ANALYTICAL MODELS FOR MEDITERRANEAN SPECIES : AN APPLICATION ON THE *HELICOLENUS DACTYLOPTERUS* (DELAROCHE) RESOURCE IN THE LOWER ADRIATIC

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The Bluemouth Rockfish is one of the most abundant demersal species in the trawl fishery on bathyal bottoms of the lower Adriatic (MARANO *et al.*,1977; AA.VV,1993). The biology of the species has been widely studied in Italian waters (PEIRANO & TUNESI, 1986; RAGONESE, 1989, D'ONGHIA *et al.*, 1992), whereas little has been written on its exploitation (RAGONESE & REALE, 1992). This note tries to provide an insight by means of classic analytical models into the possibile exploitation of the species . Such an application in the case of the mediterranean Bluemouth Rockfish (a teleostean with a mainly bathyal distribution, thus present in an area characterized by stable environmental characteristics), presupposing constant recruitment, can provide reliable and comparable information.

The biological data relative to the species were obtained during trawl-surveys in the lower Adriatic (between -20 and -700m) in the autumn of 1992 and the spring of 1993 (AA.VV., 1993). Sampling was carried out using a trawl net (stretched mesh = 35mm) randomly at 25 stations (one hour of fishing) for each fishing survey. The samples collected were all measured (LT, cm), weighed (g) and the otoliths extracted in order to calculate the growth parameters.

The data collected have made it possible to obtain the size distribution, C.P.U.E. estimate (Kg/h), to formulate the lenght- weight relationship and the growth curve, and therefore to estimate all the parameters necessary for the application of the Beverton & Holt (Y/R) and Thompson & Bell (SPARRE, 1987) models.

The models were applied to the fished stock without differentiation for sex (UNGARO *et al.*, 1994); the following growth parameters (Brody-von Bertalanffy curve) were obtained (UNGARO *et al.*, in prep.): Linf. =29.90 cm, K =0.19, t0 = -0.85 years. The coefficients of the lenght-weight relationship were: a=0.0208, b=2.917.The size of the first catch (LC50%) and that of recruitment were 8.75 cm and 5 cm respectively. The total mortality (Z) was estimated using the "catch curve" (PAULY, 1984) and the Jones & Van Zalinge method (JONES, 1984) with respective values of 0.57 and 0.60. The natural mortality (M), a parameter the estimate of which proved otherwise problematic (VETTER, 1988), was evaluated using the empirical fomula of Djabali (DJABALI *et al.*, in press), assuming the average temperature in the distribution area to be 13.5°C, and using the Chen & Watanabe method (CHEN & WATANABE,1989); the respective values were 0.334 and 0.28, both falling within the usually accepted range for this type of organism. Considering the similarity between the total mortality values obtained using the two methods, Z=0.57 was adopted. In the case of natural mortality, the difference between the obtained values using the two methods appears more marked and so it seemed sensible to plot two distinct Y/R curves (figs1-2). A value of M=0.28 is used for the Thompson & Bell model (fig. 3). The average fishing mortality (F) of the species Helicolenus dactylopterus in the Lower Adriatic in the period autumn 1992-spring 1993 was between 0.24 and 0.29, depending on the value of M chosen.

The same actual value of F, reported on the curves obtained from the models considered, seems in all cases to be very close to that reccomended for the optimal exploitation of the teleostean in question. It is important to note that of the two models that of Beverton & Holt proved gave the most conservative results.

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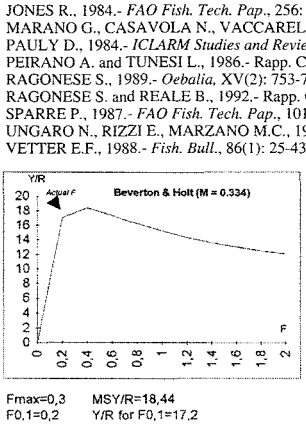
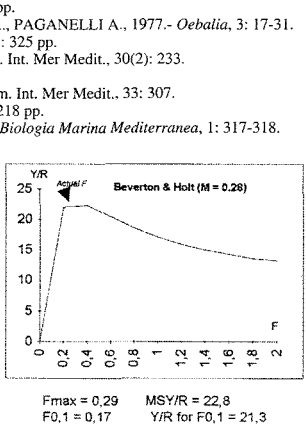


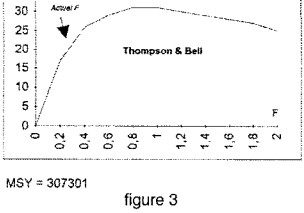
Fmax=0,3 MSY/R=18,44
F0,1=0,2 Y/R for F0,1=17,2

figure 1



Fmax = 0,29 MSY/R = 22,8
F0,1 = 0,17 Y/R for F0,1 = 21,3

figure 2



MSY = 307301

figure 3