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Population Dynamics of Vermiculated Rabbit Fish *Siganus vermiculatus* (Valenciennes) in the Negombo Estuary, Sri Lanka.

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Abstract

Vermiculated rabbit fish, *Siganus vermiculatus* (Family: Siganidae) is one of the most popular brackishwater fish in Sri Lanka. In Negombo estuary, it is caught in brush parks, gillnets and seines in large numbers and significantly contributes to the fishery. Length frequency data of this species collected by sampling the commercial catch of the above gear from July 1990 to June 1991 were analyzed using complete ELEFAN software. The asymptotic total length and growth coefficient were estimated to be 46.5 cm and 0.56 year⁻¹ respectively. The instantaneous total mortality coefficient, natural mortality coefficient and fishing mortality coefficient were estimated to be 1.97 year⁻¹, 1.11 year⁻¹ and 0.86 year⁻¹ respectively. The exploitation rate was 0.44 indicating that the stock is not overexploited. The annual recruitment occurred as two recruitment pulses separated by a 4-5 month interval. The mean size at entry into the fishery during the study period was 19.31 cm. At this mean size, the optimum rate of exploitation was estimated to be 0.48. To obtain the maximum sustainable yield from this stock, the mean size at first capture should be increased up to 23.3 cm and the exploitation rate should be increased by about 14% of the present level.

Introduction

Rabbit fish (Family: Siganidae) is an important group of edible fish that inhabit the coastal marine waters, lagoons and estuaries in the tropical regions (Fischer & Bianchi 1984). Due to their palatable firm flesh, they are among the most popular brackishwater fish in Sri Lanka. Of the 7 species of siganids recorded from Sri Lankan waters (De Bruin et al. 1994), 3 species namely *Siganus vermiculatus*, *S. javus* and *S. oramin* inhabit the Negombo estuary and significantly contribute to its fishery. They are caught in variety of gear including brush piles, gillnets, trammel nets and seines.

In the recent past, several studies on siganids have been carried out in Sri Lanka. These include the food and feeding of *Siganus stellatus*, *S. virgatus* (Chitravadivelu 1986), morphometrics, coefficient of condition and length weight relationships of *S. javus* and *S. canaliculatus* (Chitravadivelu 1985), feasibility of cage culture of *S. javus* and *S. oramin* (Chitravadivelu & Arudpragasam 1982) and food niche overlap of *S. vermiculatus* and *S. javus* with other fish species co-existing in brush piles of Negombo lagoon (Edirisinghe & Wijeyaratne 1986).