A NEW EXOPOLYSACCHARIDE FROM *Flintiella sanguinaria* : PRODUCTION AND STRUCTURAL CHARACTERIZATION

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Abstract.- The vast phylogenetic diversity of microalgae makes them extremely attractive for bioprospecting as commercial sources of metabolites such as polysaccharides. Polysaccharides are polymers of monosaccharides with high molecular weights. They are exploited by Industry as hydrocolloids (gelling, thickening, emulsifying agents) and biological agents (substitutes for glycosaminoglycans, elicitors, antioxidants, etc). They are renewable materials with a very large variety of chemical structures and, as a consequence, a variety of physico-chemical and biological properties. At this time, very few studies have investigated the exopolymers from microalgae compared to those from macroalgae, bacteria, fungi, animals and terrestrial plants. *Flintiella sanguinaria*, as other well known EPS producers such as *Porphyridium* species, belongs to the rhodophyta phylum, and the porphyridiaceae family. No information is available in literature concerning the synthesis of exopolysaccharide by this specie and its genus, nor information about its culture. The photosynthetic activity of *F. sanguinaria* was measured as function of irradiance and temperature. Saturation point, corresponding to irradiance for which photosynthetic activity is maximized, has been established at 280 µmol photons.m^{-2}.s^{-1}, and optimal temperature at 24°C. These conditions were applied to a culture in a torus shape photobioreactor. During the growth phase (~300h), µmax of 0.4 $days^{-1}$ and generation time of 1.7 days were calculated. After nitrate depletion, stationary phase and EPS production occurred and were maintained during around 300h, allowing final EPS concentration of 1.2 $g.l^{-1}$. The characterization of the extracted EPS was carried out, by colorimetric assays, chromatographic methods (HPAEC-PAD, GC-MS, SEC-MALS, HPLC) and FTIR spectroscopy, showing that the EPS of *F. sanguinaria* is a very high molecular mass polymer (>10^6 Da), mainly composed of no sulfated but partially methylated and acetylated neutral sugars. The main monosaccharides in molar ratios were xylose (~50-68% in molar ratio) and galactose (~16-25%). Other monosaccharides such as glucuronic acid (~10%), rhamnose (6-10%), glucose (~2%) and traces of arabinose were also detected. Moreover, physicochemical characterization of the EPS has shown a very strong aggregative comportment in solution, leading to very high viscosity. This study is then the first description of an EPS synthesis by a strain of *F. sanguinaria*, an the produced polymer has a great potential has a new hydrocolloid.
Keywords: Microalgae, polysaccharide, *Flintiella*