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GOFORIT PROJECT CASE STUDY: ECOSYSTEM RELATIONSHIPS OF BLACK SEA SPRAT (*Sprattus sprattus*, LINNAEUS 1758)

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Objective: This paper summarizes the results obtained so far in the project "IntelliGent Oceanographically-based short-term fishery FORecastIng applicaTions" (GOFORIT), which aims to identify links between the ecology of short-lived fish species (sprat in this case) and climate and oceanographic conditions.

Methods: The data used for this research included: catch at national and regional level for the period 1990-2014; recruits, spawning stock biomass (SSB) and total biomass at regional level 1990-2014; data on eggs and larvae at national level, through direct samples in the period 1995-2008; recruits at national level, through direct samples in the period 1995-2008; biomass of sprat fishing agglomerations (swept area method) at national level in the period 1995-2014; growth parameters (Linf., k, t0) at national level (1995-2104); fat contents for adults (1995-1998 and 2006-2007); zooplankton data available at national level from 1990 to 2014; water temperature from 1990-2014. R language was used to write a script, calculate the correlation coefficient(r) and significance coefficient(p) and interpret the values of r and p. Most of the data presented in the paper are included in the Annual Reports realized by NIMRD in the frame of the National Fisheries Data Collection Program 2010-2014.

Results and Discussion: Like most pelagic species, sprat stocks have been heavily influenced by variations in environmental conditions. In recent years, the sprat catches from the Romanian coast of the Black Sea have fluctuated, registering an upward light trend and of maintaining around 100 tons. New relationships between ecosystem parameters (temperature, phytoplankton and zooplankton) and recruitment, spawning stock biomass, stock biomass, L-infinity, mean length, mean weight, growth parameter (k), lipids, protein etc. have been identified. Based on the significance coefficient ($p <= 0.05$), it can be concluded that there is a statistically significant correlation between: biomass and catches, L-infinity and mean weight, spawning stock biomass and stock biomass, spawning stock biomass and recruitment, spawning stock biomass and catches, temperature and protein, lipids and protein, temperature and stock biomass, temperature and growth parameter (k), temperature and recruitment.

ZOOPLANKTON AS MAIN FOOD SOURCE OF BLACK SEA SPRAT (*Sprattus sprattus*, LINNAEUS 1758)

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Objective: This research shows the role of zooplankton and indicates the main mesozooplankton groups in the stomach content of the analyzed samples. Knowing the trophic basis at a certain moment in specific areas of the Romanian coast and its use by fish species is of great importance in the marine ecosystem food chain.

Methods: The analyzed samples were collected during surveys organized by NIMRD in the frame of the project "IntelliGent Oceanographically-based short-term fishery FORecastIng applicaTions" (GOFORIT) during May-June 2016. Sprat samples analyzed were collected using a special juvenile trawl and were preserved in formaldehyde 4% or frozen. Zooplankton samples were collected using the Nansen net. Triage of zooplankton samples was made extracting from the sample a 5 ml sub-sample, of which the abundant organisms were counted and, for counting rare organism, the overall samples was investigated.

Stomach content was determined by abdominal dissection of sprat specimens and stomach extraction, analyzing its content under the Olympus SZ 61 inverted microscope.

Results and Discussion: Sprat is a small pelagic species, with a key-role in the marine ecosystem. Sprat is a cold water fish, which leads to the assumption that the zooplankton species used ar also cold water.

50 sprat individuals were analyzed, collected from 10 stations along the Romanian coast (length classes 6.5-9.5 cm and mean weight 3.36 g).

After analyzing the stomach content, 4 main groups were identified in sprat's stomach: Copepoda, Cladocera, Bivalvia and Decapoda - *Balanus*. From the 4 main groups identified, Copepoda reached the highest percentage with 45.04% being followed by Bivalvia with 39.87%.

The analysis of the zooplankton species revealed high values of fodder zooplankton, both as density and biomass. Copepods and meroplankton recorded the highest values, with variations from one station to another. Other groups and cladocerans

DISTRIBUTION AND ABUNDANCE OF SPRAT JUVENILES (*Sprattus sprattus*, Linnaeus 1758) ALONG THE ROMANIAN BLACK SEA COAST

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Objective: This paper is an outline of the distribution and abundance of sprat juveniles along the Romanian Black Sea coast during May-June 2016. Sprat is a key-species in the Black Sea ecosystem representing food for larger fishes and having commercial importance.

Methods: The analyzed samples were collected during surveys organized by NIMRD in the frame of the project "IntelliGent Oceanographically-based short-term fishery FORecastIng applicaTions" (GOFORIT). Sprat samples analyzed were collected using a special juvenile trawl and the commercial trawl and were preserved in formaldehyde 4% or frozen. Subsequently, samples were analyzed in the ichthyopathology laboratory by weighing, measuring and counting sprat specimens. As a follow-up of the results obtained, distribution maps were drawn and abundance was calculated.

Results and Discussion: In May 2016, 33 samples were collected using the juvenile trawl, of which 27 were preserved in formaldehyde 4% and the remaining 6 were frozen.

For formaldehyde samples in May, the occurrence of juveniles varied from one station to another (there were 4 northern stations where juveniles were absent, in the area between Chituc and Gura Portitei). The peak value of juvenile abundance in May was recorded in Constanta, Gura Portitei and Periteasca (100%). The lowest abundance (1.22%) was recorded in Midia, while the mean abundance was 38.5%.

In June were collected 23 samples with the industrial mid-water trawl, of which 12 were preserved in formaldehyde and 11 were frozen. The peak abundance (14.5%) was recorded in Mangalia, while 0% abundance was recorded in 4 stations of the southern coast.

The distribution of sprat juveniles is influenced by environmental conditions in the sampling area, but mainly by the abundance of food.