NEOBIOTA2020 - 11TH INTERNATIONAL CONFERENCE ON BIOLOGICAL INVASIONS
15-18.09.2020, VODICE, CROATIA

AN UPDATED INVENTORY OF NEOPHYTES REPORTED FOR ROMANIA

Paulina ANASTASIU[1], Culiță SÎRBU[2], Gavril NEGREAN[1], Ioana Minodora SÎRBU[1],
Mihaela URZICEANU[1], Athanasios Alexandru GAVRILIDIS[3], Adrian OPREA[4]

[1]University of Bucharest, Faculty of Biology & Botanic Garden "D. Brandza", Bucharest, Romania
[2]"Ion Ionescu de la Brad" University of Agricultural Sciences and Veterinary Medicine, Iași, Romania, culita69@yahoo.com
[3]University of Bucharest, CCMESI, Bucharest, Romania
[4]"A.I. Cuza" University, Botanic Garden "A. Fătu", Iași, Romania

Introduction

For better understanding the biological invasions complete national and regional checklists are very valuable (Pyšek et al. 2012). Such checklists were produced for many European countries (e.g. Belgium, Estonia, Italy, Greece, Slovakia, Czech Republic). A comprehensive checklist for 48 European countries and region was compiled and published in the framework of DAISIE project (Lambdon et al. 2008, DAISIE 2008).

For Romania, the previous list of neophytes was published in 2009 and included 365 taxa (Anastasiu & Negrean 2009). Few years latter, Sirbu & Oprea (2013) published a book with 671 alien plants for Romania, neophytes and archaeophytes as well.

Since then research on alien plants has intensified at national level, so new data have become available, making it necessary to update and improve the list of neophytes reported for Romania.

Because of the lack of space on this poster, we present bellow only some of the results.

Material & methods

For each taxon, the following types of information are provided and analysed: family, native range, life form, distribution in the country, way of introduction, current invasive status, impact on ecosystems and ecosystem services, updated author, year and locality of the first report, status of the species in our country according to the Euro+Med database. Plant names are according to Euro+Med database (ww2.bgbm.org) and The Plat List (www.theplantlist.org). In order to evaluate the invasive status, we followed the terminology and definition recommended by Richardson et al. (2000), Pyšek et al (2012).

Regarding the distribution, we have gathered data from the literature (since the 19th century to present days) regarding the presence of invasive plant species in Romanian territories and created a database with the species mentions and the settlements or landform in which they were identified. Afterwards, we used shapefiles of the Romanian human settlements, landforms and hydrological features which we have joined with the UTM 5x5 km grid, creating fields for each items (settlement, landform and hydrology). The final step was joining the attributes from the database with the ones from the updated UTM 5x5 km grid, the common field being the settlement field. For the records in which the presence of a species was signaled in association with a specific landform or hydrological feature we have used *select by location* tool in ArcGIS 10.4. and selected the grid cells overlapping the indicated features. However, as these type of records covered wide areas, we have considered them with a high level of uncertainty. The resulted richness map was developed using the high level of certainty data, namely the data with more accurate location descriptions.

Results & discussion

The new checklist includes 767 neophytes, more than double the number in the list published previously (Anastasiu & Negrean 2009). The increased number of neophytes in the current list is only partially due to new introduction or recent reports. The following categories have also been added to the current list: alien plant species mentioned by various bibliographic sources, but omitted from the original list for various reasons; species mentioned in the *Flora Europaea* as being naturalised in Romania; some European or Mediterranean species that some authors consider to be native to Romania, but for which there are insufficient arguments in this regard; some species for which, although known as plants grown in Europe before 1492, there is insufficient evidence that they are archaeophytes in Romania (e.g. *Prunus* spp., *Triticum* spp. etc.); alien species previously reported as escaped from cultivation or naturalised, but considered extinct due to the absence of more recent data; naturalised species in some botanic gardens in the country. The most neophytes belong to **families** knowing to invade habitually areas with temperate climate (Fig. 1).

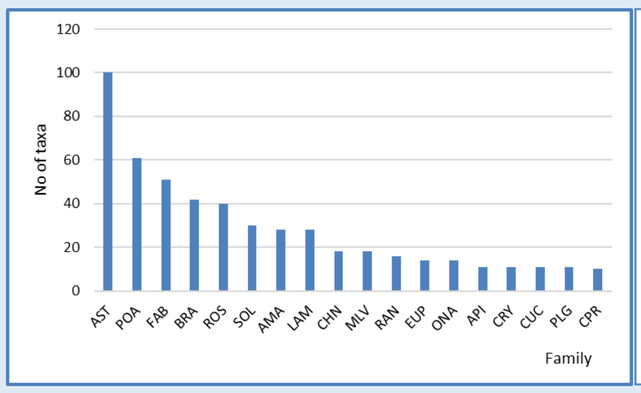

Fig. 1. The representative families in the alien flora of Romania

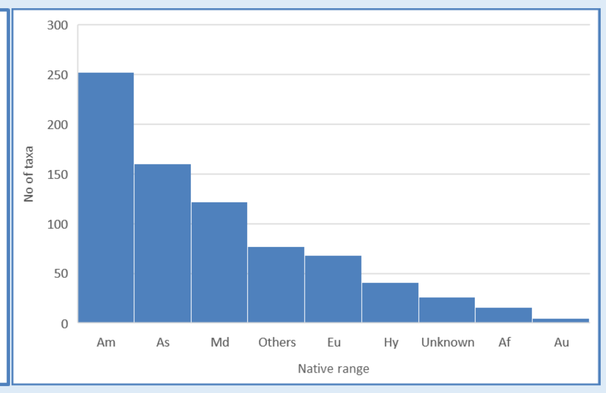

Fig. 2. Native range of the neophytes reported for Romania

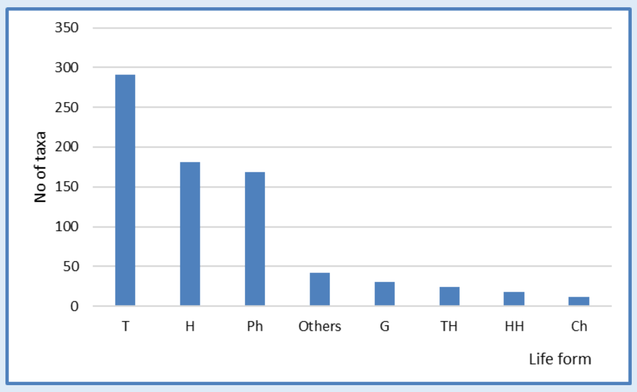

Fig. 3. Spectrum of life forms of the neophytes reported for Romania

Most neophytes from Romania are the **native range** in America (252 taxa – 32.85%). Asian species follow those American (160 taxa – 20.86%). On the third place are the Mediterranean elements (122 taxa – 15.90%) (Fig. 2).

The analyses of life forms revealed the dominance of therophytes with 291 taxa (37.94%). They are followed by hemicryptophytes with 181 taxa (23.59%) and phanerophytes with 169 taxa (22.03%) (Fig. 3).

Among 767 neophytes inventoried for Romania, 467 (60.75%) are classified as **casual**, 110 (14.21%) as **naturalized**, and 56 (7.30%) as **invasive**. Others 108 (14.08%) are considered vanished, and for 24 (3.52%) of them the invasive status is unknown (Fig. 4). In this last category there are species mentioned in Flora Europaea as naturalised for our country, but nor occuring in Romania (e.g. *Acacia dealbata*, *Gossypium herbaceum*, *Jasminum officinale* etc.) or native in Romania (e.g. *Angelica archangelica*). In relation of the **way of introduction**, Fig. 5 is very suggestive. For five species we have not data about way of introduction. They are mentioned in Flora Europaea as naturalised in Romania, but these species could be present in our country only as cultivated in greenhouses (e.g. *Jasminum officinale*, *Acacia dealbata* etc.).

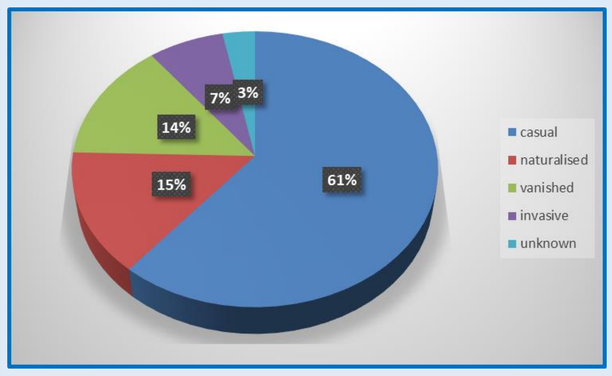

Fig. 4. Representation of neophytes according to their invasion status

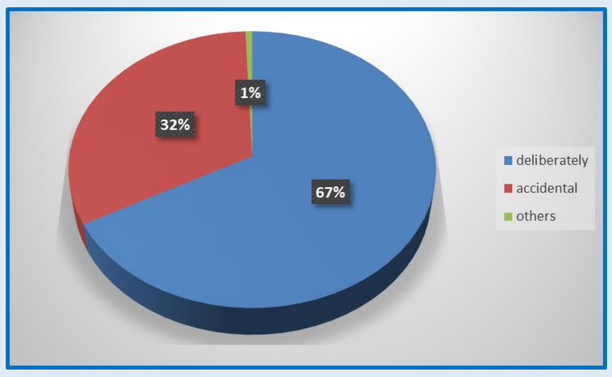

Fig. 5. Representation of neophytes in relation to their way of introduction

Regarding the distribution of neophytes, they are present in all the historic regions of the country, with a higher number of taxa in area with universities (e.g. Bucharest, Iasi, Brasov, Sibiu, Cluj-Napoca) (Fig. 6).

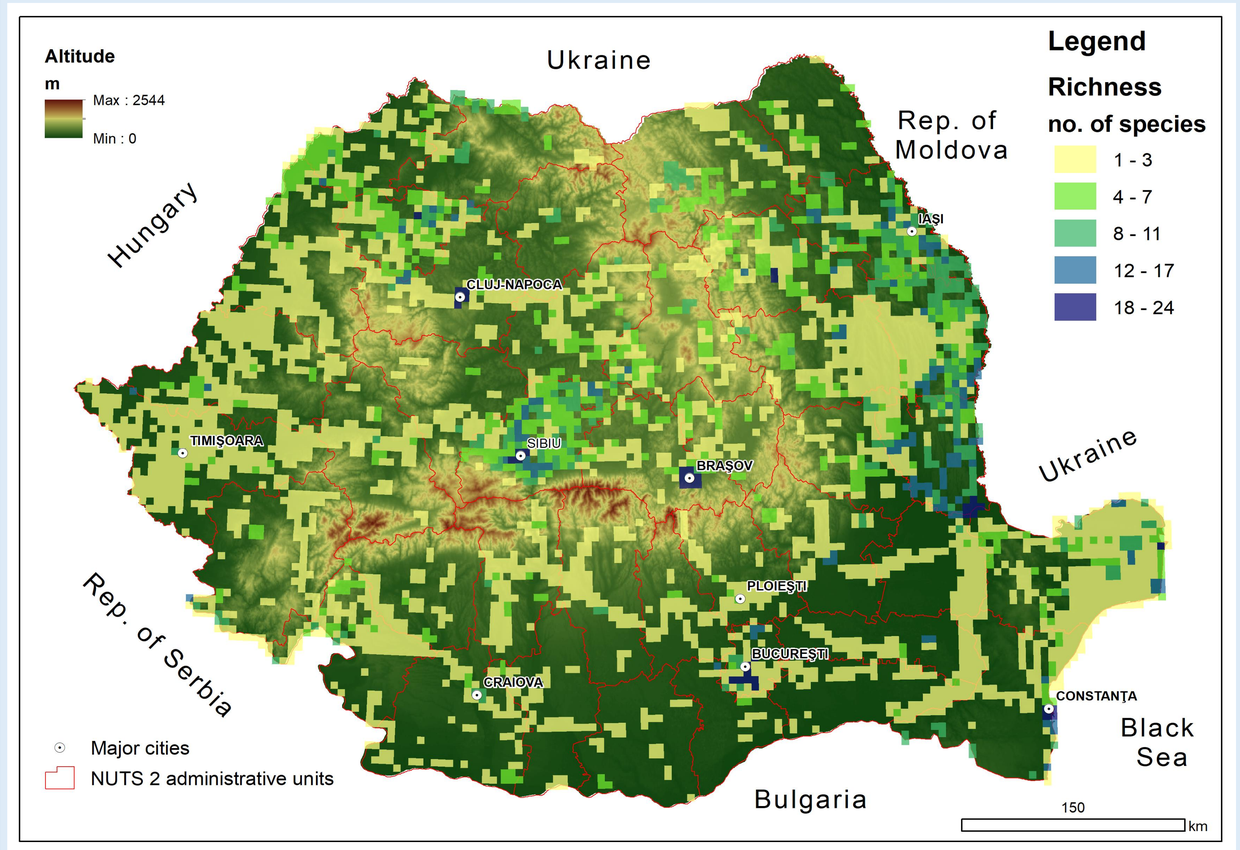

Fig. 6. Distribution of neophytes in Romania in relation to the richness of the number of taxa

References

- Anastasiu, P. & Negrean, G. (2009). Neophytes in Romania (pp. 66-97). In: Rákosy L., Momeu L. - *Neobiota din România*, Cluj-Napoca: Editura Presa Univ. Clujeană.
- Lambdon, P. W. et al. (2008). Alien flora of Europe: species diversity, geographical pattern and state of the art of research. *Preslia,* 80(2): 101–149.
- Pyšek, P. et al. (2012). Catalogue of alien plants of the Czech Republic (2nd edition): checklist update, taxonomic diversity and invasion patterns. *Preslia*, *84: 155–255.*
- Richardson, D.M. et al. (2000): Naturalization and invasion of alien plants: concepts and definitions. *Diversity and Distribution*, 6: 93-107.
- Sîrbu, C. & Oprea, A. (2011). *Plante adventive în flora României*. Iași: Editura "Ion Ionescu de la Brad".

Acknowledgements

This work have been done in the framework of the project *„Managementul adecvat al speciilor invazive din România, în conformitate cu Regulamentul UE 1143/2014 referitor la prevenirea și gestionarea introducerii și răspândirii speciilor alogene invazive*", co-funded by European Regional Development Fund (ERDF), POIM 2014-2020. The content of this paper does not represent the official position of the European Union or Romanian Government.
Participation to the Neobiota 2020 Conference is funded by the project CNFIS-FDI-2020-0028.