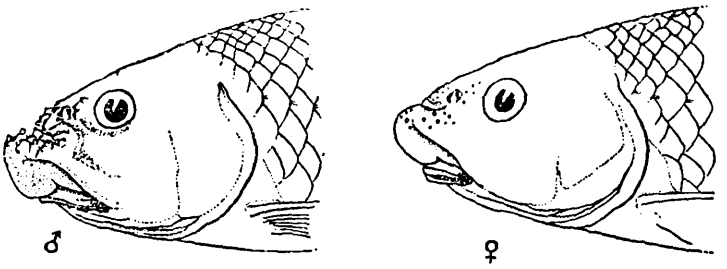
SEXUAL DIMORPHISM IN THE CARP *LABEO DERO* (HAM.).

By SUNDER LAL HORA, *D.Sc.*, *F.R.S.E.*, *F.N.I.*, Assistant Superintendent and K. S. MISRA, *M.Sc.*, Assistant, *Zoological Survey of India, Calcutta.*

Sexual dimorphism is exhibited by various types of fishes, but records from India are rather rare. One[1] of us described the secondary sexual characters of certain Cobitidae from the high altitudes of Central Asia, and since then similar modifications have been observed in several species of *Nemachilus* from different parts of India. Amongst the Cyprinid fishes Hora and Mukerji[2] recorded sexual differences in *Barbus chagunio* (Ham.), and showed that *B. spilopholus* McClelland represented the males of *B. chagunio*. Recently both the forms were collected in the Eastern Doons[3] from the same locality and the sex differences confirmed. It was observed that in nature the number of females greatly exceeds that of males.



TEXT-FIG. 1.—Lateral view of head and anterior part of body of a male and a female specimen of *Labeo dero* (Ham.).

Male × ½; female, × ¾.

While identifying a collection of fish from the Naga Hills, one[4] of us examined the entire material of *Labeo dero* (Ham.) in the collection of the Indian Museum and found marked modifications in the structure of the snout and the form of the dorsal fin in a number of specimens. It was presumed that these modifications were probably of the nature of secondary sexual characters. Examination of the gonads in 18 specimens collected in the Eastern Doons confirmed this view, and in the present note we give a detailed description of these modifications and indicate the sexual differences between the adult males and females of *L. dero*.

In *Labeo dero* the snout bears a transverse groove and its dorso-lateral surface is covered by " pearl organs " (a term generally used for small cornified, epidermal tubercles which appear on the head of various Cyprinoid fishes during breeding time). In young individuals of both

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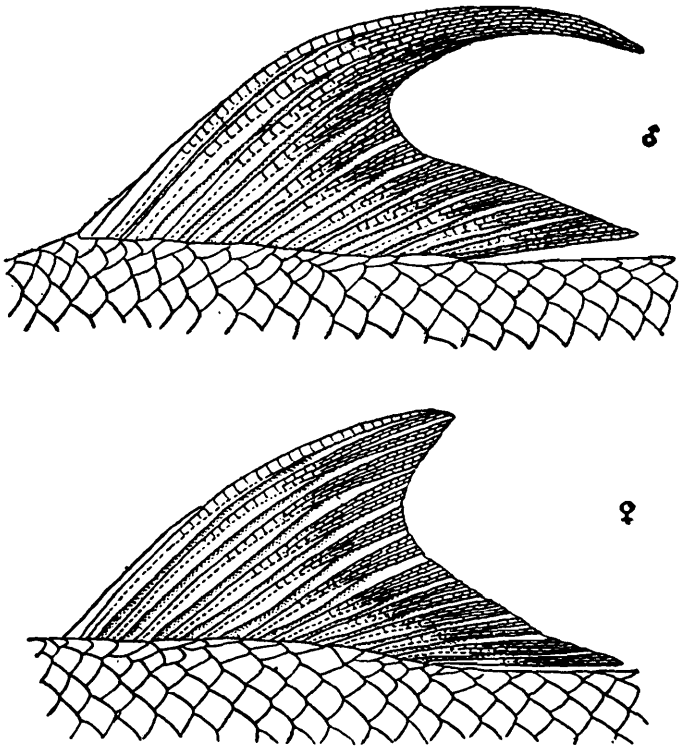
[1] Hora, *Rec. Ind. Mus.*, XXIV, pp. 81-83, 2 figs. (1922).

[2] Hora & Mukerji, *Journ. As. Soc. Bengal*, (N. S.), XXVII, 1931 pp. 137-139, 2 figs. (1933).

[3] Hora & Mukerji, *Rec. Ind. Mus.*, XXXVIII, p. 142 (1936).

[4] Hora, *Rec. Ind. Mus.*, XXXVIII, p. (1936).

sexes, up to about 110 mm. in total length, the tubercles are rudimentary and the groove is only slightly marked; at this stage the tubercles are usually represented by small, open pores. As sexual maturity is reached and the fish attains a size of 160 mm. or more, the groove becomes deeper and more definitely defined, and the tubercles much more prominent. In the males the "pearl organs" are very greatly enlarged and as a result of the very fleshy snout the groove becomes comparatively much deeper than in the female. These sexual differences in the form of the snout are shown in text-figure 1.



TEXT-FIG. 2.—Lateral view of dorsal fin of a male and a female specimen of *Labeo dero* (Ham.).

Male $\times\frac{3}{4}$; female $\times 1\frac{1}{4}$.

Correlated with the above differences is the prolongation of the anterior rays of the dorsal fin. In young specimens the superior border of the dorsal fin is concave and if the anterior rays are adpressed against the posterior rays, the former do not reach to the tip of the latter and there is usually a distance of several millimetres between them. This condition of the fin persists in females even at maturity, but in the males the anterior rays become greatly elongated and in some cases extend beyond the tip of the posterior rays by about 10 mm. This difference in the two sexes is shown in text-figure 2.

Of 18 specimens examined from the Eastern Doons, 9 are males (158-238 mm. in total length), 7 females (137-160 mm. in total length) and 2 juveniles (104 mm. in total length). These specimens were obtained in September-October when the gonads were not fully mature. It is likely that the species breeds just before or during the monsoon period. The relative numbers of males and females in the collection show that the two sexes are found in almost equal proportions.

As marked sexual dimorphism may result in the description of the same species under two names, it is desirable to note such characters as are liable to vary with sex.