

**Preliminary Observations on the Biology  
of 'Horse Mackerel', *Caranx kalla*  
(Cuvier and Valenciennes)**

The 'Horse Mackerel' fishery along the Malabar coast of India is constituted chiefly of *Caranx kalla*. In spite of its importance very little attention seems to have been paid towards the detailed study of this fish except for the general notes by Chidambaram and Venkatraman<sup>1</sup>, Devanesan and Chidambaram<sup>2</sup>, and Chacko and Mathew<sup>3</sup>. Hence the detailed study on the biology of this species was undertaken and the account presented here is based on the results of an investigation carried out at Calicut during the period from 1957 to 1961.

Samples from Calicut landing place indicate that the *kalla* fishery is constituted of individuals ranging in size from 6-15 cm. Specimens are caught both in gill-nets and in boat-seines. Studies on the size-frequency distribution show that so far as this species is concerned there is no gear selectivity; that the young fish, 77-87 mm. in modal length, appear twice in a year, i.e., once in December-January and again in July-August; that the fish measuring 127-137 mm. in modal length are two year olds and those measuring 165-169 mm. are three year olds. Observations indicate that the individuals enter the inshore fishery towards the end of the first year's growth, remain till they complete second year's growth and migrate to the off-shore region towards the end of the second or at the beginning of the third year of life. Scales and otoliths were found to be not useful for aging purposes. Following Walford's method the ultimate length,  $l_{\infty}$  is located at 271 mm.

Examination of gonads of *C. kalla* from different size groups indicates that this species matures for the first time at a size of 121-130 mm. by about the beginning of the third year. The maturing eggs reach maximum size between the maturity stages IV and V. A similar phenomenon is reported in *Rastrelliger canagurta* (Cuv.) by Pradhan<sup>5</sup>. A study of the intra-ovarian eggs shows that this species spawns only once a year and for a short duration. Specimens with spent gonads appear all through the year with high percentages during May-June and December-January. Hence it may be concluded that the population of *C. kalla* as a whole spawns all the year round with two peak periods corresponding to December-January and May-June.

Study on the food and feeding habits indicates that *C. kalla* is a carnivorous fish feeding mainly on Crustaceans comprised of Copepods (*Acartia*, *Paracalanus*, *Labidocera*, *Euterpina*, *Macrosetella*, *Microsetella*, *Oithona*, etc.), Amphipods (*Hyperiidæ*), Stomatopods (*Squilla* spp.), Cladocera, Decapods (*Acetes*, *Lucifer*, etc.). Items of minor importance in the food are diatoms, dianoflagellates, *Sagitta* spp., molluscan larvae, polychaetes and post larval forms of fish. Fish scales and crustacean eggs are also noticed in the stomachs.

The weight-length relationships for male and female *kalla* respectively can be expressed by the following formulae:

$$\text{Log. } W = -4.7599 + 2.8468 \text{ Log. } L$$

$$\text{Log. } W = -4.6734 + 2.8026 \text{ Log. } L$$

The equation for converting total length to standard length or *vice versa* was found out to be:

$$Y = 2.3668 + 0.7612X,$$

where  $Y$  = standard length, and  $X$  = total length.

Racial studies based on the morphometric measurements indicate that the *C. kalla* fisheries at three places, namely Calicut, Mangalore and Cochin, are supported by a single stock.

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