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24. AGE AND GROWTH IN *TELESCOPIUM TELESCOPIUM* L

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ABSTRACT

In length frequincy analysis, model were traced for • pe'iod of two years and the growth was found to be 55 and 95 mm for I and 11 years respectively. Growth determined by months mode curve indicated that *T. telescopium* can grow upto 62, 85 and 110 mm in the I, II and III year respectively Growth assessed by probability plot was found to be upto 23,57.5, 91 and 108 mm in the 0, I II and III year respectively. Integrated method showed growth rates of 60, 92 and 111.6 mm respectively in the I, II and III year of life. Employing von Bertalanffy's growth equation It was found that it can grow upto 57.5, 91 and 108 mm respectively in the I, II and III year of life. The empirical length at different ages found by von B^rtalanffy's growth equation showed general agreement with the growth estimates *i others.

INTRODUCTION

The results of age and growth studies go a long way in proper management of fisheries constituted by commercially important organisms. In Porto Novo, *Telescopium telescopium* is used for making lime. No information is available on the age and growth of this organism. Hence the present study.

MATERIAL AND METHODS

Specimens were sampled for a period of one year from January to December, 81 in the Vellar estuary (lat. 110 29 N; long. 790 46'E). Length of the shell was measured with a vernier caliper nearest to 0.1 mm. Shells with wornout upper whorls and broken lips were discarded. As no sexual dimorphism could be discerned externally, no effort was made to study the age and growth sexwise. Age evaluation was done by length frequency analysis (Petersen. 1891), months mode curve (Devaraj, 1977; Sriraman, 1978) and probability technique (Harding, 1949; Cassie, 1954, and growth evaluation by integrated method (Pauly, 1983), von Bertalanffy's growth equation (Von Bertalanffy, 1938) and Ford-Walford graph (Ford, 1933; Walford, 1946). For studying the length-weight relationship, the live total weight of the snail was determined after cleaning the shells of adhering encrustations and sediment particles. The weight was taken nearest to 0.1 mg using an electrical balance. Hare also as the sex could not be made out externally, no effort was made to study the length-weight relationship sexwise,

RESULTS

Age evaluation

^^"9*^ frequency distribution for the period January to Decembej, 1981 is shown in the form of histograms (Fig.1). Probably due to the extensive breeding habit of this animal, modes appeared every month. Among them the egrliest mode in the length group of 6-10 mm in November (a) was traced to 61-65 mm group again in November recording a growth of 55 mm in 12 months time. Thus it grows to 55mm in 1 year. The mode m the

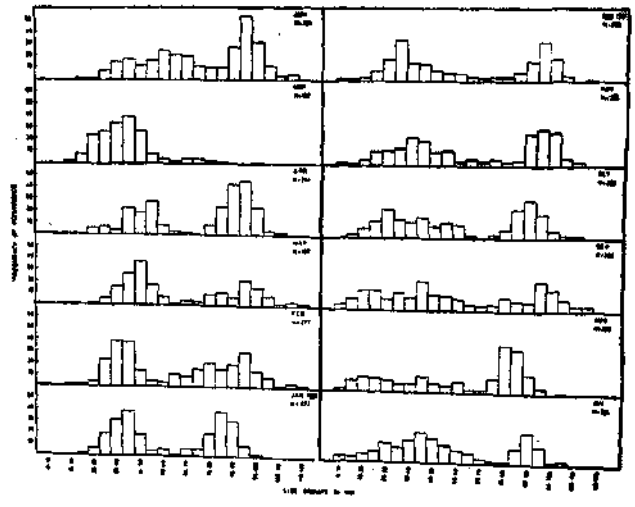

Fig. 1 Length frequency histogram of *Telescopium telescopium*

length group 51-55 mm in November (b) was traced to 91-95 mm group again in November showing a growth of 40 mm during the second year. So by the end of second year it grows to 95 mm size. Further modes could not be .

The progression of modes through sucessive months along series of trend lines, representing the rate of growth of various broods is summarised in Fig. 2 and 3. Mean growth based on the value of various broods and the missing values found from the fitted line can be read from the figure. As per the findings of this method, the size attained was 52, 85 and 110 mm in the pi^^

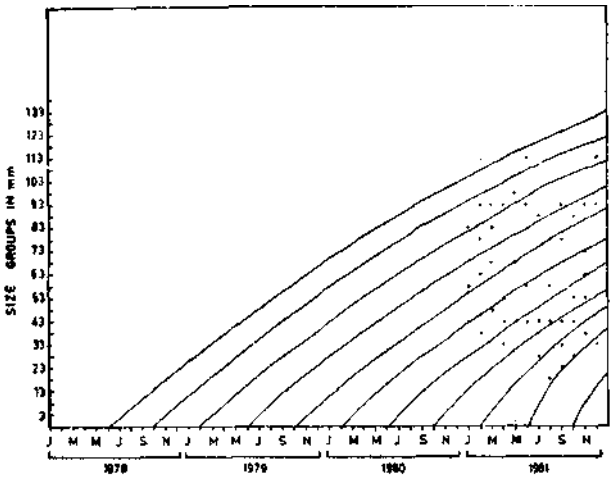

Fig. 2 Scatter diagram of months mode fof *Telescopium telescopium*

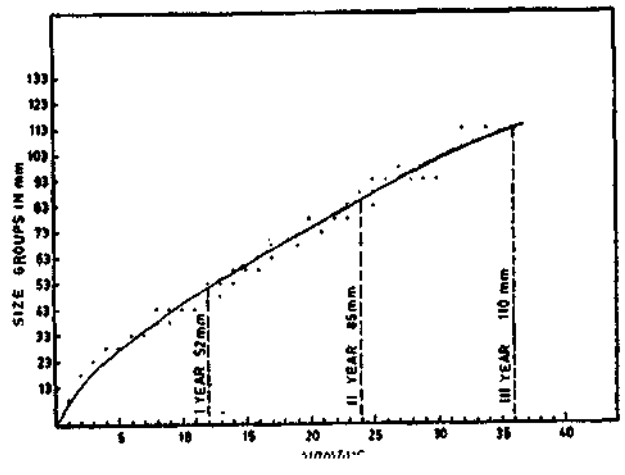

fig. 3 *Gro'*,\.h oi Telescopium telescopium* based on icatter diaoram of months mode

I, II and III year respectively, The time involved between sucessive brood origins could also be derived. It can be seen that there were 3 broods in a year.

In the probabilityplot, the curve showed points of inflexion at 20, 70 and 99 (Fig, 4). 't was found that the I modal value representing the'o'year class was 23 mm. The II, III and '^ "^odes at 57,5, 91 and 108 mm represented ^he I, II and III year age groups recpectively.

Growth evaluation

In integrated method (Fig. 5), the curve in figure interconnect most of the peaks and thus was helpful to estimate the growth parameters of this species. It showed a growth of 60, 92 and 111.5 mm respectively in the I, II and III year of life.

Making use of von Bertalanffy's formula the growth equation was calculated and presented below:

$$Lt = 125.5190\ (1\text{-}e\text{-}o.6783\ (t\text{-}0.0967)$$

The theoretical growth curve is presented in Fig. 6b. From this growth curve, it can be observed that the I year animals attain 57.5 mm, II year ones 91 mm and III year ones 108 mm Through Ford Walford graph, Leo was determi-. ned as 125 mm (Fig. 6a).

The regression line fitted to the length weight data. (Fig 7) showed a linear relationship between these two variables. It can be seen from the figure that the points are very close to the line and hence can be presumed that there is a close relationship between length and weight. The correlation coefficient value was found to be highly significant (0.978 $P < 0.001$). The regression equation can be expressed as follows:

$$\log W = -0.4150 + 2.6268 \log L$$

DISCUSSION

Determination of age and growth based on a Single method has its own limitation especially

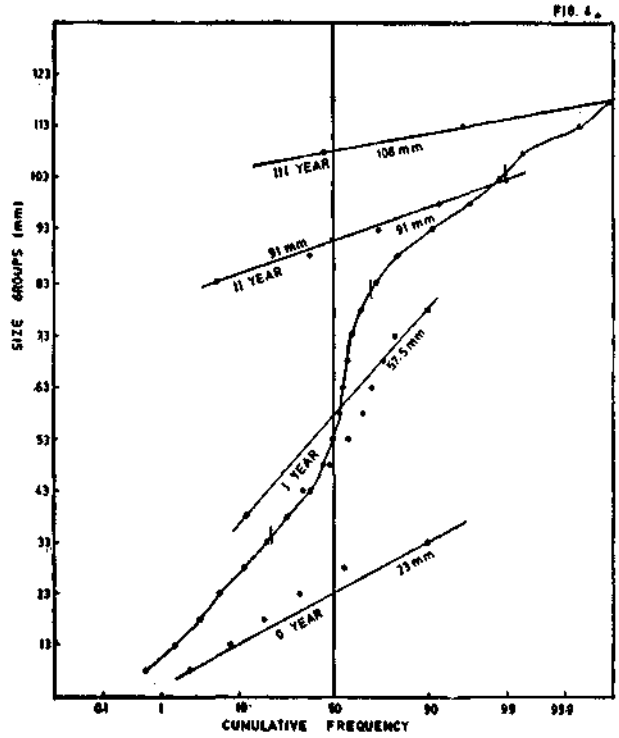

Fig. 4 Probability plot of *Telescopium telescopium*

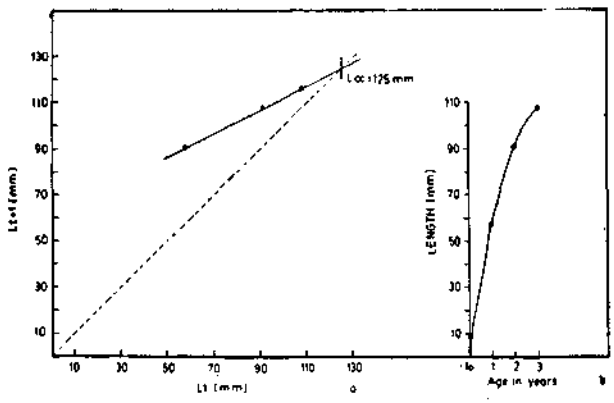

Fig. 6 a. Ford Walford plot of *Telescopium telescopium*; b. Theoretical growth curve

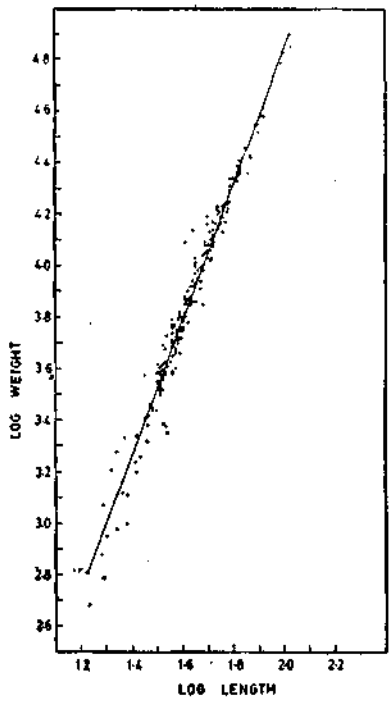

Fig. 7 Length-weight relationship of *Telescopium telescopium*

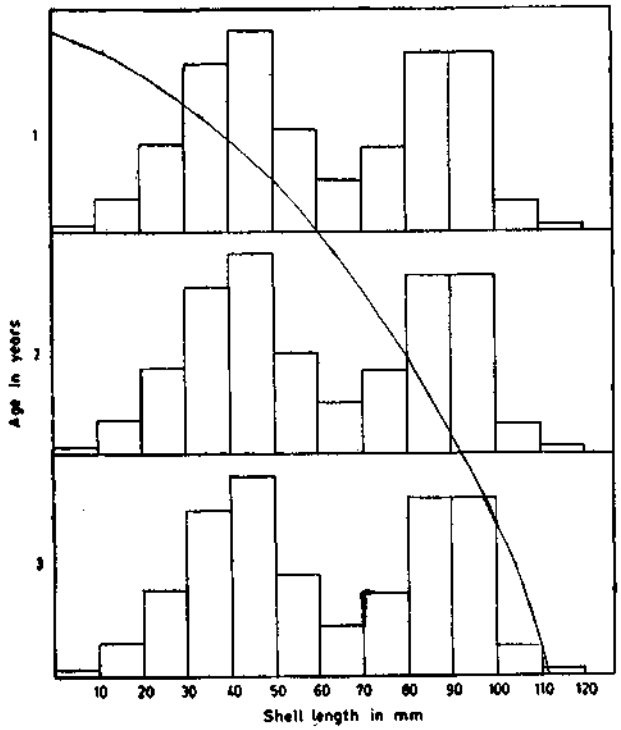

Fig. 5 Integrated method of *Telescopium telescopium*

when the determination of age and growth is through indirect method or through statistical analysis as this. So, presently age and growth data in *T. telscopium* have been analysed in six different ways so that the outcome of one will act as check and control over the other. For easy comparision, the results of age and growth are

presented in label 1. Age and growth estimated showed that the information derived agree more or less The empirical length at different ages made by von Bertalanffys growth equation shows some agreement with the other estimate showing that, in the length ranges studied, the theoretical growth equation adequately describes actual growth. As there is no any sexual dimorphism in *T. telscopium,* age and growth were not studied separately sexwise

TABLE 1. *Mean shell length fin mm) attained* 6y Telescopium telescopium *in different years of life as found out by various methods.*

Method	Years 0	i	n	m
Length frequency	—	55	95	—
Months mode	_	52	85	HO
Probability plot	23	57.5	91	108
Integrated method	-	60	92	111.5
von Bertalanffy's	-	57.5	91	108

Comfort (1957) estimated the longevity for a number of gastropods and found it to range from 1 to 20 years. Generally temperate and polar species live for more years than tropical animals. In tropics few studies have been done on the age and growth of gastropods. Sadasivan (1947) based on his studies suggested that the longevity of *Cerithidea cingulata* a species closely related to *T. telscopium* as around 5J years. Balaparameswara Rao (1976) found the longevity of *Cellana radiata* to be around 5 years. Sreenivasan (1985) studied the age and *grovjth 0^ Cerithidea cingulata,* and found it to live for 4 years. Presently T. *telescopium* is found to live for 3 years. Thus compared to temperate and polar regions where some species live for as many as 20 years, tropical species are ephemeral, in the present study age and growth has been studied in *T. telscopium* through indirect method Direct information regarding rate of growth and variations during different seasons and ages will give a correct picture. Therefore experimental studies in this line involving marking experiments should be done and such studies will add quite a lot of valuable clue to the phenomenon of age and growth in this animal.

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