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Observations on the fishery and biology of the cusk eel *Monomitopus nigripinnis* (Alcock, 1889) occurring in deepsea landings at Chennai

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ABSTRACT

The cusk eel *Monomitopus nigripinnis* was observed in the deepsea trawl landings at Chennai Fisheries Harbour during February–April 2008 to 2011. Some observations were made on the biology of this species based on 122 specimens collected during 2010-2011. The length and weight ranges of males were 208-402 mm and 53-558 g and those of females were 216-415 mm and 55-556 g respectively. Parameters of the length-weight relationship were derived as $a = 0.00000096$ and $b = 3.346$. The male-female sex ratio was 1:1.1. About 50% of the females were in advanced stages of gonadal maturation. Spawning or spent fishes were not encountered. Analysis of gut contents revealed a preference for shrimps. The fecundity was estimated to be 82,600 in a fish of 412 mm TL.

Keywords: Bathydemersal, Cusk eel, *Monomitopus nigripinnis*, Neobythitinae, Ophidiidae, Ophidiiformes, *Thangal* trawlers

The cusk eel, *Monomitopus nigripinnis* (Alcock, 1889) (Sub-family: Neobythitinae, Family: Ophidiidae, Order: Ophidiiformes) is known to be distributed in the Indian Ocean, off East Africa to the Andaman Sea. It is a bathydemersal fish found in the depth range of 700-1510 m (Nielsen *et al.*, 1999). It does not hold any commercial interest and has not been known to form a fishery anywhere. The species was first recorded from the Indian coast by Alcock (1899) from specimen(s) (*Investigator* stn. 150) that could not be located in the ZSI collection in December 1996. It is known from several localities in the Indian Ocean and in 700-1,200 m off South Africa (Nielsen and Cohen, 1986).

M. nigripinnis has been observed in the deepsea trawl landings at Kasimedu Fisheries Harbour at Chennai, since 2008 (Rajapackiam *et al.*, 2008). About 5-6 multi-day *thangal* trawlers operate regularly every year for deepsea prawns during February-April. Among the deepsea fishes landed with the prawns, *M. nigripinnis* was also observed in good numbers in 2008, 2009, 2010 and 2011. These fishes were caught in deepsea fishing operations carried out at 400 m depth, about 60 km from the shore, along south-east of Chennai. There is not much information documented on this species and hence the present study was undertaken.

Observations were made on 122 specimens of *M. nigripinnis* collected from deepsea trawl catch landed at Chennai Fisheries Harbour during March-April 2010 and February-March 2011. The samples were examined for length-weight relationship, length distribution, maturity

stages and gut content. The length-weight relationship was determined separately for the two sexes by linear regression after log transformation and expressed in the exponential form (Le Cren, 1951), $W = aL^b$ (W = weight in g; L = total length in mm), and analysis of covariance (Snedecor, 1961) was performed to test the equality of the two regression lines. Female maturity stages were classified based on the macroscopic appearance of the gonads as immature, early maturing, late maturing, mature, spawning and spent. Length at first maturity in females was estimated using the logistic function for non-linear regression (Saila *et al.*, 1988):

$$P = 1 / \{1 + e^{-(r(L-L_m))}\}$$

where P is the proportion of mature individuals (late maturing stages and above) in each size class (L), r (slope) indicates the width of the maturity curve and $L_m = a/r$, where 'a' is the intercept. Feeding condition was assessed from the degree of fullness of the gut, which was classified as empty (E), with traces (T), quarter full (Q), half full (H), three-fourth full (TH), full (F) and gorged (G). Prey was identified to the extent possible, depending on the state of decomposition.

The fish is characteristically pink skinned but the dark sheen on the cycloid scales gives it a shade of black (Fig. 1). All the fins are typically black; the dorsal and anal fins are continuous with the caudal fin. Dorsal and anal fins lack spines. Although it has been reported to have 99-104 dorsal rays and 79-86 anal rays, the specimens used in the present study were found to have 101-102 dorsal rays and 81-84 anal rays.

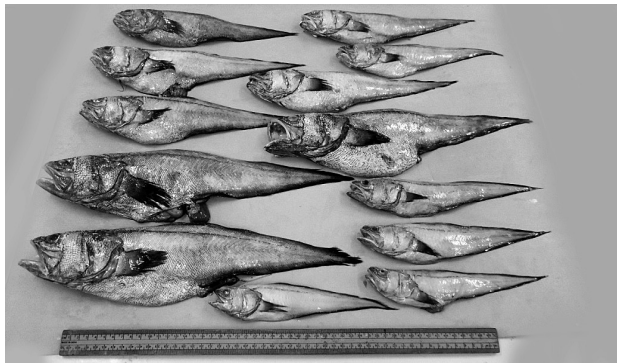


Fig. 1. *Monomitopus nigripinnis* landed by deepsea trawlers at Chennai

The sampled specimens ranged from 208 to 415 mm in length and 53 to 558 g in weight. The length and weight ranges of males were 208 to 402 mm and 53 to 558 g and those of females were 216 to 415 mm and 55 to 556 g. The length-weight relationships for male and female *M. nigripinnis* were derived as $W = 0.00000094 L^{3.351}$ ($r^2 = 0.967$) for males and $W = 0.000001 L^{3.339}$ ($r^2 = 0.973$) for females. Analysis of covariance showed that the slopes did not differ significantly between the sexes ($\alpha = 0.05$). Hence, a common length-weight equation was derived as $W = 0.00000096 L^{3.346}$ ($r^2 = 0.971$).

The male-female sex ratio was 1:1.1. Fig. 2 shows the distribution of the sexes in 10 mm length classes. Among the females, 18.8% were immature, 28.1% were in the early stages of gonadal maturation, 50% were in the late maturing stages and 3.1% were mature. Spawning and spent stages were not encountered. The length at first maturity of female *M. nigripinnis* was estimated to be 278.7 mm TL (Fig. 3). The fecundity was estimated to be 82,600 in a fish of 412 mm TL.

Of the 122 guts examined, more than 50% were empty while only about 5% were in well-fed state. Gorged guts were not encountered (Fig. 4). The diet appeared to

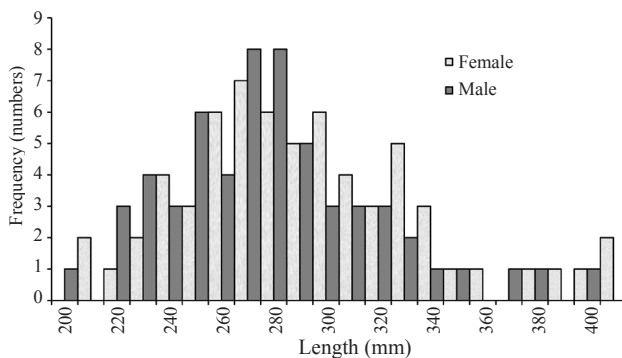


Fig. 2. Sex-wise size distribution (TL) of *M. nigripinnis* in deepsea trawl landings at Chennai

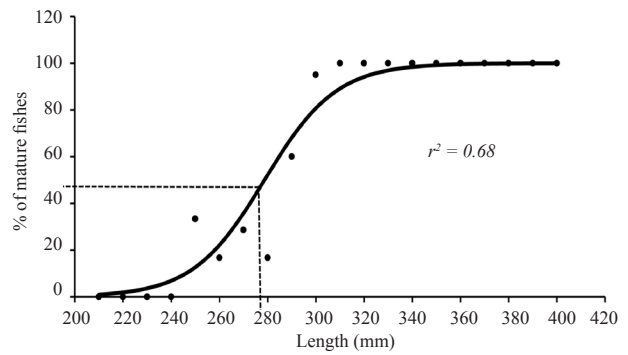


Fig. 3. Length at first maturity of *M. nigripinnis* (female)

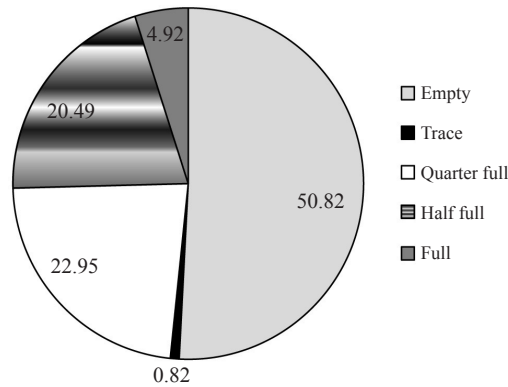


Fig. 4. Gut condition in *M. nigripinnis* landed at Chennai

comprise exclusively of deep sea prawns, in both males and females.

The cusk eels that were landed by deepsea trawlers at Chennai were sold in the local domestic markets. In the fresh condition, these fishes fetched prices between ₹ 35 to 50/- per kg. Spoilt fishes were grouped along with trawl discards and sold @ ₹ 15 to 20/- per kg for drying and fish meal processing. This fish is a non-conventional resource which has now found a place in the commercial fishery and market. With increased fishing in deeper waters, there is scope for establishing a regular fishery for this resource, and the information presented through this study holds significance as baseline information on biological aspects of the species from Indian waters.

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