

STUDIES ON THE EFFICACY OF CHEMICAL PRESERVATIVES ON COIR TWINES

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INTRODUCTION

ALTHOUGH certain studies have been made on the dynamic characteristics of coir twines as a fishing gear material (Nayar, 1959; Kuriyan and Radhakshmy, 1961) the information on the methods of preservation of this important vegetable fibre twine is scanty. Nayar and Naidu (1960) while studying the effectiveness of certain methods of tannin preservation on coir have indicated the importance of such studies. The present communication is a continuation of the work done by Nayar and Naidu (*op. cit.*); the efficacy of some of the popular chemical preservatives on this material are discussed.

EXPERIMENTAL METHODS AND PROCEDURE

The material used for the study was "Special Mangaden", a variety of coir twine having the same specifications as those used by Nayar and Naidu (*op. cit.*). The chemical preservatives were:

1. Garnol + Kerosene (1:3)
2. Cunimine - Kerosene (2:3)
3. Brown Cuprinol
4. B.C. Green Cuprinol
5. Standard Green Cuprinol
6. Marstein
7. Cunilate.

The samples of twines were immersed in the respective solutions for about 20 minutes and after draining off the excess preservative, were dried in shade. The amount of solution prepared in each case was 6 times the

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weight of the twines to be treated. After determination of the percentage impregnation of the different preservatives and the initial breaking strength, the twines were subjected to continuous immersion in Cochin backwaters. The breaking strength of the immersed twines was determined at regular intervals of 20 days. The temperature of the water where the twines were immersed was also recorded daily.

RESULTS

1. *Percentage impregnation of the preservatives.*—The percentage uptake of the various preservatives are indicated in Table I. The percentage uptake of the preservatives was calculated on the basis of the differences in weight of the twines before and after treatment.

TABLE I

Showing the percentage impregnation of the different preservatives

Name of preservatives	Weight in gm.		% Impregnation
	Before treatment	After treatment	
Garnol + Kerosene (1 : 3)	33.54	51.24	42.7
Cunimine + Kerosene (2 : 3)	31.84	37.71	18.4
Brown Cuprinol	32.28	45.96	11.1
B.C. Green Cuprinol	31.18	45.20	44.9
Standard Green Cuprinol	35.86	40.84	13.8
Marstein	36.08	49.95	27.3
Cunilate	32.94	38.70	17.4

2. *Breaking strength of twines after continuous immersion.*—The percentage breaking strength of twines after continuous immersion is represented in Fig. 1.

The temperature of the water where the twines were exposed did not vary very much during the period of investigation, *i.e.*, August 1960 to March 1961. The variation observed was between 28° and 32° C.

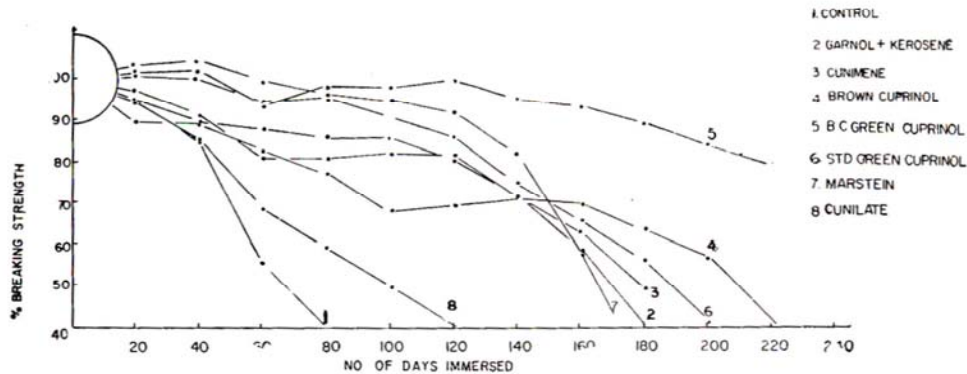


FIG. 1. Showing the percentage retention of breaking strength of treated and untreated twines under continuous immersion in the backwaters.

DISCUSSION

1. *Percentage impregnation of preservatives.*—Among the preservatives studied the percentage impregnation was lowest in the case of Brown Cuprinol and highest in the case of B.C. Green Cuprinol. It is interesting to note that the nature of impregnation of the different preservatives is more or less similar to that of cotton (Miyamoto and Shariff, 1959), sunn-hemp (George and Radhalakshmy, 1961), sisal (Nayar *et al.*, 1960) and manila (Nayar and Naidu, 1961).

2. *Breaking strength of treated twines.*—An examination of Fig. 1 would show that twines treated with B.C. Green Cuprinol deteriorated at a slower pace when compared with those treated with other preservatives. It is significant to mention that these preservatives exhibited a similar effectiveness as on sunn-hemp (George and Radhalakshmy, 1961), sisal (Nayar *et al.*, 1960), and manila (Nayar and Naidu, 1961).

The basis for evaluating the effectiveness of the preservatives is similar to the method outlined by Nayar and Naidu (1960, 1961) and Nayar *et al.* (1960). The effectiveness of the different preservatives are shown in Table II.

It has already been mentioned that the preservative effects of these chemical preservatives on coir twines are similar to those observed on sunn-hemp, sisal and manila. This inference confirms the fact that the preservative effects of chemical preservatives are almost similar irrespective of the difference in the vegetable fibre gear materials. It must however be mentioned that according to Miyamoto and Shariff (1959) these preservatives are little effective on cotton twines while Clague and Dattigaling (1950) maintain

TABLE II
Showing the effectiveness of the various preservatives

Names of preservative	No. of days by which the twines lost half their original breaking strength	Effectiveness $e = b/a^*$
Control (untreated) ..	66 (a)	1.00
B.C. Green Cuprinol ..	220* (b)	3.3*
Brown Cuprinol ..	208 (b)	3.16
Standard Green Cuprinol ..	188.5 (b)	2.85
Cunimine + Kerosene (2:3)	178.7 (b)	2.70
Garnol + Kerosene (1:3) ..	169.7 (b)	2.57
Marstein ..	165.7 (b)	2.51
Cunilite ..	100.5 (b)	1.52

*a—Number of days by which untreated twine reached 50% of breaking strength.

b—Number of days by which treated twine reached 50% of breaking strength.

e—Effectiveness of preservative.

that they were highly effective on cotton twines in Philippine waters. Nayar and Naidu (1960), based on their experiments on the preservation of coir twines, have observed that tannin + coal-tar treatment enhances the life of coir webbings and ropes by nearly three times. The present studies indicate that the same degree of effectiveness can be imparted to the twines by these chemical preservatives especially by the Cuprinol group of preservatives. The treatment of twines with these preservatives has apparently the added advantage of enhancing the life of the gear without unnecessarily increasing the weight as is the case of tannin + coal-tar treatment.

According to Burdon (1955), however, chemical preservatives containing copper compounds should be avoided in the tropics as "strong sunlight rapidly decomposes these preservatives, rendering them ineffective". Hence further tests on the resistance of these preservatives to sunlight are necessary for deciding their suitability in the tropics.

SUMMARY

The effectiveness of seven chemical preservatives on coir twines have been evaluated on the basis of continuous immersion tests.

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