

Effects of extraction methods on the morphology and chemical properties of kahili ginger (*Hedychium gardnerianum*) fibres

T Eleutério¹, A Silva Pinto¹, M J Pereira² and H C Vasconcelos^{2,3}

¹University of the Azores, Ponta Delgada, Portugal

²University of the Azores, Angra do Heroísmo, Portugal

³Nova University of Lisbon, Portugal

Hedychium gardnerianum (kahili ginger) stems are the most abundant invasive plant residues in the Azores (Portuguese Isles of the North Atlantic) and has not yet been adequately studied as source of vegetable fibres for different kinds of applications, namely reinforcement materials for composites. This study aims to investigate the extraction method effect on the chemical composition and morphology of those fibres. Three different extraction methods were compared: mechanical, chemical and biological (enzymatic). The fibres chemistry was characterized in terms of structural carbohydrates (cellulose and hemicellulose content), lignin, ash and moisture content. The results showed that enzymatic extraction yielded fibres with higher cellulose and hemicellulose contents than the other two methods; the lignin content decreases if chemical and enzymatic methods are used; the moisture and the water absorption on the fibres were independent of the used method. This study concluded that the enzymatic extraction has potential advantages in comparison to other extractive processes, because it significantly increases the number of possible reaction sites (OH groups) at fibre surface, since the amount of cellulose in those fibres is larger.



Figure: a) Kahili ginger plants; b) fibres extracted from kahili ginger stems.

Recent Publications

- Eleutério T, Pinto AS, Pereira MJ, Vasconcelos HC (2017) Preliminary structural and thermal characterization of Conteira's (*Hedychium gardnerianum*) fibers for further functionalization with silica colloidal nanoparticles. *Procedia Engineering*.
- Pereira MJ, Eleutério T, Canhoto J (2015) The influence of cytokinin and auxin types and their concentration on the proliferation and rooting of *Viburnum treleasei* Gand seedling explants. *Acta Horticulturae*. 1083: 311-318.

Biography

T Eleutério graduated in Biology and Geology at Azores University (UAC) in June 2013. In February 2016, he got a Master's Degree in Biotechnology and Biodiversity. Throughout his professional career, he has worked as a Volunteer Researcher on three research projects in areas such as micropropagation and biological control; organized four workshops in the field of biology; was the author of five scientific publications in the area of biotechnology and was part of the organizing committee of the third edition of the International Conference on Natural Fibers and the twenty-second meeting of the Portuguese Society of Electrochemistry. He was Speaker at five international conferences including OCTA Innovation - Sustainable Islands' Growth. He is a member of the Center of Biotechnology of the Azores (University of the Azores) since 2016.

telmo.mf.eleuterio@uac.pt