

Some terricolous Sphaerocerids and Drosophilids from Hungary
(Diptera: Sphaeroceridae and Drosophilidae)

By

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Abstract: Soil traps on important method for collecting species of these families; localities and locality data of 44 Sphaerocerid and 11 Drosophilid species with remarks (description of *C. (Copromyza) pseudostercoraria* sp. n., four Sphaerocerid species new to Hungary, *Limosina meijerei* Duda bona species, first record of fully winged *C. (Apterina) pedestris* Meig. and of male of *Drosophila hexasticha* L. Papp, ect.). Finally a summary is given on the terricolous life-habit of flies and on features of terricolous species.

It was noticed during the identification of the Sphaerocerid material of the Zoological Department of the Hungarian Natural History Museum (HNHM) for the series of Fauna Hungariae that besides the obligately coprophagous species also the terricolous Sphaerocerid species are strikingly poorly represented in the collection. This fact is easily understandable if we take into consideration that these species are not collected or collected only in very low numbers by netting or singling. At the same time among the Sphaerocerids, which were collected by Dr. Z. KASZAB in Mongolia, many new species were described from soil trap materials. Thus, I decided to begin the methodical soil trapping of flies in Hungary.

The placing and the fitting into the soil of the soil traps for collecting flies need far more care and precise work than those of the traps for collecting large-bodied beetles or other insects. The rim of the plastic pits used must be placed 2-3 cm below the ground level and then the soil around the rim of the pit must be made declivous. When collecting in forest soils, it is advisable to have the rim of the pit deeply under the upper litter layers, i.e. to the lower level of the decomposed litter. Instead of pits, plastic cups are also useful, for killing and preseving liquid it is advisable

to use only ethylene-glycol because this liquid guarantees the intact condition on the flies without decay for a month even in summer. A large square aluminium cover each is placed over the soil traps covered in most cases with forest litter (crumbling branches or with cut grass or sedge in accordance with the collecting place).

First results of this work is given in the present paper. The materials collected in South and North Hungary are well supplemented by the soil trap and other materials, which the scientists of the Zoological Department of the HHNM caught in the Hortobágy National Park (E - Hungary).

The specimens are preserved in vials in 70 per cent alcohol except for the minutia-pinned specimens of the new species described below.

The materials were collected with soil traps if not otherwise stated. Below the locality data are given followed by the list of the species with remarks.

1. South Hungary (leg. Zs. Bajza - L. Papp)

A: Aranyosgadány, boggy meadow, 24 April-18 May, 1973; B: *ibid.*, 31 August-1 October, 1973; C: Aranyosgadány, cemetery, 2 Sept.-5 October, 1972; D: Pellérd, boggy meadow with high *Carex* spp., 2 September-5 October, 1972; E: *ibid.*, in a Canadian poplar plantation, planted on boggy meadow; F: *ibid.*, high *Carex* meadow with *Fraxinus pennsylvanica*; G: Szaporca, lake-shore, 2-30 August, 1973.

North Hungary (leg. Zs. Bajza-L. Papp)

H: Magyarokút, Börzsöny Mts., forest, 12 August-16 September, 1973; I: Bükk Mts., Sikfőkut Project, oak forest, 9 May-7 June, 1973; J: *ibid.*, 8 August-5 September, 1973.

Hortobágy National Park

HNP1: Egyek, Ohat forest, funnel extraction from moss on tree-trunk, 26 September, 1974, leg. S. & L. Mahunka; HNP2: Egyek, Ohat forest, 24 April, 1974, leg. Hámoriné; HNP3: Püspökladány, Ágotapuszta, Farkassziget, forest, 16. June, 1975, leg. S. & L. Mahunka; HNP4: *ibid.*, sifted, 20 October 1975, leg. Hámoriné; HNP5: *ibid.*, 4 September 1974 - 5 February 1975, leg. S. & L. Mahunka; HNP6: Ujszentmargita, forest, 11 July, 1975, leg. Hámoriné-Marótiné; HNP7: *ibid.*, 23 Oct., 1975, leg. Hámoriné; HNP8: *ibid.*, 19 June, 1975, leg. Kaszab; HNP9: *ibid.*, 24 April, 1975, leg. Hámoriné-Marótiné; HNP10: *ibid.*, fringe of the forest, 23 October 1975, leg. Hámoriné; HNP11: *ibid.*, reedy part, sifted, 21 April, 1975, leg. Horvatovich; HNP12: Balmazújváros, Darassa, 4 February, 1975, leg. S. & L. Mahunka; HNP13: Nagyhegyes, Vajdapolos forest, 7. July, 1975, leg. Hámoriné-Marótiné.

Sphaeroceridae

Sphaerocera monilis Haliday, 1836. - H: 1 ♀. Terricolous species in wet forests, very rare in collections. It was reared from fungi and it was found in vertical karst pits and on deer manure mixed with forest litter (PAPP 1973, PAPP & PLACHTER 1976).

Ischiolepta micropyga (Duda, 1938). - H: 1 ♂. Very rare, probably obligate terricolous species. First known specimen from Hungary.

I. paracrenata (Duda, 1920). - B: 1 ♂, 2 ♀; G: 3 ♂, 1 ♀. Second and third collecting locality in Hungary. Little known species: it was found alive in nest of coot, and it was reared from runway litter sample found in burrows of rat-vole in, Finland (HACKMAN 1967).

I. pusilla (Fallén, 1820). - A: 1 ♂. Known as a coprophagous species.

Copromyza (Apterina) pedestris (Meigen, 1830). - A: 1 ♂, 11 ♀, B: 3 ♂, 5 ♀. It was known as a brachypterous, terricolous species, was reared from dead snails and found in wet forests and meadows, under cut sedge, in burrows of small mammals, etc.; but two fully-winged male specimens are in the present material, which show all the characteristics of the subgenus Fungobia Lioy. The specimens resemble very much C. (F.) fimetaria (Meigen, 1830), only their genitalia are completely different. Thus, I think, this species is only a specialized, in most cases brachypterous species of Fungobia Lioy. The discussion of this question will be given elsewhere.

C. (Olinea) atra (Meigen, 1830) - B: 1 ♂, 1 ♀, G: 1 ♀. A common coprophagous species, also known from burrows of small mammals.

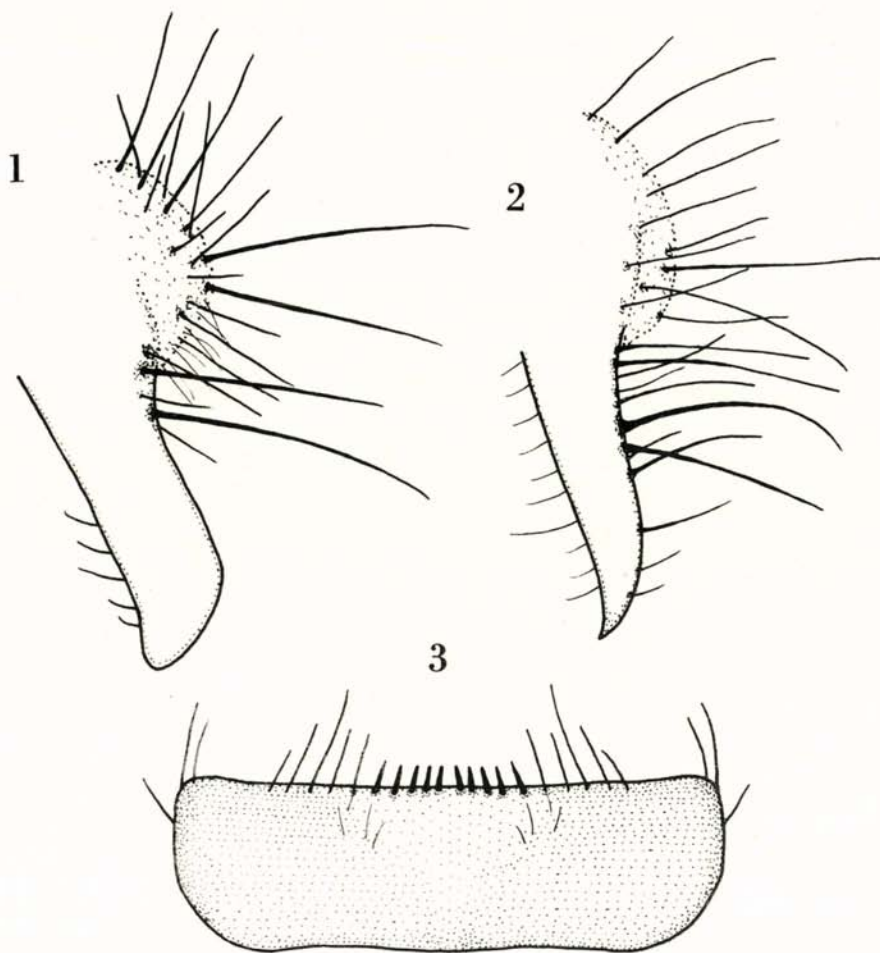
C. (Crumomyia) glabrifrons (Meigen, 1830) - A: 1 ♀. Widespread in Europe but not a common species. It is a psychrophilous and athmophilous species, the imagines were found on wet meadows and in woods, and in the near-to-entrance region of caves.

Copromyza (Copromyza) pseudostercoraria sp.n.

Robust, black-bodied species with yellow legs.

Head as long as high with dirty yellow to yellowish red hue over a big area below eyes and with a small reddish or greyish red diffuse area on front of frons. Orbitalia moderately shining grey. Head chaetotaxy as in stercoraria Meig., postocular hairs in one row, no genal bristle. Arista with scattered short ciliae. Eyes small, longest diameter: genal width = 1,5. Thorax and abdomen black, mesopleura mainly shining black, only its narrow upper region and a stripe along its hind margin dusted. Mesonotum with 3 pairs of dc bristles. Scutellum with thin but comparatively long bristle-like hairs on margin and on upper surface. Legs mainly yellow, only apices of femora darkened: reddish brown to reddish grey. Femora swollen, first femur only 3,0-3,5 times longer than wide. Mid tibia with 2-3 short and not thick anterodorsal bristles. No anterodorsal on hind tibia. mt_3 ventrally as long as second joint, hind tibia with a moderately long curved ventral spine and with a small apical lateral spine. Wings somewhat browned, venis dark brown, all veins with brownish

margin. Discal cell with short hind vein appendage. Wing length: holotype ♂: 3.39 mm, paratype ♂: 3.39-3.61 mm, paratype ♀: 3.40 mm; wing width: holotype ♂: 1.36



Figs. 1-3.

1: male surstylus of a paratype of *Copromyza (Copromyza) pseudostercoraria* sp.n., 2: male surstylus of *C. (Copromyza) stercoraria* (Meig.), 3: fifth sternite of *Limosina pullula* Zett. male

mm, paratype ♀: 1.24-1-1.47 mm, paratype ♂: 1.16 mm. Genitalia of males are very characteristic. Genital vault small with usual thin bristles, surstyli (Fig. 1) shining black, parallel sided, not pointed but with an anteriorly placed blunt apex, without long thick bristles on their apical half, contrarily to stercoraria Meig.

Body length: holotype ♂: 4.16 mm, paratype ♂♂: 3.85-4.70, paratype ♀: 3.62 mm (when in alcohol; a little bit smaller when pinned).

Holotype ♂: Szaporca, tópart (=lake shore), talajcsapda (=soil traps), 2-30. August 1973, leg. Zs. BAJZA & L. PAPP.

Paratypes: 1 ♂: data as for holotype; 1 ♂, 1 ♀: Aranyosgadány, láprét (= boggy meadow), talajcsapda, 31. August - 1 October 1973, leg. ZS. BAJZA & L. PAPP.

C. (Copromyza) pseudostercoraria sp. n. is closely related to C. stercoraria Meig., but its legs are almost completely yellow, and the shape and armature of the male surstyli are wholly different (Fig. 1, cf. Fig. 2).

The type-specimens are deposited in the Zoological Department of the Hungarian Natural History Museum. The specimens are pinned from alcohol deriving from soil trap material, thus their bodies are covered with very small soil particles.

C. (Copromyza) stercoraria (Meigen, 1830). - A: 1 ♀, B: 1 ♂, 1 ♀, G: 1 ♀. Male surstyli pointed (Fig. 2), with long thick bristles also on apical half. The drawing was made from the genitalia of a male specimen, which was found in the same soil trap as a pseudostercoraria sp.n. male. The shape of the surstyli agrees well with Fig. 31 of HACKMAN (1965). This species is rather common in mammal burrows and it was reared from litter taken from burrows of rat-vole; it occurs also on manure, but generally it is terricolous.

Coproica ferruginata (Stenhammar, 1854): A: 1 ♂, B: 2 ♂, G: 1 ♂, 3 ♀ - Coproica vagans (Haliday, 1833): G: 1 ♀ - Elachisoma aterrimus (Haliday, 1833): G: 1 ♀ - Limosina bifrons Stenhammar, 1854: A: 1 ♂, G: 2 ♂, 3 ♀ - Limosina mirabilis (Collin, 1902): A: 3 ♂, G: 1 ♂. All these species are coprophagous developing in large numbers mainly in dung heaps. Two kilometres back in the dominate wind direction there were big dung heaps of stable manure in Aranyosgadány (locality A and B). As all these species were found in two localities only, it seems highly probable that the wind blew some of the millions of the specimens of these species, which develop in dung heaps (cf. PAPP, 1975) to the sites of soil trapping. These data can be regarded as proofs of the statement that in the distribution of the above coprophagous species the wind (passive flight) and human activity play much bigger role than the active flight of the flies.

Puncticorpus cribratum (Villeneuve, 1918) - 112 ♂, 164 ♀. A: 1 ♂, G: 2 ♂, 1 ♀, H: 4 ♂, 5 ♀, I: 20 ♂, 59 ♀, J: 25 ♂, 29 ♀, HNP2: 1 ♂, HNP3: 30 ♂, 42 ♀, HNP4: 1 ♂, HNP6: 21 ♂, 21 ♀, HNP7: 2 ♀, HNP8: 6 ♂, 5 ♀, HNP9: 1 ♂. Commonest species in our soil trap materials. First ROHÁCEK (1974) wrote about this species that it is a common one, when collected by soil traps. It was reared from fungi (PAPP 1972) and found in small mammalian burrows and in ant nests. As it appears to me, all these records are related to the micromycophagous habit of the species.

P. susannae L. Papp, 1974 - A: 1 ♀. Formerly described from the present soil trap material. Unfortunately, male still unknown.

Limosina claviventris Strobl, 1909 - J: 1 ♂, 2 ♀. Scotophilous, hygrophilous, terricolous species. Common also in intermediate parts of caves and in vertical karst pits. It was found and reared from small mammalian burrows. This species gives a fine example for the connection between the terricolous and the micro- and macrocavernicolous habits of the species of the family Sphaeroceridae.

L. collini (Richards, 1929) - A: 1 ♂. Little known species. The larvae develop in cattle droppings only.

L. crassimana Haliday, 1836 - A: 2 ♀. Rather ubiquitous species. It was found in woods, on meadows, on dung heaps, in caves, on carrion. The larvae live in decaying plant materials and in manure, too.

L. flavipes (Meigen, 1830) - A: 1 ♀. Scotophilous species with various life-habits (for details see PAPP, 1973).

L. fucata (Rondani, 1880) - H: 2 ♂. Little known species; we have no reliable record on the life-habit of the larvae.

L. glabrescens (Villeneuve, 1917) - H: 1 ♀. Extremely rare species. It is the second known specimen from Hungary.

L. heteroneura Haliday, 1836 - B: 1 ♂, 2 ♀, C: 1 ♀, F: 3 ♂, G: 4 ♂, 3♀, HNP7: 1 ♀, HNP5: 1 ♂. Rather common species; it develops in dung heaps and in various decaying plant materials; it was found also in small mammalian runs.

L. luteilabris Rondani, 1880 - A: 1 ♂. Scotophilous, coprophagous species. It is one of the few sphaerocerids, which develops also in human excrement.

L. moesta Villeneuve, 1918 - A: 3 ♂, 4 ♀, B: 5 ♂, 3 ♀, C: 1 ♂, G: 2 ♂, 4 ♀, H: 1 ♂, 6 ♀, I: 1 ♀, HNP13: 1 ♂. It is a characteristic terricolous species, living also in compost and other decaying plant material, all these records indicate the micromycophagous habit of the larvae.

L. ochripes (Meigen, 1830) - B: 2 ♀. A common coprophagous species.

L. palmata (Richards, 1927) - A: 1 ♂, 2 ♀, G: 2 ♂, H: 2 ♂, 3 ♀, J: 1 ♂. First of all terricolous. It has various life-habits, living in dung, in carrion and in small mammalian burrows.

L. parapusio Dahl, 1909 - 169 ♀. A: 34 ♀, B: 4 ♀, F: 1 ♀, H: 9 ♀, I: 37 ♀, J: 80 ♀, HNP6: 1 ♀, HNP8: 3 ♀. It is a very interesting mycophagous species reproducing through parthenogenesis; no male was found in these materials (cf. PAPP 1972).

L. pullula Zetterstedt, 1847 - 12 ♂, 200 ♀. A: 1 ♂, 34 ♀ (one of them possibly L. mejerei Duda), B: 44 ♀, C: 1 ♀, D: 7 ♀, E: 6 ♀, G: 11 ♂, 108 ♀. It seems the commonest terricolous species in Hungary. It is very probable that the specimens of this species never fly, and there are various brachypterous forms in the present material, which were unknown before. Recently ROHÁČEK (1975) published a paper on the Czechoslovakian species of the L. heteroneura-group, including this and the

next species, in which proofs are listed for support of the opinion that L. meijerei Duda, 1918 is only a brachypterous form of pullula Zett., and thus it is synonymous with pullula. The simple truth is that both species have fully winged and brachypterous forms, too (even in the present materials), ROHÁCEK probably had no true pullula males and he reproduced the male organs of meijerei only as pullula male genitalia. In the present materials there are 12 true pullula males having completely different genitalia. Now only the fifth sternite of male is depicted (Fig. 3, cf. Fig 10 of ROHÁCEK), which alone permits a easy and reliable separation of the two species. Anyway, the surstyli also have a wholly different form from meijerei (resembling more those of moesta Vill.). But the separation of the females of the two species still remains problematic. The pullula females have minute anterior and posterior pairs of interfrontal bristles in every case and the middle pair is very big, horn-like. In meijerei females the differences in the length of the interfrontals are usually smaller (the middle one is shorter, the others are bigger), the meijerei females have bigger head, etc. The thorough discussion of these problems will be given in a subsequent paper.

L. meijerei (Duda, 1918) bona species (see above) A: 1 ♂, H: 1 ♂, 8 ♀. First records from Hungary (cf. PAPP, 1973). A former record from Szaporca was based on a misidentified brachypterous pullula female. All the females from Magyarkut have the above outlined differences from pullula Zett., some of them are fully winged.

L. secundaria (Duda, 1918) - A: 1 ♀. New to Hungary. It is the third known specimen in the world (see DUDA, 1938).

L. silvatica (Meigen, 1830) - A: 1 ♂, 1 ♀. Common species, which was found in wet forests, on dung, on compost and in the near-to-entrance and intermediate zones of the caves (PAPP & PLACHTER, 1976).

L. spinosa Collin, 1930 - G: 1 ♀. Very rare species, this is the second record from Hungary.

L. splendens (Duda, 1928) - A: 1 ♀, B: 1 ♂, 2 ♀, D: 1 ♀, G: 2 ♀. It was known from Germany and from Hungary (Börzsöny Mts., one record). The imagines were collected in wet forests and on rotten mushroom (PAPP, 1973).

L. talparum (Richards, 1927) - A: 6 ♂, 15 ♀, B: 2 ♂, 2 ♀. A scotophilous, mainly microcavernicolous species, found and reared from burrows of small mammals and found in the near-to-entrance region of caves.

L. vitripennis Zetterstedt, 1847 - HNP 10: 1 ♀. Rare species, which was collected on dung heaps (PAPP 1975), on wet meadows and forests, and in small mammalian nests.

Chaetopodella scutellaris (Haliday, 1836) - A: 1 ♀. A common fly, developing in droppings of large mammals.

Leptocera (Pteremis) fenestralis (Fallén, 1820) - A: 5 ♀, B: 1 ♂, 2 ♀, C: 1 ♀, HNP6: 1 ♂. First known specimens in Hungary. It occurs on wet meadows, rarely in microcavernae.

L. (Opacifrons) coxata (Stenhammar, 1854) - A: 1 ♂, 2 ♀, D: 1 ♂, E: 2 ♂, G: 3 ♂, 6 ♀, H: 1 ♂. The imagines occur on wet meadows, and they were reared from runway litter of rat-vole burrows (HACKMAN, 1967). The larvae develop also in mud.

L. (Rachispoda) breviceps (Stenhammar, 1854): B: 1 ♀ - L. (Rachispoda) anceps (Stenhammar, 1854): G: 1 ♀ - L. (Rachispoda) limosa (Fallén, 1820): G: 1 ♂. The larvae of these species develop in various kinds of mud.

L. (Leptocera) curvinervis (Stenhammar, 1854) - A: 3 ♀, G: 1 ♀. Commonest sphaerocerid on mud. The larvae can develop also in wet soil of plough-lands.

L. (Leptocera) fontinalis (Fallén, 1826) - A: 1 ♀. An interesting species; as regards its life-habits. It was found in caves, in small mammalian burrows (rearing record: HACKMAN, 1967), on dung heaps, and it was reared from dead snails, too.

Drosophilidae

Scaptomyza (Parascaptomyza) pallida (Zetterstedt, 1847) - B: 1 ♀, D: 1 ♀, F: 1 ♂, G: 4 ♂, 2 ♀, HNP12: 1 ♂. The species develops in decaying plant materials, it was reared from mushrooms (PAPP, 1972).

Amiota sp. - HNP11: 1 ♂. The closer identification was impossible owing to the poor condition of the specimen. Nothing is known on the life-habit of the species of this genus.

Drosophila funebris (Fabricius, 1787): HNP1: 1 ♂, 3 ♀ - Drosophila hydei Sturtevant, 1921: HNP11: 1 ♀. These species live first of all near to or in human dwellings; the former species has various life-habits (cf. PAPP, 1973), hydei Sturt. develops in fallen, fermenting fruits only. These records may indicate a stronger human influence on the fauna of the Hortobágy National Park.

D. kuntzei Duda, 1921: A: 1 ♀, HNP7: 1 ♀ - Drosophila phalerata Meigen, 1830: B: 8 ♀, G: 4 ♀, H: 3 ♀, J: 4 ♀ - Drosophila transversa Fallén, 1823: HNP13: 3 ♀. All these species develop in large numbers in mushrooms (PAPP 1973), but I think, at least a part of the larvae are feeding on the mycelia of mushrooms in soil.

D. picta Zetterstedt, 1847 - G: 1 ♀. Very rare species, this is the fourth specimen from Hungary. No concrete data are known on its bionomics.

D. (Lordiphosa) andalusiaca Strobl, 1906: G: 1 ♂ - Drosophila (Lordiphosa) fenestrarum Fallén, 1823: A: 5 ♀, B: 3 ♂, 39 ♀, G: 8 ♀, H: 1 ♂, 9 ♀. They are seldom captured with net, thus they are rare in museum collections. It seems probable that together with the next species their larvae are feeding on the mycelia of fungi in the soil.

D. (Lordiphosa) hexasticha L. (PAPP, 1971) - A: 3 ♂, 5 ♀, B: 3 ♂, 15 ♀, G: 7 ♀. It was described on the basis of three females from Hungary. The first known males are in the present materials. The features of the male genitalia are similar to those of acuminata Coll., and these male specimens permit a comparative study of the two species, which is needed for the safe separation of the species. Anyway, this rich material does not confirm some of the characteristics of the species written in its

description: many of the specimens have two humerals of equal length, and some of the females have almost uniformly dark abdomen; thus the correct identification is possible only by the examination of the genitalia of females and males. Many of the specimens are slightly brachypterous: the wings are more or less shortened and narrowed. It is a wholly new feature among the wild populations of the Hungarian species of Drosophila.

The above data reveal, a highly valuable material, in which there are 872 specimens of 44 Sphaerocerid and 140 specimens of eleven Drosophilid species. To make a comparison we can say that about 35 per cent of the 115 Sphaerocerid species is true terricolous species or they are in close relations with the soil fauna. The bulk of these species are represented also in these materials. Of course, not only the true terricolous species are collected with soil traps but also coprophagous species (e.g. Coproica spp., Elachisoma aterrimus, Limosina bifrons and mirabilis) and the species living in mud [L. (Rachispoda) spp.] are caught, or broadly speaking, the soil traps can catch imagines of all the species, which - even if rarely - crawl on soil surface. The separation of the latter ones from the true terricolous species requires at least a rough knowledge of every species of the whole fauna (e. g. the Sphaerocerid fauna of Hungary comprises 50 % coprophagous species, 35 % terricolous species, 12 % of the whole fauna develop in mud, and two percent true cave-dwelling species.) When studying our data, it is obvious that the terricolous Sphaerocerid and Drosophilid fauna of the Hortobágy National Park are rather poor, which can be explained by the strongly secondary state of that area, by the comparatively big changes of the ground water level and by the fact that at least a part of the territory is covered with water for a longer period of time in every year; however, the revival of the soil fauna is a rather long process, which is interrupted from time to time by inundations.

In order to correctly interpret my data I thought to give a more precise definition of the term "terricolous" for the studied fly species. The larvae of a part of the species collected in fact live in the soil but their imagines fly well and are present in or on the soil during egg-laying only, or may hide in it temporarily. In the case of the other part of the species also the imagines accommodated to the conditions of the soil in which their larvae live [e.g. C. (Apterina) pedestris, Puncticorpus spp., Limosina pullula, etc.]. It is very probable that in the case of Sphaerocerids and Drosophilids this latter is the more advanced state from a phylogenetic point of view. It seems proper to restrict the meaning of the term "terricolous" sensu lato for the occurrence of a species in the soil only; because the larvae which occur in the soil can feed on the amorphous dead plant materials (saprophagous spp.), they can be carrion feeders or consumers of mycelia of fungi or consumers of mushrooms or also species, which live in the burrows of small mammals. These interesting problems are not discussed here, only the attention is called to some of the available literature. (HACKMAN 1963, 1964, 1967, RICHARDS 1930, PAPP 1972, PAPP & PLACHTER 1976, etc.) But a diagram is given, which shows the possible ways of the life-habit changes during the phylogenesis of the Sphaerocerid species in question.



A more precise and profound knowledge of the bionomics of the species and confirmation of some of the points of the above diagram require the breeding of these species and the study of their ontogeny, of their feeding, etc. This work will soon be undertaken in our Institute.

Finally, we think proper to summarize the features, which can be observed in the morphology and bionomics of the true terricolous fly imagines owing to their life-habit. These are: 1. reduction of the wing moving muscles, inability to fly, appearance of brachypterous, micropterous and apterous forms; 2. reduction of eyes; 3. in many cases lengthening of tarsi, in the species living in drier soil, thickening of the chitinization of body; 4. changes in the morphology of the genitalia owing to the changes in the way of the copula (e.g. in males of *Puncitopus cribratum* the genitalia became asymmetrical; 5. partial or complete parthenogenesis; in an initial state a strong disproportion in the sex-ratio for the advantage of females; 6. a strong dependence of periodicity of the propagation from the physical and chemical properties of the soil, from the microclimate; in an extreme state aperiodic propagation.

The principal aim is to continue the collecting of these and other flies with soil traps in order to better understand the interesting terricolous fly fauna.

PAPP, L.: Adatok a hazai talajlakó trágyalegyek és harmatlegyek ismeretéhez (Diptera)

A szerző a bevezetésben ismerteti a végzett munka indítékait és a talajcsapdákkal való légygyűjtés követelményeit. Ezután közli a gyűjtőhelyek adatait, majd a gyűjtött fajokat. Az anyagban egy, a tudományra új faj volt *Copromyza (Copromyza) stercoraria* sp. n., valamint 4 hazánk faunájára új faj. Bebizonyítja, hogy a *Limosina meijerei* Duda valid faj. A közleményben az első közölt adatokat találjuk az egyébként csökevényes szárnyú *Copromyza (Apterina) pedestris* Meig. teljes szárnyú alakjáról, valamint a *Drosophila hexasticha* L. Papp faj eddig ismeretlen him példányairól. Végül a szerző összefoglalja a talajban élő fajok különféle életmódjának egyes kérdéseit, illetve a talajban éléshez alkalmazkodott imágók néhány morfológiai és egyéb jellegzetességét.

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