WOODY SPECIES CULTIVATED FOR ORNAMENTAL PURPOSES WITH INVASIVITY CAPACITIES IN OLTENIA, ROMANIA

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Abstract

The researched territory is located in the Oltenia area, in the interfluve between Danube, Jiu and Olt river, the studied area being an integral part of the grassland, forest, wetland, agricultural ecosystems and segetal, ruderal and of course urban areas. The invasive species have a negative impact on the native flora and vegetation of a region, with direct effects on soil, agro- and silvobiodiversity occupying more and more space. In recent years in Oltenia, especially in the southern part, the number of invasive species has increased considerably, their ability to spread and invasiveness being very high. Some of these species exert a high degree of aggression on wet, practical and forest habitats, influencing the structure and functionality of edifying phytocoenoses. A significant number of woody species, which were cultivated for ornamental purposes in Oltenia, either in the urban environment or within natural ecosystems, have become invasive and have developed particularly important populations, such as: Acer negundo, Rhus typhina, Amorpha fruticosa, Ailanthus altissima, Eleagnus angustifolia, Fraxinus pensylvanica, F. americana, Parthenocissus inserta, P. quinquefolia, Prunus serotina, Albizia julibrissin, Robinia hispida.

Key words: *Oltenia, invasive species, woody species, natural habitats, urban area*

INTRODUCTION

Changes in climatic conditions influence the expansion on ever larger surfaces as well as the exacerbated development of populations of invasive species introduced in southern Romania initially for ornamental purposes. In the last decades, an increasing number of species that were cultivated for different purposes but also that accidentally entered Oltenia became successful invaders in different habitats. Many factors may contribute to the increased invasiveness of these species, including seed production, germination, and their relatively high growth rate. The impact of invasive species on native vegetation in a region can have different intensities, but they can increase with the accentuation of the drought and the aridification of the lands in the south of Oltenia, this may lead to the loss or irreversible degradation of habitats or species populations. In recent years in Oltenia, especially in the southern part, in the large hydrographic basins of the Danube, Jiu and Olt, the number of invasive species has increased considerably, their ability to spread and invasiveness being very high. Some of these species exert a high degree of aggression on wet, practical and forest habitats, influencing the structure and functionality of edifying phytocoenoses.

MATERIALS AND METHODS

The researched territory is located in the Oltenia area, in the interfluve between Danube, Jiu and Olt river, the studied area being an integral part of the grassland, forest, wetland, agricultural ecosystems and segetal, ruderal and of course urban areas. In order to identify the species we looked into: Romanian Flora, vol. I-XII (1952-1976), Flora

Europaea, vol. I-V (Tutin, T. G. et al., 1964-1980), The alien
(nonnative) flora of Moldavia (Romania) (Sîrbu C., 2004), Plante adventives în flora României (Sîrbu and Oprea, 2011) and lists of invasive species at national and European level. Every species have been analyzed and characterized from the chorological, ecological point of views.

RESULTS AND DISCUSSIONS

This paper presents a preliminary study on invasive woody plant species that were introduced for ornamental purposes and which in recent years have experienced a high degree of aggressiveness and population expansion in the interfluve of the Jiu, Danube, Olt rivers in Oltenia.

Among the invasive species introduced for ornamental purposes in Oltenia, particularly important populations have developed: *Acer negundo, Rhus typhina, Amorpha fruticosa, Ailanthus altissima, Eleagnus angustifolia, Fraxinus pensylvanica, F. americana, Morus alba, Lyceum barbarum, Parthenocissus inserta, P. quinquefolia, Prunus serotina, Robinia hispida*.

The excessive development of the number of individuals in a population, as well as the increase in the degree of invasiveness in close correlation with global climate changes in recent years, have a strong impact on biological diversity in most types of ecosystems and habitats. These species introduced intentionally, especially for ornamental purposes, influence the stability and development of the entire natural heritage, potentially leading to the disappearance of native species and to ecological, biological and functional changes at the level of the entire ecosystem.

For all these species it is important to consider the routes and mechanisms of introduction and spread, confirm the presence and number of individuals in a population and avoid their spread to neighboring territories, as well as define and apply the best measures for their management and control.

It should be noted that in recent years the species *Albitzia julibrisin* was introduced for ornamental purposes in Romania, but also in Oltenia. In the last decades, *Albizia julibrissin* Durazz., which represents a new threat from an invasive point of view, was introduced in Romania for ornamental purposes. Following the observations made in the last years, this species has an extremely fast growth rate, low water requirements and the ability to withstand hot temperatures and atmospheric pollution.

This species is cultivated excessively, in gardens, green spaces, private yards and especially in the open spaces in front of private yards in most locations in Oltenia. Following the studies carried out regarding the invasive potential of this species, we can mention the fact that this species has a very high spreading power, quickly conquering new territories, each individual produces a very large number of seeds that have a very high germination power, is a species extremely resistant to drought, to various anthropogenic factors, including atmospheric pollution, to harmful mechanical factors, very high temperatures of over 40^0 during the summers in the south Oltenia, growing on the sides of roads, alleys, on several types of soil, including sandy. Around each individual, but also at distances between 2-80 m from it, vigorous saplings were identified, with increased vitality and accelerated growth, being able to reach up to 30-40 cm in height in one year of vegetation. Thus, we can specify that this species can be considered a new invasive species for Romania.

Ailanthus altissima (Miller) Swingle, coming from China, was cultivated for decorative purposes in Europe (in France) and in our country, but

it also grows subspontaneously in the degraded and sunny fields. Species installs very quickly,
is very lively and has a very high growth rate. We find this invasive species in the forest habitats and in the meadows, but also in the public parks, gardens, besides buildings and and roadsides (Niculescu et al., 2018). According to the geobotanical research in the in the South-Western of Romania, it has been noted that in the *Balloto nigrae-Ailanthetum altissime* Sîrbu and Oprea 2011 plant community.
This species is very widespread in urban areas and has a very high expansion power. It is characterized by an increased vivacity and a very strong multiplication power of development and regeneration, being extremely difficult to combat, especially as it presents a special resistance to excessive environmental conditions.

Rhus typhina L. It is a species frequently cultivated for ornamental purposes in Oltenia, very often on the streets, in front of houses. The species spreads extremely easily and is installed especially on wet soils and open areas. Although it is a species with a high degree of invasiveness, it is still cultivated for ornamental purposes mainly due to its attractive decorative appearance, especially through the leaves and fruits of the plant.

Acer negundo L. is an invasive woody species originating from the USA, introduced in Romania for ornamental purposes, but also in forest habitats with a role in restoring eroded areas. It then spread extremely quickly, in some areas becoming dominant and suffocating native species. The species is very widespread, especially in the meadow habitats of the Dinaric, Jiu and Olt Valleys. It develops very well and forms important populations especially in poplar, ash and willow habitats, entering the floristic composition of the plant communities that build the Natura 2000 habitats: 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae*, *Salicion albae*) (CLAS. PAL.: 44.3, 44.2 şi 44.13), 92A0 *Salix alba* and *Populus alba* galleries (CLAS. PAL.: 44.141, 44.162 şi 44.6), 91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis* and *Ulmus minor, Fraxinus excelsior* or *Fraxinus angustifolia* along the great rivers (*Ulmenion minoris*) (CLAS. PAL.: 44.4).

Eleagnus angustifolia L. is a very widespread species in Oltenia, both in the natural habitats of meadows, bushes or even forests in the Danube floodplain, especially on sandy, wet soils. In the Olt and Jiu basins, the species also develops very well in the area of agricultural crops, next to the abandoned buildings of former farms from the communist period or on the edge of former irrigation canals in southern Oltenia. It is also found in urban areas on the edge of railways and in places with a high degree of abandonment. The species is difficult to combat, being a drought-resistant species and not very demanding on ecological conditions and especially on current global climate changes.

Amorpha fruticosa L. is a fast-growing shrub, native to North America, introduced to Europe and our country for ornamental purposes. This species has quickly conquered vast territories, especially in river meadows, in humid and forest habitats, due to its great power of sprouting, drainage, germination, very rapid growth and very high resistance to extreme ecological conditions, especially to global climate changes. In Oltenia, the species is found in all river basins, especially in the Danube, Olt and Jiu Valleys where it forms dense networks, for entire kilometers, affecting the conservation status of humid and forest habitats, being almost impossible to combat.

Fraxinus pensylvanica Marshall and *F. americana* L. are native to North America and were introduced for both

ornamental and forestry purposes. Both species have become invasive species in Romania, occurring in Oltenia, mainly in meadow forest habitats, but also in some urban areas.

Parthenocissus inserta (A. Kerner) Fritsch. and *P. quinquefolia* (L.) Planch both species were introduced for ornamental purposes and spread rapidly due to their morphological characters and the habit of climbing vines that spreads and quickly conquers new territories. Both species can be found both in natural habitats, especially forest ones, but also in more or less anthropized urban areas. It is very difficult to combat and is a very widespread species in Oltenia, being particularly resistant to the eco-pedo-climatic conditions of this region.

Robinia hispida L. is a species that has also been introduced for ornamental purposes in Romania and Oltenia due to its pleasant habit and beautiful pink or purplish pealike flowers. It is frequently found in urban areas, but I have also encountered it at the edge of some forest meadow habitats in the Tisoviata Valley, Mehedinti County. We consider that this species does not currently have a high degree of invasiveness, but it must be kept under constant observation.

Prunus serotina Ehrh. is an invasive species originating from North America that is less widespread in Oltenia. It was introduced for ornamental purposes, in the researched territory being found mainly in urban areas.

CONCLUSIONS.

In the researched area, a series of invasive woody species that have been introduced for ornamental purposes or have been introduced into forest crops were identified, for some of them new locations were established for Romania or Oltenia.

One of the species - *Albizia julibrissin* is not yet on the list of invasive species in Romania, but following studies conducted in recent years, it has been shown to have a pronounced spread and aggressiveness, especially in the urban area of Oltenia, so we consider this to be a new invasive species or certainly potentially invasive in Romania. The species was introduced for ornamental purposes first in the west of the country, but it spread extremely quickly, migrating to the southwest and then throughout the country. It produces a large number of seeds, which have an extremely high capacity for spreading and germination, and the species has a high capacity for adapting to eco-pedoclimatic conditions.

Considering the rapid spread and high degree of invasiveness and aggressiveness on natural habitats and ecosystems of invasive species introduced mainly for ornamental purposes, we consider it particularly important to inventory and monitor them for the management of immigration and biological invasion in our country, and especially in protected areas but also in urban centers.

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