TITLE: MODIFICATION OF PHENOLIC COMPOUNDS CONTENTS, COLOR AND TECHNOLOGICAL PARAMETERS IN SUGARCANE JUICE INDUCED BY RATIOON STUNTING DISEASE

AUTHORS: MAGRI, N. T. C.\textsuperscript{a}, HEREDIA, F. J.\textsuperscript{b}, CAMARGO, L. E. A.\textsuperscript{c}, HERNANZ, D.\textsuperscript{d}, MANARIM, G. R.\textsuperscript{a}, OGANDO, F. I. B.\textsuperscript{a}, CIA, M. C.\textsuperscript{c}, AGUIAR, C. L.\textsuperscript{a}

INSTITUTION: \textsuperscript{a} Hugot Sugar Technology Laboratory, Luiz de Queiroz College of Agriculture, University of São Paulo, 13418-900, Piracicaba, Brazil
\textsuperscript{b} Food Colour and Quality Laboratory, Department of Nutrition and Food Science, Facultad de Farmacia, Universidad de Sevilla, 41012, Sevilla, Spain
\textsuperscript{c} Laboratório de Genética Molecular, Escola Superior de Agricultura “Luiz de Queiroz”, Universidade de São Paulo, 13418-900, Piracicaba, Brazil
\textsuperscript{d} Department of Analytical Chemistry, Facultad de Farmacia, Universidad de Sevilla, 41012, Sevilla, Spain

ABSTRACT:
Sugarcane is one of the most important crops in Brazil and widely cultivated in many parts of the world. The propagation is made by stalk cuttings containing lateral buds and it's a semi-perennial crop, which means that the buds can regrow for up to 6 to 8 times before the cane field is replanted. In the first year the plants are denominated cane-plant and the new plants regenerated in the following years are denominated of ratoon. Sugarcane is the host to a large number of pathogens, which may limit its production. Ratoon Stunting Disease (RSD) is a disease caused by the endophytic bacterium \textit{Leifsonia xyli} subsp. \textit{xyli} (Lxx). RSD infection can occur by planting contaminated material or by the transmission of the pathogen from contaminated plants to healthy plants during planting and harvesting through the contamination of the cutting instruments by the xylem juice of the plant. The disease is not related to the death of the plant, but to the significant reduction of its productivity. Two cultivars of sugarcane, CB49-260 (susceptible) and SP80-3280 (resistant), were used in the experiment. The plants were divided into two distinct groups, inoculated (I) with Lxx (strain CTCB07) and non-inoculated (NI). Lxx was quantified by real-time PCR. Technological parameters were measured through $^\circ$Brix, turbidity and Icumsa and color parameters ($L^*$, $b^*$, $a^*$, $C_{ab}^*$, $h_{ab}$) were scanned by CAS 140 spectroradiometer. Chromatography analysis were performed (from 200 to 700 nm) in triplicate using UHPLC Agilent 1290 system with diode-array detector (DAD). Inoculated plants (CB and SP) had higher values of $^\circ$Brix, turbidity and color parameters (mainly $L^*$, $b^*$, $C_{ab}^*$, $h_{ab}$). All samples were located in the first quadrant of the ($a^*b^*$)-plane, which represents positive values for $a^*$ and $b^*$ in the yellow-orange region. CB samples inoculated with Lxx form a distinct group of the other samples, being closer to the angle of 70°. In chromatography analysis, 13 phenolic compounds could be identified for the susceptible variety, mainly from the flavones, flavonols and flavanones groups with isoorientin being the compound with higher concentrations. For the resistant variety, benzoic acids and hydroxycinnamic acids had greater participation among the 12 identified phenolics, being vanillic acid the one of greater concentration.

Keywords: Sugarcane juice, CIELAB, Ratoon Stunting Disease, Phenolic compounds, Sugar production

Development Agency: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) - Bolsista da Capes/Programa de Doutorado Sanduíche no Exterior/Processo nº {88881.188971/2018-01}, Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq-Brasil) - Project No. 142026/2017-4, Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) - Project No. 2009/54635-1 and the Laboratório de Genética Molecular da Escola Superior de Agricultura "Luiz de Queiroz", Universidade de São Paulo.