

Length Frequency Analysis of Pelagic Fish Species

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Introduction

The capture of small pelagic fish supports a considerable number of artisanal and commercial fishermen in the Philippines. In the province of Marinduque, the commercial fishery - which relies exclusively on ringnet vessels - depends upon stocks of small, juvenile *Decapterus macrosoma*, *russelli*, *Rastrelliger kanagurta*, *Auxis thazard*, *Selar crumenophthalmus*, *Katsuwonus pelamis*, *Thunnus albacares*, and *T. obesus*.

Specimens of these species were sampled around Marinduque to learn how their growth compares with estimates obtained from samples collected in other parts of the Philippines. The mean sizes of the major species captured by ringnets were also calculated. These were compared to the national mean for this gear type (BFAR 1986).

Methods

Length-frequency data were collected between October 1985 and August 1986 in the Tablas Strait-Tayabas Bay region of the Central Philippines. Sampling was carried out aboard a ten gross ton ringnet vessel one to three times per month. Mesh size in the bunt of the ringnet was 2.6 centimeters. The methods for deck sampling recommended by FAO (1980, 1981) were followed.

All species in the catch were noted. The ELEFAN programs (Pauly 1982, Ingles and Pauly 1984) were used to analyze some of the length frequency data that were collected.

Results and Discussion

The bulk of the catch consisted of the abovementioned species; incidental species were: *Euthynnus affinis*, *Megalaspis cordyla*, *Elagatis bipinnulata*, *Trichiurus haumela*, *T. lepturus*, *Gnathodon speciosus*, *Sphyræna barracuda*, *S. obtusata*, *Rachycentron canadus*, *Scomberomorus commerson*, *Megalops cyprinoides*, *Tylosurus strongylurus*, *T. giganteus*, *Hemirhamphus far*, *Medapetalion breve*, *Sarda orientalis*, *Coryphaena hippurus*, and *Scomberoides commersonianus*.

Mean lengths and length ranges of the dominant species in the catch are given in Table 1. The range of lengths of fishes caught in Marinduque is smaller than reported elsewhere, and this suggests that immature individuals from much of the catch in Marinduque. This is particularly obvious for *Thunnus albacares* and *Auxis thazard*.

This limited size range reduced the usefulness of length frequency data for growth estimations, and hence results for only two species are presented here.

Table 1. Length range (in cm) of pelagic fishes caught off Marinduque and in other provinces of the Philippines.^a

Species	Marinduque range (mean)	Range in other provinces
<i>Katsuwonus pelamis</i>	13 - 56 (28)	13 - 62 (FL)
<i>Thunnus albacares</i>	13 - 51 (26)	22 - 78 (FL)
<i>Auxis thazard</i>	8 - 30 (19)	20 - 50 (FL)
<i>Decapterus macrosoma</i>	5 - 25 (14)	7 - 32 (TL)
<i>Decapterus russellii</i>	7 - 22 (13)	7 - 29 (TL)
<i>Selar crumenophthalmus</i>	7 - 27 (19)	9 - 33 (TL)

^abased on data in Philbrick (1987), White (1982) and Ingles and Pauly (1984).

The growth parameter estimates obtained for *Decapterus macrosoma* are $L_{\infty} = 26$ cm, $K = 1.0$, with mean length at first capture $L_C = 17.5$ cm and $M = 1.8$ year⁻¹ (Fig. 1). Annual recruitment appears to have occurred in one single pulse (Fig. 2); this matched the results obtained for this species by Ingles and Pauly (1984) and Corpuz et al (1985). The growth parameter estimates obtained for *Selar crumenophthalmus* are $L_{\infty} = 26.5$ cm., $K = 1.25$. $L_C =$

21.1 cm and $M = 2.1$ year⁻¹. Annual recruitment of *S. crumenophthalmus* appears to occur in two pulses (Fig. 2). These estimates of growth, mortality and recruitment may be of utility in modelling fish populations for the purpose of fisheries management or may add to the knowledge on the life history of the three species. It is recommended, however, that an alternative method of aging be undertaken for comparative purposes.^a

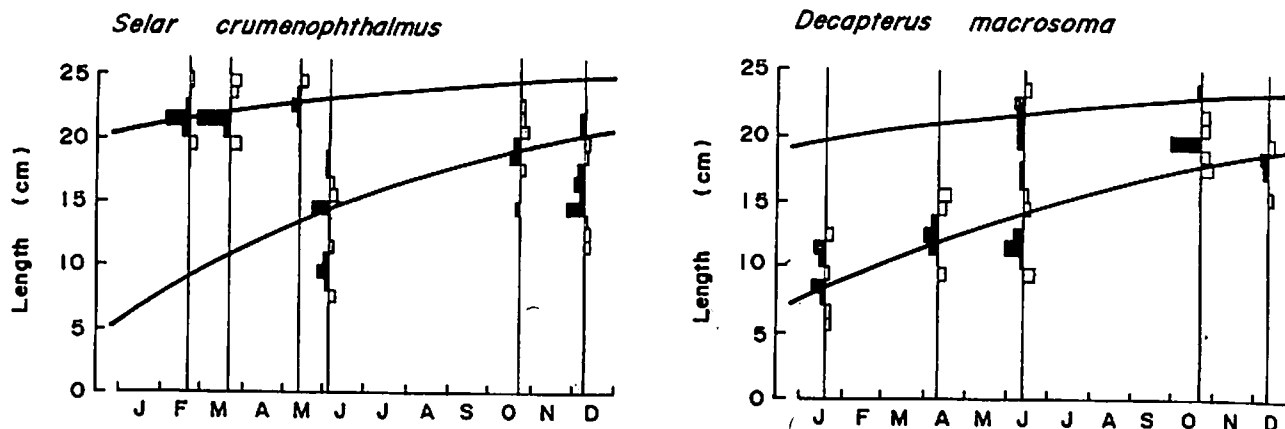


Fig. 1. Length-frequency data on *S. crumenophthalmus* and *Decapterus macrosoma*, as restructured by ELEFAN I, with superimposed growth curves estimated by that same program (see text for growth parameters estimates).

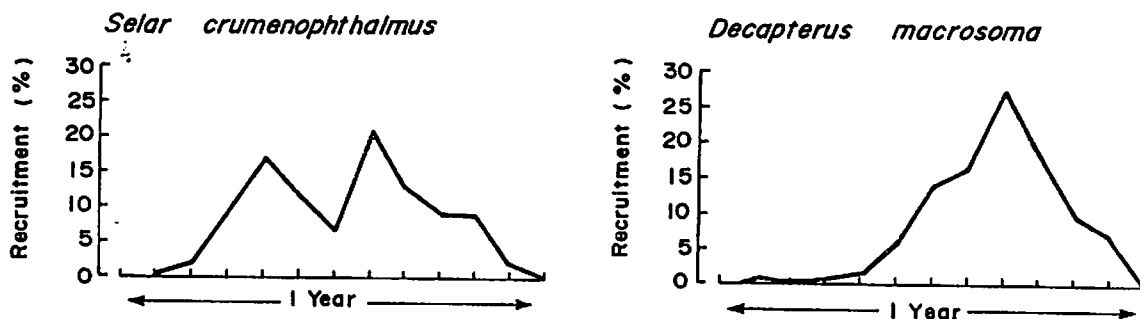


Fig. 2. Annual recruitment pattern for *S. crumenophthalmus* and *D. macrosoma*. Note two peaks in the former and one in the latter, as also reported for these two species by Ingles and Pauly (1984).

References

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^a Editor's note: several authors have had in the past problems with the estimation of growth parameters from length frequency data on *S. crumenophthalmus*, i.e., it was difficult to assess whether K was "high" (near 2 year⁻¹) or "low" (near 1 year⁻¹, as in the present case) (See also Dalzell, this issue).