COLLEMBOLA (HEXAPODA) FROM THE RIPARIAN HABITATS OF THE DNIESTER RIVER

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Abstract. The paper includes 138 Collembolan species from diverse habitats situated along the banks of the Dniester River. The majority of species has a large zoogeographical distribution: European (36 species), cosmopolitan (33), Palaearctic (28), Holarctic (25) and Mediterranean (5). Eleven species have restricted area of distribution; some of them are known also from Romania and Ukraine, the others are endemic. Identified Collembola species are highly diversified ecologically and in many cases habitat-restricted that indicate the importance and conservation value of the Dniester River ecosystems.

Keywords: Collembola, Dniester River, ecology, species diversity.

Abstract. Collembola (Hexapoda) din ecosistemele riverane ale fluviului Nistru. Lucrarea include 138 specii de colembole identificate în diverse biotopuri amplasate de-a lungul malurilor fluviului Nistru, cu predominrea speciilor cu areal larg de distribuţie: Europene (36 species), cosmopolite (33), Palaearctice (28), Holarctice (25) şi Mediteraneene (5). Unsprezece specii au areal îngust de răspândire, fiind cunoscute în România şi Ucraina sau sunt endemice. Speciile de colembole identificate au preferinţe ecologice diverse şi sunt adesea depistate în microhabitate unice, ceea ce indică importanţa şi necesitatea păstrării şi conservării ecosistemelor riverane ale Nistrului.

Cuvinte cheie: Collembola, fluviul Nistru, ecologie, diversitate specifică.

INTRODUCTION

Collembola are the most diverse, abundant and widely distributed groups of invertebrate animals and constitute the vast majority of fauna living in the soil and litter. These invertebrates have some very important attributes: taxonomic and ecological diversification; fidelity to narrow niches and microhabitats; high endemism; easy sampling; sensitivity to perturbation; important contribution to ecosystem function, so Collembola, among other invertebrate groups, were the most useful indicators for locating biodiversity hotspots and for measuring change.

The faunistic and ecological researches of the river banks and floodplains using this small group of invertebrates present special interest (KHANISLAMOVA, 1988; BULIMAR, 1992; ČARNOGURSKÝ, 1998; STERZYNSKA & EHRNSBERGER, 1999; STERZYNSKA & PILIPIUK, 1999; RUSSELL et al., 2004; TRONSTAD et al., 2005). The bank of rivers and floodplains are in a permanent transformation. The spring river floods or abundant rains increase greatly the water level and transcend the usual bank limit, bringing to the banks biogenic elements such as fine particle of organic matter.

The Dniester River is unique because of its geographical and transboundary position and the broad spectrum of habitats including petrophyte and Mediterranean types of forests, *Populus alba*, *Pinus nigra* and *Robimia pseudoacacia* plantations, the rocky slope of calcareous canyons, small lakes, meadows, large flooded areas and agricultural fields (POSTOLACHE, 1995).

The first result of the study of Collembola along the banks of the Dniester River was published in 2004. Since then several papers including the biotopic, faunistic and ecological analysis have been done (BUŞMACHIU, 2004, 2006, BUŞMACHIU & ZUBCOV, 2007). The aim of this paper is to unify all data concerning collembolan species richness and diversity along the banks of the Dniester River, their distribution, ecology and preferences. The study was supported by the projects No. 08.820.08.02 BF and 10.820.08.07 BF.

MATERIALS AND METHODS

Characteristics of the studied habitats. The samples of the faunistic material were collected from the soil, litter, wood decompose, moss, tree trunks, herbs and aquatic plants near 29 localities situated along the Dniester River. The banks of river changed gradually from calcareous to sand and silt with different texture along the riverbeds, forming a large spectrum of habitats. The Carpathian part of the river is covered by petrophyte forests and low shrubs; the poplar, willow and acacia plantations are in the Middle part; the flooded forests and meadows are in the Lower Dniester. The Mediterranean types of the forest and spot of steppe are situated on the bank with high altitude of the Lower Dniester.

The list of habitats, localities and its abbreviation:

1. The petrophyte community on the rocky slope of calcareous canyons near the localities Butuceni (B.), Camenca (C.), Orheiul Vechi (OV), Mărcăuţi (M.), Lalova (L.), Raşcova (Rc.), Saharna (S.), Sărăteni (St.), Tătărăuca Nouă (TN), Ţipova (Ţ.), Unguri (U.) and Vîşcăuţi (V.).
2. The banks of the river covered with herbaceous plants and trees plantations near the towns Soroca (Sr.) and Rezina (R.), villages Cocieri (Co.), Goieni (G.), Gura Bîcului (GB), Holercani (H.), Otaci (O.), Malovata (Ml.) and Naslavcea (N.).

3. Flooded areas expanded through dozens of kilometres along numerous meanders with paludous vegetation, natural forest on the base of oak, as well as meadows on alluvial soil near the villages Copanca (Cp.), Crocmaz (Cr.), Iagorlîc (I.), Leuntea (Le.), Olaneşti (Ol.) and Talmaza (T.).

4. Spot of natural steppe - xerophilous ecosystem occurs near the village Răscăieți (Rs.).

5. Natural forest with elements of Mediterranean flora adapted to xerothermic conditions near the village Grădinița (Gr.).

Sampling and extraction. Collembola were collected during 2001-2010 years; extraction was made using flotation method and then fixed in 70-80 % ethyl alcohol. The species of Collembola in the open habitats, meadows and from aquatic plants were also collected by exhauster and fixed immediately in alcohol. Collembolan specimens were mounted on permanent slides and identified according to the basic keys and some modern systematic works.

RESULTS AND DISCUSSIONS

As a result of investigation, 138 species of Collembola belonging to 66 genera and 17 families have been found in different habitats situated along the banks of the Dniester River. That is more than half of the species of this group cited from the Republic of Moldova (BUŞMACHIU, 2010). The highest number of registered collembolan species were from the families Entomobryidae (33 species), Neanuridae (19), Isotomidae (18), Hypogastruridae (15), Onychiuridae (13) and Tullbergidae (11). Two families, Sminthuridae and Katiannidae, were represented by 5 species, when the families Tomoceridae, Odontellidae and Dicyrtomidae only with 3 species each. The other collembolan families such as Brachystomellidae, Cyphoderidae, Sminthurididae and Neelidae have only two found species, while Poduridae and Arrhopalitidae only one species each.

The list of collembolan species with the localities, distributions, life forms and some ecological data (CHERNOBAI et al., 2003; FJELLBERG, 1998; KRAWCZYNSKI, 2006) are included in Table 1. The abbreviation of the localities is included in the material and methods.

In the petrophyte forests, there were found such species as: *Ceratopysella engadinensis*, *Schoettella ununguiculata*, *Morulina verrucosa*, *Pseudachorutella assigilata*, *Superodontella* sp., *Tetrodontophora bielanensis*, *Pseudosinella imparipunctata*, *Orchesella orientalis*, *O. multifasciata*, *Sphaeridia pumilis* and *Ptenothrix leucostrigata*.

From the moist soil along the bank and aquatic herbs, we sampled the following hygrophilous species – *Friesea afurcata*, *Anurida ellipsoides*, *Stenaphorura denisi*, *Ballistura schoetti, Isotomurus palustris*, and epineustic species *Podura aquatica*, *Sminthurides aquaticus*.

The typical species for calcareous soil and moss on calcareous soil are: *Kalaphorura paradoxa*, *Thalassaphorura tovtrensis*, *Protaphorura pannonica*, *Jevania weineriae, Orchesella maculosa*, *Xenylla uniseta, Folsomides angularis* and *F. marchicus*. Some species, such as *Stachia populosa*, *Isotomodes productus, Folsomides parvulus*, have been found only in open xerothermophilous steppe habitats.

In the litter of natural forests, trees plantation and under low shrubs the following 15 species were found: *Ceratophysella succinea*, *Pseudachorutes subcrassus*, *Deutonura albella, Neanura moldavica, Pogonognathellus flavescens, Tomocerus minor*, *Orchesella albofasciata*, *Entomobrya atrocincta*, *Entomobrya multifasciata*, *E. quinquelineata*, *Pseudosinella octopunctata*, *Pseudosinella horaki*, *Heteromurus major*, *Folsomia quadrioculata* and *Orchesella pseudobifasciata.*

Among the studied species, it is interesting to emphasize some of them: *Orchesella orientalis* and *O. maculosa* were cited earlier in Romania (IONESCO, 1915) and Ukraine (CHERNOBAI et al., 2003), two species *Dimorphaphorura irinae* and *Endonura gracilirostris* have been recently described in Ukraine and then found in the soil of calcareous canyon of the Dniester River. Two species *Morulina verrucosa* and *Tetrodontophora bielanensis* are the Carpathian elements in the fauna of the Republic of Moldova, while such species as *Willemia intermedia*, *Hymenaphorura polonica*, *Jevania weinerae* and *Neanura minuta* are very rare, with few individuals and found only in one microhabitat of the studied localities. It is important to reveal the zoogeographical analysis of the studied species (Fig. 1).

Most of them have a large area of distribution: European 36 species (26.1%), cosmopolitan 33 (23.9%), Palaearctic 28 (20.3%), Holarctic 25 (18.1%) and Mediterranean 5 (3.6%). However, among the studied species, 11 (8%) have a restricted area of distribution being also present in the adjacent countries Romania and Ukraine or are endemic, such as *Lathriopyga nistru* (BUŞMACHIU, DEHARVENG & WEINER, 2010), *Neanura moldavica* (BUŞMACHIU & DEHARVENG, 2008), *Xenylla andrzeji* (BUŞMACHIU & WEINER, 2008), *Pseudosinella gruiae* (DA GAMA & BUŞMACHIU, 2002), *Protaphorura* sp., *Arrhopalites* sp. and *Superodontella* sp.

Collembola are highly diversified ecologically and also habitat-restricted taxa, so the presence of rare and unique collembolan species as well as newly described species, indicate the importance and conservation value of the Dniester River ecosystems.

CONCLUSIONS

The investigation carried out in different habitats situated along the banks of the Dniester River allows us to reveal 138 species of Collembola belonging to 66 genera and 17 families. Among the studied species 127 have a large area of distribution: European 36 species (26.1%), cosmopolitan 33 (23.9%), Palaearctic 28 (20.3%), Holarctic 25

(18.1%) and Mediterranean 5 (3.6%). Eleven species have a restricted area of distribution; some of them are also known from Romania and Ukraine; the others are endemic.

The identified Collembola species are highly diversified ecologically and in many cases habitat-restricted. The presence of the rare and unique collembolan species as well as newly described species, indicate the importance and conservation value of the Dniester River ecosystems.

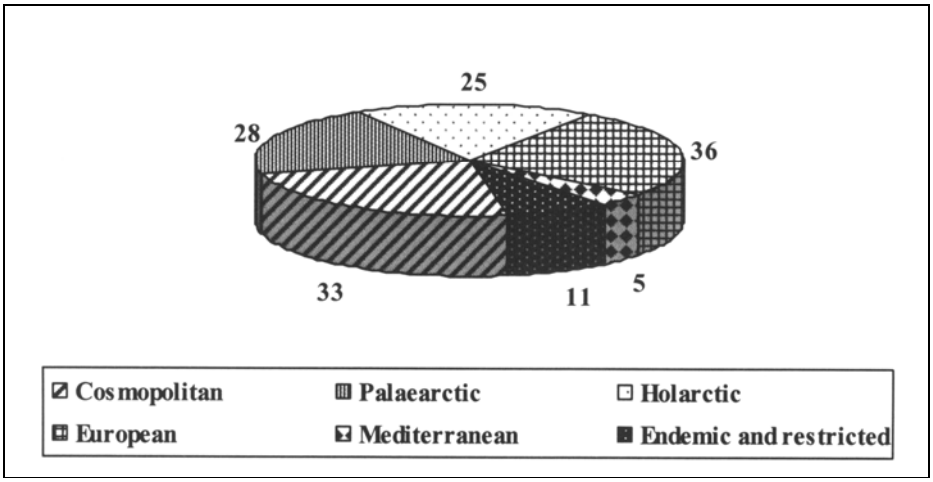

Figure 1. Distribution of collembolan species identified in the riparian habitats of the Dniester River.
Figura 1. Distribuţia zoogeografică a speciilor de colembole identificate în habitatele riverane ale fluviului Nistru.

ACKNOWLEDGEMENTS

I'm warmly grateful to Professor Wanda Weiner - Institute of Systematics and Evolution of Animals (Krakow, Poland) for the help in the identification of some species and scientific support.

REFERENCES

BULIMAR FELICIA. 1992. *Compoziţia faunistică şi structura comunităţilor de colembole (Collembola: Insecta) în ecosistemele stuficole din Delta Dunării.* Analele Ştiinţifice ale Institutului Delta Dunării. Tulcea: 95-100.

BUŞMACHIU GALINA. 2004. *Biotopical distribution of Collembola in the riverbank of transboundary Dniester River*. In: Integrated menagenent of natural resources in the transboundary Dniester River basin. Proceedings of the International Conference. Chişinău: 67-69.

BUŞMACHIU GALINA. 2006. *The structure of collembolan communities in the riverside zone of the Lower Prut.* Collection of Scientific Articles. Bender: 142-146.

BUŞMACHIU GALINA. 2010. *Checklist of springtails (Collembola) from the Republic of Moldova.* Travaux du Museum National d' Histoare Naturelle "Grigore Antipa". Bucureşti. **53**: 149-160.

BUŞMACHIU GALINA & DEHARVENG L. 2008. *Neanurinae and Morulininae of Moldova (Collembola: Neanuridae), with description of Neanura moldavica sp.n.* Zootaxa. Krakow. 1714: 61-66.

BUŞMACHIU GALINA, DEHARVENG L., WEINER WANDA MARIA 2010. *A new species of the genus Lathriopyga Caroli, 1910 (Collembola: Neanuridae: Neanurinae) from the Republic of Moldova.* Zootaxa. Krakow. 1639: 53-58.

BUŞMACHIU GALINA & ZUBCOV E. 2007. *Some peculiarities of Collembola distribution in the riverain zones of the Dniester River.* Studia Universitates "Babes-Bolyai". Cluj-Napoca. **52**(2): 3-10.

BUŞMACHIU GALINA & WEINER WANDA MARIA. 2008. *Species of Xenylla (Collembola: Hypogastruridae) from the Republic of Moldova, with description of Xenylla andrzeji sp.nov.* Zootaxa. Krakow. 1959: 65-68

ČARNOGURSKÝ J. 1998. *Influence of the simulated flood on the collembolan communities in the former seasonally flooded Danubian forest near the Gabčikovo.* Soil Zoology in Central Europe. Ceske Budějovice: 13-17.

CHERNOBAI J. M., KAPRUS I. I., RISUN V. B. et al. 2003. [*Ecology and fauna of soil invertebrates from Western Volino-Podolie]*. Kiev. Naukova dumka. 387 pp.

FJELLBERG A. 1998. *The Collembola of Fennoscandia and Denmark. Part I: Poduromorpha*. Fauna Entomologica Scandinavica. Denmark. 15: 1-184.

GAMA DA MARIA MANUELA & BUSMACHIU GALINA. 2002. *Systématique évolutive des Pseudosinella. XVI. Espèces édaphiques de la Moldavie (Insecta: Collembola)*. Revue suisse de Zoologie. **109**(4): 679-685.

IONESCO C. N. 1915. *Contributions à la faune des insects Collemboles (terrestres, cavernicoles et aquatiques) de Roumanie*. Annales Scientifiques de l'Université de Jassy. **9**(3-4): 463-518.

KHANISLAMOVA GUZEL 1986. *Particularity of Collembolan communities in the condition of floodplain.* In: Fauna and ecology of Collembola. Moscow. Nauka: 78-89.

KRAWCZYNSKI R. 2006. *Succession of Collembola in the post-mining landscape of Lower Lusatia.* Hannover. 201 pp.

POSTOLACHE G. 1995. *Vegetația Republicii Moldova.* Ştiința. Chişinău. 340 pp.
RUSSELL D., HAUTH A., FOX O. 2004. *Community dynamics of soil Collembola in floodplains of the Upper Rhine Valley.* Pedobiologia. **48**: 527-536.
STERZYNSKA MARIA & EHRNSBERGER R. 1999. *Diversity and structure of Collembola communities in wetlands.* Proceedings of 5th Central European Workshop on Soil Zoology. Ceske Budejovice: 325-334.
STERZYNSKA MARIA & PILIPIUK I. 1999. *Communities of soil fauna (Enchytraeidae, Collembola) in Biebrza river basin.* Soil Zoology in Central Europe. Česke Budějovice: 335-342.
TRONSTAD L., TRONSTAD B., BENKE A. 2005. *Invertebrate seedbanks: rehydration of soil from an unregulated river floodplain in the south–eastern US.* Freshwater Biology. **50**: 646-655.

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Received: March 25, 2011
Accepted: July 19, 2011

Table 1. The list of Collembola species from the riverine ecosystems with distribution and some ecology.
Tabel 1. Lista speciilor de colembole, distribuţia şi ecologia lor în ecosistemele riverane.

No.	Taxa	Localities	Distribution, life forms and ecological data
	Family Hypogastruridae		
1	*Hypogastrura manubrialis* (TULLBERG, 1869)	V.	Cosmopolitan, compost and fungivorous species
2	*Hypogastrura vernalis* (CARL, 1901)	GB, Le.	Cosmopolitan, hygrophilous, riverine and meadow species
3	*Ceratophysella denticulata* (BAGNALL, 1941)	Cp., Ol.	Cosmopolitan, hemiedaphic, mesophilous species
4	*Ceratophysella engadinensis* (GISIN, 1949)	L., Le., S., T.	Cosmopolitan species of dry open habitats
5	*Ceratophysella succinea* GISIN, 1949	B., GB.	Cosmopolitan, mesophilous and compost species
6	*Schoettella ununguiculata* (TULLBERG, 1869)	Gr., GB, L., H., OV.	Holarctic, thermophilous and xerophilous, epiedaphic species
7	*Choreutinula inermis* (TULLBERG, 1871)	O.	Palaearctic, forest species
8	*Xenylla andrzeji* BUSMACHIU, WEINER, 2008	B.	R. Moldova, forest species
9	*Xenylla boerneri* (AXELSON,1905)	B.	Palaearctic, bryophilous and silvicolous species
10	*Xenylla brevicauda* TULLBERG, 1869	B., Gr., H.	Palaearctic, epiedaphic, forest species, prefers dry habitats
11	*Xenylla brevisimilis brevisimilis* STACH, 1949	GB, OV, Le., Rs., T.	European, thermophilous, silvicolous species
12	*Xenylla maritima* TULLBERG, 1869	OV, T., Ţ.	Cosmopolitan, corticicolous species
13	*Xenylla uniseta* GAMA, 1963	S.	European bryophilous species
14	*Willemia intermedia* MILLS, 1934	Le.	Holarctic, euedaphic, mycetophagous and acidophilous species
15	*Willemia scandinavica* STACH, 1949	Gr., Le.	Holarctic, euedaphic, troglophilous species
	Family Brachystomellidae		
16	*Brachystomella curvula* GISIN, 1948	Le.	European, xerophilous and thermophilous species
17	*Brachystomella parvula* (SCHÄFFER, 1896)	O.	Cosmopolitan, mesophilous species of moist open habitats
	Family Neanuridae		
18	*Friesea afurcata* DENIS, 1927	Co.	Mediterranean, hemiedaphic, hygrophilous species
19	*Friesea mirabilis* (TULLBERG, 1871)	Le., TN, S., Sr.	Cosmopolitan, ubiquist and acidophilous species
20	*Friesea truncata* CASSAGNAU, 1958	S.	Palaearctic, common forest species
21	*Pseudachorutella assigilata* BORNER, 1901	St.	Palaearctic, rare forest species
22	*Pseudachorutes dubius* KRAUSBAUER, 1898	Le.	Palaearctic, forest species
23	*Pseudachorutes parvulus* BORNER, 1903	Gr., Le., Rs.	Palaearctic, hemiedaphic, acidophilous forest species
24	*Pseudachorutes pratensis* RUSEK, 1973	B., Rs., T., Ţ.	European, eurytopic, mesophilous hemiedaphobiont
25	*Pseudachorutes subcrassus* TULLBERG,1871	Le., O., S., V.	Palaearctic, mesophilous, forest hemiedaphobiont
26	*Micranurida pygmaea* BÖRNER, 1901	Le., OV, Rs., S., Ţ	Cosmopolitan, eurytopic, hygrophilous and acidophilous species
27	*Anurida ellipsoides* STACH, 1949	Sr.	Palaearctic, euedaphic, hygrophilous species
28	*Anurida tullbergi* SCHOTT, 1891	Ol., M.	Holarctic, hygrophilous species
29	*Morulina verrucosa* (BORNER, 1903)	U.	Central European, epiedaphic species
30	*Neanura minuta* GISIN, 1963	S.	European, hemiedaphobiont, forest species
31	*Neanura moldavica* BUŞMACHIU, DEHARVENG, 2008	GB, Le., OV, H., Rs., T., Ţ., S.	R. Moldova, hemiedaphic, mesophilous forest species
32	*Neanura muscorum* (TEMPLETON, 1835)	Cp., O.	European, hemiedaphic, mesophilous silvicolous species
33	*Deutonura albella* (STACH, 1920)	Cr., Rs., S.	European, hemiedaphic, mesophilous forest species
34	*Deutonura stachi* (GISIN, 1952)	Cp., H., S.	European, hemiedaphic, mesophilous forest species
35	*Endonura gracilirostris* SMOLIS, SKARZYNSKI, POMORSKI, KAPRUS, 2007	B., GB, H., OV, Le.	R. Moldova, Ukraine, hemiedaphic, thermophilous species
36	*Lathriopyga nistru* BUŞMACHIU, DEHARVENG, WEINER, 2010	L., OV, Rc., Rs., Ţ., V.	R. Moldova, littericolous species, under low shrubs
	Family Odontellidae		
37	*Superodontella* sp.	U.	R. Moldova, hemiedaphic, silvicolous species of wood decompose
38	*Axenyllodes bayeri* KSENEMAN, 1935	GB, Le.,V.	European, euedaphic, thermophilous species
39	*Stachia populosa* (SELGA, 1963)	Rs.	Palaearctic, euedaphic, xerothermophilous species

	Family Onychiuridae		
40	*Tetrodontophora bielanensis* WAGA, 1842	U.	European, Carpathian, littericolous epigeont
41	*Kalaphorura paradoxa* (SCHAFFER, 1900)	L., Ţ., S.	European, euedaphic
42	*Micraphorura uralica* (KHANISLAMOVA, 1986)	Ţ.	Holarctic, euedaphic
43	*Dimorphaphorura irinae* (THIBAUD,TARASCHUK, 1997)	V.	R. Moldova, Ukraine, euedaphic species
44	*Protaphorura armata* (TULLBERG, 1869)	Cp., N., Ţ.	Cosmopolitan, euedaphic, eurytopic species
45	*Protaphorura cancellata* (GISIN,1956)	GB, Rs.	Palaearctic, euedaphic, meadows and forest species
46	*Protaphorura gisini* (HAYBACH, 1960)		European euedaphic species
47	*Protaphorura pannonica* (HAYBACH, 1960)	Rc.	Palaearctic, euedaphic species
48	*Protaphorura sakatoi* (YOSII, 1966)	B., L., Le., O., Rc., Sr.	European, euedaphic, xerothermophilous species
49	*Protaphorura subarmata* (GISIN, 1957)	B., Rc., S., V.	European, euedaphic,
50	*Protaphorura* sp.	B., G., OV	R. Moldova, xerothermophilous euedaphobiont
51	*Thalassaphorura tovtrensis* (KAPRUS, WEINER, 1994)	B.	R. Moldova, Ukraine, Russia, xerothermophilous euedaphobiont
52	*Orthonychiurus stachianus* (BAGNALL,1939)	Gr., Sr.	European, euedaphic species
	Family Tullbergiidae		
53	*Jevania weinerae* RUSEK, 1978	L.	European, euedaphic, silvicolous species
54	*Doutnacia xerophila* RUSEK, 1974	B., I., H., OV, Ţ.	European, xerothermophilous species of open habitats
55	*Mesaphorura critica* ELLIS, 1976	B., I., L., Ml., Rs., Ţ.	Palaearctic, euedaphic, xerothermophilous species
56	*Mesaphorura hylophila* RUSEK, 1982	I., Le.	Cosmopolitan, euedaphic, eurytopic species
57	*Mesaphorura italica* (RUSEK,1971)	H., OV	European, euedaphic, eurytopic species
58	*Mesaphorura krausbaueri* BÖRNER, 1901	G., GB, L., Le., Ţ.	Cosmopolitan, euedaphic, eurytopic species
59	*Mesaphorura macrochaeta* RUSEK, 1976	I.	Cosmopolitan, euedaphic, eurytopic, acidophilous species
60	*Mesaphorura sylvatica* (RUSEK, 1971)	GB, Ţ., H.	Holarctic, euedaphic species
61	*Mesaphorura yosii* (RUSEK, 1967)	Rs., Ţ.	Holarctic, euedaphic acidophilous woodland species
62	*Metaphorura affinis* (BÖRNER, 1902)	Gr., G., I., Ml., Rs., Sr., Ţ.	Palaearctic, euedaphic, xerothermophilous species of open habitats
63	*Stenaphorura denisi* (BAGNALL, 1935)	Gr.	European, euedaphic, hygrophilous species
	Family Isotomidae		
64	*Anurophorus cuspidatus* STACH,1920	Gr.	Palaearctic, littericolous species
65	*Folsomia candida* WILLEM,1902	C., G., Sr.	Cosmopolitan, ubiquist, thermophilous and compost species
66	*Folsomia manolachei* BAGNALL, 1939	S.	Palaearctic, eurytopic species
67	*Folsomia penicula* BAGNALL,1939	B., Rs., S.	Palaearctic, mesophilous, and silvicolous species
68	*Folsomia quadrioculala* (TULLBERG, 1871)	Ţ.	Holarctic, eurytopic hemiedaphic, hygrophilous species
69	*Isotomodes productus* (AXELSON, 1906)	L., Rs., V., TN, Ţ.	Cosmopolitan, xerothermophilous euedaphobiont
70	*Isotomodes sexsetosus sexsetosus* GAMA, 1963	Gr.	European, euedaphic xerothermophilous species of open habitats
71	*Isotomiella minor* (SCHÄFFER, 1896)	Gr., I., Le., Rs., V., S.	Holarctic, ubiquist, euedaphic mesophilous species
72	*Folsomides angularis* (AXELSON, 1905)	OV	Holarctic, xerothermophilous species
73	*Folsomides marchicus* (FRENZEL, 1941)	Rs., L., S.	Palaearctic, xerothermophilous species of open habitats
74	*Folsomides parvulus* STACH, 1922	GB, L., Le., N., T., Ţ., S.	Cosmopolitan, euedaphic, xerothermophilous species
75	*Cryptopygus bipunctatus* (AXELSON, 1903)	Co., S.	Palaearctic, xerotolerant hemiedaphobiont
76	*Cryptopygus thermophilus* (AXELSON, 1900)	G., GB, Le., Sr.	Cosmopolitan, nitrophilous, xerothermophilous hemiedaphobiont
77	*Ballistura schoetti* (DALLATORRE, 1895)	H.	Cosmopolitan, hygrophilous species of open habitats
78	*Proisotoma minima* (ABSOLON, 1901)	Le.	Holarctic, eurytopic, mesophilous hemiedaphobiont
79	*Proisotoma minuta* (TULLBERG, 1871)	G., Sr.	Cosmopolitan, thermophilous, mesophilous, hemiedaphobiont
80	*Isotomurus palustris* (MÜLLER,1776)	O., H.	Holarctic, hygrophilous, algivorous species
81	*Parisotoma notabilis* (SCHÄFFER, 1896)	Cp., Gr., Le., O., Rs., S.	Cosmopolitan, ubiquist, mesophilic, alkalophilous hemiedaphobiont
82	*Isotoma viridis* BOURLET, 1839	Cp., Gr., Le., T., TN.	Holarctic, ubiquist, mesophilous species
	Family Poduridae		
83	*Podura aquatica* LINNAEUS, 1758	Ol.	Cosmopolitan, epineustic, hygrophilous species
	Family Entomobryidae		

84	*Entomobrya atrocincta* SCHOETT, 1896	L., Rs.	Cosmopolitan, mesophilous, thermophilous macrophytobiont
85	*Entomobrya handshini* STACH, 1922	V.	Europe and Asia Minor, mesophilous and xerophilous species
86	*Entomobrya marginata* TULLBERG, 1871	Le., V.	Palaearctic, meso - and xerophilous, corticophilous species
87	*Entomobrya multifasciata* (TULLBERG, 1871)	L,.Rs.	Cosmopolitan, xerothermophilous macrophytobiont
88	*Entomorbya nivalis* (LINNAEUS,1758)	V.	Cosmopolitan, atmobiont and corticolous, mesophilous species
89	*Entomobrya quinquelineata* BORNER, 1901	B., Cp., Ml.	Mediterranean, xerothermophilous macrophytobiont
90	*Entomobrya violaceolineata* STACH, 1913	Le., V., S.	European littericolous species
91	*Lepidocyrtus cyaneus* TULLBERG, 1871	S.	Holarctic, mesophilous microphytobiont
92	*Lepidocyrtus lignorum* (FABRICIUS, 1775)	Gr., O., Rs., Ţ.	Holarctic, eurytopic, meso and hygrophilous epigeont
93	*Lepidocyrtus paradoxus* UZEL, 1890	G., Le., O., S., TN, V.	Holarctic, mesophilous macrophytobiont
94	*Lepidocyrtus violaceus* LUBBOCK, 1873	Le., Ţ., TN.	Holarctic, epiedaphic and silvicolous species
95	*Pseudosinella alba* (PACKARD,1873)	I., Le.	Cosmopolitan, mycetophagous, hemiedaphic and compost species
96	*Pseudosinella albida* (STACH,1930)	Gr.	Mediterranean, hemiedaphic, forest species
97	*Pseudosinella gruiae* GAMA, BUŞMACHIU, 2002	Cp.	R. Moldova, hemiedaphic, forest species
98	*Pseudosinella horaki* RUSEK, 1985	Cp., Gr., S., St., R. Rs., Ţ., T.	European, hemiedaphic species of forest litter
99	*Pseudosinella imparipunctata* GISIN, 1953	Cr., Gr., Le., L., Rs.	European, hemiedaphic, forest and widely distributed species
100	*Pseudosinella moldavica* GAMA, BUŞMACHIU, 2002	Cp., Gr., Le., R., St., Ţ.	R. Moldova, Ukraine, hemiedaphic species of forest and open habitats
101	*Pseudosinella noseki* RUSEK, 1985	Ol.	European, hemiedaphic species
102	*Pseudosinella octopunctata* BÖRNER, 1901	GB, Gr., H., Le., Ml, OV, Rs.	Cosmopolitan, eurytopic, hemiedaphic species
103	*Pseudosinella sexoculata* SCHOT, 1902	Le.	Cosmopolitan hemiedaphic compost species
104	*Willowsia nigromaculala* (LUBBOCK, 1873)	T., OV.	Cosmopolitan, corticophilous species of warm habitats
105	*Orchesella albofasciata* STACH, 1960	O., C., GB.	European, xerophilous, epiedaphic species
106	*Orchesella cincta* (LINNAEUS, 1758)	Gr., Le., TN, S., Le.	Holarctic, atmobiont and epiedaphic, mesophilous species
107	*Orchesella flavescens* (BOURLET, 1839)	S.	Holarctic, atmobiont and epiedaphic, mesophilous species
108	*Orchesella maculosa* IONESCO, 1915	S.	R. Moldova, Romania, Ukraine, atmobiont
109	*Orchesella multifasciata* STSCHERBAKOW, 1898	L., Le., O., Rs., TN, Ţ.,V.	European, xerothermophilous species of forest and open habitats
110	*Orchesella orientalis* STACH, 1960	Rs., Ţ.	European, atmobiont and epiedaphic species
111	*Orchesella pseudobifasciata* STACH, 1960	V., S.	European, atmobiont and epiedaphic species
112	*Orchesella spectabilis* TULLBERG, 1872	O.	Palaearctic, atmobiont and xerothermophilous species
113	*Orchesella xerothermica* STACH, 1960	V.	European, atmobiont, xerothermophilous species
114	*Seira domestica* (NICOLET, 1841)	Ţ.	European, ubiquist, synanthropic, thermophilous species
115	*Heteromurus major* (MONIEZ, 1889)	Cp., L., Le., OV, Rs., Ţ.	Mediterranean, thermophilous, forest hemiedaphobiont
116	*Heteromurus nitidus* (TEMPLETON, 1835)	C., Cp., G., H., Le., TN	Cosmopolitan, hygro - and mesophilous, euedaphobiont
	Family Cyphoderidae		
117	*Cyphoderus albinus* (NICOLET, 1842)	B., Cp., GB, G., T.	Palaearctic, myrmecophilous, mesophilous, euedaphobiont
118	*Cyphoderus bidenticulatus* (PARONA, 1888)	B., Le., S., TN	Mediterranean, myrmecophilous, thermophilous, euedaphobiont
	Family Tomoceridae		
119	*Tomocerus minor* (LUBBOCK,1862)	B.	Cosmopolitan, hygrophilous, forest species
120	*Tomocerus vulgaris* (TULLBERG, 1871)	Le.	Holarctic, mesophilous, silvicolous species
121	*Pogonognathellus flavescens* (TULLBERG, 1871)	I., S.	Holarctic, hygrophilous, acidophilous, silvicolous species
	Family Neelidae		
122	*Megalothorax minimus* WILLEM, 1900	Gr., Ţ.	Cosmopolitan, eurytopic, mesophilous euedaphobiont
123	*Neelus murinus* FOLSOM,1896	Gr., I., S.	Cosmopolitan, mesophilous euedaphobiont
	Family Sminthurididae		
124	*Sminthurides aquaticus* BOURLET, 1842	H.	Holarctic, hygrophilous, epineustic species
125	*Sphaeridia pumilis* (KRAUSBAUER, 1898)	Le., Rs., Sr., S.	Cosmopolitan, ubiquist, mesophilous species
	Family Arrhopalitidae		
126	*Arrhopalites* sp.	Le., OV, St.	R. Moldova, mesothermophilous silvicolous species
	Family Katiannidae		

127	*Sminthurinus aureus* (LUBBOCK, 1862)	Le., Rs., V., S.	Palearctic, eurytopic, mesophilous species
128	*Sminthurinus bimaculatus,* AXELSON, 1902	O., Sr.	Palaearctic, hygrophilous, species of open habitats
129	*Sminthurinus elegans* (FITCH, 1863)	Rs., Sr.	European, xerothermophilous species
130	*Sminthurinus niger* (LUBBOCK, 1868)	L.	Palaearctic, eurytopic species
	Family Dicyrtomidae		
131	*Dicyrtoma fusca* (LUBBOCK, 1873)	Gr.	Holarctic, meadow macrophytobiont
132	*Ptenothrix atra* (LINNAEUS, 1868)	Le.	Palaearctic, silvicolous species
133	*Ptenothrix leucostrigata* STACH, 1957	Sr., B.	European, silvicolous species
	Family Sminthuridae		
134	*Lipothrix lubocki* (TULLBERG, 1872)	M.	Palaearctic, silvicolous macrophytobiont
135	*Allacma fusca* (LINNE, 1758)	Le.	Holarctic, silvicolous and corticophilous species
136	*Caprainea marginata* (SCHOTT, 1893)	Cp., Gr., L., S.	Palaearctic, xerothermophilous species
137	*Sminthurus viridis* (LINNAEUS, 1758)	GB, Gr., O.	Holarctic, mesophilous, meadows macrophytobiont
138	*Sminthurus wahlgreni* STACH, 1920	Gr.	European, meadows macrophytobiont