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Diptera Acalyptrata rašelinišť severní Moravy (ČSSR)

Část 8. Clusiidae, Acartophthalmidae, Milichiidae, Carnidae, Lauxaniidae, Chamaemyiidae

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Další z příspěvků k poznání dvoukřídlých skupin *Acalyptrata* na rašeliništních ekosystémech v Severomoravském kraji pojednává o šesti čeledích, které jsou na rašeliništích zastoupeny jen malým počtem druhů. Některé z těchto čeledí obsahují převážně lesní druhy, které pronikají jen do okrajových zón rašelinišť (např. *Clusiidae, Milichiidae, Lauxaniidae*) ale ostatní zahrnují i druhy preferující otevřené luční ekosystémy, takže tvoří součást dipterofauny na laggových rašelinných loukách (*Chamaemyiidae*). Každý druh nalezený na studovaných rašeliništích je hodnocen podle klasifikační stupnice ekologické afinity, kterou navrhli Roháček & Máca (1982) a to na základě publikovaných údajů i získaných poznatků o jejich biologii a rozšíření. Je provedeno rovněž srovnání druhového složení, které bylo zjištěno na severomoravských rašeliništích se spektry zaregistrovanými dřívějšími autory na rašeliništích ve Velké Británii, střední i severní Evropě a rozdíly jsou podrobně diskutovány.

Veškerý níže uvedený materiál byl nasbírán v rámci resortního výzkumného úkolu a je uložen ve Slezském muzeu v Opavě s výjimkou některých duplicitních exemplářů, které si ponechali determinátoři. Mouchy čeledi *Clusiidae* laskavě určil dr. J. Zuska, CSc., *Acartophthalmidae* J. Roháček, *Milichiidae* a *Carnidae* dr. L. Papp, CSc., *Lauxaniidae* doc. ing. V. Martinek, CSc. a *Chamaemyiidae* B. H. Cogan, dr. I. F. G. McLean a dr. V. N. Tanasijtshuk. Výsledky předložené práce lze shrnout do následujících bodů:

(1) Druhy čeledi *Clusiidae* (1 sp.), *Acartophthalmidae* (1 sp.), *Milichiidae* (1 sp.), *Carnidae* (2 spp.), *Lauxaniidae* (6 spp.) a *Chamaemyiidae* (7 spp.) nalezené na studovaných rašeliništích jsou pojednány se zvláštním důrazem na jejich biologii a rozšíření a jejich vztah k rašeliništním společenstvům je hodnocen za použití klasifikace, kterou navrhli Roháček & Máca (1982).

(2) Nebyl zjištěn žádný tyrfobiontní druh. Dva druhy jsou považovány za tyrfofilní — *Acartophthalmus nigrinus* přiřazený do kategorie B—C a *Chamaemyia paludosa,* jež je pravděpodobně tyrfofilní B. Všechny ostatní hodnocené druhy jsou tyrfoneutrální. Koprofilní druhy rodu *Meoneura* jsou tyrfoneutrální A—B, druhy upřednostňující louky a podobné otevřené biotopy (téměř všechny druhy rodu *Chamaemyia*) tyrfoneutrální B a konečně lesní druhy pronikající jen do okrajových částí rašelinišť (*Clusia flava, Neophyllomyza acyglossa,* téměř všechny druhy čeledi *Lauxaniidae,* druhy rodu *Leucopis*) tyrfoneutrální C.

(3) Druhy *Acartophthalmus nigrinus, Lyciella illota* a *Chamaemyia paludosa* pravděpodobně preferují horské polohy ve střední Evropě.

(4) Na horských hřebenových vrchovištích bylo zjištěno pouze 5 ze studovaných druhů (*Acartophthalmus nigrinus, Meoneura* sp., *Lyciella decipiens, Sapromyza hyalinata, Chamaemyia elegans*). Fauna na níže položených rašeliništích je mnohem bohatší a zahrnovala 11 (vrchoviště Rejvíz), respektive 10 druhů (přechodové rašeliniště Skřítek).

(5) *Acartophthalmus nigrinus* byl nejhojnější z nalezených druhů a vyskytoval se na všech třech typech severomoravských rašelinišť. Je to výrazně psychrofilní druh se zřetelnou afinitou k rašeliništním biotopům. Nález druhu *Chamaemyia paludosa* je velmi zajímavý, protože je první z kontinentální Evropy; jeho biologie je zatím neznámá, ale zdá se, že ve střední Evropě bude vázán na rašeliniště a příbuzné ekosystémy.

(6) *Chamaemyia elegans, Ch. paludosa* a *Leucopis tapiae* jsou z Československa hlášeny poprvé. Druh *Leucopis atratula* je nový pro území Moravy.

ACALYPTERATE DIPTERA OF PEAT-BOGS IN NORTH MORAVIA (CZECHOSLOVAKIA)

Part 8. Clusiidae, Acartophthalmidae, Milichiidae, Carnidae, Lauxaniidae, Chamaemyiidae

This is a further contribution in a series dealing with the fauna of the *Acalypterate Diptera* associated with the moorland ecosystems of North Moravia. It deals with six families which are represented by small number of species on peat-bogs. Some of these families contain mainly woodland species which penetrate only rarely into marginal areas of mires (e. g. *Clusiidae, Milichiidae, Lauxaniidae*) but the other include species of open grassy habitats and thus forming a component of dipterous fauna on lagg peat-bog meadows (some *Chamaemyiidae*). Each of the species recorded on the mires under study is classified according to scale of ecological affinity proposed by Roháček & Máca (1982) after carefully evaluating all published records and obtained relevant data about their biology and distribution. The species composition found on North Moravian peat-bogs is compared with those recorded by previous authors from British, Central European and North European moorland habitats and the differences are discussed.

The material mentioned below was collected by J. Roháček and is deposited in the Silesian Museum, Opava, except for some duplicates retained by determinators. The flies of the family *Clusiidae* were identified by Dr. J. Zuska, CSc., *Acartophthalmidae* by J. Roháček, *Milichiidae* and *Carnidae* by Dr. L. Papp, CSc., *Lauxaniidae* by Doc. Ing. V. Martinek, CSc. and Chamaemyiidae by Mr. B. H. Cogan, Dr. I. F. G. McLean and Dr. V. N. Tanasijtshuk.

Acknowledgements: My sincerest thanks are due to all specialists who helped me with the identification of the flies and/or provided valuable biological, distributional or faunistic data about the species found, viz. to Mr. B. H. Cogan (British Museum /Natural History/ London), Dr. V. Lapáček, CSc. (Praha), Dr. I. F. G. McLean (Nature Conservancy Council, London), Doc. Ing. V. Martinek, CSc. (Forestry and Game Management Research Institute, Zbraslav n. Vlt.), Dr. L. Papp, CSc. (Hungarian Natural History Museum, Budapest), Dr. V. N. Tanasijtshuk (Zoological Institute, Academy of Sciences of the USSR, Leningrad) and Dr. J. Zuska, CSc. (Research Institute of Food Industry, Praha). Dr. J. C. Coulson (University of Durham) kindly checked the English of this paper with a number of helpful comments.

Abbreviations used in list of the material examined: (3/2) = 3♂ 2♀, B — from sifted grass and moss in and around runs of *Microtus agrestis,* E — on excrement, F — on decaying fungi, M — swept from peat-bog meadows, S — sifted from *Sphagnum* and moss, T — soil traps. In addition to the material listed in Part 1. (Roháček 1982) specimens obtained at Rejvíz in 1984 are included.

Remarks: The system and nomenclature follow the Catalogue of Palaearctic Diptera (Papp 1984a, b; Soós 1984; Tanasijtshuk 1984). Because of different conceptions of some species of *Chamaemyia* by Collin (1966) and Tanasijtshuk (1970, 1984) it was necessary to ask for identification both British specialists (Mr. Cogan, Dr. McLean) and Dr. Tanasijtshuk. The comparison of their identifications made it possible to clarify the status and identity of some species (see remarks under species). The most important finding is that *Chamaemyia aridella* sensu Collin (1966) is absent from the Catalogue of Palaearctic Diptera (Tanasijtshuk 1984).

Clusiidae

Clusia flava (Meigen, 1830)
(syn. *Heteroneura spurca* Haliday, 1833; *Peratochaetus lutescens* Rondani, 1874)

Affinity to Moravian peat-bog communities: *tyrphoneutral C*

Biology: This species occurs in various types of forests from lowlands to mountains. Larvae live under bark of rotting trunks and logs of deciduous as well as coniferous trees (Soós 1981); puparia were found by Smith (1950) in a dry beech stump. Adults occur in V—IX, usually on trunks in which to lay eggs. There is only one previous record of *C. flava* from peat-bogs — Krogerus (1960) found it in peaty woods (= Bruchmoore) in Finland. The single male swept on transient peat-bog at Skřítek probably originates from rotting trunks of birches (*Betula pubescens* var. *carpatica*), being common in the site (see Roháček 1982).

Distribution: A Palaearctic species, known from most of Europe and also from Japan (Soós 1984). Previous Czechoslovakian records are from southern Bohemia (Máca 1976), central and southern Moravia (Landrock 1907, 1908; Czižek 1910) and northern Slovakia (Soós 1943).

Material examined (1♂): Skřítek, 27. 7. 1978 (1/0—M).

Acartophthalmidae

Acartophthalmus nigrinus (Zetterstedt, 1848)

Affinity to Moravian peat-bog communities: *tyrphophilous B—C*

Biology: Life-history is unknown. Adults occur on decaying organic matter of various kinds (decayed fungi, vegetation, tree sap, various excrement, carrion), mainly in sites with cold mesoclimate (or microclimate) such as damp woods and peat-bogs (see Chandler 1976; Papp 1978b; Máca & Roháček 1983). The flight period ranges from V to X. This small species has apparently been overlooked on peat-bogs until now and Doskočil (1973) first recorded it from a mou-

tain peat-bog meadow in the Krkonoše Mts. (Bohemia). Recent records by Máca & Roháček (1983) are based on the material from North Moravian peat-bogs, where *A. nigrinus* was found on all three types of mires, most commonly on decaying fungi. The close affinity of *A. nigrinus* to moorland habitats is probably determined by the need of a cold environment for its larval development.

Distribution: Holarctic species (Papp 1984b), widespread in North and Central Europe but the southernmost records are all from mountains. In Czechoslovakia it is known from Bohemia, Moravia as well as Slovakia (Zuska & Laštovka 1969; Doskočil 1973; Roháček 1982, 1983; Máca & Roháček 1983; Vaňhara 1983).

Material examined (9♂ 16♀): Skřítek, 21. 6. (0/2—E), 3. 8. (0/1—F), 16. 8. (0/1—F), 30. 8. 1977 (7/3—F); Rejvíz, 12. 9. 1979 (2/7—F, 0/1—E); Keprník—Vozka, 16. 8. 1980 (0/1—M).

Milichiidae

Neophyllomyza acyglossa (Villeneuve, 1920)

Affinity to Moravian peat-bog communities: *tyrphoneutral C*

Biology: Poorly known. Adults were collected mainly in forests, on swellings of oaks and poplars, on flowers and dead insects (Papp 1978a); their occurrence dates are from V—VIII and X (Papp 1978a; Roháček 1985). The finding of a single male on a raised bog in North Moravia (already published by Roháček & Gregor 1984) is the first from moorlands and should be considered exceptional because the species clearly prefers forest (especially deciduous) habitats.

Distribution: A Palaearctic species, known from France, FRG, Poland, Czechoslovakia, Hungary, Roumaina, USSR and Mongolia (Papp 1984b). In Czechoslovakia, it was recorded from a few localities in Bohemia (Roháček 1985), Moravia (Roháček & Gregor 1984) and Slovakia (Papp 1978a; Roháček 1985).

Material examined (1♂): Rejvíz, 10. 6. 1980 (1/0—M).

Carnidae

Meoneura flavifacies Collin, 1930

Affinity to Moravian peat-bog communities: *tyrphoneutral A—B*

Biology: A coprophagous species, preferring cold and humid, but often open, habitats (Gregor & Papp 1981). Adults occur on excrement of various herbivores, in V—X (Papp 1978a). Only one female was swept from low vegetation in lagg meadow of the raised bog at Rejvíz, showing that mires do not belong to habitats frequented by this species.

Distribution: A widespread Holarctic species, in Europe recorded from Finland, G. Britain, FRG, GDR, Czechoslovakia, Austria, Hungary, Roumania and USSR; also known from Mongolia, Himalaya and the Nearctic Region (Papp 1978a, 1984b). In Czechoslovakia it is known from several localities in Bohemia, Moravia as well as Slovakia (Doskočil 1962; Gregor & Papp 1981; Roháček & Gregor 1984).

Material examined (1♀): Rejvíz, 18. 7. 1979 (0/1—M).

Meoneura sp. ♀♀

The specimens mentioned below cannot be determined because they belong to species unidentifiable from females. They may represent more than one species whose affinities to peat-bog communities are probably *tyrphoneutral A—B.*

Material examined (4♀): Rejvíz, 23. 5. 1981 (0/1—B); Keprník—Vozka, 23. 6. (0/1—M), 6. 8. 1980 (0/1—M); K. Sněžník—Sušina, 23. 7. 1980 (0/1—M).

Lauxaniidae

Lyciella decipiens (Loew, 1847)
(syn. *Sapromyza nitidifrons* Becker, 1895; *Lycia deludens* Czerny, 1932)

Affinity to Moravian peat-bog communities: *tyrphoneutral C*

Biology: A common species, particularly in humid deciduous forests from lowlands to montane zones (Martinek 1974b); according to Papp (1979) larvae were found in wet leaves on the ground and adults fly in V—IX. There are only two previous records from moorlands (Rabeler 1931; Krogerus 1960) from which it is apparent that *L. decipiens* is restricted to forested parts of mires or to peaty woods (= Bruchmoore) where it may be sometimes common (cf. Krogerus 1960). In North Moravia only one specimen was collected; it was taken in marginal zone of a mountain ridge raised bog.

Distribution: Widespread in the West Palaearctic (see Papp 1984a); in Czechoslovakia it is common in all the regions (see e. g. Martinek 1971, 1973, 1974a, b, 1975, 1976, 1977, 1984a, b, c; Vaňhara 1981).

Material examined (1♂): Keprník—Vozka, 15. 8. 1979 (1/0—M).

Lyciella illota (Loew, 1847)

Affinity to Moravian peat-bog communities: *tyrphoneutral C*

Biology: A woodland species occurring in forests and shrubby vegetation along brooks and rivers, in Central Europe mainly in submontane to montane zones (Martinek 1972, 1974b; Papp 1979). The flight period of adults ranges between VI and IX (Papp 1979). *L. illota* is a rather psychrophilous species and was also recorded from mires or their vicinity. Krogerus (1960) found it relatively commonly in peaty woods in North Europe but rarely or never on other types of peat-bogs. Only 2 specimens were caught in marginal wooded zones of a raised peat-bog in North Moravia.

Distribution: The species is widespread throughout much of Europe, including the European part of the USSR and the Caucasus, but in more southern areas it is restricted to mountains (Martinek 1972; Papp 1979, 1984a). In Czechoslovakia it was recorded from all the regions (e. g. Martinek 1971, 1972, 1973, 1974a, b, 1976, 1977, 1984a).

Material examined (1♂ 1♀): Rejvíz, 14. 7. (0/1—M), 19. 8. 1980 (1/0—M).

Lyciella platycephala (Loew, 1847)
(syn. *Sapromyza difformis* Loew, 1858)

Affinity to Moravian peat-bog communities: *tyrphoneutral C*

Biology: A species confined to wet, mainly decidous woods and riverside shrubby forests; it is most common in the beech zone (Martinek 1971, 1974b; Papp 1979). Adults occur in V—X (Papp 1979).

L. platycephala very rarely penetrates into peat-bogs; there is only one record — from the vicinity of a mire in southwestern Bohemia (Martinek 1975). On the peat-bogs under study one female was collected by soil traps placed near the edge of a spruce forest surrounding the transient bog at Skřítek.

Distribution: Europe, from southern Sweden and Finland to Italy (see Papp 1984a). In Czechoslovakia, it is a common species in all the regions (e.g. Martinek 1971, 1974a, b, 1975, 1976, 1977, 1984a, b).

Material examined (1♀): Skřítek, 20. 9. — 4. 10. 1978 (0/1—T).

Lauxania cylindricornis (Fabricius, 1974)
(syn. *Musca chrysoptera* Schrank, 1803; *Lauxania rufitarsis* Latreille, 1804)

Affinity to Moravian peat-bog communities: *tyrphoneutral B—C*

Biology: A relatively eurytopic species occurring in several wet habitats; it is one of a few Lauxaniids which regularly occurs in open biotopes such as wet or boggy meadows (Martinek 1971, 1974b). Adults fly in IV—VIII (Martinek 1977; Papp 1979) but the records from VII and VIII are from mountains. In the moorland habitats *L. cylindricornis* is uncommon (Rabeler 1931; Krogerus 1960). Only one male was swept from lagg meadows of a transient peat-bog in North Moravia.

Distribution: A Holarctic species, widespread in the Palaearctic Region (see Papp 1984a). In Czechoslovakia it is common throughout the country (see Martinek 1971, 1974a, b, 1975, 1976, 1977, 1984a, b, c).

Material examined (1♂): Skřítek, 8. 6. 1977 (1/0—M).

Calliopum elisae (Meigen, 1826)
(syn. *Lauxania atrocoeruleum* Becker, 1895; *Calliopum atriceps* Czerny, 1935)

Affinity to Moravian peat-bog communities: *tyrphoneutral C*

Biology: A relatively common species in wet forests and bushes along streams and rivers, especially at submontane altitudes but also occurring in lowlands (Papp 1979). More rarely it occurs in wet meadow biotopes, where it is associated with shrubby areas. Adults fly in VI—IX (Papp 1979). It was recorded (as a scarce species) from moorland habitats, usually from zones with birch (see Peus 1928; Rabeler 1931; Krogerus 1960). In North Moravia, *C. elisae* was also found in lagg meadows and marginal parts of a raised bog in growths of *Betula pubescens* var. *carpatica,* but in small numbers.

Distribution: The species is widespread throughout much of Europe (see Papp 1979, 1984a). Czechoslovakian records are from all the regions, see Martinek (1971, 1973, 1974a, b, 1975, 1976, 1977, 1984a, b, c).

Material examined (5♂ 1♀): Rejvíz, 18. 7. 1979 (1/0—M), 14. 7. (3/1—M), 19. 8. 1980 (1/0—M).

Sapromyza (Schumannimyia) hyalinata (Meigen, 1826)
(syn. *Lauxania amica* Haliday, 1833; *Lauxania frontalis* Loew, 1858; *Lauxania leucostoma* Zetterstedt, 1860)

Affinity to Moravian peat-bog communities: *tyrphoneutral C*

Biology: An uncommon species occurring in various types of forests; it is univoltine and adults fly in IV—VI (Papp 1979), at higher altitudes it also occurs in VII. There is only one previous record of *S. hyalinata* from moorlands — Krogerus (1960) recorded it as tychocoenic in peaty woods (= Bruchmoore) in North Europe. Its rarity on North Moravian mires (only one female found on a ridge raised mountain bog) indicates that it is a woodland species scarcely penetrating into margins of peat-bogs from the surrounding forest biocoenoses.

Distribution: North and Central Europe, Mongolia (see Papp 1984). Czechoslovakian records are relatively scarce. Máca (1976) and Martinek (1984c) recorded it from Bohemia, Martinek (1977) from Moravia and Martinek (1976, 1984a) from Slovakia.

Material examined (1♀): K. Sněžník—Sušina, 24. 7. 1980 (0/1—M).

Chamaemyiidae

Chamaemyia aridella (Fallén, 1823) sensu Collin (1966)

Affinity to Moravian peat-bog communities: *tyrphoneutral B*

Biology: The life-history of this species is unknown, but presumably the larvae prey on coccids associated with grasses or sedges. Flight period of adults ranges between VI and IX. Because the interpretation of this species by various authors is different (see the remarks below) it is difficult to decide which of previous records actually belong to this species. The most reliable records from moorlands are those of Nelson (1971) from northern England and those of Doskočil (1973) from a mountain peat-bog meadow in northern Bohemia. However, Harnisch (1925) also found this (?) species on a mire Seefelder (= Topieliska, Poland). From unpublished records from Czechoslovakia (Lapáček in litt.), the species appears to be rather eurytopic, occurring on various meadow habitats and is therefore considered tyrphoneutral B. It was swept from lagg meadows of two North Moravian peat-bogs at lower altitudes.

Distribution: Poorly known because of previous confusion with allied species (see below) but *Ch. aridella* probably is widespread in North and Central Europe though positively recorded only from Great Britain (Collin 1966) and Czechoslovakia. Older records from Czechoslovakia (Thalhammer 1899; Czižek 1906; Brancsik 1910; Vimmer 1913) are of only historical value; more reliable recent records are those of Doskočil (1973) and Martinek (1973) from Bohemia and of Doskočil (1962) from Moravia.

Material examined (7♂ 4♀): Skřítek, 16. 8. 1977 (2/0—M); Rejvíz, 18. 7. 1979 (0/1—M), 4. 8. 1984 (5/3—M).

Remarks: Tansijtshuk (1984) considers *Ch. aridella* to be synonymous with *Ch. juncorum* (Fallén, 1823). Having revised the above material identified by British specialists as *Ch. aridella* sensu Collin (1966) he found that it is a valid species unknown to him previously (Tanasijtshuk in litt.). Thus, the previous records of this species can be considered reliable only if they were determined by Collin's (1966) key.

Chamaemyia elegans (Panzer, 1809)
(syn. *Ochtiphila pulchra* von Roser, 1840; *Ochtiphila fasciata* Loew, 1858)

Affinity to Moravian peat-bog communities: *tyrphoneutral B—C*

Biology: Unknown. Adults seems to be associated with grassy habitats in forests, particularly in clearings with *Calamagrostis* spp. and occur in VI—VIII (Papp 1979; Lapáček in litt.). There is no previous

record from peat-bogs. Single specimens were collected in marginal zones of three North Moravian peat-bogs, including one mountain ridge raised bog.

Distribution: Widespread in the Palaearctic Region but not recorded from southern Europe till now (see Tanasijtshuk 1984). A new species for Czechoslovakia.

Material examined (1♂ 3♀): Skřítek, 6. 7. 1977 (0/1—M); Rejvíz, 13. 6. 1979 (1/0—M); Jezerník—Slatě, 22. 6. 1978 (0/2—M).

Chamaemyia juncorum (Fallén, 1823) sensu Tanasijtshuk (1984) = *Ch. herbarum* (Robineau-Desvoidy, 1830) sensu Collin (1966)

Affinity to Moravian peat-bog communities: *tyrphoneutral B*

Biology: A common, rather eurytopic species, occurring in various grassy biotopes. Larvae were recorded preying on coccids of the genera *Balanococcus* and *Metadenopus* and adults were taken in IV—VIII (Papp 1979). Collin (1966) mentioned the affinity of this species with *Carex arenaria.* There are some previous records of *Ch. juncorum* or *Ch. herbarum* respectively from mires which probably belong to the same species as the material recorded here. Krogerus (1960) found it to be eucoenic b on poor sedge fens (= Weissmoore) and tychocoenic on rich fens (= Braunmoore). Harnich (1925) recorded it from a raised peat-bog in Poland, Doskočil (1973) from a peat-bog mountain meadow in northern Bohemia and Martinek (1974b) from a raised bog in western Bohemia. Nelson's (1971) records of *Ch. juncorum* from moorlands of northern England belong to a different species (*Ch. juncorum* sensu Collin 1966). In North Moravia *Ch. juncorum* was found on lagg meadows of two peat-bogs.

Distribution: The species is widely distributed in the Palaearctic Region, including the southern areas (see Tanasijtshuk 1984). There are numerous records from Czechoslovakia (e. g. Kowarz 1894; Thalhammer 1899; Czižek 1906; Landrock 1907; Brancsik 1910; Doskočil & Hůrka 1962), but only those published under *Ch. herbarum* (see Doskočil 1962, 1973) are reliable.

Material examined (2♂ 4♀): Skřítek, 16. 8. (0/2—M), 30. 8. 1977 (0/1—M); Rejvíz, 25. 7. 1978 (1/0—M), 13. 6. 1979 (0/1—M), 4. 8. 1984 (1/0—M).

Remarks: Tanasijtshuk (1984) placed *Ch. herbarum* (Robineau-Desvoidy, 1830) as synonym of *Ch. juncorum* (Fallén, 1823). However, this synonymy has not been verified up to the present. The interpretation of *Ch. juncorum* by Collin (1966) differs from that of Tanasijtshuk (1970, 1984). However, it has been established that *Ch. herbarum* sensu Collin (1966) is identical with Tanasijtshuk's (1984) conception of *Ch. juncorum.* A revision of the type material is necessary to solve the problem.

Chamaemyia paludosa Collin, 1966

Affinity to Moravian peat-bog communities: *tyrphophilous B*

Biology: Unknown. This very little known species was described from English inland fens (see Collin 1966), and since that time it was found several times in other marshes and fens in England (McLean in litt.). Adults were recorded from V—VI by Collin (1966) and from VI—VII by McLean (in litt.). *Ch. paludosa* belongs to the most frequent (though uncommon) species of the family *Chamaemyiidae* on North Moravian peat-bogs; all specimens were swept from low vegetation in lagg meadows of two bogs at lower altitudes (740—850 m).

Although unrecorded previously from moorlands, the species shows a distinct association with peat-bogs and allied habitats and is therefore classified as tyrphophilous B.

Distribution: The species was hitherto only recorded from England (Collin 1966; Cogan 1976) but recently it was also discovered in Canada (Alberta) and Alaska (I. F. G. McLean, letter communication, 1984). It is a new species to continental Europe.

Material examined (4♂ 5♀): Skřítek, 8. 6. 1977 (1/1—M), 8. 6. (1/1—M), 13. 7. (0/1—M), 27. 7. 1978 (2/1—M); Rejvíz, 14. 7. 1980 (0/1—M).

Chamaemyia polystigma (Meigen, 1830)

Affinity to Moravian peat-bog communities: *tyrphoneutral B*

Biology: Larvae of this species were found preying upon the coccid *Trionymus phalaridis* (Green) living on the ribbon-grass *Phalaris arundinacea* (see Collin 1966; Papp 1979), but it is certain that they are also predatory on other species of *Coccidae. Ch. polystigma* is a very common and eurytopic species, occurring in various grassy habitats including marshes and moorlands. It is multivoltine in Central Europe and adults fly in IV—IX (Papp 1979). There are several previous records from peat-bogs. Krogerus (1960) recorded it from various types of bogs but found it is eucoenic only on poor sedge fens (= Weissmoore) and acoenic on other types. Single specimens were recorded from raised bogs in western and southern Bohemia by Martinek (1974b) and Máca (1976). On peat-bogs studied only one specimen was obtained — in lagg meadow of the transient bog at Skřítek.

Distribution: The species is widespread throughout much of the Palaearctic Region including North Africa and the Far East (see Tanasijtshuk 1984). Czechoslovakian records are numerous and originate from Bohemia (Vimmer 1913; Martinek 1974b, Máca 1976), Moravia (Landrock 1908; Czižek 1910) as well as Slovakia (Thalhammer 1988; Martinek 1976).

Material examined (1♂): Skřítek, 23. 8. 1978 (1/0—M).

Leucopis (Neoleucopis) atratula (Ratzeburg, 1844)

Affinity to Moravian peat-bog communities: *tyrphoneutral C*

Biology: Primary host of the larvae of this species is the balsam woolly aphid *Adelges piceae* on *Abies* spp.; they are also predatory on *Pineus* species living on pines (rarely even on spruces) and on several other *Adelges* spp. on firs. Adults of this woodland species fly in IV—IX (McAlpine 1971). There is no previous record from peat-bogs. In North Moravia, only 2 specimens were found in marginal parts of the transient bog at Skřítek; they could have originated either from the surrounding spruce forests or from *Pinus mugo* introduced on margin of this mire (see Roháček 1982).

Distribution: The species is native in Europe (Great Britain, FRG, Austria, Switzerland, Czechoslovakia, Yugoslavia, Turkey) but introduced also into North America (Canada, USA) to control *Adelges piceae* (see McAlpine 1971; Tanasijtshuk 1984). There is only one record from Czechoslovakia (Slovakia: Cemjata — McAlpine 1971). The species is new to Moravia.

Material examined (2♀): Skřítek, 30. 8. 1977 (0/1—S), 25. 7. 1978 (0/1—M).

Leucopis (Neoleucopis) tapiae Blanchard, 1964
(syn. *Agromyza chermivora* Kaltenbach, 1843 nom. nud., *Leucopis obscura* auct., *L. atratula* auct.)

Affinity to Moravian peat-bog communities: *tyrphoneutral C*

Biology: Larvae prey primarily upon aphids of the genus *Pineus* living on various species of *Pinus*. Most rearing records are from *Pineus pini* on *Pinus sylvestris*. Adults fly in VI—VIII (field records — see McAlpine 1971). There is no previous record from peat-bogs but the record on the raised bog at Rejvíz indicate that *L. tapiae* could also live in moorland pine woods on *Pinus rotundata*. However, the species appears to be preferably associated with forests dominated by *Pinus sylvestris* and therefore it is considered tyrphoneutral C.

Distribution: According to McAlpine (1971) *L. tapiae* probably originated as a Euroasian species but now it occurs in all regions where *Pinus sylvestris* was introduced. The Palaearctic records are from Great Britain, Gibraltar, FRG, Austria, Switzerland, Turkey, USSR (see Tanasijtshuk 1984); other records (recent introductions) are from Canada, USA, Argentina, New Zealand (McAlpine 1971). The species is new to Czechoslovakia.

Material examined (1♀): Rejvíz, 25. 7. 1978 (0/1—M).

Discussion

Clusiidae

Representatives of this family are rare on peat-bogs because they are closely associated with forests of various types where their larvae develop in rotting wood. Previous records of *Clusiidae* from moorland habitats are scarce; Krogerus (1960) found two species *(Clusiodes geomyzinus, Clusia flava)* on peat-bogs in North Europe but they were very sporadic in peaty woods and on rich fens. The single record of the latter species from North Moravian mires also demonstrates that *Clusia flava* is a woodland species (tyrphoneutral C) occurring rarely and only in marginal zones of peat-bogs.

Acartophthalmidae

Although *Acartophthalmus nigrinus* has been only rarely recorded from peat-bogs and allied biotopes (Doskočil 1973; Máca & Roháček 1983) it probably has a closer affinity to moorland habitats, at least in Central Europe, but it was apparently overlooked in previous investigations of peat-bog dipterofauna. In Czechoslovakia, *A. nigrinus* clearly prefer sites with cold mesoclimate, such as montane forests and particularly peat-bogs (see Máca & Roháček 1983). However, it is much less confined to mires in more northern latitudes, where climatic factors are not limiting and the species is probably ubiquitous.

Milichiidae

Milichiidae (excl. *Carnidae*) have not been recorded from moorlands up to the present, except for the finding of *Neophyllomyza acyglossa* on the raised bog at Rejvíz (North Moravia) (Roháček & Gregor

1984). This species displays no distinct affinity for mires and similar biotopes; it clearly prefers forest ecosystems and should therefore be considered tyrphoneutral C.

Carnidae

Species of this family are not flies typical of peat-bog communities. Although many of *Meoneura* species are relatively eurytopic because of their association with excrement or carrion, they are very scarce on peat-bogs. There is no previous record from mires in Great Britain or North Europe and only two from Central Europe: Harnisch (1925) published a record of 1♂ 1♀ of *Meoneura obscurella* (Fall.) from a mire Seefelder (= Topieliska, Poland) and Doskočil (1973) recorded one specimen of *M. vagans* (Fall.) from a mountain peat-bog meadow in the Krkonoše Mts. (Bohemia). Only five specimens were collected on North Moravian mires and this supports the view about the general rarity of Carnids on peat-bogs. However, it should be noted that these minute flies are difficult to collect by the usual methods and that the results could be different if baited traps were used (cf. Gregor & Papp 1981).

Lauxaniidae

The majority of species of this family are confined to woodlands or at least shrubby riverside vegetation; their larvae are saprophagous in decaying vegetation, mainly in wet leaf litter on the ground (Papp 1984a). Apart from some exceptions, Lauxaniids do not occur in open habitats and, consequently, their occurrence on moorlands is restricted to marginal zones or to mires belonging to the peaty wood (= Bruchmoore) type. For instance, no species of *Lauxaniidae* was found on tree less moorland habitats in northern England (Nelson 1971) or on mountain peat-bog meadows in northern Bohemia (Doskočil 1973). The infrequent occurrence of Lauxaniids on peat-bogs in Central Europe was previously noted by Peus (1928, 2 species) and Rabeler (1931, 6 species) who found them asociated either nith the moorland birches or pine woods. Krogerus (1960) recorded a total of 10 species from North European mires but 6 of them were collected only in peaty woods. Interestingly, some species of *Lauxaniidae* were relatively common in the latter type of peat-bogs and were classified by Krogerus (1960) as eucoenic b, e. g. *Lyciella decipiens* (Loew), *L. illota* (Loew), *L. rorida* (Fall.) and *L. laeta* (Zett.). Six species of *Lauxaniidae* were found on North Moravian peat-bogs but all were rare and most of them limited to marginal parts of mires formed by waterlogged spruce forests. Only two species were found in more internal parts on peat-bog meadows *(Lauxania cylindricornis)* or in groups of birches *(Calliopum elisae). Generally* all of the species found on peat-bogs under study are classified as tyrphoneutral C, with the possible exception of *Lauxania cylindricornis* which can also live in open habitats and therefore is considered tyrphoneutral B—C.

Chamaemyiidae

Larvae of chamaemyiid flies are predatory on aphid and coccid species living in various ecosystems; the adults seem to feed on excre-

tions of the same homopterous insects (Tanasijtshuk 1971, 1977, 1984; Papp 1979). The species of *Chamaemyiidae* found on peat-bogs and allied habitats belong to two main ecological groups. The larger group is formed by species of the genera *Chamaemyia, Parochthiphila* and possibly *Acrometopia* which prey on coccids living under leafsheats of grasses (see Tanasijtshuk 1971). *Chamaemyia* species were previously recorded from moorlands in Central Europe by Harnisch (1925), Doskočil (1973), Martinek (1974b) and Máca (1976), in England by Nelson (1971) and in North Europe by Krogerus (1960). All these authors found only 1—3 species of this genus, but Krogerus (1960) also recorded *Acrometopia wahlbergi* (Zett.) and *Parochthiphila spectabilis* (Loew). However, these last two species occurred (as eucoenic species!) only on one type of bogs — on poor sedge fens (= Weissmoore). In North Moravian mires 5 species of *Chamaemyia* were found, 3 of which were recorded from moorlands also by the above authors. Four species are classified as tyrphoneutral B because they prefer meadow biotopes and on the peat-bogs studied occurred infrequently and were restricted to marginal lagg meadows. One species *(Ch. paludosa)* is considered typhophilous B, in spite of the fact that it was not previously reported from peat-bogs. However, it is a rare species associated with inland fens in England; in Czechoslovakia it seems to have distinct affinity with peat-bog meadows.

The second ecological group is formed by *Leucopis (Neoleucopis)* species whose larvae prey on flocculent, non-gallicous colonies of aphids of the family *Adelgidae* on coniferous trees. These species have not been previously recorded from peat-bogs, but two were found in the present investigations on North Moravian moorland Acalypterates. They are apparently associated with forested areas and seem to be restricted to marginal zones of mires. Therefore they are considered tyrphoneutral C. Previously Krogerus (1960) and Doskočil (1973) found species of *Leucopis* on moorlands but these species belonged to a different taxonomic (subg. *Leucopis* s. str.) as well as ecological group, because they were found on open meadow habitats.

Conclusions

(1) In the 8th part of studies devoted to the *Acalypterate Diptera* of peat bogs in North Moravia the species of the *Clusiidae* (1 sp.), *Acartophthalmidae* (1 sp.), *Milichiidae* (1 sp.), *Carnidae* (2 spp.), *Lauxaniidae* (6 spp.) and *Chamaemyiidae* (7 spp.) found on mires are considered with special reference to their biology and distribution. Their affinity to peat-bog communities is evaluated using the classification proposed by Roháček & Máca (1982).

(2) No tyrphobiont species was found. Two species are considered tyrphophilous — *Acartophthalmus nigrinus* belonging to category B—C and *Chamaemyia paludosa* being probably tyrphophilous B. All the remaining species are classified as tyrphoneutrals. The coprophilous *Meoneura* spp. are tyrphoneutral A—B, the species preferring meadow and other open habitats (almost all *Chamaemyia* spp.) tyrphoneutral B and the woodland species penetrating into marginal zones of peat-bogs

(*Clusia flava, Neophyllomyza acyglossa, almost all Lauxaniidae, Leucopis* spp.) tyrphoneutral C.

(3) *Acartophthalmus nigrinus, Lyciella illota* and *Chamaemyia paludosa* seem to prefer mountain altitudes in Central Europe.

(4) Only 5 species of the families under study were found on mountain ridge raised bogs (*Acartophthalmus nigrinus, Meoneura* sp., *Lyciella decipiens, Sapromyza hyalinata, Chamaemyia elegans*); the fauna of mires at lower altitudes was much richer and contained 11 (raised bog at Rejvíz) and 10 species (transient bog at Skřítek) respectively.

(5) *Acartophthalmus nigrinus* was the most common of the recorded species and occurred on all three types of North Moravian peat-bogs. It is a psychrophilous species with distinct affinity for moorland habitats. The record of *Chamaemyia paludosa* is the most interesting because it is the first from continental Europe. The biology of this species is unknown but it seems to be clearly associated with peat-bogs in Central Europe.

(6) *Chamaemyia elegans, Ch. paludosa* and *Leucopis tapiae* are recorded from Czechoslovakia for the first time. *Leucopis atratula* is new to Moravia.

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Diptera Acalyptrata торфянных болот из Северной Моравии (ЧССР) Часть 8. Clusiidae, Acartophthalmidae, Milichiidae, Carnidae, Lauxaniidae, Chamaemyiidae

Восьмая статья к познанию группы Acalyptrata торфяников из Северной Моравии посвящена семействам Clusiidae (1 sp.), Acartophthalmidae (1 sp.), Milichiidae (1 sp.), Carnidae (2 spp.), Lauxaniidae (6 spp.), Chamaemyiidae (7 spp.).

Ни один из определенных видов не является торфобионтным. Два вида по-видимому торфофильные — Acartophthalmus nigrinus принадлежит к категории B—C, Chamaemyia paludosa к категории B. Остальные обнаруженные виды являются торфоневтрльными A—B (Meoneura spp.), B (Chamaemyia spp.) или (большинство видов) C (Clusia flava, Neophyllomyza acyglossa, Leucopis spp., Lauxaniidae).

На горных болотах верхового типа было обнаружено только 5 из изученных видов; видовой состав был значительно богаче на ниже положенных болотах переходного (10 видов) и верхового (11 видов) типа. Три вида (Chamaemyia paludosa, Ch. elegans, Leucopis tapiae) новые для территории Чехословакии, причем первый вышеуказанный вид докладывается впервые из континентальной Европы. Leucopis atratula является новым видом для фауны Моравии.

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