Experiments with Polyethylene Yarn Gill Nets

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Experiments were conducted with polyethylene yarn gill nets in comparison with nylon twine gill nets used by artisanal fishermen at three centres in Cochin area. Catch details from the two types of nets are compared and it was found that polyethylene yarn can be considered as an alternate material for nylon twine in fine gill nets.

Nylon as multifilament twines form the commonest material for the fabrication of gill nets. Ratcliffe *et al.*(1978), Silas *et al.* (1984) refer to the use of monofilament for gill net fabrication. Pajot (1980), Radhalakshmi & Nayar (1985) and Pillai *et al.* (1989) have experimented with Polyethylene gill nets. Tangoose net (Anon 1981) operated along Tamil Nadu coast is an example of monofilament gill net.

The material used for indegenous gill net operated for sardines, mackerels and other small fishes in Cochin is nylon multifilament twines of size 210Dx1x2 and 210Dx1x3. In comparison with this indigenous nylon net, experimental fishing was done using polyethylene (PE) yarn gill nets and the results are presented as part of the multilocational testing of alternate material for nylon twines.

Material and Methods

Particulars of netting

Material size	Breaking load N	Mesh size	Meshes	Hanging coefficient
PE monofilament 0.268 mm	16.0	38.0 mm	2100x200	0.53

Particulars of floats, sinkers and rope

Material	Size	Number/ length m	Buoyancy/ weight g
Head rope PE	2.0mm	45	
Floats Plastic		35	420 each
Sinkers Cement		4	250 each

PE nets were operated along with indigenous nylon units. Sixty fishing trips were made from three centres during October- February from 1983-85. A maximum of 4 hauls were made on each day. The catch was recorded as weight/number in the three centres.

The characteristics of the materials were determined prior to fabrication, and presented.

Results and Discussion

The characteristics of PE yarn used for the experimental gill net are as under:

Table 1. *Properties of PE yarn, nylon twine*

	PE yarn	Nylon twine
Size	0.268 mm	210D x 1 x 2
Rtex	59	53
Breaking load N	16	25
Elongation %	36.00	28.50
Meshes/kg	26,500	21,000
Cost of webbing/kg Rs.	200/-	210/-

Catch composition and total catch at the three centres are given in Table 2

Table 2. *Results of fishing operations*

Centre	No. of operation	catch PE net	Nylon net	total
I	30	161.5 kg	190.0 kg	351.5 kg
II	13	62.0 kg	115.5 kg	177.5 kg
III	17	4213 Nos.	3571 Nos.	7784 Nos.

The results are analysed by ANOVA and the F-values caluculated are given in Table 3.

Table 3. *Analysis of data on fishing operations*

Centre	I	II	III	I	II	III
	Between nets			Between days		
df	1,29	1,12	1,16	29,29	12,12	16,16
F calculated	2.22	7.46	3.69	5,17	4.96	20.92
F Table	4.18	4.75	4.99	1.85	2.69	1.35

Nylon twines were stronger than PE yarns, but not much damage was observed after the operations in the case of latter net also. The results indicate there is no significant variation between nets at centres I & III at 5% level. Between days variations were significant at all centres and between nets and centre II, where the minimum number of operations were carried out.

Some of the attributes for a good gill net material are softness, pliability and invisibility under water and nylon twines are cited as the softest material by Klust (1973) Visibility as determined through under water observations shows that only knots of PE nets were visible while nets of nylon were clearly visible. (Steinberg, 1964). Thus, PE yarn and nylon possess one of the desirable attributes for a gill net material accounting for equal efficiency. The number of meshes that can be fabricated out of the materials are equal, so also the cost.

Results of experimental fishing with PE yarn suggest that the material can be considered for the fabrication of fine gill nets. The findings are in conformity with the observations made by Pillai *et al.* (1989).

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