

Emerging light and hand jigging fishery for cephalopods along Ratnagiri coast, Maharashtra

Sujit Sundaram and David Sawant
Research Centre of CMFRI, Mumbai

Cephalopods have emerged as one of the prime foreign exchange earners in India. Trawl nets operating up to 100 m depth account for nearly 85% of the cephalopod landings and use of high opening bottom trawl nets resulted in rapid increase in production. Other gears that exploit cephalopods as bycatch are boat seines, purse seines and dol nets. Jigging, a specialised fishing method developed for cephalopods in Japan, has slowly emerged in India too. Cephalopod jigging by hand has been reported along various places such as Vizhinjam, Kanyakumari, Palk Bay coast, Tuticorin, Karnataka, Devipattinam and Keelakarai in the Gulf of Mannar. The present report of squid jigging off Ratnagiri appears to be the first report from the state of Maharashtra.

In Ratnagiri, three types of boats are used for squid jigging. The boats with outboard engines and fitted with halogen lamps connected to 12 V batteries. The fishermen set out for fishing at 16 00 hrs and return next day at around 06 30 hrs in the morning. The time to reach the fishing grounds is about 3 h and fishing activities last for about 6 h. Generally the fishing is carried out towards the south-west of Ratnagiri. The boats are anchored on reaching the fishing grounds. Lights are put on and since squids are phototropic, they are attracted by the illumination and aggregate around the boundary zone between the illuminated and shadow zones and they are easily jigged by the sharp hooks around the jigging device. They are then lifted up and gently removed with the help of scoop nets.

Small boats of about 4 m in length fitted with 8 HP outboard engines (Fig. 1) are used to catch squids. The depth of operation is between 14-15 m. Fishermen generally do not use jigs in these small boats. Only one person in the boat engages in fishing by light jigging. The squids are caught by scoop nets, when they congregate near the boats, attracted to

the light. The average catch per unit effort (CPUE) of squids is 30-50 kg. Medium sized boats (Fig. 2) which are 5-7 m in length use exclusively jigs and about 3-4 members are generally present in the boat. The boats are fitted with 16 HP outboard engines. The depth of operation is between 15-25 m. The average CPUE of cephalopods is 100-120 kg. Large sized boats (Fig. 3) with an overall length of 6-7 m are also used for squid jigging and are fitted with 24-32 HP outboard engines. The depth of operation



Fig. 1. Small boats employed for squid jigging in Ratnagiri



Fig. 2. Medium sized boats used for squid jigging in Ratnagiri



Fig. 3. Large sized boats used for squid jigging in Ratnagiri

is between 20-30 m. About 4-5 crew members are engaged in this activity and from this boat, even castnet, locally called as 'paag' are used for exploiting squids using light fishing. The average CPUE of cephalopods is 200-250 kg.

The jigs are made of bakelite moulding to resemble a live shrimp which at the time of operation lures cephalopods. The lures are brightly coloured in different shades. A small lead weight is attached to the lower part of the lure so that it maintains the jig in a proper dorso-ventral position. Another type of jig is also used which is cylindrical in shape and is coated with radium, which glows in the dark (Fig. 4). Both types of jigs have pointed recurved hooks, usually with numbering from 16 to 18 in two rows, attached in the tail region. Baits are not used for jigging. Each jig is tied to a nylon wire rope with length ranging from 6-15 m and is rolled on a wooden frame reel or spindle. The jigs cost ₹ 200 (prawn) and

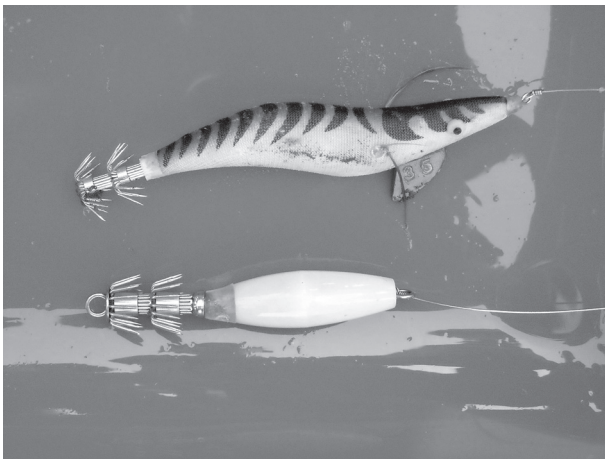


Fig. 4. Squid jigs used in Ratnagiri

₹ 100 (radium) per piece and available in the local market in Ratnagiri. The jigs are imported from international market and are sold at Princess Street in Mumbai where there is an entire lane catering to all sorts of accessories that are required for the fishing industry. These jigs are then taken to Ratnagiri market.

The entire catch is unloaded at Rajiwada landing centre. The catch fetches about ₹ 80-100 per kg which is procured by the processing companies and is immediately iced in huge plastic crates. More than 95% of the catch is constituted by the Indian squid, *Loligo duvauceli* (Fig. 5) and the remaining 5% by Pharaoh cuttlefish, *Sepia pharaonis*. The dorsal mantle length (DML) of the squids measured randomly ranged between 71 to 327 mm with the corresponding weight ranging between 23 to 590 g. The dominant mode was in the size group

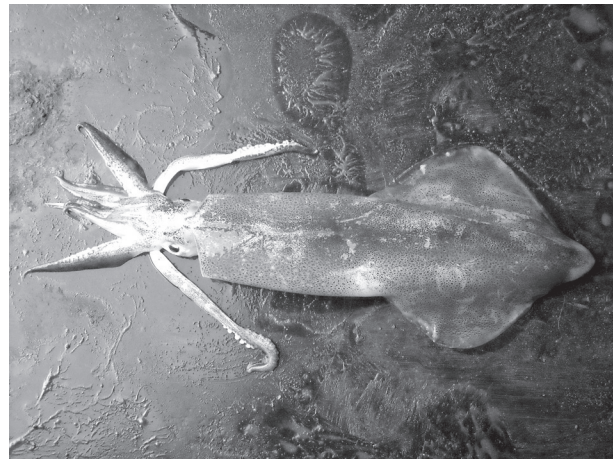


Fig. 5. Indian squid, *Loligo duvauceli* caught by jigging at Ratnagiri

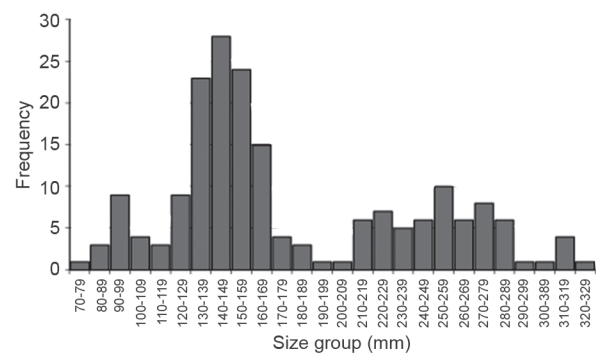


Fig. 6. Size frequency polygon of squids caught by hand jigging from Ratnagiri waters

140-149 mm (Fig. 6). The DML of *S. pharaonis* varied between 224 to 310 mm.

Samples of *L. duvauceli* from the landing centre were brought to the laboratory for further biological analyses. The 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 DML ranged from 70 to 310 mm with the corresponding weight ranging between 20 to 484 g. The food items in the gut were in well crushed and macerated condition, therefore it was possible only to categorise into groups. The Index of preponderance was estimated as suggested by Natarajan and Jhingran (1961). It was observed that, 78.6% of the stomachs were empty and they fed mainly on fish (96.8%) followed by prawn and squid (1.6% each). Maturity studies were carried out following Silas (1985) and it was found that 78.6% were in gravid condition, 7.1% in mature and 14.3% in immature condition.

Fecundity ranged from 1,640 to 2,870 numbers. The sex-ratio was observed to be 1:0.8.

Since the catch is extremely fresh, it fetches very high price and the fishery has become lucrative. Many fishermen are gradually getting engaged in squid jigging. The present observation reveals the emergence of a new fishery for cephalopods along the Ratnagiri coast in Maharashtra. In contrast to the cephalopod catch by trawl net, the present exploitation by jigs is highly selective and brings in comparatively larger sized cephalopods belonging to one species and the freshness of the catch makes it much more commercially viable. With the introduction of improved facilities such as introduction of powerful artificial light attracting systems, mechanisation of jigging operations, financial assistance as well as technical know-how to the fishermen *etc*, squid jigging fishery could contribute to enhanced cephalopod production from Maharashtra waters.