

β -CAROTENE INVOLVING IN FREE RADICALS ANNIHILATION IN SPIRULINA BIOMASS CULTIVATED UNDER THE OXIDATIVE STRESS CONDITIONS

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Carotenoids are a group of pigments that play multiple structural and functional roles. They are molecules with conjugated double bonds, allowing them to participate in photosynthetic functions. The most abundant carotenoids in cyanobacteria are β -carotene, essential component of cytoplasmic and thylakoid membranes. As photosynthetic pigments, β -carotene has a protective role of trapping the singlet oxygen in thylakoid membranes.

The stress-induced light experiences during *Spirulina platensis* cultivation showed carotene involvement to maintain membrane function. Cell membrane integrity was determined by modifying the values of the assay of the thiobarbituric acid-reactive products in *Spirulina* biomass cultivated under light stress that was induced by shortening the duration of light from 24 to 4 hours during 4 days of the 10 days cultivation cycle.

The correlation coefficient $r = 0.7$ indicates a strong negative correlation between carotene content and malonyl dialdehyde (MDA) values in spirulina biomass grown under light stress (Figure 1).

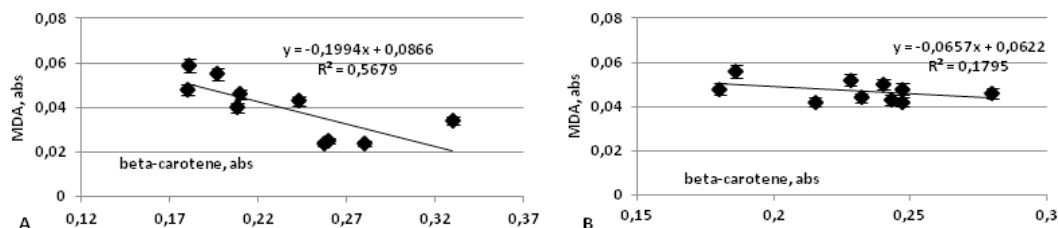


Fig.1 The correlation between carotene content (abs) and MDA values (abs) in spirulina biomass cultivated under light stress (A) and standard conditions (B), during the cultivation cycle

The correlation between carotene content and malonyl dialdehyde (MDA) values in spirulina biomass, grown under standard conditions of a continuous illumination, indicates no dependence between the process of carotene synthesis and accumulation of fatty acid free radicals that is considered an indirect indicator of radical accumulation process. The coefficient $r = 0.4$ indicates a very weak correlation.

Therefore, the assumption of carotene involvement in the processes of radical annihilation was confirmed by the lack of correlation between carotene content and MDA values of spirulina biomass obtained under the optimal conditions.