Low input extraction of bioactive Phytochemicals from *Salicornia* residue straw

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Subcritical water extraction obtains the best extraction yield of phenolics without the use of chemicals.

The circular approach of AQUACOMBINE combines aquaculture, farming and bioprocessing to utilize all fractions of the produced biomass and produce value added food, feed, bio-compounds and bioenergy.

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Bioactive plant-based compounds, here phenolics, can be extracted from the residual straw of *Salicornia ramosissima* (glasswort) for use in cosmetics, feed, or food supplements. As the species in the glasswort family are known to produce a high concentration of said bioactive compounds, a concentrated extractives fraction can yield a high profit for the producer with easily manageable methods. As the bioactive compounds of interest are bound in the cellular tissue of the biomass, these are targeted removed. Methods investigated were decoction, maceration, sub-critical water extraction, ultrasound-assisted extraction, alkaline hydrolysis, and conventional Soxhlet extraction. Of these individual methods, sub-critical water extraction interesting results and is proposed for economical and practical reasons. Alkaline hydrolysis, already used in agriculture for some grains, showed to be an excellent extraction method to extract bound and conjugate phenolic compounds after sub-critical extraction. Soxhlet extraction is a good extraction method if the use of hydroalcoholic chemicals can be considered. Alkaline hydrolysis extracts high amounts of phenolics after a first extraction and could be used in conjunction with a different primary extraction. Alkaline hydrolysis extracts more monophenolic compounds, as these are found to be more stable than the polyphenolics. Of the monophenolic compounds were caffeic acid and ferulic acid in high concentration of the bound phenolics. Sub-critical water extraction targets more polyphenolic compounds, e.g., neochlorogenic acid, isoquercitrin.

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