INTRODUCTION: Hemostasis is a physiological process that include clot development (pro-clotting), anticoagulation process and clot dissolution (fibrinolysis). Imbalances in this process can cause severe disorder both as thrombosis and thromboembolism, as bleeding disorders such as hemophilia. The aim of our work was evaluated the influence of a mannan chemically sulphated polysaccharides in hemostasis.

MATERIAL AND METHODS: The polysaccharide was previously extract from yeast extract, with a main-chain of (1→6)-linked α-D-mannopyranosy units, mainly branched at O-2 with side-chains of different lengths with 2-O- and 3-O- substituted mannopyranosyl units, named Mn. This polymer was chemically sulfated sulfated giving a product (Mn-S1) with a degree of substitution of 1.66. Mn-S1 was submitted to structural analysis, such as NMR $^{13}$C, and in vitro and in vivo hemostasis assays.

RESULTS AND DISCUSSION: The $^{13}$C NMR spectrum of the Mn-S1 contained signals broader than those of the Mn, also consistent with a high DS. Mn-S1 was able to prolong aPTT in a concentration-dependent manner. Otherwise, Mn-S1 had a pro-coagulant profile in recalcification test. In assays with isolated coagulation cascade proteins Mn-S1 was able to inhibit the thrombin activity directly and in the presence of heparin co-factor II. However, Mn-S1 also activated the factor XII. The sulfated polysaccharide activated the platelet aggregation when was used a rich platelet plasma. This duality was also observed in in vivo tests. Using a venous thrombosis model, Mn-S1 at lower doses inhibited at 50% thrombus formation, but at higher doses the polysaccharide was pro-thrombotic. This effect was also observed on the aPTT ex vivo test.

CONCLUSIONS: The Mn-S1showed a dual effect on hemostasis, as procoagulant at higher doses and anticoagulant at lower doses. Its procoagulant effect should be confirmed using hemophilic plasmas. This research contributes to a better understanding of the influence of sulfated polysaccharides on hemostasis.