

# Extraction and characterization of cellulose microfibrils from Gravatá leaves (*Bromelia Balansae* Mez)

V.B. Carmona<sup>1,2</sup>, F. Galvani<sup>3</sup>, M.H.A. Jorge<sup>3</sup>, M.T.S. Soares<sup>3</sup>, J.M. Marconcini<sup>1</sup>, L.H.C. Mattoso<sup>1</sup>

<sup>1</sup>Embrapa Instrumentação, São Carlos, SP, Brazil

<sup>2</sup>Universidade Federal de São Carlos, São Carlos, SP, Brazil,

<sup>3</sup>Embrapa Pantanal, Corumbá, MS, Brazil

Natural fibers are constituted mainly by cellulose, hemicelluloses and lignin; and others substances like pectin, oils, waxes and mineral oxides in lower concentrations. Cellulose is the major structural constituent and responsible for the stability and strength of the fibers [1]. Alkaline peroxides are efficient in removal non-cellulosic substances such as waxes, hemicelluloses and lignin from natural fibers; in addition this is a chlorine-free process [2], increasing mechanical properties and enabling a better adhesion to polyesters matrices. This work aims to obtain and to characterize cellulose microfibrils from gravatá leaves (*Bromelia balansae* Mez). Gravatá occurs all over the Pantanal region in the shape of long spiny leaves (0,5 – 2,0 meters) and was characterized in earlier works presenting appropriate thermomechanical properties to be applied in composites, although it was reported the difficult to extraction fibers manually [3]. In this work we used milded gravatá leaves as raw material and were used 2 alkaline peroxides solutions (6 wt% and 12 wt% of H<sub>2</sub>O<sub>2</sub>) to prepare cellulose microfibrils. The samples of gravatá leaves and cellulose microfibrils were characterized by mass yield, thermogravimetry, X-ray diffraction and cellulose content (Table 1). SEM micrographs were used to observe the samples surfaces and dimensions. In general way, it was possible to obtain cellulose microfibrils with high cellulose content with diameter of about 10µm using alkaline peroxides solutions.

**Table 1. Properties of gravatá leaves and obtained cellulose microfibrils.**

Sample name	Treatment	Mass Yield	T <sub>i</sub>	Crystallinity	Cellulose Content
Grav.	No treatment	-	180 °C	45,5%	29,2%
Bleach_1	6 wt% H <sub>2</sub> O <sub>2</sub>	21%	250 °C	80,1%	88,4%
Bleach_2	12 wt% H <sub>2</sub> O <sub>2</sub>	20%	250 °C	78,9%	83,9%

**Keywords:** Cellulose, microfibrils, gravatá and bleaching.

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[brait\\_carmona@hotmail.com](mailto:brait_carmona@hotmail.com) – LNNA – Embrapa Instrumentação, CEP 13560-970, São Carlos, SP, Brazil.