



Short Communication

Some aspects of biology of *Octopus defilippi* Verany, 1851 from the northwest coast of India

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Abstract

'Lilliput longarm octopus', *Octopus defilippi* Verany, 1851 has been reported for the first time from Mumbai waters, northwest coast of India. This species was observed in trawl catches off Mumbai during March-June from 2007 onwards and the dorsal mantle length (DML) ranged between 52 and 99 mm. The left arm ratio is $3 > 2 > 4 > 1$ and the right arm ratio is $2 > 4 > 1 > 3$. Relationship between DML and total body weight (TBW) was $TBW = 0.01361 \cdot DML^{1.83443}$. Fish formed the major food item with 93.3% and 70.6% of individuals in the samples in mature condition.

Keywords: *Octopus defilippi*, Lilliput longarm octopus, Mumbai

Introduction

As many as 200 species of Octopodidae are known to occur in the world oceans (Worms, 1983) of which about 60 are reported from the Indian Ocean (Roper *et al.*, 1984). Silas (1985) reported thirty-eight commercial species from the Indian seas. The major species of octopods that contribute to the world fishery are under the genera *Octopus*, *Cistopus* and *Eledone*.

In India, octopus is caught as bycatch in trawlers. Among the cephalopods, the octopods are the least exploited and studies on them from Indian waters are very few. Oommen (1966, 1967, 1971, 1975, 1976, 1977) and Silas *et al.* (1985) described the species of octopods from Indian waters. Sarvesan (1969) and Paul (1997) described the brooding behaviour. Victor and Jayabalan (1998) reported landing of a giant octopus from Gulf of Mannar. Kripa and Joseph (1994) and Kripa *et al.* (2000) described landings of octopus from Kochi waters while Sundaram and Sarang (2004) gave an account on the octopus fishery from Mumbai waters.

The present paper reports on *Octopus defilippi* landed by trawlers at New Ferry Wharf, Mumbai, northwest coast of India.

Material and Methods

The trawlers of New Ferry Wharf operated 70 - 80 km off northwest coast of Mumbai at a depth of 30 - 40 m. Samples of *Octopus defilippi* collected from trawl landings at New Ferry Wharf during March - June 2008 were brought to the laboratory for biological analysis. The dorsal mantle length (DML) was measured using a digital caliper and total body weight (TBW) (± 0.01 g) was determined using an electronic balance after the specimens were dried on blotting paper. The measurements were taken as described in CMFRI manual (1995).

The relative length of arms *i.e.*, the arm formula was estimated following Silas *et al.* (1985). Since the arms are extremely long and fragile, it is difficult to get specimens with all arms intact. The arm-ratio was determined by measuring eight specimens. Sixty eight specimens with DML ranging from 52 to 99 mm and corresponding body weight ranging from 18.8 to 56.4 g were studied for length-weight relationship, gut analysis and reproductive biology.

The length-weight relationship was obtained from regression analysis by the method of 'least squares' based on individual measurements. The relationship of the length and weight was expressed

by parabolic equation of the form, $W = a * L^b$ (Le Cren 1951). The stomach condition was analysed following Kore and Joshi (1975). The food items were in well-crushed and macerated condition, therefore it was possible to categorise them into groups only such as fish. The Index of Preponderance was estimated as suggested by Natarajan and Jhingran (1961). Maturity studies were carried out following Silas (1985).

Results and Discussion

The species was identified as *Octopus defilippi* Verany, 1851 commonly called as 'Lilliput longarm octopus' based on the identification characters as described in Roper *et al.* (1984). The mantle is relatively very small compared to the strikingly long arms. The skin is smooth with no pigmented ocellus or ring. All the arms were very long, slender, with tapering ends, fragile and highly asymmetrical with three primary suckers on each arm.

Though Roper *et al.* (1984) mentions Indian peninsula as the range of distribution of this species, the present report from Mumbai waters seems to be the first record from the northwest coast of India.

The species was landed by trawlers at New Ferry Wharf from the year 2007 onwards. They are very seasonal and observed in the catch during March-June and contribute about 10-15% to the total octopus fishery from this centre during this period. They fetch low price. Kripa *et al.* (2000) have mentioned stray landings of an octopus species with extremely long arms in Cochin waters.

Usually in octopods the left side arms (LA) and the right side arms (RA) follow the same symmetry but in this species both the sides have different arm ratio. The left arm ratio is $3 > 2 > 4 > 1$ and the right arm ratio is $2 > 4 > 1 > 3$. Overall the proportion of the arms is in the order of $LA-3 > LA-2 > RA-2 > LA-4 > RA-4 > LA-1 > RA-1 > RA-3$.

The relationship between DML and total body weight (TBW) showed exponential relationship. Therefore the values of length and weight were transformed into log to linearise the equation and expressed as $TBW = 0.01361 * DML^{1.83443}$ ($r^2 = 0.812$). According to Roper *et al.* (1984), the maximum length of this species is 90 mm but from

Mumbai waters, specimens up to 99 mm were observed.

The Index of Preponderance showed that fish formed the major constituent food (93.3%) followed by 'digested matter' (6.7%). The fish which dominated the gut content seems to be *Leiognathus* spp. It was recorded that 41.2% of the guts analysed were in full condition followed by empty stomach (35.3%), $\frac{1}{4}$ full (17.6%) and $\frac{1}{2}$ full (5.9%). It was observed that males dominated as in all species of octopods and the sex-ratio was 1:0.03. Out of the specimens (males) observed, 29.4% were immature, 70.6% were mature and no specimen was in gravid or spent condition. According to Roper *et al.* (1984), females release more than 10,000 eggs which are 2.1 mm long.

With increased exploitation and expansion of fishing grounds, new records of cephalopods are reported all along the Indian coast. Specimens of *O. defilippi* have been deposited in Central Marine Fisheries Research Institute, Mumbai.

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