NOTES

FOOD INTAKE AND CONVERSION IN *AMBASSIS GYMNOCEPHALUS*

ABSTRACT

Transformation of food has been studied in the euryhaline fish *Ambassis gymnocephalus* (Lacépède) by using energy transfer criteria. Duration of the experiments varied from 15–21 days. Flesh of the prawn *Metapenaeus dobsoni* was used as food. The absorption efficiencies are more than 96% and conversion efficiencies vary between 20.57 and 27.73% in different weight groups of fish. The conversion efficiency of *A. gymnocephalus* was found to be lower than that of young ones of similar size of fishes, that growto larger size.

FOOD intake and conversion in the euryhaline fish *Ambassis gymnocephalus* have been estimated using energy transfer criteria. Most of the earlier studies on conversion efficiency (Menzel, 1960; Pandian, 1967; Kelso, 1972) were on fishes with high growth potential and that grow to large sizes. The present study is on a small fish *A. gymnocephalus*, growing upto 5–5.2 g body weight. A wide range of sizes from 0.7 to 4.85 g in body weight have been covered in this study.

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Material and methods

Fish collected from Cochin Backwater by Chinese dipnets were brought alive to the laboratory and transferred to glass tanks of 40 litre capacity containing water from the collection spot. The fish were acclimatized to laboratory conditions. Experimental fish were starved for two days to empty their stomach contents and were grouped according to body weight. The experiments were conducted in polythene tubs of 25 litre capacity. Four or five fishes of more or less same weights were grouped together in each experiment, which lasted 15–21 days. Throughout the experiment salinity was maintained constant at 15‰ and continuous aeration was given. Water was changed at 7-day intervals. The experiments were conducted at a room temperature of 27 ± 1.5°C.

Meat of prawn *M. dobsoni* was given as food *ad libitum* daily in the evening. Excess food was removed next day morning along with the faeces. Faeces were washed with distilled water and kept in an oven at 70° C. Since a day's faeces was quantitatively inadequate for caloric determination, faeces collected daily were transferred to a container till the end of the experiments.

The materials for chemical estimation, whole fish, food and faeces, were dried to constant weight at 105°C, homogenised and stored in desiccator. Caloric content was determined by the wet oxidation method (Karzinkin and Tarkovskaya, 1964).

The experimental design used was the 'sacrifice method' (Maynard and Loosli, 1962). At the start of each experiment fish of same weights and similar conditions as those used in the study were dried and kept to determine the initial caloric value. At the end of the experiments the experimental fishes were sacrificed to estimate the final caloric value. Since the estimations were based on energy transfer, the weights of fish, food and faeces were converted to their energy equivalents.

Absorption efficiency was calculated as percentage and was calculated from the amount of

food consumed minus the faeces. The term conversion efficiency was used in the sense of Richman (1958) as expressed by Pandian (1967). 'Gross efficiency' and 'Net efficiency', which correspond to Ivlev's (1939) Coefficient of the first order oi K_1 and coefficient of the second order or K_2, were based on the percentage of food consumed and percentage of food absorbed respectively.

Results and Discussion

Feeding rate as expressed in percentage body weight decreased with increase in weight. It decreased from 12.74% in 0.86 g fish to 6.67% in fish weighing 4.42 g (Table 1). The decrease in feeding rate with increase in body weight in *A. gymnocephalus* is in agreement with similar observations on bigger fishes by other authors (Pandian, 1967; Kelso, 1972). *A. gymnocephalus* with less than 1 g body weight recorded feeding rate of 10.34 to 12.94% which was higher than the maximum of 9.2% and 7.2% observed in young ones weighing less than 2 g of *Megalops cyprinoides* and *Ophiocephalus striatus* respectively by Pandian (1967). This indicates that the feeding rate is relatively high in small fishes.

Absorption efficiency varied between 96.89% and 99.27% (Table 1). The efficiency of food absorption observed in *A. gymnocephalus* is higher than that recorded in other fishes by many authors (Ivelv, 1939; Menzel, 1960; Pandian, 1967). As in other fishes, absorption efficiency did not vary much in *A. gymnocephalus* with increase in size.

'Gross conversion efficiency' varied between 20.57% in 4.424 g fish and 27.73% in 2.155 g fish (Table 1). There was not much difference between the 'gross efficiency' and 'Net efficiency' since the absorption efficiency was above 96% in all experiments. In Table 2, the energy consumed, excreted, absorbed and converted per

TABLE 1. *Feeding rate, absorption efficiency and conversion in* Ambassis gymnocsephalus *fed on prawn* Metapenaeus dobsoni

No. of Expt.	Weight of fish (g)	Consumption (% body wt.)	'Gross efficiency' (Production/ consumption)	% of Absorption	'Net efficiency (Production/ consumption)
1	0.722 ± 0.02	11.92	24.05	99.00	24.30
2	0.860 ± 0.03	12.74	21.99	99.27	22.15
3	0.901 ± 0.02	10.39	27.38	99.10	27.62
4	1.425 ± 0.02	7.41	26.50	96.89	27.35
5	2.155 ± 0.04	8.84	27.73	99.18	27.96
6	2.666 ± 0.09	7.78	27.61	99.10	27.86
7	4.424 ± 0.25	6.67	20.57	98.53	20.83

TABLE 2. *Energy consumed, energy absorbed and energy converted in different size groups of* Ambassis gymnocephalus *fed with the prawn* Metapenaeus dobsoni

No. of Expt.	Weight of fish (g) (Mean)	Energy consumed (cal/day)	Energy in faeces (cal/day)	Energy absorbed (cal/day)	Energy converted (cal/day)
1	0.722 ± 0.02	70.10	0.73	69.37	17.00
2	0.860 ± 0.03	79.40	0.58	78.82	17.52
3	0.900 ± 0.02	69.50	0.62	68.88	19.00
4	1.425 ± 0.02	93.91	2.91	91.00	24.90
5	2.155 ± 0.04	168.89	1.37	167.52	46.78
6	2.666 ± 0.09	186.88	1.67	185.21	51.61
7	4.424 ± 0.25	282.63	2.10	280.53	58.24

day are expressed. An increase was observed in all these parameters with increase in weight.

Decrease in conversion efficiency with increase in weight has been reported for many fishes (Gerking, 1952; Pandian, 1967; Kelso, 1972). No such definite trend in conversion efficiency was recorded for small to medium sized *A. gymnocephalus*. However, the conversion efficiency reduced as the fish approached near maximum size.

Though the feeding rate and absorption efficiency are higher, the conversion efficiency of *A. gymnocephalus* is lower than that of young ones of more or less same weights of *M. cyprinoides* and *O. striatus* observed by Pandian (1967). This may be due to the relative growth potential of these fishes, while *A. gymnocephalus* grows to a maximum of only 5.2 g, *M. cyprinoides* and *O. striatus* attains more than one Kilogram in body weight.

Central Marine Fisheries Research Institute, Madras-600 105.

M. VIJAYAKUMARAN

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