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BIOREFINERY FOR SEQUENTIAL EXTRACTION OF FUCOIDAN AND ALGINATE FROM BROWN ALGA *Sargassum cristaefolium*

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ABSTRACT

The critical step in the sequential extraction of fucoidan and alginate from brown algae is acid treatment, since it noticeably affects physicochemical properties of the both components. This study aimed to investigate the effects of acid treatment on the multiple responses of alginate and fucoidan yield from brown alga *Sargassum cristaefolium*. Box Behnken Design (BBD) from Response Surface Methodology (RSM) was established to understand the effects of temperature, time and pH in acid treatment on the fucoidan yield and multiple-response alginate as follows: yield, intrinsic viscosity, and molecular weight. The experimental results revealed that temperature, time and pH significantly affected fucoidan yield, alginate yield, intrinsic viscosity, and molecular weight of alginate. The optimum acid treatment was found at temperature 33.75 °C, time 58.22 min, and pH 3.07, resulting in fucoidan yield 1.22±0.068%, alginate yield 29.85±0.24%, intrinsic viscosity 409.72±8.23 ml/g and molecular weight 194.08±3.77 kDa with the desirability value 0.805.