

# STUDIES ON THE EFFECTIVENESS OF CERTAIN CHEMICAL PRESERVATIVES ON COTTON TWINES

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## INTRODUCTION

EVEN THOUGH chemical fish net preservatives are extensively used in many countries of the temperate region their use in India seems to be restricted to the States of Gujerat and certain regions of West Bengal (Kuriyan and Nayar, 1961). Experiments conducted earlier to evaluate the effectiveness of some of the imported chemical preservatives on cotton (Miyamoto and Shariff, 1959), sunn-hemp (George and Radhalakshmy, 1962), Sisal (Nayar *et al.*, 1962), and Manila (Nayar and Naidu, 1962) have indicated that these are relatively ineffective. In the present series of experiments the effectiveness of some of the chemical preservatives produced within the country are discussed.

## MATERIAL AND EXPERIMENTAL PROCEDURE

The cotton twines used for the study were of specifications Ne 20 (Tex 30); 3 ply; 18 yarns, Mass 0.619 gm./metre, Inner twist 12.2 turns per inch and Outer twist 6.7 turns per inch.

The chemical preservatives tried were:

- (i) Commercial fish net preservative A.
- (ii) Commercial fish net preservative B.
- (iii) Creosote 40.
- (iv) Coal-tar + Kerosene (3 : 1).
- (v) Coal-tar + Creosote (3 : 1).

Five bundles of twines each consisting of 44 pieces and 6' in length were taken and treated in different preservatives by immersing them for ten minutes. The volume of solution prepared in each case was five times the

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weight of the bundle. After immersion the bundles were taken out, the excess preservative allowed to drain off and dried completely in shade. The weight of the bundles before and after treatment was recorded. The respective breaking strength (wet condition) of the treated and untreated (control) twines was also determined prior to their immersion in the Cochin backwaters. The strength of the twines after immersion was tested at regular intervals of three days.

### RESULTS

The percentage impregnation of the different preservatives on the basis of weight before and after treatment as well as their effectiveness are shown in Table I.

TABLE I

*Showing the percentage impregnation and effectiveness of different preservatives*

Name of preservative	% Impregnation	Effective days	Effectiveness $e = b/a$
Control (untreated)	..	10.6 (a)	1.00
Commercial fish net preservative A	42.9	8.4 (b)	0.79
Commercial fish net preservative B	51.5	9.9 (b)	0.93
Creosote 40	3.7	12.0 (b)	1.13
Coal-tar Kerosene (3:1) ..	58.6	27.0 (b)	2.54
Coal-tar Creosote (3:1) ..	60.8	29.0 (b)	2.73

*The course of rotting of the treated twines.*—The course of rotting of the twines after continuous immersion is indicated in Fig. 1. Let  $S_0$  denote the original breaking strength of each of the treated and untreated twines in the wet condition and  $S$  the breaking strength of each twine after  $n$  days of immersion. Then  $S/S_0$  shows the ratio of breaking strength after  $n$  days. The value  $S/S_0$  is shown in the Y-axis and  $n$  the number of days on the X-axis in the figure.

The temperature of the backwaters where the twines were immersed is shown in Table II.

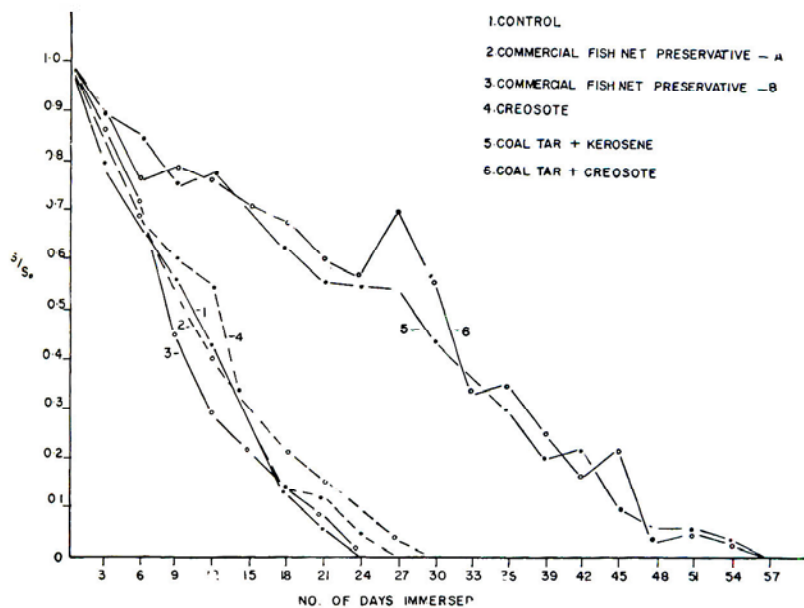


FIG. 1. Course of rotting of twines under continuous immersion.

TABLE II

Showing the temperature of the backwater during the course of the experiments

Period	Temperature of water in ° C.		
	Average	Maximum	Minimum
December 1960			
Second fortnight ..			
17-12-1960			
to			
31-12-1960	29.45	30.1	28.8
January 1961			
First fortnight ..			
2-1-1961			
to			
16-1-1961	29.5	30.1	28.9
Second fortnight ..			
17-1-1961			
to			
31-1-1961	29.7	30.2	29.2
February 1961			
First fortnight			
1-2-1961			
to			
15-2-1961	30.6	31.3	30.3

## DISCUSSION

*Percentage impregnation.*—It will be apparent from Table I that the percentage impregnation was lowest in the case of Creosote while it was highest for Coal-tar-Creosote combination.

The nature of impregnation of these preservatives follows more or less a similar pattern to what was observed for cotton with imported preservatives (Miyamoto and Shariff, 1959).

*The course of rotting of treated twines.*—It will be obvious from Fig. 1 that the progress of rotting of twines treated with Commercial Fish net preservative A, Commercial Fish net preservative B, and Creosote is rapid compared to twines treated with Coal-tar + Kerosene and Coal-tar + Creosote combinations.

*Effectiveness of preservatives.*—The effectiveness of the various preservatives was determined on the criterion of the time taken by the untreated and treated twines to lose half their original breaking strength. If  $a$  and  $b$  denote respectively the time taken by the treated and untreated twines to reach the 50% level of their original breaking strength, then the effectiveness  $e$  of the preservative can be represented by the formula  $e = b/a$  (Nayar *et al.*, 1962; Nayar and Naidu, 1962). The values of  $a$  and  $b$  are calculated from Fig. 1 and the effectiveness  $e$  for each preservative is shown in Table I. It will be evident from Table I that Commercial Fish net preservatives A and B can be considered as ineffective whereas Coal-tar + Creosote combination and Coal-tar + Kerosene combination treatments seem to be fairly effective.

## SUMMARY

The effectiveness of four varieties of chemical preservatives on cotton twines has been studied.

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REFERENCES

- George, N. A. and Radha-  
lekshmy, K. 1962 Preliminary studies on the preservation of sun-hemp fishing  
net twines (In press).
- Kuriyan, G. K. and Nayar, S.  
Gopalan. 1961 **Common Indian fishing gear preservatives—A general  
account.** *J. Asiat. Soc. Bengal*, 3 (1), 21-37.
- Miyamoto, H. and Shariff, A. T.  
1959 Experiments on fishing net preservation. *Indian J. Fish.*,  
6 (1), 145-85.
- Nayar, S. Gopalan, George, N. A.  
and Narayanan, K. P. 1962 Studies on the preservation of sisal twines (In press).
- and Naidu, R. M.  
1960 A note on the preservative qualities of certain indigenous  
preservatives on coir twines. *Sci. and Cult.*, 26 (6),  
271-72.
- , 1962 Studies on the preservation of Manila twines (In Press).