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"Management of land use systems for enhanced food security: conflicts, controversies and resolutions"

Wood of Three Brazilian Species for Energy Purposes

Ananias Francisco Dias Júnior[1], Carlos Rogério Andrade[1], José Otávio Brito[1], Cléssio Gomes da Silva[2], Artur Queiroz Lana[1]

[1] *University of Sao Paulo, Faculty of Agriculture Luiz de Queiroz, Brazil*

[2] *Georg-August-Universität Göttingen, Faculty of Forest Sciences and Forest Ecology, Germany*

Abstract

The Caatinga biome is the predominant vegetation in the Brazilian semi-arid region, covering 54.53 % of 1,548,672 km^2 area of the region. The biome has relatively low number of species. However, the region has a large number of endemic species. In addition, several plants have been described as endemic to the region, indicating that the botanical knowledge and its potential uses are still at early stages. Restrictively, the most common use of these species has been as firewood for direct burning or for charcoal production. In general terms, the charcoal is the solid product obtained by the carbonisation of wood, whose characteristics depend on the techniques used to obtain it and the purpose for which it is intended. The charcoal yield ranges between 25 and 35 %, based on dry wood. Thus, this study aimed to characterise the wood of three species of the Brazilian semi-arid targeting energy use. Three native tree species of the Brazilian semi-arid region located in the state of Pernambuco, Brazil, were selected: *Poincianella pyramidalis* (Tul.) L.P.Queiroz; *Cnidoscolus quercifolius* Pohl and *Mimosa tenuiflora* (Willd.) Poir. In the Integrated Laboratory of Chemistry, Pulp and Energy - Bioenergy and Forest-Based Bioproducts Group (ESALQ / USP) were quantified the total extractives, lignin content, holocellulose and higher heating value of wood of three species. The charcoal yield, pyroligneous acid yield and of non-condensable gases yield were also determined. By analysing the set of characteristics, *Mimosa tenuiflora* species showed better results in charcoal yield, higher lignin content, higher calorific value and lower ash content, being considered the most suitable species for uses aiming energy production.

Keywords: Biomass energy, Brazilian semi-arid, energy use

Contact Address: Ananias Francisco Dias Júnior, University of Sao Paulo, Faculty of Agriculture Luiz de Queiroz, Pádua Dias, 11, 13416350 Piracicaba, Brazil, e-mail: ananiasjr@usp.br