

On the Efficacy of a Platform in a Semi-pelagic Trawl

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Fishing performance of a 20m semi-pelagic trawl additionally equipped with a platform panel as a forward extension of lower belly, has been evaluated in this paper, based on comparative field trials with a control gear, from a 10.9m LOA wooden trawler (65 hp) in the waters off Mormugao. Significant improvement in the catch of quality fishes by 68.4% ($p < 0.05$), other fish categories by 92.2% ($p < 0.01$) and total landings by 86% ($p < 0.001$) has been obtained with the experimental gear with platform panel, compared to the control gear. Improved performance of the experimental gear is attributed to the effective prevention of downward escapement of fishes by the platform panel, during the fish capture process.

Attention has increasingly been focused on diversification of fishing methods and improvements in the existing trawl designs to enhance the catch per unit effort and to efficiently harvest the hitherto unexploited or underexploited finfish resources. In semi-pelagic trawling, the otterboards remain in contact with the bottom while the trawl operates at some distance above the ground. This technique has been found to be effective in harvesting fishes which aggregate just above the bottom and are generally not accessible to conventional bottom trawls with less vertical opening (Anon, 1987). Many successful attempts have been made by different workers to enhance the effectiveness of pelagic and semipelagic trawls (Larsson, 1964; Dickson, 1971; Mohr, 1971; Vijayan *et al.*, 1985, 1992).

Observations on fish behaviour in the vicinity of trawl gear has shown that many fish when it is within about 7 m of the approach of the trawl board, tend to evade this conspicuous object and those outside the track of the boards are lost while those inside are guided inwards by the boards, sand clouds and sweeps. Once the net and

foot rope come in sight, they turn forward to escape and swim in front of the foot rope (Anon, 1984). In this context, the attachment of a platform to the lower belly of a semi-pelagic trawl can be advantageous in preventing escape when the fish try to dive down. Attachment of a platform to the indigenous boat-seines may possibly be based on this behavioural aspect. The effectiveness of incorporating a platform to the lower belly of a trawl has not been evaluated in detail so far and the present study is an attempt to focus attention on this important aspect of gear design based on fish behaviour.

Materials and Methods

Design details of the experimental net with platform are given in Fig.1. The control net is identical in construction except that the platform is absent. A twenty meshes deep platform is attached as an extension of the lower belly of the trawl. Both the platform trawl and the control net were rigged with 20.5m double bridles and 1200x600 mm vertically curved otterboards (Sivan *et al.*, 1970). The investigations were carried out from a 10.9 m LOA wooden

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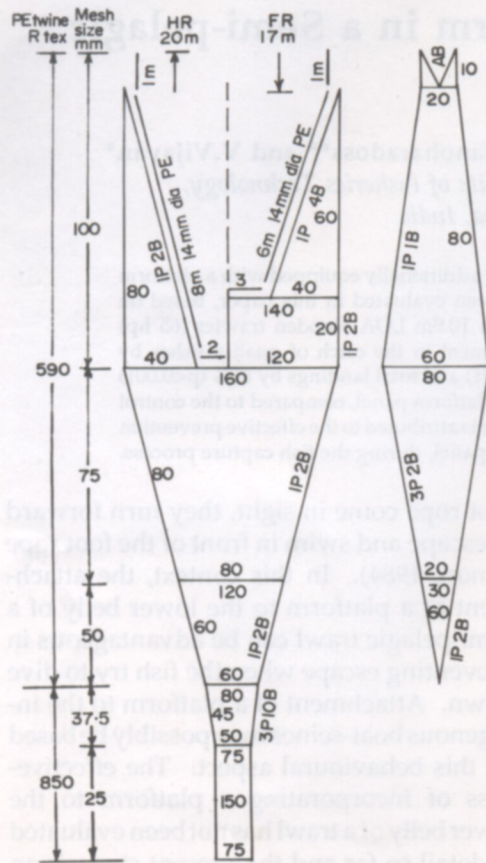


Fig. 1. 20 m platform trawl

trawler, Fishtech No.IV (65-85 hp at 1100-1300 rpm), during November 1987 to December 1989. The trawling operations were carried out in a depth range of 10 to 40m off Mormugao (Lat.15°25'-35'N and Long. 73°45'-58'E). Both the nets were towed for 1 h duration each and changed in regular rotation at successive hauls, keeping the various parameters such as fishing ground, depth of operation, scope-ratio and trawling speed constant so as to give both the nets equal chances. A total of fifty hauls were made using each net (total towing time: 50h) during the comparative fishing operations. Warp tension offered by the nets was estimated following the method suggested by Satyanarayana & Nair (1965).

Results and Discussion

The operational details are given in Table 1 and the comparative catch data are furnished in Table 2. The platform trawl landed a total catch of 2818 kg while the control net could catch only 1515 kg of fish.

Table 1. Particulars of comparative fishing operations

	Experimental gear	Control gear
No. of fishing trips	29	29
No. of hauls	50	50
Total towing time, h	50	50
Depth range, m	10 - 40	10 - 40
Warp, m	60 - 200	60 - 200
Towing speed, kn	2.5	2.5
Bridles, m		
upper	20	20
lower	20.5	20.5
Otter boards	Vertically curved, wood and steel construction, 1200x600 mm size	
Average warp tension, kg		
along current	522.5	512.5
against current	567.5	525.0

Table 2. Comparative catch details

Groups	Experimental gear		Control gear	
	Catch, kg	CPUE, kg.h ⁻¹	Catch, kg	CPUE, kg.h ⁻¹
Quality fishes	660.8	13.2	392.3	7.9
Other fishes	2157.0	43.1	1122.5	22.5
Total catch	2817.8	56.4	1514.8	30.3

Table 3. Results of statistical analysis using paired t- test

Groups	d	s	df	t-value
Quality fishes	0.2447	0.5136	28	2.566 *
Other fishes	0.2650	0.4095	28	3.485 **
Total catch	0.2606	0.2744	28	5.114 ***

*, **, ***, significant at 0.05, 0.01 and 0.001 levels, respectively

The percentage increase in the catching efficiency in respect of quality fishes, other fishes and total catch was 68.4, 92.2 and 86.0% respectively. An increase in total drag was noted in the platform trawl compared to the control net (Table 1).

Results of statistical analysis of the log-transformed catch data using paired *t*-test, are given in Table 3. The differences in the catch of quality fishes, other fishes and total landings between the platform trawl and control gear were found to be significant at 0.05, 0.01 and 0.001 levels, respectively.

It is evident from the results (Table 2 and 3) that the attachment of a platform in a semi-pelagic trawl is effective in preventing downward escape of fishes and thereby causing significant improvement in its fishing performance.

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