Wrapping Paper From Acacia Nilotica SSP Indica

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Pilot plant scale experiment on suitability of **Acacia nilotica** *for wrapping paper using sulphate pulping has been discussed. Unbleached pulp yield was 46.5 percent on oven dry chips. Runnability of pulp on the paper machine was good. Wrapping paper produced on pilot plant had strength properties comparble with kraft paper grade II as given in I.S. No. 1397–1960 of Indian Standard Institution.*

Introduction

Acacia nilotica ssp. indica is native of India M/s. Seshasayee Paper and Boards Ltd., Erode[1] has reported that a mixture containing 50% Bamboo and remaining *Eucalyptus* hybrid *Erythrina suberosa* and *Acacia nilotica* gives satisfactory paper properties. In an earlier publication[2] it has been reported that *A. nilotica* contains 0.85 percent ash, 16.05 percent pentosans, 20.8 percent lignin and 75.61 percent holocellulose The average fibre length of *A. nilotica* is 1.23 mm and average fibre diameter is 15 microns. Laboratory pulping indicates its suitability for paper and rayon grade pulps using sulphate and prehydrolysis sulphate process. The strength properties of standard sheets when pulped using 18 percent total chemicals, 25 percent sulphidity, 1:4 material to liquor ratio for 4 hours at 162 C as reported are given below—

(a) Breaking length, Km. —8.59
(b) Burst Factor —42.4
(c) Tear Factor —118.8

As the laboratory results were encouraging a pilot plant scale experiment was conducted to produce wrapping paper from *A. nilotica*. The results are recorded in this article.

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Raw Material

About 5 tonnes of *A. nilotica* was obtained from Salem Division, Salem. Tamilnadu. The wood was debarked. The moisture content of the wood as received was 25 percent. The debarked logs were chipped in a four knife chipper and screened. The screened chips were used for the experiment.

Production of Pulp

Screened chips were loaded in a 11.2 cubic metre indirectly heated forced cirulation type mild steel digester. The digestion was carried out using following conditions :

(a) Total chemical as NaoH, % on oven-dry chips 18
(b) Sulphidity, % 25
(c) Material to liquor ratio 1:4
(d) Digestion period, (This includes 1.5 hours to raise the temperature of the contents to maximum temperature), hour 4
(e) Maximum temperature, °C 162

After the digestion pulp was blown at 2.8 Kg per sq. cm. pressure into a blow tank. The pulp was passed over a coarse screen, sand table and washed over Kamyr filter. The unbleached pulp yield was 46.5 percent on oven-dry chips and the rejects were 2.7 percent on oven-dry chips. The Kappa Number of the pulp was 30.4. Wet laps were taken out on the fourdrinier paper machine.

Production of Paper

The wet laps were loaded in Banning beater fitted with phosphor-bronze tackle on roll and bed plate for beating. After beating rosin soap and alum were added. Wrapping paper of 80 g.s.m. basis weight was made on fourdrinier pilot paper machine. Paper ran smoothly. The conditions of stock prepartion, paper making and strength properties of paper are recorded below :

1. Initial freeness of pulp, ml. (C.S F:) 600
2. Consistency of pulp during beating, % 6.6
3. Freeness of pulp after beating, ml. (C.S.F.) 320

4. Rosin soap on oven-dry pulp, % 2.5
5. Alum on oven-dry pulp, % 7.5
6. Freeness of pulp after addition of chemicals, ml. (C.S.F.) 300
7. Freeness after conical refiner, ml. (C.S.F.) 200
8. Consistency of stock at head box, % 0.56
9. pH of stock at headbox, 4.5
10. pH of tray water 5.0
11. Machine speed, m.p.m. 60
12. Basis weight, g.s.m. 60
13. Burst Factor 31.6
14. Breaking length metres
    (a) Machine direction 5390
    (b) Cross direction 3280
15. Tear Factor
    (a) Machine direction 93.3
    (b) Cross direction 103.3

Conclusions

1. The pilot plant trial indicates that *A. nilotica* is a suitable raw material for paper manufacture. Pulp had good runnability on the paper machine.
2. Wrapping paper made on the pilot plant had strength properties comparable to grade II kraft of I.S. No. 1397–1960 of Indian standard Institution.

Reference

1. Krishnamachari, I.S., Rangan, S. G., Ravindranathan, N. and Reddy, D.V., IPPTA, Vol. IX, No. 3, P. 287–2914, 1972.
2. Guha, S.R.D., Sharma, Y.K. and Agarwal, A.K. "Pulping of *Acacia nilotica*", presented to Forest Products Conference held at F.R.I. and Colleges, 1973.