Seaweeds biosynthesize sulfated polysaccharides, and most of them have potential biological activity. The aim of this study was to analyze the chemical structure of the Smith-degraded products obtained from the sulfated heterorhamnans and evaluate their antitumor activity. The milled seaweed *G. oxysperma* was sequentially extracted five times with water (80°C, 4h) yielding OX-1-OX-5 fractions. The chemical and NMR spectroscopy analyses showed that the raw fractions consist of sulfated heterorhamnans, so they were pooled into fraction OX-6. This fraction was subjected to controlled Smith degradation, yielding the Smith-degraded product OX-6S, which was fractionated on DEAE-Sephacel producing two major fractions OX-6sb and OX-6sc. These fractions presented 33.7 and 41.1% of sulfate groups and Mw of 109 and 250 kDa, respectively. OX-6sb and OX-6sc are constituted principally by 3-linked α-L-rhamnosyl units C-2 sulfated and C-4 sulfated besides 2-linked α-L-rhamnosyl units C-4 sulfated. Additionally, OX-6sc presents a significant proportion of 2-linked 3,4-sulfated α-L-rhamnosyl units. The antitumor activity was assayed at the concentrations of 10, 100 and 1000 µg/mL in U373MG and U87MG human glioma cell lines, using MTT cell viability method. Fraction OX-6sc was the most effective in reducing human glioblastoma cell viability in vitro and its biological activity seems to be correlated with the content of the 3,4- and 4-sulfated rhamnosyl units, molecular weight and degree of sulfation.

Word Keys: Green algae, Sulfated polysaccharides and antitumor activity.
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