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# DEVELOPMENT OF INNOVATIVE ALTERNATIVE CROPS FOR THE PRODUCTION OF NATURAL RUBBER

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**Effect of Supercritical CO2 and type of co-solvent for extraction of lipids and terpenics from Guayule biomass (Parthenium argentatum)**

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Guayule (Parthenium argentatum), a perennial crop under semi-arid climate, producing polyisoprene (Guayule rubber, GR) and resin, is the most probable alternative source of natural rubber. GR is similar to Hevea's. To date e_orts aimed at marketing GR, while the bagasse (GB) (90%-dw, dry weight) left after water-based extraction remains underused. Thus Cirad is investigating a "green" process for extracting valuable compounds from GB, including lipids. After having obtained preliminary results, showing that a co-solvent is necessary in addition to SC-CO2, we now investigate the inuence of operating parameters.
Under SC-CO2, resin extract is higher with ethanol as co-solvent (12.1%-dw) compared to acetone (7.8%-dw), at temperature 35_C and 300 bar, co-solvent ow rate 3mL/min, CO2 ow rate 34.4 g/min. Acetone-based extraction under pressurized conditions above boiling point (ASE-acetone) is used as reference method. The selectivity for aromatic carboxylic acids (cinnamic, p-anisic) initially linked to sesquiterpenes, is better with SC-CO2-ethanol compared to SC-CO2-acetone. The minor components are lipids rich in C18:2, C16:0, C18:3, in between cotton and soybean oils, although poorer in C18:1. The unsaponifiable contains sesquiterpenes, whose extraction is mainly dependent on pressure but not temperature with SC-CO2-ethanol. From these trials SC-CO2-ethanol shows a higher efficiency compared to SC-CO2-acetone, for extracting aromatic carboxylic acids as potential industrial feedstock.

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