

## **Squid Jigging Technology**

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### **SUMMARY**

Squid jigging is a popular fishing technique used to catch squid, primarily for commercial purposes. The main species targeted for squid jigging in India is the Indian squid (*Loligo duvaucelii*), also known as the Asian common squid. It is a commercially important species due to its high demand in domestic and international seafood markets. Squid jigging involves using specialized lures called squid jigs, which are designed to mimic small fish or shrimp. The jigs typically have multiple barbed hooks and are attached to a fishing line. Anglers or commercial fishermen lower the jigs into the water and perform a rhythmic jerking motion to attract squid. When the squid attack the jigs, they get caught on the hooks. Squid jigging in India contributes significantly to the local economy, providing livelihood opportunities for fishermen and supporting the seafood industry.

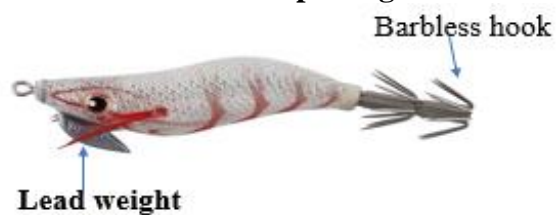
### **INTRODUCTION**

Squid jigger is specialized equipment for capturing squids with the help of light attraction; first developed in Japan during 14th century. 'Jig' is a spindle/prawn-shaped structure with barbless hooks fixed circularly on the rear side for easy access to the squids approaching the jig. Prawn shaped jig has a balancing counterweight in the front.

**Spindle-shaped Jig**



**Prawn Shaped Jig**



**Spindle shaped jig vs Prawn shaped jig**

Jigs of various types and colours were attached to the handline at an interval of 70 to 90 cm. Total of 8 to 12 jigs are attached on one line in the hand line, and many numbers are used in automatic squid jigging machine. The lines are lowered to a depth of 30 to 100 m depending on the strength of the lights used. The depth of operation of vessels ranges beyond 500 m for oceanic squids. It is important to keep the jig moving constantly in the water. This is usually done by jerking the line.

### **Squid jigging technology**

Technological aspects of squid jigging consist of

- Structure and parts of the squid jig
- Methods of squid jigging
- Principle of operation

### **Typical parts of a modern squid jigging line**

A modern squid jigging line typically consists of several components that work together to facilitate effective squid fishing. Here are the main parts of a squid jigging line:

**Main line:** The main line is the primary line which connects the fishing apparatus to the fishing vessel. The main line is made of monofilament which is strong and more durable. A typical jig consists of a shrimp or stalk-like body made up of flexible plastic with one to three hooks or more sharp barbless steel hooks at the end of the handline. It has rings at both ends (hook and stalk) that are joined by steel wire through which a jig is attached to the line. At the end of each line a 1.5 kg weight is attached. It is operated by jerking or moving up and down, which is otherwise called 'Jigging'.

**Parts of Squid Jig**



It consists of 7 parts such as Plastic Blank, 3D eyes, Jig weight, Plastic feather plugs, Feather, Jig hook.

After completion of fixing the parts

**Types of jigs**

There are two types of jigs that can be operated:

- (i) Local jigs
- (ii) Imported jigs - a) Jigs without LED light  
b) Jigs with LED light



Jigs without LED light



Jigs with LED light

**Methods of Squid Jigging**

Based on local fishing conditions, materials or devices assisting squid jigging, the four basic methods are as follows:

**Pole and line or handline jigging**

It consists of one line with a two branch lines with a jigs made of wood, steel, plastic or bamboo along with a sinker. The handline jigging unit (Vertical line) has 15 to 20 jigs at regular intervals on the mainline of 20 to 30 m in length and weight at the end of the handline.

**Hand-operated reel jigging**

A multipurpose vessel uses a handle on the drum to haul back the jigging lines. A wire mesh frame and outboard roller are the parts of the hand-operated jigging machine. It guides the dropped-out squids into a box on the vessel's deck or to a conveyor system.

**Serial jigging**

Serial jigging with a pole differs from a line or handline jig, which has several jigs in a single jigging line. Immediately the line is hauled when squid gets entangled with jigs. Each line has 20 to 30 jigs arranged in an adequate interval and the end is tied with a sinker.

**Automated jigging machine**

The machine operates two elliptical-shaped drums (hexagonal in shape) on one shaft and each central power steering unit. The machine is operated by either an electrical drive (220 volts) or a hydraulic drive, and about 1/2 hp (0.4kW) power is required for one jigging machine. Usually, an automated jigging machine has a 0.75-1 mm diameter jigging line equipped with 30 modern squid jiggers. The light-assisted squid jigging vessels with automated machines operate overnight in depths of 60 to 120 meters.

**Squid Jigging operation with accessories**

Modern squid jigging vessels have three basic accessories.

- Jigging machines
- Lights
- Sea anchors

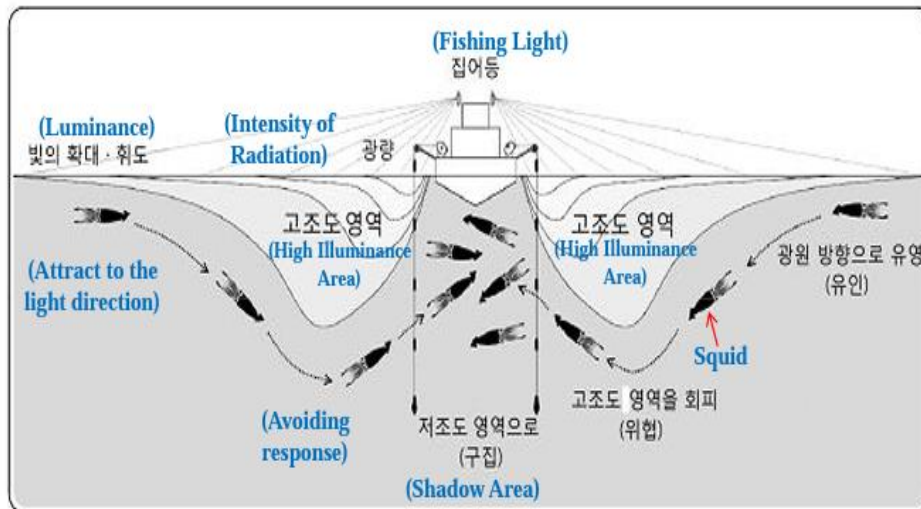
**Jigging machines**

A squid jigging machine is a specific type of jigging machine designed specifically for squid fishing. It automates the process of jigging a squid lure or jig in the water, attracting squids and increasing the chances of successful catch.

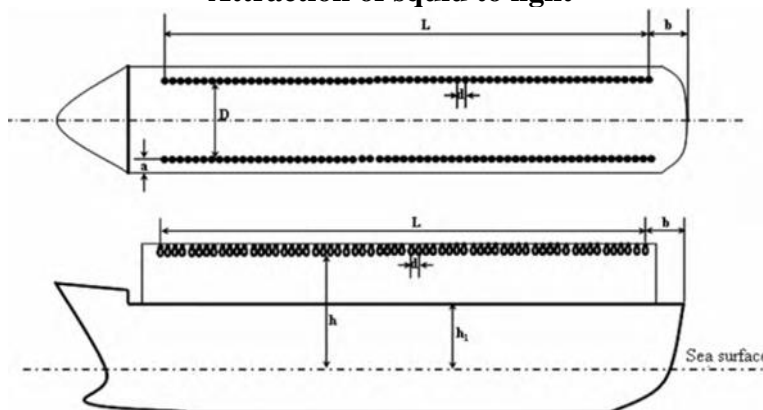
**Lights**

**Attraction response of squid to the light:**

Squids are generally attracted to light sources and exhibit positive phototaxis, when exposed to light, they tend to move towards the light source. Moreover, light can attract prey organisms such as small fish, crustaceans, and plankton which are an essential source for squids. Squids may be attracted to light sources as it increases the chances of encountering and capturing the prey. Light can simulate feeding behaviour in squids. It is observed that squids are more active and exhibit increased feeding activity during periods of increased light intensity.



**Attraction of squid to light**

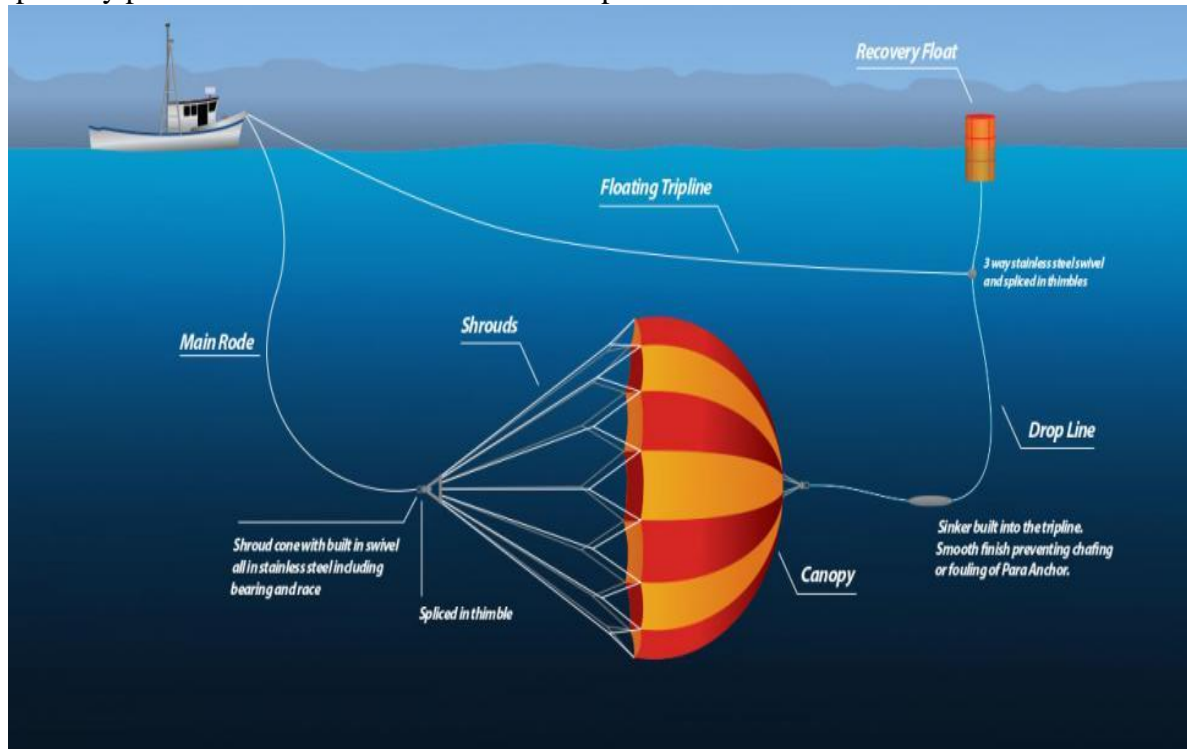


The height of the lamps ranges from 2.2 to 6.5m from the deck. The position of the lamps is above the vessel, rather than above the water, due to the behaviour of the squid, which aggregates in the boundary between the

shadow of the ship's hull and the lighted zone. For large industrial vessels, there must be 150 or more lamps with 2 KW per lamp. Visual sensitivity of the Japanese squid *Todarodes pacificus* has been reported as 482 nm by Matsui *et al.*, 2016. Japanese squid preferred a range of underwater illuminance of approximately 10 lux. Although squid moved toward the artificial light, they usually avoided the highly illuminated regions and often stayed in the shadow zone below the vessel which had low illumination, ranging from  $3 \times 10^2$  lux to  $3.4 \times 10^3$  lux have been reported by Inoue (1972); Choi and Arakawa (2001).

### Sea anchors

The sea anchor is a large parachute deployed off the bow or one side into the sea. It is kept steady in the water with the help of a sinker and floats along with a bridle using an additional warp. The size of the sea anchor depends on the size of the boat. In large vessels, the structure may have 20- 30 feet diameter. Strong weather, heavy rolling, and fast drifting of the boat will affect the efficiency of squid jigging. Rigging and the use of sea anchors, especially parachute anchors can minimize this problem.



### CONCLUSION

Squid jigging is a popular recreational activity and commercial fishing methods that involves using specialized lures called squid jigs to attract and catch squid. There is different type of squid jigs which differ in the machine used, parts and method. The cost of jigs needs to be improved, and technologies feasible for all levels of the fishing community in India and indigenous squid jigs can best achieve it. Cheap and low-cost technology in the field would improve the efficiency of squid jigging and can be enhanced squid jigging methods in India.

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