Isolation and Characterization of Sulfated Polysaccharides from Marine Algae

Gracilaria caudata

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Introduction: Marine organisms are rich source of compounds with multiple biological properties. Over the past 50 years, sulfated polysaccharides have drawn attention of researchers since it became clear involvement in several cellular processes and therefore may present many pharmacological opportunities. In marine algae, these sulfated polysaccharides are complex macromolecules presents in extracellular matrix and its structure varies among different species of seaweed, both on the type of constituent sugar, as the position of the glycosidic linkage and sulfation site, this being an important factors for determining their specific biological functions. The investigation of these biomolecules has increased in recent years due to its broad potential as antithrombotic, antioxidant, anticoagulant, antiviral, anti-inflammatory and anti-proliferative agent. Thus, this work aims the extraction and structural characterization of sulfated polysaccharides from marine macroalgae Gracilaria caudata.

Materials and Methods: Initially, sulfated polysaccharides from G. caudata was extracted by proteolytic digestion. After that, crude extract was submitted to electrophoresis on agarose gel, chromatographed on ion-exchange column (DEAE-cellulose) and purified sulfated polysaccharides were tested at partial thromboplastin activation time (aPTT) assay. Results and discussion: The result of agarose gel electrophoresis demonstrated polydispersity with a majority band co-migrating with standard heparin. Moreover, chromatography on DEAE-cellulose presented two fractions of sulfated polysaccharides eluting at 0.3 and 0.5 M of NaCl, respectively. Additionally, the anticoagulant activity of sulfated polysaccharides fractions was evaluated by aPTT assay and prolonged human plasm coagulation time. Conclusion: The results show presence of sulfated polysaccharides in seaweed G. caudate with anticoagulant activity. Therefore, we intend to characterize structurally these sulfated polysaccharides and study their possible biological activities based on their structure, since the emergence of new biologically active molecules may precede the development of new drugs.

Key words: Sulfated Polysaccharides, Gracilaria caudata, marine macroalgae and biomolecules.

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