# IMPREGNATION OF ROT-RETARDING PRESERVATIVES BY EGYPTIAN COTTON NETTING TWINES

*By*

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## INTRODUCTION

This work is carried out in an attempt to give further bases for the evaluation of the different preservatives used with cotton netting twines. The percentage impregnation with the respective preservative and the degree of water absorption by the treated twines are investigated. This latter has much to do as far as the efficiency of the fishing operation is concerned.

## MATERIALS AND METHODS

Egyptian cotton twines of different thicknesses are treated with various preservatives following the technique mentioned by koura (1963). The degree of impregnation is calculated in each case as the percentage increase in weight of the treated twines with reference to its weight before treatment.

As for the estimation of the degree of water absorption, it is calculated as percentage increase in weight from *the dry weight* of the already treated twines :

$$\text{Water Absorption } \% = \frac{\text{Wet weight} - \text{Dry weight}}{\text{Dry weight}} \times 100 \text{ (Lal, 1969).}$$

## RESULTS

*A— Percentage impregnation :*

Table (1) includes the percentage impregnation with cutch fixed with copper sulphate and with the same plus coal tar, for Egyptian cotton netting twines of different thicknesses.

Table (2) includes similar results using potassium dichromate instead of copper sulphate for the fixation of cutch.

Table (3) and figure (1) demonstrate a study of the variation in the percentage in crease in weight of 10 types of Egyptian cotton netting twines treated exclusively with coal tar.

The following conclusions can be drawn :

(1) Comparing the percentage impregnation with cutch fixed with copper sulphate and with cutch fixed with potassium dichromate for Egyptian cotton netting twines, it is clear that the values are higher in the case of the later fixative (from 30.5 to 38 percent compared with values from 19.0 to 25.0 percent - with only one exception of 31.4 - in the case of copper sulphate). This may be the explanation of the higher

efficiency of cutch fixed with potassium dichormate as preservative for cotton twines immersed in sea water (see Koura, 1963). These results support the opinion of Klust (1952) who referred the relative high efficiency of preservation methods containing chromium, to that the surface of the fibre becomes completely covered with the preserving agent that have the quality, besides destroying germs, of strong adhesion.

(2) Coating the twines preserved with fixed cutch, with diluted coal tar produced a percentage increase in weight within a range from 83.3 to 139.3 percent in case of copper sulphate and a range from 122.2 to 148.3 percent in case of potassium dichromate.

As a matter of fact retreatment of fixed tanned net-twines with coal tar gave a noticeable imporovement in the efficiency of this preservative (Al-Sayes, Botros & Koura, in press). Farrar (1949) stated that this treatment is very effective in protection of the gear against bacterial action, abrasion and weathering.

(3) As for the treatment with diluted coal tar alone, it is exclusively a matter of an increase in weight rather than of impregnation. Within this range of percentage increase in weight (from about 67.0 to 103.0%) the increments increased comparatively fast at first then slowed down considerably after a certain twine-thickness (Ne 20/4).

Exclusive treatment with diluted coal tar as a preservative gave poor results as far as efficiency is concerned. (Al-Sayes,Botros and Koura, in press). According to Klust (1952) these poor results can be referred to the low degree of cohesion to the fibres ; although deposited in a thick layer on the surface of the yarn, it fails to cling to each individual fibre without leaving gaps, and are therefore considerably less effective than special tanning.

The better performance noticed in the application of coal tar to twines treated with fixed cutch can be due to the fact that its water-repelling character acts to protect the already effective fixed cutch, adding to its efficiency.

*B. — Absorption of water by treated twines :*

Table (4) includes the degree of absorption of water by cotton twines treated by various preservatives. For the sake of comparison, absorption of water by untreated cotton twines is included.

The following facts can be deduced from this table :

(1) Treatment of cotton twines generally decrease their absorption to water.

(2) The decrease in the degree of absorption is not strongly felt as far as treatment with cutch fixed with either copper sulphate or potassium dichromate is concerned. In case of coating the twines with coal tar, on the other hand, the degree of absorption dropped considerably. This can be referred to its water-repelling character.

This result is demonstrated in figure (2), for twine 20/12 taken as an example.

Yet it has to be taken into consideration that the degree of water absorption is calculated as the percentage increase in weight from the dry wlight of the already treated twines in each case. As a matter of fact, treatment with coal tar, although has more or less water-proofed the twines, it has however already added considerably to the weight of the untreated twines, which is a disadvantage strongly felt during field operations.

TABLE 1.—The percentage impregnation of cotton netting twines with cuth fixed with copper sulphate.

| Serial No. | Ne | (a) — Cutch + Cu SO 4 | | | (b) — + coal tar | |
|---|---|---|---|---|---|---|
| | | initial weight | wt after treatment | % impreg— nation | wt after treatment | % impreg— nation |
| 1 | 120/6 | 0.90 | 1.10 | 22.2 | 1.65 | 83.3 |
| 2 | 80/6 | 1.20 | 1.50 | 25.0 | 2.45 | 104.1 |
| 3 | 60/6 | 1.75 | 2.30 | 31.4 | 3.80 | 117.1 |
| 4 | 20/6 | 3.95 | 4.90 | 24.0 | 8.65 | 119.0 |
| 5 | 20/8 | 5.40 | 6.60 | 22.2 | 12.55 | 132.4 |
| 6 | 20/9 | 4.20 | 5.10 | 21.4 | 10.05 | 139.3 |
| 7 | 20/16 | 6.55 | 7.80 | 19.0 | 14.60 | 123.7 |

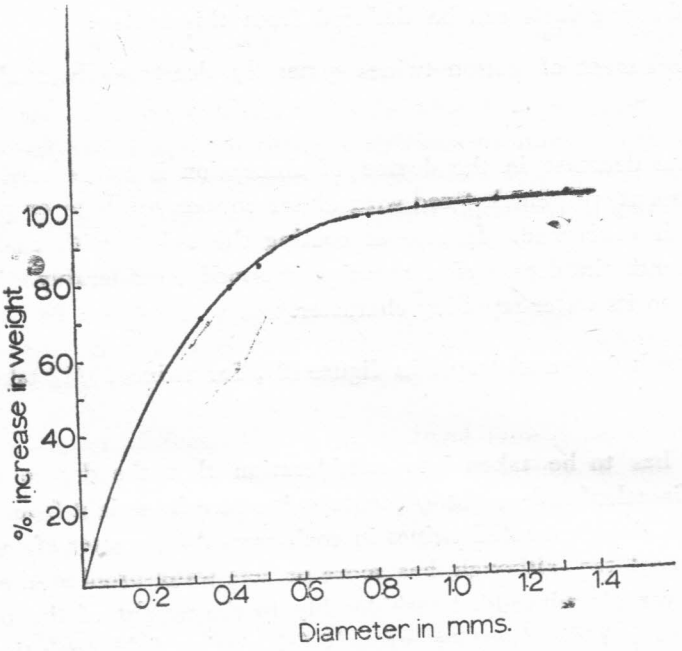


FIG. 1.—Percentage increase in weight of 10 types of Egyptian cotton netting twines treated eclusively with coal tar.

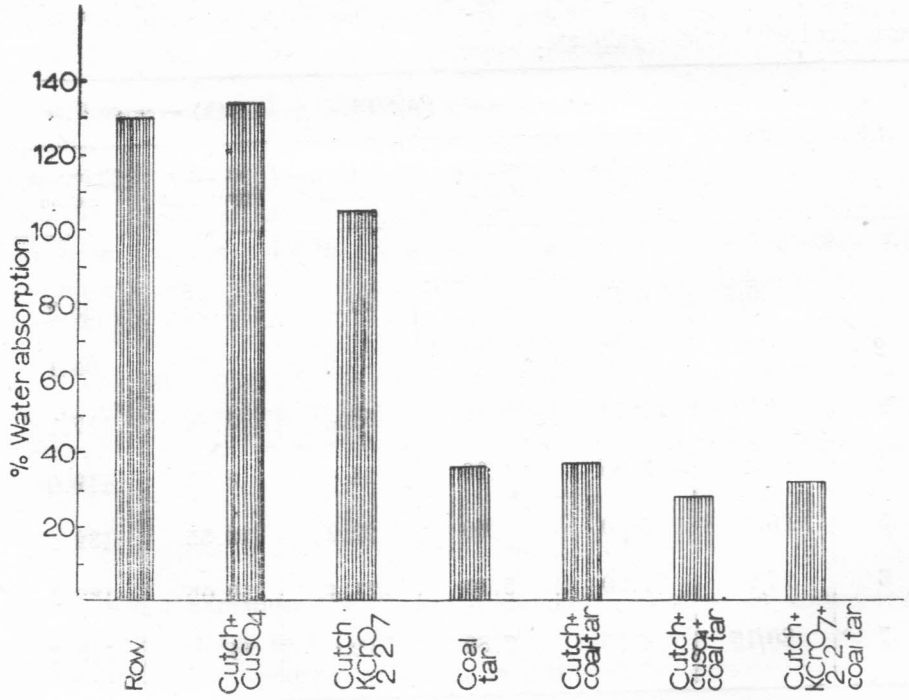


FIG. 2.—Absorption of water by Egytptian cotton netting twines 20/12 treated by various preservatives.

TABLE 2.—The percentage impregnation of cotton netting twines with cuthc fixed with potassium dichromate

| Serial number | Ne | (a) - Cutch + $K_2 Cr_2 O7$ | | | (b) - + coal tar | |
|---|---|---|---|---|---|---|
| | | initial weight | wt. after treatment | % impaeg impregnation | wt. after treatment | % impregn-ation |
| 1 | 50/9 | 2.45 | 3.30 | 34.7 | 5.60 | 128.6 |
| 2 | 20/4 | 2.90 | 4.00 | 38.0 | 7.20 | 148.3 |
| 3 | 20/12 | 7.20 | 9.40 | 30.5 | 16.0 | 122.2 |

TABLF 3.—The percentage increase in weight of 10 types of Egyptian cotton netting-twines treated with coal tar.

| Serial Number | Ne | Initial weight | Wt. after treatment | % increase in weight |
|---|---|---|---|---|
| 1 | 120/6 | 0.90 | 1.50 | 67.00 |
| 2 | 80/6 | 1.20 | 2.05 | 70.84 |
| 3 | 60/6 | 1.45 | 2.60 | 79.30 |
| 4 | 50/9 | 2.50 | 4.60 | 84.00 |
| 5 | 20/4 | 2.80 | 5.40 | 92.86 |
| 6 | 20/6 | 3.00 | 5.40 | 80.00 |
| 7 | 20/8 | 5.40 | 10.60 | 96.30 |
| 8 | 20/9 | 4.27 | 8.50 | 99.08 |
| 9 | 20/12 | 7.30 | 14.85 | 100.68 |
| 10 | 20/16 | 6.80 | 13.80 | 102.92 |

TABLE 4.—The degree of absorption of water by cotton tiwnes treated by various preservatives

(expressed as the percentage increase in weight to the initial weight)

| Serial number | Ne | Row | Preservative | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Cutch + Cu $SO_4$ | Cutch + $K_2Cr_2O7$ | Coal tar | Cutch + Coal Tar | Cutch + $CuSO_4$ + Coal Tar | Cutch + $K_2Cr_2O7$ + coal tar |
| 1 | 120/6 | 179 | 123 | 97 | 45 | 63 | 42 | 58 |
| 2 | 80/6 | 180 | 160 | 92 | 38 | 48 | 43 | 54 |
| 3 | 60/6 | 206 | 139 | 107 | 26 | 54 | 29 | 41 |
| 4 | 50/9 | 153 | 145 | 102 | 35 | 48 | 28 | 29 |
| 5 | 20/4 | 180 | 177 | 143 | 38 | 43 | 32 | 33 |
| 6 | 20/6 | 154 | 144 | 114 | 46 | 48 | 147 | 29 |
| 7 | 20/8 | 131 | 153 | 125 | 36 | 41 | 22 | 30 |
| 8 | 20/9 | 153 | 145 | 46 | 36 | — | 24 | 31 |
| 9 | 20/12 | 130 | 134 | 105 | 36 | 37 | 28 | 32 |
| 10 | 20/16 | 135 | 131 | 119 | — | 31 | 26 | 29 |

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