

J. Plant Develop.
15 (2008): 77–82

FLORA AND VEGETATION OF GRASSLANDS FROM NÂRNOVA RIVER'S BOTTOMLAND

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Abstract: The paper represents a synthesis of the investigation issues performed in Nârnova River's grassland during the 2006-2007 vegetation periods. Floristic and phytocoenotic composition of vegetation's grassland was established. Floristic Inventory of Nârnova River's grassland includes 193 species, appertaining to 112 genus and 38 families. Flora was analyzed from taxonomic, bioform, geoelement, ecological index, economical importance points of view. 11 species with different endangered level were identified. Studied phytocoenosis appertain to 15 associations included into 10 alliances, 10 orders and 4 classes.

Key words: Nârnova river's grassland, floristic and phytocoenotic composition.

Introduction

Nârnova river's springs out in the south part of the villages Vânători and Nisporeni, have 49 ha length, is closer village Leușeni. The basin is situated in the vest part of Codrii highland. Height average of reception basin is of 160 m, area - 358 km. River Nârnova has 40 affluent, majority of which don't exceed 10 km length. The most part of basin area is ploughed, in the superior part of the river are extended the forests. Valleys affluent are narrows, with abrupt versants, exposed to erosion. The bottomland is bilateral, length is 150-400 m; maximal – 600 m (4 km upstream of the village Leușeni) and minimal – 60 m at the spring. In the grassland persists alluvial and halomorphic soils. The cauce is instable, predominantly drought, have 1-7 m width. Closer the river mouth the cauce is canalized [10], where 8 lacks are built [9].

Some literature data about flora and vegetation of Nârnova river grassland is unknown. Our investigations had the target of evidencing floristic and phytocoenotic composition of vegetation for elaborate biosafety measures and sustainable use of Nârnova river grasslands' flora and vegetation.

Material and method

Floristic and phytocoenotic investigations according Central-European Phytocoenologic School [1, 2, 4 and 5], during 2006-2007 periods of vegetation, were performed. Flora and Vegetation of the grassland, beginning from the spring, till its flowing into river Prut, conform itinerary method were studied. For studying the phytocoenosis, the phytocoenologic description, as basic method, was used. Identification of the associations, according characteristic and dominant species, comparatively to synthetic similar tables from the special, national and occidental literature works was done. Coenotaxonomic Conspectus of the associations was compound on the base of the scientific works [3, 7, 8].

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Results and discussions

A. Floristic diversity

Taxonomic analysis

In the grassland spontaneous flora 193 species, appertaining to 112 genus and 38 families were evidenced. Taxonomic analysis the number of species of families was established: *Asteraceae* (30 sp.-15,5%), *Poaceae* (23 sp.-11,9%), *Fabaceae* (17 sp.-8,8%), *Cyperaceae* (15 sp.-7,7%), *Brassicaceae* and *Polygonaceae* (11 sp.-5,7% each). 6 fam. includes 107 sp. (55,4%) of vascular plant, others 32 fam. summarize 44,6%.

The most representative genuses are *Carex* (11 sp.-5,7%), *Rumex* (7 sp.-3,6%), *Plantago* (6 sp.-3,1%), *Juncus*, *Trifolium*, *Polygonum* (4 sp. each). The List of the vascular plant species evidenced in grassland flora's is presented: *Achillea collina*, *A. nobilis*, *A. setacea*, *Agrostis stolonifera*, *A. tenuis*, *Alisma lanceolatum*, *A. plantago-aquatica*, *Allium rotundum*, *Alopecurus arundinaceus*, *A. pratensis*, *Althaea officinalis*, *Ambrosia artemisiifolia*, *Anchusa gmelinii*, *Arctium minus*, *Arrhenatherum elatius*, *Artemisia absinthium*, *A. austriaca*, *A. vulgaris*, *Atriplex littoralis*, *A. micrantha*, *A. nitens*, *Bassia sedoides*, *Batrachium rionii*, *Beckmannia eruciformis*, *Berteroa incana*, *Bolboschoenus maritimus*, *Borago officinalis*, *Bromus arvensis*, *B. japonicus*, *B. squarrosus*, *Bryonia alba*, *Butomus umbellatus*, *Capsella bursa-pastoris*, *Caragana scythica*, *Cardaria draba*, *Carex acutiformis*, *C. distans*, *C. extensa*, *C. hirta*, *C. hordeistichos*, *C. melanostachya*, *C. muricata*, *C. otrubae*, *C. riparia*, *C. secalina*, *C. vulpina*, *Cerastium perfoliatum*, *Ceratophyllum demersum*, *C. submersum*, *Chenopodium album*, *C. glaucum*, *Cichorium intybus*, *Cirsium arvense*, *Conium maculatum*, *Consolida regalis*, *Convolvulus arvensis*, *Cynodon dactylon*, *Cynoglossum officinale*, *Daucus carota*, *Descurainia sophia*, *Echinops ritro*, *Elaeagnus angustifolia*, *Eleocharis palustris*, *Elytrigia intermedia*, *E. repens*, *Equisetum arvense*, *E. telmateia*, *Erigeron acris*, *Festuca arundinacea*, *F. pratensis*, *Fragaria vesca*, *Frankenia pulverulenta*, *Galega officinalis*, *Galium aparine*, *G. mollugo*, *G. verum*, *Geranium collinum*, *Glyceria fluitans*, *G. nemoralis*, *Hieracium caespitosum*, *Inula germanica*, *Iris germanica*, *I. halophila*, *I. pseudacorus*, *Juncus bufonius*, *J. compressus*, *J. gerardii*, *J. inflexus*, *Lactuca quercina*, *Lathyrus tuberosus*, *Lemna minor*, *Leonurus quinquelobatus*, *Lepidium latifolium*, *L. ruderale*, *Leucanthemum vulgare*, *Linaria ruthenica*, *Lolium perenne*, *Lotus corniculatus*, *L. tenuis*, *Lycopus europaeus*, *L. exaltatus*, *Lysimachia nummularia*, *Lythrum salicaria*, *L. virgatum*, *Malva neglecta*, *Matricaria perforata*, *M. recutita*, *Medicago falcata*, *M. lupulina*, *M. sativa*, *Melampyrum arvense*, *Melilotus alba*, *M. officinalis*, *Mentha arvensis*, *Myosotis arvensis*, *Papaver rhoeas*, *Phragmites australis*, *Picris hieracioides*, *Plantago cornuti*, *P. lanceolata*, *P. major*, *P. maritima*, *P. media*, *P. urvillei*, *Poa angustifolia*, *P. pratensis*, *Polygonum amphibium*, *P. aviculare*, *P. lapathifolium*, *P. scabrum*, *Potentilla argentea*, *P. recta*, *P. reptans*, *Prunella vulgaris*, *Prunus spinosa*, *Puccinellia distans*, *P. gigantea*, *P. limosa*, *Ranunculus acris*, *R. repens*, *R. sceleratus*, *Raphanus raphanistrum*, *Rorippa austriaca*, *R. palustris*, *R. sylvestris*, *Rubus caesius*, *Rumex confertus*, *R. conglomeratus*, *R. crispus*, *R. maritimus*, *R. palustris*, *R. sanguineus*, *R. stenophyllus*, *Salicornia europaea*, *Salix alba*, *S. pentandra*, *Salvia nemorosa*, *Sambucus ebulus*, *Scirpus sylvaticus*, *S. tabernaemontani*, *Scorzonera parviflora*, *Sonchus arvensis*, *S. palustris*, *Spergularia marina*, *S. maritima*, *S. rubra*, *Suaeda maritima*, *S. prostrata*, *Symphytum officinale*, *Tamarix ramosissima*,

Tanacetum vulgare, *Taraxacum bessarabicum*, *T. officinale*, *T. palustre*, *Teucrium chamaedrys*, *Thymus ucrainicus*, *Torilis arvensis*, *Tragopogon orientalis*, *Trifolium fragiferum*, *T. patens*, *T. pratense*, *T. repens*, *Tripolium vulgare*, *Tussilago farfara*, *Typha angustifolia*, *Urtica dioica*, *Verbascum phlomoides*, *Veronica anagallis-aquatica*, *V. scutellata*, *Vicia angustifolia*, *V. hirsuta*, *V. sylvatica*, *Xanthium spinosum*, *X. strumarium*.

Bioform Analysis

In the grassland predominate the hemicytopytes - 47,7%, terophytes - 27,5%, geophytes - 12,4%, hydro-helophytes - 5,2%, phanerophytes – 3,1%, chamaephytes - 1,6%. Altitudinal index (**Ka**) for grassland flora is equal with 58%, which denote a slow climate and severe anthropic influence [4]. Vital duration analysis evidenced the predominance of perennial herbaceous (68,4%), annual (21,2%), biennial (5,7%) plants.

Analysis of Floristic Elements

In flora species of eurasiatic element predominate (55%), considerable role have the cosmopolite (13,5%), circumpolar (9,8%), european (9,3%), pontic (7,3%) and mediterranean (2,6%) by less percentage.

Analysis of the Ecological Indexes

Analysis of the humidity indexes shows that the mesophytes (24,4%), xeromesophytes (23,6%), mesohygrophytes (23,6%) hygrophytes (7,8%), hydrophytes (6,2%), euriphytes (5,7%), xerophytes (3,6%) react differently. Referring to the exigencies of species to the thermic factor the greater part remains for micromesoterme (54,4%), amphitolerant (19,7%), temperate-thermophile (16,6%), microtherm only 3,6%. According soil reaction the most of species are slightly acid-neutrophilous (39,9%), euryionics (34,2%), acid-neutrophile (10,4%) and, neutrobasiophile (8,8%). Trophic soil reaction is represented by eutrophic (35,8%), mesotrophic (28%), oligotrophic and eutrophic with 6,7% and 2,1%, respectively. In the floristic composition persists 17,8% of species as indicators of the azotes soil fixing level. The most numerous, ensured with nutritive elements, are the plant of medium soil (N3-6,8%) and poor soil (N2-5,2%). In the grassland 39 halophyte species (20,4%) from the total number of species were identified.

Economical Plant Importance

Analyses of plant from wild flora show that the number achieves more than 120 species (65% from the total number of species). The most numerous are the medicinal (31,4%), industrial (26,2%), technical (23,6%), melliferous and alimentary plant have equal percentage (16,2%), toxic and decorative have less values (5,2%).

Rare Plant Species

Conform to the International Classification (IUCN, 1994) of endangered species 11 rare plant species (5,7%) were identified which are grouped in 3 categories [6]:

1. **Endangered** (EN) – *Carex extensa*, *Cerastium perfoliatum*;
2. **Vulnerable** (VU) – *Frankenia pulverulenta*, *Spergularia rubra*, *Tamarix ramosissima*, *Veronica scutellata*;
3. **Rare** (R) – *Agrostis tenuis*, *Anchusa gmelinii*, *Carex secalina*, *Equisetum telmateia*, *Iris haplophila*.

B. Phytocoenotic diversity

There are 3 types of vegetation: paludal and pratal (**Fig. 1**).

The conspectus of paludal vegetation

PHRAGMITI – MAGNOCARICETEA Klika in Klika et Novak 1941.

Phragmitetalia Koch 1926.

Phragmition communis Koch 1926.

Scirpo-Phragmitetum Koch 1926 (art. 36).

Corology: village Vânători (district Nisporeni), town Nisporeni.

Typhetum angustifoliae Pignatti 1953.

Corology: Leușeni (Hâncești).

Magnocaricetalia elatae Pignatti 1953.

Magnocaricion elatae Koch 1926.

Caricion gracilis (Neuhaus 1959) Oberd. et al. 1967.

Caricetum vulpinae Soo 1927.

Corology: Leușeni (Hâncești).

Eleocharitetum palustris Ubrizsy 1948.

Corology: Nisporeni.

Caricetum ripariae Soo 1928 (art. 2b).

Corology: Vărărești (Nisporeni).

Bolboschoenotalia maritime Egger 1933.

Cirsio brachycephali – Bolboschoenion (Passarge 1978) Mucina in Grabherr et Mucina 1993.

Bolboschoenetum maritimi Egger 1933.

Corology: Nisporeni; Ivanovca, Leușeni (Hâncești).

Schoenoplectetum tabernaemontani Soo 1947.

Corology: Vânători (Nisporeni), Nisporeni.

The conspectus of pratal vegetation

MOLINIO – ARRHENANTHERETEA R. Tx. 1937.

Molinietalia caeruleae Koch 1926.

Alopecurion pratensis Passarge 1964.

Ranunculo repentis – Alopecuretum pratensis Ellmauer et Mucina in Mucina et al. 1993.

Corology: Vânători (Nisporeni), Nisporeni; Ivanovca (Hâncești).

Arrhenatheretalia R. Tx. 1931.

Arrhenatherion Koch 1926.

Pastinaco - Arrhenatheretum Passarge 1964.

Corology: Vânători (Nisporeni).

Potentillo – Polygonetalia R. Tx. 1947.

Potentillion anserinae R. Tx. 1947.

Agrostietum stoloniferae Burduja et al. 1956.

Corology: Vărărești (Nisporeni), Nisporeni.

Rorippo austriacae - Agropyretum repentis (Timar 1947) R. Tx. 1950.

Corology: Vânători (Nisporeni), Nisporeni; Ivanovca (Hâncești).

THERO – SALICORNIETEA (Pignatti 1953) R. Tx. in R. Tx. et Oberd. 1958.

Thero – Salicornietalia (Pignatti 1953) R. Tx. in R. Tx. et Oberd. 1958.

(*Thero -*) *Salicornion strictae* Br.-Bl. 1933 em. R. Tx. 1950.

Salicornietum europaeae Wendelbg. 1953.

Corology: Nisporeni; Ivanovca (Hâncești).

- Puccinellio – Salicornietea* Țopa 1939.
Crypsidetalia aculeatae Vicherek 1973.
Cypero – Spargularion Slavnic 1948.
Spargularietum mediae (Șerbănescu 1965) Popescu et al. 1992.
 Corology: Ivanovca (Hâncești).
Puccinellietalia Soo 1940.
Puccinellion peisonis (Wendelbg. 1943) Soo 1957.
Puccinellietum distantis Soo 1937; Knapp 1948.
 Corology: Vinători (Nisporeni); Ivanovca (Hâncești).
Scorzonero – Juncetalia gerardii Vicherek 1973.
Scorzonero – Juncion gerardii Vicherek 1973.
Astero tripoli - Juncetum gerardii Smarda 1953.
 Corology: Vânători (Nisporeni), Nisporeni; Ivanovca, Leușeni (Hâncești).

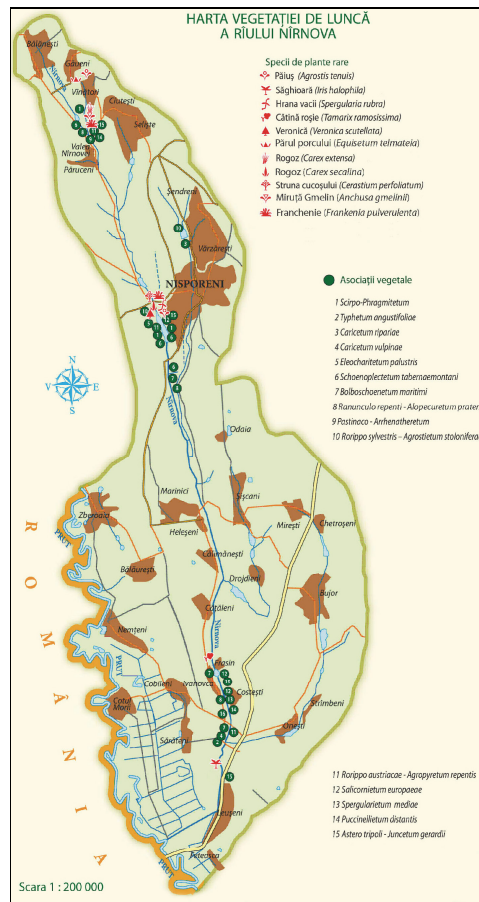


Fig. 1. The map of vegetation's Nârnova River

Conclusions

- Bioform Analysis evidenced the predominance of hemipterophytes (47,7%), meantime, the Analysis of Floristic Elements reflects the predominance of eurasiatic element (55%).
- Ecological Analysis established that from the humidity exigencies, thermal and soil reaction point of view, numerically predominate the mesophytes (24,4%), micromesoterme (54,4%), slightly acid-neutrophile (39,9%).
- Conform International Classification (IUCN, 1994) in spontaneous flora 11 sp. by different endangered level were evidenced.
- Coenotaxonomic Conspectus includes 15 associations vegetable from 10 alliances, 10 orders and, 4 classes of vegetation.

References

1. BORZA A., BOȘCAIU N., 1965 – *Introducere în studiul covorului vegetal*, Edit. Acad. Române, București.
2. BRAUN-BLANQUET J., 1964 – *Pflanzensoziologie*, Springer, Verlag, Berlin.
3. CHIFU T., MÎNZU C., ZAMFIRESCU O., 2006 – *Flora și vegetația Moldovei (România)*. II. *Vegetația*, Edit. Universității „Alexandru Ioan Cuza”, Iași.
4. CRISTEA V., 1991 – *Fitocenologie și vegetația României. Îndrumător de lucrări practice*, Cluj-Napoca.
5. CRISTEA V., 2004 – *Fitosociologie*, Edit. Presa Univ. Clujeană, Cluj-Napoca.
6. NEGRU A., ȘABANOV G., CANTEMIR V., 2002 – *Plantele rare din flora spontană a Republicii Moldova*, CE USM, Chișinău.
7. SANDA V., POPESCU A., 1991 – Studiul fitocenozelor clasei *Molino-Arrhenatheretea* Tx. 37 din România. *Acta Bot. Horti Bucurestiensis*, București: 49-80.
8. TOFAN-BURAC T., CHIFU T., 2002 – *Flora și vegetația din valea Prutului*, Edit. Corson, Iași.
9. ГОРЯЧЕВА Н., ДУКА Г., 2004 – *Гидрохимия малых рек Республики Молдова*, Изд-во Молдавского гос. унив., Кишинев, 167-174 с.
10. РЕСУРСЫ ПОВЕРХНОСТНЫХ ВОД СССР, 1978 — *Описание рек и озер и расчеты основных характеристик их режима*. Т. 6. *Украина и Молдавия*. Вып 1. *Западная Украина и Молдавия (без бассейна р. Днестра)*, Л., Гидрометеиздат, 244 – 245 с.