



## FAUNISTIC RECORDS OF SOME DIPTERA FAMILIES FROM THE BABIA GÓRA MASSIF IN POLAND

### ZAPISKI FAUNISTYCZNE DOTYCZĄCE NIEKTÓRYCH RODZIN MUCHÓWEK (DIPTERA) Z MASYWU BABIEJ GÓRY W POLSCE

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**ABSTRACT.** Faunistic records of 41 species from 13 Diptera families (Bibionidae, Cylindrotomidae, Dixidae, Empididae, Heleomyzidae, Hybotidae, Lauxaniidae, Limoniidae, Lonchopteridae, Pediciidae, Psychodidae, Ptychopteridae, and Rhagionidae) are presented. Among them, seven species are new to the fauna of Poland territory: *Ula (Ula) mixta* STARÝ, 1983 (Pediciidae), *Clytocerus dali* (EATON, 1893), *Feuerborniella obscura* (TONNOIR, 1919), *Pneumia stammeri* (JUNG, 1956), *Saraiella rotunda* (KREK, 1970), *Sycorax feuerborni* JUNG, 1957 and *Threticus balkaneolpinus* KREK, 1972 (Psychodidae).

**KEYWORDS:** flies, faunistics, first country records, Babia Góra, Western Carpathians Pediciidae, Psychodidae

## INTRODUCTION

The Babia Góra is an isolated mountain massif belonging to the outer Western Carpathian mountain range (the Western Beskidy Mountains) situated in the southern part of Poland at the border with Slovakia (MERGANIČOVÁ *et* MERGANIČ 2010). The investigation of Diptera biodiversity in the Babia Góra Massif in Poland is still far from finished. Older literature data (e.g. NOWICKI 1868a-b, 1870; KISS *et* OLASZ 1907) and relatively recent data (e.g. BAŃKOWSKA 1959, 1964; NOWAKOWSKI 1967, 1973; GRIFFITHS 1968; DRATNAL 1970; TROJAN 1974; KAPUŚCIŃSKI 1982; KRZEMIŃSKI 1983, 1984, 1991; ZATWARNICKI 1985, 1996; NIESIOŁOWSKI 1990; SZADZIEWSKI *et al.* 1991, 2007; WOŹNICA 1993; KLASA 1993, 2001, 2002; SZADZIEWSKI 2001) were summarized by PALACZYK *et* KLASA (2003). The aforementioned publication was based on a review of literature data. Moreover the authors mentioned above have also contributed their additional records of dipterans and some unpublished data acquired by other entomologists (e.g. B. DYLEWSKA and S. SZAFRANIEC). The list of Diptera species presented in mentioned work includes 781 species, of which 684 have been reported from the Polish part of the Babia Góra Massif. In recent years several papers concerning various dipteran families such as biting midges (DOMINIAK *et al.* 2015; SZADZIEWSKI *et al.* 2019), empidid flies (PALACZYK *et al.* 2015) and pallopterid flies (KLASA *et* PALACZYK 2016) in that area were published.

This paper adds to the overall knowledge of the Diptera biodiversity of the Babia Góra, by expanding the number of recorded species, as well as new distributional data from Polish part of this massif.

## STUDY AREA

The Babia Góra Massif is built of tertiary flysch rocks, mainly sandstones, marl, claystones, slate and conglomerates. The soil types that occur in the area are raw soil, andosol and most frequently podzol. The mean annual precipitation is 1600 mm, and the mean annual temperature 2°C. It is covered mainly by forests and alpine floor vegetation above the forests. The forest stands of upper floor are composed of Norway spruce (*Picea abies* (L.) H. KARST.) with a small admixture of rowan (*Sorbus aucuparia* L.) and Silver fir (*Abies alba* MILL.). On the northern slopes of Babia Góra are patches of Carpathian beech forest (*Fagus sylvatica* L.) (mod. MERGANIČOVÁ *et* MERGANIČ 2010). A list of sampling sites including name, latitude, longitude, altitude are presented in the Table.

**TABLE.** The list of sampling sites on the Babia Góra Massif.

No	Site name	GPS	Altitude [m]
1	near Górny Płaj (touristic trail)	49°35'08.8"N 19°32'47.1"E	1165
2	near Dolny Płaj	49°35'29.5"N 19°32'47.0"E	1001
3	Dolny Płaj between Sulowy Potok brook and Słonowy brook	49°35'31.7"N 19°32'41.8"E	973
4	Zawoja Czatoża – Markowe Szczawiny (touristic trail) near Policzne	49°36'46.9"N 19°33'02.8"E	742
5	Górny Płaj near Rybny Potok brook	49°34'54.3"N 19°31'53.8"E	1249
6	Rybny Potok brook near Stonów	49°36'08.5"N 19°32'37.5"E	790
7	Górny Płaj near Przełęcz Lipnicka (Krowiarki)	49°35'17.8"N 19°34'41.1"E	1066
8	Górny Płaj near tributary of Rybny Potok brook	49°34'56.8"N 19°31'57.5"E	1226
9	Dolny Płaj near Sulowy Potok brook	49°35'28.9"N 19°32'36.3"E	985

## MATERIAL AND METHODS

The material was obtained during a one-day trip in June 2019. Dipterans were collected by sweep netting from the vegetation growing along the watercourses and lakes. The captured specimens were preserved in 75% ethanol directly in the field. In the laboratory, a part of the specimens was dried, pinned, glued onto points, identified to species level and later on deposited in the collections of the authors.

Specimens of the families Bibionidae, Ptychopteridae and Rhagionidae were identified by L. DVOŘÁK using the following keys: ROZKOŠNÝ *et* SPITZER (1965); ZITEK-ZWYRTEK (1971); MIKOŁAJCZYK (1976) and HAARTO (2012). All material is deposited in the private collection of L. DVOŘÁK at Tři Sekery, Mariánské Lázně (LDPC) in the Czech Republic. Specimens of the families Empididae, Hybotidae and Heleomyzidae were identified by R. VAN DER WEELE using determination keys: CHVÁLA (1981, 1994); PAPP (1981) and BARTÁK (1982). Flies of the family Lauxaniidae were identified by K. DVOŘÁKOVÁ using the key by SHATALKIN (2000), and they are deposited in the private collection of K. DVOŘÁKOVÁ at Tři Sekery, Mariánské Lázně (KDPC), Czech Republic. Specimens of the families: Dixidae, Lonchopteridae, Cylindrotomidae, Limoniidae and Pediciidae were identified by J. OBOŇA using the following keys: VAILLANT (1969); BÄHRMANN *et* BELLSTEDT (1988); DISNEY (1999); PODENAS *et al.* (2006) and OOSTERBROEK (2019).

The questionable specimens were consulted with J. STARÝ. All individuals identified by J. OBOŇA are deposited in the Laboratory and Museum of Evolutionary Ecology, Department of Ecology, University of Prešov (LMEE), Slovakia. Specimens of the family Psychodidae were identified by J. JEŽEK and they are deposited in the National Museum (Natural History Museum), Department of Entomology, Prague, Czech Republic. Slides are labelled with Inv. No. = Inventory Slide Number of the family Psychodidae and they are included in the Diptera collection (NMPC), see TKOČ *et al.* (2014). Nomenclature used in this paper follows VAILLANT (1972-1983) and WAGNER (1990, 2018) using the classifications of e.g. JEŽEK (1990, 1999, 2007); JEŽEK *et VAN HARTEN* (2006); OMELKOVÁ *et JEŽEK* (2012); OBOŇA *et JEŽEK* (2014); KROČA *et JEŽEK* (2015) and JEŽEK *et al.* (2019). The photographs were taken using a Leica M205C stereomicroscope by I. SŁOWIŃSKA.

The symbol # is used for species hitherto not recorded from this territory, for more details see PALACZYK *et KLASA* (2003). Information on the Palearctic distribution is given only for species recorded from Poland for the first time. The altitude is given with an accuracy of 30 m.

## RESULTS AND DISCUSSION

A total of 60 specimens representing 41 species from 13 Diptera families were collected. More interesting species are listed below.

### ORDER DIPTERA

#### Family Bibionidae

##### **#*Bibio varipes* MEIGEN, 1830**

**MATERIAL EXAMINED:** Near Górny Płaj (touristic trail), 6.6.2019, 1♂; near Dolny Płaj, 6.6.2019, 1♂; Dolny Płaj between Sulowy Potok brook and Słonowy brook, 6.6.2019, 1♂, all det. DVOŘÁK.

##### **#*Bibio nigriventris* HALIDAY, 1833**

**MATERIAL EXAMINED:** Zawoja Czatoża – Markowe Szczawiny (touristic trail) near Policzne, 6.6.2019, 1♂, det. DVOŘÁK.

#### Family Cylindrotomidae

##### **#*Cylindrotoma distinctissima distinctissima* (MEIGEN, 1818)**

**MATERIAL EXAMINED:** Zawoja Czatoża – Markowe Szczawiny (touristic trail) near Policzne, 6.6.2019, 1♂, det. OBOŇA.

#### Family Dixidae

##### **#*Dixa maculata* MEIGEN, 1818**

**MATERIAL EXAMINED:** near Dolny Płaj, 6.6.2019, 1♂, det. OBOŇA.

**#*Dixa puberula* LOEW, 1849**

**MATERIAL EXAMINED:** near Dolny Płaj, 6.6.2019, 1♂, det. OBOŃA.

**Family Empididae**

***Empis borealis* LINNAEUS, 1758 (FIG. 1)**

**MATERIAL EXAMINED:** Górny Płaj near Rybny Potok brook, 6.6.2019, 1♂; near Dolny Płaj, 6.6.2019, 1♂, all det. VAN DER WEELE.



**FIG. 1.** *Empis borealis* – male habitus (PHOTO by I. SŁOWIŃSKA)

***Empis chioptera* MEIGEN, 1804**

**MATERIAL EXAMINED:** near Górny Płaj (touristic trail), 6.6.2019, 1♂, det. VAN DER WEELE.

***Rhamphomyia stigmosa* MACQUART, 1827 (FIG. 2)**

**MATERIAL EXAMINED:** Rybny Potok brook near Stonów, 6.6.2019, 1♂; near Dolny Płaj, 6.6.2019, 1♂, all det. VAN DER WEELE.

***Rhamphomyia umbripennis* MEIGEN, 1822**

**MATERIAL EXAMINED:** Górny Płaj near Przełęcz Lipnicka (Krowiarki), 6.6.2019, 1♂; Górny Płaj near tributary of Rybny Potok brook, 6.6.2019, 1♂; Rybny Potok brook near Stonów, 6.6.2019, 1♂; near Dolny Płaj, 6.6.2019, 1♂, all det. VAN DER WEELE.



**FIG. 2.** *Rhamphomyia stigma* – male habitus (PHOTO by I. SŁOWIŃSKA)

**Family Heleomyzidae**

**#*Eccoptomera pallescens* (MEIGEN, 1830)**

**MATERIAL EXAMINED:** Górny Płaj near Rybny Potok brook, 6.6.2019, 1♂, det. VAN DER WEELE.

## Family Hybotidae

### #*Oedalea tristis* SCHOLTZ, 1851

MATERIAL EXAMINED: near Górny Płaj (touristic trail), 6.6.2019, 1♂, det. VAN DER WEELE.

## Family Lauxaniidae

### #*Sapromyza obscuripennis* LOEW, 1847

MATERIAL EXAMINED: Dolny Płaj between Sulowy Potok brook and Słonowy brook, 6.6.2019, 1♂, det. DVOŘÁKOVÁ.

## Family Limoniidae

### #*Austrolimnophila* (*Archilimnophila*) *unica* (OSTEN SACKEN, 1869)

MATERIAL EXAMINED: Zawoja Czatoża – Markowe Szczawiny (touristic trail) near Policzne, 6.6.2019, 1♂, det. OBOŇA.

### #*Crypteria* (*Crypteria*) *limnophiloides* BERGROTH, 1913

MATERIAL EXAMINED: Zawoja Czatoża – Markowe Szczawiny (touristic trail) near Policzne, 6.6.2019, 1♂, det. OBOŇA.

### #*Dicranomyia* (*Dicranomyia*) *frontalis* (STAEGER, 1840)

MATERIAL EXAMINED: Dolny Płaj between Sulowy Potok brook and Słonowy brook, 6.6.2019, 1♂, det. OBOŇA.

### #*Erioptera* (*Erioptera*) *verralli* EDWARDS, 1921

MATERIAL EXAMINED: Dolny Płaj between Sulowy Potok brook and Słonowy brook, 6.6.2019, 1♂, det. OBOŇA.

### #*Limonia albifrons* (MEIGEN, 1818)

MATERIAL EXAMINED: Zawoja Czatoża – Markowe Szczawiny (touristic trail) near Policzne, 6.6.2019, 2♂, 1♀, det. OBOŇA.

### #*Limonia hercegovinae* (STROBL, 1898)

MATERIAL EXAMINED: Zawoja Czatoża – Markowe Szczawiny (touristic trail) near Policzne, 6.6.2019, 2♂, 1♀, det. OBOŇA.

### #*Metalimnobia* (*Metalimnobia*) *quadrinaculata* (LINNAEUS, 1760)

MATERIAL EXAMINED: Rybny Potok brook near Stonów, 6.6.2019, 1♂, det. OBOŇA.

### #*Molophilus* (*Molophilus*) *curvatus* TONNOIR, 1920

MATERIAL EXAMINED: Dolny Płaj near Sulowy Potok brook, 6.6.2019, 1♂, det. OBOŇA et STARÝ.

### #*Prionolabis hospes* (EGGER, 1863)

MATERIAL EXAMINED: Rybny Potok brook near Stonów, 6.6.2019, 2♂, 1♀, det. OBOŇA.

**#*Rhypholophus lichtwardti* (LACKSCHEWITZ, 1935)**

**MATERIAL EXAMINED:** Górny Płaj near tributary of Rybny Potok brook, 6.6.2019, 1♂, det. OBOŃA *et* STARÝ.

**Family Lonchopteridae**

***Lonchoptera lutea* PANZER, 1809**

**MATERIAL EXAMINED:** Górny Płaj near Rybny Potok brook, 6.6.2019, 2♂, det. OBOŃA.

**Family Pediciidae**

**#*Dicranota (Ludicia) lucidipennis* (EDWARDS, 1921)**

**MATERIAL EXAMINED:** near Górny Płaj (touristic trail), 6.6.2019, 2♂, det. OBOŃA.

**#*Pedicia (Pedicia) rivosa* (LINNAEUS, 1758)**

**MATERIAL EXAMINED:** near Dolny Płaj, 6.6.2019, 1♀, det. OBOŃA.

**#*Tricyphona (Tricyphona) immaculata* (MEIGEN, 1804)**

**MATERIAL EXAMINED:** near Dolny Płaj, 6.6.2019, 1♂, det. OBOŃA.

**#*Ula (Ula) mixta* STARÝ, 1983**

**MATERIAL EXAMINED:** Dolny Płaj between Sulowy Potok brook and Słonowy brook, 6.6.2019, 1♂, det. OBOŃA *et* STARÝ.

**Distribution.** Species known from Europe: Austria, Czech Republic, Finland, Germany, Great Britain, Lithuania, Norway, Romania, Serbia, Slovakia, Sweden, Switzerland and Russia (Kareliya, Moskovskaya oblast, Yaroslavskaya oblast, Bashkortostan Republic) (OOSTERBROEK 2019). **First record from Poland.**

**#*Ula (Ula) mollissima* HALIDAY, 1833**

**MATERIAL EXAMINED:** Dolny Płaj between Sulowy Potok brook and Słonowy brook, 6.6.2019, 1♂, det. OBOŃA.

**Family Psychodidae**

**#*Clytocerus dalii* (EATON, 1893)**

**MATERIAL EXAMINED:** near Dolny Płaj, 6.6.2019, 1♂, slide Inv. No. 24956, det. JEŽEK.

**Distribution.** European species, known from Belgium, Czech Republic, Denmark, Great Britain, Hungary, Ireland, Slovakia and Slovenia (JEŽEK *et* OMELKOVÁ 2012). **First record from Poland.**

**#*Clytocerus ocellaris* (MEIGEN, 1804)**

**MATERIAL EXAMINED:** Górny Płaj near Przełęcz Lipnicka (Krowiarki), 6.6.2019, 1♂, slide Inv. No. 24957, det. JEŽEK.



**#*Feuerborniella obscura* (TONNOIR, 1919)**

**MATERIAL EXAMINED:** near Dolny Płaj, 6.6.2019, 1 ♀, slide Inv. No. 24958, det. JEŽEK.

**Distribution.** A common European species, distributed in central Europe, along the Atlantic coast, in the British Isles and reaching the Apennines, and the Balkans in the south (JEŽEK *et* OMELKOVÁ 2012). **First record from Poland.**

**#*Logima satchelli* (QUATE, 1955)**

**MATERIAL EXAMINED:** Górny Płaj near tributary of Rybny Potok brook, 6.6.2019, 1 ♀, slide Inv. No. 24959, det. JEŽEK.

**#*Pneumia cubitospinosa* (JUNG, 1954)**

**MATERIAL EXAMINED:** Dolny Płaj between Sulowy Potok brook and Słonowy brook, 6.6.2019, 1 ♂, slide Inv. No. 24960, det. JEŽEK.

**#*Pneumia palustris* (MEIGEN, 1804)**

**MATERIAL EXAMINED:** near Dolny Płaj, 6.6.2019, 1 ♂, slide Inv. No. 24961, det. JEŽEK.

**#*Pneumia stammeri* (JUNG, 1956)**

**MATERIAL EXAMINED:** Górny Płaj near Przełęcz Lipnicka (Krowiarki), 6.6.2019, 1 ♂, slide Inv. No. 24962, det. JEŽEK.

**Distribution:** Quite a rare European species distributed from the British Isles, countries along the North Sea coast and Scandinavia eastwards to Slovakia and the Balkans (JEŽEK *et* OMELKOVÁ 2012). **First record from Poland.**

**#*Saraiella rotunda* (KREK, 1970)**

**MATERIAL EXAMINED:** Górny Płaj near Przełęcz Lipnicka (Krowiarki), 6.6.2019, 1 ♂; near Dolny Płaj, 6.6.2019, 1 ♂, slides Inv. No. 24963 and 24964, all det. JEŽEK.

**Distribution:** European species, known from Bosnia and Herzegovina, Czech Republic, Italy, Serbia and Slovakia (JEŽEK 2006). **First record from Poland.**

**#*Sycorax feuerborni* JUNG, 1957**

**MATERIAL EXAMINED:** Rybny Potok brook near Stonów, 6.6.2019, 3 ♂, slides Inv. No. 24965 - 24967, det. JEŽEK.

**Distribution:** Relatively rare European species, known from Denmark, France, Germany and Italy (WAGNER 2018). **First record from Poland.**

**#*Sycorax silacea* HALIDAY in CURTIS, 1839**

**MATERIAL EXAMINED:** Dolny Płaj between Sulowy Potok brook and Słonowy brook, 6.6.2019, 1 ♂, slide Inv. No. 24968, det. JEŽEK.

**#*Threticus balkaneoalpinus* KREK, 1972**

**MATERIAL EXAMINED:** Dolny Płaj between Sulowy Potok brook and Słonowy brook, 6.6.2019, 1 ♂, slide Inv. No. 24969, det. JEŽEK.

**Distribution.** Species known from Austria, Bosnia, Czech Republic, France, Germany, Slovakia and Transcaucasia (JEŽEK *et* OMELKOVÁ 2012.) **First record from Poland.**

## Family Ptychopteridae

### #*Ptychoptera paludosa* MEIGEN, 1804

MATERIAL EXAMINED: near Dolny Płaj, 6.6.2019, 1 ♀, det. DVOŘÁK.

## Family Rhagionidae

### *Rhagio notatus* (MEIGEN, 1820)

MATERIAL EXAMINED: Zawoja Czatoża – Markowe Szczawiny (touristic trail) near Policzne, 6.6.2019, 1 ♀; Rybny Potok brook near Stonów, 6.6.2019, 1 ♂, all det. DVOŘÁK.

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### SUMMARY

These results represent only a short term and non-intensive sampling, nevertheless, they have brought a number of interesting faunistic records. Overall 41 species belonging to 13 Diptera families are recorded: Bibionidae (2 spp.), Cylindrotomidae (1 sp.), Dixidae (2 spp.), Empididae (4 spp.), Heleomyzidae (1 sp.), Hybotidae (1 sp.), Lauxaniidae (1 sp.), Limoniidae (10 spp.), Lonchopteridae (1 sp.), Pediciidae (5 spp.), Psychodidae (11 spp.), Ptychopteridae (1 sp.) and Rhagionidae (1 sp.). The majority of recorded species are common and at least numerous in Europe, 34 species are new to the territory of the Babia Góra Massif (see PALACZYK *et* KLASA 2003, etc.). Among them, seven species have been recorded in Poland for the first time: *Ula (Ula) mixta* (Pediciidae) (see OOSTERBROEK (2019)), *Clytocerus dalii*, *Feuerborniella obscura*, *Pneumia stammeri*, *Saraiella rotunda*, *Sycorax feuerborni* and *Threticus balkaneoalpinus* (Psychodidae) (see JEŽEK (2007); WAGNER (2018)). Some of these species can be considered rare, like *Pneumia stammeri* and *Sycorax feuerborni*.

Looking at the studies conducted so far, and putting all that information together, we consider that the number of dipteran species of the Babia Góra Massif may potentially increase in the future.