SULFATED POLYSACCHARIDES AS AGENTS FOR FREE RADICALS ANNIHILATION IN SPIRULINA BIOMASS CULTIVATED UNDER THE INDUCED ILLUMINATION STRESS CONDITIONS

Rudic V., Rudi L., Chiriac T., Cepoi L., Miscu V., Codreanu S., Djur S., Valuța A., Sadovnic D., Ghelbet V., Dumbrăveanu V., Chelmenciuc V., Doni V.

Institute of Microbiology and Biotechnology, Academy of Sciences of Moldova
rudiludmila@gmail.com

Spirulina platensis is the source of sulfated polysaccharides known as Na (Ca) spirulan with antiviral and anti-inflammatory action. In the cell sulfated polysaccharides as polyanionic complexes located on the external membrane surface, perform intercellular connections playing the role of tissue barriers, cell adhesion, protection against pathogens and serve as well as reservoir of growth factors. It was demonstrated the involvement of sulfated polysaccharides in the annihilation of hydroxyl radicals and peroxide formed as a result of the Fenton reaction, and indirectly in the lipid protection against oxidation.

Reducing the period of illumination to only 4 hours during 4 days of spirulina cultivation cycle, has not changed sulfated polysaccharide content during stress. Restoring the lighting regime favored the synthesis of sulfated polysaccharides, whose content has increased by 20.6%. Increased content of sulfated polysaccharides in "stressed" spirulina biomass was maintained until the end of the cultivation cycle. We can assume an intensification of sulfated polysaccharides synthesis as a response to increased biosynthetic activity in the mature spirulina biomass that has gone through the period of induced stress. Low values of MDA test vas registered during rehabilitation of spirulina culture by restoring the lighting regime. This may be a result of intense synthesis of sulfated polysaccharides.

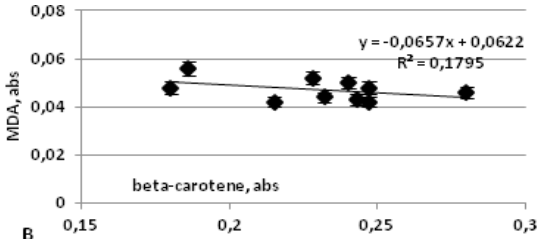

Figure. Correlation between sulphated polysaccharide content (abs) and MDA test values (abs) in spirulina biomass cultivated under light stress during the cultivation cycle

The correlation coefficient r = 0.9 indicates a strong linear dependence between the content of sulfated polysaccharide and lipid oxidation degradation products in spirulina biomass cultivated under light stress during cultivation cycle.

Therefore, sulfated polysaccharides are involved in the annihilation of radicals under a light-induced stress.