THE ACTION OF ZN(II) ACETATE ON ADAPTIVE CAPACITY OF *SPIRULINA* IN RESPONSE TO CHANGES IN THE LIGHT REGIME

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Intensive cultivation technologies of microalgae and cyanobacteria imply the presence of chemical stimulators in mineral medium that orient the activity of microorganisms in the direction of super synthesis of some biologically active compounds. The presence of chemical stimulators may be a factor leading to the loss of adaptive capacity of cyanobacterium to changing cultivation conditions with accumulation of oxidative degradation products of lipids.

In order to monitor the adaptive capacity of spirulina, grown in the presence of zinc acetate as stimulator of protein synthesis, cyanobacterium has been subjected to light-induced oxidative stress. During the adaptation period, *Spirulina platensis* was grown in the presence of 15 mg/l of Zn(II) acetate under optimal conditions with continuous illumination. On day 3 of cultivation cycle, corresponding to early exponential growth phase, spirulina was exposed to stress by reducing light period up to 4 hours from 24 hours. Thus, lighting regime was with photoperiodism of 4 hours light/20 hours dark. This regime was followed until day 7 of cultivation. It was used as control sample spirulina, grown in the absence and presence of zinc acetate under optimal conditions. In spirulina biomass, collected every 24 hours, was determined the content of malondialdehyde (TBARS assay).

Under optimal conditions, in variants with supplementing the cultivation medium with zinc acetate, TBARS test values are lower than values determined in control during exponential phase. Reducing light period during exponential growth phase of spirulina in the lack of zinc acetate did not change the content of malondialdehyde in biomass. Therefore, the reduction of light period during exponential phase of spirulina was not a stressful factor for culture.

In spirulina culture, grown in the presence of zinc acetate and exposed to light stress, it was determined an increase of malondialdehyde content. Similar values with control sample of malondialdehyde content in spirulina biomass were determined on day 4 of cultivation cycle. Therefore, reducing the light period to 4 hours in the first 24 hours of illumination stress did not alter biosynthetic activity of spirulina in the presence of chemical stimulator. In the next day of exponential phase, TBARS test values have increased with 38% from the previous day, which was with 92% more compared to malondialdehyde content in control biomass. At the end of exponential growth phase, malondialdehyde content increased with overall 29%. The beginning of stationary phase was marked by decreasing with 15% of malondialdehyde content.

Therefore, spirulina culture, grown under conditions of stimulating biosynthetic activity on the basis of zinc acetate action, became more vulnerable and reducing the light period was a significant stress factor for cyanobacterium.