Age and growth of the ponyfish *Secutor insidiator* along Porto Novo coast

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Length-frequency distribution of the fish in the commercial catches revealed that *S. insidiator* (Bloch) grows to a total length (TL) of 78 mm at the end of 12 months and 108 mm at the end of 20 months of its life. Probability plot technique indicated 73 mm and 97 mm growth in fish at the end of 1st and 2nd y respectively. Von Bertalanffy growth equation fitted indicated 120 mm as the asymptotic length (L∞) which is almost close to the maximum size of the fish actually recorded.

Estimation of age and growth of fishes is essential for proper understanding of their population dynamics. Among the commercially important ponyfishes of the Indian seas, *Secutor insidiator* (Bloch) is of considerable importance. As there is paucity of information on the age and growth of *S. insidiator* from India, the present study has been undertaken to determine the age and growth of this species collected from the waters off Porto Novo, Bay of Bengal.

Random samples of *S. insidiator* from the commercial catches between May 1976 and October 1977 of trawlnets, castnets, shore seines and boat seines at Porto Novo fish landing centre (lat. 11° 29' N and long. 79° 46' E) were measured biweekly for their total lengths (TL). A total of 5500 specimens were used and both sexes were treated together. No clear seasonal growth zones in the hard parts like vertebrae, otolith, cleithrum and supraoccipital bones of the fish were evident. Hence, the length frequency was analysed and monthly length frequency data were classified into various size groups with class interval of 5 mm and percentage frequency polygons were prepared. Growth of the fish was estimated by tracing the modal shifts through subsequent months. The pooled length-frequency data for the entire period were used to estimate age and growth of *S. insidiator*, by plotting on arithmetic probability paper. Von Bertalanffy growth equation was employed as given for fishes to determine various growth parameters and the maximum theoretical growth (L∞) was also calculated by the graphical method of Walford.

**Length-frequency distribution**—The monthly size range and modal values are given in Fig. 1. The fish of mode 'd' that occurred in commercial catches during May 1976 at 23 mm may be of approximately 2 months old. Fish of this mode attained a length of 78 mm by 1 y (April 1976 to March 1977). By further tracing this mode, the fish measured to a length of 98 mm at the end of 19 months. Based on the pattern of modal shifting established through mode ‘d’, the new recruits at mode ‘e’ of May 1976 appeared to be approximately 3 months old. This mode could be traced up to October 1977 at 108 mm as 20 months growth. Individuals of above 110 mm were not available in the commercial catches.

**Probability plot**—In *S. insidiator*, the points of inflexions in the arithmetic probability paper are at 3 points, at 27.2, 72.9 and 96.5% (Fig. 2). The corresponding modal lengths are seen in length-frequency figures at 28, 78 and 98 mm. While the length 28 mm belongs to 0-year class, 78 and 98 mm refer to 1 and 2 year classes respectively.

**Von Bertalanffy growth equation**—The Von Bertalanffy growth equation derived for length at age for *S. insidiator* is,

\[ L_t = 120 \left[ 1 - e^{-0.3318(t+1.0313)} \right] \]

**Estimation of L∞ by Walford plot**—The length at t against t+1 for *S. insidiator* on the basis of lengths attained at intervals of 3 months was plotted (Fig. 3). The points were almost in a straight line relationship and the asymptotic length (L∞) was 120 mm which is nearer to the maximum length (110 mm) recorded in the present study.

The average lengths at first maturity for males and females of *S. insidiator* of Porto Novo region were 82.5 and 81 mm TL respectively during 1976-77 and the corresponding values for 1977-78 were 79 and 82.5 mm. This indicates that *S. insidiator* of Porto Novo region starts spawning when it is about 1 y old. The growth of fish at the end of 12 months (78 mm) and 20 months (108 mm) shows that after attaining

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maturity, the growth slows down as in most of the tropical fishes. As the $L_o$ calculated (120 mm) is close
to the maximum recorded length (110 mm), it may be
said that the life span of $S$. insidiator is short and does
not exceed 2 y. While comparing the present study on
$S$. insidiator with that of $G$azza minuta$^8$ and
$Leiognathus$ splendens$^9$ from Porto Novo area, it
appears that $S$. insidiator is a short lived species than
the other 2 which live for more than 2 y but below
3 y.

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Fig. 1—Monthly length-frequency distribution of $S$. insidiator

Fig. 2—Probability plot of $S$. insidiator

Fig. 3—Walford plot of $S$. insidiator