BIOLOGICAL SCIENCES

ECOLOGICAL AND BIOLOGICAL FEATURES OF LAWN PLANTS OF NIKOPOL CITY (DNIPRO REGION)

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Man-caused load on the environment in urban areas leads to degradation of vegetation, impoverishment of phytocenoses with the loss of native species and the predominance of ruderal, the formation of short-term groups. The impact of industry and transport causes significant disruption to urban ecosystems [3].

The value of lawns is most complete when they occupy 40 - 90% of the area of greenery [2]. However, in industrial cities their share is smaller, they are mostly unsatisfactory, contain a significant number of ruderal species. Therefore, the current scientific problem is the ecological justification for the creation of stable lawn phytocenoses in cities with high man-made pressure, as well as the development of scientific and practical measures for their arrangement in a certain anthropogenic landscape, taking into account ecological and biological features of sod-forming species and urban environment.

The aim of the study is: on the basis of ecological and phytocenotic studies to establish phytocoenotic features of lawns and grasslands of urbanized ecosystems on the example of Nikopol to develop ecological bases for creating sustainable cenoses in urban agglomerations and addressing environmental optimization.

The test areas where the research was conducted were located among lawn-type grasslands and ornamental lawns in Nikopol. Administrative and residential areas of the city were covered. Trial areas were located in lawn-type grasslands and

on lawns of parks, squares, boulevards, near administrative buildings, near educational institutions, along highways, near residential buildings, near the Nikopol Ferroalloy Plant (NPF), on the coast of the Kakhovka Reservoir. A total of thirty trial areas of 1 m^2 were described, divided into 120 areas of 0.5 m^2. Signs were studied on each trial area: illuminance, species composition, percentage of projective coverage of each found species, percentage of plant-free area [1].

The names of plant species were determined by the "Определитель ..." [5] and specified by V. Tarasov [6].

In the 30 sample plots covered by our research, 44 species of plants belonging to 15 families were found. Species saturation of the studied sample areas (1m^2) varied from 10 to 17 species. Among the families, Asteraceae and Poaceae took the lead in terms of species composition (Table 1).

Table 1

Number of species and average projective coverage of families

Family	Number of species	Average projective coverage,%
Poaceae	11	26,76
Asteraceae	10	25,1
Fabaceae	6	13,4
Lamiaceae	4	2,3
Brassicaceae	2	3,7
Apiaceae	2	3,4
Rosaceae	1	0,17
Euphorbiaceae	1	1,67
Convolvulaceae	1	4,93
Plantaginaceae	1	3,77
Linaceae	1	0,33
Dipsaceae	1	0,33
Rubiaceae	1	0,33
Hypericaceae	1	0,5
Polygonaceae	1	6,83

Given the instructions of V. Tarasov [6], the range of the first percentages of families reproduces the composition of the regional flora. The analysis of grass

vegetation was carried out taking into account the prevalence (according to the species) and the quantitative role in the formation of grass (projective cover). This allowed us to find out the potential of the species in a certain area of growth, ie competitiveness.

Trifolium repens L. (happening 93%), *Polygonum aviculare* L. (90%), *Taraxacum officinale* Webb ex Wigg. (83%), *Ambrosia artemisiifolia* L. (80%), *Achillea submillefolium* Klok.et Krytska (70%), *Convolvulus arvensis* L. (70%) are the leading species in the whole spectrum of the species we found (table 2). These are representatives of transformed vegetation, mostly ruderal species, and even those that are quarantine and undesirable for urban lawn phytocenoses.

Table 2

The first species to be found in the studied phytocenoses

Species	Family	Number of squares with the species	Happening,%
Trifolium repens L.	Fabaceae	28	93,33
Polygonum aviculare L.	Polygonaceae	27	90,00
Poa angustifolia L	Poaceae	26	86,67%
Taraxacum oficinale Webb. Ex Wigg.	Asteraceae	25	83,33%
Ambrosia artemisiifolia L.	Asteraceae	24	80,00%
Elytrigia repens (L.) Nevski	Poaceae	23	76,67%
Achillea submillefolium Klok et Krytska	Asteraceae	21	70,00%
Convolvulus arvensis L.	Convolvulaceae	21	70,00%
Lolium perenne L.	Poaceae	21	70,00%

From the family Poaceae, *Poa angustifolia* L. (87%), *Elytrigia repens* (L.) Nevski (77%), *Lolium perenne* L. (70%) have a high happening.

These plants are representatives of both steppe flora and meadow and even forest, which indicates a wide range of ecological conditions of habitats among the studied lawn phytocenoses. Sod-forming species that are able to form the most decorative lawn cover (according to the classification [5]) are represented by species

Poa angustifolia, *Lolium perenne*, *Poa pratensis*, *Festuca valesiaca* Gaud. Their distribution in the herbage is quite variable: from the presence in most of the sample areas - *Poa angustifolia*, to those that were quite rare - *Festuca valesiaca*.

There are many ruderal species in the studied groups. Part of the lawns, even in the city center near office buildings and frequently visited places, was dominated by *Artemisia austriaca* Jacq. (large open area in the city center, crossed by trampled paths - more than 25%). *Convolvulus arvensis* L. (20% - on the coast of the Kakhovka Reservoir), *Elytrigia repens* (L.) Nevski (15% - 20% - on the lawns near administrative buildings), *Polygonum aviculare* L. were also found as dominants on the lawns of Nikopol (20% - 30% in Victory Park and Trubnykiv Avenue), *Taraxacum officinale* Webb. Ex Wigg. (close 20% - not far from the NPF). Thus, the studied phytocenoses very rarely contained the number and species composition of plants, which are provided by the requirements of the arrangement of lawn coverings.

It is recommended to use the index of projective cover to determine the ratio of species in phytocenoses [1]. This is one of the main characteristics, which in route studies is more convenient to determine the living condition of the coenopopulation, especially in low-growing herbaceous phytocenoses, so it was used. Lawn grasses of the first and second groups of ornamentality (those that create the most ornamental grasses according to the known classification of A. Laptev [5]) were represented by Poa angustifolia L. - present on 26 test plots, fenugreek (Lolium perenne L) .) - on 21 trial areas, fine-legged meadow (Poa pratensis) - on 11 test plots, bonfire (Festuca valesiaca Gaud.) - on 3 trial plots (Table 3).

Table 3

The number of studied phytocenoses with the presence of lawn species of the first and second groups of decorativeness according A. Laptev[5]

Festuca valesiaca	*Poa pratensis*	*Lolium perenne*	*Poa angustifolia*
3	11	21	26

On 23 studied areas the lawn cover contained a kind of the third group of decorativeness which forms not a lawn, and grasslands of lawn type of low quality.

Thus, the study of lawn-type grasslands in Nikopol showed that not all of them meet the requirements of high decorative value. A small part of the studied areas is occupied by first-class grasses. The ecological mismatch of the species used in a particular habitat leads to the fact that the species composition of lawn plants over time regenerates into ordinary grassland from a mixture of different species, mainly ruderal. This is facilitated by the lack of optimal care, external man-made factors, and so on. The increase of lawn culture should take place in two directions:

1) the use of high quality plants, taking into account their environmental compliance with the conditions of the lawn;

2) arrangement and care that correspond to modern technologies specific to the lawn culture in the steppe zone of Ukraine.

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