

FLORA AND VEGETATION OF THE NATURAL RESERVE "FÂNAȚUL DE LA GLODENI", VASLUI COUNTY

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Abstract: the authors present, in detail, the vascular flora, as well the vegetation of a natural reserve from Vaslui county, namely the Natural Reserve "Fânațul de la Glodeni". On a surface of ca. 6 ha, there are some rare vascular plants for the Romanian Vascular Flora. Also, in this area, Constantin Dobrescu cited an endemic species for Romania: *Galium moldavicum* (it is a plant species which are included in Bern Convention, Appendix I, Annex I, 1998).

Key words: vascular flora, rare plants, endemic species, natural reserve

Introduction

The natural reserve "Fânațul de la Glodeni" is a hay field, having an area of ca. 6 ha, on the Eastern slope of the same hill (Glodeni), at ca. 2 Km away of the railway station Rateș-Cuza (Vaslui county). This century-old hay field has been proposed as a protected area by C. Dobrescu, and has approved by a local decision, in 1973.

Relief: it is represented by a slope, of 10-30° proclivity, with stabilized or still active landslides of the fields. This protected area is bordered at the inferior part of the slope (towards E and S) by the crops, towards W (at the top of the slope) there are bushes of *Prunus spinosa* and *Prunus tenella*, and towards N it is bordered by a meadows, showing recently and unstabilized landslides. The soil is a leached chernozem. In the protected area there are some springs, supplied by the phreatic water, thus resulting the occurrence of some small islands of hygrophilous vegetation, edified by a few species of *Carex*. The climate is of a temperate-continental type, with yearly average temperatures of ca. 9.5°C, and yearly average precipitations of 520 mm (at Vaslui).

C. Dobrescu has surveyed the flora and vegetation of this hay field, in 1960-1970, but without any publication of a complete floristical or coenotaxonomical outlines. That's the way we have decided to make investigations over this quite interesting hay field in Moldavia.

The Flora of the Natural Reserve "Fânațul de la Glodeni"

Proceeding from the cited literature and on our own field investigations (between 1999-2004), there have been catalogued 315 vascular plant species, belonging to 176 genera, and 45 families of vascular plant species.

Floristical outline. *Abutilon theophrasti*, *Achillea collina*, *A. pannonica*, *A. setacea*, *Acinos arvensis*, *Adonis aestivalis*, *A. vernalis*, *Agrimonia eupatoria*, *Agropyron*

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cristatum ssp. *pectinatum*, *Agrostis stolonifera*, *Ajuga genevensis*, *A. laxmannii*, *Allium flavum*, *A. scorodoprasum* ssp. *rotundum*, *Althaea cannabina*, *Alopecurus pratensis*, *Anchusa ochroleuca*, *A. barrelieri*, *Anemone sylvestris*, *Anthemis tinctoria*, *Anthericum ramosum*, *Arenaria serpyllifolia*, *Aristolochia clematidis*, *Arrhenatherum elatius*, *Artemisia absinthium*, *A. austriaca*, *Asyneuma canescens*, *Asparagus officinalis*, *A. pseudoscaber*, *A. tenuifolius*, *Asperula cynanchica*, *A. tenella*, *Astragalus cicer*, *A. onobrychis*, *Avenula pubescens*, *Ballota nigra*, *Berteroa incana*, *Scirpus maritimus*, *Brachypodium pinnatum*, *Bromus arvensis*, *B. commutatus*, *B. hordeaceus*, *B. inermis*, *B. tectorum*, *Buglossoides arvensis*, *Bupleurum rotundifolium*, *Calamagrostis epigejos*, *Campanula bononiensis*, *C. sibirica*, *Capsella bursa-pastoris*, *C. rubella*, *Cardaria draba*, *Carduus acanthoides*, *C. hamulosus*, *C. x pseudohamulosus* [9], *Carex distans*, *C. hirta*, *C. michelii*, *C. otrubae*, *C. praecox*, *C. tomentosa*, *C. vulpina*, *Centaurea apiculata* ssp. *spinulosa* [6], *C. biebersteinii*, *Centaurea x flavida*, *C. x grecescui* [5], *C. jacea*, *C. x neiceffii*, *C. orientalis*, *C. x podolica*, *C. x pseudorientalis*, *C. scabiosa*, *C. solstitialis*, *C. rhenana*, *Cerastium semidecandrum*, *Ceratocarpus arenarius*, *Ceratocephalus testiculatus*, *Cerinthe minor*, *Chamaecytisus austriacus*, *Chenopodium album*, *Chorispora tenella*, *Chrysopogon gryllus*, *Cichorium intybus*, *Cirsium serrulatum*, *Consolida regalis*, *Convolvulus arvensis*, *Cornus sanguinea*, *Coronilla varia*, *Crambe tataria*, *Crataegus monogyna*, *Crepis foetida* ssp. *rheoadifolia*, *Crepis setosa*, *C. tectorum*, *Cuscuta campestris*, *Cynodon dactylon*, *Dactylis glomerata*, *Daucus carota*, *Descurainia sophia*, *Dianthus capitatus*, *D. membranaceus*, *Dichanthium ischaemum*, *Dorycnium pentaphyllum* ssp. *herbaceum*, *Draba nemorosa*, *Echium russicum*, *E. vulgare*, *Elaeagnus angustifolia* (cult.), *Elymus hispidus* ssp. *hispidus*, ssp. *barbulatus* [5], *E. repens*, *Equisetum arvense*, *E. palustre*, *E. ramosissimum*, *E. telmateia*, *Erigeron acer*, *Erodium cicutarium*, *Erophila verna* ssp. *verna*, *Eryngium campestre*, *E. planum*, *Erysimum cheiranthoides*, *E. diffusum*, *E. exaltatum*, *E. virgatum*, *E. odoratum*, *E. repandum*, *Euphorbia agraria*, *E. cyparissias*, *E. nicaeensis*, *Falcaria vulgaris*, *Ferulago campestris*, *Festuca arundinacea*, *F. pratensis*, *F. valesiaca*, *Filipendula vulgaris*, *Fragaria viridis*, *Fumaria schleicheri*, *Gagea pratensis*, *Galium glaucum*, *G. humifusum*, *G. moldavicum* [4], *G. octonarium*, *G. mollugo*, *G. verum*, *G. volhynicum* [9], *Genista tinctoria*, *Geranium pusillum*, *Glaucium corniculatum*, *Glechoma hederacea*, *Helichrysum arenarium*, *Herniaria incana*, *Hieracium praealtum* ssp. *bauhini*, *H. echioides*, *H. pilosella*, *H. viosum*, *Holosteum umbellatum*, *Hypericum perforatum*, *Inula britannica*, *I. ensifolia*, *I. hirta*, *I. germanica*, *I. oculus-christi*, *I. salicina*, *Inula x rigida*, *I. x stricta* var. *neilreichii* [7], *Iris aphylla*, *I. graminea*, *I. pumila*, *Juncus articulatus*, *J. compressus*, *J. inflexus*, *Jurinea arachnoidea*, *J. mollis*, *Knautia arvensis*, *Koeleria macrantha*, *Lactuca serriola*, *Lamium amplexicaule*, *Lappula squarrosa*, *Lathyrus pallescens*, *L. tuberosus*, *Lavatera thuringiaca*, *Leontodon crispus*, *L. hispidus*, *Leonurus cardiaca*, *Lepidium campestre*, *L. perfoliatum*, *Linum austriacum*, *L. flavum*, *L. hirsutum*, *Lolium perenne*, *Lotus corniculatus*, *Lysimachia nummularia*, *Malabaila graveolens*, *Malus sylvestris*, *Marrubium peregrinum*, *M. vulgare*, *Matricaria perforata*, *Medicago falcata*, *M. lupulina*, *M. sativa*, *Melampyrum arvense*, *M. barbatum*, *M. cristatum*, *Melica ciliata*, *Melilotus officinalis*, *Mentha x verticillata*, *Muscari comosum*, *M. neglectum*, *M. tenuiflorum*, *Nepeta*

nuda, *Nonea pulla*, *Onobrychis viciifolia*, *Ononis arvensis*, *Ornithogalum orthophyllum* ssp. *kochii*, *Oxytropis pilosa*, *Phleum phleoides*, *Ph. pratense*, *Phlomis herba-venti* ssp. *pungens*, *Ph. tuberosa*, *Phragmites australis*, *Picris hieracioides*, *Pimpinella saxifraga*, *Pyrus pyraster*, *Plantago lanceolata*, *P. media*, *P. major*, *Poa angustifolia*, *P. bulbosa* (incl. var. *vivipara*), *P. pratensis*, *Polygala vulgaris*, *Potentilla argentea*, *P. cinerea*, *P. inclinata*, *P. recta*, *Prunella x bicolor* [7], *P. grandiflora*, *P. laciniata*, *P. vulgaris*, *Prunus fruticosa*, *P. spinosa* ssp. *spinosa*, ssp. *dasyphylla*, *P. tenella*, *Pulsatilla montana*, *P. pratensis* ssp. *nigricans*, *P. vulgaris* ssp. *grandis*, *Ranunculus illyricus*, *R. polyanthemoides* ssp. *polyanthemoides*, *Rapistrum perenne*, *Reseda lutea*, *Rhamnus catharticus*, *Rhinanthus minor*, *R. rumelicus*, *Robinia pseudacacia*, *Rosa canina*, *R. corymbifera*, *R. gallica*, *Rubus caesius*, *Rumex crispus*, *R. confertus*, *R. patientia*, *Salix alba*, *S. triandra*, *Salvia austriaca*, *S. nemorosa*, *S. nutans*, *S. pratensis*, *S. x sylvestris* [5], *S. verticillata*, *Scabiosa ochroleuca*, *Scirpus lacustris* ssp. *tabernaemontani*, *Senecio erucifolius*, *S. jacobaea*, *S. vernalis*, *Serratula radiata* [6], *Seseli annuum*, *Silene otites* s.l., *Sisymbrium loeselii*, *Stachys germanica*, *S. officinalis*, *S. recta*, *Stellaria graminea*, *Stipa capillata*, *S. pennata* ssp. *pennata*, *S. lessingiana*, *S. tirsia*, *Taraxacum officinale*, *T. serotinum*, *Teucrium chamaedrys*, *T. polium* ssp. *capitatum*, *Thalictrum minus* var. *flexuosum*, *Thesium dollineri*, *Thlaspi arvense*, *Th. perfoliatum*, *Thymus glabrescens* ssp. *glabrescens*, *Th. pannonicus*, *Tragopogon dubius*, *Trifolium alpestre*, *T. arvense*, *T. medium*, *T. montanum*, *T. ochroleucum*, *T. pratense*, *T. repens*, *Trinia ramosissima*, *Tussilago farfara*, *Urtica dioica*, *Verbascum lychnitis*, *V. speciosum*, *Verbena officinalis*, *Veronica arvensis*, *V. austriaca*, *V. chamaedrys*, *V. polita*, *V. prostrata*, *V. spicata*, *Vicia angustifolia*, *V. cracca*, *Vicia hirta*, *V. sativa*, *Vinca herbacea*, *Vincetoxicum hirsutinaria*, *Viola hirta*, *V. tricolor*, *Xanthium strumarium*, *Xeranthemum annuum*.

Analysing the floristical outline of this protected area, its flora has a strong steppic and xerophilous specific features. Among the floristical elements, the most prevailing are the next ones: eurasiatic, eurasiatic-continental, and european. The pontic element (pontic, pontic-balcanic, pontic-panonic-balcanic, pontic-mediteranean) has also a higher ponderosity (15%); some pontic elements are quite frequently into the floristic composition of the vegetation, being the coenotic nucleus of the sub-alliance *Jurineo-Euphorbinion nicaeensis*: *Euphorbia nicaeensis*, *Linum hirsutum*, *Jurinea arachnoidea*, *Malabaila graveolens*, *Phlomis herba-venti* ssp. *pungens*, *Salvia nutans*, *Taraxacum serotinum*, *Dianthus membranaceus*, *Centaurea orientalis* etc [2; 6]. The scientific importance of this natural reserve is given by the presence of many rare plants even in the Romanian flora. Some of them are registered into the Romanian Red List [12]: *Cirsium serrulatum* (K), *Crambe tataria* (V/R), *Elymus hispidus* ssp. *barbulatus* (R), *Muscari neglectum* (R), *Pulsatilla vulgaris* ssp. *grandis* (R), *Serratula radiata* (R), *Galium volhynicum* (R) and so on. Other rare plants in the flora of Vaslui county, and registered in this protected area, are the next ones: *Allium flavum*, *Althaea cannabina*, *Avenula pubescens* (it is a newly plant species discovered in the flora of Vaslui county), *Capsella rubella*, *Carduus hamulosus*, *C. x pseudohamulosus*, *Centaurea x flavida*, *C. x grecescui*, *C. x podolica*, *Erysimum*

cheiranthoides, *E. exaltatum*, ? *Galium moldavicum* (VU), *Hieracium virosum*, *Inula x rigida*, *I. x stricta* var. *neilreichii*, *Iris aphylla*, *I. graminea*, *I. pumila*, *Jurinea mollis*, *Potentilla inclinata*, *Prunella x bicolor*, *Pulsatilla pratensis* ssp. *nigricans*, *Salvia x sylvestris* and so on. Among these plant species, one can observe a lot of hybrids, as: *Centaurea* (5 species), *Inula* (2 species), *Carduus*, *Mentha*, *Prunella*, *Salvia* (with only one species). As concerning *Galium moldavicum*, cited there for the 1st time by Dobrescu [4], we have not able to identify it again in the field. This could be explained by the lack of some adequate measures of preserving this hay field: the lack of a fence and a strong zoo-anthropogenic degradation, which lead to settled down of a ruderal vegetation in a part of the very centre of this natural reserve, area where the domestic animals are hosted over the winter time.

The Vegetation of the Natural Reserve “Fânațul de la Glodeni”

As concerning the natural vegetation, the largest surface is covered by the phytocoenoses of the association *Taraxaco serotini - Festucetum valesiacaе*. But, on small areas, there are some phytocoenoses edified by *Chrysopogon gryllus*, framing into the association *Thymio pannonici - Chrysopogonetum grylli*; the temporary presence of water in some small micro-depressions, lead to the presence of a hygrophilous vegetation. A pretty large surface (ca. 1000 m²) is completely occupied by the ruderal vegetation, edified by *Bromus tectorum*, *Capsella bursa-pastoris*, *Descurainia sophia*, *Urtica dioica* and so on. All the vegetal associations identified in this natural reserve are framed out like the next:

- Cl. **Festuco - Brometea** Br.-Bl. et R. Tx. in Br.-Bl. 1949
- Ord. **Festucetalia valesiacaе** Br.-Bl. et R. Tx. ex Br.-Bl. 1949
- Al. **Festucion valesiacaе** Klika 1931
- Subal. **Jurineo arachnoideae - Euphorbinenion nicaensis** Dobrescu et Kovacs 1971 corr. Sârbu, Coldea et Chifu 1999
 - 1. Ass. **Taraxaco serotini - Festucetum valesiacaе** (Burduja et al. 1956) Sârbu, Coldea et Chifu 1999
 - 2. Ass. **Thymio pannonici - Chrysopogonetum grylli** Doniță et al. 1992 (Syn. *Chrysopogonetum grylli* Soó 1939)
- Cl. **Stellarietea mediae** R. Tx., Lohmeyer et Preising in R. Tx. 1950
- Ord. **Sisymbrietalia** J. Tx. ex Görs 1966
- Al. **Sisymbriion officinalis** R. Tx., Lohmeyer et Preising in R. Tx. 1950
- 3. Ass. **Capsello - Descurainetum sophiae** Mucina 1993 (Syn. *Sisymbrietum sophiae* Kreh 1935)
 - subass. **brometosum tectori** Ad. Oprea et C. Sîrbu 2003 (Syn. *Descurainio sophiae - Brometum tectori* Burduja et al. ined., apud Horeanu 1975)
- Cl. **Galio - Urticetea** Passarge ex Kopecký 1969
- Ord. **Lamio albi - Chenopodietalia boni-henrici** Kopecký 1962
- Al. **Galio - Alliarion** (Oberd. 1957) Lohm. et Oberd. in Oberd. et al. 1967
- 4. Ass. **Urticetum dioicae** Steffen 1931, Turenschi 1966

Description of the vegetal association

1. Ass. *Taraxaco serotini* - *Festucetum valesiaca* (Burduja et al. 1956) Sârbu, Coldea et Chifu 1999 (Table I, Rel. No 1-11)

It is a meadows of stepped hair grass, having a pontic-continental characteristic, belonging to the suballiance *Jurineo arachnoideae* - *Euphorbinenion nicaeensis*, representing the dominant vegetation into this protected area. This meadow represents the zonal vegetation from the forest-steppe in Moldavia, being a secular hay field, having a relict characteristic feature, surrounded by the crop fields, ruderal meadows and bushes; all of these last vegetation types influenced a lot the floristical structure of this reservation. Thus, the ponderosity of the characteristic species for the superior coenotaxons decreased from 83% (in 1971) at ca. 74% (in 1999-2003); the ponderosity of the the characteristic species for alliance and suballiance decreased from ca. 30% (in 1971) at 19-24% (in 1999-2003); on the other hand, the ponderosity of the weeds (characteristic for classes *Stellarietea mediae* and *Artemisietea vulgaris*) have increased from 4% (in 1971) at over 10% (in 1999-2003). The vegetational cover, having a coverage of 60-95%, is made by *Festuca valesiaca* (V³⁻⁴), and the characteristic species of this association (*Taraxacum serrotinum*) has a higher presence, and, here and there, even a higher coverage of the soil (IV⁺¹). Among the species having higher coenotaxonomical indices, there are the next ones: *Adonis vernalis*, *Phlomis herba-venti* ssp. *pungens*, *Elymus hispidus* ssp. *hispidus* (V⁺¹), *Achillea setacea*, *Onobrychis viciifolia*, *Stachys recta*, *Euphorbia nicaeensis*, *Galium octonarium* (V⁺), *Chamaecytissus austriacus* (IV⁺¹), *Dichanthium ischaemum* (III⁺²) and so on. In the table no. 1, we are showing, comparatively, both the phytocoenoses published by Dobrescu [6] and those registered by us (1999-2003), in order to underline all the changes in the floristical composition of this association inside this protected area.

2. Ass. *Thymio pannonici* - *Chrysopogonetum grylli* Doniță et al. 1992

Those two phytocoenoses edified by *Chrysopogon gryllus* inside the natural reserve (Table I, rel. no. 12-13), having surfaces between 50-100 m², having a coverage of 65-90%, are framed out into this vegetal association; this is a breaked up association, installed on fields having some decline (5-10⁰), in dry and sunny ecotops. The number of the species inside those two phytocoenoses is relatively small (36, respectively 41). As a result of the influence of the neighbouring vegetation, beside the edificatory species in the coverage of the soil, *Festuca valesiaca* have a coverage between 5-20%, as well as *Teucrium chamaedrys* (5-10%).

3. The ruderal vegetation

Inside this natural reserve, as result of hosting the domestic animals (next to a draw well), there is an advanced degradation of the meadows, on a surface of ca. 1000 m², this fact lead to the installation of some pretty large ruderal phytocoenoses. These phytocoenoses edified by *Bromus tectorum*, accompanied by *Descurainia sophia*, *Capsella bursa-pastoris*, *Sisymbrium loeselli*, and other characteristic species for ord. *Sisymbrietalia* (Table II, rel. no. 1 and 2) are framed out into the ass. *Capsello - Descurainetum sophiae* Mucina 1993 (Syn. *Sisymbrietum sophiae* Kreh 1935), subass. *brometosum tectori* Ad. Oprea et C. Sîrbu, 2003 (Basionym: *Descurainio sophiae-Brometum tectori* Burduja et al.

ined., apud Horeanu 1975) [13]; all the phytocoenoses edified by *Urtica dioica* (Table II, rel. no. 3) are framed out into the ass. *Urticetum dioicae* Steffen 1931, Turenschi 1966.

Conclusions

Through our investigations, we wish to underline the outstanding scientific importance of this floristic natural reserve, preserving a century-old hay field. There are numerous rare plants, having a steppic characteristic feature. Also, there must be taken urgently conservation measures, hoping that all those rare plant species will survive over the time, especially the endemic one *Galium moldavicum*.

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Table No. 1

Ass. *Taraxaco serotini* – *Festucetum valesiacae* (Rel. No. 1-11); Ass. *Thymio pannonici* - *Chrysopogonetum grylli* (Rel. No. 12-13)

No. of releveé	1	2	3	4	5	6	7	8	9	10	11	12	13
Exposition	SE	E	E	E	E	E	E	E	E	E	E	E	E
Slope (°)	12	10	5-7	10	5	10	3	10	5	20	5	5	10
Coverage (%)	65	80	95	95	90	95	85	85	70	70	60	65	90
Surface of releveé	100	100	100	100	100	100	100	100	100	100	100	50	100
No. of species	110	81	48	44	48	50	55	49	49	46	45	36	41
<i>Festuca valesiaca</i>	3	3-4	4	4	3	3	4	4	3	3	3	1	2
<i>Taraxacum serotinum</i>	+	-	-	-	+	+	+	+	1	+	-	-	-
<i>Chrysopogon gryllus</i>	+	-	-	-	-	-	-	-	-	-	-	3	4
<i>Jurineo arachnoideae - Euphorbinenion nicaeensis</i>													
<i>Anchusa ochroleuca</i>	+	+	+	+	+	+	+	+	-	-	-	-	-
<i>Centaurea orientalis</i>	+	+	-	-	+	+	-	+	+	-	+	-	+
<i>Ceratocarpus arenarius</i>	+1	+	-	-	-	-	-	-	-	-	-	-	-
<i>Cirsium serrulatum</i>	-	-	+	-	-	-	-	-	-	-	-	-	-
<i>Crambe tataria</i>	+	-	-	-	-	-	-	+	-	-	+	-	-
<i>Dianthus membranaceus</i>	+	+	+	+	+	-	+	-	-	+	-	-	-
<i>Euphorbia nicaeensis</i>	+	+	+	+	+	-	+	+	+	+	+	+	+
<i>Galium moldavicum</i>	+	+	-	-	-	-	-	-	-	-	-	-	-
<i>Jurinea arachnoidea</i>	+	+	-	-	+	+	-	+	+	-	+	+	-
<i>Linum hirsutum</i>	+	+	-	-	+	-	-	-	-	-	-	-	+
<i>Malabaila graveolens</i>	+	+	-	-	-	-	-	-	-	-	-	-	-
<i>Phlomis *pungens</i>	+	+	+	+	-	+	+	+	+	1	1	-	+
<i>Phlomis tuberosa</i>	+	-	-	+	-	+	+	-	-	-	+	-	-
<i>Salvia nutans</i>	-	+	-	-	-	-	-	-	-	-	-	-	-
<i>Festucion valesiacae</i>													
<i>Agropyrom *pectinatum</i>	+	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ajuga laxmanni</i>	+	+	-	-	-	-	+	-	-	-	-	-	-
<i>Artemisia austriaca</i>	+	-	+	+	+	-	+	-	+	+	-	-	-
<i>Carduus hamulosus</i>	+	+	+	-	-	-	-	-	+	-	-	-	-
<i>Ceratocephalus testiculatus</i>	+	-	-	-	-	-	-	-	-	-	-	-	-
<i>Dianthus capitatus</i>	+	+	-	-	-	-	-	-	-	-	-	-	-
<i>Dorycnium *herbaceum</i>	+	+	-	-	-	-	-	-	+	+	-	-	+
<i>Echium russicum</i>	+	-	-	-	-	-	+	+	+	+	+	-	-
<i>Elymus *hispidus</i>	+	+1	+	+	+	+	1	-	+	+	+	-	-
<i>Ferulago campestris</i>	+	+	-	-	-	-	-	-	-	-	-	-	-
<i>Galium octonarium</i>	+	+	+	+	+	-	+	+	+	+	+	+	+
<i>Herniaria incana</i>	+	-	-	-	-	-	-	-	-	-	-	-	-
<i>Inula germanica</i>	+	+	-	-	-	+	-	-	+	+	1	-	+
<i>Inula oculus-christi</i>	+	-	-	-	-	-	-	-	-	-	-	-	-
<i>Iris graminea</i>	+	-	-	-	-	+	-	+	+	-	-	-	-
<i>Iris hungarica</i>	+	+	-	-	-	+	+	1	-	+	+	-	-

Marrubium peregrinum	+	-	+	+	+	+	-	-	-	-	-	-	-
Melampyrum arvense	+	+	-	-	-	-	+	+	-	-	+	-	+
Melampyrum cristatum	+	+	-	-	-	-	-	-	-	-	-	-	-
Oxytropis pilosa	+	+	-	-	-	-	-	-	-	-	-	-	-
Pulsatilla montana	+	+	-	-	-	-	+	+	-	-	+	+	-
Ranunculus illyricus	+	-	-	-	-	-	-	-	-	-	-	-	-
Salvia austriaca	+	+	+	+	-	+	+	+	-	+	-	-	-
Serratula radiata	-	+	-	-	-	-	-	-	-	-	-	-	-
Trinia ramosissima	+	-	-	-	-	-	+	-	-	-	-	+	+
Vinca herbacea	-	-	-	-	-	-	-	-	+	-	-	-	-
Xeranthemum annuum	+	-	-	-	-	-	-	-	-	-	-	-	-
<i>Festucetalia valesiaca</i>													
Achillea pannonica	-	-	-	-	+	-	-	-	-	-	-	-	-
Achillea setacea	+	+	+	+	+	+	+	+	+	+	+	+	+
Adonis vernalis	+	+1	+	-	+	+	-	+	1	1	1	+	-
Allium *rotundum	-	-	-	-	-	+	-	-	-	-	-	-	-
Anthericum ramosum	+	+	-	-	-	+	-	-	-	-	-	-	-
Asparagus officinalis	+	-	-	-	-	-	-	-	+	-	+	-	-
Astragalus onobrychis	+	+	-	-	-	-	-	-	+	+	+	+	+
Campanula sibirica	+	+	-	-	-	+	+	-	+	+	-	-	+
Centaurea *spinulosa	+	-	-	-	-	-	-	-	-	-	-	-	-
Centaurea biebersteinii	+	-	+	+	-	+	+	+	+	-	+	-	+
Centaurea rhenana	-	-	+	+	+	+	-	-	-	-	-	-	+
Chamaecytisus austriacus	+	+	+	-	+	+	+	+	1	-	-	+	+
Erysimum diffusum	+	-	-	-	-	-	-	-	-	-	-	-	-
Fragaria viridis	+	+	+	+	-	-	+	-	+	+	+	-	-
Galium humifusum	-	-	+	-	-	-	-	-	-	-	-	-	-
Hieracium *bauhinii	+	-	-	-	+	-	+	-	+	+	-	-	-
Hypericum perforatum	+	+	-	-	-	-	-	+	-	-	-	-	-
Inula ensifolia	-	+	-	-	-	-	-	-	+	-	-	-	-
Inula hirta	+	-	-	-	-	-	+	-	-	+	-	-	-
Inula salicina	+	+	-	-	-	-	-	-	-	-	-	-	-
Knautia arvensis	+	+	+	+	+	+	-	+	-	-	-	-	+
Linum flavum	+	+	-	-	-	-	-	-	-	-	-	-	-
Melica ciliata	+	+	-	-	-	-	-	-	-	-	-	-	-
Muscari tenuiflorum	-	-	-	-	-	+	-	-	-	-	-	-	+
Onobrychis viciifolia	+	+	+	+	+	+	+	+	+	+	+	+	+
Rosa gallica	+	+	-	-	-	+	-	-	+	-	-	-	+
Senecio jacobaea	+	-	-	+	-	-	+	-	-	-	-	-	+
Silene otites s.l.	+	+	-	+	+	-	-	-	+	+	+	-	-
Stachys recta	+	+	+	+	-	+	+	+	+	+	+	+	+
Stipa capillata	+	+	-	-	-	+	-	-	-	-	-	-	-
Teucrium chamaedrys	+	-	+	-	-	+	+	+	-	+	+	-	1
Teucrium *capitatum	-	+	-	-	-	+	+	-	-	+	-	-	+
Thalictrum minus	-	-	+	+	+	-	-	-	+	-	+	-	+

Thymus glabrescens	-	-	-	-	-	-	+	-	+	+	+	-	-
Thymus *pilosus	-	-	-	-	+	-	-	-	-	-	-	-	-
Thymus pannonicus	+	+	+	-	+	-	+	+	-	+	-	+	-
Veronica prostrata	-	+	-	-	-	-	-	+	+	+	+	-	-
<i>Festuco-Brometea</i>													
Achillea collina	+	-	-	-	-	-	-	-	-	-	-	-	-
Acinos arvensis	+	+	-	-	-	-	-	-	+	-	-	-	-
Arenaria serpyllifolia	-	-	+	+	-	-	-	-	-	-	-	-	-
Asperula cynanchica	+	+	+	-	-	+	+	+	+	-	+	-	-
Astragalus cicer	-	-	-	-	+	-	-	-	-	-	-	-	-
Bromus hordeaceus	+	+	-	-	-	-	-	-	-	-	-	-	-
Carex praecox	+	-	-	-	-	-	1	+	-	+	-	-	-
Carex tomentosa	+	-	-	-	-	-	+	+	-	+	-	-	-
Cerithe minor	+	+	+	+	-	+	+	-	-	-	+	+	+
Coronilla varia	+	-	+	+	-	+	-	-	-	+	-	+	-
Cynodon dactylon	-	+	-	-	-	-	-	-	-	-	-	-	-
Dichanthium ischaemum	1	+	-	-	-	2	+	-	-	+	+	-	+
Echium vulgare	+	-	+	+	-	-	+	-	+	-	-	-	-
Erigeron acer	+	-	-	-	+	-	-	-	-	-	-	-	-
Erophila verna	-	+	-	-	-	-	-	-	-	-	-	-	-
Eryngium campestre	-	+	+	+	+	-	+	-	+	+	-	+	+
Euphorbia cyparissias	+	-	-	-	-	-	-	-	-	-	+	-	-
Filipendula vulgaris	+	+	-	-	-	-	+	-	+	-	-	-	+
Galium verum	+	-	+	+	+	-	+	-	-	+	+	+	+
Helichrysum arenarium	+	+	-	-	+	-	-	-	-	-	-	+	-
Koeleria macrantha	+1	+	-	-	-	-	+	+	-	+	+	-	-
Medicago falcata	1	1	1	1	+	1	+	+	+	+	+	+	+
Medicago lupulina	+	+	-	-	-	-	-	-	+	-	-	-	-
Muscari comosum	+	+	-	-	-	-	+	+	-	-	+	-	-
Muscari racemosum	-	-	-	-	-	-	-	-	+	+	-	-	-
Nonea pulla	+	+	-	-	+	-	-	+	-	-	+	+	+
Phleum phleoides	+	+	-	-	-	-	-	+	-	+	-	-	-
Pimpinella saxifraga	-	-	+	-	-	-	-	-	-	-	-	-	-
Plantago lanceolata	+	+	+	+	+	+	+	+	+	+	+	+	+
Plantago media	-	-	+	+	+	+	-	+	+	+	+	-	-
Poa angustifolia	-	+	-	-	-	-	-	-	-	-	-	-	-
Potentilla cinerea	+1	+	-	-	+	+	+	+	+	+	+1	+	-
Potentilla argentea	-	-	-	-	-	-	+	+	-	-	-	-	-
Prunella grandiflora	+	-	-	-	-	-	-	-	-	-	-	-	-
Salvia nemorosa	+	+	+	+	+	+	+	-	+	+	+	-	-
Salvia pratensis	+	+	-	-	-	+	-	-	-	-	-	-	-
Scabiosa ochroleuca	+	-	-	-	-	-	-	-	-	-	-	+	+
Stachys germanica	-	+	-	-	-	-	-	-	-	-	-	-	-
Stipa tirsia	-	-	-	-	-	-	-	1	-	-	-	-	-
Trifolium arvense	+	-	-	-	+	-	-	-	-	-	-	-	-

Trifolium montanum	+	+	+	+	+	+	+	+	+	-	+	+
Veronica austriaca	-	-	+	-	-	-	+	+	-	-	+	-
Viola hirta	-	-	+	+	-	+	+	+	-	+	-	-
<i>Aliae</i>												
Prunus tenella	+	-	-	-	-	-	-	-	-	-	-	-
Arrhenatherum elatius	+	-	-	-	-	-	-	-	-	-	-	-
Avenula pubescens	-	-	-	-	-	-	-	+	-	-	-	-
Berteroa incana	-	-	-	-	+	+	-	-	-	-	-	-
Bromus arvensis	-	-	-	+	-	-	-	-	-	-	-	-
Capsella bursa-pastoris	-	-	-	-	-	-	+	-	-	-	-	-
Cardaria draba	-	-	+	-	-	-	+	-	-	-	-	-
Carduus acanthoides	-	+	-	+	+	-	-	-	-	-	-	-
Carex michelii	+	+	-	-	-	-	+	+	-	-	+	-
Centaurea scabiosa	-	-	+	+	-	+	-	-	-	-	-	-
Cichorium intybus	-	-	-	-	+	-	-	+	-	-	-	+
Consolida regalis	-	-	-	+	-	-	-	-	-	-	-	-
Convolvulus arvensis	-	-	-	-	-	-	+	+	-	-	-	+
Crepis *rheodifolia	-	-	-	+	+	-	-	-	-	-	-	-
Cuscuta campestris	-	-	-	-	-	-	-	-	-	-	+	-
Dactylis glomerata	+	+	-	-	-	-	+	-	+	-	-	-
Daucus carota	+	+	-	+	+	-	-	+	-	-	-	-
Elymus repens	+	+	-	-	-	-	-	-	-	+	+	-
Falcaria vulgaris	-	-	+	-	-	+	+	+	+	+	-	-
Festuca pratensis	+	+	-	-	-	-	-	-	-	-	-	-
Genista tinctoria	+	+	-	-	-	-	-	-	-	-	-	-
Hieracium virosum	+	+	-	-	-	-	-	-	-	-	-	-
Inula britannica	-	-	-	-	-	+	-	+	-	-	-	+
Lappula squarrosa	-	-	-	+	-	-	-	-	-	-	-	-
Lavatera thuringiaca	-	-	-	-	-	+	-	-	-	-	-	-
Lotus corniculatus	+1	+	-	-	-	-	-	-	-	-	-	+
Marrubium vulgare	-	-	-	-	-	-	-	+	-	+	+	-
Nepeta nuda	+	+	-	-	+	-	-	-	+	-	-	-
Phragmites australis	+	+	-	-	-	+	-	-	-	-	-	+
Polygala vulgaris	+	-	-	-	-	-	-	-	+	-	-	-
Potentilla recta	+	-	-	-	-	-	+	-	-	-	-	-
Prunella vulgaris	+	-	-	-	-	-	-	-	-	+	-	-
Rapistrum perenne	+	+	+	+	+	+	-	+	+	+	+	-
Reseda lutea	+	+	-	-	+	+	-	-	+	+	+	-
Rosa canina	-	-	+	+	-	-	-	-	-	-	-	-
Salvia verticillata	+	-	+	-	-	-	-	+	-	-	+	+
Senecio erucifolius	-	-	+	-	+	+	-	-	-	-	-	-
Stachys officinalis	-	-	-	-	-	+	-	-	-	-	-	+
Thlaspi arvense	-	-	-	+	-	-	-	-	-	-	-	-
Trifolium alpestre	+	+	-	-	+	-	-	+	-	-	-	+

Trifolium medium	-	-	-	-	-	-	+	-	+	-	+	+	-
Trifolium ochroleucum	+	-	-	-	-	-	-	-	-	-	-	-	-
Trifolium pratense	+	-	+	-	-	-	-	-	+	-	-	-	-
Trifolium repens	+	-	-	-	-	-	-	-	-	-	-	-	-
Vicia cracca	-	-	-	+	-	-	-	-	-	-	-	-	-
Equisetum arvense	-	-	-	-	-	-	-	-	-	-	-	-	+
Campanula bononiense	-	-	-	-	-	-	-	-	-	-	-	-	+
Calamagrostis epigejos	-	-	-	-	-	-	-	-	-	-	-	-	+
Centaurea jacea	-	-	-	-	-	-	-	-	-	-	-	-	+
Ononis arvensis	-	-	-	-	-	-	-	-	-	-	-	-	+
Leontodon crispus	-	-	-	-	-	-	-	-	-	-	-	-	+
Vicia sativa	-	-	-	-	-	-	-	-	-	-	-	-	+

Date of the relevés: **1, 2:** 1971 (Dobrescu); **3-6:** 1999 (Oprea & al.); **7-11:** 1.06. 2003 (Oprea & Sirbu); **12-13:** 1999 (Oprea & al.).

Table No II

Ruderal vegetation: Ass. *Capsello-Descurainetum sophiae*, subass. *brometosum tectori* (Rel. No. 1, 2); *Urticetum dioicae* (Rel. No. 3)

No. of relevé	1	2	3
Exposition	E	-	-
Slope (°)	10	-	-
Coverage (%)	95	95	90
Surface of relevé	50	5	10
No. of species			
Descurainia sophia	+	+	+
Capsella bursa-pastoris	+	+	-
Bromus tectorum	5	5	+
Urtica dioica	-	-	5
Sisymbrium loeselli	1	+	+
Lactuca serriola	+	-	+
Carduus acanthoides	+	+	+
Galium humifusum	+	+	+
Convolvulus arvensis	+	+	+
Geranium pusillum	+	-	+
Matricaria perforata	+	-	-
Leonurus cardiaca	+	-	-
Chenopodium album	+	-	+
Cuscuta campestris	+	-	-
Centaurea solstitialis	+	-	-
Rapistrum perenne	-	+	+

Chorispóra tenella	-	+	-
Cardaria draba	-	+	+
Rumex crispus	-	+	-
Achillea setacea	-	+	-
Lapulla squarrosa	-	-	+
Artemisia absinthium	-	-	+
Ballota nigra	-	-	+
Bromus inermis	-	-	+
Achillea pannonica	-	-	+
Dactylis glomerata	-	-	+
Galium mollugo	-	-	+

Date of the relevés: 1-3: 01.06.2003