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## PRODUCTION OF PAPER AND LIGNIN FROM *Hesperaloe funifera*

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### Abstract

*Hesperaloe funifera* was studied as a new raw material for paper manufacturing and lignin recovery. An experimental design was carried out to improve the quality of the obtained pulp varying the process temperature (155, 170 and 185 °C), time reaction (20, 40 and 60 minutes) and soda concentration (5, 10 and 15 %). All experiments were carried out with 1% anthraquinone. Lignin content, holocellulose content,  $\alpha$ -cellulose, viscosity, Kappa number and drainability were determined in the different pulps to establish the better experimental conditions to produce good quality paper. Delignification process was more effective at high soda concentration but to obtain pulps with low lignin content and high  $\alpha$ -cellulose content, mild conditions have to be used. Also black liquors obtained in the experimental design were characterized by determining the pH, density, dry matter, inorganic matter, organic matter and lignin concentration. After all, lignin was recovered from the black liquors in order to study its composition, structure (FTIR) and thermal behavior (TGA). The lignin yield was low in most of the experiment except for the experiment 2 (most severe conditions: 185 °C, 60 min., and 15% soda concentration). Lignin samples were contaminated with hemicelluloses and cellulose. Mild conditions produces low yield and highly contaminated lignin fractions.

**Key words:** *Hesperaloe funifera*, lignin, mathematical modeling, paper, soda pulping

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