

# Fishery, Reproductive and Feeding Biology of common octopus *Octopus vulgaris* Cuvier 1797, on the Kenyan South-coast

## Abstract

GIDEON KIVENGEA

Although common octopus, *Octopus vulgaris* (Cuvier, 1797), catches are increasing globally, lack of information on the species biology and fishery has been a major concern in its management particularly in Kenya. Currently, the common octopus has been listed within the “Endangered Status” IUCN 2010 List of Threatened Species. The present study aims at investigating the fishery, reproductive and feeding biology of *Octopus vulgaris* from Shimoni and Vanga which are some of the major fish landing sites in the Kenyan South coast. Sampling was done monthly from November 2010 to November 2012 using traditional fishing spear ‘mkuki’ or ‘shomo’. For each specimen body weight (BW), total length (TL), dorsal mantle length (DML), ventral mantle length (VML) and gonad weights were recorded. Maturity stages and Gonadosomatic Index (GSI) were determined using standard methods. Stomach content analysis was determined using both the frequency of occurrence method and the dominant (numerical) method. For the processing and markets of common octopus, information was collected from logbook records, and landings from fishermen and fish industries.

A total of 1,599 specimens were collected, 746 males and 853 females. The size distribution range of the females varied between 5.40 cm to 24.50 cm DML and from 0.07 kg to 5.50 kg BW while the DML of males ranged from 5.80 to 18.50 cm and the BW from 0.08 kg to 3.95 kg. The monthly mean DML values ranged between  $9.52 \pm 1.81$  cm to  $13.53 \pm 2.51$  cm at Shimoni and  $9.14 \pm 1.56$  cm to  $13.00 \pm 2.36$  cm at Vanga. The monthly mean DML and BW values showed a decreasing trend over the two year period, an indication that octopus population was under high exploitation pressure. The sex ratio was 1:1.1 (males: females) for both Shimoni and Vanga during the study period. However, there was no seasonal or annual significant difference ( $p > 0.05$ ) in sex ratio. When the sex ratio was analyzed by size intervals, the only significant difference ( $p < 0.05$ ) was observed in sizes over 18 cm DML in favour of the females. The results of sexual stages of gonads indicated that *Octopus vulgaris* may be breeding year round with spawning peak from June to August. Fecundity estimates ranged from 5,200 to 389,000 oocytes (mean  $154,057.61 \pm 29,131.97$ ). Maturity and gonadosomatic indices showed similar annual changes, especially in the case of females. The female length at first maturity was 10.8 cm (DML<sub>50%</sub>), while for the male was 10.5 cm (DML<sub>50%</sub>) respectively. There was no significant difference, statistically between female and male length at first maturity. The study findings also divulged that females attained their maturity at 500 g (BW). Therefore, it is recommended that a minimum size limit of 500 g should be imposed as a precautionary measure to ensure their maturation in the Kenya coast. The diet of *Octopus vulgaris* at Shimoni consisted of Crustaceans – 57 %, Molluscs – 20 %, Echinoderms – 3.7 %, Teleosts – 1.1 % and the remaining 18.2 % unidentified food items while at Vanga important prey items were Crustaceans – 53.4 %, Molluscs – 15.2 %, Echinoderms – 4.9 %, Teleosts – 2.2 % and unidentified food items was 24.3 %. The processing of octopus was done using both traditional techniques and modern facilities that are fully compliant with the food safety standards for export markets. The value-added octopus final products ranged from traditional dried octopus to chilled and frozen packed octopus. The species was marketed fresh, frozen and dried salted, mostly for human consumption. A small local market was found to exist for common octopus of which most of it was sold in local seafood tourist restaurants. International markets existed in various countries including Italy, Spain, France and Portugal. The scientific information gathered during this study on the fishery, reproductive and feeding biology of *Octopus vulgaris* will go along way in informing policy directions and the management of octopus in Kenya.

**Key words:** *Octopus vulgaris*, fishery, reproduction, feeding, Shimoni, Vanga.