

# Improving Fucoïdan Yield from *Fucus* Brown Algae by Microwave Extraction

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## Abstract

The bioactive sulfated polysaccharide from brown algae, fucoïdan, can be used for a wide array of applications. As with other natural products, there are seasonal variabilities as well as variability within the investigated species, across regions, and from using different extraction procedures. In this study, the use of hot demineralized water and two variations of hot acidified water (0.01 M Sulfuric acid and 0.1 M hydrochloric acid) as extraction solvents for microwave extraction of fucoïdan from three different brown algae of the *Fucus* genus (*F. vesiculosus*, *F. serratus*, and *F. evanescens*) were investigated. The effect on yield, degree of sulfation, and the molecular weight of the fucoïdan from the different solvents at temperatures 80°C, 100°C, 120°C, were tested. The *Fucus* used in this study were harvested in the Baltic Sea in the Kiel Fjord, Germany, during Summer and Autumn of 2017. Spray dried *F. vesiculosus* from Brittany in France was also analyzed and used for optimization of the extraction method and as a reference sample. The extraction procedure was adapted and modified from the method provided by Fletcher et al, 2017. The extracts were purified by performing dialysis and size-exclusion-chromatography, and the sugar composition of each extract was analyzed by HPLC-RID and by HPLC-MS. The presence of sulfate was compared between each solvent, to verify if hydrochloric acid, despite providing high yields, resulted in low-sulfate fucoïdan fractions.

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