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PERSPECTIVES OF RESEARCHES OF PRESERVING BIODIVERSITY OF AGROSPHERE IN UKRAINE

The purpose. To optimize biodiversity in agrosphere. **Methods.** Analytical-synthetic methods in view of fund, statistical materials, normative-legal database. **Results.** Ukraine has approximately 35% of biodiversity, occupying less than 6% of the area of Europe. That is the result of location of Ukraine on a crossroads of many native zones and migration paths of kinds of fauna. Biota of Ukraine makes more than 70 thousand kinds: of them flora — more than 27 thousand, fauna — more than 45 thousand. **Conclusions.** It is offered to develop the nation-wide program of protection of native fraction of flora and fauna in agrosphere. In a context of invasions of adventive kinds of biota it is necessary to begin their monitoring and to lead cadastre. For preservation of rare plants and animals in agrolandscapes it is expedient to optimize regional schemes of ecological nets in the structure of pan-European one.

Key words: ecozoology, monitoring, flora, fauna, agrosphere.

Ukraine has one of the most advanced agro-industrial complexes in Europe, so its impact on biodiversity is an urgent task of agroecology in fundamental research over the coming years. The definition of a national strategy for the protection of the natural environment, the conservation of species of flora and fauna, and landscapes on the principles of balanced development are topical problems of our time. By the twenty-first century. priorities for intensive agro-production were given, and nowadays elements of breadth and pastures, no-till, steam, forest bands, etc. are determined for preservation of biota. In the chorological dimension, agroecosystems of Ukraine are the basis of the territorial structure, their area is approximately 69% of the entire territory of the state, namely: agricultural land - 41 million hectares, of which arable land - 55% (33 million hectares), hayfields and pastures - 13% (7.6 million ha) [8]. Often, forests are included in the

agrosphere (the area of the forest fund of Ukraine is 10.4 million hectares, of which 9.6 million hectares are covered with forest vegetation, and 15.9 per cent are forests), but even artificially established forest plantations retain a part of the aboriginal fraction geographic region biota. Intrazonally, the agrosphere includes hydroelectric systems. The biodiversity of the agrosphere has signs of autochthony with an additionally cultivated genetic diversity. Consequently, the scientific and practical bases for optimizing the management of biodiversity conservation in the context of balanced development and European integration of Ukraine are one of the key environmental objectives. Analysis of recent research and publications. An important issue is the paradigm (system of judgments) of biodiversity protection and the implementation of policies in the field of conservation and non-exhaustive use of biota aimed at significantly reducing anthropogenic impact (in particular from agro-industrial production, agriculture), ensuring natural conditions for the existence and reproduction, non-exhaustive use of bio- and landscape resources. In addition to the natural species, population, ecosystem diversity, the genetic, cultivated biodiversity (varieties of plants, breeds of animals) occupies a significant place. Biosource agrosphere is an important component of socio-economic development of mankind [12]. Therefore, the issue of their rational use, assessment, ecological safety, cadastre, management, conservation are relevant in the global dimension, and for Ukraine, oriented to agro-industrial growth, this is a special priority. In the conditions of European integration, adaptation of the regulatory framework, harmonization of quality standards, optimization of ecological management of agro-landscapes, biodiversity is very important. Environmental degradation, caused by intensive human activities, has led to large-scale transformations in natural ecosystems, resulting in a decrease in the number or disappearance of many species of animals, plants and fungi. The use of timely measures to protect the fauna and flora will enable the halting of the negative processes of destruction of the environment and the restoration of the status of populations of vulnerable species. The World Summit on Sustainable Development in Johannesburg in 2002 and the UN

General Assembly in 2005 endorsed the global goal of a substantial reduction in biodiversity loss by 2010 [11]. In view of this, 2010 declared the United Nations the International Year of Biodiversity in order to attract the attention of the countries of the world to the urgent problem of preserving the biotic component of the environment, which is the basis for the existence of humanity on the planet. Unfortunately, these strategically important plans have not yet been implemented. Indicative is the 3rd edition of the Red Data Book of Ukraine (2009), which includes 542 species of animals and 826 species of plants and mushrooms [10]. In the 2nd edition, respectively, there were 382 and 541 species, and in the first one - 85 and 151 species. That is, the rare species increased by almost 6 times. Ukraine has ratified the Convention on Biological Diversity, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), the Convention on the Conservation of wildlife and the Convention on the Conservation of European Wildlife and Natural Resources in the last 10 to 15 years. fauna and natural habitats in Europe (Berne Convention), etc. The patterns of organization and management of nature use in Ukraine, which are in force in Ukraine, by themselves do not ensure the harmonization of economic and environmental objectives in the state. Therefore, there was a need to develop an ecological management system as a more progressive model for the conditions of market transformations. That is why we raised the issue of an integrated and all-pervading approach to the study and protection of biota and landscapes. It is supposed to substantiate the scientific principles of conservation of biotic and landscape diversity of the agrosphere of Ukraine for balanced development. An important priority is the definition of effective methods for the conservation of rare and endangered species of flora, fauna, biogeocoenoses for the formation of the pan-European ecological network [2].

In 2010, with regard to the common agricultural policy of the EU, one of the priorities is environmental safety, innovation, adaptation to environmental climatic changes. If in the twentieth century. The emphasis was on the

quantity of agricultural products, while using genetically modified organisms, dangerous for the environment drugs and technology, then at the beginning of the XXI century. - it is ecocentrism, biosafety, agro-ecological principles in the homeostatic coexistence of the agrosphere and the aboriginal environment. The new objectives of the EU common agricultural policy for the period up to 2020 are: the profitability of food production; sustainable management of natural resources; balanced territorial development [5]. It is the management of natural resources that involves environmentally safe production methods, mitigating the effects of climate change. Biodiversity conservation is key in the context of active measures. One of the directions of the biota cadastre is to create a database. In Ukraine, a register of varieties of plants and animal breeds, a National Genetic Plant of Plants, and a collection of strains of microorganisms in research institutions. However, the problem of unification of taxonomy at the state level has not yet been resolved. Only for vascular plants is an updated summary [13]. Problems associated with the threat of the proliferation of non-horticultural plants are reflected in the Convention on Biological Diversity (1995). Types of adventitious plants have been the subject of discussion at international and regional forums (Pyšek, 1995; Nentwig, 2005) [3]. Adventitiation of aboriginal flora has become one of the most visible consequences of its anthropic transformation at the present stage of development [9]. Adventist processes create a real threat to the territorial diversity of Ukraine [6]. In Ukraine, the species of adventitious plants make up 14% of the total number of flora species in the country. According to researches, the spontaneous fraction of the adventitious flora of Ukraine is 830 types of vascular plants [4]. For the monitoring of phytoinvasions already create "Black Books" [1]. The purpose of the research is to identify the most important agroecological aspects in the national (national) strategy of biodiversity conservation on the basis of balanced development of Ukraine. Materials and methods of research. Analytical-synthetic methods are applied taking into account stock, statistical materials, normative-legal base, literary sources and own data. At the heart of the conceptual proposals of the homeostatic (harmoniously balanced)

development of the agrosphere in the noosphere and the environment, a dialectical method of cognition and modern meta-ecological (philosophical and ecological) principles are used. Research results. Despite the fact that Ukraine occupies less than 6% of Europe, its biodiversity is about 35%, which is due to the location of the country at the intersection of many natural zones and migratory species of fauna. The biota of Ukraine is more than 70 thousand species, of which flora - more than 27, fauna - more than 45 thousand species [10]. In the field diversity of the agrosphere of Ukraine, synanthropy, apophytisation is actively manifested. Recommendations for the introduction into the culture of individual ruderals (in particular, for greening as a deco), adventers are unjustified, since they then illegally compete with the indigenous flora, create biotope-transformers, spontaneous phytocoenoses, and others. According to our research and other data, one of the most vulnerable to foreign species is hydro ecosystems. Biotic contamination of hydro ecosystems in XX - XXI centuries. as a result of intercontinental, man-made, communication-technological relations has become global in nature and poses a serious environmental threat. Invasions of freshwater fish adventures (*Perccottus glenii*, *Pseudorasbora parva*, *Ameiurus nebulosus*, *Gasterosteus aculeatus*, *Pungitius pungitius*) are displaced and replace the aboriginal ichthyofauna of Polissya. Here, in fact, all the water bodies are polluted, and under conditions of warming of the climate, prokaryotes (blueberries) (*Anabaena affinis*, *A. flos-aquae*, *Aphanizomenon flos-aquae*, *Microcystis aeruginosa*, *M. flos-aquae*, etc.) are developing massively, which causes ecotoxication, reduction of bioactive oxygen content in the reservoir, shading and, as a result, massive fish zombie occur. Many intruders were found at the mouth of the translastral Danube River: *Rapana thomasiana*, *Physella acuta*, *Lithoglyphus naticoides*, *Potamopyrgus jenkensi*, *Ferrissia fragilis*, *Anadara inaequalis*, *Mya arenaria*, *Sinanodonta woodiana*, *Corbicula flumina*, *C. fluminalis*, *Hypanis glabra*, *Dreissena polymorpha*, *D. bugensis* , *Eriocheir sinensis*, *Rhitropanopeus harris tridentata*, *Paramysis lacustris*, *Limnomysis beneden*, *Acartia tonsa*, *Branchiura sowerbyi*. The emergence of alien species in the

Black Sea, the Azov Sea has ecological and economic problems. Invasion of *Mnemiopsis leidyi* has led to a decrease in fish productivity, the *Rapana venosa* predatory mollusc caused a significant decrease in the number of *Ostrea edulis*, *Mytilus galloprovincialis*, and other local molluscs.

Very typical biotic pollution for the Dnieper. In particular, there are deliberately and accidentally entered species of fish: *Acipenser baerii*, *Polyodon spathula*, *Anguilla anguilla*, *Vimba vimba*, *Hypophthalmichthys molitrix*, *Aristichthys nobilis*, *Ctenopharyngodon idella*, *Mylopharyngodon piceus*, *Pseudorasbora parva*, *Ictiobus bubalus*, *I. cyprinellus*, *I. niger*, *Gambusia holbrooki*, *Poecilia reticulata*, *Oryz sinensis*, *Sander volgensis*, *Lepomy gibbosus*, *Oreochromis mossambicus*, *Perccottus glenii*, *Channa argus*; reintroduces: *Acipenser ruthenus*, *A. gueldenstaedtii*, *Huso huso*, *Leuciscus boristhenicus*, *Cyprinus carpio*, *Carassius gibel*, *Ameiurus nebulosus*, *Ictalurus punctatus*; autopoists: *Clupeonella cultriventris*, *Atherina boyeri*, *Syngnathus nigrolineatus*, *Gasterosteus aculeatus*, *Benthophiloides brauner*, *Mesogobius batrachocephalus*, *Neogobius fluviatilis*, *N. melanostomus*, *N. gymnotrachelus*, *Platichthys flesus*; relic autostads: *Rhodeus sericeus*. Among hydrogelophytes, coastal aquatic plants, there are few adventitious, actively invasive species: *Acorus calamus*, *Amorpha fruticosa*, *Azolla liculoides*, *A. caroliniana*, *Bidens frondosa*, *Cenchrus pauciflorus*, *Echinocystis lobata*, *Eichornia crassipes*, *Elodea canadensis*, *E. nuttallii*, *Heracleum mantegazzianum*, *H. sosnowskyi*, *Juncellus serotinus*, *Juncus tenuis*, *Pistia stratiotes*, *Vallisneria spiralis*, *Zizania latifolia*, *Z. aquatica* and others. Porot, their influence is significant, in the limonocsystems of *Elodea*, *Zizania*, they lead to waterlogging (Lake Nechimne, Volyn), fill the banks of *Echinocystis* (the river Sluch), *Amorpha* (Dnipro River), *Pistia* eutrophishes the water (river Siversky Donets) Causes of biological pollution are different: increasing the volume of molozapropelovyh deposits, detritus, limiting the ecological niches hydrobionts; ballast water of cargo ships; umbrella on the ship's hull; gloves of fish; aquarium species; change of physical and chemical properties; fishing, botanical introduction; eutrophication; deforestation; irrigation,

drainage reclamation; man-made and agricultural pollution, etc. It is important to conduct reclamation, purification of reservoirs. In protected objects, it is desirable to remove especially aggressive adventia, which have negative allelopathic, sanitary-epidemic properties. Priority is the development of a global cadastre program (DAISIE base), strategies for monitoring invasive species, substantiation of biotechnical, rehabilitation measures to overcome pollution of hydro ecosystems, taking into account bioethical norms, ecosocial principles. Among the adventitious vertebrate animals, invasiveness in the agrolandscapes reveals: *Canis familiaris* L., domestic *Nyctereutes procyonoides* Gray (black fox, domestic flaxseed), *Felis catus* L. (catwort) and others. Fito-invasions, adventitia in the context of global climate change have covered all regions of Ukraine, which adversely affects the aboriginal biota fraction. Phytonecias of *Reynoutria japonica* Houtt., *Amorpha fruticosa* L., *Echinocistis lobata* Gray, *Robinia pseudoacacia* L., *Quercus rubra* Du Roi, *Solidago canadensis* L., *Asclepias syriaca* L. and others were found in Polissia. In the Carpathians - *Acer negundo* L., *Fraxinus pennsylvanica* Marsh., *Heracleum sosnovskyi* Manden, *Impatiens glandulifera* Royal. etc. In the forest-steppe - *Astragalus falcatus* Lam., *Foeniculum vulgare* L., *Coreopsis grandiflora* Hogg ex Sweet, *Papaver argemone* L., *Dipsacus sylvestris* Huds, *Polygonum cuspidatum* Siebold and Zucc., *Oxybaphus nyctagineus* Sweet. etc. In the Steppe are *Anisantha sterillis* (L.) Nevski, *Bromus squarrosus* L., *Acer platanoides* L., *Cotinus coggygria* Scop., *Eleagnus angustifolia* L., etc. There are cases of invasions of indigenous species of flora (*Pinus sylvestris* L.) [7]. In the Crimea - *Ambrosia artemisifolia* L., *Acer negundo* L., *Xanthium albinum* H. Scholz, *Helianthus tuberosus* L., *Iva xanthipholia* Nutt., *Gleditsia caspia* Desf. etc. Unfortunately, there is still a general list of areas of distribution of invasive, adventitious species of Ukraine. Views require quarantine views. The basic tasks are preservation and non-exhaustive use of biodiversity, including diversity of domestic and cultivated forms of living organisms created by man of natural and cultural complexes; fair distribution of benefits from the use of biotic, first and foremost (genetic) resources; organization of application of

appropriate technologies of ecologically balanced use of biodiversity for the development of efficient and non-exhaustive agriculture, organization of financing of these tasks at the expense of the state budget, grants, funds.

The main directions aimed at the realization of the goal and its main tasks are: conservation of biodiversity in natural habitats (in-situ); conservation of biodiversity in special centers (ex-situ); ecologically balanced use of components of biodiversity; research and scientific and expert support; environmental education, professional development and public awareness; assessment and reduction of levels of negative impacts on biodiversity; measures for conservation and non-exhaustive use of biodiversity; international cooperation. The main idea of the paradigm is the optimal research support for the implementation of ecological management of agro-landscapes and biodiversity on the basis of integrated systems in the context of European cooperation. The development will cover the actual problems of preservation and rational use of bio- and landscape diversity of the agrosphere of Ukraine. The results of research will become the basis of modern approaches to the adaptation of agricultural lands to global climate change and the environment as a whole. Rational use of nature in agriculture involves the prevention of negative environmental phenomena: morbidity, invasions, synanthropy, reralization, extinction of species, as well as the use of genetically modified organisms, increase of immune stability, productivity of species of biota, etc. Therefore, the issue of biosecurity, study, cadastre and monitoring of biota is one of the main priorities of modern agriculture in Ukraine.

Conclusions

In fact, Ukraine does not have a comprehensive background monitoring of biodiversity. The inventory of flora and fauna has not been brought to a logical conclusion. It is necessary to develop a nationwide program for the protection of an aboriginal faction of flora and fauna in the agro-sphere. It is advisable to monitor the spread of invasive species, to prevent their consequences. In the future, based on the ecosogical conserva- tion of

biodiversity, the methodological aspects of correction of subjective attitude to nature will be developed, the need for informing the public and promoting environmental ideas in the agro-industrial complex of Ukraine will be developed. The justification is provided for ways to improve the normative and legal provision of the problem of conservation of bio- and landscape diversity. It is planned to improve the methods of conducting background monitoring and environmental audit for biosecurity of agrarian production, to analyze the state of implementation of international conventions on the preservation of biotic and landscape diversity, and to identify priority directions of international cooperation in this area. As a result of the tasks, the theoretical bases for preservation of the bio- and landscape diversity of the agrosphere of Ukraine will be developed; the normative and legal basis of the sphere of ecological management is substantiated; improved techniques and patents searched. According to a certain direction, the Institute of Agri-Ecology and Nature Management of the National Academy of Sciences of Ukraine provides for the formation of a herbarium of agro-landscapes, the development of agro-ecological zoning of Ukraine, substantiation of optimization of the monitoring system of the natural reserve fund of the agrosphere.

Bibliography

1. Vinogradova Yu.K. Black Book of Flora of Central Russia (Alien Plants in Central Russia Ecosystems)/Yu.K. Vinogradova, S.R. Mayorov, L.V. Hoorun - Moscow: GEOS, 2009. - 494 p.
2. Nesterov Yu.V. Practical tips on conservation of biodiversity in agricultural land/Yu.V. Nesterov - K. : Wetlands Int. Black Sea Prog., 2005. - 48 p.
3. Protopopova V.V. Dangerous Weeds. Biological Pollutants of the City of Kyiv/VV Protopopov, MV Shever - K. : LLC "Polygraph Express", 2010. - 48 p.
4. Protopopova V.V. Phyto-invasions in Ukraine as a threat to biodiversity/VV. Protopopova, SL Mosyakin, MV Shever - K., 2002. - 31 p.

5. Agriculture and nature protection. - K .: NECU, 2010. - 148 p.
6. Solomakh VA Synanthropic vegetation of Ukraine/V.A. Solomach, O.V. Kostylev, Yu.R. Shelag-Sosonko - K .: Science. opinion, 1992. - 252 pp.
7. Solomakh I.V. Plant cover of forests and shrubs Bibliography of the Northern Black Sea Coast/IV. Solomach, E.O. Vorobyov, II Moysienko - K .: Phytosociocenter, 2015. - 387 pp.
8. Furdichko O.I. Agro-ecological aspects of environmental protection on the basis of balanced development/O.I. Furdichko, V.V. Lavrov, V.V. Konishchuk//Agroecology. journ - 2010. - No. 2. - P. 5 - 10.
9. Elton C. Ecology of invasions of animals and plants/Ch. Elton - M .: Izd. Of foreign. liters, 1960. - 230 p.
10. The Red Book of Ukraine. Vegetable world; for ed. Ya.P. Grandfather - K .: Global consulting, 2009. - 900 p.
11. Biodiversity in agroecosystems/ed. W.W. Collins C.O. Qualset - 2009 - 334 p.
12. Jackson D.L. The Farm as Natural Habitat: reconnecting food systems with ecosystems/D.L. Jackson, L.L. Jackson - 2002 - 257 p.
13. Mosyakin S.L. Vascular plants of Ukraine: a nomenclatural checklist/S.L. Mosyakin, M.M. Fedoronchuk - K., 1999. - 345 p.