

Dyeing Property of Raffia

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1. INTRODUCTION

Recently, plant fibers find increasing use in diverse field [1,2]. Raffia which is obtained from the leaf of raffia palm is used as interior accessories and dry goods. Few papers are available on the dyeing property of raffia.

In this work we examined dyeing property of raffia using direct dyes, such as Sirius Yellow GC (SY) and Chicago Sky Blue 6B (CSB). The dye uptake on Raffia was compared to those on cotton and hemp fabric.

2. EXPERIMENTAL

Raffia was treated in an aqueous solution with a liquor ratio 100:1 containing 0.2 wt% sodium dodecyl sulfate (SDS) at 70 °C for 30 min, rinsed and dried. The direct dyes used were Sirius Yellow GC and Chicago Sky Blue 6B which were commercially available and purified before use. Dyeing of raffia was carried out with dye bath containing sodium sulfate (0-50 wt %) and the dye (10-100 %o.w.f.) with liquor ratio 100:1. The dyed samples were rinsed with water, and dried. The dye adsorbed on the raffia was extracted with 20 % aqueous pyridine solution to determine the concentration by using a UV-visible spectrophotometer.

3. RESULT AND DISCUSSION

Fig. 1 shows SEM micrographs of surface of raffia, which exhibited the cellular structure of the fiber. As shown in Fig. 1 impurities were removed by the treatment with SDS.

The effect of auxiliary on the dye uptake was examined. As shown by Fig.2 the CSB uptake increased with increasing concentration of sodium sulfate, reaching a maximum at the concentration of the auxiliary of 20 wt%. SY gave maximum dye uptake at the auxiliary concentration of 20 wt%. The maximum dye uptake of SY was 4 times higher than that of CSB. Increase of the concentration above 20 wt% resulted in salting-out of the SY.

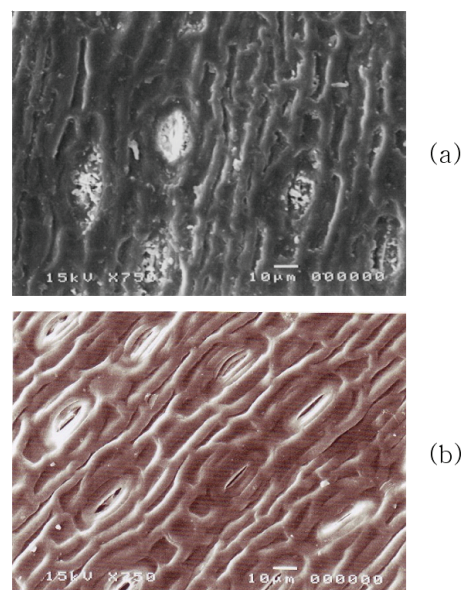


Fig. 1. SEM micrographs of surface of raffia. (a) Untreated , (b) treated with SDS.

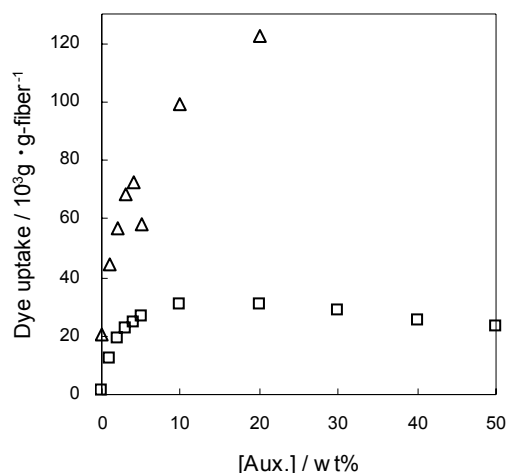


Fig. 2. Relationship between the concentration of auxiliary and dye uptake. [Dye]=20 % o.w.f.; liquor ratio=100:1; 100 °C, 60 min; Δ SY, \square CSB

The adsorption isotherms of the dyes on raffia are shown in Fig.3. With increasing concentration of CSB the dye uptake gradually increased, reaching

equilibrium at 50 %o.w.f. SY did not reach equilibrium up to the solubility limit around 100 % o.w.f.

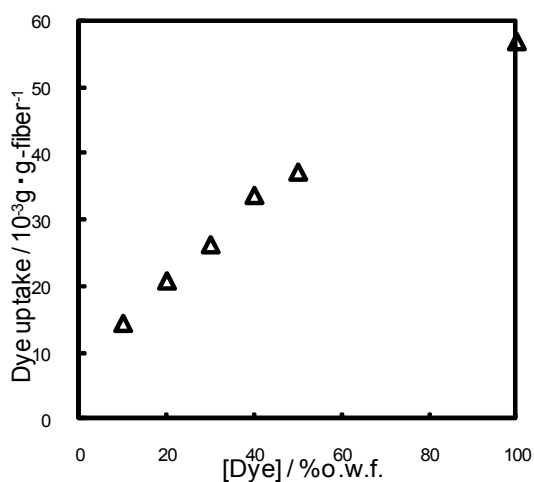
On raffia, SY gave dye uptake 4 times higher than those on cotton and hemp. CSB gave almost the same amount of dye uptake as those on cotton and hemp.

4. CONCLUSIONS

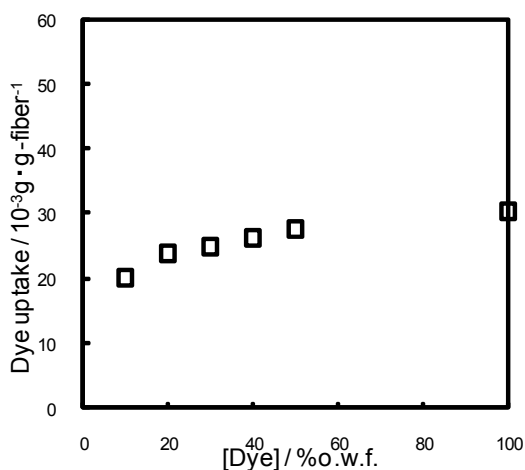
SY gave higher dye uptake than CSB. The dye uptake increased with increasing concentration of sodium sulfate, reaching a maximum at the concentration of the auxiliary of 20 wt%. On raffia, SY gave dye uptake 4 times higher than those on cotton and hemp.

5. REFERENCES

- [1] C. E. Tayag, Y. Hatakeyama, *Fiber* **47**, 434 (1991)
- [2] Y. Cao, S. Shibata, I. Fukumoto, *Proc. Of 2005 Int. Conf. Adv. Fibers Poly. Mat.* (Shanghai, 2005) p.439



(a) SY



(b) CSB

Fig. 3. Relationship between the concentration of dye and dye uptake.

(a) SY [Aux.]=0.1 wt%,

(b) CSB [Aux.]=15 wt%, Liquor ratio=100:1 ; 100 OC, 60 min.