Anticoagulant Activity of a Chemically Sulfated Fucomannogalactan From the Edible Mushroom *Lentinus edodes*

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Heparin is an important therapeutic agent for prophylaxis and treatment of thrombosis. However, the heparin source is limited and some problems are associated with its use, such as bleeding and heparin-induced thrombocytopenia. Chemical modification of polysaccharides, such as sulfation, has attracted interest because it enhances a structure similar to that of heparin. In an attempt to study an alternative to heparin, a fucomannogalactan from the edible mushroom *Lentinus edodes* was sulfated giving a product with a degree of substitution of 2.04 and it was evaluated in terms of its *in vitro* anticoagulant activity by activated partial thromboplastin (APTT) and thrombin time (TT) tests, using pooled, normal human plasma. The sulfated polysaccharide was able to prolong APTT and TT in a concentration-dependent manner. The concentration of 20 µg/ml of plasma was 2.5 times greater than that of the negative control) in respect to APTT. The initial concentration of 5 µg/ml of plasma (~2 times greater than that of the control) was able to prolong TT. At a concentration of 100 µg/ml of plasma, the polysaccharide prolonged APTT and TT by more than 300 seconds, this action resulting from the high level of negative charge density produced by the sulfated groups. The native polysaccharide did not inhibit the APTT and TT assays. The ^{13}C NMR spectrum of the sulfated fucomannogalactan contained signals broader than those of the native polysaccharide, also consistent with a high degree of substitution. Methylation analysis is being carried out to determine the position of sulfate substituents.

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