RECOVERY OF BIOACTIVE COMPOUNDS FROM *GELIDIUM SESQUIPEDALE* ALGA BY SUBCRITICAL WATER EXTRACTION (SWE)

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INTRODUCTION

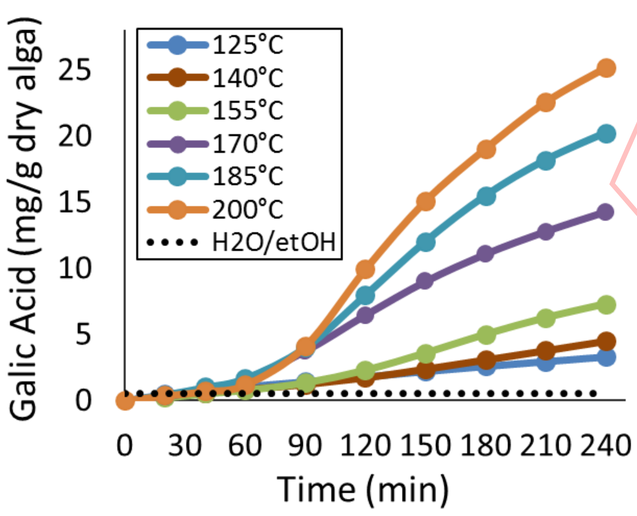
Gelidium sesquipedale is the major seawood resource in the Spanish agar industry, which generates a residue that is usually discarded.

The target of this work is the recovery of bioactive compounds through SWE from the *G. sesquipedale* residue after agar-agar extraction.

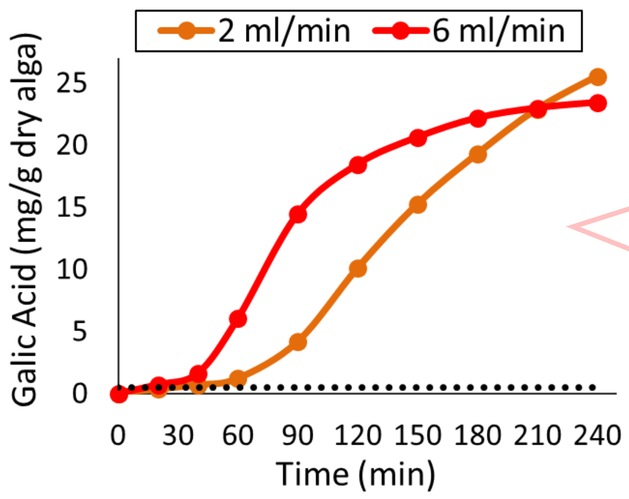
SWE consists of using water at high temperature and pressure enough to keep water at liquid state. The effect of temperature, time and solvent flow rate has been investigated in the recovery of total protein and phenolic compounds.

RESULTS AND DISCUSSION

TOTAL PHENOLIC COMPOUNDS DETERMINATION



A temperature increase leads to higher polyphenols content yield (25.53 ± 0.5 mg/g dry alga). This high total polyphenols content (TPC) could be also related to the Maillard reactions favored at high temperatures and long operating times

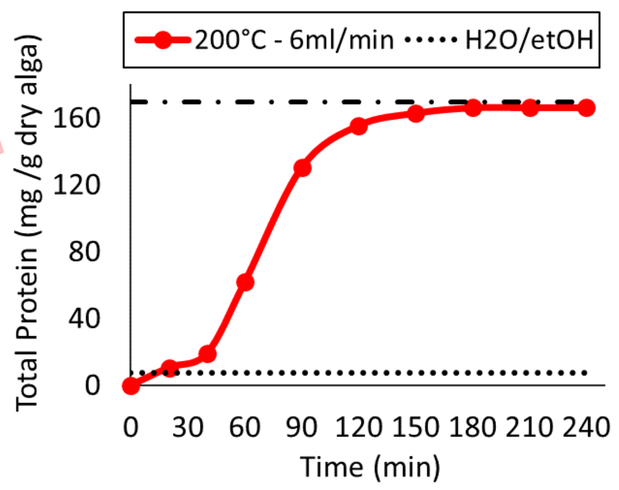


An increase of the flow rate promoted a faster polyphenols recovery

For all the experiments performed in this work, much higher values were obtained by SWE comparing to traditional water/ethanol extraction (0.24 ± 0.3 mg/g dry)

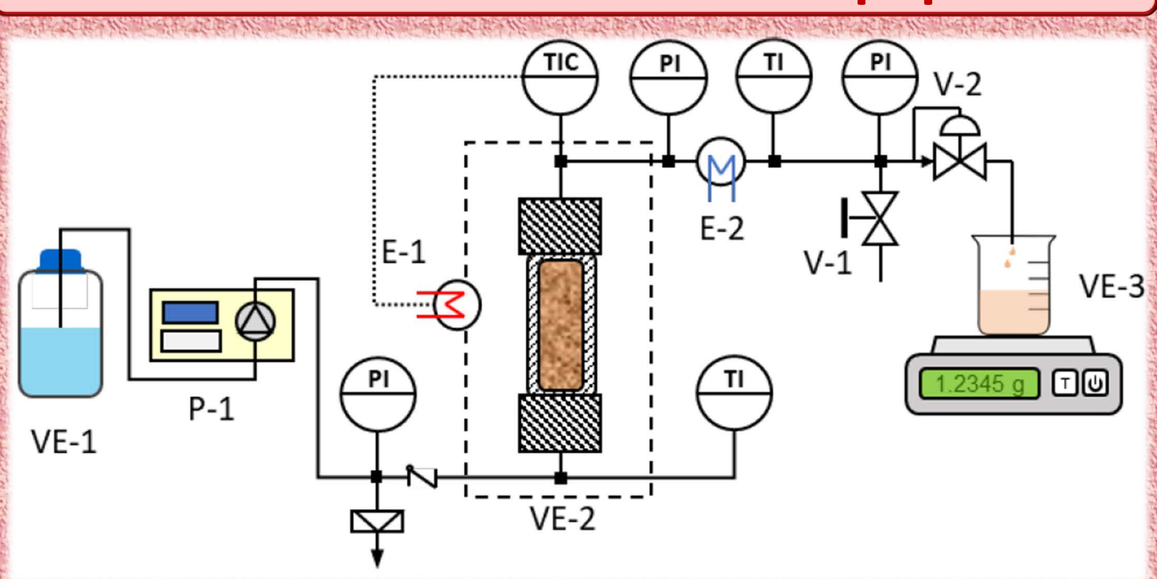
TOTAL PROTEIN DETERMINATION

The total protein content was analyzed at the best conditions for the TPC recovery: 200 °C and 6 mL/min. By SWE, proteins were almost totally extracted and faster than with traditional treatment.



The yield improvement can be explained by the improving of mass transfer with temperature as a result of the increment of the solubility of the compounds present on the matrix algae, as well as a decrease on the surface tension of water and the increasing of the ionic product of water (Kw).

Subcritical Water Extraction Equipment



CONCLUSIONS

SWE is a technique that allows improving the yield of bioactive compounds extraction. Parameters as temperature or solvent flow rate have much influence on the extraction time and the amount of the compounds extracted. Therefore, SWE constitutes an interesting alternative to the conventional treatments leading higher yields, lower costs and a better use of the algae residues.

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