

CHEMICAL CHARACTERIZATION OF BANANA PSEUDOSTEM FRACTIONS

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ABSTRACT

This work compares the lignocellulosic content of banana pseudostem variety Pacovan. The trunk was divided in four different fractions, from the outermost layer to the core of the structure. The lignocellulosic content (moisture, ashes, extractives, lignin, alpha-cellulose, and hemicellulose) were analysed. There is significant difference between the fractions, mainly extractives and alpha-cellulose contents. These data contributes to optimise the utilisation of this agricultural byproduct.

INTRODUCTION

Banana is grown in more than 120 countries and autonomous regions, with a world estimated harvested area in 20120 greater than 5 million ha and production around 100 million metric tonnes of banana fruit (FAOSTAT, 2013). The total produced byproduct mass per hectare in banana fields is about 200 metric tonnes/ha (Moreira, 1987), resulting in more than 10 billion metric tonnes of leaves and stalks. This material can be used as a natural manure in the banana fields, but it may also become a source of environmental problems (Thomsen, 2005).

Lignocellulosic fibres are complex materials. Some components may aid in the interaction fibre-polymeric matrix, whilst other substances may hinder this surface phenomenon. So, the fibre constitution is a basic knowledge to decide the best way to use the fibre.

A sample of banana (*Musa* sp.) variety Pacovan pseudostems was harvest at Embrapa Experimental Field at Paraipaba city, Ceará, Brazi, under Köppen climatic classification Aw. The stalks were fractionated into four regions, as a function of the colour and roughness. The outer fraction was composed by green sheaths, the middle fraction was light yellow-pale brown colour, the inner fraction was a little darker than the middle one, and the core was white and smooth (Figure 1). The fractions were weighed, oven-dried, and ground.

RESULTS AND CONCLUSIONS

There is a great variation in the lignocellulosic content in the fibres (Table 1). The outer and middle fractions present a significant high content of alpha-cellulose, hemicellulose, and a low content of extractives, while the inner and core fractions have high levels of extractives.

Thus, the outer and middle fractions of banana variety Pacovan pseudostem are more suitable to fibre extraction, while inner and core fractions can be used as a source of other compounds,

but are not suitable for fibre extraction, because they will reduce the total alpha- and hemicellulose contents.

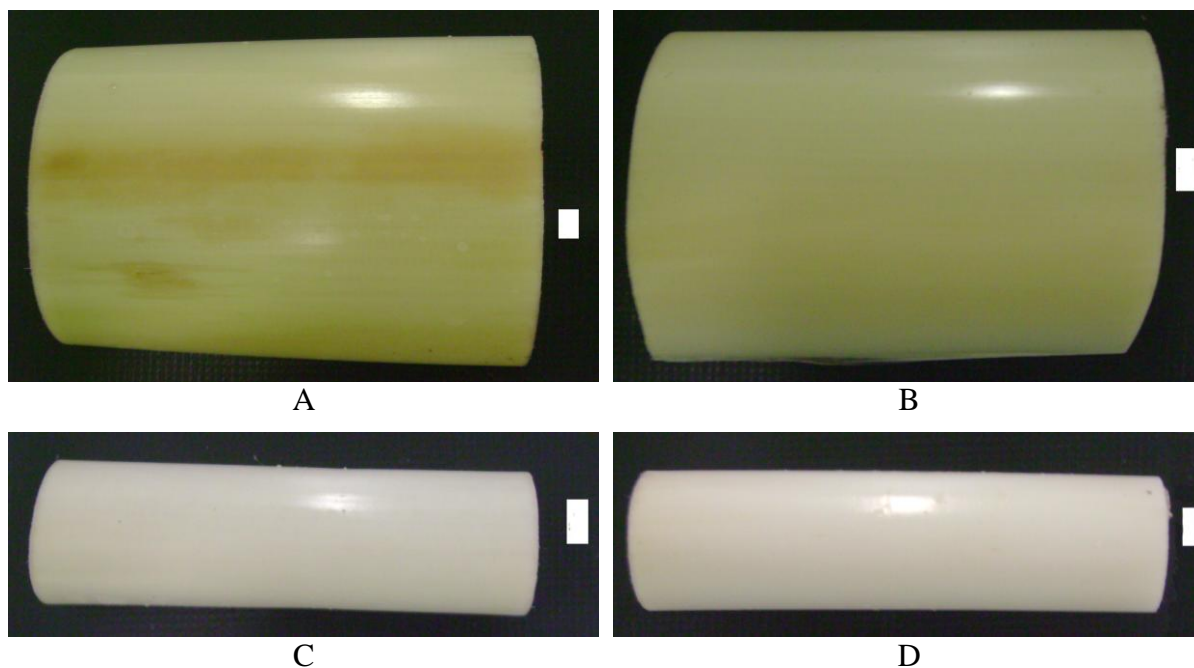


Fig.1 Fractions of banana Pacovan pseudostem: (a) outer sheaths, (b) middle sheaths, (c) inner sheaths, (d) core

Table 1 Lignocellulosic composition of banana pseudostem variety Pacovan fractions

Component	Content of the fractions (% w/w)			
	Outer	Middle	Inner	Core
Moisture	7.7	8.5	12.3	11.6
Ashes	12.5	12.9	14.4	14.8
Extractives	24.6	33.9	48.6	55.3
Insoluble lignin	8.4	6.5	2.8	4.8
Alpha-cellulose	22.9	18.3	7.9	4.6
Hemicellulose	11.3	8.6	5.2	2.7

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