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FLORISTIC SURVEYS IN THE LAKE URSU NATURE RESERVE AND ADJACENT AREAS (SOVATA, TRANSYLVANIA, ROMANIA)

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Abstract. *The paper is dealing with the vascular flora inventory in the surrounding area of the lakes in Sovata. The study territory overlies to the protected area of national interest Lake Ursu Nature Reserve. The aim of the study is to provide an up-to-date systematic checklist of the vascular plant taxa growing in the area. Field surveys were carried out in 2008-2009. The field inventory list was completed with plant taxa from the existing and consulted bibliographic sources. As a result of the study, 330 vascular plant taxa are listed, belonging to 66 families. From de total number of taxa, 275 are original data, representing specimens identified by the authors in the field, and 55 are cited from bibliographic sources. The study area is an important conservation area from botanical point of view, hosting taxa listed in the Habitats Directive, as well as taxa listed in national red lists.*
Key words: *vascular plant taxa, deciduous forests, halophytes, saline lakes, freshwater lakes, Lake Ursu Nature Reserve, Sovata*

Rezumat. *Lucrarea conţine inventarul florei vasculare din împrejurimile lacurilor de la Sovata. Teritoriul cercetat se suprapune ariei protejate de interes naţional Rezervaţia Naturală Lacul Ursu şi arboretele de pe sărături – LUas. Scopul cercetărilor a fost întocmirea unei liste actualizate şi cât mai complete asupra plantelor vasculare din acest teritoriu. Inventarierile în teren au avut loc în perioada 2008-2009. Lista taxonilor identificaţi în teren a fost completată cu date din literatură, pe baza consultării surselor bibliografice existente. Ca rezultat al cercetărilor, sunt listaţi 330 taxoni de plante vasculare aparţinând la 66 familii. Din acest total, 275 taxoni reprezintă date originale, specimene identificate de autori în teren, iar 55 taxoni sunt citaţi din surse bibliografice. Teritoriul cercetat este important din punct de vedere al conservării plantelor, adăpostind taxoni incluşi în Directiva Habitate, cât şi taxoni listaţi pe diferite liste roşii naţionale.*
Cuvinte cheie: *plante vasculare, păduri caducifoliate, halofite, lacuri sărate, lacuri cu apă dulce, Rezervaţia Naturală Lacul Ursu şi arboretele de pe sărături, Sovata.*

Introduction

Sovata is a famous Romanian spa and climatic health resort located in the eastern part of the Transylvanian Basin (Fig. 1), in the so-called Salt-Region (Mureş county, Transylvania) at approx. 530 m asl. More exactly, it is situated in the Praid-Sovata Basin, a sub-mountainous depression developed at the western foot of Gurghiului Mountains (Eastern Carpathians).

Characteristic to the area is an impressive salt massive, which was formed approximately 20-22 million years ago during the Miocene, as a result of gradual disappearance of the Pannonian Sea and salt sedimentation (Alexe *et al*. 2006; Alexe, 2007). The diapir wrinkle from Praid is 1600 m long and 500 m wide, ending on the Salt Mount (Ro: Muntele de Sare) in Sovata. The highest points of the Salt Mount are Zoltán Peak (555 m asl) and Sarea Peak (533 m asl).

Another important geomorphologic and landscape feature of the area is the presence of lakes. Majority of them naturally resulted by the dissolution on the salt massive (Alexe *et al*. 2006; Şerban, Alexe 2006; Alexe 2007). Today, there are 10 major lakes in Sovata area: 6 saline lakes (Negru, Ursu, Aluniş, Roşu, Verde, Mierlei), 3 freshwater lakes (Paraschiva, Tivoli – the former

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Tineretului, Dulce) and one saline lake turned into swamp (Şerpilor). Furthermore, there are some ponds affected by siltation or totally silted and transformed into marshes (Şerban, Alexe 2006). The Tineretului Lake, arranged and maintained in the past for recreational purposes and fishing, was drained in 1997 because of increasing infiltration of freshwater to the salt lakes system (Alexe 2007). It was rearranged recently, in 2009-2010 and now is named Tivoli Lake.

The area is situated in the low mountain vegetation belt characterised by the dominance of deciduous forests (beech, oak, hornbeam). Salty habitats and halophytes are patchily distributed in this area due to the presence of salty lakes and the appearance of salt on the soil surface. Also, aquatic and paludal habitats are linked to the presence of freshwater lakes in the area. As a result of anthropogenic activities, there are secondary semi-natural grasslands which alternate with forests.

The entire area of the lakes, the Salt Mount and the surrounding forests are included in the Lake Ursu Nature Reserve (Ro: *Rezervaţia Naturală Lacul Ursu şi arboretele de pe sărături - LUas,* Fig. 2), which was established in 1970. The protected area is defined as a nature reserve of national interest, corresponding to category IV IUCN (L 5/2000; OUG 57/2007; L 49/2011). It covers 79 ha, of which 73.3 ha are forests and 5.7 ha are water bodies. Its main purpose is to protect the Lakes Ursu, Aluniş, Roşu, Verde, Mierlei and Paraschiva, respectively to conserve the surrounding forest with role in the maintenance of the hydrogeological features of these lakes. The area is included in the larger Natura 2000 site ROSCI0019 Călimani-Gurghiu (OM 2387/2011).

The first systematic botanical researches in the area were carried out by Nyárády E. I., at the middle of the 20th century. Firstly, he published some observations and explanations regarding the presence and development of woody vegetation on the salt belt (Nyárády 1944, 1950), without providing a list of plants. However, in this period he made a complex floristic survey of the area, collected specimens and prepared a comprehensive study describing in details the surroundings of the lakes from geological, geomorphologic and botanical point of view, also including a list of species (Nyárády 1959 mscr.). This monographic work was never published; it was lost in different private libraries in Cluj-Napoca and unfortunately we could not consult this manuscript.

Observations on a special ecotype of pedunculate oak growing on the salt massive and adapted to special soil conditions were published by Ştefănescu (1961). This author also mentions some woody and herbaceous species growing in the forest surrounding Lake Ursu. Some botanical data can also be found in the study of Bulgăreanu *et al.* (1978), which mainly concerns the hydrology and hydrogeology of the Lake Ursu, but includes a list of several vascular plant species present around the lake, identified by dead vegetative parts or fruits present on the water surface and/or in the sediments of the lake.

More recent publications refer to a larger area, the Praid-Sovata Basin, from phytosociologic point of view (Pop, Buz 1994; Buz 1999) and ethnobotanical point of view (Gub 1996), containing data on the vascular flora of the surrounding area of Lake Ursu. The newest floristic data can be found in the studies of Pop (2006) and Sămărghiţan, Pop (2006). However, all the above mentioned publications contain poor and scattered botanical data, excepting Nyárády's manuscript, but which was elaborated more than half a century ago. Thus, taking into account on the one hand the poor and scattered data, and on the other hand the socio-economic and habitat changes of the last decades in the area, an updated vascular plant list became necessary. Its importance resides also from the protected status of the area: a comprehensive and up-to-date database regarding the presence and distribution of vascular plant species in the protected area can help to elaborate recommendations and/or to take good management decisions from a biodiversity conservation perspective.

The aim of this paper is to provide an up-to-date systematic checklist of the vascular plant taxa growing in the surrounding area of the lakes in Sovata, based on field surveys and bibliographic documentation.

Material and Methods

Study area

The study area completely overlies to the Lake Ursu Nature Reserve, exceeding its limits in the northwest and west, and includes the following territories (Fig. 2): the surroundings of Lakes Ursu, Roşu, Verde, Aluniş, Mierlei, Şerpilor and Paraschiva, the Salt Mount, the Pârâul Sărat and "*Pusta Nămoloasă*" areas, as well as the upper and middle course of Răchitiş rivulet, locally named

"*Jánosmező*" and "*Rakottyás*". Short characterization of these objectives is given in the followings.

Lake Ursu (Eng: Bear Lake; Hu: Medve-tó) is the largest karsto-saline lake in the Transylvanian Basin, with heliothermic properties. Its surface is 4.12 ha, the average depth is 6.36 m, at certain points reaching 18.2 m (Alexe 2007). The average salt concentration of its water is 250 g/l (Alexe *et al*. 2006). The lake was formed in 1875-1880 due to natural geological, meteorological and hydrological events: a gradual dissolution of the salt massive, followed by landslides and water accumulation after a cloudburst (Alexe 2007). The name was given by locals who have seen its shape resembled a large bearskin. At present, one part of the lake is exploited for its therapeutic properties, the other part is protected.

Lake Roşu (Eng: Red Lake; Hu: Vörös-tó) and ***Lake Verde*** (Eng: Green Lake; Hu: Zöld-tó) are located near to Lake Ursu, in its northwestern part (Fig. 2). These are two small lakes: Verde Lake (291 m^2) is smaller than Roşu Lake (1406 m^2). Their water comes from a salt spring and their surplus water runs into Lake Ursu, constituting the main salt water source of the latter one (Alexe, 2007).

Lake Aluniş (Eng: Hazelnut Lake; Hu: Mogyorós-tó) is situated 60 m west of Lake Ursu (Fig. 2). Its origin is closely linked to that of the Lake Ursu: the less salty surplus water from Ursu Lake flooded a salt doline, which collapsed in the late 1870's, giving rise to Aluniş Lake (Alexe *et al*., 2006; Alexe, 2007). The lake's surface is 3731 m^2 and its maximum depth is 6.4 m (Alexe 2007). The temperature and salinity of its water is lower than that of Lake Ursu. It is exploited therapeutically. Its name comes from the hazel bushes, which are frequent in the surrounding forest. The surplus water form Aluniş Lake overflows and gives rise to the Valea Frumoasei stream (Nyárády 1950; Fig. 2).

Lake Mierlei (Eng: Blackbird Lake; Hu: Rigó-tó) is the youngest lake formed in the early 1950's in a salt-doline (Alexe *et al.* 2006). It is located in the middle of the forest; it has a surface area of 1462 m^2 and an average depth of 1.85 m (Alexe 2007). In its surroundings there are some salt springs which feed the lake. Its name refers to the blackbird, which is very frequent in the surrounding forest.

Lake Şerpilor (Eng: Snake's Lake; Hu: Kígyó-tó) is situated in the forest, above the Mierlei Lake (Fig. 2). It was a saline lake, but in the last decades it turned into a swamp, due to sediments accumulation.

Lake Paraschiva (Hu: Piroska-tó) is situated north of Ursu Lake (Fig. 2). It is a freshwater lake formed in a salt doline by accumulation of precipitations in the spring of 1980. Sediments on the lake bed are very thick, so the water did not reach the salt layer. It was arranged for recreational purposes and fishing, being populated with fish. It has a surface of 0.23 ha (Alexe *et al*. 2006; Alexe 2007).

Muntele de Sare (Eng: Salt Mount; Hu: Só-hegy) is located near the Roşu Lake and between the Verde and Ursu Lake (Fig. 2). Following water infiltration and heavy rains, landslides have occurred on its surface, leading to the appearance of salt blocks on the surface of the slopes.

Pârâul Sărat (Eng: Saline stream; Hu: Sós-árok). Surplus water from Şerpilor and Mierlei Lake is drained by Ţifra stream (Nyárády 1950). This flows into Valea Frumoasei, which drains excess water from Lake Aluniş (Fig. 2). After the confluence, the waterflow is called Pârâul Sărat; this is the left tributary of the Sovata rivulet. Along Pârâul Sărat there are several salt springs, some of them being captured for therapeutic purposes. This flat place with gleyed soil, due to the springs and the stream flow, is called *"Pusta Nămoloasă"* (Nyárády 1950; Fig. 2). Here, a very narrow salt layer appears on the soil surface.

"Jánosmező" and "Rakottyás" areas. The Răchitiş rivulet springs on the southern, southwestern slope of Cireşului Peak (956 m asl) and crosses large meadows which along the upper course are called "*Jánosmező*", and along the middle course are named "*Rakottyás*" (Fig. 2). Finally, the brook flows into Sovata rivulet. In these areas there are large grasslands (Fig. 2), which according to the microrelief, exposure, soil moisture and floristic composition are mesic meadows (on slopes and slightly inclined terrains) or wet meadows (on flat areas).

In the study area, *the soils* are moderately deep, superficial in some places with salt on the surface. The salt massive is protected by a thin layer of soil mixed with clay and sandstone (Alexe *et al*. 2006; Alexe 2007).

The climate is temperate continental-moderate, relatively cool and wet, with average annual temperatures of 8.6°C and rainfall of more than 820 mm/year. The warmest month is August (average temperature is 18.7°C) and the coldest is January (average temperature is 3.4°C). Annual amount of rainfall is 755 mm, the driest month is September with 32.3 mm. Because of the mountains surrounding the depression covered by large forests, there are just a few days per year with wind. Occasional winds are from the northeast (Şerban, Alexe 2006; Sămărghiţan, Pop 2006; Alexe 2007).

Working methods

The field surveys were conducted in 2008-2009, between June and September.

The identification of vascular plant taxa was done in the field, using Simon (2002) and Ciocârlan (2009). In cases when field identification was difficult (particularly for polymorphic, taxonomically difficult and doubtful taxa), the plant material was collected and determined in the laboratory, using comprehensive monographic works (Săvulescu, 1956-1976; Jávorka, Csapody, 1991). A few collected specimens (only 5 herbarium vouchers) are deposited in the Herbarium of the Babeş-Bolyai University, Cluj-Napoca (CL, acronym according to *Index Herbariorum*), under inventory numbers 659865, 659866, 659867, 659868, 659869.

The bibliographic documentation consisted in reviewing the previous floristic and/or vegetation studies related to the area. Only those taxa have been extracted and added to the final floristic checklist, which location within the study area was accurately given in the bibliographic sources.

The nomenclature of plant taxa follows Flora Europaea (Tutin *et al*. 1964-1980), being actualized with the electronic online version (*http://rbg-web2.rbge.org.uk/FE/fe.html*).

In the floristic checklist, the vascular plants (cormophytes) are presented by families, in systematic order. The family names and the assignment of species and subspecies into the families are given according Flora Europaea (Tutin *et al*. 1964-1980), while the higher systematic ranks used (classis, subphylum and phylum) follow Ciocârlan (2009). Within the families, the taxa are presented in alphabetical order. The list of original data was completed with data from bibliographic sources. For taxa from bibliography, the sources are given.

For each taxa, the following features are indicated: the bibliographic sources, if it is not an original data; the habitat type in which it occurs; the place of the occurrences according to the local toponymy (ex. around Lake Paraschiva, Muntele de Sare, etc.); distribution in the area of occurrence (indicated with rare, sporadic, frequent or common); conservation status (according to the Bern Convention; Habitats Directive; L 13/1993; OUG 57/2007; L 49/2011) and/or presence on national red lists (according to Boşcaiu *et al*. 1994; Oltean *et al*. 1994; Negrean 2001), in certain cases.

Results

Floristic checklist

PTERIDOPHYTA – horsetails and ferns
Equisetaceae
1. *Equisetum sylvaticum* L.: (Sămărghiţan, Pop, 2006).
2. *Equisetum telmateia* Ehrh.: hygrophilous tall-herb fringe communities; around Lakes Paraschiva, Şerpilor, Mierlei, Aluniş; sporadic.
Dryopteridaceae
3. *Dryopteris filix-mas* (L.) Schott: deciduous forest; around Lakes Mierlei and Aluniş; frequent.
Thelypteridaceae
4. *Thelypteris palustris* Schott: littoral and palustral habitats; Şerpilor Lake; rare.
Woodsiaceae
5. *Athyrium filix-femina* (L.) Roth: deciduous forest; around Mierlei Lake; sporadic.

SPERMATOPHYTA – flowering plants
PINOPHYTINA (*Gymnospermae*) – conifers
Pinaceae
6. *Abies alba* Mill.: deciduous forest; rare; planted.
7. *Larix decidua* Mill.: deciduous forest; rare; planted.
8. *Picea abies* (L.) H. Karst.: deciduous forest; rare; planted.
9. *Pinus nigra* J.F.Arnold subsp. *nigra*: deciduous forest; rare; planted.
10. *Pinus sylvestris* L.: deciduous forest; rare; planted.

MAGNOLIOPHYTINA (*Angiospermae*) – angiosperms
MAGNOLIOPSIDA (*Dicotyledonatae*)
Aristolochiaceae
11. *Asarum europaeum* L.: deciduous forest; frequent.

Ranunculaceae
12. *Aconitum lycoctonum* L. subsp. *moldavicum* (Hacq.) Jalas: deciduous forest; around Aluniş Lake; rare; Carpathian endemic taxa.
13. *Aconitum vulparia* Rchb. ex. Spreng. subsp. *vulparia*: (Pop, Buz, 1994; Buz, 1999).
14. *Aconitum variegatum* L. subsp. *paniculatum* (Arcang.) Greuter & Burdet: (Pop, Buz, 1994; Buz, 1999).
15. *Actaea spicata* L.: deciduous forest; around Aluniş Lake; sporadic.
16. *Anemone nemorosa* L.: deciduous forest; frequent.
17. *Anemone ranunculoides* L.: deciduous forest; frequent.
18. *Caltha palustris* L.: littoral and palustral habitats; around Ursu Lake; littoral and palustral habitats, hygrophilous tall-herb fringe communities and wet meadows around Paraschiva Lake; hygrophilous tall-herb fringe communities along Pârâul Sărat; frequent.
19. *Clematis vitalba* L.: deciduous forest; sporadic.
20. *Helleborus purpurascens* Waldst. & Kit.: deciduous forest; around Lakes Mierlei and Aluniş; sporadic.
21. *Hepatica nobilis* Schreb.: deciduous forest; common.
22. *Isopyrum thalictroides* L.: deciduous forest; around Lakes Roşu, Verde, Mierlei, Aluniş; frequent.
23. *Ranunculus auricomus* L.: deciduous forest; frequent.
24. *Ranunculus cassubicus* L.: (Pop, Buz, 1994; Buz, 1999).
25. *Ranunculus polyanthemos* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
26. *Ranunculus repens* L.: wet meadows around Paraschiva Lake; mesic grasslands, wet meadows in "*Jánosmező*" and "*Rakottyás*"; common.
27. *Thalictrum aquilegiifolium* L.: (Pop, Buz, 1994; Buz, 1999).
28. *Thalictrum lucidum* L.: wet meadows in "*Jánosmező*" and "*Rakottyás*"; rare.
29. *Trollius europaeus* L. subsp. *europaeus*: wet meadows; "*Jánosmező*" and "*Rakottyás*"; rare; national red list taxa.
Ulmaceae
30. *Ulmus glabra* Huds.: deciduous forest; around Lakes Roşu, Verde and Aluniş; frequent.
31. *Ulmus minor* Mill.: deciduous forest; sporadic.
Urticaceae
32. *Urtica dioica* L.: hygrophilous tall-herb fringe communities; around Lakes Ursu, Paraschiva and Aluniş; common.
Fagaceae
33. *Fagus sylvatica* L.: deciduous forest; common.
34. *Quercus petraea* (Matt.) Liebl.: deciduous forest; frequent.
35. *Quercus robur* L.: deciduous forest; frequent.
Betulaceae
36. *Alnus glutinosa* (L.) Gaertn.: around Lakes Ursu, Paraschiva, Şerpilor, along Pârâul Sărat, in "*Jánosmező*" and "*Rakottyás*"; frequent.
37. *Alnus incana* (L.) Moench: around Lakes Ursu, Paraschiva, Şerpilor and along Pârâul Sărat; frequent.
Corylaceae
38. *Carpinus betulus* L.: deciduous forest; common.
39. *Corylus avellana* L.: deciduous forest; around Lakes Roşu, Verde, Mierlei, Aluniş; frequent.
Caryophyllaceae
40. *Dianthus armeria* L. subsp. *armeriastrum* (Wolfner) Velen.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; rare.
41. *Dianthus carthusianorum* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; sporadic.
42. *Lychnis flos-cuculi* L.: wet meadows; around Paraschiva Lake, "*Jánosmező*" and "*Rakottyás*"; sporadic.
43. *Silene latifolia* Poir. subsp. *alba* (Mill.) Greuter & Burdet: hygrophilous tall-herb fringe communities, mesic grasslands; around Lakes Ursu and Aluniş; "*Jánosmező*" and "*Rakottyás*"; frequent.
44. *Silene vulgaris* (Moench) Garcke: mesic grasslands in "*Jánosmező*" and "*Rakottyás*"; forest edge on Muntele de Sare; sporadic.
45. *Stellaria graminea* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; common.
46. *Stellaria holostea* L. (Sămărghiţan, Pop, 2006).
47. *Stellaria media* (L.) Vill.: deciduous forest; mesic grasslands in "*Jánosmező*" and "*Rakottyás*"; common.
48. *Stellaria nemorum* L. (Sămărghiţan, Pop, 2006).
Chenopodiaceae
49. *Atriplex prostrata* (Boucher) ex DC.: inland saline habitats; around Lakes Roşu and Verde, Muntele de Sare, along Pârâul Sărat and *"Pusta Nămoloasă"* area; sporadic.
50. *Salicornia europaea* L.: inland saline habitats; around Lakes Ursu, Roşu and Verde, Muntele de Sare, along Pârâul Sărat and *"Pusta Nămoloasă"* area; frequent.
Polygonaceae
51. *Polygonum amphibium* L.: wet meadows, hygrophilous tall-herb fringe communities; around Paraschiva Lake; sporadic.
52. *Polygonum bistorta* L.: wet meadows; around Paraschiva Lake, in "*Jánosmező*" and "*Rakottyás*"; sporadic.
53. *Rumex acetosa* L.: mesic grasslands; in "*Jánosmező*" and "*Rakottyás*"; sporadic.

54. *Rumex conglomeratus* Murray: hygrophilous tall-herb fringe communities; around Paraschiva Lake; sporadic.
55. *Rumex crispus* L.: hygrophilous tall-herb fringe communities; around Paraschiva Lake; sporadic.
56. *Rumex hydrolapathum* Huds.: hygrophilous tall-herb fringe communities; around Paraschiva Lake; sporadic.
57. *Rumex obtusifolius* L.: hygrophilous tall-herb fringe communities; around Paraschiva Lake; sporadic.

Crassulaceae

58. *Sedum telephium* L. subsp. *maximum* (L.) Krock: Muntele de Sare, around Aluniş Lake; rare.

Grossulariaceae

59. *Ribes uva-crispa* L. (Sămărghiţan et Pop, 2006).

Rosaceae

60. *Agrimonia eupatoria* L.: mesic grasslands; Pârâul Sărat and *"Pusta Nămoloasă"* area; "*Jánosmező*" and "*Rakottyás*"; frequent.
61. *Crataegus monogyna* Jacq.: deciduous forest; frequent.
62. *Crataegus nigra* Waldst. & Kit.: deciduous forest; rare; national red list taxa.
63. *Filipendula ulmaria* (L.) Maxim.: hygrophilous tall-herb fringe communities, wet meadows; around Lakes Ursu, Paraschiva, Şerpilor, along Pârâul Sărat and *"Pusta Nămoloasă"* area; frequent.
64. *Filipendula vulgaris* Moench: mesic grasslands; in "*Jánosmező*" and "*Rakottyás*"; frequent.
65. *Fragaria vesca* L.: deciduous forest; common.
66. *Fragaria viridis* Duchesne: (Pop, Buz, 1994; Buz, 1999).
67. *Geum urbanum* L.: deciduous forest; frequent.
68. *Malus sylvestris* Mill.: deciduous forest; sporadic.
69. *Prunus avium* L.: deciduous forest; sporadic.
70. *Rosa canina* L.: deciduous forest; around Aluniş Lake; sporadic.
71. *Rosa pimpinellifolia* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; rare.
72. *Rubus caesius* L.: hygrophilous tall-herb fringe communities; around Lakes Ursu, Paraschiva, Aluniş; frequent.
73. *Rubus hirtus* Waldst. & Kit.: deciduous forest; frequent.
74. *Rubus idaeus* L.: hygrophilous tall-herb fringe communities; around Paraschiva Lake; sporadic.
75. *Sorbus aucuparia* L.: deciduous forest; frequent.
76. *Sorbus torminalis* (L.) Crantz: deciduous forest; around Lakes Mierlei and Aluniş; sporadic.

Leguminosae (Fabaceae)

77. *Astragalus glycyphyllos* L.: hygrophilous tall-herb fringe communities around Paraschiva Lake; mesic grasslands in "*Jánosmező*" and "*Rakottyás*"; sporadic.
78. *Coronilla varia* L.: mesic grasslands; along Pârâul Sărat, in "*Jánosmező*" and "*Rakottyás*" zone, forest edge on Muntele de Sare; frequent.
79. *Dorycnium pentaphyllum* Scop. subsp. *herbaceum* (Vill.) Rouy: mesic grasslands; along Pârâul Sărat, in "*Jánosmező*" and "*Rakottyás*"; sporadic.
80. *Genista tinctoria* L.: mesic grasslands in "*Jánosmező*" and "*Rakottyás*"; deciduous forest around Aluniş Lake, Muntele de Sare; frequent.
81. *Lathyrus hallersteinii* Baumg.: (Sămărghiţan, Pop, 2006).
82. *Lathyrus niger* (L.) Bernh.: (Pop, Buz, 1994; Buz, 1999); deciduous forest; sporadic.
83. *Lathyrus vernus* (L.) Bernh.: deciduous forest; around Lakes Roşu, Verde, Mierlei, Aluniş; frequent.
84. *Lembotropis nigricans* (L.) Griseb.: (Pop, Buz, 1994; Buz, 1999).
85. *Lotus corniculatus* L.: wet meadows, mesic grasslands; around Paraschiva Lake, in "*Jánosmező*" and "*Rakottyás*"; frequent.
86. *Lotus tenuis* Waldst. & Kit. ex Willd.: hygrophilous tall-herb fringe communities; around Ursu Lake; rare.
87. *Medicago lupulina* L.: mesic grasslands; in "*Jánosmező*" and "*Rakottyás*"; frequent.
88. *Melilotus alba* Medik.: hygrophilous tall-herb fringe communities; around Ursu Lake; rare.
89. *Melilotus officinalis* (L.) Pall.: hygrophilous tall-herb fringe communities around Lakes Ursu, Paraschiva, Aluniş; hygrophilous tall-herb fringe communities and mesic grasslands along the Pârâul Sărat and *"Pusta Nămoloasă"* area; common.
90. *Ononis spinosa* L.: mesic grasslands along the Pârâul Sărat; in "*Jánosmező*" and "*Rakottyás*"; sporadic.
91. *Robinia pseudacacia* L.: deciduous forest; around Aluniş Lake; sporadic; invasive, North American taxa; planted.
92. *Trifolium medium* L.: (Pop, Buz, 1994; Buz, 1999).
93. *Trifolium montanum* L.: mesic grasslands; along Pârâul Sărat and *"Pusta Nămoloasă"* area, "*Jánosmező*" and "*Rakottyás*"; sporadic.
94. *Trifolium pannonicum* Jacq.: mesic grasslands; in "*Jánosmező*" and "*Rakottyás*"; forest edge on Muntele de Sare; rare.
95. *Trifolium pratense* L.: mesic grasslands; along Pârâul Sărat and *"Pusta Nămoloasă"* area; "*Jánosmező*" and "*Rakottyás*"; frequent.
96. *Vicia cracca* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; sporadic.

97. *Vicia sepium* L.: mesic grasslands; along Pârâul Sărat and *"Pusta Nămoloasă"* area, "*Jánosmező*" and "*Rakottyás*"; sporadic.
98. *Vicia sylvatica* L.: deciduous forest; around Lakes Mierlei and Aluniş; frequent.

Lythraceae

99. *Lythrum salicaria* L.: hygrophilous tall-herb fringe communities, wet meadows; around Lakes Ursu and Paraschiva, "*Jánosmező*" and "*Rakottyás*"; frequent.

Onagraceae

100. *Circaea lutetiana* L.: (Sămărghiţan, Pop, 2006).
101. *Epilobium angustifolium* L.: (Pop, Buz, 1994; Buz, 1999).
102. *Epilobium montanum* L. (Pop, Buz, 1994; Buz, 1999; Sămărghiţan, Pop, 2006).

Elaeagnaceae

103. *Hippophäe rhamnoides* L.: deciduous forest; around Paraschiva Lake; rare; planted.

Thymelaeaceae

104. *Daphne mezereum* L.: deciduous forest; around Lakes Mierlei and Aluniş; sporadic.

Cornaceae

105. *Cornus mas* L.: deciduous forest; sporadic.
106. *Cornus sanguinea* L.: deciduous forest; frequent.

Celastraceae

107. *Euonymus verrucosus* Scop.: deciduous forests; around Mierlei Lake; sporadic.

Euphorbiaceae

108. *Euphorbia amygdaloides* L.: deciduous forest; frequent.
109. *Euphorbia angulata* Jacq.: deciduous forest; sporadic.
110. *Euphorbia carniolica* Jacq. (Pop, Buz, 1994; Buz, 1999; Sămărghiţan, Pop, 2006).
111. *Euphorbia cyparissias* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; common.
112. *Mercurialis perennis* L.: deciduous forest; around Lakes Roşu, Verde and Aluniş; frequent.

Rhamnaceae

113. *Frangula alnus* Mill.: deciduous forest; around Aluniş Lake; sporadic.
114. *Rhamnus catharticus* L.: (Pop, Buz, 1994; Buz, 1999).

Vitaceae

115. *Parthenocissus quinquefolia* (L.) Planch.: hygrophilous tall-herb fringe communities; around Ursu Lake; ornamental invasive taxa originated from North America; rare.

Aceraceae

116. *Acer campestre* L.: deciduous forest; around Lakes Roşu, Verde, Mierlei, Aluniş; frequent.
117. *Acer platanoides* L.: deciduous forest; around Lakes Roşu, Verde, Mierlei, Aluniş; frequent.
118. *Acer pseudoplatanus* L.: deciduous forest; around Lakes Roşu, Verde, Mierlei, Aluniş; frequent.

Oxalidaceae

119. *Oxalis acetosella* L.: deciduous forest; sporadic.

Geraniaceae

120. *Geranium pratense* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; sporadic.
121. *Geranium palustre* L.: hygrophilous tall-herb fringe communities; around Paraschiva Lake; sporadic.
122. *Geranium phaeum* L.: deciduous forest; sporadic.
123. *Geranium robertianum* L.: deciduous forest; frequent.
124. *Geranium sylvaticum* L.: deciduous forest; around Aluniş Lake; sporadic.

Balsaminaceae

125. *Impatiens noli-tangere* L.: hygrophilous tall-herb fringe communities; around Lakes Paraschiva, Roşu, Verde and Aluniş; frequent.
126. *Impatiens parviflora* DC.: (Pop, Buz, 1994; Buz, 1999); invasive taxa originated from Asia.

Araliaceae

127. *Hedera helix* L.: deciduous forest; around Aluniş Lake; sporadic.

Umbelliferae (Apiaceae)

128. *Aegopodium podagraria* L: hygrophilous tall-herb fringe communities, deciduous forest; around Lakes Ursu, Paraschiva, Roşu, Verde, Şerpilor, Aluniş, along Pârâul Sărat and *"Pusta Nămoloasă"* area; common.
129. *Angelica sylvestris* L.: hygrophilous tall-herb fringe communities, wet meadows; around Lakes Ursu, Paraschiva, along Pârâul Sărat and *"Pusta Nămoloasă"* area, "*Jánosmező*" and "*Rakottyás*" zone; sporadic.
130. *Anthriscus sylvestris* (L.) Hoffm.: deciduous forest; frequent.
131. *Astrantia major* L.: deciduous forest; around Lakes Roşu, Verde, Mierlei and Aluniş; mesic grasslands in "*Jánosmező*" and "*Rakottyás*" zone; common.
132. *Chaerophyllum aromaticum* L.: hygrophilous tall-herb fringe communities; around Lakes Paraschiva and Aluniş; sporadic.
133. *Chaerophyllum aureum* L. (Pop, Buz, 1994; Buz, 1999; Sămărghiţan, Pop, 2006).
134. *Chaerophyllum hirsutum* L.: hygrophilous tall-herb fringe communities; around Lakes Ursu and Paraschiva; sporadic.
135. *Daucus carota* L. subsp. *carota*: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
136. *Heracleum sphondylium* L.: hygrophilous tall-herb fringe communities around Lakes Ursu,

Paraschiva, Roşu, Verde, Şerpilor, Aluniş, along Pârâul Sărat and *"Pusta Nămoloasă"* area; mesic grasslands in "*Jánosmező*" and "*Rakottyás*"; frequent.
137. *Laser trilobum* (L.) Borkh. (Sămărghiţan, Pop, 2006).
138. *Peucedanum oreoselinum* (L.) Moench: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; sporadic.
139. *Sanicula europaea* L.: deciduous forest around Lakes Ursu, Paraschiva, Roşu, Verde, Mierlei and Aluniş; mesic grasslands along Pârâul Sărat; common.
Hypericaceae (Guttiferae)
140. *Hypericum hirsutum* L.: deciduous forest, mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; sporadic.
141. *Hypericum maculatum* Crantz: (Pop, Buz, 1994; Buz, 1999).
142. *Hypericum perforatum* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
Violaceae
143. *Viola mirabilis* L.: (Pop, Buz, 1994; Buz, 1999).
144. *Viola reichenbachiana* Jord. ex Boreau: deciduous forest; frequent.
145. *Viola riviniana* Rchb.: (Pop, Buz, 1994; Buz, 1999; Sămărghiţan, Pop, 2006).
Tiliaceae
146. *Tilia cordata* Mill.: deciduous forest; around Lakes Roşu, Verde, Mierlei and Aluniş; sporadic.
147. *Tilia platyphyllos* Scop.: deciduous forest; around Aluniş Lake; sporadic.
Cruciferae (Brassicaceae)
148. *Alliaria petiolata* (M. Bieb.) Cavara & Grande: deciduous forest; frequent.
149. *Cardamine bulbifera* (L.) Crantz: deciduous forest; common.
150. *Cardamine glanduligera* O. Schwarz: (Sămărghiţan, Pop, 2006); Carpathian subendemic taxa.
Salicaceae
151. *Populus alba* L.: around Aluniş Lake; rare; planted.
152. *Populus tremula* L.: deciduous forest; around Lakes Paraschiva, Mierlei and Aluniş; sporadic.
153. *Salix alba* L.: around Ursu Lake; rare.
154. *Salix caprea* L.: around Lakes Paraschiva and Şerpilor, along Pârâul Sărat and *"Pusta Nămoloasă"* area, "*Jánosmező*" and "*Rakottyás*"; frequent.
155. *Salix cinerea* L.: around Lakes Ursu, Paraschiva, Şerpilor, along Pârâul Sărat and *"Pusta Nămoloasă"* area, "*Jánosmező*" and "*Rakottyás*"; frequent.
156. *Salix purpurea* L.: around Paraschiva Lake; rare.
157. *Salix triandra* L.: around Paraschiva Lake; rare.
Primulaceae
158. *Lysimachia nummularia* L.: hygrophilous tall-herb fringe communities around Ursu Lake; hygrophilous tall-herb fringe communities, wet meadows around Paraschiva Lake, in "*Jánosmező*" and "*Rakottyás*" zone; frequent.
159. *Lysimachia vulgaris* L.: hygrophilous tall-herb fringe communities, wet meadows; around Lakes Ursu and Paraschiva, along Pârâul Sărat, in "*Jánosmező*" and "*Rakottyás*" zone; frequent.
160. *Primula elatior* (L.) Hill: (Sămărghiţan, Pop, 2006).
161. *Primula veris* L.: mesic grasslands; along Pârâul Sărat, "*Jánosmező*" and "*Rakottyás*"; sporadic.
Gentianaceae
162. *Centaurium erythraea* Rafn: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
163. *Gentiana asclepiadea* L.: deciduous forest; around Aluniş Lake; rare.
164. *Gentiana cruciata* L.: (Pop, Buz, 1994; Buz, 1999).
165. *Gentiana pneumonanthe* L.: wet meadows; "*Jánosmező*" and "*Rakottyás*"; rare; national red list taxa.
Oleaceae
166. *Fraxinus excelsior* L.: deciduous forest; around Aluniş Lake; sporadic.
167. *Ligustrum vulgare* L.: deciduous forest; around Lakes Roşu, Verde and Mierlei; frequent.
Convolvulaceae
168. *Calystegia sepium* (L.) R. Br.: littoral and palustral habitats, hygrophilous tall-herb fringe communities; around Lakes Ursu and Paraschiva; sporadic.
169. *Convolvulus arvensis* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
Boraginaceae
170. *Echium vulgare* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; sporadic.
171. *Myosotis scorpioides* L.: hygrophilous tall-herb fringe communities, wet meadows; around Paraschiva Lake; sporadic.
172. *Pulmonaria mollis* Wulfen ex Hornem. subsp. *mollissima* (A.Kern.) Nyman: (Pop, Buz, 1994; Buz, 1999).
173. *Pulmonaria obscura* Dumort.: deciduous forest; around Aluniş Lake; sporadic.
174. *Pulmonaria officinalis* L.: deciduous forest; around Aluniş Lake; sporadic.
175. *Pulmonaria rubra* Schott: (Sămărghiţan, Pop, 2006).

176. *Symphytum officinale* L.: hygrophilous tall-herb fringe communities around Ursu Lake, wet meadows around Paraschiva Lake; frequent.
177. *Symphytum tuberosum* L.: deciduous forest; around Lakes Paraschiva, Roşu, Verde, Mierlei and Aluniş; frequent.
Labiatae (Lamiaceae)
178. *Ajuga genevensis* L.: deciduous forest; common.
179. *Ajuga reptans* L.: deciduous forest; common.
180. *Clinopodium vulgare* L.: deciduous forest; common.
181. *Galeopsis tetrahit* L.: deciduous forest; common.
182. *Glechoma hederacea* L.: deciduous forest; around Lakes Roşu, Verde, Mierlei and Aluniş; common.
183. *Glechoma hirsuta* Waldst. & Kit.: deciduous forest; common.
184. *Lamiastrum galeobdolon* (L.) Ehrend. & Polatschek: deciduous forest; around Lakes Roşu, Verde and Aluniş; frequent.
185. *Lamium purpureum* L.: hygrophilous tall-herb fringe communities; around Ursu Lake; sporadic.
186. *Melittis melissophyllum* L.: (Pop, Buz, 1994; Buz, 1999).
187. *Origanum vulgare* L.: forest edge around Aluniş Lake; mesic grasslands along Pârâul Sărat and *"Pusta Nămoloasă"* area, "*Jánosmező*" and "*Rakottyás*"; frequent.
188. *Prunella vulgaris* L.: mesic grasslands; along Pârâul Sărat and *"Pusta Nămoloasă"* area, "*Jánosmező*" and "*Rakottyás*" zone; frequent.
189. *Salvia glutinosa* L.: deciduous forest; around Lakes Roşu, Verde, Mierlei and Aluniş; frequent.
190. *Salvia nemorosa* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
191. *Salvia verticillata* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
192. *Stachys annua* (L.) L.: hygrophilous tall-herb fringe communities around Ursu Lake; mesic grasslands in "*Jánosmező*" and "*Rakottyás*"; frequent.
193. *Stachys officinalis* (L.) Trevis.: wet meadows, mesic grasslands; around Paraschiva Lake, along Pârâul Sărat and *"Pusta Nămoloasă"* area, "*Jánosmező*" and "*Rakottyás*"; frequent.
194. *Stachys sylvatica* L.: deciduous forest; around Lakes Roşu, Verde, Mierlei and Aluniş; frequent.
195. *Thymus pannonicus* All. s.l.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
Plantaginaceae
196. *Plantago cornuti* Gouan: inland saline habitats; along Pârâul Sărat and *"Pusta Nămoloasă"* area; frequent; national red list taxa.
197. *Plantago lanceolata* L.: mesic grasslands; around Paraschiva Lake, along Pârâul Sărat, "*Jánosmező*" and "*Rakottyás*"; common.
198. *Plantago maritima* L.: inland saline habitats; along Pârâul Sărat and *"Pusta Nămoloasă"* area; frequent.
199. *Plantago media* L.: mesic grasslands; along Pârâul Sărat, "*Jánosmező*" and "*Rakottyás*"; common.
Scrophulariaceae
200. *Digitalis grandiflora* Mill.: deciduous forest; around Lakes Roşu, Verde, Mierlei, Aluniş, Muntele de Sare; sporadic.
201. *Lathraea squamaria* L.: (Sămărghiţan, Pop, 2006).
202. *Melampyrum bihariense* A. Kern.: deciduous forest; around Aluniş Lake; sporadic.
203. *Melampyrum nemorosum* L.: deciduous forest; around Lakes Paraschiva, Roşu, Verde, Mierlei and Aluniş; frequent; national red list taxa.
204. *Rhinanthus angustifolius* C.C. Gmel.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
205. *Scrophularia nodosa* L.: deciduous forest; around Aluniş Lake; sporadic.
206. *Verbascum phlomoides* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; sporadic.
207. *Veronica austriaca* L. subsp. *teucrium* (L.) D.A.Webb: (Sămărghiţan, Pop, 2006).
208. *Veronica officinalis* L.: (Pop, Buz, 1994; Buz, 1999).
Solanaceae
209. *Atropa bella-donna* L.: hygrophilous tall-herb fringe communities; around Ursu Lake; rare.
210. *Solanum dulcamara* L.: hygrophilous tall-herb fringe communities; around Lakes Ursu, Paraschiva, Şerpilor; sporadic.
Campanulaceae
211. *Campanula glomerata* L.: (Pop, Buz, 1994; Buz, 1999).
212. *Campanula patula* L. subsp. *patula:* mesic grasslands; along Pârâul Sărat, "*Jánosmező*" and "*Rakottyás*"; frequent.
213. *Campanula persicifolia* L.: deciduous forest; around Lakes Roşu, Verde and Aluniş, Muntele de Sare; mesic grasslands in "*Jánosmező*" and "*Rakottyás*"; frequent.
214. *Campanula rapunculoides* L.: deciduous forest; around Lakes Paraschiva, Roşu, Verde, Mierlei and Aluniş; frequent.
215. *Campanula rapunculus* L.: deciduous forest; around Lakes Paraschiva, Roşu, Verde, Mierlei and Aluniş; frequent.
216. *Campanula trachelium* L.: deciduous forest; around Lakes Mierlei and Aluniş; sporadic.
Rubiaceae

217. *Cruciata glabra* (L.) Ehrend.: (Pop, Buz, 1994; Buz, 1999).
218. *Cruciata laevipes* Opiz: (Sămărghiţan, Pop, 2006).
219. *Galium album* Mill.: hygrophilous tall-herb fringe communities around Lakes Ursu, Paraschiva and Aluniş, Muntele de Sare; mesic grasslands in "*Jánosmező*" and "*Rakottyás*"; frequent.
220. *Galium odoratum* (L.) Scop.: deciduous forest; frequent.
221. *Galium schultesii* Vest: deciduous forest; around Aluniş Lake; sporadic.
222. *Galium verum* L.: mesic grasslands; along Pârâul Sărat, "*Jánosmező*" and "*Rakottyás*"; frequent.
Caprifoliaceae
223. *Lonicera xylosteum* L.: (Pop, Buz, 1994; Buz, 1999).
224. *Sambucus nigra* L.: deciduous forest; sporadic.
225. *Viburnum lantana* L.: deciduous forest; sporadic.
226. *Viburnum opulus* L.: deciduous forest; around Aluniş Lake; sporadic.
Valerianaceae
227. *Valeriana officinalis* L.: wet meadows around Paraschiva Lake; mesic grasslands along Pârâul Sărat; sporadic.
Dipsacaceae
228. *Knautia arvensis* (L.) Coult.: mesic grasslands; along Pârâul Sărat, "*Jánosmező*" and "*Rakottyás*"; frequent.
229. *Succisa pratensis* Moench: wet meadows; "*Jánosmező*" and "*Rakottyás*"; sporadic.
Compositae (Asteraceae)
230. *Achillea millefolium* L.: mesic grasslands; along Pârâul Sărat, "*Jánosmező*" and "*Rakottyás*" zone; frequent.
231. *Achillea ptarmica* L.: wet meadows; "*Jánosmező*" and "*Rakottyás*"; sporadic; national red list taxa.
232. *Artemisia vulgaris* L.: hygrophilous tall-herb fringe communities; around Ursu Lake; sporadic.
233. *Aster tripolium* L.: inland saline habitats, hygrophilous tall-herb fringe communities; around Lakes Ursu, Roşu, Verde and Mierlei, Muntele de Sare, along the Pârâul Sărat and *"Pusta Nămoloasă"*; frequent.
234. *Bellis perennis* L.: mesic grasslands; around Paraschiva Lake; frequent.
235. *Carlina acaulis* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; rare.
236. *Centaurea jacea* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
237. *Cichorium intybus* L.: mesic grasslands; along the Pârâul Sărat, "*Jánosmező*" and "*Rakottyás*"; frequent.
238. *Cirsium canum* (L.) All.: hygrophilous tall-herb fringe communities, wet meadows; around Paraschiva Lake, "*Jánosmező*" and "*Rakottyás*"; sporadic.
239. *Cirsium oleraceum* (L.) Scop.: hygrophilous tall-herb fringe communities; around Lakes Ursu and Paraschiva, along the Pârâul Sărat, "*Jánosmező*" and "*Rakottyás*"; sporadic.
240. *Cirsium palustre* (L.) Scop: hygrophilous tall-herb fringe communities; around Lakes Ursu and Paraschiva; rare.
241. *Cirsium rivulare* (Jacq.) All.: wet meadows; around Paraschiva Lake; sporadic.
242. *Cirsium vulgare* (Savi) Ten.: hygrophilous tall-herb fringe communities; around Ursu Lake; sporadic.
243. *Crepis paludosa* (L.) Moench: hygrophilous tall-herb fringe communities; around Ursu Lake; sporadic.
244. *Erigeron annuus* (L.) Pers.: hygrophilous tall-herb fringe communities, mesic grasslands; around Paraschiva Lake, along Pârâul Sărat and *"Pusta Nămoloasă"* area, "*Jánosmező*" and "*Rakottyás*"; invasive taxa originated from North America; frequent.
245. *Eupatorium cannabinum* L.: hygrophilous tall-herb fringe communities; around Lakes Ursu, Paraschiva, Mierlei and Aluniş; frequent.
246. *Galinsoga parviflora* Cav.: hygrophilous tall-herb fringe communities; around Ursu Lake; invasive taxa originated from South America; sporadic.
247. *Hieracium murorum* L. agg.: deciduous forest; frequent.
248. *Hieracium racemosum* Waldst. & Kit. ex Willd.: (Sămărghiţan et Pop, 2006).
249. *Hieracium umbellatum* L.: deciduous forest; sporadic.
250. *Inula britannica* L.: inland saline habitats; along the Pârâul Sărat and *"Pusta Nămoloasă"* area; sporadic.
251. *Inula salicina* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; sporadic.
252. *Lapsana communis* L.: (Pop, Buz, 1994; Buz, 1999).
253. *Leucanthemum vulgare* Lam.: mesic grasslands; along the Pârâul Sărat, "*Jánosmező*" and "*Rakottyás*"; frequent.
254. *Mycelis muralis* (L.) Dumort.: deciduous forest; common.
255. *Rudbeckia laciniata* L.: hygrophilous tall-herb fringe communities; around Paraschiva Lake, Pârâul Sărat and *"Pusta Nămoloasă"* area, "*Jánosmező*" and "*Rakottyás*"; ornamental and invasive, North American taxa; frequent.

256. *Senecio doria* subsp. *umbrosus* (Waldst. & Kit.) Soó: hygrophilous tall-herb fringe communities; around Ursu Lake, along Pârâul Sărat and *"Pusta Nămoloasă"* area; sporadic.
257. *Senecio nemorensis* L.: mesic grasslands; along Pârâul Sărat and *"Pusta Nămoloasă"* area; rare.
258. *Senecio papposus* (Rchb.) Less.: (Pop, Buz, 1994; Buz, 1999).
259. *Solidago virgaurea* L.: deciduous forest; sporadic.
260. *Tanacetum corymbosum* (L.) Sch. Bip.: deciduous forest; around Lakes Roşu, Verde, Mierlei and Aluniş, Muntele de Sare; frequent.
261. *Tanacetum vulgare* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; sporadic.
262. *Telekia speciosa* (Schreb.) Baumg.: hygrophilous tall-herb fringe communities; around Lakes Paraschiva, Mierlei and Aluniş, along Pârâul Sărat and *"Pusta Nămoloasă"* area, "*Jánosmező*" and "*Rakottyás*" zone; sporadic.
263. *Tussilago farfara* L.: hygrophilous tall-herb fringe communities; around Lakes Ursu, Paraschiva, Şerpilor; frequent.

LILIOPSIDA (*Monocotyledonatae*)

Alismataceae

264. *Alisma plantago-aquatica* L.: littoral and palustral habitats; Paraschiva Lake; rare.

Juncaginaceae

265. *Triglochin maritima* L.: inland saline habitats; along the Pârâul Sărat and *"Pusta Nămoloasă"* area; rare.

Potamogetonaceae

266. *Potamogeton natans* L.: aquatic habitats; Paraschiva Lake; sporadic.
267. *Potamogeton pectinatus* L.: aquatic habitats; Paraschiva Lake; sporadic.

Liliaceae

268. *Allium vineale* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; rare.
269. *Erythronium dens-canis* L.: (Sămărghiţan, Pop, 2006).
270. *Lilium martagon* L.: (Pop, Buz, 1994; Buz, 1999); deciduous forest; rare.
271. *Maianthemum bifolium* (L.) F.W.Schmidt: deciduous forest; around Mierlei Lake; sporadic.
272. *Paris quadrifolia* L.: deciduous forest; around Aluniş Lake; rare.
273. *Polygonatum latifolium* (Jacq.) Desf.: deciduous forest around Lakes Mierlei and Aluniş; mesic grasslands along the Pârâul Sărat; frequent.
274. *Polygonatum multiflorum* (L.) All.: (Pop, Buz, 1994; Buz, 1999; Sămărghiţan, Pop, 2006); deciduous forest; common.
275. *Polygonatum odoratum* (Mill.) Druce: deciduous forest; around Lakes Mierlei and Aluniş; frequent.
276. *Polygonatum verticillatum* (L.) All.: (Pop, Buz, 1994; Buz, 1999, Sămărghiţan, Pop, 2006); deciduous forest; sporadic.
277. *Veratrum album* L.: wet meadows, hygrophilous tall-herb fringe communities; "*Jánosmező*" and "*Rakottyás*"; sporadic.

Amaryllidaceae

278. *Galanthus nivalis* L.: deciduous forest; sporadic; protected according to Habitats Directive, 92/43/EEC; OUG 57/2007; L 49/2011.
279. *Narcissus poëticus* L. subsp. *radiiflorus* (Salisb.) Baker: wet meadows; "*Jánosmező*" and "*Rakottyás*"; rare; national red list species.

Iridaceae

280. *Crocus banaticus* J. Gay: deciduous forest; Carpathian subendemic taxa; sporadic.

Orchidaceae

281. *Cephalanthera damasonium* (Mill.) Druce: (Sămărghiţan, Pop, 2006).
282. *Cephalanthera longifolia* (L.) Fritsch: (Pop, Buz, 1994; Buz, 1999; Sămărghiţan, Pop, 2006); deciduous forest; rare.
283. *Corallorhiza trifida* Châtel.: (Sămărghiţan, Pop, 2006).
284. *Cypripedium calceolus* L.: deciduous forest; around Aluniş Lake; rare; community interest species, protected according to Bern Convention, 82/72/EEC; Habitats Directive, 92/43/EEC; L 13/1993; OUG 57/2007; L 49/2011; national red list species.
285. *Epipactis atrorubens* (Hoffm.) Besser: (Pop, Buz, 1994; Buz, 1999); deciduous forest; rare.
286. *Epipactis helleborine* (L.) Crantz: deciduous forest; around Lakes Mierlei and Aluniş; mesic grasslands along the Pârâul Sărat; sporadic.
287. *Gymnadenia conopsea* (L.) R. Br.: mesic grasslands, wet meadows; along the Pârâul Sărat, "*Jánosmező*" and "*Rakottyás*"; sporadic.
288. *Listera ovata* (L.) R. Br.: deciduous forest; around Mierlei Lake; sporadic.
289. *Neottia nidus-avis* (L.) Rich.: deciduous forest; frequent.
290. *Orchis ustulata* L.: mesic grasslands, wet meadows; "*Jánosmező*" and "*Rakottyás*"; rare; national red list taxa.
291. *Platanthera bifolia* (L.) Rich.: deciduous forest; sporadic.

Juncaceae

292. *Juncus conglomeratus* L.: littoral and palustral habitats, wet meadows around Paraschiva Lake; hygrophilous tall-herb fringe communities along Pârâul Sărat and *"Pusta Nămoloasă"* area;

wet meadows in "*Jánosmező*" and "*Rakottyás*"; frequent.
293. *Juncus effusus* L.: littoral and palustral habitats, hygrophilous tall-herb fringe communities; around Lakes Paraschiva and Şerpilor; frequent.
294. *Juncus inflexus* L.: littoral and palustral habitats, wet meadows; around Paraschiva Lake; frequent.
295. *Luzula luzuloides* (Lam.) Dandy & Wilmott: deciduous forest; frequent.
296. *Luzula sylvatica* (Huds.) Gaudin: deciduous forest; around Aluniş Lake; sporadic.
Cyperaceae
297. *Carex digitata* L.: (Pop, Buz, 1994; Buz, 1999).
298. *Carex divulsa* Stokes: (Pop, Buz, 1994; Buz, 1999).
299. *Carex nigra* (L.) Reichard: littoral and palustral habitats around Paraschiva Lake; inland saline habitats along the Pârâul Sărat and *"Pusta Nămoloasă"* area; sporadic.
300. *Carex pilosa* Scop. (Sămărghiţan, Pop, 2006).
301. *Carex remota* L.: hygrophilous tall-herb fringe communities; around Şerpilor Lake; sporadic.
302. *Carex sylvatica* Huds.: deciduous forest; frequent.
303. *Carex vulpina* L.: littoral and palustral habitats; around Paraschiva Lake; sporadic.
304. *Scirpus sylvaticus* L.: littoral and palustral habitats, hygrophilous tall-herb fringe communities; around Lakes Ursu and Paraschiva; frequent.
Gramineae (Poaceae)
305. *Agrostis capillaris* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; common.
306. *Agrostis stolonifera* L.: inland saline habitats; along Pârâul Sărat and *"Pusta Nămoloasă"* area; frequent.
307. *Anthoxanthum odoratum* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; common.
308. *Brachypodium sylvaticum* (Huds.) P. Beauv.: deciduous forest; around Lakes Roşu, Verde, Mierlei and Aluniş; frequent.
309. *Briza media* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
310. *Bromus benekenii* (Lange) Trimen: (Pop, Buz, 1994; Buz, 1999).
311. *Cynosurus cristatus* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
312. *Dactylis glomerata* L.: mesic grasslands; along the Pârâul Sărat, "*Jánosmező*" and "*Rakottyás*"; frequent.
313. *Dactylis glomerata* L. subsp. *aschersoniana* (Graebn.) Thell.: deciduous forest; around Lakes Roşu, Verde, Mierlei and Aluniş; sporadic.
314. *Deschampsia cespitosa* (L.) P.Beauv: wet meadows; around Paraschiva Lake, "*Jánosmező*" and "*Rakottyás*"; frequent.
315. *Festuca drymeja* Mert. & W.D.J.Koch: deciduous forest; frequent.
316. *Festuca gigantea* (L.) Vill.: (Pop, Buz, 1994; Buz, 1999; Sămărghiţan, Pop, 2006).
317. *Festuca heterophylla* Lam.: (Sămărghiţan et Pop, 2006).
318. *Festuca pratensis* Huds.: wet meadows, mesic grasslands; around Paraschiva Lake, in "*Jánosmező*" and "*Rakottyás*"; frequent.
319. *Festuca rubra* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
320. *Glyceria arundinacea* Kunth: littoral and palustral habitats, hygrophilous tall-herb fringe communities; around Lakes Ursu and Paraschiva; sporadic.
321. *Holcus lanatus* L.: mesic grasslands, wet meadows; "*Jánosmező*" and "*Rakottyás*"; sporadic.
322. *Melica uniflora* Retz.: (Pop, Buz, 1994; Buz, 1999).
323. *Molinia caerulea* (L.) Moench: wet meadows; "*Jánosmező*" and "*Rakottyás*"; sporadic.
324. *Phleum pratense* L.: mesic grasslands; "*Jánosmező*" and "*Rakottyás*"; frequent.
325. *Phragmites australis* (Cav.) Trin. ex Steud.: littoral and palustral habitats, hygrophilous tall-herb fringe communities around Lakes Ursu, Paraschiva, Şerpilor and Mierlei; hygrophilous tall-herb fringe communities along the Pârâul Sărat and *"Pusta Nămoloasă"* area, "*Jánosmező*" and "*Rakottyás*", Muntele de Sare; frequent.
326. *Poa nemoralis* L.: deciduous forest; frequent.
327. *Puccinellia distans* (L.) Parl. subsp. *distans*: inland saline habitats; around Lakes Roşu and Verde, along the Pârâul Sărat and *"Pusta Nămoloasă"* area; frequent.
328. *Puccinellia distans* (L.) Parl. subsp. *limosa* (Schur) Jáv.: inland saline habitats; along the Pârâul Sărat and *"Pusta Nămoloasă"* area; sporadic.
Typhaceae
329. *Typha latifolia* L.: littoral and palustral habitats, hygrophilous tall-herb fringe communities around Lakes Paraschiva and Şerpilor; sporadic.
Lemnaceae
330. *Spirodela polyrhiza* (L.) Schleid.: aquatic habitats; Lakes Paraschiva and Şerpilor; frequent.

Discussion

Up to the present, 330 vascular plant taxa have been identified, belonging to 66 families. From the total number of taxa, 275 are original data,

representing plants identified in the field, and 55 are cited from bibliographic sources.

The most abundant families (>5 %) are: Compositae (Asteraceae) – 10.30%; Gramineae (Poaceae) – 7.27%; Leguminosae (Fabaceae) – 6.66%; Labiatae (Lamiaceae) – 5.45% and Rosaceae with 5.15%.

The highest level of particularity of the flora from phytogeographic point of view is given by its Carpathians endemic (*Aconitum lycoctonum* subsp. *moldavicum*) and subendemic (*Cardamine glanduligera, Crocus banaticus*) elements (Hurdu *et al.* 2012). Other taxa indicate the floristic links with the mountainous (*Pulmonaria rubra, Telekia speciosa*) and sub-mountainous (*Lathyrus hallersteinii, Geranium sylvaticum, Melampyrum biharіense*) areas of the Carpathians and the Balkan Mountains.

The salty soils are populated by halophytes: some species are obligatory halophytes (*Aster tripolium, Plantago cornuti, P. maritima, Puccinellia distans* subsp. *distans, Puccinellia distans* subsp. *limosa, Salicornia europaea, Triglochin maritima*), which form patches of characteristic vegetation.

Two protected species are present: *Cypripedium calceolus* (Bern Convention, 82/72/EEC; Habitats Directive, 92/43/EEC; L 13/1993; OUG 57/2007; L 49/2011) and *Galanthus nivalis* (Habitats Directive, 92/43/EEC; OUG 57/2007; L 49/2011). Seven taxa are included in national red lists (Boşcaiu *et al*. 1994; Oltean *et al*. 1994; Negrean 2001): *Achillea ptarmica, Crataegus nigra, Gentiana pneumonanthe, Melampyrum nemorosum, Narcissus poëticus* subsp. *radiiflorus, Orchis ustulata, Trollius europaeus* subsp. *europaeus*). Out of these, only *Cypripedium calceolus, Galanthus nivalis* and *Narcissus poëticus* subsp. *radiiflorus* are included in the European Red List of Vascular Plants (Bilz *et al.* 2011).

It is worth mentioning the presence of 6 invasive neophytes (Anastasiu, Negrean 2009): *Erigeron annuus*, *Galinsoga parviflora, Impatiens parviflora, Parthenocissus quinquefolia, Robinia pseudacacia* and *Rudbeckia laciniata.* These taxa require special attention from a biodiversity conservation perspective.

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Fig. 2. The Lake Ursu Nature Reserve and the study area.

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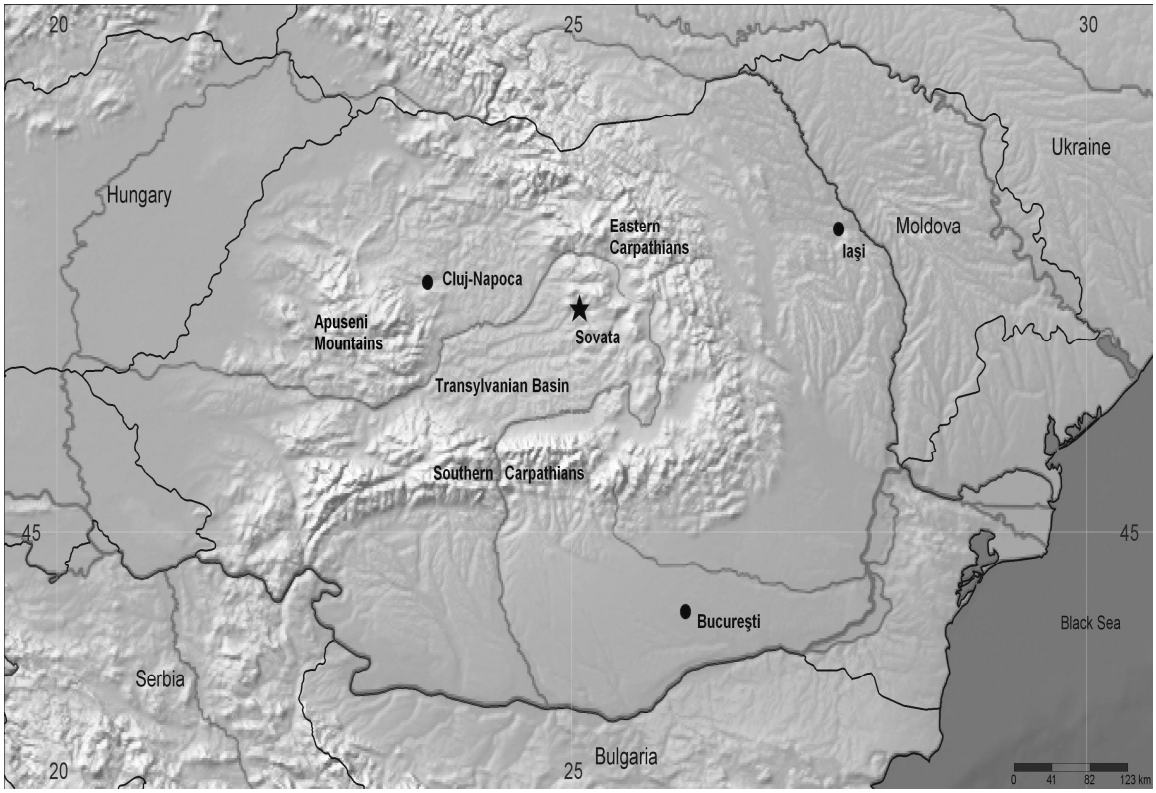
Fig. 2. Rezervaţia Naturală Lacul Ursu şi arboretele de pe sărături, respectiv perimetrul teritoriului cercetat



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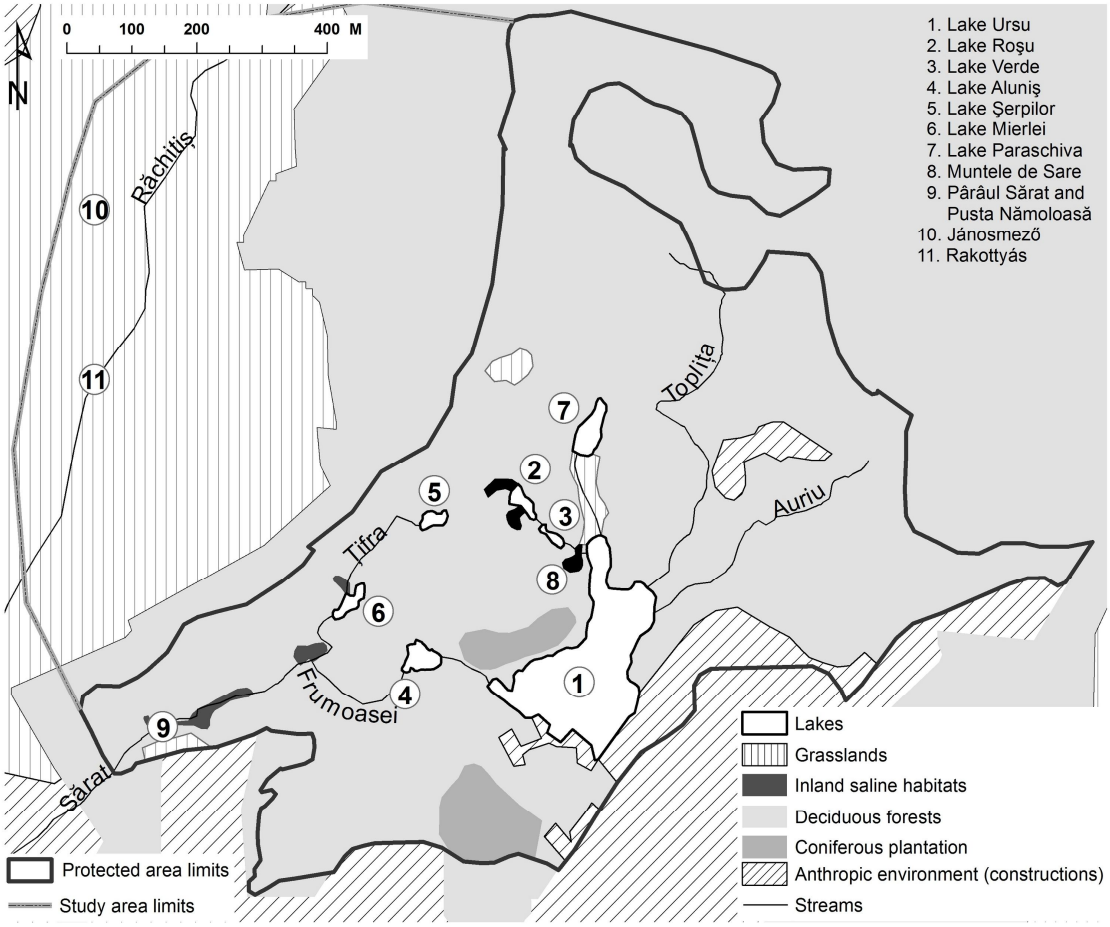

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