂. **Meandry Smědé NR**, 26.v.2012, 2 ♂♂; 12.vi.2012, 4 ♂♂; 30.v.2014, 2 ♂♂; 13.vii.2015, 6 ♂♂ (all SW). **Nové Město pod Smrkem**, 2.–20.vi.2006, 1 ♂ (PT). **Panský lom NM**, 11.v.2012, 8 ♂♂; 13.viii.2012, 2 ♂♂ (all SW). **Poustecká obora**, 16.v.–12.vi.2012, 1 ♂ (MT, baited with meat); 12.vi.2012, 3 ♂♂ (SW). **Rejdice**, 30.v.2016, 2 ♂♂ (SW). **Šolcův rybník**, 26.v.–13.vi.2011, 2 ♂♂ (MT); 26.v.–13.vi.2011, 2 ♂♂; 1.vii.–3.viii.2011, 2 ♂♂; 13.ix.–6.x.2011, 1 ♂ (all MT, baited with meat). **Špičák Mt.**, 30.iv.2014, 4 ♂♂ (SW). **Výpřež**, 12.vi.2013, 1 ♂ (SW). [total 204 specimens]

Fannia corvina (Verall, 1892)

Holarctic species, in Europe from Ireland, Great Britain and Sweden to Switzerland and Hungary (Preisler et al. 2013).

New data: **Bukovec NR**, 13.vi.2013, 24 ♂♂ (SW). **Ferdinandov**, 15.vi.2012, 2 ♂♂ (SW). **Liberec-Broumovská**, 21.v.2014, 1 ♂; 10.vi.2014, 1 ♂ (all SW). **Liberec-Vesec**, 20.v.2013, 1 ♂; 6.vi.2013, 1 ♂; 28.v.2015, 1 ♂; 20.vi.2015, 1 ♂ (all SW). **Lučany nad Nisou**, 23.v.2012, 2 ♂♂ (SW). **Malá Strana NR**, 7.v.–12.vi.2015, 1 ♂; 12.vi.–9.vii.2015, 1 ♂; 9.vii.–5.viii.2015, 1 ♂ (all MT). **Šolcův rybník**, 26.v.–13.vi.2011, 1 ♂ (MT). **Tichá říčka NM**, 21.v.2014, 1 ♂ (SW). [total 39 specimens]

Fannia difficilis (Stein, 1895)

Holarctic species, frequent in deciduous forests, distributed throughout Europe, also in China. Mostly fungivorous, but also recorded from rotting wood and nests of birds (Rozkošný et al. 1997).

New data: **Liberec-Rudolfov**, 16.vii.2013, 1 ♂ (SW). **Liberec-Staré Město**, 14.vii.–14.viii.2014, 5 ♂♂ (WT). **Meandry Smědé NR**, 13.vii.2015, 1 ♂ (SW). [total 7 specimens]

Fannia fuscula (Fallén, 1825)

Holarctic species, not frequent but widely distributed throughout Europe from Ireland, Great Britain, Fennoscandia and northwestern Russia to Spain, Corsica, Italy and Bulgaria, also in the Near East, Mongolia, China, Japan and Oriental Region (Preisler et al. 2013). Common species in the studied area. Often recorded using the protein (meat) traps.

Published data: **Bílý Potok**, 1.viii.1961, 1 ♂ (Čepelák 1983).

New data: **Bílý Potok**, 3.v.–3.vi.2005, 3 ♂♂; 3.–16.vi.2005, 8 ♂♂ (all PT). **Bukovec NR**, 27.v.–19.vi.2006, 1 ♂ (PT). **Holubník Mt.**, 11.v.–16.vi.2011, 6 ♂♂ (MT, baited with meat); 16.vi.–14.vii.2011, 6 ♂♂ (MT); 16.vi.–14.vii.2011, 3 ♂♂; 14.vii.–24.viii.2011, 6 ♂♂ (all MT,

baited with meat). **Horní Maxov**, 23.v.2012, 1 ♂ (SW). **Jizerka**, 20.vii.2013, 1 ♂; 13.vii.2015, 1 ♂ (all SW). **Liberec-Starý Harcov**, 9.v.–16.vi.2016, 1 ♀ (PT). **Liberec-Vesec**, 28.v.2015, 1 ♂; 20.vi.2015, 4 ♂♂ (all SW). **Malá Strana NR**, 14.vi.2012, 1 ♂ (SW). **Meandry Smědé NR**, 22.vi.–5.vii.2005, 5 ♂♂ (PT); 4.vi.2010, 1 ♂ (SW). **Poustecká obora**, 16.v.–12.vi.2012, 4 ♂♂ (MT, baited with meat); 12.vi.–18.vii.2012, 3 ♂♂ (MT); 12.vi.2012, 1 ♂ (SW). **Rejdice**, 5.–28.vii.2005, 2 ♂♂ (PT). **Šolcův rybník**, 26.v.–13.vi.2011, 15 ♂♂; 1.vii.–3.viii.2011, 7 ♂♂ (all MT, baited with meat). [total 81 specimens]

Fannia genualis (Stein, 1895)

Holarctic species distributed in northern and Central Europe (Preisler et al. 2013).

New data: **Liberec-Vesec**, 19.v.2012, 1 ♂ (SW). **Malá Strana NR**, 9.vii.–5.viii.2015, 2 ♂♂ (MT). **Meandry Smědé NR**, 4.vi.2010, 2 ♂♂ (SW). [total 5 specimens]

Fannia hirticeps (Stein, 1892)

Holarctic species, though known only in Alaska in the Nearctic region, uncommon in Europe and apparently absent in its southern parts (Preisler et al. 2013).

New data: **Bukovec NR**, 20.v.–15.vi.2010, 1 ♂ (MT). **Černousy-V Poli**, 27.iv.–16.v.2012, 1 ♂ (MT). **Poustecká obora**, 27.iv.–16.v.2012, 6 ♂♂ (MT). **Šolcův rybník**, 8.iv.–11.v.2011, 14 ♂♂ (MT). **Špičák Mt.**, 30.iv.2014, 1 ♂ (SW). [total 23 specimens]

Fannia immutica Collin, 1939

Holarctic species but rare in Europe (Great Britain, Sweden, Germany, Czech Republic, France), also recorded in Japan (Rozkošný et al. 1997).

New data: **Holubník Mt.**, 16.vi.–14.vii.2011, 1 ♂ (MT); 16.vi.–14.vii.2011, 1 ♂ (MT, baited with meat). **Jizerka**, 22.vii.2013, 1 ♂ (SW). **Liberec-Rudolfovo**, 23.vii.–11.viii.2011, 1 ♂ (PT); 11.–22.viii.2015, 4 ♂♂ (BT). [total 8 specimens]

Fannia lepida (Wiedemann, 1817)

Holarctic species, in Europe from the Faeroe Islands and Fennoscandia to Spain, Sicily and Greece, also in Algeria and Japan (Preisler et al. 2013).

New data: **Bukovec NR**, 2.–21.vii.2010, 1 ♂ (PT); 30.viii.2015, 2 ♂♂ (SW). **Černousy-V Poli**, 24.iv.–14.v.2007, 1 ♂ (PT). **Holubník Mt.**, 11.v.–16.vi.2011, 4 ♂♂; 16.vi.–14.vii.2011, 1 ♂; 14.vii.–24.viii.2011, 1 ♂ (all MT, baited with meat). **Liberec-Rudolfovo**, 2.–23.v.2009, 1 ♂ (PT); 10.vii.2010, 1 ♂ (SW). **Poustecká obora**, 16.v.–12.vi.2012, 1 ♂ (MT). **Šolcův rybník**, 26.v.–13.vi.2011, 12 ♂♂ (MT); 26.v.–13.vi.2011, 2 ♂♂ (MT, baited with meat). **Višňová**, 30.v.2014, 1 ♂ (SW). [total 28 specimens]

Fannia limbata (Tiensuu, 1938)

Little known species, up to now recorded only in Scandinavia (Norway, Sweden, and Finland), the Czech Republic and Germany. In the Czech Republic, recently found in surprisingly large numbers early in the spring (April) under unusually hot weather, being recorded using Malaise traps (baited with meat) in damp localities near ponds and rivers (Preisler et al. 2013). Listed in the national Red List as an endangered species (Gregor et al. 2005a).

New data: **Poustecká obora**, 27.iv.–16.v.2012, 1 ♂ (MT). [total 1 specimen]

Fannia lustrator (Harris, 1780)

Eurasian species, in Europe from Ireland, Great Britain, Fennoscandia and northern Russia to France, Sicily and Greece, more frequent on warmer slopes, eastwards ranging to Japan (Preisler et al. 2013). Often in the protein (meat) traps.

New data: **Bukovec NR**, 13.vi.2013, 1 ♂ (SW); 30.v.–26.vi.2016, 11 ♂♂, 10 ♀♀ (PT). **Karlové bučiny NNR**, 8.–19.vi.2013, 1 ♂; 22.xii.2015–27.v.2016, 19 ♀♀ (all PT). **Liberec-Rudolfovo**, 22.v.–6.vi.2009, 1 ♂; 21.v.–4.vi.2011, 2 ♂♂; 4.–18.vi.2011, 4 ♂♂; 1.–30.v.2012, 14 ♂♂; 2.–15.v.2015, 1 ♂; 15.–31.v.2015, 1 ♂, 1 ♀; 13.vi.–19.vii.2015, 1 ♀ (all PT). **Liberec-Starý Harcov**, 9.v.–16.vi.2016, 3 ♂♂, 362 ♀♀ (PT). **Poustecká obora**, 16.v.–12.vi.2012, 1 ♂ (MT, baited with meat). **Rejdice**, 5.–28.vii.2005, 1 ♂ (PT). **Velký Vápenný NR**, 13.x.2006–19.v.2007, 1 ♂ (PT). **Výpřež**, 8.xi.2012–12.vi.2013, 2 ♂♂ (PT). [total 437 specimens]

Fannia manicata (Meigen, 1826)

Holarctic species, in Europe from Iceland and northern Fennoscandia to Spain, Corsica, Albania and Bulgaria, also in North Africa (Preisler et al. 2013). Common species in the studied area. Often in the protein (meat) traps.

New data: **Bílý Potok**, 19.v.–3.vi.2005, 1 ♀ (YPT), 3.–16.vi.2005, 1 ♂ (PT). **Bukovec NR**, 27.v.–19.vi.2006, 16 ♂♂ (PT); 13.vi.2013, 1 ♂ (SW). **Holubník Mt.**, 11.v.–16.vi.2011, 3 ♂♂; 14.vii.–24.viii.2011, 1 ♂ (all MT, baited with meat). **Horní Řasnice**, 29.vi.–20.vii.2007, 1 ♂ (PT). **Karlové bučiny NNR**, 25.iv.–15.v.2013, 6 ♂♂; 15.v.–8.vi.2013, 3 ♂♂; 8.–19.vi.2013, 3 ♂♂ (all PT). **Liberec-Rudolfovo**, 11.iv.–2.v.2009, 2 ♂♂; 23.vii.–11.viii.2011, 1 ♂; 1.–30.v.2012, 45 ♂♂; 2.–16.ix.2012, 4 ♂; 1.–20.v.2013, 27 ♂♂; 19.iv.–10.v.2014, 4 ♂♂; 20.iv.–2.v.2015, 3 ♂♂; 2.–15.v.2015, 18 ♂♂; 15.–31.v.2015, 42 ♂♂ (all PT). **Malá Strana NR**, 9.vii.–5.viii.2015, 2 ♂♂ (MT). **Nová louka NR**, 1.xii.2013–13.v.2014, 1 ♂ (PT). **Nové Město pod Smrkem**, 30.iii.–3.v.2007, 1 ♂ (PT). **Rašeliníště Jizerky NNR**, 19.v.–3.vi.2005, 4 ♀♀ (PT). **Smrk Mt.**, 30.iii.–3.v.2007, 1 ♂ (PT). **Šolcův rybník**, 26.v.–13.vi.2011, 2 ♂♂ (MT); 1.vii.–3.viii.2011, 5 ♂♂ (MT, baited with meat). **Výpřež**, 8.xi.2012–12.vi.2013, 10 ♂♂ (PT). [total 208 specimens]

Fannia melania (Dufour, 1839)

Broadly distributed but apparently rare Eurasian species. Finding of two males from the studied area was previously published by Barták et al. (2016) as the first record for the Czech Republic. Published data only: **Holubník Mt.**, 16.vi.–14.vii.2011, 2 ♂♂ (MT) (Barták et al. 2016). [total 2 specimens]

Fannia metallipennis (Zetterstedt, 1838)

Holarctic species, distributed throughout Europe and Asia to Japan, mainly at forest edges, rather locally (Rozkošný et al. 1997).

New data: **Janov nad Nisou**, 20.v.2014, 1 ♂ (SW). **Liberec-Rudolfovo**, 3.vii.2010, 1 ♂ (SW). **Malá Strana NR**, 7.v.–12.vi.2015, 2 ♂♂ (MT). **Meandry Smědé NR**, 4.vi.2010, 1 ♂ (SW). **Nová louka NR**, 26.v.–17.vi.2014, 1 ♂ (MT). **Panský lom NM**, 11.v.2012, 2 ♂♂ (SW). **Poustecká obora**, 27.iv.–16.v.2012, 1 ♂; 16.v.–12.vi.2012, 8 ♂♂; 12.vi.–18.vii.2012, 1 ♂ (all MT); 16.v.–12.vi.2012, 9 ♂♂ (MT, baited with meat). **Šolcův rybník**, 26.v.–13.vi.2011, 1 ♂ (MT). [total 28 specimens]

Fannia minutipalpis (Stein, 1895)

Holarctic species, relatively rare in northern and Central Europe, ranging as far south as Switzerland and Bulgaria, also in North Africa, China and Taiwan (Preisler et al. 2013). In the studied area, a relatively common species.

New data: **Bukovec NR**, 13.vi.2013, 1 ♂ (SW). **Karlové bučiny NNR**, 16.v.–4.vi.2013, 7 ♂♂ (MT). **Liberec-Vesec**, 19.v.2012, 1 ♂; 20.v.2013, 2 ♂♂; 3.v.2015, 1 ♂; 18.v.2015, 1 ♂ (all SW). **Ludvíkov pod Smrkem**, 10.–31.v.2016, 6 ♂♂; 31.v.–23.vi.2016, 1 ♂ (MT). **Malá Strana NR**, 7.v.–12.vi.2015, 6 ♂♂ (MT). **Panský lom NM**, 11.v.2012, 1 ♂ (SW). **Poustecká obora**, 27.iv.–16.v.2012, 22 ♂♂; 16.v.–12.vi.2012, 1 ♂ (all MT). **Špičák Mt.**, 30.iv.2014, 1 ♂ (SW). **Šolcův rybník**, 8.iv.–11.v.2011, 3 ♂♂; 11.–26.v.2011, 7 ♂♂ (all MT). [total 61 specimens]

Fannia mollissima (Haliday in Westwood, 1840)

Holarctic species, in Europe from Iceland, Fennoscandia and northern Russia to France, Italy and Romania, in Central and southern Europe chiefly in submontane and montane areas, eastwards through Siberia and Mongolia to Japan (Preisler et al. 2013). Adults occur in spring.

New data: **Bukovec NR**, 20.v.–15.vi.2010, 1 ♂ (MT); 13.vi.2013, 55 ♂♂; 26.v.2014, 3 ♂♂; 6.vi.2015, 5 ♂♂ (all SW). **Černousy-V Poli**, 27.iv.–16.v.2012, 1 ♂ (MT). **Horní Maxov**, 23.v.2012, 3 ♂♂ (SW). **Liberec-Vesec**, 6.v.2014, 2 ♂♂; 3.v.2015, 36 ♂♂; 18.v.2015, 7 ♂♂ (all SW). **Lučany nad Nisou**, 23.v.2012, 1 ♂ (SW). **Malá Strana NR**, 7.v.2015, 10 ♂♂ (SW); 7.v.–12.vi.2015, 4 ♂♂ (MT). **Meandry Smědé NR**, 4.vi.2010, 1 ♂; 27.iv.2012, 6 ♂♂ (all SW). **Panský lom NM**, 8.v.2012, 1 ♂; 11.v.2012, 1 ♂ (all SW). **Rejdice**, 30.v.2016, 1 ♂ (SW). [total 138 specimens]

Fannia monilis (Haliday, 1838)

Palaeartic species, ranging throughout Europe to the Canary Islands and North Africa and through the Middle East to Mongolia (Preisler et al. 2013).

New data: **Bukovec NR**, 13.vii.2015, 2 ♂♂ (SW). **Holubník Mt.**, 16.vi.–14.vii.2011, 4 ♂♂ (MT); 16.vi.–14.vii.2011, 1 ♂; 14.vii.–24.viii.2011, 1 ♂ (MT, baited with meat). **Horní Maxov**, 21.vii.2013, 2 ♂♂ (SW). **Jablonec nad Nisou-Mšeno**, 8.vii.2013, 9 ♂♂ (SW). **Liberec-Perštýn**, 10.viii.2015, 2 ♂♂ (SW). **Liberec-Vesec**, 20.v.2013, 1 ♂; 6.v.2014, 1 ♂; 18.v.2015, 4 ♂♂; 28.v.2015, 4 ♂♂; 20.vi.2015, 2 ♂♂ (all SW). **Meandry Smědé NR**, 13.vii.2015, 3 ♂♂ (SW). **Šolcův rybník**, 13.ix.–6.x.2011, 1 ♂ (MT, baited with meat). [total 37 specimens]

Fannia nidica Collin, 1939

Very rare species, known only from England, Denmark and the Czech Republic (Preisler et al. 2013). Listed in the national Red List as an endangered species (Gregor et al. 2005a). All findings from the study area were previously published by Barták et al. (2016). Adults occur in spring.

Published data only: **Černousy-V Poli**, 16.v.–12.vi.2012, 1 ♂ (MT). **Poustecká obora**, 27.iv.–16.v.2012, 10 ♂♂ (MT). **Šolcův rybník**, 11.–26.v.2011, 1 ♂ (MT) (all Barták et al. 2016). [total 12 specimens]

Fannia nigra Malloch, 1910

Palaeartic species, in Europe distributed in temperate and northern parts, south to Switzerland (Preisler et al. 2013).

New data: **Liberec-Vesec**, 20.v.2013, 1 ♂ (SW). **Poustecká obora**, 18.vii.–8.viii.2012, 1 ♂ (MT). [total 2 specimens]

Fannia ornata (Meigen, 1826)

Females attracted to decaying meat. Throughout Europe but more frequent in lowlands (Rozkošný et al. 1997).

New data: **Bukovec NR**, 1.ix.2015, 1 ♀ (SW). **Hamrštejn NR**, 9.vii.–2.viii.2013, 1 ♂ (MT). [total 2 specimens]

Fannia pallitibia (Rondani, 1866)

Females attracted to decaying meat and excrements. Distributed in a large part of Europe, more frequent in lowlands and in autumn (Rozkošný et al. 1997).

New data: **Bukovec NR**, 30.viii.2015, 2 ♂♂ (SW). **Hamrštejn NR**, 9.vii.–2.viii.2013, 1 ♂; 2.–21.viii.2013, 2 ♂♂ (all MT). **Karlové bučiny NNR**, 21.viii.–26.ix.2013, 2 ♂♂ (MT). **Malá Strana NR**, 5.viii.–10.ix.2015, 2 ♂♂ (MT). **Poustecká obora**, 18.vii.–8.viii.2012, 1 ♂ (MT). **Šolcův rybník**, 3.–24.viii.2011, 1 ♂ (MT). [total 11 specimens]

Fannia parva (Stein, 1895)

Eurosiberian species, common in Europe from Northern Ireland, Britain and Fennoscandia to France, Italy, Croatia and Bulgaria, eastwards to eastern Siberia (Preisler et al. 2013).

New data: **Bukovec**, 30.viii.2013, 1 ♂; 30.viii.2015, 3 ♂♂; 1.ix.2015, 1 ♂ (all SW). **Horní Řasnice**, 7.viii.2013, 1 ♂ (SW). **Karlové bučiny NNR**, 2.–21.viii.2013, 2 ♂♂ (MT). **Liberec-Broumovská**, 1.vii.2014, 1 ♂ (SW). **Liberec-Kateřinky**, 10.viii.2013, 2 ♂♂; 25.viii.2013, 8 ♂♂; 27.viii.2013, 1 ♂ (all SW). **Liberec-Krásná Studánka**, 11.viii.2013, 2 ♂♂ (SW). **Liberec-Rudolfov**, 3.viii.2015, 3 ♂♂ (SW). **Liberec-Starý Harcov**, 15.viii.2013, 1 ♂ (SW). **Liberec-Vesec**, 17.viii.2013, 16 ♂♂ (SW). **Liberec-Vratislavice nad Nisou**, 3.viii.2013, 2 ♂♂ (SW). **Panský lom NM**, 13.viii.2012, 1 ♂ (SW). **Rašeliniště Jizerky NNR**, 28.vii.–17.viii.2005, 1 ♀ (MT). **Špičák Mt.**, 5.ix.2006, 14 ♀♀ (SW). [total 60 specimens]

Fannia pauli (Pont in Rozkošný, Gregor & Pont, 1997)

Distributional data are scattered from Great Britain, Denmark and northwestern Russia to Spain, Italy and Romania, known to occur also in North Africa (Preisler et al. 2013).

New data: **Ludvíkov pod Smrkem**, 31.v.–23.vi.2016, 1 ♂ (MT). [total 1 specimen]

Fannia polychaeta (Stein, 1895)

European species of broadleaved forests, known from Ireland, Great Britain and Fennoscandia to Spain, Italy and Bulgaria (Preisler et al. 2013). Common species in the studied area, very abundant in samples from sweeping of male swarms under tree branches.

Published data: Bílý Potok, 4.viii.1961, 2 ♂♂ (Čepelák 1983).

New data: **Bedřichov**, 3.vii.2014, 131 ♂♂ (SW). **Bukovec NR**, 13.vii.2015, 66 ♂♂ (SW). **Hamrštejn NR**, 19.vi.–9.vii.2013, 2 ♂♂; 9.vii.–2.viii.2013, 1 ♂; 2.–21.viii.2013, 1 ♂ (all MT). **Holubník Mt.**, 16.vi.–14.vii.2011, 3 ♂♂ (MT, baited with meat). **Horní Maxov**, 21.vii.2013, 106 ♂♂ (SW). **Jablonec nad Nisou-Mšeno**, 1.viii.2012, 1 ♂; 8.vii.2013, 76 ♂♂ (all SW). **Jizerka**, 20.vii.2013, 1 ♂; 22.vii.2013, 150 ♂♂; 13.vii.2015, 18 ♂♂ (all SW). **Karlové bučiny**

NNR, 19.vi.–9.vii.2013, 1 ♂ (MT); 9.vii.2013, 27 ♂♂ (SW). **Liberec-Broumovská**, 1.vii.2014, 2 ♂♂ (SW). **Liberec-Kateřinky**, 8.vii.2012, 2 ♂♂; 10.viii.2013, 203 ♂♂; 25.viii.2013, 10 ♂♂; 27.viii.2013, 3 ♂♂ (all SW). **Liberec-Krásná Studánka**, 11.viii.2013, 8 ♂♂ (SW). **Liberec-Lidové sady**, 3.vii.2014, 10 ♂♂ (SW). **Liberec-Perštýn**, 29.vi.2015, 2 ♂♂; 10.viii.2015, 1 ♂ (all SW). **Liberec-Rudolfov**, 16.vii.2013, 725 ♂♂; 23.vii.2014, 127 ♂♂ (all SW); 19.vii.–3.viii.2015, 1 ♂ (BT). **Liberec-Starý Harcov**, 10.vii.2013, 358 ♂♂; 15.viii.2013, 12 ♂♂ (all SW). **Liberec-Vratislavice nad Nisou**, 3.viii.2013, 18 ♂♂ (SW). **Kořenov**, 29.viii.2013, 45 ♂♂ (SW). **Malá Strana NR**, 9.vii.–5.viii.2015, 7 ♂♂; 5.viii.–10.ix.2015, 1 ♂ (all MT). **Meandry Smědé NR**, 13.vii.2015, 2 ♂♂ (SW). **Nová louka NR**, 11.vii.2014, 18 ♂♂ (SW). **Oldřichov v Hájích**, 21.viii.2013, 27 ♂♂ (SW). **Rašeliniště Jizerky NNR**, 5.–28.vii.2005, 1 ♂ (MT); 13.vii.2015, 34 ♂♂ (SW). **Šolcův rybník**, 1.vii.–3.viii.2011, 1 ♂ (MT); 1.vii.–3.viii.2011, 1 ♂ (MT, baited with meat). **Tichá říčka NM**, 11.vii.2014, 1 ♂ (SW). [total 2204 specimens]

Fannia postica (Stein, 1895)

Holarctic species, in Europe from Iceland and Fennoscandia to Spain, Italy and Bulgaria, also in the Near East and in Asia to Japan but nowhere too common (Preisler et al. 2013). Common species in the studied area.

New data: **Bukovec PR**, 28.viii.2005, 1 ♀ (SW); 8.vi.2008, 2 ♂♂; 13.vi.2013, 6 ♂♂; 7.vi.2014, 2 ♂♂; 13.vii.2015, 2 ♂♂ (all SW). **Horní Maxov**, 23.v.2012, 3 ♂♂ (SW). **Jablonec nad Nisou-Mšeno**, 8.vii.2013, 1 ♂ (SW). **Jizerka**, 22.vii.2013, 1 ♂; 13.vii.2015, 3 ♂♂ (all SW). **Karlovské bučiny NNR**, 4.–19.vi.2013, 1 ♂; 9.vii.–2.viii.2013, 1 ♂ (all MT). **Liberec-Broumovská**, 19.v.2014, 7 ♂♂; 21.v.2014, 4 ♂♂; 10.vi.2014, 1 ♂. **Liberec-Vesec**, 19.v.2012, 6 ♂♂; 6.vi.2013, 1 ♂; 18.v.2015, 17 ♂♂; 28.v.2015, 19 ♂♂; 20.vi.2015, 4 ♂♂ (all SW). **Ludvíkov pod Smrkem**, 31.v.–23.vi.2016, 2 ♂♂ (MT). **Lučany nad Nisou**, 23.v.2012, 2 ♂♂ (SW). **Malá Strana NR**, 7.v.–12.vi.2015, 1 ♂; 12.vi.–9.vii.2015, 1 ♂; 9.vii.–5.viii.2015, 3 ♂♂ (all MT). **Poustecká obora**, 12.vi.2012, 2 ♂♂ (SW); 12.vi.–18.vii.2012, 3 ♂♂ (MT). **Rejdice**, 30.v.2016, 1 ♂ (SW). **Šolcův rybník**, 26.v.–13.vi.2011, 1 ♂; 1.vii.–3.viii.2011, 2 ♂♂ (MT, baited with meat); 13.vi.–1.vii.2011, 2 ♂♂; 1.vii.–3.viii.2011, 3 ♂♂ (all MT). **Tichá říčka NM**, 11.vii.2014, 1 ♂ (SW). **Výpřež**, 12.vi.2013, 2 ♂♂ (SW). [total 108 specimens]

Fannia posticata (Meigen, 1826)

Females attracted to decaying meat and faeces. Eurasian species, ranging to Japan but nowhere very common, usually an autumnal species (Rozkošný et al. 1997).

New data: **Jablonec nad Nisou-Mšeno**, 1.viii.2012, 2 ♂♂, 2 ♀♀ (SW). **Liberec-Rudolfov**, 3.–11.viii.2015, 1 ♂ (BT). [total 5 specimens]

Fannia pruinosa (Meigen, 1826)

Mainly in Central Europe, only locally more frequent. From Sweden to France, Switzerland, Hungary and the central part of European Russia, also in Asia (Preisler et al. 2013).

New data: **Šolcův rybník**, 24.viii.–6.x.2011, 1 ♂ (MT). [total 1 specimen]

Fannia ringdahllana Collin, 1939

Broadly distributed Palaearctic and Oriental species. In Europe widely distributed possibly except its southern parts (Preisler et al. 2013).

New data: **Bukovec NR**, 15.vi.–2.vii.2010, 1 ♂ (MT); 6.vi.2015, 3 ♂♂; 13.vii.2015, 3 ♂♂ (all SW). **Hamrštejn NR**, 19.vi.–9.vii.2013, 1 ♂ (MT). **Holubník Mt.**, 16.vi.–14.vii.2011, 3 ♂♂ (MT, baited with meat). **Horní Maxov**, 23.v.2012, 2 ♂♂ (SW). **Janov nad Nisou**, 20.v.2014, 1 ♂ (SW). **Jizerka**, 20.vii.2013, 1 ♂; 22.vii.2013, 4 ♂♂ (all SW). **Liberec-Rudolfov**, 1.vi.2008, 1 ♂; 10.vii.2010, 1 ♂ (all SW). **Liberec-Vesec**, 18.v.2015, 1 ♂ (SW). **Malá Strana NR**, 7.v.–12.vi.2015, 1 ♂ (MT). **Poustecká obora**, 12.vi.–18.vii.2012, 1 ♂ (MT). [total 24 specimens]

Fannia rondanii (Strobl, 1893)

Holarctic species, known from the whole of Europe (from Ireland, Great Britain, Fennoscandia and northern Russia to Spain, Corsica, Italy and Greece), also in the Near East and Japan; in deciduous forests and peat bogs (Preisler et al. 2013).

New data: **Bílý Potok**, 15.vi.2012, 1 ♂ (SW). **Černousy-Boleslav**, 8.viii.2012, 14 ♂♂ (SW). **Hamrštejn NR**, 9.vii.2013, 6 ♂♂ (SW). **Horní Maxov**, 23.v.2012, 1 ♂. **Horní Řasnice**, 7.viii.–5.ix.2008, 1 ♂ (PT). **Jablonec nad Nisou-Mšeno**, 8.vii.2013, 1 ♂ (SW). **Janov nad Nisou**, 11.vii.2014, 1 ♂. **Jizerka**, 22.vii.2013, 3 ♂♂. **Liberec-Broumovská**, 10.vi.2014, 1 ♂ (SW). **Liberec-Kateřinky**, 25.viii.2013, 1 ♂ (SW). **Liberec-Perštýn**, 10.viii.2015, 1 ♂ (SW). **Liberec-Rudolfov**, 1.vi.2008, 1 ♂; 3.vii.2010, 1 ♂; 16.vii.2013, 3 ♂♂ (all SW). **Liberec-Vesec**, 17.viii.2013, 1 ♂; 18.v.2015, 1 ♂ (all SW). **Lučany nad Nisou**, 23.v.2012, 1 ♂ (SW). **Ludvíkov pod Smrkem**, 10.–31.v.2016, 3 ♂♂ (MT). **Malá Strana NR**, 7.v.–12.vi.2015, 1 ♂ (MT). **Panský lom NM**, 13.viii.2012, 3 ♂♂ (SW). **Poustka**, 8.viii.2012, 2 ♂♂ (SW). [total 48 specimens]

Fannia scalaris (Fabricius, 1794)

Almost cosmopolitan species, at least some populations even synanthropic, in the western Palaearctic from Iceland to the Azores, Canary Is. and North Africa, throughout Europe from lowlands to mountains (Preisler et al. 2013).

Published data: **Bílý Potok**, 1.viii.1961, 1 ♂ (Čepelák 1983).

New data: **Bukovec NR**, 27.v.–19.vi.2006, 2 ♂♂ (PT). **Jizerka**, 12.vi.2012, 3 ♂♂; 20.vii.2013, 2 ♂m; 22.vii.2013, 7 ♂♂; **Liberec-Rudolfov**, 23.vii.–11.viii.2011, 1 ♂ (PT). **Liberec-Staré Město**, 14.vii.–14.viii.2014, 4 ♂♂ (WT). **Meandry Smědé NR**, 24.iv.–14.v.2005, 1 ♂ (PT). [total 20 specimens]

Fannia serena (Fallén, 1825)

Holarctic species, throughout Europe from the Faeroe Islands, northern Fennoscandia and northern Russia to Spain, Italy and Bulgaria, also in Japan (Preisler et al. 2013). Very common species in the studied area.

New data: **Bílý Potok**, 19.v.–3.vi.2005, 4 ♀♀ (YPT); 15.vi.2012, 1 ♂ (SW). **Bukovec NR**, 27.v.–19.vi.2006, 1 ♂ (PT); 15.vi.–2.vii.2010, 1 ♂ (MT); 8.vi.2008, 1 ♂; 13.vi.2013, 126 ♂♂; 26.v.2014, 20 ♂♂; 31.v.2014, 11 ♂♂; 7.vi.2014, 2 ♂♂; 6.vi.2015, 19 ♂♂; 13.vii.2015, 9 ♂♂; 23.vi.2016, 4 ♂♂ (all SW). **Černousy-Boleslav**, 8.viii.2012, 1 ♂ (SW). **Černousy-V Poli**, 27.iv.–16.v.2012, 1 ♂; 16.v.–12.vi.2012, 1 ♂ (both MT). **Hamrštejn NR**, 16.v.2013, 5 ♂♂. **Horní Maxov**, 23.v.2012, 7 ♂♂; 21.vii.2013, 1 ♂ (all SW). **Jablonec nad Nisou-Mšeno**, 1.viii.2012, 2 ♂♂; 8.vii.2013, 1 ♂ (all SW). **Janov nad Nisou**, 11.vii.2014, 3 ♂♂ (SW). **Jedlový důl NR**, 30.v.–1.vii.2005, 1 ♀ (MT).

Jizerka, 20.vi.2008, 1 ♂; 20.vii.2013, 9 ♂♂; 22.vii.2013, 4 ♂♂; 6.vi.2015, 2 ♂♂; 13.vii.2015, 3 ♂♂ (all SW). **Karlové bučiny NNR**, 16.v.2013, 1 ♂ (SW); 16.v.–4.vi.2013, 1 ♂ (MT). **Kořenov**, 13.vi.2012, 1 ♂ (SW). **Liberec-Broumovská**, 13.v.2013, 4 ♂♂; 25.iv.2014, 10 ♂♂; 5.v.2014, 41 ♂♂; 19.v.2014, 11 ♂♂; 21.v.2014, 35 ♂♂; 25.v.2014, 5 ♂♂; 10.vi.2014, 7 ♂♂; 1.vii.2014, 1 ♂ (all SW). **Liberec-Perštýn**, 29.vi.2015, 1 ♂; 10.viii.2015, 1 ♂ (both SW). **Liberec-Rudolfov**, 3.vii.2010, 1 ♂; 1.v.2012, 1 ♂; 13.vi.2015, 1 ♂ (all SW). **Liberec-Růžodol I**, 3–vii.2015, 2 ♂♂ (SW). **Liberec-Vesec**, 19.v.2012, 4 ♂♂; 25.v.2012, 5 ♂♂; 20.v.2013, 57 ♂♂; 6.vi.2013, 9 ♂♂; 6.v.2014, 113 ♂♂; 3.v.2015, 25 ♂♂; 18.v.2015, 687 ♂♂; 28.v.2015, 173 ♂♂; 20.vi.2015, 106 ♂♂ (all SW). **Lučany nad Nisou**, 23.v.2012, 3 ♂♂ (SW). **Ludvíkov pod Smrkem**, 10.v.2016, 16 ♂♂ (SW); 10.–31.v.2016, 3 ♂♂; 31.v.–23.vi.2016, 3 ♂♂ (all MT). **Malá Strana NR**, 7.v.2015, 1 ♂ (SW); 7.v.–12.vi.2015, 2 ♂♂; 5.viii.–10.ix.2015, 4 ♂♂ (all MT). **Meandry Smědé NR**, 4.vi.2010, 11 ♂♂; 26.iv.2012, 2 ♂♂; 26.v.2012, 5 ♂♂; 18.vii.2012, 5 ♂♂; 8.viii.2012, 1 ♂; 30.v.2014, 2 ♂♂; 13.vii.2015, 2 ♂♂ (all SW). **Nová louka NR**, 11.vii.–1.viii.2014, 1 ♂ (MT). **Panský lom NM**, 11.v.2012, 5 ♂♂; 13.viii.2012, 1 ♂. **Poustecká obora**, 27.iv.–16.v.2012, 4 ♂♂; 18.vii.–8.viii.2012, 1 ♂ (all MT); 16.v.–12.vi.2012, 4 ♂♂ (MT, baited with meat); 12.vi.2012, 1 ♂ (SW). **Pouстка**, 8.viii.2012, 2 ♂♂ (SW). **Rašeliniště Jizerky NNR**, 13.vii.2015, 1 ♂ (SW). **Rejdice**, 19.–30.v.2005, 1 ♀ (YPT); 30.v.2016, 11 ♂♂ (SW). **Šolcův rybník**, 11.–26.v.2011, 8 ♂♂; 26.v.–13.vi.2011, 3 ♂♂; 1.vii.–3.viii.2011, 1 ♂; 3.–24.viii.2011, 2 ♂♂ (all MT). **Špičák Mt.**, 5.ix.2006, 1 ♀, 30.iv.2014, 4 ♂♂ (all SW). **Tichá říčka NM**, 21.v.2014, 21 ♂♂; 11.vii.2014, 3 ♂♂ (all SW). **Višňová**, 30.v.2014, 16 ♂♂ (SW). [total 1695 specimens]

Fannia similis (Stein, 1895)

Eurosiberian species, common in Europe (from Ireland, Great Britain, Fennoscandia and northwestern Russia to France, Italy, Slovenia and Romania), eastwards through western Siberia to China (Preisler et al. 2013).

New data: **Bukovec NR**, 13.vi.2013, 6 ♂♂ (SW). **Jablonec nad Nisou-Mšeno**, 8.vii.2013, 1 ♂ (SW). **Karlové bučiny NNR**, 15.v.–8.vi.2013, 2 ♂♂ (PT); 16.v.–4.vi.2013, 1 ♂ (MT); 8.vi.2013, 1 ♂ (SW). **Liberec-Broumovská**, 5.v.2014, 2 ♂♂; 19.v.2014, 2 ♂♂; 21.v.2014, 4 ♂♂; 10.vi.2014, 3 ♂♂ (all SW). **Liberec-Rudolfov**, 13.vi.2015, 1 ♂ (SW). **Liberec-Vesec**, 6.v.2014, 5 ♂♂; 28.v.2015, 1 ♂; 20.vi.2015, 15 ♂♂ (all SW). **Ludvíkov pod Smrkem**, 31.v.–23.vi.2016, 4 ♂♂ (MT). **Malá Strana NR**, 9.vii.–5.viii.2015, 1 ♂ (MT). **Meandry Smědé NR**, 4.–19.v.2005, 1 ♀ (YPT); 13.vii.2015, 2 ♂♂ (SW). **Tichá říčka NM**, 21.v.2014, 1 ♂ (SW). [total 53 specimens]

Fannia sociella (Zetterstedt, 1845)

Holarctic species, common throughout Europe from Ireland, Great Britain, Fennoscandia and northwestern Russia to Spain, Italy and Greece, also in the Azores, eastwards to China and Japan (Preisler et al. 2013). Very common species in the studied area.

New data: **Bedřichov**, 3.vii.2014, 2 ♂♂ (SW). **Bílý Potok**, 3.v.–3.vi.2005, 2 ♂♂; 3.–16.vi.2005, 1 ♂ (all PT). **Bukovec NR**, 15.vi.–2.vii.2010, 1 ♂ (MT); 13.vi.2013, 7 ♂♂; 7.vi.2014, 1 ♂; 30.viii.2015, 1 ♂; 23.vi.2016, 1 ♂ (all SW); 30.v.–26.vi.2016, 1 ♂ (PT). **Holubník Mt.**, 11.v.–16.vi.2011, 5 ♂♂; 16.vi.–14.vii.2011, 3 ♂♂; 14.vii.–24.viii.2011, 15 ♂♂ (all MT, baited with meat); 16.vi.–14.vii.2011, 1 ♂ (MT). **Horní Maxov**, 21.vii.2013, 1 ♂ (SW). **Horní Řasnice**,

30.iv.–16.v.2008, 1 ♂; 7.viii.–5.ix.2008, 1 ♂ (both PT). **Jablonec nad Nisou-Mšeno**, 8.vii.2013, 1 ♂ (SW). **Jizerka**, 20.vi.2008, 1 ♂; 22.vii.2013, 1 ♂ (both SW). **Karlové bučiny NNR**, 16.v.–4.vi.2013, 1 ♂; 2.–21.viii.2013, 1 ♂ (both MT). **Liberec-Broumovská**, 13.v.2013, 2 ♂♂; 5.v.2014, 2 ♂♂; 19.v.2014, 1 ♂; 21.v.2014, 3 ♂♂; 25.v.2014, 1 ♂; 10.vi.2014, 2 ♂♂; 1.vii.2014, 1 ♂ (all SW). **Liberec-Perštýn**, 10.viii.2015, 1 ♂ (SW). **Liberec-Rudolfovo**, 16.vii.2013, 6 ♂♂; 3.viii.2015, 1 ♂ (all SW). **Liberec-Růžodol I**, 3.vii.2015, 1 ♂ (SW). **Liberec-Starý Harcov**, 10.vii.2013, 1 ♂ (SW). **Liberec-Vesec**, 19.v.2012, 1 ♂; 20.v.2013, 1 ♂; 17.viii.2013, 1 ♂; 6.v.2014, 2 ♂♂; 18.v.2015, 6 ♂♂; 28.v.2015, 4 ♂♂ (all SW). **Ludvíkov pod Smrkem**, 31.v.–23.vi.2016, 1 ♂ (MT). **Malá Strana NR**, 7.v.–12.vi.2015, 2 ♂♂; 9.vii.–5.viii.2015, 4 ♂♂; 5.viii.–10.ix.2015, 1 ♂ (all MT). **Meandry Smědé NR**, 4.vi.2010, 1 ♂; 13.vii.2015, 1 ♂ (both SW); 27.iv.–16.v.2012, 1 ♂ (PT). **Panský lom NM**, 13.viii.2012, 1 ♂ (SW). **Poustecká obora**, 27.iv.–16.v.2012, 3 ♂♂; 16.v.–12.vi.2012, 11 ♂♂; 12.vi.–18.vii.2012, 3 ♂♂; 18.vii.–8.viii.2012, 3 ♂♂ (all MT); 16.v.–12.vi.2012, 20 ♂♂ (MT, baited with meat). **Rašeliště Jizerky NNR**, 13.vii.2015, 4 ♂♂ (SW). **Rejdice**, 30.v.2016, 3 ♂♂ (SW). **Šolcův rybník**, 26.v.–13.vi.2011, 1 ♂; 1.vii.–3.viii.2011, 1 ♂ (both MT, baited with meat); 1.vii.–3.viii.2011, 3 ♂♂; 3.–24.viii.2011, 3 ♂♂; 24.viii.–6.x.2011, 2 ♂♂ (all MT). **Višňová**, 30.v.2014, 1 ♂ (SW). **Výpřež**, 8.xi.2012–12.vi.2013, 2 ♂♂ (PT). [total 159 specimens]

Fannia spathiophora Malloch, 1918

Holarctic species, widespread but not too common. Fennoscandia, northwestern Russia, Germany, Poland, Austria, Czech Republic and Switzerland; eastwards through Central Asia to Japan (Preisler et al. 2013). From the Czech Republic only one record previously published from Bohemia (Preisler et al. 2013) and two records from Moravia (Gregor & Rozkošný 2005; Gregor et al. 2005b).

New data: **Bukovec NR**, 23.vi.2016, 1 ♂ (SW). **Liberec-Rudolfovo**, 3.vii.2010, 1 ♂; 5.vii.2013, 1 ♂ (both SW). [total 3 specimens]

Fannia speciosa (Villeneuve, 1898)

Palearctic species, in Europe known from the temperate and northern regions (Preisler et al. 2013). In spite of being considered rare in Central Europe (Rozkošný et al. 1997), surprisingly large numbers of specimens in Vráž near Písek recorded by Preisler et al. (2013). From Slovakia reported only recently by Straka (2011).

New data: **Bukovec NR**, 2.–21.vii.2010, 1 ♀ (PT); 13.vii.2015, 1 ♂ (SW). **Holubník Mt.**, 14.vii.–24.viii.2011, 2 ♂♂ (MT, baited with meat). **Karlové bučiny NNR**, 15.v.–8.vi.2013, 1 ♀ (PT). **Liberec-Rudolfovo**, 22.viii.–14.ix.2015, 1 ♀ (BT). **Liberec-Růžodol I**, 3.vii.2015, 1 ♂ (SW). **Šolcův rybník**, 1.vii.–3.viii.2011, 2 ♀♀ (MT, baited with meat). [total 9 specimens]

Fannia subsimilis Ringdahl, 1934

Reliable records known from Ireland, Great Britain, Fennoscandia and northwestern Russia to France, Italy and Croatia (Preisler et al. 2013).

New data: **Bukovec NR**, 13.vi.2013, 2 ♂♂ (SW). **Liberec-Broumovská**, 21.v.2014, 1 ♂ (SW). **Liberec-Vesec**, 6.vi.2013, 1 ♂; 18.v.2015, 28 ♂♂; 28.v.2015, 8 ♂♂; 20.vi.2015, 9 ♂♂ (all SW). **Rejdice**, 30.v.2016, 2 ♂♂ (SW). [total 51 specimens]

Fannia tuberculata (Zetterstedt, 1849)

Rare species, known previously from only two Czech records: Mariánské Lázně and Lačnov near Valašské Klobouky (Barták et al. 2016; see Rozkošný & Gregor 1988). From Slovak Republic reported by Straka (2011).

New data: **Malá Strana NR**, 7.v.–12.vi.2015, 3 ♂♂; 9.vii.–5.viii.2015, 1 ♂; 5.viii.–10.ix.2015, 1 ♂ (all MT). [total 5 specimens].

Fannia umbratica Collin 1939

Holarctic species, in Europe known only from Great Britain, Germany, Czech Republic, Switzerland, Sweden and Slovakia (Preisler et al. 2013).

New data: **Hamrštejn NR**, 16.v.2013, 2 ♂♂ (SW). **Karlové bučiny NNR**, 16.v.–4.vi.2013, 1 ♂ (MT). **Liberec-Vesec**, 28.v.2015, 1 ♂ (SW). **Panský lom NM**, 11.v.2012, 1 ♂ (SW). [total 5 specimens]

Fannia umbrosa (Stein, 1895)

European species, not too frequent. Distributed from Ireland, Great Britain, Fennoscandia and northwestern Russia to France, Italy, Serbia and Romania (Preisler et al. 2013).

New data: **Jablonec nad Nisou-Mšeno**, 8.vii.2013, 9 ♂♂ (SW). **Jedlový důl NR**, 21.vii.2013, 2 ♂♂ (SW). **Liberec-Broumovská**, 10.vi.2014, 1 ♂; 1.vii.2014, 3 ♂♂ (all SW). **Liberec-Perštýn**, 29.vi.2015, 1 ♂ (SW). **Liberec-Rudolfovo**, 5.vii.2013, 1 ♂; 16.vii.2013, 3 ♂♂ (all SW). **Liberec-Vesec**, 17.viii.2013, 3 ♂♂; 18.v.2015, 2 ♂♂; 28.v.2015, 1 ♂; 20.vi.2015, 2 ♂♂ (all SW). **Liberec-Vratislavice nad Nisou**, 3.viii.2013, 2 ♂♂ (SW). **Malá Strana NR**, 7.v.–12.vi.2015, 1 ♂ (MT). **Poustecká obora**, 27.iv.–16.v.2012, 1 ♂; 16.v.–12.vi.2012, 2 ♂♂ (all MT). [total 34 specimens]

Fannia verrallii (Stein, 1895)

Rarely collected Holarctic species known in Europe only from Great Britain, Germany, Norway, Finland, Sweden and Czech Republic (Pont 2007), from Bohemia published by Gregor et al. (2003). Listed in the national Red List as a vulnerable species (Gregor et al. 2005a). Finding of one male from the study area was previously published by Barták et al. (2016) as a confirmed occurrence of this species in the Czech Republic.

Published data only: Jizerka, 20.vi.2008, 1 ♂ (SW) (Barták et al. 2016). [total 1 specimen]

Fannia vesparia (Meade, 1891)

Holarctic species, not very common, mainly in central and northern Europe, also in Japan (Rozkošný et al. 1997).

New data: **Holubník Mt.**, 16.vi.–14.vii.2011, 1 ♂ (MT). [total 1 specimen]

Piezura pardalina Rondani, 1866

Holarctic species, in Europe predominantly in broadleaved forests, from Great Britain, Scandinavia and Estonia to Belgium, Corsica, Sardinia, Italy and Romania (Preisler et al. 2013).

New data: **Liberec-Lidové sady**, 3.vii.2014, 1 ♂ (SW). **Liberec-Starý Harcov**, 9.v.–16.vi.2016, 1 ♂ (PT). **Liberec-Vesec**, 20.vi.2015, 1 ♂; 9.ix.2015, 1 ♂; 12.ix.2015, 1 ♂, 1 ♀ (all SW); 13.viii.–9.ix.2015, 16 ♂♂, 73 ♀♀; 9.–28.ix.2015, 6 ♀♀ (all BT). [total 100 specimens].

DISCUSSION AND CONCLUSIONS

Altogether 52 species of the family Fanniidae are reported from the Jizerské hory Mts, Frýdlant region and the vicinity of the Liberec city, representing 73.2% of all species known from the Czech Republic and 76.5% of all species known from Bohemia (Barták et al. 2016). Five species found are listed in the Red List of Invertebrates of the Czech Republic (Gregor et al. 2005a): *Fannia limbata* and *F. nidica* as endangered species, *F. alpina*, *F. atripes* and *F. verrallii* as vulnerable species.

The most abundant species was *Fannia polychaeta* (2204 specimens), followed by *F. serena* (1695 spec.) and *F. lustrator* (437 spec.). The most frequent species was *F. serena* (31 localities), followed by *F. sociella* (25 localities), *F. polychaeta* (24 localities) and *F. coracina* (23 localities).

The most significant findings are records of *Fannia collini* and *F. melania*, which were previously recorded in the study area as new species for the Czech Republic by Barták et al. (2016), together with findings of other two rare species (*F. nidica* and *F. verrallii*).

Compared with the results of other complex surveys of Diptera in the Czech Republic, the studied area hosts a high number of species: Pálava Biosphere Reserve – 47 species (Gregor & Rozkošný 1999); Bílina and Duchcov surroundings – 43 species (Gregor & Barták 2001); Podyjí National Park – 42 species (Gregor et al. 2005b); Vráž near Písek – 42 species (Preisler et al. 2013).

Acknowledgements. We thank our colleagues Romana Dufková (North Bohemian Museum in Liberec) for the help with installing Malaise traps and Hana Šuláková (Prague) for valuable comments on the manuscript.

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SOUHRN

V práci jsou shrnuty výsledky průzkumu čeledi Fanniidae v Jizerských horách, na Frýdlantsku a v okolí Liberce, uskutečněného v letech 2005–2016. Materiál byl získán smýkáním vegetace (SW) a odchytom do Malaiseho (MT), masových (PT), pivních (BT) a vinných (WT) pastí a žlutých misek (YPT). Podrobněji tyto metody popisuje např. Vonička (2008). Veškerý materiál sbírali J. Preisler a P. Vonička, vzorky vytrídil a dokladové exempláře vypreparoval J. Preisler. Většinu materiálu determinoval J. Preisler a některé exempláře revidoval M. Barták, menší část materiálu z let 2005–2006 determinoval R. Rozkošný. Dokladové exempláře jsou uloženy v soukromé sbírce J. Preislera a dále ve sbírkách Severočeského muzea v Liberci a České zemědělské univerzity v Praze. Nomenklatura je převzata z práce Barták et al. (2016).

Celkem bylo na 46 lokalitách ve sledovaném území zaznamenáno 52 druhů čeledi Fanniidae, což představuje 73,2% všech druhů známých z České republiky a 76,5% všech druhů známých z Čech (Barták et al. 2016).

Pět druhů je zařazeno v Červeném seznamu ohrožených druhů bezobratlých České republiky (Gregor et al. 2005a): *Fannia limbata* a *F. nidica* v kategorii ohrožených, *F. alpina*, *F. atripes* a *F. verrallii* v kategorii zranitelných druhů.

Ve vzorcích byl nejpočetněji zastoupen druh *Fannia polychaeta* (2204 exemplářů), dále *F. serena* (1695 ex.) a *F. lustrator* (437 ex.). K nejvíce rozšířeným druhům ve sledované oblasti patří *F. serena* (31 lokalit), *F. sociella* (25 lokalit), *F. polychaeta* (24 lokalit) a *F. coracina* (23 lokalit).

K nejvýznamnějším výsledkům patří nálezy druhů *Fannia collini* a *F. melania*, které byly již dříve publikovány jako první v České republice a v případě *F. collini* i ve střední Evropě (Barták et al. 2016). Významné jsou i nálezy dalších dvou vzácných druhů – *F. nidica* a *F. verrallii*, které byly již také dříve publikovány (Barták et al. 2016).

Porovnáme-li výsledky s komplexními výzkumy dvoukřídlých včetně čeledi Fanniidae z jiných oblastí České republiky, v Jizerských horách, na Frýdlantsku a v okolí Liberce byl zaznamenán dosud nejvyšší počet druhů. V biosférické rezervaci Pálava bylo zjištěno 47 druhů (Gregor & Rozkošný 1999), v okolí Bíliny a Duchcova 43 druhů (Gregor & Barták 2001), v Národním parku Podyjí 42 druhů (Gregor et al. 2005b) a ve Vráži u Písku rovněž 42 druhů (Preisler et al. 2013).



Fig. 1. Malaise trap at the locality Bílé bukovi under Holubník Mt. (2011). Photo by P. Vonička.
Obr. 1. Malaiseho past na lokalitě Bílé bukovi pod Holubníkem (2011). Foto P. Vonička.



Fig. 2. Near the Malaise trap in the Karlovské bučiny NNR (2013). From the left J. Preisler, R. Dufková. Photo by P. Vonička.
Obr. 2. U Malaiseho pasti v NPR Karlovské bučiny (2013). Zleva J. Preisler, R. Dufková. Foto P. Vonička.



Fig. 3. Malaise trap in the Nová louka NR (2014). Photo by P. Vonička.
Obr. 3. Malaiseho past v PR Nová louka (2014). Foto P. Vonička.



Fig. 4. Malaise trap in alder grove near Ludvíkov pod Smrkem (2016). Photo by P. Vonička.
Obr. 4. Malaiseho past v olšíně u Ludvíkova pod Smrkem (2016). Foto P. Vonička.