# Biodiversity of Ichthyofauna in the Coastal Waters of the Zmiinyi Island

Snigirov S.M.

Odessa National I.I. Mechnikov University

snigirev@te.net.ua

Zmiinyi Island is the unique natural complex in the North-Western Black Sea. Its coastal waters are notable for their significant biodiversity, which had formed the basis for General Zoological Protected Area of national significance establishing in the area in 1998. The objective of this work is the studies of ichthyofauna biodiversity dynamics in the coastal waters of the Zmiinyi Island in 2003-2010 and revealing of the factors influencing the biodiversity. Ichthyological studies had been carried out in accordance with the national methodology using stake nets in 2003-2010. Altogether 500 stake-net catches had been studies. Visual underwater observations with the help of lightweight diving outfit had also been used. Studying the biodiversity of ichthyofauna we used three indices of communities' species composition: Margalef's species richness, Shannon's total diversity index and Pielou's evenness index. Results of ichthyological observations had been discussed. According to those results 52 fish species belonging to 13 orders, 32 families and 42 genera had been found within eight years in the Zmiinyi Island area, i.e. approximately one-fourth of all the fish species found in the Black Sea. It had been shown that the basis of the Zmiinyi Island area ichthyofauna was formed by the Mediterranean immigrants - 42 species, which made 80.8% of total number of the species observed. It was revealed that out of 52 species registered near the Zmiinyi Island 12 species had been entered into the Red Data Book of Ukraine, 19 species - into the Black Sea Red Data Book, 8 species were in the lists of Bern

Convention on the Conservation of European Wildlife and Natural Habitats, 15 species - in the list to the Protocol of Bucharest Convention 1992. Thus, about 60% of all the fish living in the coastal waters of the Zmiinyi Island belonged to the species protected on the national and international level. This is forming a special biological value of this area for the entire western part of the Black Sea. One of the main prerequisites for the unique coastal island ichthyofauna biodiversity conservation is the prohibition of all kinds of economic activities both on the island and in its coastal waters. Analyses of the results of ichthyological surveys in 2003-2010 had shown that even insignificant anthropogenic pressure on the coastal ecosystem of the island cause sharp decrease in biodiversity. It had been found out that the main reasons of ichthyofauna biodiversity changes in the coastal (500 meters zone around the island) waters were construction and shore-pitching activities in 2007-2009, as well as increase in number of the invading species M. leidyi and R. thomasiana. For example, increase of anthropogenic pressure on the coastal waters had cut the indices of ichthyofauna species richness according to Margalef almost in half compared to 2005, Pielou's evenness index - 1,3 times, Shannon's total diversity index - 1,5 times. The studies had been carried out in the framework of research activities funded by the Ministry of Education and Science of Ukraine (2003-2010) with the financial support from the ENVIROGRIDS Project of the FP7 Programme (2009-2010). The author would like to express his gratitude to the staff of the "Island Zmiinyi" Research Station for their help in material collection and to V.I.Medinets, Head of the Regional Centre for Integrated Environmental Monitoring and Ecological Studies, Odessa National I.I.Mechnikov University, for his help and advice during the analyses of the materials collected.