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Ministry of Education and Science of Ukraine  
Mechnykov Odesa National University, Odesa, Ukraine



Materials  
of IV International  
Young Scientists conference

# Biodiversity. Ecology. Adaptation. Evolution

dedicated to 180th anniversary  
from the birth of famous physiologist  
**Ivan Sechenov**  
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Ilyasov R.A., Poskryakov A.V., Nikolenko A.G. Population genetics analysis of bees from populations of Ural and Volga regions. Materials of IV international conference of young scientists "biodiversity. ecology. adaptation. evolution". Odesa. 2009. C. 99-100.

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## Section 2. Fauna of terrestrial ecosystems

Worsening of the state of biotopes as a result of economic activity (mowing and burning out of herbage, throwing open of virgin steppe, application of pesticides and others like that), violation of structure of forests are the limiting factors of butterflies, in particular elimination of wild fruit-trees and bushes, replacement of natural forests with artificial afforestations, that results in impoverished grass cover.

So, currently research of specific variety of butterflies, and also determination of their functional and economic value is an actual question. Among the measures of butterflies protection it is expedient in places with the high quantity of individuals to create entomologists reservations, limit the use of pesticides, and also more detailed studying the features of biology of these species is necessary.

### POPULATION GENETICS ANALYSIS OF BEES FROM POPULATIONS OF URAL AND VOLGA REGIONS

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In Bashkortostan republic there is very hard problem of preservation of aboriginal bee subspecies *A.m.mellifera*. For preservation it is necessary to identify hybrid families, to eliminate their further distribution. Intergenic locus COI-COII of mtDNA varies among bees subspecies. There are the genetic markers of this locus allowing to identify hybrid origin bees colonies, in particular hybridization with bees from Caucasus (*A.m.caucasica* and *A.m.armeniaca*). In Bashkortostan republic we shown existence pool of the saved aboriginal bees in the north of republic on territory of several districts (Fatyshlynski, Birski, Karadelski, Mishkinski, Buraevski and Askinski) and in the south of republic on territory of Burzyan district.

We studied populations of bees on territory of several regions of Ural and Volga region. Large populations of bees *A.m.mellifera* for our research were saved on territory of Permski oblast, Bashkortostan republic and republic Udmurtiya. The higher degree of hybridization is observed in bee population on territory of the Chelyabynski and Sverdlovski oblast. On the basis of the conducted research it is already possible to make the map of geographical distribution of natural area of aboriginal bee *A.m.mellifera*.

Genetic relatedness of *A.m.mellifera* populations we show using nuclear DNA locuses, in particular microsatellites ap243, 4a110, ap049, a113, a43, a8. The grouping of population is influenced both as community of their origin and their geographical location in relation to each other. Cluster analysis was conducted using neighbour joining method. On built dendrogram Bee population of Iglinski district groups separately from other populations of Bashkortostan republic. On dendrogram bee populations of different regions (Bashkortostan republic, Permski



oblast, republic Udmurtiya and Sverdlovskaya oblast) population of bees of Sverdlovskaya oblast are disposed separately. Such separate location of bees population of Iglinski district of Bashkortostan republic and Sverdlovskaya oblast is explained by their hybrid origin. Our laboratory plans to extend genetic research of bees populations on territory of Russia and also countries of CIS.

### **ISOLATION OF CARBOHYDRATES BACTERIUM-DESTRUCTORS FROM THE SOILS OF ZMIINIY ISLAND**

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Environmental protection, including soil, from oil pollution under conditions of infrastructure development and limited anthropogenic influence on the Zmiiniy island is very important.

We have conducted the research the main purpose of which was to study the destructive activity of bacteria isolated from oil contaminated soil on the Zmiiniy island.

9 samples of soil with fresh and old petroleum pollution were sampled from the contaminated areas of the Zmiiniy island to isolate carbohydrates bacterium-destructors. The specimens were sampled at the rate of 500 g by a spatula treated with alcohol. The fourteen bacterial cultures were isolated from petroleum contaminated soil of the Zmiiniy island. The cultures were sowed on liquid synthetic MKD medium contained petroleum or diesel fuel to determine their destructive activity in relation to oil carbohydrates. Petroleum and diesel fuel were sterilized and added to the tubes with MKD in 1 % concentration. The cultivation of specimens was performed for seven days with the temperature of 22° C. On the seventh day the presence of bacterial growth as compared with control tubes was registered. The evidences of growth for heterotrophic bacteria using petroleum and diesel fuel as the only source of carbon and energy were considered: the destruction of the substrate layer, change of transparency or color of medium, appearance of bacterial tapes under the bottom petroleum layer, formation of flake in column of medium.

As the result of our research it was determined that seven of the fourteen bacterial cultures had destructive properties relatively to oil carbohydrates (Пс11, Пс12, Пс13, Пх21, Пх22, Пх23, Пх24). The most active destructor of carbohydrates was strain Пс13. The strain caused increasing rate of biomass already after 2-4 days while the destructive activity was being observed - disaggregation of a petroleum tape. In ten days it its almost complete destruction was observed. The data obtained may help to develop new methods of environmental protection from pollution by chemical agents such as oil and diesel fuel.

The work was carried out in frames of the project № 3M 323-2008 and state budget project № 422.