Isolation and Characterization of Sulfated Polysaccharides from Macroalgae

Penicillus capitatus

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Introduction. Marine algae are natural sources of macromolecules known as sulfated polysaccharides. This class of compounds is widely distributed and their pharmacological properties have been attracted great interest in the Pharmaceutical Sciences. Several studies with sulfated polysaccharides structurally distinct have shown that the structural conformation varies among species and this feature makes these compounds possess diverse biological activities: anticoagulant, antithrombotic, among others. Therefore, this study aims to extract, isolate and purify the sulfated polysaccharides from seaweed Penicillus capitatus, whereas this specie do not had biotechnological potential prospected.

Material and Methods. The sulfated polysaccharides were extracted by proteolytic digestion and subsequently precipitated with increasing concentrations of ethanol. The precipitates were characterized initially by agarose gel electrophoresis and quantified using the dimethyl methylene blue dye. After that, the sulfated polysaccharides were tested at partial thromboplastin activation time (aPTT) assay and chromatographed on ion-exchange column (DEAE-cellulose).

Results and Discussion. The results obtained in electrophoresis showed that the bands presented migration below of heparin, suggesting that the degree of sulfation of polysaccharides is next to it. With intention to evaluate anticoagulant activity, an aPTT was made and was observed that fractions F30 and F80 prolonged human plasm clotting. Due to fractions F30 and F80 altered clotting time in aPTT assay, these fractions were performed an ion exchange chromatography. The fraction F30 showed two peaks eluted at 0.5 and 1.0 M NaCl, while fraction F80 showed three peaks eluted in 0.3, 0.5 and 1.0 M NaCl. After that, purified sulfated polysaccharides were subjected to the aPTT again, which confirmed the activity as an anticoagulant. Conclusions. The results show presence of sulfated polysaccharides fractions purified from seaweed P. capitatus with anticoagulant activity. As future directions, we intend to fully characterize these sulfated polysaccharides and study more deeply to its pharmacological activity based on the elucidated structure.

Key Words: sulfated polissaccharide, Penicillus capitatus, anticoagulant

Financial support: FAPERJ and CNPq