Large Mesh Trawl for Quality Fishes

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Comparative performance of two variants of a 20 m demersal trawl,
one with large mesh (300 mm) in the front sections but identical in
other design features was evaluated off Veraval, northwest coast of
India. Results indicated significantly better performance of the large
mesh 'sputnik' trawl compared to small meshed trawl, with respect
to catch of quality finfishes like pomfret and seer.

Key words: Large mesh demersal trawl, comparative performance,
quality fishes

The concept of using large meshes in the fore parts of trawls has been reported
by several workers (Kunjipalu *et. al.*, 1989; Pillai *et. al.*, 1979; Nayak and Sheshappa,
1993). Results of comparative fishing trials conducted off Veraval, northwest coast
of India, with two variants of a demersal trawl design of 20 m headline, one with
large mesh sputnik trawl (LMST) and other with small mesh sputnik trawl (SMST),
are presented in this paper.

Materials and Methods

Two 20 m demersal trawls named "sputnik trawl" of identical parameters except
for the difference in mesh size were designed and fabricated. Field trials were carried
out onboard Fish Tech No. 8, a 15.2 m OAL wooden vessel fitted with 165 hp engine.
A pair of 'V' form otter boards of size 1500 x 890 mm each weighing 125 kg described
by Kunjipalu *et. al.* (1984) were used in combination with 20 m double bridles. The
design details of the trawls are given in Figs 1 and 2, and Table 1. The two nets were
operated alternately during day under identical conditions keeping the depth, length of
warp, duration and speed of trawling constant. Details of catch were recorded separately
and analysed using paired t-test. Details of operations are given in Table 2.

Results and Discussion

Of the total pomfret catch of the two trawls LMST accounted for 74.7% and SMST
25.3%. Of the total seer catch 63.6% was landed by LMST and 36.4% by SMST
(Table 3). Statistical analysis using paired t test for some important fishes caught are
given in Table 4. Significant differences ($P<0.05$, df, n-1 = 13) were noted in the
case of quality fishes like pomfret and seer. Landings of other fishes did not differ
significantly.

So far, large mesh of size 120 to 240 mm have been tried in the fore parts of
demersal trawls in inshore waters (Kunjipalu *et.al.*, 1979; 1989; Nayak and Sheshappa,
1993). In the present investigation the mesh size was increased to 300 mm in the
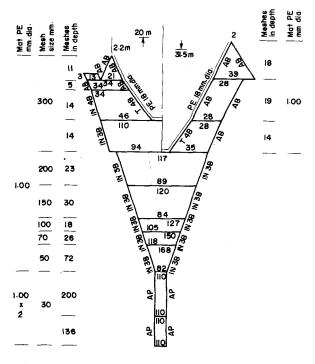
Mat PE mm. dia. | Mesh size mm. | Meshes in depth

20 m

2·2 m

31·5 m

2

AB
AB
AB
AB
AB
AB
39
28

11

3
5
34
34
34

21

PE 18 mm dia.

T 4B

IN 4B

PE 18 mm. dia.

AB

AB

28
28

Meshes in depth | Mat PE mm dia.

18

19 1·00

300   14

46
110

IN 3B

T 4B

AB

14

14

94

IN 3B

117

35

200   23

IN 3B

89
120

IN 3B

1·00

150   30

84

IN 3B

IN 3B

127

100   18

105

150

IN 3B

70   26

118

168

IN 3B

50   72

IN 3B

82
110

IN 3B

1·00
x
2   30   200

AP

AP

110
110

136

AP

AP

110

Fig. 1.   Design of large mesh sputnik trawl

Mat PE mm. dia. | Mesh size mm. | Meshes in depth

20 m

2·2

31·5 m

AB
AB
AB
118
105

53   100

41
6
17

51
81
132

AB
AB
AB

PE 18 mm. dia.

Meshes in depth | Mat PE mm. dia. | Mesh size mm.

80   52

132

IN 4B

T 4B

AB

71   1·00   80

173
553

PE 18 mm. dia.

105
140

60   70

IN 3B

469

T 4B

AB

470

175

70   60

IN 3B

AB

1·00

50   181

IN 3B

IN 3B

254   250
320   315

40   180

IN 3B

IN 3B

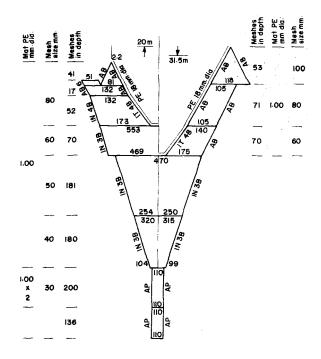104   99

1·00
x
2   30   200

110

AP

AP

110
110

136

AP

AP

110

Fig. 2.   Design of small mesh sputnik trawl

Table 1. Details of large mesh (LMST) and small mesh (SMST) trawls

	SMST	LMST
Wings (mesh size, mm)	110	300
	80	300
	60	300
Overhang (mesh size, mm)	60	300
Body (mesh size, mm)	50	300
	50	200
	40	150
		100
		70
		50
		30
Codend (mesh size, mm)	30	30
Other particulars		
Total No. of mesh	383687	119814
Material	HDPE	HDPE
Wt. of webbing, kg	33	16
Length of headrope, m	20	20
Length of footrope, m	31.5	31.5
Size of rope, mm dia	18	18
Size of bolch line, mm dia	6	6
No. of floats	13	11
Size of floats, mm dia	150	200
Link chain, GI(6 mm dia) kg	35	35

Table 2. Results of fishing with LMST and SMST

Particulars	LMST	SMST
Depth of operation, m	25-35	25-35
No. of days	14	14
No. of hauls	28	28
Duration, h	56	56
Catch, kg	1330	1424
Catch rate, kg/h	23.7	25.4

Table 3. Catch composition

Fish species	LMST Kg	%	SMST Kg	%
Pomfret	67.3	5.1	22.8	1.6
Seer	15.9	1.2	9.1	0.6
Squid	60.5	4.5	62.5	4.4
Lactarius	27.5	2.1	134.2	9.4
Silverbar	19.5	1.5	41.7	2.9
Sciaenids	54	4.1	63	4.4
Ribbonfish	170.5	12.8	360.5	25.3
Miscellaneous	915.1	68.8	730.6	51.3
Total	1330.3	100	1424.4	100

Table 4. Results of paired 't' test

Fish species	*t* value
Ribbonfish	0.833
Silverbar	0.932
Sciaenids	0.328
Squid	0.063
Lactarius	1.027
Pomfret	2.092*
Seer	2.529*
Miscellaneous	0.448
Total	0.387

* $p<0.05$; df, n-1 = 13

fore parts of the trawl. Results confirm the earlier findings that the use of large mesh in the fore parts of the trawl have a herding effect which guides the fish into the trawl in addition to other advantages like reduction in the drag and hence less fuel consumption (Nayak and Sheshappa, 1993).

Therefore it is concluded that sputnik trawl with large mesh can be used effectively to catch quality fishes like seer and pomfret. Even though it is observed that incorporating larger mesh in the fore parts of trawls results in an increase in catch of many finfish species, the optimum size of mesh that can be used in trawls operated in the inshore waters has not so far been systematically studied and standardised and hence needs further investigation.

References

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