STOCK ASSESSMENT OF WHITING
(*MERLANGIUS MERLANGUS EUXINUS* NORDMANN) ALONG BULGARIAN BLACK SEA COAST DURING 1976-1993

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The catches of whiting are obtained with trapnets and also – it appears as bycatch – in the sprat fishery, with the bathypelagic trawl. All this embarrasses the correct determination of actual catches on account of which the whiting has always been considered as a poorly exploited fish (DOMASHENKO and SEROBABA, 1990). The largest catches have been realized by Turkey : the mean catch during 1981-1991 is 20.46 thousand tons. Length composition of these catches varied from 8-10 to 30-34 cm , while the Bulgarian catches ranged whitin 5-25 cm.

Whiting biomass during 1976-1993 was calculated by VPA (MESNIL, 1989) and Jones'length converted cohort analysis (LCOHORT) (SPARRE, 1987). The fishing efforts, respectively the values of Fst for sprat are according to IVANOV's (1989) and DASKALOV's (1993) data. As it was mentioned, the whiting catches are realized mainly as a bycatch in the sprat fishery. That's why we used the sprat values for Fst although the whiting is a demersal fish, while the sprat is a mudfish. Besides, the eldest age groups of whiting (5 and 6 years old) keep away from the shore in contrast to sprat whose fishery is going on in the coastal zone (20-40m depth). Having in mind all these differences, we consider that the assessment made have to examine as an attempt for determining the margin stock of whiting along Bulgarian Black sea coast.

In table 1, the results from VPA and LCOHORT are represented. It appears that assessments obtained by the above mentioned methods differ from one another mainly during 1990-1991. Accordig to VPA and LCOHORT analyses the initial and mean biomasses of whiting had varied from 27 273.6 tons (1976) to 10 893.4 tons (1988) and from 16 072.3 tons (1978-1979) to 2 554.1 tons (1990-1991), respectively. Having in mind the abundance of offspring, we consider that the assessments made by LCOHORT analysis reflect more correctly the actual state of whiting's stocks during the last 4 years. The sharp decrease of the whiting's biomass is due to the low abundant generations from 1987 to 1989. The increase of whiting's biomass after 1991 is conditioned by the streigth abundant generation of 1990 : more than 50 and 7 times in comparison with generations of 1987 and 1988, respectively.

ARKHIPOV and ROVNINA's (1990) data confirm the considerable decrease of the abundance of the generations after 1987, which comes to show that the natural reproduction of whiting was seriously disturbed between 1987-1989. The reasons for that are complex and are related to the significant alterations of the environment : the "blooms" of the phytoplancton were more frequent and more extensive. The food supply of the larvae and young fish was also subjected to rapid variations connected with the overall changes of the environment as well as with the mass development of the new ctenophore *Mnemia mccradyi*, which appears to be a vigorous competitor in relation to the small-size crustaceans from Copepoda and also presents itself as a predator on eggs and maybe fish larvae (ZAIKA, SERGEEVA, 1991).

Table 1. Initial (calculated by VPA) and mean biomasses (calculated by LCOHORT) of whiting along Bulgarian Black Sea coast (1976 - 1993)

Years	*B_{1-4+}	*F_{1-4+}	**B_{10-18+}	**F_{10-18+}
1976	27273.6	0.0628	12652.2	0.0997
1977	25281.6	0.0797	12652.2	0.0997
1978	25234.4	0.1219	16072.3	0.1161
1979	25104.2	0.1157	16072.3	0.1161
1980	21610.6	0.2451	12441.1	0.1946
1981	17861.1	0.2284	12441.1	0.1946
1982	15693.3	0.2703	10415.6	0.1945
1983	13469.7	0.1545	10415.6	0.1945
1984	14687.6	0.1497	10568.9	0.1557
1985	14632.4	0.1324	10568.9	0.1557
1986	13967.5	0.1137	6886.1	0.1511
1987	12760.9	0.1314	6886.1	0.1511
1988	10893.4	0.1230	6343.2	0.1245
1989	12100.6	0.0765	6343.2	0.1245
1990	14543.4	0.0253	2554.1	0.1113
1991	15399.6	0.0206	2554.1	0.1113
1992	15123.8	0.0427	6397.7	0.0690
1993	12813.5	0.0657	6397.7	0.0690

*B1-4+ - amount of the initial biomasses of the age groups from 1 to 4+ ;*F1-4+-the mean value of fishing mortality coefficient from 1 to 4+;**B10-18+-amount of the mean biomasses of length classes from 10 to 18+ cm; **F10-18+-the mean value of fishing mortality for length classes from 10 to 18 cm;

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