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Structure and adjective vegetations of grass-plots in Kyiv

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Abstract: The paper present of ecological floristic classification of Kyiv grass-plots. Ecological floristic classification of given 5 classes (*Molinio-Arrhenatheretea, Agropyretea repentis, Plantaginetea majoris, Chenopodietea and Artemisietea vulgaris),* 8 alliances*,* 11 unions, 27 associations and 33 variants.

Floristic structure and qualitative adjectives of Kyiv grass-plots were investigated. Common evaluations of qualitative adjectives of Kyiv grass-plots coverings were cited. There are 63 alochtonic species among the ones found in the grass-plots on the territory of Kyiv. They include 35 species imported before the XVI century (archeophytes), and 28 brought later.

Keywords: grass-plots, syntaxonomia, vegetation, qualitative adjectives.

Introduction

Cities native habitant is mainly represented as the man-made grass cover or diversely transformed natural one. Natural cover is the most sensitive component of urban landscapes. It is the first to perceive even marginal environment changes; respond on their degradation or disappearance of certain plants specimens. Therefore, grass-plots vegetation in cities requires constant care and regeneration.

Plant cover of urban territories is represented by the large number of species and is highly diverse. As a whole it could be grouped into three main decorative compositions:

- tree and bush plantations;
- flower compositions;
- grass-plotts covers.

The contamination level of urban environment is dramatically increasing on the grounds of high scientific and technical progress pace, abrupt increase of newest technologies and industry intensification. As is known, vegetation is one of the most efficient stabilizing factors in the settlements. It is considered that optimum conditions for human being living in urban conglomerations are formed when trees and bushes make up by crown projection 20 - 30 % of explained by their universal peculiarities based on their permanent use independently of relief features and territory architecture.

Grass-plots perform important functions in urban environment. They improve environment's aestheticism, taking up the dust and toxic compounds, influencing on local ecological conditions. Another important characteristic of sod grasses in cities is their ability to hamper distribution of adventitious (quarantine, in particular) plants. Solid herbage and strong sod structure give no possibility to tap-root ruderal plants.

Material and methods

Grass-plots in Kyiv of different functional purposes and on various stages of their development were studied. The experiments were conducted during 2002 – 2005 by the means of standard methods. All phytocoenoses were analysed in the field using methods of Zürich-Montpelliér school (BRAUN-BLANQUET 1964, WESTHOFF & VAN DER MAAREL 1978). Geobotanical descriptions were made according to the J. Braun-Blanquet method. Sample grounds were selected in different city regions. Their sizes have varied from 4 to 100 m^2.

Results

There are several grass-plots' classification schemes. Scheme designed by A. A. LAPTEV (1983) includes various in structure functional aspect grass-plots associations which are combined into more general categories.

According to the Mytsik L.P. classification there are five categories which completely cover all grass-plots characteristics: classic grass-plot, ordinary, cultural and natural.

We posed a task to determine complete floristic composition of grass-plots comparing to the classification scheme of vegetation of Ukraine. After handling of all descriptions the following classification scheme was obtained.

Syntaxonomic vegetation scheme of grass-plots in Kyiv

Cl. *Molinio-Arrhenatheretea* R.Tx. 1937
Ord. *Arrenatheretalia elatioris* Pawl. 1928
Cynosurion cristati Br.-Bl. et R.Tx. 1943
Ass. *Plantagini lanceolatae-Festucetum rubrae* Scamoni 1956
P.l.-F.r. var. *Elytrigia repens*
P.l.-F.r. var. *typicum*
Festucetum rubrae Rübel 1912
F.r. var. *Elytrigia repens*
F.r. var. *typicum*
Lolio-Cynosuretum Buker 1941
L.-C.c. var. *Festuca rubra*
L.-C.c. var. *Poa pratensis*
L.-C.c. var. *typicum*
B.c. Lolium perenne *[Cynosurion]*
Agrostio tenuis-Trifolietum repentis (Walther 1977)
Leontodono-Poetum pratensis Anishczenko et L. Ishb. 1989
L.-P.p. var. *Elytrigia repens*
L.-P.p. var. *Festuca rubra*
L.-P.p. var. *typicum*
Poetum pratensis Stepanovič 1999
P.p. var. *Festuca rubra*
P.p. var. *Trifolium repens*
P.p. var. *Elytrigia repens*
P.p. var. *typicum*
B.c. Poa pratensis [Cynosurion]
Agropyretea repentis Oberd., Th.Mull. et Gors in Oberd. et al. 1967
Agropyretalia repentis Oberd., Th.Mull. et Gors in Oberd. et al. 1967
Convolvulo-Agropyrion repentis Gors 1966
Calamagrostietum epigeios Kost. in V.Solomakha. et al. 1992
C. ep. var. *typicum*
C. ep. var. *Dactylis glomerata*
Convolvulo-Agropyretum repentis Felf. (1942) 1943
C.-A.r. var. *Potentilla argentea*
C.-A.r. var. *Poa pratensis*
C.-A.r. var. *typicum*
Agropyretum repentis Gors 1966
A.r. var. *Lolium perenne*
A.r. var. *Poa pratensis*
A.r. var. *typicum*
Poetum pratensis-compressae Bornkamm 1974
Polygono arenastri-Poëtea annua Rivas-Martinez 1975 corr. Rivas-Martinez et al. 1991

Plantaginetalia majoris R. Tx. et Prsg. in R. Tx. 1950 em Rivas-Mart. 1975
Polygonion avicularis Br.-Bl. 1931
Cynodonto-Plantaginetum majoris Brun-Hool 1962
Polygonetum avicularis Gams 1927 em. Jehlik in Hejny et al. 1979
Plantagini-Lolietum perennis Beger 1930
L.-P.m. var. *Poa pratensis*
L.-P.m. var. *Trifolium repens*
L.-P.m. var. *typicum*
Poetum annuae Gams 1927
P.a. var. *Poa pratensis*
P.a. var. *typicum*
Juncetum tenuis (Diem., Siss. et Westh. 1940) Schwick.1944 em R.Tx. 1950
Prunello-Plantaginetum majoris Falinski 1963
Agrostio tenuis-Poetum annuae Gutte et Hilbig 1975
Agrostietalia stoloniferae Oberd. in Oberd. et al. 1967
Agropyro-Rumicion crispi Nordhagen 1940
Rumici crispi-Agrostietum stoloniferae Moor 1958
Potentillietum anserinae Rap. 1927 em Poss. 1964
Chenopodietea Br.-Bl. 1951 em Lohm., J. et R. Tx 1961 ex Matsz. 1962
Sisymbrietalia J. Tx. ex Matsz. 1962 em Gors. 1966
Malvion neglectae Gutte 1972
Malvetum neglectae Felf. 1942
Sisymbrion officinalis R.Tx., Lohm., Prsg. in R.Tx 1950 em Hejny et al. 1979
Matricarietum perforatae Kepczynska 1975
M. p. var. *Echinochloa crusgalli*
M. p. var. *typicum*
Chenopodietum albi-viridae Hejny 1979
Ch. al.-v. var. *typicum*
Ch. al.-v. var. *Lolium perenne*
Ch. al.-v. var. *Lolium multiflorum*
Ch. al.-v. var. *Portulaca oleracea*
Ch. al.-v. var. *Eragrostis minor*
Eragrostietalia J.Tx. in Poli 1966
Eragrostion (R.Tx. 1950) Oberd. 1954
Eragrostio-Amaranthetum albi Morariu 1943
E.-A. al. var. *Artemisia absinthium*
E.-A. al. var. *Festuca rubra*
E.-A. al. var. *Melilotus album*
E.-A. al. var. *Urtica dioica*
E.-A. al. var. *Typicum*

Digitario-Portulacetum (Felf. 1942) Timar et Bodrogkosi 1959
D.-P. var. *Berteroa incana*
D.-P. var. *Festuca ovina*
D.-P. var. *typicum*
Artemisietea vulgaris Lohm., Prsg. et al. ex von Rochow 1951
Meliloto-Artemisietalia absinthii Elias 1979
Potentillo-Artemision absinthii Elias (1979) 1980
Tanaceto-Artemisietum vulgaris Br.-Bl. corr. 1949
T.-A.v. var. *typicum*
T.-A.v. var. var. *Lolium perenne*
Dauco-Melilotion albi Gors em Elias 1980
Berteroetum incanae Siss. et Tidem. ex Siss. 1950
Artemisietalia vulgaris Lohm. in R.Tx. 1947
Arction lappae R.Tx. 1937 em Gutte 1972
Artemisietum vulgaris R. Tx. 1942
D.c. *Lactuca serriola* [Sisimbrion officinalis]

As is well seen from the scheme sod covers' vegetation in Kyiv constitutes of 27 associations, 33 variants, 2 basal and 1 decorative communities, which belong to the 11 unions, 8 orders and 5 classes.

There are 63 alochtonic species among the ones found in the grass-plots on the territory of Kyiv. They include 35 species imported before the XVI century (archeophytes), and 28 brought later. The first group includes *Anisantha tectorum* (L.) Nevski*, Atriplex patula* L.*, Lepidium ruderale* L.*, Portulaca oleracea* L.*, Ranunculus repens* L.*, Setaria glauca* (L.) Beauv. etc., the second – *Ambrosia artemisiefolia* L.*, Eragrostis minor* Host., *Lolium multiflorum* Lam.*, Saponaria officinalis* L., *Trifolium hybridum* L., etc. The xenophytes/archeophytes correlation is 1/1.25 with archeophytes domination. Such ration is typical for Steppe zone of Ukraine and Polesie, while in southern regions xenophytes are prevailed (PROTOPOPOVA 1991).

By the importing means this species are divided into two groups: acolutophytes – species imported occasionally and the ones that are spread via anthropogenic broken ecotopes; and ergasiophytes – species imported in purpose for cultivation, and widespread into natural phytocenosises. Xenophytes are represented mainly by the adventive species: *Amaranthus albus* L., *Anagallis arvensis* L., *Bromus squarrosus* L., *Iva xanthifolia* Nutt.*, Sisymbrium officinale* (L.) Scop. etc. Ergasiophytes are represented with the small number of species – *Trifolium hybridum, Saponaria officinalis* L., *Raphanus raphanistrum* L., *Lolium multiflorum, Lepidotheca suaveolens* etc.

By the naturalization degree in the natural flora research area two plant species groups are marked out –agriophytes (15) and epoecophytes (48). Epoecophytes are the species spread only in disturbed ecosystems. They form ruderal communities *(Amaranthus retroflexus* L., *Capsella bursa-pastoris* (L.) Medik., *Chenopodium polyspermum* L., *Descurainia sophia* (L.) Webb. et Prantl, *Digitaria sanguinalis* (L.) Scop., *Galinsoga parviflora* Cav., *Xanthoxalis stricta*

(L.) Small etc.). Epoecophytes are resistant to the anthropogenic load which actually promotes their propagation and distribution. To agriophytes belong species widespread both in anthropogenic transformed landscapes and in natural phytocoenosises were they occupy a stable position. They include – *Juncus tenuis* Willd., *Phalacroloma annuum, Saponaria officinalis, Ranunculus repens, Lamium maculatum* etc.

Correlation between indigenous and adventive fractions formed during the years is considered as very important characteristic of synantropic flora of every region since it indicates flora synantropization degree (PROTOPOPOVA 1991).

Now urban flora in Kyiv includes more than 600 adventive species which mainly are expansive. Plants causing mass allergic illnesses among the population (quarantine weeds) constitute a high menace for the human health – *Ambrosia artemisiifolia, Artemisia absinthium* L., *A. vulgaris* L., *Iva xanthifolia,* etc. Forming of solid and highly efficient sod cover on the cities territories prevents penetration and distribution of quarantine species; promotes environment optimization and decreases flora advetization degree in the region.

Conclusions

Species composition of grass-plots in Kyiv includes 198 species of vascular plants, part of which are archeophytes (17, 68%) and part – kenophytes (14,14%). Most of the allohtonic species are weeds, part of which is quarantine.

It was established that plant communities of grass-plots cultural phytocoenosises belong to the 5 vegetation classes, which combine 11 unions and 27 associations: *Molinio-Arrhenatheretea, Agropyretea repentis, Plantaginetea majoris, Chenopodietea* and *Artemisietea vulgaris.*

The ruderal degree of decorative covers of different functions was determined. The overall assessment of grass-plots quality indicates on low quality of cultural phytocoenosises in Kyiv.

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