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Cell wall proteins identified in sugarcane young and mature internodes: a focus on lipid transfer proteins (LTPs)

Maria Juliana Calderan-Rodrigues[1], Juliana Fonseca Guimarães[1], Elisabeth Jamet[2,3], Thibaut Douché[2,3], Maria Beatriz Rodrigues Bonassi[1], Thaís Regiani Cataldi[1], Fabricio Edgar de Moraes[1], Hélène San Clemente[2,3], Rafael Pont-Lezica[† 2,3] and **Carlos Alberto Labate[1]**

[1]Universidade de São Paulo, Brazil
[2]Université de Toulouse, France
[3]CNRS, Castanet-Tolosan, France

Second generation ethanol has become a great promise for supplying the fuels demand, increasing the production without widening planted area. However, the cell wall recalcitrance represents a major obstacle to transform the cellulosic ethanol commercially viable. Information dedicated to elucidate the mechanisms of cell wall plasticity is still scarce, wherein cell wall proteins (CWPs) play important roles. Therefore, this work identified CWPs from 2 and 4 month-old ~~stem~~ internodes of sugarcane,; addressing some differences between them. CWPs were obtained using a vacuum infiltration protocol, based on Boudart *et al.* (2005). Acquisition of MS data used Synapt G2 HDMS equipped with ion mobility cell and NanoLockSpray source in the positive ion and `V´ mode (Waters®). Altogether, 258 different CWPs distributed into 8 functional classes were identified in 2- and 4-month-old internodes. From these, 47 appeared to be identified at both developmental stages (54,6% - 2 months and 21,5% - 4 months). Proteins related to Lipid Metabolism (LM) were the only class that was more represented in 2-month-old internodes. At this age, LM comprised mostly Lipid Transfer Proteins (LTPs). LTPs were assumed to enhance cell wall loosening, thus facilitating extension. Therefore, the high number of LTPs identified in young internodes could be related to a higher rate of extension than in mature ones. This work suggests focusing genetic manipulation not only on proteins acting on polysaccharides, but also on LTPs, to facilitate bioethanol production.

Biography

CALDERAN-RODRIGUES MJC has completed her PhD at the age of 28 years from University of São Paulo, Brazil. She has a bachelor degree in Biological Sciences, obtained at the same University, when she earned the first place in the general course classification (Adealq and "Luiz de Queiroz" prizes). She is currently *Planning and Evaluation Coordinator* at the Brazilian Bioethanol Science and Technology Laboratory, in Brazil. She earned the SISCA (Dow Sustainability Innovation Student Challenge Award) Gran Prize in 2013, for the work developed in her thesis and partially presented in this abstract.

phdjuliana@gmail.com

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