

PRELIMINARY OBSERVATIONS ON  
THE BIOLOGY OF *CHIROCENTRUS*  
*DORAB* FORSK.\*

THE flourishing dorab fishery along the coasts of Palk Bay and Gulf of Mannar in Ramnad District in South India is constituted chiefly of *Chirocentrus dorab*, probably the only clupeoid fish growing to a size of nearly 100 cm. In spite of its importance as a marine fishery resource, very little attention seems to have been paid towards a detailed study of this fish except for preliminary accounts on taxonomy by Hardenberg<sup>1</sup> and Deraniyagala,<sup>2</sup> general notes by Devanesan and Chidambaram<sup>3</sup> and description of eggs and larvæ by Delsman.<sup>4</sup> Owing to the occurrence of large shoals of dorab in the coastal as well as off-shore waters of Palk Bay and Gulf of Mannar, a detailed study of its biology was taken up at the suggestion of Dr. N. K. Panikkar, as part of the research programme of the Central Marine Fisheries Research Station.

The data collected from weekly samples of fish from fish landing places indicate that the dorab fishery is constituted of individuals ranging in size from 18-86 cm. Specimens in the larger size groups are caught in gill-nets whereas smaller as well as bigger ones are caught in shore-seines. Almost all the individuals landed from gill-nets are either in mature or post-mature stages and those caught in shore-seines possess immature as well as mature and post-mature gonads. An interesting peculiarity noticed in the commercial fish landings was that no male was observed in any of the size groups above 60 cm. Studies on size frequency distribution made for the past 18 months (from October 1951) have shown that the dorab fishery is constituted of individuals from 1-4 year classes. The average sizes attained by the first to fourth year class fishes were calculated to be 28, 44, 62 and 78 cm. respectively. Observations indicate that the first year class individuals ranging in size up to 22 cm. remain in the off-shore waters until the end of first year or the beginning of the second year of their life and that they do not make a significant contribution to the dorab fishery.

The results obtained from size frequency distribution studies were checked by a critical examination of the growth zones on the scales and otoliths of specimens in different year classes. In the scales of fishes ranging in size from 22-

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86 cm., growth rings varying in number from one to four were observed and the average lengths of individuals were calculated to be 30.8, 42.03, 64.33 and 76.43 cm. Comparing these values with those arrived at from size frequency distribution studies, it could be seen that both the values are in good agreement. Similarly, the occurrence of identical growth rings ranging from one to four on otoliths also confirm the inferences made from the size frequency distribution and scale studies. Although it is rather difficult to ascribe special reasons for the formation of annuli in the scales and otoliths of these tropical fishes, it is probable that they are formed owing to the following reasons. In the immature specimens the change in environment from the deep and off-shore waters to the coastal waters may have some effect on the formation of annuli on the scales. In the mature fish the cessation of growth or the decrease in feeding activity soon after spawning (once a year) may well cause a drop in the rate of growth. These can, however, be established only on the basis of more intensive work. As this species is not a plankton feeder it is doubtful if the scarcity conditions of plankton are likely to cause growth checks to the same extent as in plankton feeders like the Malabar sardine.<sup>6</sup> Similarly, the effects of the monsoon in this area being not so marked as on the Malabar coast, the growth rings observed here are also not likely to be caused by factors ascribed by Seshappa and Bhimachar<sup>7</sup> to the monsoon-rings in the Malabar sole.

Regular examination of gonads of *C. dorab* from different size groups indicates that this species attains sexual maturity when about 50 cm. long, during the third year of life or at the completion of two years and that the mature individuals spawn during July-August. A statistical study of the measurements of the intra-ovarian eggs shows that spawning is restricted to a short and definite period, as the mature stock of ova are sharply differentiated from the immature. However, the spawning place of *C. dorab* which undoubtedly migrates away from the inshore area, is yet to be located.

Other aspects relating to the biology of *C. dorab* under investigation are the fecundity, rate of growth of gonads in relation to the growth of individuals, length-weight relationship in pre- and post-mature males and females, taxonomic and racial studies, development and seasonal variations, if any, on the food and feeding habits.

The author is grateful to Dr. N. K. Panikkar for guidance and encouragement.

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September 7, 1953.

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