

Date of poster presentation: 12 April 2022

Extraction of bioactive phenolic and antioxidant compounds from lignified *Salicornia ramosissima*

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The lignified part of the edible salt-tolerant plant *Salicornia ramosissima* is rich in phytochemicals, such as phenolics compounds. In this study, extraction optimization is performed on discarded waste biomass aiming for safe and non-toxic extraction methods for optimized extraction of high-value phenolic compounds from the lignocellulosic biomass. Methods investigated include solvent extraction on Soxhlet using water, 40/60 v% ethanol, ethanol, and ethyl acetate, decoction, maceration, subcritical extraction at 120 °C, and ultrasound-assisted extraction. The bioactive activity of the extract is determined by the antioxidant activity by 2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assay, and phenolic acid content is determined by the Folin-Ciocalteu total phenolics assay. Soxhlet extraction using water shows good extraction of phenolics, and the introduction of ethanol in the extraction process yields a higher antioxidant capacity of the extract. Subcritical extraction shows overall good extraction of phenolic and antioxidant compounds. Decoction and maceration using water show limited extraction efficiency due to mass transfer limitations of the phenolic compounds. Ultrasound-assisted extraction shows good extraction of phenolic compounds with less energy consumption compared to other extraction methods. *Salicornia ramosissima* is a novel feedstock for biorefinery and can be used for the production of bioactive compounds, that can be reintroduced in the human diet.

Keywords: Halophyte, Salicornia ramosissima, extraction, phenolic acids