

**PRODUCTIVITY, CAROTENOID AND GLYCEROL CONTENT OF
DUNALIELLA SALINA CULTIVATED IN THE PRESENCE OF GeO_2
WITH VARYING LIGHTING REGIME**

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Due to the increased content of bioactive substances, especially carotenoids and glycerol, microalga *Dunaliella salina* is of interest and practical advantage in industrial cultivation, being a microalga of biotechnological interest. And due to the metabolisation by *D. salina* of microelements from the structure of chemical compounds, microalgal biomass acquires high nutritional values and new qualitative properties (immunostimulatory, regenerative, cytoprotective etc.), a valuable fact in obtaining ecological multifunctional products with unique properties.

The trends of modern biotechnology require obtaining products in a closed cycle by reusing industrial waste. Green microalga *D. salina* is also an attractive object for the cultivation on the liquid waste especially obtained from the production of the biomass of other microalgae. Thus, the aim of this research was to evaluate the productivity, the content of carotenoids and glycerol in the biomass of *D. salina* cultivated on organo-mineral medium, elaborated from the cultural liquid, resulting from the cultivation of *Spirulina platensis* (production waste), in the presence of GeO_2 compound with the modification of lighting. It was established that light intensity is an important factor in the accumulation of *D. salina* biomass, cultivated both in the absence and in the presence of the GeO_2 compound. The productivity of the control sample grown under intense illumination was 54.2% higher than the control sample grown under regular illumination. The addition of the GeO_2 inorganic compound showed an increase in the *D. salina* productivity by 12.4% at the concentration of 10 mg/L compound and regular lighting, and by 11.2% at the concentration of 20 mg/L, but intense lighting, compared to corresponding controlsamples.

In the samples grown under regular illumination (3500 lx), the most representative stimulating effect on the synthesis of carotenoids was observed for 5 mg/L GeO_2 compound. The content of carotenoids increased with 22.95%. The further increase of the GeO_2 concentration led to the decrease of the carotenoid content. In the samples grown under intense illumination (5000 lx), the highest content of carotenoids were obtained at the addition of the maximal concentration of GeO_2 (20 mg/L). The increase of the carotenoid content was 27%.

The amount of glycerol increased with the increase of the GeO_2 concentration in the samples cultivated under intense illumination (5000 lx) and showed the highest experimental values at the maximal added concentration of 20 mg/L. The increase of glycerol was 33.2%, compared to the control sample. At the regular illumination (3500 lx), only the addition of the minimal concentration of the GeO_2 compound (5 mg/L) stimulated the synthesis of the glycerol. The increase of glycerol content was 24.2%, compared to the control sample. As the concentration of GeO_2 increased in the culture medium, the accumulation of glycerol in the *D. salina* biomass decreased.

Keywords: *Dunaliella salina*, productivity, content of carotenoids, glycerol, biotechnology.