LETTERS TO THE EDITOR

STUDIES ON AGE AND GROWTH OF THE CATFISH *OSTEOGNEIOSUS MILITARIS* (LINN.)

The determination of age and growth of warm-water fishes is rendered difficult for one or more of the following reasons:

a. The spawning seasons are generally long and there is evidence to show that there are two (PANTULU, 1962) or more broods during each season. The length frequency distribution of each year class would form a bi- or multi-modal curve or polygon and it would be difficult if not impossible to follow the identity and history of each brood in the length frequency data of succeeding months and years.

b. Most fisheries are seasonal in respect to a given area and hence data on length frequency distribution are not available for an appreciable part of the year.

c. In India and perhaps in many other countries similarly situated, samples for analysis are available only from catches of commercial gear which are selective for particular length- (and hence age-) groups *or* which are operated only during particular months.

d. Field workers often have to contend with individual samples of small size for a variety of reasons. Due to the inadequacy of individual samples, the data of the different samples during a calendar month are often pooled. One possible consequence of this is that the time interval (in days or weeks) between monthly samples is not equal, although the samples do belong to consecutive months. Length frequency data from such pooled samples are practically useless for studies involving rate of growth because among other things such data would show uneven growth in consecutive months.

e. Although growth checks are formed in some species, they are not formed during the same period (winter) or with the same regularity (annual) as in fishes of higher latitudes. In many cases they are believed to be formed during the spawning season. In fishes like the oil sardine *Sardinella longiceps* Val. and the tropical Indo-west Pacific mackerel *Rastrelliger kanagurta* (Cuv.) with spawning periods extending over at least four months, the interval between adjacent growth checks could possibly be anywhere between eight and sixteen months because, having spawned at the beginning of the season in one year, they may have done so at the end of the preceding and succeeding spawning seasons.

f. Since growth checks are in the nature of spawning marks and since the interval between successing spawning periods may not necessarily be equal, estimation of growth rate becomes difficult. The number of growth checks does not correspond to the age of the fish (except in those species which spawn when they are about a year old) but only the number of times the fish has spawned. For each species in which such spawning checks are formed therefore, it has to be determined whether first spawning is at the age of one, two or more years.

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The catfish *Osteogeneiosus militaris* accounts for a seasonal fishery from December to May in the Hooghly estuary. According to PANTULU (1963) the spawning season is from March to May and the translucent growth checks in the pectoral spines are formed during January to April. The author has attempted to determine the age and growth of this fish on the basis of the length frequency distribution in samples collected during the months November to April, over a six-year period (1956–61). The data show that the absence of data for some months (no data for the period May to October) and pooling of data of different years create difficulties in interpreting age and growth. These are problems to which adequate importance has not been attached in India.

The author admits that peak spawning occurs during March and April and that the "yolked larvae"[1] (most probably embryos) in the buccal cavities of spent adults with a modal size of 36·0 ± 2·15 mm in April (Table 2, p. 300) are one month old. There are no data for May, but one would expect that the eggs spawned in April would also develop into embryos measuring around 36 mm in May and that the embryos measuring 36 mm in March and April (p. 302) would by then be at least a little larger. The author, however, considers the occurrence of more than one brood as "highly improbable" (p. 300).

The author uses the pooled data of six years (1956–61) to interprete growth (Table 2, p. 300; Fig. 4, p. 301) although in each of these years there are no data for the months May through October. He assumes that the embryos measuring around 36 mm in April grow to males measuring 65.5 mm and females measuring 94·5 mm in December. The males measuring 65·5 mm in December are already 69·5 mm in November, but this awkward figure is ignored in the text for calculating growth rate.

There are other instances in the data given (Table 2) where the modal length during a particular months is less than in the preceding month:

I Age-group. Samples of January show a modal length of 140·5 mm but those of December have already attained a modal length of 154·5 mm.

II Age-group. Samples of males in February have a modal length of 237·5 mm but those of the next month have a modal length of only 230·5 mm.

III Age-group. Males (first row of data) with a modal length of 333·5 mm in December have a modal length of only 323·5 mm in January.
Females (second row of data) with a modal length of 370·5 mm in December have a modal length of only 363·5 mm in January.

These discrepancies could be due to one or more of the following reasons:

a. Variation in the growth rate of the different year classes whose data are pooled.

b. Non-uniformity in size of different samples pooled.

c. Selectivity of gear.

d. Intervals between samples (measured in terms of days or weeks and *not* months) are not equal and uniform in the different years.

Whatever the reason or reasons, the above data show clearly the limitations of utilising pooled data of different year classes in studies on growth.

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[1] On p. 313, the author states "Males and females with fertilised eggs, in various stages of development, in the mouth are available during March and April . . . "