ACADEMY OF SCIENCES OF MOLDOVA
SECTION OF NATURAL AND EXACT SCIENCES
INSTITUTE OF ZOOLOGY

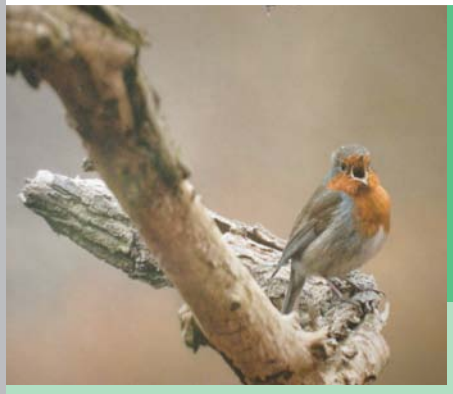
VIII-th International Conference of Zoologists

ACTUAL PROBLEMS OF PROTECTION AND SUSTAINABLE USE OF THE ANIMAL WORLD DIVERSITY



10-12 OCTOBER 2013

Book of Abstract



Chisinau – 2013

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The materials of VIII-th International Conference of Zoologists **„Actual problems of protection and sustainable use of animal world diversity"** organized by the Institute of Zoology of the Academy of Sciences of Moldova are a generalization of the latest scientific researches in the country and abroad concerning the diversity of aquatic and terrestrial animal communities, molecular-genetic methods in systematics, phylogeny, phylogeography and ecology of animals, taxonomy and evolution of animals, structure and dynamics of animal populations from natural and anthropized ecosystems, population functioning and animal role in ecological equilibrium maintenance, monitoring, evaluation of threats, and assessment of risks of aquatic ecosystems, biological control in regulation of pests number, invasive animal species, their ecological and socio-economic impact, protection of rare, endangered and vulnerable animal species under conditions of anthropogenic pressing intensification

The proceedings are destined for zoologists, ecologists, ethologists and for professionals in the field of protection and sustainable use of natural patrimony.

The reviewed materials are approved and recommended for editing by the Scientific Council of Institute of Zoology of A.S.M.

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Thecla betulae, *Favonius quercus*, *Thymelicus sylvestris* prefer forests and forest roads with thickets of bushes (9 species). The first two species inhabit only in rare sectors of oak forests.

Most species inhabit many biotopes, preferring derelict areas (30 species), the right bank of the Dniester River (23 species), and various agrocoenoses (8 species): gardens, orchards ripe fruit (*Vanessa atalanta* and *V. cardui*) forest strips from agricultural fields etc.

Zoogeographical analysis of diurnal Lepidoptera of the nature reserve «Cobîleni» shows that in the studied area Eurasian species complex type (27 species or 44%) and westpalearctic (12 species, or 19%) dominated. European elements include 8 species with a value of 13%. Lepidoptera with palearctic distribution include 6 species, or 10%, and group items Holarctic species include 4 species (6%).

The study was performed within the project 11.817.08.16A financed by ASM.

NEW INVASIVE SPECIES IN THE REPUBLIC OF MOLDLVA: MULTICOLORED ASIAN LADYBIRD *HARMONIA AXYRIIS* PALLAS (COLEOPTERA: COCCINELLIDAE)

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Harmonia axyridis Pallas is a predatory ladybird, native to large areas of Central and South-East Asia. Numerous morphotypes of *H. axyridis* with different color (from yellow to orange, red to black) and with different number of spots on the elytra (0 to 21) are known. The species is bivoltine, but under favorable conditions can produce up to five generations per year.

In the last 2-3 decades, this ladybird migrated and settled in North and South America, Europe, Middle East and Africa. It was used as an agent for biological control of insect pests in the second half of the 20th century. At the beginning of the 21st century due to the identified threat to the diversity of native species of coccinellids the spreading of *H. axyridis* in Europe has received the status of invasion. It is arguably the most harmful invasive species of insects in the XXI century.

The aim of our work is to prove the fact of penetration of multi-colored Asian ladybird *H. axyridis* to the territory of the Republic of Moldova and forecast the possible negative consequences of this invasion.

Specimens were sampled in July - October 2011-2012 in the colonies of aphids in agrocenoses of peach orchard and sorghum fields in the outskirts of the city of Kishinev. At the end of October 2012 adult coccinellids aggregating before hibernation were collected in the crevices of the window frames in residential buildings in Kishinev. Specimens were sorted by elytra pattern, the presence

elytra comb and stored in 70% ethanol. Morphotypes and species identification was carried out by known methods.

In the summer of 2011 multicolored Asian ladybird represented 42% from the total number of adult coccinellids collected by us on peach trees. In the field season of 2012, this type was dominated among coccinellids to an even greater extent (86%). In the season 2012, in sorghum field agrocenose, the rate of *H. axyridis* has reached 90%. Among coccinellids collected within the buildings this species was represented at a similarily high rate (93%). In our samples *H. axyridis* is dominated by individuals of morphotype succinea (93% - 96,%). Three other adult morphotypes: spectabilis, conspicua and axyridis also occur.

It should be stressed that in 2011 the rate of native coccinellids *Coccinella septempunctata* L. and *Adalia bipunctata* L. in the peach garden was 27% and 13%, however in 2012, it decreased to 7% and 2% respectively. This means that the invasive species *H. axyridis*, having competitive advantages in comparison with the native European coccinellid species, quickly displaces them from their ecological niches and becomes the dominant species of predatory ladybugs. Similar invasion by multi-colored Asian ladybird has been observed in several European countries. Our results allow us to assert that the Republic of Moldova was on the path of the spread of H. axyridis all over Europe. We believe that the invasion of the invider-insect to our country happened in 2009 - 2010, from the neighboring Romania and (or) Ukraine.

The experience of many countries that suffered from invasion of *H. axyridis* in the last 20 - 25 years, predicts the following possible negative consequences for the Republic of Moldova:

1. Reduction of biodiversity of native species of terrestrial arthropods, including predatory coccinellids, with unpredictable disturbances in existing ecosystems.
2. The threat to human health because of the clustering of adults in residential homes for winter. Beetles can bite people and cause allergic reactions, manifested as rinoconjunctivitis, hives or asthma attacks.
3. Disadvantage for apiculture because of the damages caused by larvae and imago *H. axyridis* penetrating into the hives.
4. Damage to fruit growing, viticulture and winemaking. *H. axyridis* has the unique ability to change their eating behavior from herbivorous to carnivore if necessary, giving a viable offspring. In the U.S. and Canada *H. axyridis* is treated as a pest of ripening fruit and wine grapes. A lot of adult Asian ladybirds migrate to the crop plantations causing considerable damage just before the harvest. It was found that the presence of only 1-2 adult *H. axyridis* pro 1 kg harvested grapes leads to the formation of undesirable odors and flavors in the wine prepared. This is due to the excess of the threshold concentrations of N-heterocyclic compounds in wines, such as methoxypyrazin contained in the hemolymph of *H. axyridis*.

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