ALIEN SPECIES OF PLANTS IN THE FLORA OF THE PRIPYAT POLESYE (BELARUS) AND THEIR INVASIVE POTENTIAL

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Introduction. Currently, one of the most important threats to biodiversity is biological pollution. It means the invasion of alien species of plants and animals into natural communities, which is a consequence of anthropogenic impact. That is why the issues of studying the ways of penetration and the peculiarities of the distribution of alien organisms, as well as their interaction with the representatives of local flora and fauna, are of high urgency (Vinogradova, Mayorov & Khorun, 2009). The problem of the wide distribution of invasive plants is especially relevant for the Belarusian Polesye, the territory of which has a high degree of anthropogenization of landscapes, as well as the transboundary nature of river basins. In this regard, the issues related to the study of the adventive fraction of the flora of the Belarusian Polesye and the assessment of its invasive potential are of high relevance.

Materials and methods. The assessment of the invasive potential of alien plant species of the Belarusian Polesye was carried out using the example of the flora of the Pripyat Polesye. This natural region is located in the central part of the Belarusian Polesye and to the greatest extent reflects the natural features of the entire Polesye region. When compiling a list of alien plant species, we used the results of our own floristic research carried out in the region in 2009–2020, available literary sources on the Polesye flora, as well as materials from herbarium collections (BRTU, GMU, LE, MSK, MSKH, MSKU, MW). The analysis of adventive species was carried out taking into account the introduction time (archaeophytes and neophytes) and method (xenophytes and ergasiophytes), as well as the degree of naturalization (ephemerophytes, colonophytes, epecophytes, agriophytes) (Thellung, 1918–1919) in the natural conditions of southern Belarus.

Results. The modern flora of the vascular plants of the Pripyat Polesye is represented in total by 2.162 species (842 genera, 172 families). These include all wild, and also cultivated in open ground plant species. The indigenous fraction is represented by 881 species from 370 genera and 117 families. 1.281 species (621 genera, 132 families) have alien origin, among them 641 species are noted only in culture. Consequently, 640 alien plant species grow spontaneously in the region and, together with the aborigines, form a spontaneous fraction of the flora.

Taking into account the time of introduction, the group of neophytes, represented by 432 species, prevails among adventive species. These plants (*Lunaria annua* L., *Lepidium densiflorum* Schrad.) have been introduced here since the XIV century (the beginning of the Age of Discovery). The group of archaeophytes (old immigrants) includes 208 species, which are represented mostly by weeds and ruderal plants (*Ballota nigra* L., *Urtica urens* L.).

According to the method of introduction, xenophytes (accidentally introduced plants) predominate among adventive species. The appearance of these 365 species (*Vicia cracca* L., *Viola arvensis* Murray) is not directly related to human activities. Ergaziophytes include 275 species, introduced purposefully for subsequent economic use. These representatives of flora (*Bellis perennis* L., *Nicandra physalodes* (L.) Gaertn.) were able to "escape from culture" and adapt to the natural conditions of the south of Belarus.

The most important characteristic of adventive species, which makes it possible to assess their invasive potential, is the degree of their naturalization. To clarify the extent of penetration of species into flora, it is important to take into account the degree of plant resistance (the ability to reproduce and overwinter), the breadth and frequency of distribution (depends on the regularity of the introduction of seed material and the rate of independent propagation), ecological and phytocenotic features (the ability to penetrate into natural or semi-natural phytocenoses).

The group of ephemerophytes (without signs of naturalization) is represented by 51 species. They include the species of synanthropic communities (*Abutilon theophrasti* Medik., *Fagopyrum tataricum* (L.) Gaertn.) and some cultivated plants (*Cucumis melo* L., *Datura tatula* L.), which grow in places of introduction for a short time. The group of colonophytes is represented by 173 species (*Phlox paniculata* L., *Narcissus poeticus* L.), which can remain in places of introduction for several years, but do not have the ability to spread further). Epecophytes include 316 adventive species (*Alyssum calycinum* L., *Phytolacca acinosa* Roxb.) widespread in various disturbed habitats (roadsides, outskirts of agricultural fields). All of these plants can spread beyond the areas of their primary introduction. Agriophytes, represented by 100 species, are characterized by the highest naturalization. Plants of this group (*Berberis vulgaris* L., *Carex brizoides* L., *Echium vulgare* L.) are able to grow and spread widely in natural phytocenoses.

In accordance with the above, alien plant species that have naturalized well in the conditions of the south of Belarus can be classified as invasive. Among epecophytes and agriophytes, invasive species are those that can spread widely and significantly change the features of the functioning of natural plant communities: *Acer negundo* L., *Acorus calamus* L., *Ambrosia artemisiifolia* L., *Amelanchier spicata* (Lam.) K. Koch, *Angelica archangelica* L., *Asclepias syriaca* L., *Aster* × *salignus* Willd., *Aster novi-belgii* L., *Bidens connata* Muhl. ex Willd., *Bidens frondosa* L., *Conyza canadensis* (L.) Cronquist, *Cyclachaena xanthiifolia* (Nutt.) Fresen., *Echinocystis lobata* (Michx.) Torr et A. Gray, *Elodea canadensis* Michx., *Elodea nuttallii* (Planch.) H. St. John, *Epilobium adenocaulon* Hausskn., *Erechtites hieracifolius* Raf., *Festuca trachyphylla* (Hack.) Krajina, *Galinsoga parviflora* Cav., *Galinsoga quadriradiata* Ruiz et Pav., *Helianthus tuberosus* L., *Heracleum sosnowskyi* Manden., *Hippophae rhamnoides* L., *Impatiens glandulifera* Royle, *Impatiens parviflora* DC., *Lupinus polyphyllus* Lindl., *Oenothera biennis* L., *Oenothera rubricaulis* Kleb., *Padus serotina* (Ehrh.) Borkh., *Parthenocissus quinquefolia* (L.) Planch., *Petasites hybridus* (L.) G. Gaertn., *Phalacroloma annuum* Dumort., *Phalacroloma septentrionale* (Fernald et Wiegand) Tzvelev, *Phragmites altissimus* (Benth.) Mobille, *Populus alba* L., *Quercus rubra* L., *Reynoutria japonica* Houtt., *Reynoutria sachalinensis* (F. Schmidt) Nakai, *Robinia pseudoacacia* L., *Rumex confertus* Willd., *Sambucus nigra* L., *Sambucus racemosa* L., *Sarothamnus scoparius* (L.) W.D.J. Koch, *Schedonorus arundinaceus* (Schreb.) Dumort., *Solidago canadensis* L., *Solidago gigantea* Aiton, *Sorbaria sorbifolia* (L.) A. Braun, × *Sorbaronia mitschurinii* (A.K. Skvortsov et Maitul.) Sennikov, *Xanthium albinum* H. Scholz, *Zizania latifolia* (Griseb.) Turcz. et Stapf. (Mialik, 2016). 50 species listed by origin are predominantly neophytes brought from the temperate latitudes of North America, Asia and adjacent regions of Europe. All these plants are distinguished by high vegetative mobility, as well as the capacity for abundant seed reproduction.

Conclusion. Taking into account the introduction time and method, and the degree of naturalization of the adventive representatives of the flora of the Pripyat Polesie, it can be concluded that out of 1.281 species, only 640 are part of the spontaneous flora. Only 416 species (32.5 %) make up a stable component of the adventive flora, that is, they were able to adapt to the natural conditions of the south of Belarus. Of these, only 50 plants can be classified as invasive in the conditions of the Pripyat Polesye.

References

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