

Effect of Sulfated polysaccharides rich fractions from *Dictyopteris delicatula* on calcium oxalate crystallization and crystal morphology

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INTRODUCTION: Kidney stones are usually composed of calcium oxalate (CaOx) crystals. Three types of CaOx crystals have a stable form, monohydrate (COM), dihydrate (COD) and trihydrate (COT). COD are the least offensive to the kidney tissue and are not present in kidney stones. Both crystal aggregation and nucleation as the damage to the renal epithelium caused by crystal induce urolithiases. Sulfated polysaccharides extracted from the brown seaweed *Dictyopteris delicatula* (DDSP) are bioactive molecules, which have activities like antioxidant, anticoagulant and antiproliferative. However, there are no data about the DDSP effect on CaOx crystals formation. **OBJECTIVE:** Our goal was to analyze DDSP-rich fractions interference on CaOx crystallization *in vitro*, as well as, crystal morphology. **MATERIALS AND METHODS:** The DDSP-rich fraction were obtained after proteolysis and sequential acetone precipitation. They were submitted to gel electrophoresis (AGE) and chemical analyses. CaOx crystallization (aggregation/nucleation) was analyzed by spectrophotometry, whereas crystal morphology and size was analyzed by optical microscope. **RESULTS AND DISCUSSION:** Six fractions were obtained, F05V, F07V, F10V, F13V, F15V, F20V and they showed different profiles on AGE. The sugar and sulfated percentage ranged from 49,83% to 82,75% and from 14,1% to 19,0%, respectively. Protein contamination was less than 2%. All DDSP-rich fractions inhibit CaOx aggregation/nucleation in a dose-dependent way, also, they reduce crystal size and increase COD/COM ratio. We highlight F0.5V and F0.7V fractions that showed activity at lower concentrations, especially F0.5V that even in lowest concentration (0,02mg/mL) was able to reduce crystal size (30%), COD/COM ratio (89%) and inhibit nucleation and aggregation in 46,8% and 42%, respectively. Furthermore, F05V had the highest yield in the extraction. **CONCLUSION:** DDSP-rich fractions extracted from *D.delicatula* are able to interfere on CaOx crystallization, and further studies are needed in order to clarify the mechanism of action of these fractions.

KEYWORDS: heterofucan, nephrolith, marine biomolecules.

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