Komoditas : Abaca
Tahun 2004-2008 (7 judul)

Fabiola Vilaseca, Alex Valadez-Gonzalez, Pedro J. Herrera-Franco, M. Angels Pelach, Joan Pere Lopez, Pere Mutje, Biocomposites from abaca strands and polypropylene. Part I: Evaluation of the tensile properties, Bioresource Technology, In Press, Corrected Proof, Available online 22 August 2009, ISSN 0960-8524, DOI: 10.1016/j.biortech.2009.07.066.
(http://www.sciencedirect.com/science/article/B6V24-4X2BV2T-2/2/a23ba629984c8f5adeb0009dd09a2f2f)
Abstract:
In this paper, abaca strands were used as reinforcement of polypropylene matrix and their tensile mechanical properties were studied. It was found relevant increments on the tensile properties of the abaca strand-PP composites despite the lack of good adhesion at fiber-matrix interface. Afterwards, it was stated the influence of using maleated polypropylene (MAPP) as compatibilizer to promote the interaction between abaca strands and polypropylene. The intrinsic mechanical properties of the reinforcement were evaluated and used for modeling both the tensile strength and elastic modulus of the composites. For these cases, the compatibility factor for the ultimate tensile strength was deduced from the modified rule of mixtures. Additionally, the experimental fiber orientation coefficient was measured, allowing determining the interfacial shear strengths of the composites and the critical fiber length of the abaca strand reinforcement. The mechanical improvement was compared to that obtained for fiberglass-reinforced PP composites and evaluated under an economical and technical point of view.
Keywords: Abaca strands; Polypropylene; Natural fiber composites; Interface; Injection molding

R.B. Armecin, F.M. Gabon, Biomass, organic carbon and mineral matter contents of abaca (Musa textilis Nee) at different stages of growth, Industrial Crops and Products, Volume 28, Issue 3, November 2008, Pages 340-345, ISSN 0926-6690, DOI: 10.1016/j.indcrop.2008.03.014.
(http://www.sciencedirect.com/science/article/B6T77-4SH7DVX-1/2/99bf21ec032e3be43c6d59aeee6f4831)
Abstract:
This study was conducted to measure the biomass, organic carbon and mineral matter contents of abaca at different stages of growth as baseline information for material cycling of the plant. These were attained through destructive sampling of the identified sample plants. Different parameters such as moisture content, dry matter, organic carbon and mineral matter contents were determined. Regression and correlation analyses were also conducted to find out possible relationship between growth parameters and plant biomass.
Biomass contents ranged from 11 to 21% regardless of the growth stages of abaca. Based on the weight of partitioned components, biomass, organic carbon and mineral matter contents (g/plant) of all tissues increased as the growth of abaca plant progressed. Pseudostem tissue showed the highest percent moisture content but it also showed the highest biomass (dry weight per plant) during the vegetative and flagleaf stages of growth. The pseudostem biomass accounted nearly two-thirds of the above-ground biomass at harvesting stage in the production system. Cumulative effect could be disadvantageous and would most likely result to nutrient imbalance in the system due to crop removal and nutrient mining. A strong relationship was found between biomass and pseudostem length ($r = 0.997$).
Keywords: Abaca; Musa textilis; Biomass; Organic carbon; Mineral matter

L. Jimenez, E. Ramos, M.J. De la Torre, I. Perez, J.L. Ferrer, Bleaching of soda pulp of fibres of Musa textilis nee (abaca) with peracetic acid, Bioresource Technology, Volume 99, Issue 5, March 2008, Pages 1474-1480, ISSN 0960-8524, DOI: 10.1016/j.biortech.2007.01.061.
(http://www.sciencedirect.com/science/article/B6V24-4NK472S-1/2/d7222487a5d757da860a8e85e7af1f72)
Abstract:
In this work, we studied the influence of operational variables in the bleaching of soda pulp of Musa textilis nee (abaca) [viz. temperature (55-85 [degree sign]C), bleaching time (30-150 min) and peracetic acid concentration oven dry pulp (0.5-4.5%)] on the kappa number and viscosity of the bleached pulp, as well as on the breaking length, burst index and brightness of paper sheets made from it.
For this purpose, we used a central composite factorial design in order to identify the optimum operating conditions. In this way equations relating the dependent variables to the operational variables of the bleaching process were derived. These equations reproduce the dependent variables with errors less than 12% for all, except the viscosity which was predicted with errors less than 18%.
Obtaining bleached pulp with the highest possible viscosity (1519 ml/g), and paper sheets with the maximum possible breaking length (6547 m) and burst index (5.00 kN/g), entails using a temperature of 55 [degree sign]C, a peracetic acid concentration of 4.5% and a bleaching time of 150 min. This provides a brightness of 79.90%, which is only 6.53% lower than the maximum possible value (85.48%).
Keywords: Musa textilis nee; Abaca; Bleaching; Soda pulp; Strength properties

Daiyong Ye, Xavier Farriol, Preparation and characterization of methylcelluloses from some annual plant pulps, Industrial Crops and Products, Volume 26, Issue 1, June 2007, Pages 54-62, ISSN 0926-6690, DOI: 10.1016/j.indcrop.2007.01.004.
(http://www.sciencedirect.com/science/article/B6T77-4N4408W-1/2/ef2f8d0ad4b618194c83e031b27b80e9)
Abstract:
We used iodomethane to synthesize methylcelluloses from elemental chloride free (ECF) bleached abaca, hemp, flax, jute, and sisal pulps via heterogeneous methylations. The heterogeneous methylation was carried out in isopropanol with iodomethane at 60 [degree sign]C for 22 h after a pulp was mercerized in excessive 50% NaOH solution for 1 h at ambient temperature. A further methylation was carried out in dimethyl sulfoxide with iodomethane at 30 [degree sign]C for 48 h using a methylcellulose of low degree of substitution. Fourier transform infrared (FTIR) spectra of the synthesized methylcelluloses showed the existence of methoxyl groups on methylcellulose macromolecules. The degrees of substitution of the synthesized methylcelluloses were measured by 13C nuclear magnetic resonance (NMR) spectroscopy. The molecular weights of the water-soluble methylcelluloses were determined by size exclusion chromatography (SEC). Intrinsic viscosities of the synthesized methylcelluloses were measured in 4% NaOH solution at 20 [degree sign]C. Methylcelluloses with better properties, such as greater degrees of substitution, molecular weights, viscosities, and intrinsic viscosities, were prepared from the pulps with higher accessibilities and reactivities. The factors influencing the preparation of methylcelluloses from these pulps are discussed.
Keywords: Annual pulps; Iodomethane; Methylation; Mercerization; Methylcellulose

L. Jimenez, E. Ramos, A. Rodri'guez, M.J. De la Torre, J.L. Ferrer, Optimization of pulping conditions of abaca. An alternative raw material for producing cellulose pulp, Bioresource Technology, Volume 96, Issue 9, June 2005, Pages 977-983, ISSN 0960-8524, DOI: 10.1016/j.biortech.2004.09.016.

(http://www.sciencedirect.com/science/article/B6V24-4DSR1G8-2/2/24723c45a8e7f27842149ef12d22f4d9)
Abstract:
The influence of temperature (150-170 [degree sign]C), pulping time (15-45 min) and soda concentration (5-10%) in the pulping of abaca on the yield, kappa, viscosity, breaking length, stretch and tear index of pulp and paper sheets, was studied.
Using a factorial design to identify the optimum operating conditions, equations relating the dependent variables to the operational variables of the pulping process were derived that reproduced the former with errors lower than 25%.
Using a high temperature, and a medium time and soda concentration, led to pulp that was difficult to bleach (kappa 28.34) but provided acceptable strength-related properties (breaking length 4728 m; stretch 4.76%; tear index 18.25 mN m2/g), with good yield (77.33%) and potential savings on capital equipment costs. Obtaining pulp amenable to bleaching would entail using more drastic conditions than those employed in this work.
Keywords: Non-wood; Abaca; Pulping optimization; Pulp; Paper; Soda; Cellulose

Romel B. Armecin, Ma. Helen P. Seco, Pauline S. Caintic, Emma Josefa M. Milleza, Effect of leguminous cover crops on the growth and yield of abaca (Musa textilis Nee), Industrial Crops and Products, Volume 21, Issue 3, May 2005, Pages 317-323, ISSN 0926-6690, DOI: 10.1016/j.indcrop.2004.04.028.
(http://www.sciencedirect.com/science/article/B6T77-4CMJGDV-2/2/9c214f9674ab56daa52edfeb34e1f4b5)
Abstract:
This 6-year study was conducted to determine the effect of three leguminous cover crops on the growth and yield of abaca and measure the contribution of the cover crops in restoring and conserving the inherent fertility of the soil. In the later years of the experiment (2000-2002), cover cropping with Desmodium ovalifolium and Calopogonium muconoides significantly increased the stalk and leaf lengths, and stalk circumferences. Fiber yield also significantly increased in plots with C. muconoides as plant cover. Among the cover crops used, D. ovalifolium showed the highest biomass production of 8.9 and 8.6 tons/ha in the 1999 and 2000 data gathering, respectively. Highest N content in the tissues among the covercrops used was noted in C. muconoides. Accumulation of soil organic matter was observed in plots with D. ovalifolium while higher total N in the soil was found in plots cover cropped with C. mucunoides. Among the cover crops tested, Centrocema pubescens is not an effective companion crop for abaca. However, lower erosion rates were noted in plots planted with cover crops.
Keywords: Abaca; Musa textilis; Cover cropping; Biomass; Soil loss

Carmen G. Boeriu, Dominique Bravo, Richard J. A. Gosselink, Jan E. G. van Dam, Characterisation of structure-dependent functional properties of lignin with infrared spectroscopy, Industrial Crops and Products, Volume 20, Issue 2, 6th International Lignin Institute conference, September 2004, Pages 205-218, ISSN 0926-6690, DOI: 10.1016/j.indcrop.2004.04.022.
(http://www.sciencedirect.com/science/article/B6T77-4CPM5Y2-1/2/4468371740eb228b4ea6d52398bd6f01)
Abstract:
Fourier-transformed infrared spectroscopy (FT-IR) was evaluated as an analytical technique for the estimation of the chemical composition and functional properties of lignin. A sample set containing various non-wood, hardwood and softwood lignins isolated by different processing technologies was used. The lignin samples were characterised by both conventional chemical analysis and non-destructive methods, such as diffuse reflectance FT-IR. Principal component analysis (PCA) based on the IR-fingerprint spectral region allowed classification of lignins according to origin and processing conditions.

The antioxidative properties of each lignin sample in both aqueous and micellar systems were determined. All lignin samples showed radical scavenging activity, with sisal and abaca lignin being the most effective radical scavengers. The radical scavenging efficiency of the most efficient lignin was about 20% of that of BHT and tocopherol (based on weight), compounds that are commonly used in food and cosmetic industries.
Multivariate analysis was applied to correlate chemical composition and antioxidative properties of lignins with the FT-IR spectral data. Partial least squares (PLS) models were able to predict the major components' concentrations and radical scavenging activity at the 99% confidence level presenting r2 values higher than 0.80 in most cases.
Keywords: Lignin characterisation; FT-IR; Antioxidant; Multivariate analysis; Structure-function relationship