

The analysis of alien species in Mykolayiv urban flora by primary aerals and the time

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The alien fraction of the Mykolayiv urban flora includes 235 species, which are composed 25.8% of the total species number of the studied flora. Geographic range 28 groups are combined in eight migroelements of the flora. They are: Mediterranean migroelement – 48 species, Mediterranean Irano-Turanian – 42, North American – 37. Four species are of anthropogenic origin. Primary areas of distribution were not considered for five species. All alien species are distributed between three migrochroelements by their period of immigration. They are archeophytes (immigrated before the 15th century) – 77 species, kenophytes (immigrated during the 16 – 19th centuries) – 69, and eukenophytes (immigrated in the 20th century) – 89.

Keywords: alien species, urban flora, migration analysis

Ключові слова: адвентивні види, урбанофлора, міграційний аналіз

Introduction

Anthropogenic impact on natural landscapes, namely, industrial forms of management serves as a powerful factor causing changes of plant cover the borders of cities and suburbs. The basic man-made transformation processes are bringing, spreading and naturalization of alien plants.

Alien group within Mykolayiv urban flora includes 235 species, which constitutes 25,8% of the whole flora studied here. In general, alien constitute 14,2% of the Ukraine flora [ПРОТОПОПОВА, 1973] and it confirms a considerable role of cities in the invasion of alien species.

Materials and Methods

This investigation includes 235 plant specimens collected in Mikolayiv during 1996-2003. All taxa are given according to S.L. Mosyakin and M.M. Fedoronchuk [MOSYAKIN, FEDORONCHUK, 1999]. While carrying out the migration analysis of urban flora alien fraction in urban flora of Mykolayiv, we used the alien plants classification of Ya. Kornas [KORNAS, 1968] that is modified by V.V. Protopopova [ПРОТОПОПОВА, 1991] and enriched by I.I. Moysienko [МОЙСИЄНКО, 1999]. This analysis includes two directions: place migration analysis (migroelement) and time migration analysis (migrochroelement). According to Yu. D. Kleopov [КЛЕОПОВ, 1990] a migrochroelement is a group of species migrated to a certain territory simultaneously.

Results

As the result of the analysis of alien element structure 28 area groups of primary natural habitats have been recognized (chart 1). The groups were singled out due to the similar classification by V.V. Protopopova [ПРОТОПОПОВА, 1973] and developed for the alien element of the Ukrainian flora.

To make the analysis more handy 28 natural habitat groups were unified into 8 flora elements according Moysienko [1999] (chart 1). The four species are found to be of anthropogenic origin (due to Zayonts A.). The primary natural habitats of 5 alien species have not been found.

The structure of alien migroelements of flora studied (chart 1) shows a prevailing role of the species of the Old Mediterranean origin (alien migroelements: Mediterranean, Mediterranean-Irano-Turanian and Turan-Iranian) in the formation of its alien element. They constitute 56,6% of the general number of alien species in Mykolayiv urban flora.

Table 1.
Natural habitat groups of migroelements of Mykolayiv urban flora

Таблиця 1.

Ареалогічні групи мігроелементів урбанофлори Миколаєва

Type of migroelement	Natural habitat group and number of species	Total number of species
Mediterranean	Mediterranean – 48 East Mediterranean – 3 West Mediterranean – 1 Asia Minor – 1	53
Mediterranean-Irano-Turanian	Mediterranean-Irano-Turanian – 42 Mediterranean-East-Turanian – 2 Mediterranean-Turanian – 3	47
North American	North American – 37	37
Irano-Turanian	Irano-Turanian – 19 Middle East – 10 Central Asian – 2 Caucasian – 2 Iranian – 1	33
Asian	Asian – 10 East Asian – 5 South-East Asian – 5 South Asian – 1 South- and Southeast Asian – 1 Indo- Malayan – 2 Indo- Malayan and Sudanese – 1	25
European	Middle European – 7 South European – 6 West European – 2 Balkan – 3	18
South American	South American – 10 Southern and Central American – 2	12
African	African – 1	1
Antropogenic origin	4	
Unknown origin	5	

Data highlighted are agreement with the other Black Sea regions such as Odessa [ВАСИЛЬЄВА-НЕМЕРЦАЛОВА, 1996], Kherson [МОЙСІЄНКО, 1999] as well as with the synanthropic flora of Ukraine in general [ПРОТОПОПОВА, 1973]. Mediterranean migroelement an analogous prevails here (53 species or 22,5% of the general number of the adventitious urban flora), especially *Consolida ajacis* (L.) Schur, *Diploaxis tenuifolia* (L.) DC., *Lamium purpureum* L., *Onopordum acanthium* L., *Saponaria officinalis* L., *Sisymbrium loeselii* L. etc.

There are 42 Mediterranean-Irano-Turanian species (*Anisantha sterilis* (L.) Nevski, *Atriplex prostrata* Boucher, *Bromus squarrosus* L., *Lactuca serriola* Torner, *Lamium amplexicaule* L., *Papaver dubium* L.) in the Mediterranean-Irano-Turanian migroelement (17,9% of total amount). The third largest group of species is the North American

migroelement (37 species or 15,7%), including *Acer negundo* L., *Amaranthus albus* L., *A. blitoides* S. Wats., *Cenchrus longispinus* (Hack.) Fernald, *Oenothera biennis* L., *Oxybaphus nyctagineus* (Michx.) Sweet etc. The smallest group is the African migroelement – only one species.

While carrying out the migration analysis of alien species in terms of time spreading, we used the following migroelement classification [MOYSIENKO, 1999]:

1. Archaeomigrochrooelement;
2. Kenomigrochrooelement;
3. Eukenomigrochrooelement.

The classification of the Ukrainian alien plants in terms of time spreading of archaeophytes and kenophytes by V.V. Protopopova [ПРОТОПОПОВА, 1991] served as a basis for such a developed division. The eukenophytes were classified directly using literature data and herbarium collections being dated: by the end of the 19-th – beginning of the 20-th century and relating the researched area. The most intensive alien species invasion process has been developing in the 20th century that was proved by a prevailing number of appropriate species within the alien migroelements (chart 1), eukenomigrochrooelements (89 species or 38,0%).

The archaeomigrochrooelements and kenomigrochrooelements include approximately equal number of species: 77 (32,7%), and 69 (29,3%) correspondingly.

The fate of new alien species differed. Some of them disappeared quickly and other adapted to a new environment with further wide distribution. Many of eukenophytes, i.e. alien species that was brought to a studied area in the 20-th century, did not propagate widely on the territory with showing low naturalization level. 23 eukenophytes reached the expansion level in the urban flora of Mykolayiv, in particular: *Acer negundo*, *Ailanthus altissima* (Mill.) Swingle, *Ambrosia artemisifolia* L., *Amorpha fruticosa* L., *Artemisia annua* L., *Atriplex hortensis* L., *Bidens frondosa* L., *Cenchrus longispinus*, *Chenopodium striatiforme* J. Murr., *Cuscuta campestris* Yunck., *Iva xantifolia* Nutt., *Diploaxis muralis* (L.) DC., *D. tenuifolia*, *Echinocystis lobata* (Michx.) Torr. & A. Gray, *Galinsoga parviflora* Cav., *Grindelia squarrosa* (Pursh) Dunal, *Kochia scoparia* (L.) Schrad., *Medicago sativa* L., *Saponaria officinalis*, *Ulmus pumila* L., *Xanthium albinum* (Widder) H. Scholz, *X. pensilvanicum* Wallr. and *Xanthoxalis dillenii* (Jacq.) Holub. They are present in all types of anthropogenic flora complexes.

Literature

- ВАСИЛЬСВА-НЕМЕРЦАЛОВА Т.В. Синантропна флора припортових міст північно-західного Причорномор'я і шляхи її розвитку: Автореф. дис. ... канд. біол. наук: 03.00.05. – К., 1996. – 22 с.
- КЛЕОПОВ Ю.Д. Анализ флоры широколиственных лесов Европейской части СССР. – К.: Наук. думка, 1990. – 352 с.
- МОЙСИЕНКО І.І. Урбанofлора Херсона: Дис. ... канд. біол. наук: 03.00.05. – Ялта, 1999. – 19 с.
- ПРОТОПОПОВА В.В. Адвентивні рослини Лісостепу і Степу України. – К.: Наук. думка, 1973. – 192 с.
- ПРОТОПОПОВА В.В. Синантропная флора Украины и пути ее развития. – К.: Наук. думка, 1991. – 204 с.
- MOSYAKIN S., FEDORONCHUK M., Vascular plants of Ukraine: a nomenclatural checklist. – Kiev, 1999. – 345 p.
- KORNAS J. Geographical – Historical Classification of Synantropic Plants // Mater. Zakl. Fitosoc. Stos. UW. – 1968. – № 25. – P. 33-41.

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