

Data to the vegetation of mushrooms in the Upper-Tisa Region

Márta Béres

Introduction

All the rivers of the historical Maramuresh (the Maramuresh Basin and the surrounding mountain ring) belong to the water system of River Tisa. The ecological conditions of the area within Romanian territory, constituting 3,217 sq. km, allowed the formation of a rich vegetation of mushrooms.

In Maramuresh, gathering mushrooms is an ancient activity, and is still regularly (seasonally) done. It is also done in an organized form, regarding especially certain species of the genus *Boletus* (*B. aerus*, *B. edulis*, *B. aestivalis*). Furthermore, *Cantharellus cibarius* is also purchased at the collecting centres. The organized gathering of *Armillariella mellea* has been discontinued.

At the vegetable markets mushrooms other than the above-mentioned species are also sold (we enlist only the most common ones), such as: (*Russula virescens*, *R. vesca*, *R. integra*, *R. cyanoxantha*, *Lactarius glaucescens*, *L. piperatus*, *L. volemus*, *Grifola umbellata*, *Macrolepiota procera*, *Laetiporus sulphureus*, *Agaricus sp.*, *Ramaria sp.*) etc.

The scientific value of the mushroom vegetation in Maramuresh is strengthened by mushrooms that grow here but are declared to be rare or becoming rare nationwide or in Europe: *Caloscypha fulgens* (Pers.) Boud., *Spathularia clavata* (Schff.) Sacc., *Mitrula paludosa* (Fr.: Fr.), *Sarcodon laevigatum* (Swartz.) Quél., *Hydnellum suaveolens* (Scop.:Fr.) P.Karst., *Clavariadelphus pistillaris* Fr., *Hygrocybe calyptraeformis* (Berk. et Br.) Fayod., *Lyophyllum ovisporum* Reid., *Melanoleuca brevipes* (Bull.: Fr.) Pat., *Catathelasma imperiale* (Fr.) Sing., *Sarcomyxa serotina* (Schnader: Fr.) Karst., *Amanita caesarea* (Scop.: Fr.) Pers. ex Schw., *Macrolepiota subsquarrosa* (Lasq.) Bon., *Xerocomus parasiticus* (Bull.: Fr.) Quél.

Keywords: mushrooms, Upper Tisa Region, Romania

Material and methods

The mushroom vegetation is an enormous biological and economic treasure, whose survey and enlistment are important. In our study, according to gathering sites, we have grouped the mushrooms from the Maramureshian Tisa region into two charts: the first consists of the species gathered from areas close to River Tisa, whereas the second chart, as a supplement, provides a list of species from the regions of 3 left-

side tributaries of River Tisa (species found in the latter sites but already enlisted in the first chart are not included in the second chart).

The literature provides only few data about the mushrooms of the Upper-Tisa Region. L. Hollós, in his works mentioned in the bibliography, gives an account of the following Gasteromycetes: *Itiphallus impudicus* (L.) Fisch., *Calvatia candida* (Rostk.) Hol., *Lycoperdon furfuraceum* Schaeff., *L. hiemale* (Bull. p.p.) emend Vitt.

From the Romanian territory of Maramuresh a total of 17 species (of that six subterranean: *Tuber aestivum* Vitt., *Choiromyces meandriformis* Vitt., *Picoa carthusiana* Tul., *Elaphomyces hirtus* Tul., *E. aesperulus* Vitt., *Hysterangium fragile* Hesse) were found. Of these we found 3 species.

I started gathering and dissecting mushrooms for the Maramureshian Muzeum in 1977; these species are the subject of the present study, while I used certain species from the study published about my collecting trip with mycologist K. László. Some species were re-examined (primarily the ones whose identification was difficult), or classified by Margit Babos, Kálmán László and Dénes Pázmány, based on the material and description sent to them. I hereby thank them for their help.

An account of the natural conditions influencing mushrooms

I. Along the Upper-Tisa

This region lies along the border of Romania and Ukraine, in the N-NW part of Romania, stretching 62 km long and 50-900 m wide between the villages Valea Visuelui (at an altitude of 337 m) and Piatra (190 m). Administratively it belongs to 12 villages/towns in county Maramuresh.

Geomorphologically, data provided are from two regions: (a) the flood plain of River Tisa, where abandoned river-beds, ox-bow lakes, tributaries and levees disrupt the monotony of the relief, (b) terraces I-IV, with smaller or larger interruptions, which can be traced along River Tisa.

Their substratum is Pleistocene, Holocene shales, sands, deluvium and colluvial deposits. Their soil is usually acidic alluvial soil. In the flood plain it is rough gravelly and sandy alluvial soil, on elevated parts it is alluvial soils humified to various degrees, gley, pseudogley and marshy meadow soils. On the 'Livada' terrace region there is yellowish brown forest soil.

Its climate belongs to the Df. b. k. sub-province according to Köppen, which is characterized by a rainy, boreal climate, cold winters and cool summers - even in the hottest month temperatures are below 22°C. The average annual temperature calculated over many years is 8°C. The first day of the year with a temperature below zero is October 6 on average, the last one is April 28. The average annual precipitation is 948.6 mm.

As regards flora, plant communities in the flood plains along the Upper-Tisa are influenced by water; their stands are steadily covered by water many times a year (at spring thaw, at times of torrential rains and floods).

The strip along the banks are characterized by bushy willow groves consisting of various species of willow. High tree stands usually stretch only in a narrow strip. (At certain sections they have been thinned or cut down completely in recent years.) In the countryside of Teceu Mic, Remeți, Săpânța, Câmpulung pe Tisa, there are significant willow-poplar gallery forests left, in which the species *Populus nigra*, *Salix alba*, *S. purpurea*, *S. triandra* etc., as well as the tree species *Alnus glutinosa*, *Acer campestre*, *Prunus padus* and in the shrub stratum *Sambucus nigra*, *Crataegus monogyna*, *Cornus sanguinea*, *Frangula alnus*, *Euonymus europaeus* etc. grow. With *Humulus lupulus*, *Vitis vinifera*, *Echinocystis lobata*, and *Clematis vitalba* climbing on them they constitute an impenetrable thicket, and cast a heavy shadow. Areas of deforestation are covered densely with stands of *Polygonum cuspidatum* and *Helianthus tuberosus*.

Grasses are more common at the edges of gallery forests, and forest belts at higher altitudes on the terraces. They are hygrophilous, meso-hygrophilous and mesophytic mosaic plant communities of secondary meadows, hayfields and pastures. Their areas are increasingly taken up by field (root) and ruderal plants.

In the village of Săpânța on the second terrace of the River Tisa, at an altitude of 270 m at the so-called 'Livada', an original forest community survives on 11.6 ha. Its main stand consists of specimens of *Quercus robur* as old as 150 years (0.58 m diameter, height of 23 m) and trees from natural regeneration. Beside the oak forest, in the place of deforestation, the Sighet Forest Inspectorate ('Ocolul Silvic Sighet') created a park forest consisting of 39 planted species in 1965 (a dendrological reserve).

II The environment of the tributaries of River Tisa

Along the lower section of the River Iza, northern, northwestern and northeastern hill slopes of Dealul Solovan (270-616 m) facing the river belong here. Their substratum is sandstone, clayey shale. Their soil is yellowish brown and brown forest soil. Their forest communities are *Quercus-petrea-Carpinetum betuli*, *Carpino-Fagetum silvaticae* and their grass communities are known from the literature as *Agrostio-Festucetum rubrae*, *Arrhenatheretum elatioris*.

The Cărbunărești Stream rises at the foot of the volcanic plateau, crosses the piedmonts and flows into River Tisa at the village of Teceu Mic. Its substratum is talus, sandstone, clayey shale and Quaternary gravelly sand. Its flora is oak *Quercus robur* forests at a few places, alder (*Alnus glutinosa*) forests along the stream, and oak forests mixed with beech forests at higher altitudes.

The catchment area of the Săpânța Stream is on the Ignis volcanic plateau (also called Platoul Oaș Maramureș) at an average altitude of 900 m. Its substratum consists of pyroxene-andesite originating from Quaternary volcanism, while at the foot of the plateau it consists of accumulations of talus, then Mesozoic and Quaternary deposits. Its soil types are acidic brown forest soils (podsolized, eubasic, argillaceous, alluvial) and sphagnous swamps. Its vegetation belongs to the Carpathian flora region, to the oak zone. Around 75% of the forest stand is beech, interspersed by spruce forests (17%), at its lower section there are hornbeam-oak forests, at the confluence willow

forests and all along the riverbed alder forests are found. As a result of deforestation, groved pastures (500 ha), alpine pastures, moors and peat bogs have formed. Their plant communities are known from the literature as *Festucetum rubrae montanum*, *Molinietum coeruleae*, *Leersietum oryzoidis*, *Nardo-Juncetum*, *Junco-Molinietum*, *Nardo-Molinietum*. Because of intense grazing *Nardus stricta* is becoming more and more common. Peat bogs are rich in glacial relict species. The climate of the volcanic plateau is wet (annual average precipitation is 1200 mm) and the narrow valleys provide high humidity for the nearby forests.

The mushroom vegetation of the areas surveyed

I. Mushrooms of the Upper-Tisa Region

The mushroom vegetation of the Upper-Tisa Region is primarily determined by the climate, soil conditions, and plant communities, to which anthropogenic factors largely contribute.

The taxonomical classification of mushrooms gathered here are enlisted in Table 1, in which I provided the exact locality, data concerning the habitat, and the date of collection. For classification I used the taxonomy appearing in the *Handbuch für Pilzfreunde*, Jena, 1975 by Michel - Henning - Kreisel (page 189, vol. 6) as a basis. Within the system species appear in an alphabetical order. Most of the mushrooms enlisted have their documentary material, from a dissection following the Herpell method, at the Department of Natural History in the Maramureshului Muzeum (Table 1).

The mushrooms classified so far belong to 26 families. Families representing the highest number of species are Trichomataceae with 12, Russulaceae with 8, Boletaceae with 6 species (the sporophores of the latter appeared in the Livada oak forest and forest park), Coprinaceae with 7, Strophariaceae with 5, Polyporaceae with 4 species, mainly appearing in the flood plains. Genera are generally characterized by a low number of species. Genera with the highest number of species are *Russula* with 5, *Pholiota* with 4, *Coprinus* with 4, and *Lyophyllum* with 3 species. These are not final data, for we have more collected material yet to be classified, and surveys in the field are not complete either. The material still unclassified is from the flood plains, and contain primarily small, nitrophilous, ephemeral species.

Regular work in the fields and continuous surveys are necessary.

From an alimentary physiological point of view, taxa found have so far been distributed numerically as follows: saprobionts are represented by the highest number (34) of species, 19 species live in a mycorrhizal connection, 9 parasite species were present, and there were 8 saproparasites. Out of the total number of species (70) 45 live on the ground (on humus, leaf-mould, twigs or in grass). A total of 31 mushrooms live on wood (live or dead). The mycorrhizal species are exclusively from the 'Livada' site.

The mushrooms enlisted are considered to be common species, with some exceptions such as *Pluteus variabilicolor* Babos (det. Babos, M.). It was found in two consecutive years in ruderal soil with sawdust, but later, due to construction and soil moving, we did not find any more sporophores. Sporophores of *Lyophyllum ovisporum* Reid. have also disappeared after gardening activities. Sporophores of *Melanoleuca brevipes* (Bull.: Fr.) Pat. appeared in patches of various sizes at the city boundaries, on rubbish dumpsites with sawdust. People use it as food. In the 'Livada' forest park character species appeared in the *Pinus* plantation: under *Chroogomphus rutilus* we found the mycorrhizal mushroom *Suillus granulatus*, while under *Larix decidua* *Suillus elegans* was found.

2. Mushrooms of the environment of the tributaries

These are mostly large forests in which thick leaf-mould and pine-needles accumulated on the ground. The moss strata, the special microclimate of the forests and the humid air of the narrow valleys all permit the establishment of an abundant mushroom vegetation representing a wide variety of species and being capable of growing sporophores (Table 2.)

Our table includes 126 taxa from 36 families (122 species and 4 variants), of which one is a subterranean mushroom (*Elaphomyces granulatus* Fr., det. Pazmany, D.).

The surroundings of the Săpânța Stream is one of the most significant habitats of *Boletus* spp. in Maramureș. At a single purchasing centre 1870 kg were purchased in 1998, which is only a tiny part of the mushrooms collected here (by organizations or holiday-makers). There are several collecting centres that purchase boletuses from this region.

Pastures are much poorer in species. Apart from the typical *Calvatia caellata* (Bull.) Morgan yielding a number of sporophores, and *Marasmius oreades* (Bull.: Fr.) Fr. appearing in the form of witch-circles, *Stropharia semiglobata* (Batsch.: Fr.) Qel., and *Panaeolus semiovata* (Sow.: Fr.) Nannf. have become numerous because of grazing.

In the followings we highlight some rare species: *Anthurus archeri* (Berk.) E. Fischer, the population of which is increasing, is reported only from here in Romania. There are 5 places known in Maramureș, of which 4 are near River Tisa, with several sporophores. *Phaeolepiota aurea* (Matt.: Fr.) Mre. appeared in 2 habitats in this region (on the banks of the Săpânța Stream, among young spruce and common nettle (*Urtica dioica*) and on the banks of the Cărbunărești Stream, under hazel and common alder (*Alnus incana*). I found it in Maramureș in two other localities: in Polonenca (the village of Bistra) at an altitude of 1200 m in a common nettle field, and on the flood plain of the Luhei Stream among *Alnus incana* and *Urtica dioica*. I found the following mushrooms in only one habitat in Maramureș: *Omphalotus olearius* (DC.) Sing. on a rotten tree trunk, which most likely had been an apple tree, and *Tylopilus felleus* (Bull.: Fr.) P. Karst. at one of the oxbows of Săpânța Stream, in a spruce forest, which has been cut down since then, thus the survival of the species is uncertain.

Porphyrellus pseudoscaber (Secr.) Sing. is regarded rare even in the region of Maramuresh; from here one locality is known: Săpânta-Colibi, the edge of the forest. *Strobilomyces floccopus* (Vahl.: Fr.), was encountered in the valley of the Săpânta Stream, in an oak grove; it was spotted in two more localities in Maramuresh.

Summary

The study enlists the mushroom species collected in the drainage basin of River Tisa, 196 taxa altogether, in 2 tables. The first table contains 70 taxa found in the floodplain and on the terraces of River Tisa, while the second table contains 126 taxa from the surroundings of the lower section of River Iza, the region of the streams Săpânta and Cărbunărești, all of which are tributaries of River Tisa in Maramuresh. We have highlighted some economically important and some rare mushroom species. The environment of River Tisa is an area of significant mushroom vegetation. The conservation of its natural-ecological endowments, in the present condition at least, is an important task, because these characteristics have combined effects that influence the mushroom vegetation together.

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Márta Béres
Museum of Maramureș
44225 Sighetu Marmăției
Cart. 1 Mai, Bl. 4. Ap. 5.
Romania

Table 1.

ASCOMYCETES

PEZIZALES

Pezizaceae

1. *Peziza cerea* Sow. Ex Merat.
2. *Peziza varia* (Hedwig : Fr.) Boud.-

Morchellaceae

3. *Morchella esculenta* (L.) Pers.

Sarcoscyphaceae

4. *Sarcoscypha coccinea* (Fr.) Lambotte

- S.M., on sandy soil, 11.07.1984. (det. K. László)
S.M., on bare calcareous soil, garden, 30.04.1982
S.M. on meadow of Tisa, open wood-edge, amongst grass, 19.04.1991
S.M. Câmpu Negru, shrubby place, on rotting twigs, 19.04.1991
Sap: Livada, on rotting twigs, 02.04.1990

BASIDIOMYCETES

PORIALES

Laetiporaceae

5. *Laetiporus sulphureus* (L. : Fr.) Pilat

Coriolaceae

6. *Trametes versicolor* (L. : Fr.) Pilat

7. *Daedalea quercina* (L. : Fr.) Pilat

Ganodermataceae

8. *Ganoderma lucidum* (Fr.) Karst.

Hymenochaetaceae

9. *Inonotus hispidus* (Bull. : Fr.) Karst.

- S.M meadow of Tisa, on Salix, 05.05.1981
Teceu Mic, meadow of Tisa, in open wood, on stumps, 02.10.1984
Sap. Livada, on stumps of deciduous trees 12.10.1984
Sap. Livada, on Quercus stumps, 03.09.1979
S.M. valley Iza on Tilia, 01.09.1985
S.M. valley Tisa, on Acer, 01.09.1985

CANTHARELLALES

Fistulinaceae

10. *Fistulina hepatica* (Schff.) Fr.

Sap. Livada, on stumps of Quercus, 12.10.1984

POLYPORALES

Polyporaceae

11. *Fomes fomentarius* (L. : Fr.) Gill

12. *Pleurotus ostreatus* (Jacq. : Fr.) Kummer

13. *Polyporus arcularius* (Batsch.) Fr.

14. *Polyporus squamosus* (Huds.) Fr.

- Câmpulung pe Tisa, bank of Tisa, on stump Populus, 28.07.1979
S.M. in garden on a *Juglans regia*, 22.12.1977
Sarasău, on bank of Tisa, on rotting twigs on the soil 07.09.1993.
Sap. Livada, on rotting twigs, 07.09.1993.
Sap. and Câmpulung pe Tisa, on *Populus nigra* and *Juglans regia*, on bank of Tisa, 28.07.1979.

| | | Table 1. continue |
|--|---|-------------------|
| Schizophyllaceae | | |
| 15. Schizophyllum commune Fr. | Sap. Livada, on rotting twigs or wody debris, 12.09.1990 | |
| AGARICALES | | |
| Hygrophoraceae | | |
| 16. Camarophyllum pratensis (Pers.: Fr.) Kummer | Sarasău, in grassland, on bank of Tisa, 15.11.1984. S.M. on meadow of Tisa in grassy lace, 07.11.1984. | |
| Tricholomataceae | | |
| 17. Armillariella mellea (Vahl.: Fr.) Karst. | Sap. on stumps ad truncum, 02.09.19882. | |
| 18. Collybia dryophila (Bull.: Fr.) Kummer | Sap. Livada, on the soil, 07.09.1994 | |
| 19. Flammulina velutipes (Cart.: Fr.) Sing. | S.M. in garden on a Juglans regia, 22a, 01.12.1978. | |
| 20. Lyophyllum decastes (Fr.) Sing. | S.M. Cămara, garden, on the soil, 07.11.1984 | |
| 21. Lyophyllum fumosum (Pers.: Fr.) Kühn § Romagn. | Câmpulung pe Tisa on decaying sawdust, 02.10.1984. | |
| 22. Lyophyllum ovisporum Reid. | S.M. Cămara on the soil, 07.11.1984, (det. K. László) | |
| 23. Marasmius oreades (Bull.: Fr.) Fr. | S.M. In grassy place poplar wood, 30.05.1985. | |
| 24. Marasmius rotula (Scop.: Fr.) Fr. | Câmpulung pe Tisa, on stump of Populus, 02.10.1984 Sap. Livada, on rotting twigs, 07.09.1993. | |
| 25. Melanoleuca brevipes (Bull.: Fr.) Pat. | S.M. on decaying sawdust, 24.04.1983, (det. K. Laszlo) | |
| 26. Mycena viscosa (Secr.) R.Mre. | S.M. ad truncum Salix, 26.08.1982. | |
| 27. Mycena galericulata (Scop.: Fr.) S. F. Gray. | Sap. Livada, on stumps, 07.08.1990. | |
| 28. Oudemansiella longipes (Bull.) Moser | Sap. Livada, on the soil, sub Quercus, 07.09.1994. | |
| Rhodophyllaceae | | |
| 29. Clitopilus prunulus (Scop.: Fr.) Kummer | Sap. Livada, wood-edge, on the soil, 07.09.1994. | |
| Cortinariaceae | | |
| 30. Gymnopilus spectabilis (Fr.) Sing. | S.M. Grădina Morii, on the roots Quercus robur, 26.08.1984. | |
| Amanitaceae | | |
| 31. Amanita phalloides (Vaill.: Fr.) Secr. | Sap. Livada on the soil, 07.08.1990 | |
| 32. Amanita vaginata (Bull.: Fr.) Quéf. | Sap. Livada, on the soil, 20.06.1986, (det. K. László) | |
| Pluteaceae | | |
| 33. Pluteus depauperatus Romagn. | S.M. Street Eminescu, on stump Aesculus, 26.10.1984 (det. K. László) | |
| 34. Pluteus variabilicolor Babos | S.M. on the sawdust soil, 20.08.1980, (det. M. Babos) | |
| 35. Volvariella speciosa (Fr.) Sing. | Câmpulung pe Tisa, on disturbed soil on banc of Tisa, 02.09.1982. | |
| Lepiotaceae | | |
| 36. Lepiota acutesquamosa (Weinm.) Kummer | SA.M. on sandy soil, 25.09.1977. Câmpulung pe Tisa, on sawdust, 02.10.1984. | |
| 37. Lepiota cristata (A. § S.: Fr.) Kummer | S.M. in park, on the soil, 18.09.1981. | |
| Agaricaceae | | |

Table 1. continue

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| 38. <i>Agaricus xanthoderma</i> Genev. var. <i>xanthoderma</i> Genev | S.M. in garden on the soil, 28.09.1978. |
| 39. <i>Macrolepiota procera</i> (Scop. : Fr.) Sing. | Sap. Livada, on the soil 07.09.1994. |
| Strophariaceae | |
| 40. <i>Hypholoma fasciculare</i> (Huds.:Fr.) Kummer | S.M., in park Grădina Morii, 20.08.1980. |
| 41. <i>Pholiota aurivella</i> (Batsch.:Fr.) Kummer | S.M. on stumps, rotting twigs, (<i>Salix</i> sp., <i>Populus</i> sp., 26.10.1984. |
| 42. <i>Pholiota destruens</i> (Brond.) Quéf. | S.M. in park Grădina Morii, on stump <i>Populus nigra</i> , 26.10.1984. |
| 43. <i>Pholiota gummosa</i> (Lasch) Sing. | S.M. sub <i>Salix</i> , on bare sandy soil, 18.09.1981. |
| 44. <i>Pholiota squarrosa</i> (Pers.:Fr.) Kummer | S.M. Cămara on truncum <i>Populus canadensis</i> , 11.07.1984. |
| Bolbitiaceae | |
| 45. <i>Agrocybe aegerita</i> (Brig.) Sing. | S.M. sub <i>Populus</i> sp. 30.05.1985. |
| 46. <i>Pholiotina arrhenii</i> (Fr.) Sing. | S.M. on sandy soil, sub <i>Populus</i> sp., <i>Salix</i> sp., 16.04.1981 |
| Coprinaceae | |
| 47. <i>Coprinus atramentarius</i> (Bull.:Fr.) Fr. | S.M. on the soil, 06.06.1982. Câmpulung pe Tisa, 02.10.1984. Teceu Mic, 02.10.1984 |
| 48. <i>Coprinus comatus</i> (Müll. in Fl. Dan. :Fr.) S.F. Gray | Sap. On bare sandy soil, 26.08.1982. |
| 49. <i>Coprinus disseminatus</i> (Pers.:Fr.) S.F. Gray | Sap. Livada on truncum of deciduous trees, 07.08.1990 |
| 50. <i>Coprinus micaceus</i> (Bull.:Fr.) Fr. | S.M. park Grădina Morii, on stumps, 26.10.1984. Teceu Mic, on stumps, 02.10.1984. |
| 51. <i>Psathyrella candolleana</i> (Fr.) Mre | Teceu Mic on stump, 02.10.1984. |
| 52. <i>Psathyrella velutina</i> (Pers.:Fr.) Sing. | S.M. in cemetery, on the soil, 26.08.1982. |
| BOLETALES | |
| Gomphidiaceae | |
| 53. <i>Chroogomphus rutilus</i> (Schff.:Fr.) O.K. Miller | Sap. Livada under <i>Pinus</i> , 07.09.1994. |
| Boletaceae | |
| 54. <i>Leccinum quercinum</i> (Pill.) Green et Watl. | Sap. Livada, under <i>Quercus robur</i> , 17.07.1994. |
| 55. <i>Leccinum carpini</i> (Schulz.) Mos. | Sap. Livada, under <i>Quercus robur</i> and <i>Corylus avellana</i> , 17.07.1994. |
| 56. <i>Suillus elegans</i> (Schum.) Snell. | Sap. Livada under <i>Larix decidua</i> culta, 07.09.1994. |
| 57. <i>Suillus granulatus</i> (L.) Kuntze | Sap. Livada, under <i>Pinus</i> , 07.09.1994. |
| 58. <i>Xerocomus rubellus</i> (Krbch.) Quéf. | Sap. Livada, under <i>Quercus robur</i> , 07.09.1993 |
| 59. <i>Xerocomus subtomentosus</i> (L.) Quéf. | Sap. Livada, on the soil, 12.09.1990 |
| RUSSULALES | |
| Russulaceae | |
| 60. <i>Lactarius azonites</i> Bull. : Fr. | Sap. Livada, wood-edge, 12.10.1984 |
| 61. <i>Lactarius glaucescens</i> (Crosst.) Pearson sensu Nechof | Sap. Livada, oakwood, on the soil, 02.09.1985 |
| 62. <i>Lactarius pyrogalus</i> Bull. : Fr. | Sap. Livada, under <i>Corylus avellana</i> , 07.09.1994 |

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| 63. <i>Russula foetens</i> Fr. | Sap. Livada, on the soil, 20.06.1986 | Table 1. continue |
| 64. <i>Russula nigricans</i> Bull. : Fr. | Sap. Livada, woodland, 02.09.1985 | |
| 65. <i>Russula heterophylla</i> (Fr.) Fr. | Sap. Livada, on the soil, 20.06.1986 86, (det. K. Laszló) | |
| 66. <i>Russula lutea</i> (Huds.: Fr.) S.F. Gray | Sap. Livada, Quercetum, 28.08.1983. | |
| 67. <i>Russula virescens</i> | Sap. Livada, on the soil, Quercetum, 17.07.1994. | |
| NIDULARIALES | | |
| Nidulariaceae | | |
| 68. <i>Cyathus olla</i> (Batsch.: Pers.) | S.M. in garden, 20.08.1980. | |
| LYCOPERDALES | | |
| Lycoperdaceae | | |
| 69. <i>Lycoperdon pyriforme</i> Schaeff. ex Pers. | S.M. Câmpu Negru, on stumps, 01.10.1980. | |
| 70. <i>Calvatia excipuliformis</i> (Scop. ex Pers.) Perd. | Sap. Livada, in grassy place, 17.07.1994. | |

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| | | DI.Solovan | nărești | ta |
| 1. | Otidea onotica (Pers. Ex S.F.Gray.) Fuck. | x | | |
| 2. | Aleuria aurantia (Fr.) Fuckel | | | x |
| 3. | Scutellinia scutellata L. ex St.Amans | | | x |
| 4. | Gyromitra esculenta (Pers.: Fr.)Fr. | | | x |
| 5. | Gyromitra infula (Schff.: Fr.) Quél. | | | x |
| 6. | Ptychoverpa bohemica (Krbch.) Boud | x | | |
| 7. | Chlorosplenium aeruginascens (Nyl.) Karst. | | | x |
| 8. | Sclerotinia tuberosa (Hedw. : Fr.) Fuck. | x | | |
| 9. | Elaphomyces granulatus Fr. | | | x |
| 10. | Xylosphaera hypoxylon (L.) Dum. | | | x |
| 11. | Xylosphaera polymorpha (Pers. ex Méret) Dum. | | | x |
| 12. | Merulius tremellosus Schrad.: Fr. | | | x |
| 13. | Sarcodon imbricatum L. Fr. | | | x |
| 14. | Thelephora palmata Scop. : Fr. | | | x |
| 15. | Thelephora palmata var. diffusa (Fr.) | | | x |
| 16. | Thelephora terrestris Fr. | | | x |
| 17. | Albatrellus cristatus (Pers. : Fr.) Kotl. et Pouz. | | | x |
| 18. | Grifolla umbellata (Pers. : Fr.) Pil. | x | | |
| 19. | Fomes fomentarius (L.: Fr.) Fr. | x | x | x |
| 20. | Fomitopsis pinicola (Sow. : Fr.) Karst. | | | x |
| 21. | Ganoderma applanatum (Pers. ex S.F.Gray.) Pat. | | x | x |
| 22. | Hymenochaete rubiginosa (Dicks.§ Fr.) Leveille | x | | |
| 23. | Cantharellus cibarius Quél. | x | | x |
| 24. | Cantharellus cinereus Fr. | x | | |
| 25. | Craterellus cornucopioides (L. : Fr.) Pers. | x | | |
| 26. | Hydnum repandum Schaeff. | | | x |
| 27. | Hydnum rufescens (Schff. ex Pers.) Fr. | | | x |
| 28. | Hericium cirrhatum (Fr.) Nikol | | | x |
| 29. | Hericium ramosum (Bull. ex Mér.) Le | | | x |
| 30. | Lentinellus cochleatus (Pers.:Fr.) Karst | | | x |
| 31. | Ramaria flava (Schff. : Fr.) Quél. | | | x |
| 32. | Panus rudis Fr. | | x | |
| 33. | Piptoporus betulinus (Bull. : Fr.) Karst. | | | x |
| 34. | Pleurotus dryinus (Pers. : Fr.) Kummer | | | x |
| 35. | Polyporus anisoporus Det. et Mont. | | | x |
| 36. | Polyporus varius Pers. : Fr. | | | x |
| 37. | Hygrophorus obrussea (Fr.) Wünche | | | x |
| 38. | Hygrocybe eburneus (Bull.: Fr.) Fr. | | | x |
| 39. | Hyghophorus olivaceoalbus (Fr. : Fr.) Fr. | | | x |
| 40. | Hygrophorus pustulatus (Pers. : Fr.) Fr. | | | x |
| 41. | Hygrophorus russula (Schff. : Fr.) Quél. | x | | |
| 42. | Calocybe gambosa (Fr.) Donk. | x | | |
| 43. | Cantharellula umbonata (Gmel. : Fr.) Sing. | | | x |
| 44. | Collybia acervata (Fr.) Karst. | | | x |
| 45. | Collybia butyracea (Bull. : Fr.) Quél. | | | x |
| 46. | Collybia butyracea var. asema Fr. | | | x |
| 47. | Collybia fusipes (Bull.: Fr.) Quél. | | | x |
| 48. | Collybia maculata (A.§ Fr.) Quél. | | | x |
| 49. | Collybia marasmoides (Britz.) Brsky § Stangl. | | x | |
| 50. | Clitocybe odora (Bull. : Fr.) Kummer. | | | x |
| 51. | Clitocybe gibba (Pers. : Fr.) Kummer. | | | x |
| 52. | Laccaria laccata (Scop. : Fr.) Bk.§ Br. | x | | |
| 53. | Lentinellus cochleatus (Pers. : Fr.) Karst. | | | x |
| 54. | Lepista gilva (Pers. : Fr.) Roze. | | | x |

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| 55. | <i>Lepista nebularis</i> (Fr.) Harmaja | x | | |
| 56. | <i>Lepista nuda</i> (Bull. : Fr.) Cke. | x | | |
| 57. | <i>Lepista sordida</i> (Fr.) Sing. | x | | |
| 58. | <i>Lyophyllum fumosum</i> (Pers.: Fr.) Kühn. § Romagn. | | | x |
| 59. | <i>Marasmius alliaceus</i> (Jacq. : Fr.) Fr. | | | x |
| 60. | <i>Marasmius androsaceus</i> (L. : Fr.) Fr. | | | x |
| 61. | <i>Marasmius scorodoni</i> (Fr.) Fr. | | | x |
| 62. | <i>Mycena epipterygia</i> (Scop. : Fr.) S.F.Gray. | | | x |
| 63. | <i>Mycena inclinata</i> (Fr.) Quéf. | | | x |
| 64. | <i>Mycena pura</i> (Pers. : Fr.) Kummer. | | | x |
| 65. | <i>Omphalina ericetorum</i> (Pers. : Fr.) M.Lge. | | | x |
| 66. | <i>Omphalina obscurata</i> Reid. | | | x |
| 67. | <i>Omphalotus olearius</i> (DC.) Sing | x | | |
| 68. | <i>Oudemansiella mucida</i> (Schrad. : Fr.) V.Hoehn. | | | x |
| 69. | <i>Oudemansiella radicata</i> (Relhan. : Fr.) Sing. | | x | |
| 70. | <i>Tricholoma imbricatum</i> (Fr. : Fr.) Kummer | | | x |
| 71. | <i>Tricholoma inodermeum</i> (Fr.) Gill. | | | x |
| 72. | <i>Tricholoma saponaceum</i> (Fr.) Kummer. | x | | |
| 73. | <i>Tricholoma stans</i> (Fr.) Sacc. | | | x |
| 74. | <i>Tricholoma vaccinum</i> (Pers. : Fr.) Kummer | | | x |
| 75. | <i>Tricholomopsis rutilans</i> (Schff. : Fr.) Sing. | | | x |
| 76. | <i>Xeromphalina campanella</i> (Batsch. : Fr.) R.Mre. | | | x |
| 77. | <i>Rhodophyllum clypeatum</i> (L. : Fr.) Kummer | x | | |
| 78. | <i>Rhodophyllum sinuatum</i> (Bull. : Fr.) Kummer. | x | | |
| 79. | <i>Cortinarius venetus</i> (Fr. : Fr.) Fr. var. <i>montanus</i> Mos. | | | x |
| 79. | <i>Dermocybe cinnabarina</i> (Fr.) Wünche. | | | x |
| 80. | <i>Rozites caperata</i> (Pers. : Fr.) Karst. | | | x |
| 81. | <i>Amanita citrina</i> (Schff.) S.F.Gray. | x | | |
| 82. | <i>Amanita gemmata</i> (Fr.) Gill. | | | x |
| 83. | <i>Amanita muscaria</i> (L.:Fr.) Hooker. | | | x |
| 84. | <i>Amanita regalis</i> (Fr.) | | | x |
| 85. | <i>Amanita rubescens</i> (Prs. : Fr.) Gray5 | x | x | x |
| 86. | <i>Cystoderma fallax</i> Smith § Sing. | | | x |
| 87. | <i>Lepiota clypeolaria</i> (Bull. : Fr.) Kumm. | | | x |
| 88. | <i>Phaeolepiota aurea</i> (Matt.: Fr.) Mre. | x | | x |
| 89. | <i>Agaricus esettei</i> Bon. | | | x |
| 90. | <i>Agaricus silvicola</i> (Vitt.) Sac. | | | x |
| 91. | <i>Hypholoma capnoides</i> (Fr. : Fr.) Kummer. | | | x |
| 92. | <i>Hypholoma sublateritium</i> (Fr.) Quéf. | | | x |
| 93. | <i>Kuehneromyces mutabilis</i> (Schff. : Fr.) Sing. § Smith | | x | x |
| 94. | <i>Stropharia aeruginosa</i> (Curt. : Fr.) Quéf. | | | x |
| 95. | <i>Stropharia semiglobata</i> (Batsch. : Fr.) Quéf. | | | x |
| 96. | <i>Agrocybe praecox</i> (Pers. : Fr.) Vay. | x | x | x |
| 97. | <i>Panaeolus semiovata</i> (Sow. Fr.) Lund. § Nannf. | | | x |
| 96. | <i>Omphalotus olearius</i> (DC.) Sing. | x | | |
| 98. | <i>Paxillus atrotomentosus</i> (Batsch.) Fr. | | | x |
| 99. | <i>Gomphidius glutinosus</i> (Schff.) Fr. | | | x |
| 100. | <i>Boletus aestivalis</i> Paulet : Fr. | x | | x |
| 101. | <i>Boletus edulis</i> Bull. : Fr. | | | x |
| 102. | <i>Boletus erythropus</i> (Fr. : Fr.) Pers. | | | x |
| 103. | <i>Boletus impolitus</i> Fr. | | | x |
| 104. | <i>Boletus pinicola</i> Vitt. | | | x |
| 105. | <i>Boletus regius</i> Krbh. | | x | |

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| 106. | <i>Suillus bovinus</i> (L. : Fr.) O.Kuntze | | | x |
| 107. | <i>Tylopilus felleus</i> (Bull. : Fr.) P.Karst. | | | |
| 108. | <i>Xerocomus badius</i> (Fr.) Kühn. ex Gilb. | | | x |
| 109. | <i>Xerocomus chrysenteron</i> (Bull. ex St.Amans.) Quéf. | | | x |
| 110. | <i>Porphyrellus pseudoscaber</i> (Secr.) Sng. | | | x |
| 111. | <i>Strobilomyces floccopus</i> (Vahl. : Fr.) Karst. | | | x |
| 112. | <i>Lactarius mitissimus</i> Fr. | | | x |
| 113. | <i>Lactarius rufus</i> (Scop.) Fr. | | | x |
| 114. | <i>Lactarius serifluus</i> DC. : Fr. | | x | |
| 115. | <i>Lactarius torminosus</i> (Schff. : Fr.) S.F.Gray. | x | | x |
| 116. | <i>Lactarius volemus</i> Fr. | x | | |
| 117. | <i>Russula adulterina</i> Fr. | | | x |
| 118. | <i>Russula atropurpurea</i> Krbh. | | | x |
| 119. | <i>Russula nauseosa</i> (Pers. ex Schw.) Fr. | | | x |
| 120. | <i>Russula ochroleuca</i> (Pers.) Fr. | | | x |
| 121. | <i>Crucibulum laeve</i> (Bull. ex DC.) Kambly. | | | x |
| 122. | <i>Cyathus striatus</i> (huds. ex Pers.) Willdenov. | | | x |
| 123. | <i>Lycoperdon perlatum</i> Pers. ex Pers. | | | x |
| 124. | <i>Calvatia utriformis</i> (Bull. : Pers.) Jaap. | x | | x |
| 125. | <i>Anthurus archeri</i> (Berk.) E.Fischer | x | | x |
| 126. | <i>Phallus impudicus</i> L. ex Pers. | | | x |