Roháček & Barták 2001

ABSTRACT

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Diptera of Northwest Bohemia (28 localities between villages Osek - Štěpánov nr. Kostomlaty - Braňany at Bílina) were studied during 1992-1999. Altogether 2,806 species are identified, of which 434 are the first findings in the territory of Bohemia, and about one-third representing simultaneously the first record from the Czech Republic. Distributional data is added to each species as well as an index of relative abundance in the Czech Republic and larval food preference. On the basis of these characters, the biological value of the area as a whole is evaluated. The process of Diptera succession on restored or spontaneously revitalised localities is discussed. This second volume comprises the rest of Brachyceran Diptera, i.e. the Schizophora, Acalyptratae and Calyptratae, totalling 48 families.

Keywords: Diptera, Brachycera, Schizophora, Acalyptratae, Calyptratae, Czech Republic, faunistics, succession, restoration, zoogeography, index of relative abundance, larval food preference, faunistics, distribution, monitoring

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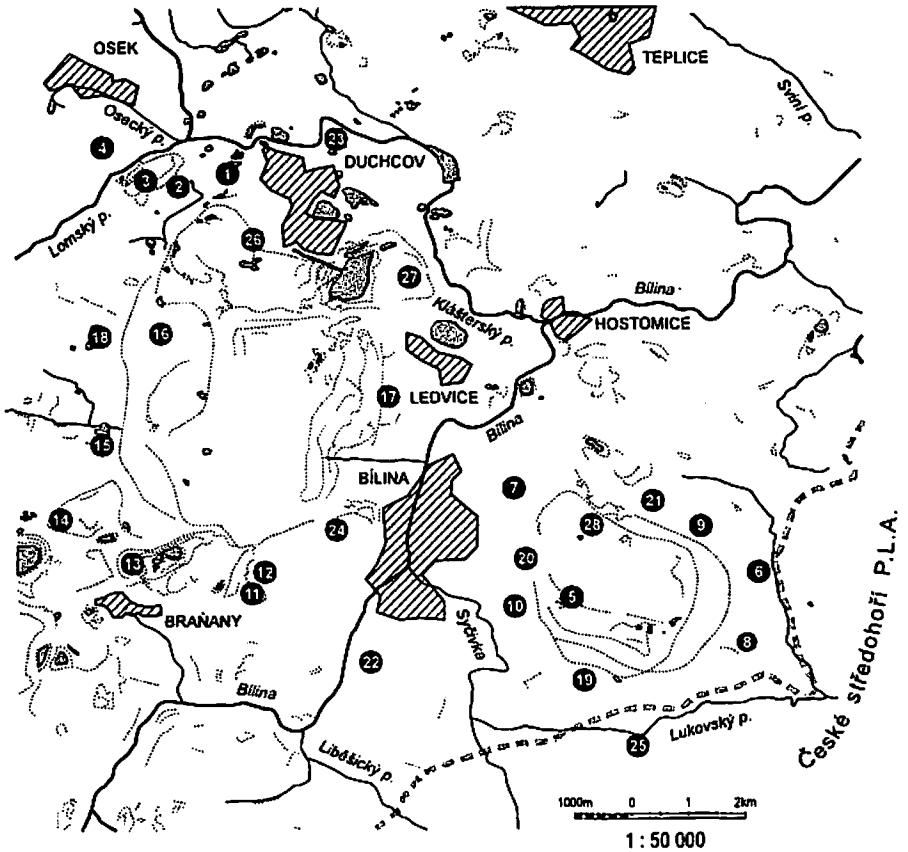
DIPTERA IN AN INDUSTRIALLY AFFECTED REGION

(North-Western Bohemia, Bílina and Duchcov Environs)



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APPENDIX: 2

LOCALITIES:

(1) **Floodplain forest near Duchcov:** Forest (alliance *Salicion albae*) 2 km NW of Duchcov; vigorous trees of *Salix alba*, sporadically willows (*S. purpurea, S. triandra*), *Populus nigra* (probably hybridogenous), rarely *Ulmus laevis*; in the undergrowth *Caltha palustris, Carex acutiformis, Iris pseudacorus, Solanum dulcamara, Urtica dioica* and liane *Humulus lupulus*.

(2) **The area of the former village Pokrok:** Synanthropic vegetation, ruderals and old orchards together with the remnant of a pond in former village Pokrok, 2 km NW of Duchcov; locality destroyed by cutting all vegetation and drying in 1995, in 1997 the locality changed into a mine dump.

(3) **Old mine dump "Osecká":** 25 year old mine dump growth with *Calamagrostis epigejos* and *Betula alba* in more dry places but frequently with small rainfed pits or more damp places with *Typha angustifolia, Salix caprea, S. cinerea, Alnus glutinosa*, etc. The environment of the southern slopes of Osecká mine dump was quite damaged by mine refuge dumped in 1998.

(4) **Oak wood Dubina:** An old oak wood (*Quercus petraea*) with about 40-60 year old trees, with good developed strata, and includes many dead trees both standing and on the ground. The forest is continuous with woods covering the SE slopes of the Krušné hory Mts.

(5) **Damp birch grove:** Naturally revitalised south-western slope of an old mine dump 500 m NE of the hill Trupelník; tree growth formed almost exclusively of *Betula alba* with only a few *Salix caprea* and *S. alba* intermixed; undergrowth almost exclusively *Calamagrostis epigejos* with only a minimum of other plants; landslide destroyed the locality in summer 1994.

(6) **Chloumek:** Chlomek or Klomka on some maps, the hill between the villages of Kostomlaty and Štěpánov, alliance *Alnion glutinosae* along the north foothill, the samples were taken on hilltop steppe bordered with oak woods (former reserve "Kajba").

(7) **Dump restoration "Jirásek III" near Bílina:** Mine dump restoration of a forest type with 10 years old poplars; in lower part larch and *Alnus glutinosa*; the grass vegetation regularly cut.

(8) **Štěpánov:** Waterside vegetation of Lukovský potok Brook 1 km NW of village Štěpánov; a narrow strip of plant communities of alliance *Alnion glutinosae* alongside the brook; surrounding area dominated by uncut abandoned damp meadows.

(9) **Štrbický vrch:** A hill (475,1 m a.s.l.) about 1 km W of Kostomlaty village; the SE slope is covered with *Quercetum*, with *Betula* (mostly dying trees) intermixed; more damp SE slope is covered with mixed wood.

(10) **Trupelník:** A hill (355,8 m a.s.l.) roughly 2 km SE from the town of Bílina; area as xerothermic herb communities of alliance *Bromion erecti*; now partly overgrown by trees.

(11) **Dump restoration near Braňany – Kaňkov:** New restoration (in 1994 covered with topsoil, in spring 1995 planted with trees and clover - grass mixture), lying about 200 m N of the Bílina - Braňany road, opposite of village part called Kaňkov; locality very close to locality No. 12 - mixed woods, which acted as a possible source of species within the process of revitalisation.

(12) **Mnišský les:** Mixed woods, predominantly *Quercus petraea, Sorbus torminalis*, and *Carpinus betulus*, with a plentiful undergrowth of *Rubus* spp.; degradation stage of productive forest; locality along the S margin of woods near Kaňkov, nearby damp valley.

(13) **Gravel-pit:** The bottom, as well as N (south-facing) slopes of the former mine "Maxim Gorkij"; 2 km N of Braňany; site is characterised by sandy terraces covered with sparse grass vegetation and a few birch trees.

(14) **Poplar woods near "Venuše":** A locality 100 m from a sharp curve of the former Braňany-Lom road; old poplar trees, ruderal vegetation; more damp places with *Phragmites australis* characterise this site.

(15) **Radčický potok:** A locality is where the former Radčický potok Brook crossed a provisional road; approximately 2 km SE of the former village Libkovice; waterside vegetation formed by old poplars and oaks; rich shrub stratum (undergrowth of *Urtica dioica*), surrounded by abandoned fields covered mostly with unusually large *Elytrigia repens*.

(16) **Velký Klín:** A small pond partly dried by preparatory operations prior to opencast mine, with large areas of open mud, partly with vegetation, and a few willow shrubs. The locality was quite damaged by a mine and it has not existed since 1996.

(17) **Mine dump near Ledvice:** A locality near small rainfilled ponds bordered by *Typha*; the dump itself is covered almost exclusively with *Calamagrostis epigejos*; non-recultivation.

(18) **Small pond near village Lom:** The locality 2 km NE of village Libkovice; the pond has shallow banks with rich growth of *Typha latifolia, T. angustifolia*, and a few willows (*Salix viminalis, S. cinerea., S. alba*); large areas of abandoned fields surround.

(19) **Syslík:** A locality along the southern margin of mixed woods (predominantly *Carpinion*) which covers the hilltop as well as northern slopes of Syslík Hill

(20) **Bezovka:** Easternmost edge of the Bezovka woods near "Radovesická" mine dump; locality situated near a pond along the S margin of oak woods (*Quercus petraea*).

(21) **Vršíček:** S slope of Vršíček Hill (on some maps as "Špičák"); stone debris with sparse old trees (*Tilia cordata, Acer platanoides, A. pseudoplatanus, Quercus petraea*) characterise this former natural reserve.

(22) **Bořeň:** A hill situated about 2 km S of Bílina in a Nature Reserve.

(23) **Duchcov – Křinec:** Margin of an old restored mine dump; woods dominated by *Alnus glutinosa, Acer platanoides*, and *Tilia cordata*.

(24) **Bílina – Větrák:** Margin of an old restored mine dump just close to the city.

(25) **Holibka:** Two very different, but closely situated biotopes - a very well preserved stony steppe (suballiance *Potentillo arenariae festucenione pallustris*) and an alliance of *Alnion glutinosae* near a small pond.

(26) **Pokrok:** A quite new mine dump restoration; in the centre of area is a small rainfed pond; the environs are dominated with grass vegetation and small freshly planted trees, mainly *Acer pseudoplatanus, Quercus robur, Larix decidua*, etc.

(27) **Fučík:** About a 10 year old mine dump restoration, with some 5 m high trees and bushes (*Acer pseudoplatanus, A. negundo, Quercus rubra, Alnus glutinosa, Larix decidua, Ligurnum vulgare, Suida sanguinea*), and rich undergowth of *Calamagrostis epigejos*.

(28) **Radovesice:** Mine dump restoration covered mostly with grass; a few young trees (*Alnus, Acer, Pinus, Tilia*) 3-5 years old.

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Diptera in an Industrially Affected Region
(North-Western Bohemia, Bílina and Duchcov Environs), II
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Carnidae

JINDŘICH ROHÁČEK & MIROSLAV BARTÁK
Silesian Museum, Department of Entomology, Masarykova 35, 746 46 Opava, Czech Republic. E-mail: szmoprir@opanet.cz
&
Czech University of Agriculture, Faculty of Agronomy, Department of Zoology and Fishery, 165 21 Praha 6 - Suchdol, Czech Republic. E-mail: bartak@af.czu.cz

Carnidae is a small group (some 35 species occur in the whole of Europe - PAPP 1998b) of acalyptrate flies, of which three genera and 21 species are known from the Czech Republic (ROHÁČEK 1997, 1999).

Adults are very minute (1-2.4 mm) black flies, having wings with two costal breaks. The family is characterised by the following autapomorphies: frons with two pairs of inclinate lower orbital setae (in addition to two pairs of exclinate upper orbitals) and with a pair of supralunular interfrontal setae; inner occipital (paravertical) setae well developed; pleural membrane of abdomen strongly setulose; distiphallus distinctly pubescent; ejaculatory apodeme minute; female cerci fused (McALPINE 1989; PAPP 1998a). Further diagnostic features include weakly sclerotized male postabdominal sclerites (segments 6-8), gonostylus (=surstylus) often bilobed to bipartite, female abdominal sterna reduced, female postabdominal segments weakly sclerotized, and sclerotized spermathecae absent. The larva is simple, slender, S-shaped, with anterior segments (cephalic and prothoracic) downcurved, and posterior end with distinct protuberances. The cephalopharyngeal skeleton is of the saprophagous type, very simple, with only mouthhooks (simple but with a sharp ventral process) and intermediate sclerites well sclerotized. The pharyngeal sclerite bears a ventral trough with several ridges. The anterior spiracle is small, with 3-7 lobes, and the posterior spiracle possesses three protuberances (PAPP 1998a). The puparium is barrel-shaped, transversely wrinkled, with shortened larval protuberances. For more details on immature stages see FERRAR (1987) and PAPP (1998a). All known larvae are saprophagous, most of them develop in decayed organic matter of animal origin, including excrement and carrion. Some species are specialised either copropagous or necrophagous, while others can develop in a number of media, including decayed fungi or plant matter (some *Meoneura* spp. - ROHÁČEK 1999). Adults usually occur on or near the breeding substrates of larvae. Several species are associated with bird's nests (e.g., *Meoneura neottiophila, M. prima*), with *Carnus hemapterus* particularly specialised in this habitat, where larvae feed on nest debris and adults feed semiparasitically on skin secretions or even blood of nestlings (PAPP 1998a).

A key to Palaearctic genera of Carnidae is given by PAPP (1998a), and species occurring in Central Europe are best identified by means of PAPP (1978), supplemented by

subsequent studies describing additional species from the area (PAPP 1981, 1997). The Catalogue of Palaearctic Diptera (PAPP 1984) is followed here in as regards to nomenclature. *Meoneura neglecta* is treated here as a synonym of *M. glaberrima* in accordance with OZEROV (1994).

The history of faunistic investigations of Carnidae in the Czech Republic was briefly outlined by GREGOR (1987) who summarised data available up to 1985 and listed 18 species from the country, with references to all former records. The most important papers dealing with the family betweeen 1970-1985 include: GREGOR (1973), GREGOR & PAPP (1981) and ROHÁČEK & GREGOR (1984). Further data were added by ROHÁČEK (1985, 1986, 1987, 1996, 1999) and ROZKOŠNÝ & VAŇHARA (1992), and ROHÁČEK (1997) compiled the last regional checklist.

Only DOSKOČIL & CHVÁLA (1972) fomerly recorded two carnid species from the environs of Radovesická mine dump (near locality No. 6): *Meoneura vagans, M. flavifrons*. Recently ROHÁČEK (1996) mentioned (as new to Bohemia) an additional species, *M. triangularis*, from the localities 1, 2 and 3.

Explanations: **D = distribution** (HO = Holarctic; PA = Palaearctic; WPA = West Palaearctic; E = Europe; TE = temperate Europe), **BL = biology of larvae** (Co = coprophagous, Ne = necrophagous, Sa = saprophagous), **L = localities** (see chapter "Diptera of the Bílina and Duchcov Environs"), **SO = seasonal occurrence** (months, as observed during this investigation), **A = relative abundance** (2 = species first reported from Bohemia or the Czech Republic from the research of Duchcov and Bílina environs; 3 = rare species, maximum about 10 known Czech localities; 4 = common species).

LIST OF SPECIES

Meoneura carpathica Papp, 1977. D: TE. BL: Sa. L: 6, 25. SO: v-x. A: 4.

M. flavifacies Collin, 1930. D: HO. BL: Sa-Co. L: 6, 11, 16, 25. SO: iv-ix. A: 4.

M. freta Collin, 1937. D: E. BL: Ne. L: 13. SO: v. A: 2.

M. glaberrima Becker, 1910 /=*neglecta* Collin, 1930/. D: WPA. BL: Sa. L: 6, 25. SO: vii-x. A: 3.

M. lacteipennis (Fallén, 1823). D: PA. BL: Sa. L: 7, 11, 16, 25. SO: v-vii. A: 3.

M. prima (Becker, 1903). D: HO. BL: Sa - Co-Ne. L: 1. SO: vii. A: 3.

M. triangularis Collin, 1930. D: HO. BL: Sa -Co-Ne. L: 1, 2, 3. SO: iv, vi. A: 2.

M. vagans (Fallén, 1823). D: HO. BL: Sa-Ne. L: 1, 6, 8, 18, 25. SO: iv-vii. A: 4.

DISCUSSION

Out of 21 species of the family Carnidae known from the Czech Republic, only eight species (i.e. 38 %) of the genus *Meoneura* were found in the study area. However, two of them were recorded for the first time from the territory of Bohemia (*M. freta* and *M. triangularis*). *Meoneura triangularis* has been published (as new records from Bohemia) from a few localities in the Czech Republic including those from the study area (ROHÁČEK 1996) and *M. freta* is only known from locality No. 13 (gravel-pit nr. Braňany, May 12-18, 1996, 4♂♂, pan traps) in Bohemia. The latter species appears to prefer warm steppe and forest steppe biocoenoses, and in the Czech Republic it has been known only from southern and central Moravia until now (cf. GREGOR & PAPP 1981, ROHÁČEK 1999).

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