

NOTE II

CHOLESTEROL CONTENT IN THE EGGS OF SOME FRESHWATER TELEOSTS

Although the chemical analysis of the fish egg and ovary has been pursued by several workers in the past (Smith, 1957; Hasan and Jafri, 1964; Love, 1970), little attention has been paid to study the pattern of cholesterol distribution in hard roes and eggs. Earlier investigation on fish cholesterol in this laboratory were related to feedback mechanism in its biosynthesis in liver (Siddiqi, 1966a), distribution in various tissues (Siddiqi, 1966 b; Shreni and Jafri, 1974) and relationship with feeding, maturation and spawning of fish (Siddiqi, 1966c; Siddiqi and Naseem, 1971). In the present note we report the distribution of total cholesterol in the ripe, unspawned eggs of some freshwater teleosts.

Fully ripe and almost running fishes were procured from the local fish market and their ovaries were dissected out. The eggs were then quickly removed from the ovaries and sampled for cholesterol determination. For each species, triplicate determinations were made and the mean values calculated. Cholesterol estimation was made according to the method of Reinhold and Shiels as given by Hawk *et al.* (1954). The egg diameter records were made on the samples fixed in 10% formalin for about an hour.

The values obtained for the total cholesterol content in the eggs of various species have been summarised in Table I. The fish egg, with its relatively bulky yolk, has been found to be fairly rich in

cholesterol. The cholesterol values in the eggs have, however, been found to differ from one species to another. The lowest value (790 mg./100 g.) was recorded in the eggs of *Wallago attu* and the highest (1537 mg./100 g.) in those of *Heteropnuestes fossilis*. On an average basis, however, the amount of cholesterol, with the exception of *W. attu*, have been found to be higher in the eggs of cat-fishes and murels than in those of the carps. It may be mentioned that the eggs of some of the species, like *Ophicephalus punctatus*, were reported to be rich in lipids (Hasan and Jafri, 1964), but no relationship could be observed between the lipid and cholesterol contents in fish eggs. Similarly, no definite correlation could be established between egg diameter and the total egg cholesterol in the various fish species examined.

The synthesis of cholesterol, a precursor of sex and other steroid hormones, is known to take place in many animal tissues including the ovary and the egg yolk is specially rich in this substance (West and Todd, 1961; Love, 1970). The variations observed in the amount of egg cholesterol in various teleosts presumably give an indication of the differences in the initial rate of cholesterol synthesis that occurs in the ovary of these species during the maturation of the oocytes. Ripening of the oocytes is perhaps associated with a greater mobilization and synthesis of cholesterol in the ovarian tissue and by the time the eggs are fully mature, a con-

TABLE I
Total cholesterol content in the eggs of some freshwater teleosts.

Species	Maximum egg diameter (mm.)	Total cholesterol (mg./100 g. wet tissue)
CARPS:		
<i>Barbus stigma</i>	0.653	864.00
<i>Labeo bata</i>	1.010	970.00
3. <i>Labeo gonius</i>	1.340	1103.00
CAT FISHES:		
4. <i>Wallago attu</i>	1.316	790.00
5. <i>Mystus seenghala</i>	1.163	1049.00
6. <i>Mystus vittatus</i>	0.626	1164.00
7. <i>Heteropnuestes fossilis</i>	1.102	1537.00
MURRELS:		
8. <i>Ophicephalus marulius</i>	1.554	1054.00
9. <i>Ophicephalus punctatus</i>	1.049	1090.00
10. <i>Ophicephalus striatus</i>	1.268	1182.00

siderable quantity of this substance is laid down in the egg yolk. Surprisingly enough, no relationship was found to exist between the cholesterol content of eggs and the fecundity of the various fish species examined.

It is, however, interesting to observe that fishes which are generally carnivorous, consuming more fatty and proteinaceous diet, like the cat-fishes and murrels, contained relatively more concentration of cholesterol in their eggs than the herbivorous carps which relish on plant food. Though a part of cholesterol in animal body is known to arise from the diet it consumes, it may require some more work to ascertain if diet has any bearing on the total egg cholesterol concentration in fish. At the moment, we may presume that the distribution of cholesterol in fish egg, in general, is species specific.

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