Macro and microporosity of different particle size of fiber coconut

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INTRODUCTION

Coconut fibers (CF) are naturally occurring, abundant in Brazilian territory, and especially renewable. Due to the high availability of raw materials and ease of production coconut fiber has low production costs, allowing its use as an agricultural substrate. The physicochemical properties of CF vary widely depending on the source of raw materials and their processing.

OBJECTIVE

The objective was to evaluate the volume (%) porosity, macro and microporosity of Fiber Coconut different textures for agriculture use as substrate.

MATERIAL AND METHODS

This study was conducted in the laboratory in the Department of Soil Science of the FCA/Univ. Estadual Paulista, Botucatu, Sao Paulo - Brazil.

The experimental design was randomized blocks with seven treatments, three blocks and three replicates. Treatments: Coconut fiber (CF) fibrous (particles of 25 to 55mm); chips (15 to 25 mm), mixed (5 to 15 mm) and granulated (<5 mm).

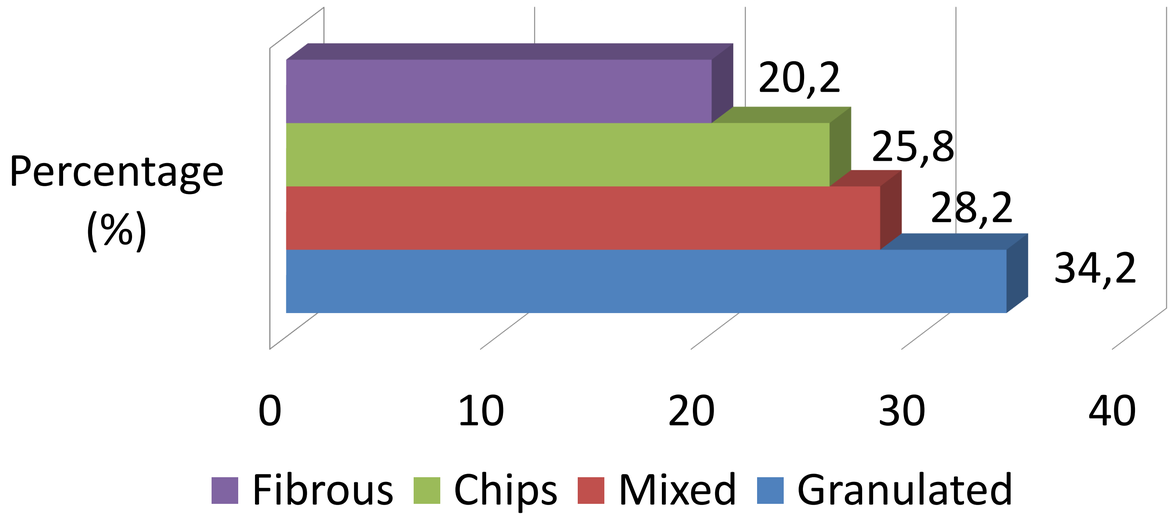
The materials were placed into rings with a volume of 90,478 cm³ and allowed to saturate for 24 hours, after this period, the rings were placed in the tension table under tensions 0,1, 0,6 and 1,0 kPa, remaining for 48 hours each tension and measuring the weight in each time interval. Upon reaching constant weight the rings were dried with forced air circulation at a temperature of 65 ºC.

Formulas: Percentage saturation = (saturated weight - dry weight) x 100/ring volume; microporosity = (0,6 kPa weight - dry weight) x 100/ring volume; macroporosity = Percent saturation - microporosity; Porosity = microporosity + macroporosity.

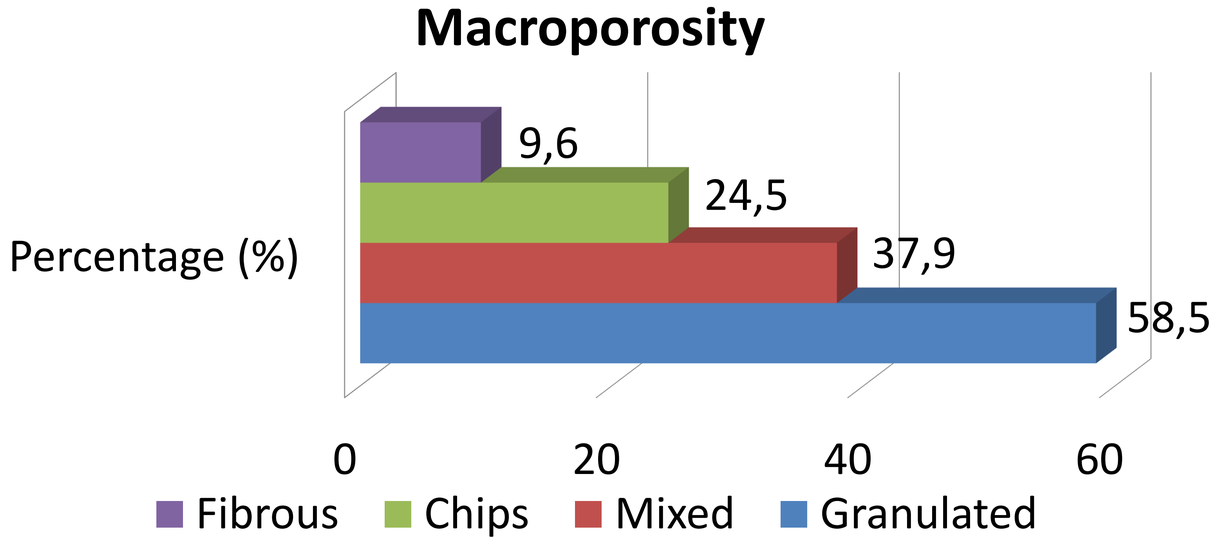
The results were statistically analyzed using the Tukey test.

RESULTS

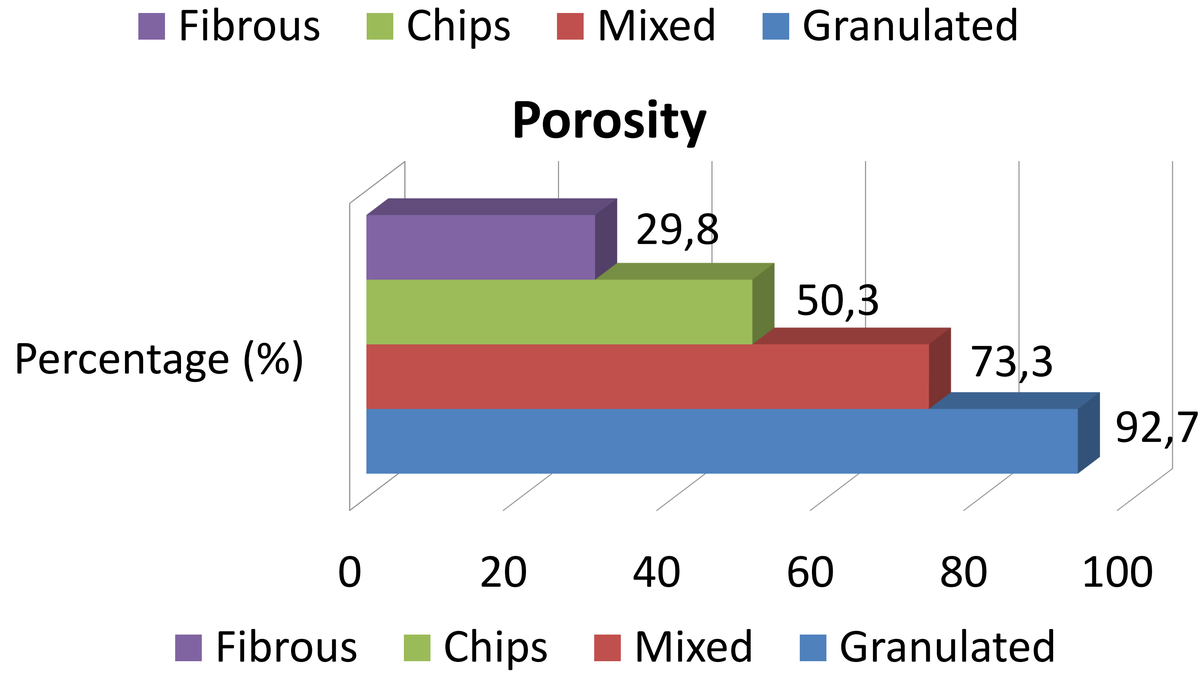
Microporosity



Macroporosity



Porosity



CONCLUSIONS

With the reduction in particle size was an increase in porosity (29,8% fibrous, 50,3% chips, 73,3% mixed e 92,7% granulated), microporosity (20,2% fibrous, 25,8% chips, 28,2% mixed e 34,2% granulated) and macroporosity (9,6% fibrous, 24,5% chips, 37,9% mixed e 58,5% granulated).