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Length weight relationship and feeding intensity of Anabas testudineus (Bloch)

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ABSTRACT

The pond ecosystem is one of the most important natural resources for aquaculture which sustain different types of organism. To maintain the equilibrium in the interaction of abiotic and biotic parameters. The relationship of an aquaculture may lead to the enhancement of fish production. Water body are essential for all around development. Sitamarhi District of Bihar is very rich in water resources which have great potentiality of fish production. The A.testudineus is one of the most important protein rich food constituent. In view of practical utility in estimating the weight of fish of knows length of vice versa .The food preference in different month of the year depending upon the availability of the food in their in natural habitat hence it is necessary to study in detail the nature, relationship, abundance of a particular pond so that maximum advantage of knowledge could be utilized for boosting up fisheries.

Key word - Anabas testudineus, Feeding intensity, Length weight relationship

INTRODUCTION

Anabas testudineus (Bloch). Commonly known as "Climbing perch" and locally known as "Kabai" is found in estuaries and freshwaters of India. Its body is stout, almost cigar shaped, slightly compressed and with a wide head. It is a voracious carnivore. It possesses a pair of accessory respiratory organs which enables it to breathe from air and survive out of water for prolonged periods. These organs are in the form of spacious air on the either side of the skull, communicating freely with the bucco-pharyngeal cavity on one side and opercular cavity on the other. The respiratory epithelium lining the air-chambers are highly vascularised. A. testudineus is considered as a valuable item of diet for sick and convalescent. The fish contains high values of physiologically available iron and copper essentially needed for hemoglobin synthesis. In addition, it also contains easily digestible fat of very low melting point and good many of essential amino-acids. Amount of food consumed by fish is a direct indicator of growth in a fish. Vasnetsov (1974, 1953 b) opined that growth of a fish resulted from the consumption of food, its assimilation, and the construction of the organisms body. In view of practical utility in estimating the weight of fish of known lengths of vice-versa and in assessing the condition cycle of fish, the study of length/weight relationship is important. Ricker (1958), the cube law described growth isometrically hence it did not hold good in fishes as the form and specific gravity of animals are inconsistent due to changes affected in their body proportions during their life. The length/weight relationship has been worked out by a number of workers who have made valuable contribution to this aspect of fish study. The investigators who need special mention are : Price (1931), Pradhan (1950), Le Cren (1951), Prabhu (1954), Mohammad (1956), Bal and Joshi (1956), Radha Krishnan (1957), Sarojini (1957), Pillay (1954, 1958), Balan (1963). Interspecific or intraspecific variations in the power function of length/weight relationship have also been emphasized and reported at different stages of growth in fishes. Systematic work has not been done on the relationship between the available food and feeding habits of A. testudineus in India. The actual relationship of the food consumed to the available supply is ambiguous. Therefore, in this thesis the average number of organisms present in the gut of A. testudineus have been studied to state the food preference of this species. The food preference in A. testudineus vary in different months of the year depending upon the availability of the food in their natural habitat.

MATERIALS AND METHODS

Live specimens of the fish, A. testudineus were collected from the local fish dealers at Sitamarhi (Bihar). The fishes were carried in plastic buckets to the laboratory where they were transferred in glass aquaria measuring 29" x 14" x 14" Acclimation period : The group of fish were held in glass troughs known as Aquarium' for 7 to 10 days. This acclimation period was used to inspect the fish for parasites and injuries, and also to accustom them to a confined space, and to condition then to different foods. Also a pinch of potassium permanganate was put in the water in an effort to keep it free from external parasites. Measurements: Before putting the fish in experimental aquaria, the standard length in centimetre was measured. Also, the weight (in grams) of the fish were taken with the help of the three beam Monopan balance. Temperature : The temperature of the aquaria used were not artificially controlled. Hence, the temperature of water almost coincided with the atmospheric temperatures. Lighting : No effort was made to control the light of the room. Twelve hours of light was used and 12 h of darkness, However, the number of hours of light varied in different months. Feeding regime : Food was given regularly after a 24 h duration i.e., they were fed once daily, at 9 AM. The food offered each day was consumed by the fish. The uneaten food was removed before giving the feed on the next day. Its weight was subtracted from the amount offered to arrive at the amount consumed. pH : The pH of the aquaria was seen to fluctuate between 6.7 to 7.5. After measuring the standard length and weight of each fish, the length/weight relationship was established. LENGTH/ WEIGHT RELATIONSHIP The average length and weight of all the fish, for a period of twelve months have been summarized in different tables. The general equation given by Huxley was used: W=alb where, W=the weight of fish L=length a=intercept b=regression coefficient or slop Also, log Y=log a b log x where, x and y are independent and dependent variables respectively The relationship was established by least square regression method after the logarithmic transformation of the date. The monthly growth in per cent of A. testudineus has also been studied.

Showing length and weight of *A. testudineus* in different months of the year (N = 10 in each month).

Months	Body length (in cm)	Body weight (in g)
January	3.1	2.0
February	6.0	7.5
March	8.1	10.0
April	9.2	11.65
May	9.6	16.2
June	10.2	20.3
July	10.8	20.6
August	10.9	20.8
September	11.3	21.0
October	11.4	22.8
November	11.5	24.9
December	11.5	25.3

TABLE- 1

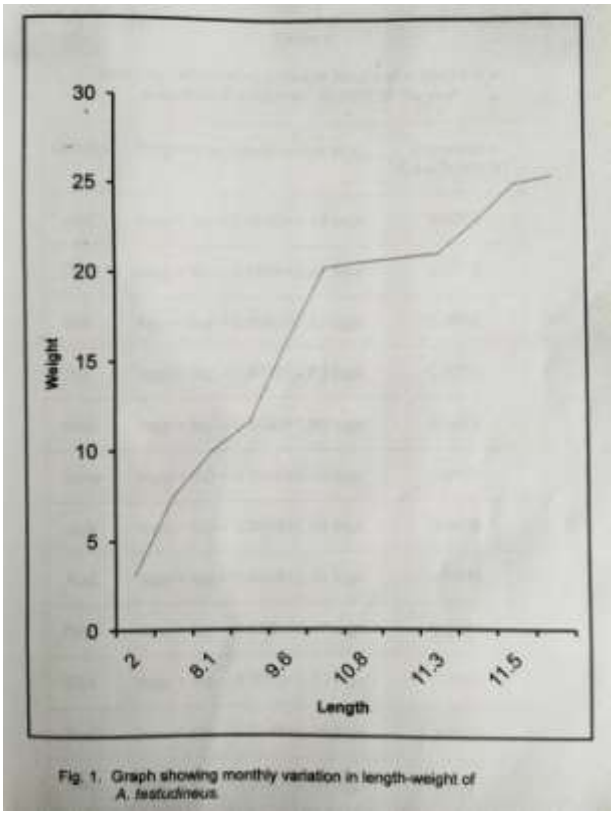

Fig. 1. Graph showing monthly variation in length-weight of *A. testudineus*.

FIGURE- 1

OBSERVATIONS The seasonal changes in body length and body weight are listed in Table 3 and Fig. 1. The enlisted values are a clear indication to the fact that there is an increase in body weight with increasing body length. Feeding intensity : Feeding intensity of fishes was examined through studies of length/weight relationship. The table indices for various months are represented in Table 1. The table reveals that the feeding intensity in fishes showed increasing trend with the body length and body weight reaching minimum in January. Highest values were recorded in November and December. Thus it indicates that there is an increase in body weight with increasing body length.

DISCUSSION

The weight of a fish is expressible as a function of length and these two factors together are useful in deriving index of condition of fishes which, in turn, indicates the environmental suitability, for the fish studied. The equation has a biological basis in that it represents isometric growth, the weight increasing in proportion to be cube of length. The cube law relationship is of common occurrence in fish as reported by several workers (Sekharan, 1968; Sinha, 1975; Ramakrishnaiah, 1972; Rao and Rao, 1972; A.L. sinha, 1973; Pathak, 1975. Observations, however, do not strictly confirm to this cube law and equilibrium constant frequently shows certain variability around 3. Rita et al. (1978) worked the length/weight relationship of the Loaches noemacheilus triangularis and Lepidocephalous thermalis (3.0676) for male, 3.2514 for female). Soni et al. (1979) reported the Length/weight relationship in Cirrhina mrigala to be 4.36 and in Cyprinus carpia it is 3.75 Mookerjee and Mazumdar (1946) studied the growth rates of A. testudineus of the same brood stock grown under laboratory and natural conditions. They concluded that the growth of the fish is influenced by the environment which is turn also reflects on the reproductive activity of the fish as can be observed by the difference in the number of ova specimen reared under laboratory conditions. Hora and Pillay observed that in ponds, the fish grow to about 12 cm in length in the 1st year and 20 cm at the end of the second. Variation in feeding intensity has been studied by determining the Food Index (Kow, 1950). In this species, no marked seasonal fluctuation in the rate of feeding was noticed. No slackness in feeding has been observed in this species and this can be explained on the basis that in this fish the ovary occupies a small portion of the body cavity and thus does not greatly affect the distension of the gut during feeding. The fairly uniform rate of feeding noted in A. testudineus can be attributed partly to the irregularly continuous nature of feeding and partly to the almost continuous availability of food in the habitat.

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