young and the adult with regard to erythrocyte count.

Dept. of Zoology, Institute of Science, Nagpur. *April* 24, 1972.

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EFFECT OF BODY WEIGHT ON INTAKE AND CONVERSION OF FOOD IN THE FISH *RASBORA DANICONIUS*

IT has earlier been shown that feeding rate has considerable effect on conversion in the fishes *Tilapia mossambica* and *Megalops cyprinoides*[1-2]. Therefore, it would be important to study the effect of body size on rates of feeding and conversion in fish. The results on *Rasbora daniconius* presented below show such a relationship.

A collection of *Rasbora daniconius* was made from the Bellandur fish farm (near Bangalore) and the fish were kept in individual aquaria (30l capacity) containing standing aerated water at $22 \pm 1 \cdot 5°$ C. Test individuals were fed with chopped pieces of earthworm for a period of 30 minutes; each experiment lasted for a period of 20 days. Amount of food converted into dry fish was estimated using the "sacrifice method"[3].

Figure 1 presents the average feeding rate of *Rasbora daniconius* as a function of body weight. Individuals weighing less than 1 g consumed about 35·1 mg dry food/g wet fish/day. It fell rapidly to about 9·7 mg dry food/g wet fish/day for an individual of 1·4 g and thereafter gradually decreased to about 4·9 mg dry food/g wet fish/day in the largest test individual used (15·3 g). The inverse relation was linear for individuals of 1·1 to 15·3 g; this straight line is altered below 1·1 g body weight (Fig. 1); hence the regression line for feeding rate-body weight relationship has been calculated from the basic data obtained from 1·1 to 15·3 g body weight. The formula $Y = a + bX$ has been applied[4]; where Y is the feeding rate, X is the body weight, *b* regression coefficient and *a* the point where the regression intercepts Y (at 1·1 g). The regression coefficient was $Y = 9 \cdot 43 - 0 \cdot 184\,X$; *i.e.*, it shows that for every one gram increase in wet body weight feeding rate decreased by 0·184 mg dry food.

Conversion rate (total dry substance converted in mg/g wet fish/day) of individuals weighing less than 1 g was 8·33 mg/g fish/day; it decreased gradually to 0·4 mg/g fish/day in an individual weighing 14·9 g. Weight exponent calculated for conversion rate-body weight relationship indicated that ($Y = 3 \cdot 62 - 0 \cdot 21X$) decrease in conversion rate is of the order 0·21 mg dry food/g increase in wet body weight of the fish. Figure 1 shows that there exists an almost parallel trend for rate of feeding and conversion to body weight. This suggests that feeding rate determines the conversion rate.

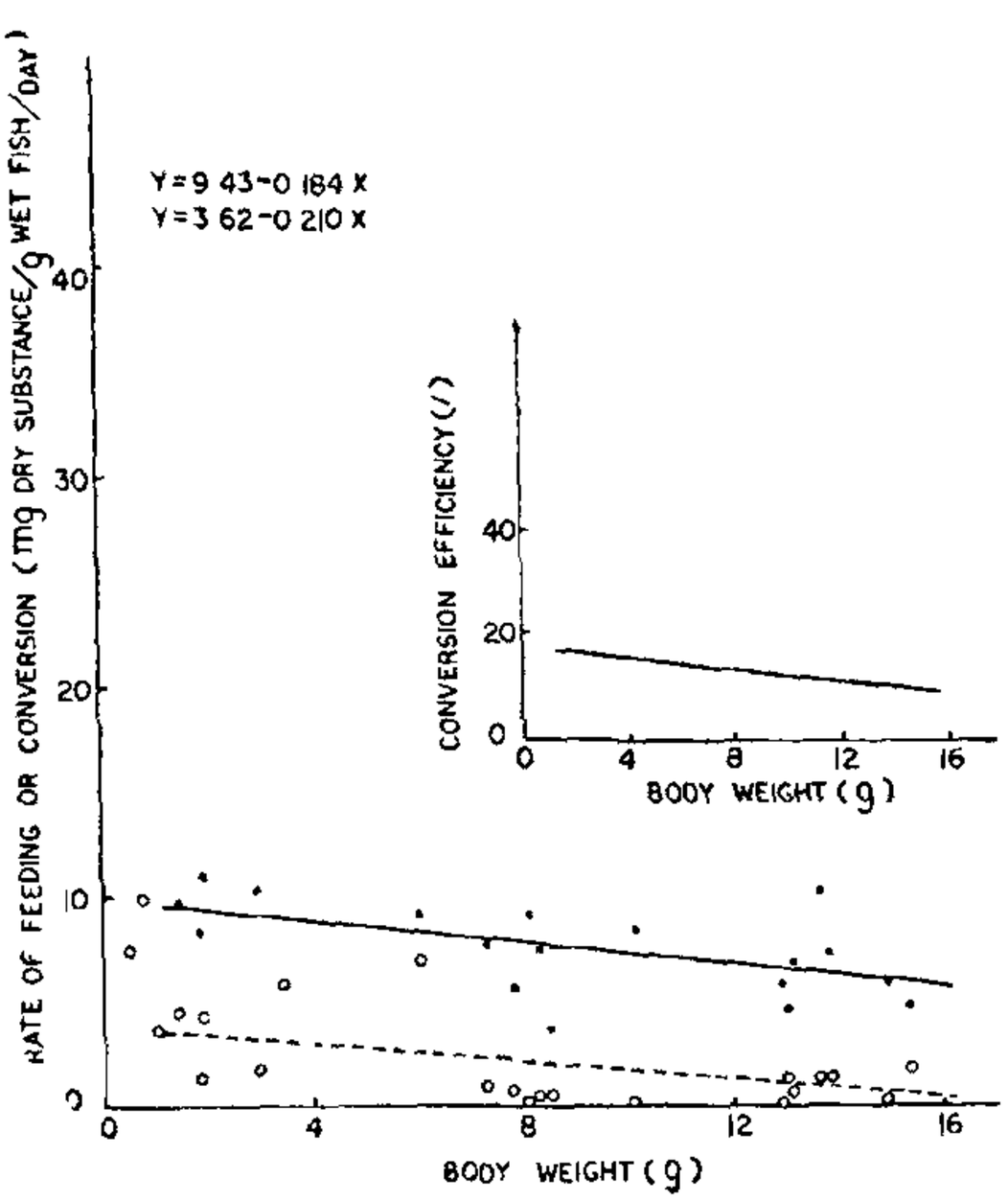

FIG. 1

Conversion efficiency, *i.e.*, food converted as percentage of food consumed (K_1), averaged to 24·4% for individuals weighing 0·6 g. It rapidly decreased to 16·5% in the test group of 2·9 g body weight; and thereafter decreased to 6·7% for the test groups of 14·9 g individuals. Weight exponent calculated for conversion efficiency-body weight relationship indicated that ($Y = 16 \cdot 7 - 0 \cdot 51X$) decrease in the efficiency is 0·5%/g increase in wet body weight of the fish. Thus the trend obtained for conversion efficiency-body weight relationship is also curvilinear and is more or less parallel to those obtained for the feeding rate-body weight relationship (Fig. 1). It indicates that the decrease in conversion efficiency is partly due to decreased quantity of food consumed per unit weight of the fish per unit time.

However, the fact that the observed *b* values (0·184 for feeding rate-body weight relation and 0·210 for conversion rate-body weight relation) are not exactly the same indicates that conversion rate

depends not only upon feeding rate but also body weight.

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THE SPAWN OF A CYMATID GASTROPOD *CYMATIUM PILEARE* (LINNE)

THE Cymatidae (Triton Shells) represent a large family of thick, rugged, strong and heapily built univalve Gastropod snails with a spiral pattern of growth. The members of this family inhabit the bottom from the shore line to depths of three hundred feet or more and are found particularly in the shallow warm waters of the Indo-Pacific region among coral reefs of rocky shores.

Anderson[1] gave the first account of the egg mass and early life-history of a Cymatid, *Cymatilesta spengleri* (Perry) (Family Cymatidae) from the Eastern Australian sea-board. Recently the reproductive behaviour of 4 more species of Cymatids have been described by Laxton[2] from New Zealand waters. Although 3 species of the genus *Cymatium, C. pileare* (Linne), *C. rhinoceros* (Lamarck), *C. cingulatum* (Lamarck) are known to occur in Indian waters[3], there is no previous report on the egg mass of any Indian species or of the genus *Cymatium*.

While engaged in the breeding and reproductive behaviour of the local littoral Prosobranch Gastropods we came across a single specimen of a female *Cymatium pileare* (Linne) in the shingle beds in the intertidal region of the local coast. The snail was collected with the egg mass on February 23, 1971 during extreme low tide ($-0{\cdot}04$ m).

The snail was carrying a freshly laid egg mass closely attachel to the operculum. The animal measured about $32{\cdot}5 \times 22{\cdot}1$ mm and was actively moving the siphon to ward off any predator that may approach it.

Description of the egg mass.—The egg mass is hemispherical and attached to the operculum of the snail by its flattened base. The egg capsules are arranged in four concentric layers, and all the capsules are ensheathed in a gelatinous coat. A total of 77 egg capsules was counted. The egg capsule is broadly conical measuring $2{\cdot}3 \times 3{\cdot}0$ mm. Each capsule contained about 200 eggs which are creamy in colour. The eggs occupy about three-fourths of the space in each capsule (Figs. 1–3). When observed

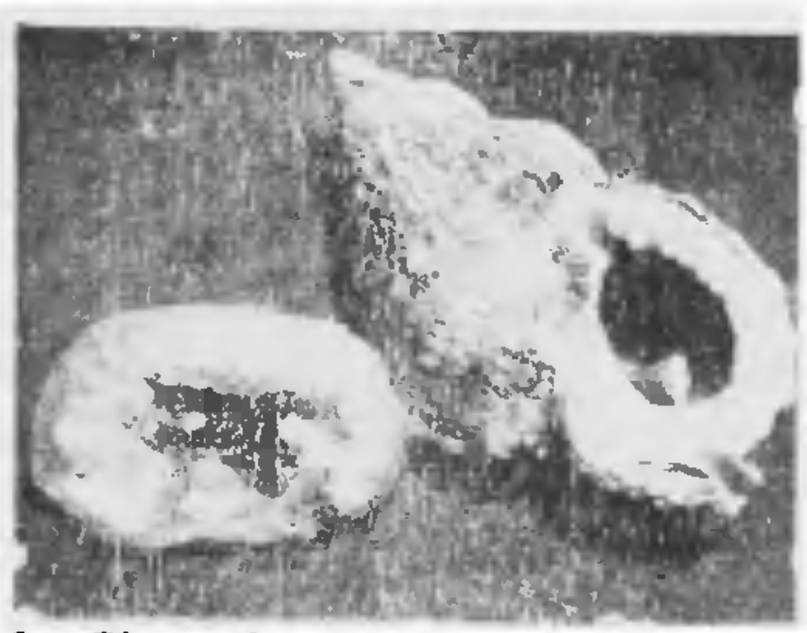

FIG. 1. Photomicrograph showing the snail and egg capsule.

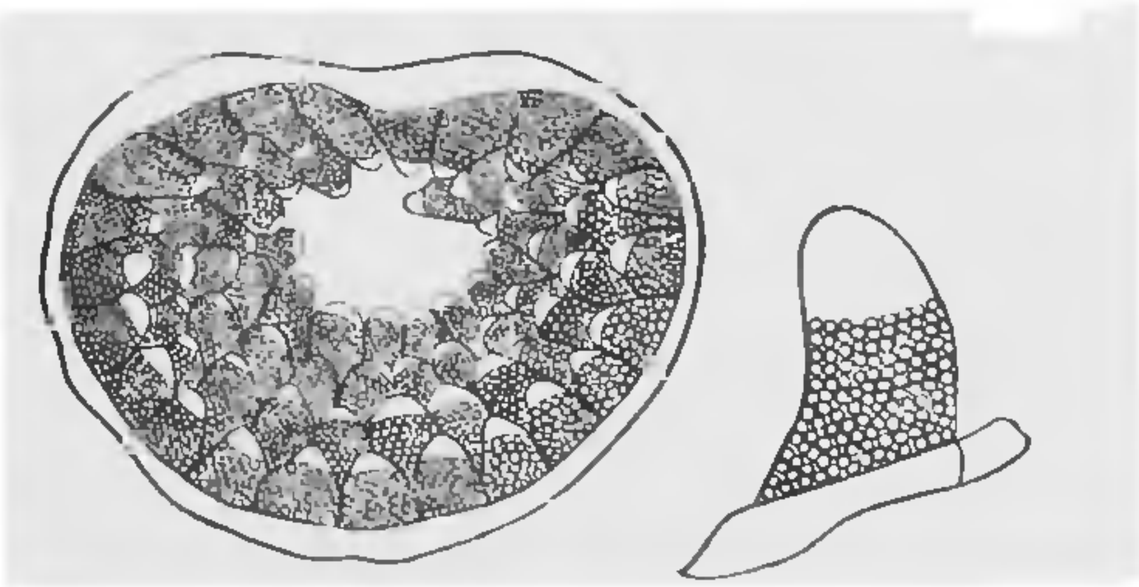

FIG 2
EGG MASS X5

FIG 3
EGG CAPSULE X10

under the microscope some of the eggs showed actively moving trochophores and others various earlier stages of development. Further observations on the spawning habits and development will be made when more material is collected.

Our thanks are due to Dr. K. V. S. Acharyulu for preparing the photograph.

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