

A SYSTEMATIC CONSPECTUS OF THE INVERTEBRATE SPECIES IDENTIFIED IN THE SCREE AND LITHOSOL AREAS FROM THE NORTH -WESTERN SECTOR OF THE LEAOTA MOUNTAINS (SOUTHERN CARPATHIANS), ROMANIA

Magdalin Leonard Dorobăț, Eugen Nitzu, Ionuț Popa, Andrei Giurginca, Augustin Nae, Ștefan Baba, Codruța Mihaela Dobrescu

Key words: invertebrate fauna, Leaota, mesovoid shallow substratum (MSS), shallow subterranean habitat (SSHs), scree, new species for Romania's Fauna, Araneae, Isopoda, Collembola, Coleoptera, Diplopoda, Chilopoda

INTRODUCTION

This paper inventories the invertebrate species which, almost on the whole, with several, have been signaled for the first time on the surface of Leaota Mountains, the Bucegi Mountains Group, the East of the Southern Carpathians, Romania (Fig. 1).

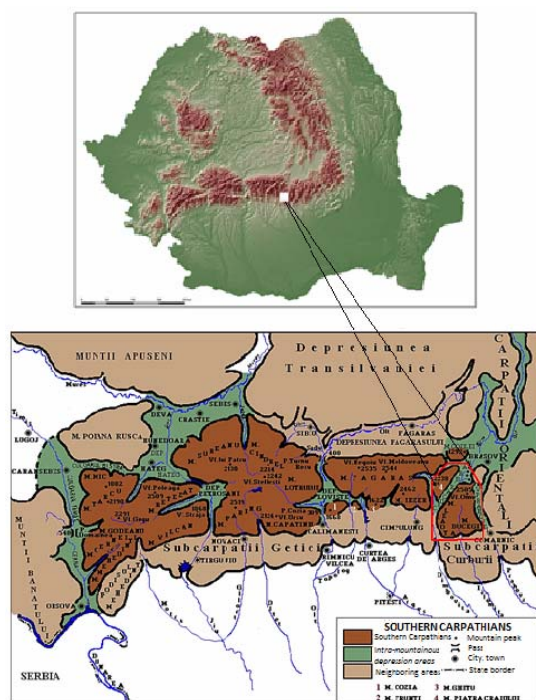


Fig.1. Localization of the Leaota Mts in Romania (in the red border)
(after www.oocities.org, modified by Dorobăț, 2016)

This was possible due to some researches carried out in 2014, 2015 and 2016, in the north-western part of the Massif. Until the beginning of our research, from the perspective of the invertebrate

fauna, Leaota Mountains have not been studied, so that these studies represent a premiere to this extent.

Zoocenotic components have been collected from the edaphic environment (limestone lithosol or made of crystalline mesometamorphic schist) and also scree, part of what speleologists call the mesovoid shallow substratum (MSS), also named *shallow subterranean habitat(s)*. These concepts that define a certain, individualized environment, with own ecologic features, has not been yet clearly defined as unitary by the researchers (Nitzu *et al.*, 2010, 2014; Mamolla *et al.*, 2016, 2017).

Giachino & Vailati consider that the MSS is defined by a set of environmental features, such as empty spaces inside the scree, the absence of light, humidity close to the saturation degree (Nitzu *et al.*, 2014).

Thus, in “*The biology of caves and other subterranean habitats*” (2009), Culver and Pipan refer to other subterranean habitats, excepting caves, including SSHs (MSS). The same authors continue the idea in the “*Shallow Subterranean Habitats: Ecology, Evolution and Conservation*” (2014), claiming that low depth subterranean habitats, namely the *Shallow Subterranean Habitats (SSHs)* are living areas for invertebrate species, which are located at depths of maximum 10 meters from the surface.

This definition is the most actual and includes a wider range of the mesovoid shallow substratums, also according to the recent bio-speleological researches and can be considered as bringing the opinions of various specialists to a common point.

These results, presented in the paper, are just a component of a research assembly which proposed the analysis of the relations between the habitat and the invertebrate species (Dorobăț, 2016), of the way in which the geologic substratum influences the distribution of some fauna components in the case of the MSS.

MATERIALS AND METHODS

The collection of invertebrates was done in nine ecological stationaries (Fig. 2).

Four stationaries were installed in the scree (three in limestone scree and one in schist scree), and other five stationaries were placed in edaphic environment in limestone lithosoil (two) and in schist lithosoil (three).

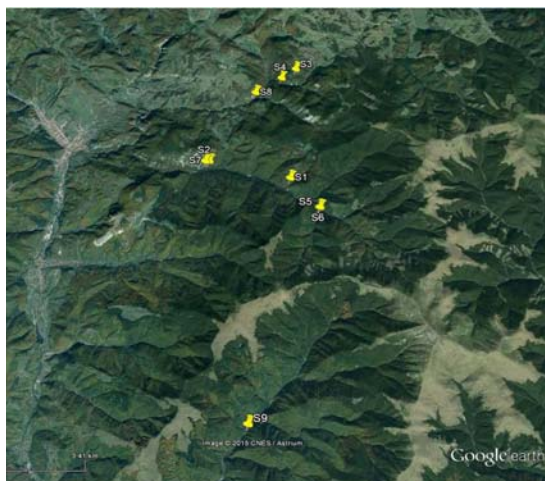


Fig. 2. Location of the ecological stationaries in the north-west sector of the Leaota Massif (Google Earth Pro)

For this purpose, we used Barber traps (for the invertebrates from the litosoil); for invertebrates from the scree we used surveys [the method described by Nitzu *et al.* (2010), Mammola *et al.* (2016) etc.] installed at different depths: 0.5m; 0.75m; 1m (for the fauna from the scree).

To this, was screened a large number of samples which contains more than 10,000 individuals and were processed data taking into account the different geological substrate (limestone and shale).

The collection of the material in the traps in the soil or from the samples was monthly realized. From the fauna content of the traps, we analyzed species belonging to the following taxonomic groups: Araneae, Isopoda, Collembola, Coleoptera, Diplopoda and Chilopoda.

RESULTS AND DISCUSSIONS

Subsequently to the collection of the fauna material in the field and the determination of the species in the laboratory, we have made the first record of the invertebrates in the north-western part of Leaota Massif (table 1).

As a result of the research, 253 taxa (248 species plus another 5 taxa which were determined only at the gender level) were identified for the first time in the Leaota Massif. As for the taxonomic analysis on units inferior to the subphylums (supra-

class, class, sub-class, supra-order, order, infra-order) there are numerous classification systems and different opinions between the specialist of the arthropods' groups.

Table 1. The record of the invertebrate species identified in Leaota Massif, on the studied areas

PHYLUM ARTHROPODA
1. Subphylum CHELICERATA
Arachnida Class
Micrura Sub-class
Megoperculata Infra-class
Araneae Order
Fam. Nesticidae
<i>Nesticus balacescui</i> Dumitrescu, 1979
Fam. Linyphiidae
<i>Centromerus serratus</i> (O.P.- Cambridge, 1875)
<i>Diplostyla concolor</i> (Wider, 1834)
<i>Gonatium rubellum</i> (Blackwall, 1841)
<i>Lepthyphantes notabilis</i> Kulczynski, 1887
<i>Lepthyphantes pallidus</i> (O.P.- Cambridge, 1871)
¹ * <i>Lesertinella kulczynski</i> (Lessert, 1910)
<i>Micrargus herbigradus</i> (Blackwall, 1854)
<i>Pelecopsis radicola</i> (L. Koch, 1872)
<i>Taramucnus bihari</i> Fage, 1931
<i>Tenuiphantes tenebricola</i> (Wider, 1834)
<i>Walckenaeria cucullata</i> (C.L. Koch, 1836)
<i>Walckenaeria cuspidata</i> Blackwall, 1833

¹ *= New species for Romania's fauna (Dorobăț, 2016; Dorobăț <i>et. al.</i> 2017)
Fam. Lycosidae
<i>Aulonia albimana</i> (Walckenaer, 1805)
<i>Pardosa lugubris</i> (Walckenaer, 1802)
Fam. Agelenidae
<i>Coelotes terrestris</i> (Wider, 1834)
<i>Histopona torpida</i> (C. L. Koch, 1834)
<i>Inermocoelotes inermis</i> (L. Koch, 1855)
<i>Tegenaria silvestris</i> L. Koch, 1872
Fam. Cybaeidae
<i>Cybaeus angustiarum</i> L. Koch, 1868
Fam. Hahniidae
<i>Cryphoea silvicola</i> (C. L. Koch, 1834)
Fam. Dictynidae
<i>Cicurina cicur</i> (Fabricius, 1793)
Fam. Liocranidae
<i>Apostenus fuscus</i> (Westring, 1851)
Fam. Gnaphosidae
<i>Drassodes lapidosus</i> (Walckenaer, 1802)
<i>Zelotes apricorum</i> (L. Koch, 1872)
<i>Zelotes subterraneus</i> (C. L. Koch, 1833)
2. Subphylum CRUSTACEA
Malacostraca Class
Eumalacostraca Sub-class
Peracarida Superorder
Isopoda Order
Oniscidea Sub-order
Fam. Ligiidae
<i>Ligidium hypnorum</i> (Cuvier, 1792)
Fam. Agnaridae
<i>Protracheoniscus politus</i> (C. Koch, 1841)
Fam. Cylisticidae
<i>Cylisticus convexus</i> (de Geer, 1778)
<i>Cylisticus transsilvanicus</i> Verhoeff, 1908
Fam. Trachelipodidae
<i>Porcellium conspersum</i> (C. Koch, 1841)
<i>Porcellium productum</i> Frankenberger, 1940
<i>Trachelipus arcuatus</i> (Budde-Lund, 1885)
3. Subphylum HEXAPODA

Entognatha Supra-class
Collembola Class
Poduromorpha Order
Fam. Neanuridae
<i>Deutonura conjuncta</i> (Stach, 1926)
<i>Deutonura plena</i> (Stach, 1951)
<i>Morulina verrucosa</i> (Börner, 1903)
<i>Pseudachorutella asigillata</i> (Börner, 1901)
<i>Pseudachorutes dubius</i> Krausbauer, 1898
<i>Pseudachorutes palmiensis</i> Börner, 1903
<i>Pseudachorutes subcrassus</i> Tullberg, 1871
<i>Thaumanura carolii</i> (Stach, 1920)
Fam. Brachystomellidae
<i>Brachystomella parvula</i> (Schaeffer, 1896)
Fam. Hypogastruridae
<i>Ceratophysella armata</i> (Nicolet, 1841)
<i>Ceratophysella granulata</i> Stach, 1949
<i>Ceratophysella luteospina</i> (Stach, 1920)
<i>Ceratophysella silvatica</i> Rusek, 1964
<i>Choreutinula inermis</i> (Tullberg, 1871)
<i>Hypogastrura purpurescens</i> (Lubbock, 1870)
<i>Schoetella unungiculata</i> (Tullberg, 1869)
<i>Xenylla mucronata</i> Axelson, 1903
Fam. Onychiuridae
<i>Deharvengiurus denisi</i> (Stach, 1934)
^{2*} <i>Deuteraphorura cebennaria</i> (Gisin, 1956)
<i>Deuteraphorura silvaria</i> (Gisin, 1952)
<i>Kalaphorura tuberculata</i> (Moniez, 1890)
<i>Protaphorura armata</i> (Tullberg, 1869)
<i>Protaphorura fimata</i> (Gisin, 1952)
<i>Protaphorura glebata</i> (Gisin, 1952)
<i>Protaphorura quadriocellata</i> (Gisin, 1947)
<i>Protaphorura subarmata</i> (Gisin, 1957)
<i>Onychiuiroides granulosus</i> (Stach, 1930)
<i>Onychiuiroides subgranulosus</i> (da Gama, 1964)
<i>Orthonychiurus rectopapillatus</i> (Stach, 1933)
<i>Tetradontophora bielensis</i> (Waga, 1842)

^{2*} = New species for Romania's fauna (Popa & Dorobăţ, 2015)
Entomobryomorpha Order
Fam. Tomoceridae
<i>Plutomurus carpaticus</i> Rusek & Weiner 1978
<i>Pogonognathellus flavescens</i> (Tullberg, 1871)
<i>Pogonognathellus longicornis</i> (Muller, 1776)
<i>Tomocerus vulgaris</i> (Tullberg, 1871)
<i>Tomocerus minor</i> (Lubbock, 1862)
Fam. Isotomidae
<i>Desoria olivacea</i> (Tullberg, 1871)
<i>Desoria violacea</i> (Tullberg, 1876)
<i>Desoria tigrina</i> Nicolet, 1842
<i>Folsomia alpina</i> Kseneman, 1936
<i>Folsomia quadrioculata</i> (Tullberg, 1871)
<i>Isotomurus cf. antennalis</i> Bagnall, 1940
<i>Isotomurus fucicolus</i> Reuter, 1891
<i>Pseudisotoma sensibilis</i> (Tullberg, 1876)
<i>Vertagopus cinereus</i> (Nicolet, 1842)
<i>Vertagopus westerlundii</i> (Reuter, 1898)
Fam. Entomobryidae
<i>Entomobrya lanuginosa</i> (Nicolet, 1841)
<i>Entomobrya marginata</i> (Tullberg, 1871)
<i>Entomobrya multifasciata</i> (Tullberg, 1871)
<i>Entomobrya muscorum</i> (Nicolet, 1842)
<i>Entomobrya nivalis</i> (Linnaeus, 1758)
Fam. Lepidocyrtidae
<i>Lepidocyrtus cyaneus</i> Tullberg, 1871
<i>Lepidocyrtus lignorum</i> (Fabricius, 1775)
<i>Lepidocyrtus serbicus</i> Denis, 1933
<i>Pseudosinella alba</i> (Packard, 1873)
Fam. Orchesellidae
<i>Orchesella maculosa</i> Ionesco, 1915
<i>Orchesella multifasciata</i> Stscherbakow, 1898
<i>Orchesella pontica</i> Ionesco, 1916
<i>Orchesella pseudobifasciata</i> Stach, 1960

<i>Orchesella xerothermica</i> Stach, 1960
Fam. Heteromuridae
<i>Heteromurus major</i> (Moniez, 1889)
Neelipleona Order
Fam. Neelidae
<i>Neelides minutus</i> (Folsom, 1901)
<i>Neelus murinus</i> Folsom, 1896
Symphyleona Order
Fam. Katiannidae
<i>Sminthurinus aureus</i> (Lubbock, 1862)
<i>Sminthurinus elegans</i> (Fitch, 1862)
<i>Sminthurinus niger</i> (Lubbock, 1868)
Fam. Arrhopalitidae
^{3*} <i>Pygmarrhopalites cochlearifer</i> (Gisin, 1947)
<i>Pygmarrhopalites pygmaeus</i> (Wankel, 1860)
<i>Pygmarrhopalites sericus</i> (Gisin, 1947)
^{3*} = New species for Romania's fauna (Popa & Dorobăţ, 2015)
Fam. Sminthuridae
<i>Allacma fusca</i> (Linnaeus, 1758)
<i>Caprainea marginata</i> (Schott, 1893)
<i>Lipothrix lubbocki</i> (Tullberg, 1872)
<i>Spatulosminthurus flaviceps</i> (Tullberg, 1871)
Fam. Bourletiellidae
<i>Deuterosminthurus bicinctus</i> (Koch, 1840)
Fam. Dicyrtomidae
<i>Dicyrtoma fusca</i> (Lubbock, 1873)
<i>Dicyrtomina minuta</i> (Fabricius, 1783)
<i>Dicyrtomina ornata</i> (Nicolet, 1842)
<i>Ptenothrix atra</i> (Linnaeus, 1758)
Insecta Class
Coleoptera Order
Fam. Carabidae
<i>Abax parallelus</i> (Duftschmid, 1812)
<i>Abax parallelepipedus</i> (Piller et Mitterpacher, 1783)
<i>Bembidion (Ocydromus) stephensii</i> Crotch, 1866
<i>Carabus auronitens escheri</i> Palliard, 1825
<i>Carabus cancellatus</i> Illiger 1728
<i>Carabus irregularis</i> Fabricius, 1792
<i>Carabus coriaceus</i> Linnaeus, 1758
<i>Carabus linnei</i> Panzer, 1812
<i>Carabus planicollis</i> Kuster, 1846
<i>Carabus violaceus</i> Linnaeus, 1758
<i>Cychrus caraboides</i> Linnaeus, 1758
<i>Duvalius dieneri</i> (Csiki, 1910)
<i>Molops piceus</i> (Panzer, 1793)
<i>Nebria joksichii hoepfneri</i> Dejean, 1826
<i>Platynus assimilis</i> (Paykull, 1790)
<i>Platynus glacialis</i> Reitter, 1877
<i>Poecilus lepidus</i> (Leske, 1785)
<i>Pterostichus findeli</i> Dejean, 1828
<i>Pterostichus foveolatus interruptistriatus</i> Bielz, 1850
<i>Pterostichus jurinei</i> (Panzer, 1803)
<i>Pterostichus niger</i> (Schaller, 1783)
<i>Pterostichus oblongopunctatus</i> (Fabricius, 1787)
<i>Pterostichus pilosus wellensii</i> (Drapiez, 1819)
<i>Pterostichus unctulatus</i> (Duftschmid, 1812)
<i>Trechus pulchellus</i> Putzeys, 1846
<i>Trichotichnus laevicollis</i> (Duftschmid, 1812)
Fam. Staphylinidae
<i>Aleochara diversa</i> (Sharp, 1869)
<i>Aleochara erythroptera</i> Gravenhorst, 1806
<i>Aleochara</i> sp.
<i>Anotylus (Oxytelops) tetracarinatus</i> (Block 1799)
<i>Anotylus insecatus</i> (Gravenhorst, 1806)
<i>Anotylus sculpturatus</i> (Gravenhorst, 1806)
<i>Anthobium melanocephalum</i> (Illiger, 1794)
<i>Atheta crassicornis</i> (Fabricius, 1792)
<i>Atheta laevana</i> (Mulsant et Rey, 1873)
<i>Atheta sodalis</i> (Erichson, 1837)
<i>Atheta</i> sp.
<i>Bothridiopisalia subcarpathica</i> Roubal, 1931
<i>Bryaxis heydeni</i> (Reitter, 1879)
<i>Bryaxis sculptifrons</i> (Reitter, 1880)

<i>Deliphrosoma prolongatum</i> (Rottenberg, 1873)
<i>Leptusa subcarpathica</i> Roubal, 1931
<i>Leptusa eximia</i> Kraatz, 1856
<i>Lordithon lunulatus</i> (Linnaeus, 1761)
<i>Megarthritis depressus</i> (Paykull, 1789)
<i>Ocalea</i> sp.
<i>Ocypus biharicus</i> (J. Müller, 1926)
<i>Ocypus nitens</i> (Schränk, 1781)
<i>Ocypus olens</i> (Müller, 1764)
<i>Omalium caesum</i> Gravenhorst, 1806
<i>Omalium riparium</i> Thomson, 1857
<i>Omalium rivulare</i> (Paykull, 1789)
<i>Omalium validum</i> Kraatz, 1858
<i>Oxyopoda opaca</i> (Gravenhorst, 1802)
<i>Parabolitobius inclinans</i> (Gravenhorst, 1806)
<i>Philonthus decorus</i> (Gravenhorst, 1802)
<i>Philonthus splendens</i> (Fabricius, 1792)
<i>Proteinus laevigatus</i> Hochhuth, 1872
<i>Quedius (Raphirus) collaris</i> Erichson, 1840
<i>Quedius mesomelinus</i> (Marshall, 1802)
<i>Stenus glacialis</i> Heer, 1838
<i>Stenus lustrator</i> Erichson, 1839
<i>Syntomium aeneum</i> (P. W. & J. Müller, 1821)
<i>Tachinus corticinus</i> Gravenhorst, 1802
<i>Tachinus lignorum</i> Linnaeus, 1758
<i>Tachinus marginellus</i> Fabricius, 1781
<i>Tachinus pallipes</i> (Gravenhorst, 1806)
<i>Taxicera deplanata</i> (Gravenhorst, 1802)
<i>Tychobythinus ottonis</i> Ganglbauer, 1896*
<i>Myrmecocephalus (Falagria) concinnus</i> (Erichson, 1840)
<i>Tachyporus nitidulus</i> (Fabricius 1781)
Fam. Corylophidae
<i>Sericoderus lateralis</i> (Gyllenhal, 1827)
Fam. Histeridae
<i>Margarinotus striola</i> (Sahlberg, 1819)
Fam. Silphidae
<i>Nicrophorus vespilloides</i> Herbst, 1784
<i>Oiceoptoma thoracicum</i> (Linnaeus, 1758)
<i>Phosphuga atrata</i> (Linnaeus, 1758)
Fam. Leiodidae
<i>Catops coracinus</i> Kellner, 1846
<i>Catops fuscus</i> (Panzer, 1794)
<i>Catops kirbyi</i> (Spence, 1815)
<i>Catops picipes</i> (Fabricius, 1792)
<i>Catops subfuscus</i> Kellner, 1846
<i>Catops tristis</i> (Panzer, 1794)
<i>Choleva (Cholevopsis) spadicea</i> (Sturm, 1839)
<i>Ptomaphagus varicornis</i> (Rosenhauer, 1847)
<i>Scioldrepoides watsoni</i> (Spence, 1815)
Fam. Scydmaenidae
<i>Cephenium majus</i> Reitter, 1881
<i>Euconus (Tetramelus) oblongus</i> (Sturm, 1838) Reitter, 1881
<i>Stenichmus pelliceus</i> (Holdhaus, 1908)
Fam. Elateridae
<i>Zoroachros quadriguttatus</i> (Laporte de Castelnau, 1840)
<i>Dima elateroides</i> Charpentier, 1825
Fam. Dermestidae
<i>Dermestes (Montandonia) latissimus</i> Bielz, 1850
Fam. Nitidulidae
<i>Cychramus variegatus</i> (Herbst, 1792)
<i>Epuraea melanocephala</i> (Marshall, 1802)
<i>Epuraea marseuli</i> Reitter, 1872
Fam. Rhizophagidae
<i>Rhizophagus parallelcolis</i> Gyllenhal, 1827
Fam. Cryptophagidae
<i>Atomaria atrata</i> Reitter, 1875
<i>Atomaria bicolor</i> Erichson, 1846
<i>Atomaria carpathica</i> Reitter, 1875
<i>Cryptophagus pilosus</i> Gyllenhal, 1828
<i>Cryptophagus pubescens</i> Sturm, 1845
<i>Cryptophagus montanus</i> C. Brisout deBarneville 1863
Fam. Geotrupidae
<i>Anoplotrupes stercorosus</i> (Hartmann in L.G. Scriba, 1791) Reitter, 1872

Fam. Aphodiidae
<i>Limarus maculatus</i> (Sturm, 1800)
Fam. Lathridiidae
<i>Dienerella (Cartoderema) ruficollis</i> (Marshall, 1802)
<i>Cartodere nodifer</i> (Westwood, 1839)
Fam. Endomychidae
<i>Sphaerosoma pilosum</i> (Panzer, 1793)
<i>Sphaerosoma globosum</i> (Sturm, 1807)
Fam. Tenebrionidae
<i>Necrophilus subterraneus</i> (Dahl, 1807)
Fam. Cerambycidae
<i>Evodinus clathratus</i> (Fabricius, 1793)
Fam. Chrysomelidae
<i>Timarcha rugulosa</i> Herrich-Schäffer, 1838
Fam. Curculionidae
<i>Acalles camelus</i> (Fabricius, 1792)
<i>Otiorynchus (Dorimerus) obtusus</i> Boheman, 1843
<i>Otiorynchus (Tournieria) coarctatus</i> Stierlin, 1861
<i>Otiorynchus (Tournieria) rotundatus</i> Seibold, 1847
<i>Otiorynchus (Dorymerus) kollari</i> Gyllenhal, 1834
<i>Otiorynchus deubeli</i> Ganglbauer, 1896
<i>Otiorynchus inflatus</i> Gyllenhal, 1834
<i>Otiorynchus raucus</i> (Fabricius, 1777)
<i>Otiorynchus geniculatus</i> (Germar, 1817)
<i>Rutera hypocrita</i> (Boheman, 1837)
<i>Xyleborus dispar</i> (Fabricius, 1792)
<i>Xylosandrus germanus</i> (Blandford, 1894)
4. Subphylum MYRIAPODA
Clasa Diplopoda
Chilognatha Sub-class
Glomerida Order
Fam. Glomeridae
<i>Glomeris hexasticha</i> Brandt, 1833
<i>Glomeris connexa</i> C.L.Koch, 1847
<i>Glomeris</i> sp.
Fam. Trachysphaeridae
<i>Trachysphaera acutula</i> (Latzel, 1884)
Fam. Polyzoniidae
<i>Polyzonium germanicum</i> Brandt, 1837
Fam. Julidae
<i>Leptoiulus trilobatus</i> (Verhoeff, 1894)
<i>Megaphyllum projectum</i> Verhoeff, 1894
<i>Unciger transsilvanicus</i> (Verhoeff, 1899)
Fam. Mastigophyllidae
<i>Heterobraueria scopifera</i> Verhoeff, 1898
Fam. Paradoxosomatidae
<i>Strongylosoma stigmatosum</i> (Eichwald, 1830)
Fam. Polydesmidae
<i>Polydesmus montanus</i> Daday, 1889
<i>Polydesmus burzenlandicus</i> Verhoeff, 1925
<i>Polydesmus complanatus</i> (Linnaeus, 1761)
<i>Polydesmus</i> sp.
Chilopoda Class
Pleurostigmophora Sub-class
Lithobiomorpha Order
Fam. Lithobiidae
<i>Strigamia engadina</i> (Verhoeff, 1935)
<i>Strigamia transsilvanica</i> (Verhoeff, 1928)
Scolopendromorpha Order
Fam. Cryptopidae
<i>Cryptops hortensis</i> (Donovan, 1810)

CONCLUSIONS

Methods used for the capturing of the invertebrates were efficient for the invertebrates in the Isopoda, Collembola, Coleoptera, Diplopoda and Chilopoda taxonomic groups and less efficient for the ones regarding the Araneae Order.

We identified, in premiere, 248 invertebrate species in Leaota, and these on a relatively small surface compared to the entire surface of the Massif. This shows the need of continuing the researches on the whole surface of Leaota Mountains, as it is extremely probable to identify new species compared to the ones that we have previously mentioned.

We identified three new species for the Romanian fauna, and also rare or endemic species for Romania or for the Carpathians.

Between the free interclast spaces, scree and also lithosoil are proven to be habitats with ecologic particularities which host a large biodiversity, irrespective of the limestone or schist substratum.

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ABSTRACT

Unlike the Piatra Craiului Massif, spectacular through its developed karstic relief, where multiple caves develop and also, scree and other types of mesovoid shallow substratum (MSS), named also shallow subterranean habitats (SSHs), Leaota Massif has not been studied nearly at all from the micro-fauna perspective, until recent years, in spite of the fact that it is an accessible Massif. Moreover, from the petrology perspective, Leaota Massif presents a much higher diversity compared to the Piatra Craiului Massif; on the surface of these mountains occur sedimentary, metamorphic and also igneous (magmatic) rocks.

In fact, we can say that, in Leaota Massif, only the relief developed on sedimentary and metamorphic rocks is defining, as the igneous rocks occurs just as exception, located only as some intrusion.

Due to these reasons, during the three years (2014-2016), we have collected the invertebrate fauna from two different type of lithosoil and scree (limestone and crystalline schists), considering that the geological diversity of the substrate leads to a specific diversity of invertebrates.

Were identified for the first time in the Leaota Massif 248 species, among these, three new species for Romania's Fauna.

This paper is part of a wider project that aims to study the connections between the type of lithologic substrate and the distribution of some zoocenotic components.

AUTHORS' ADDRESS

DOROBĂȚ MAGDALIN LEONARD, DOBRESCU CODRUȚA MIHAELA - University of Pitești, Faculty of Science, Physical Education and Informatics, Department of Natural Science, Târgu din Vale Street, No. 1, 110040 - Pitești, Romania, e-mail: leonard.dorobat@upit.ro; codrutza_dobrescu@yahoo.com;

NIȚU EUGEN, POPA IONUȚ, GIURGINCA
ANDREI, NAE AUGUSTIN, BABA ȘTEFAN -
"Emil Racoviță" Institute of Speleology , Calea 13
Septembrie, No. 13, 050711 - Bucharest, Romania, e-
mail: eunitu@yahoo.com; ionut.popa@iser.ro;
sankao2@yahoo.com; augustin.iser@gmail.com;
stefan.baba@iser.ro;

Corresponding author: DOBRESCU
CODRUȚA MIHAELA, e-mail:
codrutza_dobrescu@yahoo.com

