

DEMERSAL RESOURCES IN SICILY

by

Alvaro J. Abella
Istituto di Tecnologia
della Pesca e del Pescato
Via Luigi Vaccara 61
Mazara del Vallo, Italy

Table 1. Growth parameters, total mortality (Z), natural mortality (M), fishing mortality (F) and emigration (I) for two emigrating species from the mangroves of Pagbilao, Philippines. Large individuals of *Ambassis kopsi* had mature gonads whereas the other two species did not.

Species	L_{max} (in records)*	L_{max} (in mangroves)	L_{∞}
<i>Leiognathus brevirostris</i>	12.00	9.40	9.75
<i>Lutjanus johni</i>	70.00	23.80	66.70
<i>Ambassis kopsi</i>	—	10.90	10.20

Species	K	Z	F	M	I
<i>Leiognathus brevirostris</i>	1.20	3.66	0.91	2.75	4.65
<i>Lutjanus johni</i>	0.13	1.29	0.91	0.38	0.44
<i>Ambassis kopsi</i>	0.73	2.88	0.91	1.96	0

*Data from Fischer and Whitehead (1974).

abundant resident species, *Ambassis kopsi*. Thus, knowing Z and Z', the instantaneous rate of emigration (I) can be estimated. Table 1 also shows the results obtained for such emigrating species from the mangroves of Pagbilao, Philippines using the ELEFAN programs.

References

- Fischer, W. and P.J.P. Whitehead. 1974. FAO species identification sheets for fishery purposes. Eastern Indian Ocean (Fishing Area 57) and Western Central Pacific (Fishing Area 51) Vol. 1-3 FAO/UN, Rome.
- Pauly, D. 1980. On the interrelationships between natural mortality, growth parameters and mean environmental temperature in 175 fish stocks. *Journal du Conseil international pour l'exploration de la Mer* 39(3):175-192.
- Pauly, D. and J.L. Munro. 1984. Once more of the comparison of growth in fishes and invertebrates. *Fishbyte* 2(1): 21-25.

The real impact of fisheries on demersal fish stocks in the Western and Southern Sicilian Continental shelf is unknown. Historical information on the structure by length or by age for each species in the landings do not exist for the area, nor are there records on catch and effort data. Nevertheless, there are reasons to think that many species are very intensely exploited. This makes it urgently necessary to assess the real effect of fishing activity on the stocks.

In this zone, many fishing strategies are utilized, many species are involved and conspicuous changes in fishing intensity take place during the exploited phase of many resources. Deep water basins (more than 1000 m deep), determine very clearly the limits between the Italian and African continental shelves and constitute true geographic barriers for the distribution of many benthonic and demersal species. The oceanographical conditions seem to be very homogeneous for the whole area. Fishing grounds included in the area are exploited at different rates depending mainly on the relative importance of the nearer ports.

The lack of catch and effort time series, the difficulties related to the partition of fishing effort in these multispecies-multigear fisheries, the standardization of units of effort, etc., should discourage us from attempting a stock assessment approach based on the likely relationship between catch and effort. In situations like that, simplified versions of "Analytical Models" have been proposed as the appropriate way to follow for the stock assessment. However, taking in consideration the particular characteristics of the area, we have proposed to

utilize a variant of the classic "Production Models" that avoids many of the problems listed before. If neither total yield data nor total effort are available, it is even possible to fit a "Surplus Production Model" utilizing overall instantaneous mortality rates (Z) as a direct index of fishing mortality (Csirke and Caddy, 1983) and an annual estimate of catch rate. An index of abundance (cpue) and estimates of Z could be obtained from the analysis of trawl survey data on species composition in the catches and their structures by length or by age.

The problem of the lack of historical data sets could be solved by utilizing a recently developed approach (Munro, 1980; Caddy and Garcia, 1982). Briefly, this approach consists of replacing the cpue and effort time series by couples of these data derived from different areas exploited at different rates, in the same period of time (assuming previously similar basic productivity and similar evolution under fishing pressure for the whole areas).

This approach, a combination of a "semianalytical production model" with a "composite production model," should represent the simplest one that might be utilized for a preliminary assessment of the resources in the area. In this way, we can estimate the total production that may be harvested by fishermen or removed by natural mortality (e.g. by predation) and should permit us to know which is the situation of each species in each fishery of the area in relation to the maximum biological production.

References

- Caddy, J.F. and S. Garcia. 1982. Production modeling without long data series. FAO Fish. Rep. (278) Suppl.: 309-313.
- Csirke, J. and J.F. Caddy. 1983. Production modeling using mortality estimates. Can. J. Fish. Aquat. Sci., 40:43-51.

Munro, J.L. 1980. Stock assessment models: applicability and utility in tropical small-scale fisheries. p 35-47. In Salla, S.B. & P.H. Roedel (Eds.) Stock Assessment for Tropical Small-scale Fisheries. Proc. Internat. Workshop Sept. 1979. Univ. Rhode Island, Int. Cent. Mar. Resource Dev. Kingston, R.I. 198 pp.

A SIMPLE MATHEMATICAL MODEL FOR DETERMINING EGG SURVIVAL AND PRERECRUITMENT MORTALITY OF *COILIA DUSSUMIERI* (CUV. AND VAL.) FOR 1982-1983

by

I. Fernandez

Central Institute of Fisheries Education, Indian Council of Agricultural Research, Bombay 400 061 India

(Correspondence address: University Settlement, Dr L Melville Road, Bombay Central, Bombay 400 008, India

Introduction

The number of eggs produced by mature females of a population that enter the prerecruit stage plays an important role in the determination of the number of recruits that enter a fishery. Earlier studies on the estimation of prerecruitment mortality were made by Pauly (1980) and Navaluna (1982). The present study on the survival rate of eggs per mature female has been undertaken on the gold spotted grenadier anchovy, *Coilia dussumieri*, from the northwest coast of India.

Materials and methods

Samples of *C. dussumieri* were collected randomly at weekly intervals from three major fish landing centres of Bombay from Dakti Dahanu and the Central Institute of Fisheries Education's research vessels MFV SARASWATI

FISHBYTE