

## EFFECT OF SQUARE MESH COD-END IN DEMERSAL TRAWL OFF PARADEEP COAST FOR SUSTAINABLE FISHING

R. MISHRA AND K. NEELAKANTAN

See end of article for authors' affiliations.

Correspondence to :

**R. MISHRA**

Department of Fishery,  
Krishi Vigyan Kendra,  
Bhanjanagar, GANJAM  
(ORISSA) INDIA

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### ABSTRACT

Selectivity in demersal trawls was studied by comparing the catches of the conventional High opening Bottom Trawl (HOBT) with traditional diamond mesh cod end and the experimental gear of HOBT with square mesh cod end. Alternate trawling technique was used by maintaining similarity in towing direction, towing duration, speed and depth of operation to minimize possible errors between the gears. The results showed that the experimental gear caught less quantity of juveniles of quality fin fish and shell fish compared to that of conventional gear having diamond mesh in the cod end. The by-catch was also reduced considerably indicating that the new gear would be helpful for the better management of marine fishery resources.

**Key words :** Square mesh cod end, Demersal trawl, Orissa coast, Sustainable fishing

The by-catch landing in tropical countries like India is a serious problem in demersal shrimp trawling. The amount of by-catch accounts to 75% to 80% of total catch and of which about 40% consist of juveniles and those in early growth stages of commercially important fishes. These are generally discarded into the sea leading to the depletion of the resources (Pillai, 1998). In order to protect these resources, indiscriminate exploitation of juveniles, younger ones and sub-adults must be stopped and they must be allowed to escape from the net for maintaining the sustainability of the resources. This can be achieved by enhancing the filtering capacity of the trawl, which could be possible either by enlarging the mesh size or by preventing the closure of the lumen under tow. Thom (1977) reported that the shape and size of the net meshes affect the selectivity of the towed gear. Since the mesh size cannot be increased beyond a certain limit, the measure of maintaining square shape for the meshes in the cod end facilitates easy escape of smaller size groups and enhances the filtering capacity.

Investigations were carried out by many workers to study the effect of cod end mesh size on the catch (Panicker and Sivam, 1965 and Kunjipalu *et al.*, 1994). Gulland (1969) also suggested the method to find out the mean selection length ( $L_{50}$ ), which is proportional to the mesh size of cod end trawl. Although studies on square mesh cod end and also square mesh windows on cod end have been made by Halifax *et al.* (1987), Chen *et al.* (1991), Monaghan (1992), Kunjipalu *et al.* (1994) and

Varghese *et al.* (1996), the information on superiority of square mesh cod end over the traditional diamond mesh cod end in facilitating escapement are scanty. Therefore, the present study was undertaken to find out the suitability of square mesh cod end in demersal trawl for sustainable fishing.

### MATERIALS AND METHODS

Two high opening bottom trawls were designed equally as suggested by Bay of Bengal Programme (BOBP). They are having the cod ends, one the conventional diamond shape mesh and the other as square shape mesh, both with the mesh size of 30 mm stretched length, were fabricated using 1 mm diameter PE twine. Both the cod ends were covered with nylon webbing of 10 mm mesh size to study the extent of escapement as suggested by Gulland (1969). The length of Head Rope was 27.9 m while that of Foot Rope was 32.4 m. A pair of flat rectangular otter board each measuring 1500 mm X 750 mm and weighing 65 kg was used for the horizontal spreading of the net. Investigations were conducted from the trawler of Government of Orissa, M.V. ORIFISH (42ft LOA ; 148 hp) off Paradeep, North East coast of India during 2000.

Thirty comparative hauls were made with HOBT having diamond and square mesh cod ends by alternative tows under identical conditions. Details of catch composition and length statistics of predominant species, both in the cod end and cover were estimated from random samples, separately during each haul. Total weight of the catch was also recorded. Four fin fishes namely *Trichiurus lepturus*, *Nemipterus japonicus*, *Otolithus*