

## Characterization of a Sulfated Fucan from the Egg Jelly Coat of the Three Color Morphs of the Sea Urchin *Paracentrotus gaimardi*

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Sea urchin eggs are surrounded by a jelly layer composed mainly of sulfated polysaccharides: a sulfated fucan and a sulfated sialoglycoconjugate, the first being responsible for inducing the acrosome reaction and the second one for its potentiation. The sperm acrosome reaction is induced when a sperm with the correct receptor type contacts specific sulfated fucan in the egg jelly. This reaction exposes the protein bindin outside of the sperm tip, which then reacts with a matching egg membrane receptor. We have demonstrated that sulfated fucans have simple structures with well-defined repetitive units. The specific pattern of sulfation and the position of glycosidic bond vary among the sulfated fucans from each species of sea urchins. In this study we isolated, purified and determined the structure of the sulfated fucan from the egg jelly coat of three color morphs (brownish, greenish and pinkish) of the sea urchin specie *Paracentrotus gaimardi*. The crude polysaccharides from the egg jelly were applied to a DEAE-cellulose column and separated into two distinct fractions. The second peak, eluted at ~ 1.5 M NaCl, corresponds to the sulfated fucan. NMR experiments and chemical analysis of the purified sulfated fucans from distinct color morphs of *P. gaimardi* evaluated in this study revealed that these polysaccharides are constituted only for repetitive sequence of fucose 1 → 3 linked, 4-sulfated units. Our results show clearly a new structure of the sulfated fucan. Besides, we could suggest that this polysaccharide would be able to induce acrosome reaction between the three color morphs sperms of *P. gaimardi*. However, we cannot conclude that fertilization will occur because bindin mechanism. This observation pointed to the fact this specie could have started a speciation process.

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