MODERN TENDENCIES OF SCIENTIFIC INTEREST IN THE PROBLEM OF INVASIVE ANIMAL AND PLANT SPECIES IN EUROPEAN COUNTRIES' SCIENTIFIC PUBLICATIONS

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The resettlement of various types of plants and animals around the planet is a side effect of the commodity circulation in the world's development, climate change, the commodity-transport networks' development. One of the modern environmental problems is the rapid spread of invasive species. Invasive species are objects of wildlife that are settled in the course of human activities, which may raise the question of the local flora and fauna species' existence.

Relatively recently, research has begun on the identification of such species, their inventory, the development of destruction measures, etc. All activities involving the prevention of the alien species to new territories' spread are regulated according to the Convention on Biological Diversity, signed in 1992 in Rio de Janeiro [1].

Active research has begun worldwide in the field of work with invasive species: determining the rate of spread, analyzing the results of alien species into new territories' introduction.

In the Republic of Belarus, as well as throughout the world, the last few years have been actively combating rapidly spreading invasive species, such as *Heracleum sosnowskyi*, *Solidago Canadensis* and *Echinocystis lobata*.

The purpose of this study was to analyze the scientific interest in the problem of the invasive species' spread, the experience gained in their inventory.

The relevance is a certain summing up over the past decades of experience in conducting research of invasive species field.

Material and methods. The main material for the work was the content analysis of leading international scientific databases, such as PubMed, Scopus and Web of Science.

Articles of journals and conference materials including topics of invasive species in Europe since 1990 were chosen for consideration.

The primary analysis was carried out according to several criteria: the type of plant or animal (we were primarily interested in plants and insects); determination of the frequency of occurrence of a species in this kind of research and the possibility of applying the described experience.

Findings and their discussion. 64 articles were selected for the analysis, where most met all the established search criteria. In general, in one way or another, the problem of biological invasions has been touched upon in more than 300 scientific articles. Changes in interest in this research topic can be

represented as a graph showing the interest of the scientific community's increase (Figure 1).

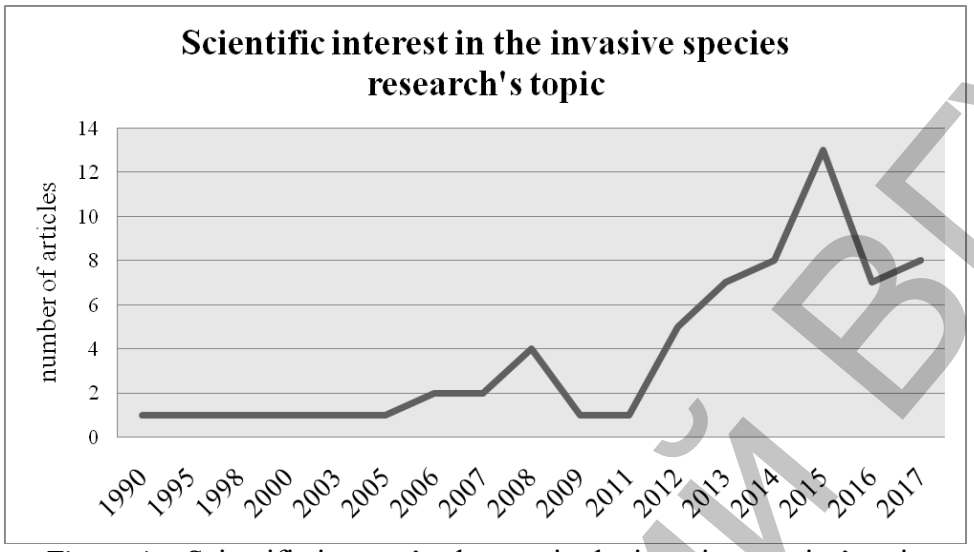

Figure 1 – Scientific interest's changes in the invasive species' topic

As a result of the analysis, it became clear that interest in the invasive species study increases of every year, although it has undergone a slight decline in some years. Probably, the growth of scientific interest is directly proportional to the rate of spread and rate of change of native flora and fauna's biodiversity. As a rule, this sharp reduction of species already in the first years of the "neighborhood" with invasion [2].

In the analysis of articles, it was found that the focus is on insects (39 articles out of 46 published in the period from 1990 to 2017). First of all, mosquitoes (*Aedes albopictus* and *Aedes japonicus* are two main invasive species), which are actively "capturing" new territories. Also, these are *Harmonia axyridis*, *Diabrotica virgifera*, *Anoplolepis gracilipes* and other species of hipworms.

It can be seen that the focus is on the mosquitoes' (*Aedes albopictus* and *Aedes japonicus*) study because these species are especially dangerous to humans. Mosquitoes are carriers of viral infectious diseases to Europe, such as chikungunya and dengue fevers. More rarely, there may be carriers of another viral disease, yellow fever, but cases of the disease are extremely rare. The fight against both invasive species and the consequences of their spread (reduction in the number of native species, treatment of diseased people) is conducted not only at the local levels but also at the international level. For example, the World Health Organization (the Regional Office for Europe) carries out a strict epidemiological survey and control over the implementation of measures to combat invasive species (conducting transboundary programs) [1].

Analyzing the publication activity of invasive plants, we can distinguish two of the most common genus: *Heracleum* and *Solidago*. In their composition

and species common in Belarus: *Heracleum sosnowskyi*, *Heracleum persicum*, *Heracleum mantegazzianum*, *Solidago canadensis*, *Solidago gigantea*. The active uncontrolled spread of invasive species in Eastern Europe, threatening not only the biodiversity of the territories but also the health of the population, *Heracleum sosnowskyi* has been known since the 1980s. At the same time, the first events on the invasion's local destruction began, but in the absence of a coordination center that could organize a coordinated and qualified "struggle" there was no. In 2005 the collective authors released The Practical Guide to Combating Giant Hogweed (based on European experience in dealing with invasive weeds), which became the main reference source for all land users faced with the problem of "contamination" of the territories by *Heracleum*. The fight against the spread of *Solidago* is also underway, but not so organized, since direct contact is not dangerous either to humans or to animals.

Conclusion. We can conclude about the high level of work's related relevance of to the study of invasive species. For comparison, in the Republic of Belarus such scientific papers began to appear only in the last 5-7 years. Such studies are gaining popularity since the problem of active propagation takes a leading position on par with other environmental problems of our time. The main work is carried out on invasive plant species' inventory and analysis of growth in our country, while studies related to the examination of invasive insect spreads are very rare.

Reference list:

1. Regional Framework for Surveillance and Control of Invasive Mosquito Vector and Returnable Vector-borne Diseases 2014–2020. / World Health Organization. European Regional Office. - Copenhagen, 2013. - 35 p.

2. Callaway, R.M. Invasive plants versus a new invasion / R.M. Callaway, E.T. Aschehoug // Science. – 2000. – Oct 20; 290 (5491).

ACTIVITY OF GENERAL GLUTATHIONPEROXIDASE IN THE HEMOLYMPH OF A PONDER OF THE ORDINAL

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Environmental changes affect aquatic ecosystems in general and their inhabitants in particular. Therefore, pulmonary freshwater mollusks are used as bioindicators of anthropogenic influence on the environment. Bioindication methods have a number of significant advantages compared with physicochemical methods of analysis: high sensitivity and specificity of bioindicators to toxic substances; summation of all pollution data without exception; the ability to characterize the state of a particular environment over a long period of time; low cost of research.