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## EXPERIENCE OF *DUNALIELLA SALINA* TEOD MASS CULTIVATION ON SEDIMENTARY SALT MINING

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Green microalgae *D. salina* is the most promising object for mass cultivation to obtain  $\beta$ -carotene. Current interest in microalgae is associated with the possibility of commercial cultivation on the basis of artificial salt water reservoirs, widespread in Crimea. The purpose of this work was to test *D. salina* two-stage cultivation system using a natural population of microalgae from sedimentary salt mining pools.

The experiment was carried out in industrial complex "Halite" (western part of the Crimean Peninsula) under natural light in two stages: initially orange cells of *D. salina*, selected from salt mining pools, were placed into experimental tanks (with dimensions 2,25 × 4,50 m) with the nutrient medium. At the second stage, grown biomass was selected from the pool and diluted 2 times in culture medium without salts - nitrogen and phosphorus sources. Salinity was gradually increased in pools from 120 to 240 g · l<sup>-3</sup>. In the time of growing a culture was fed with gas and air mixture with a concentration of 3% CO<sub>2</sub> in volume. Within 2 weeks there was a gradual adaptation of cells to changed conditions, accompanied by their partial loss and the change in color from orange to the green (for those, stayed alive). After replacing the culture medium with the fresh one, an increase in number of microalgae cells was observed. Change of morphological cell forms from orange to green was accompanied by a change in the quantitative composition of pigments. Thus, the content of carotenoids reduced from 10.5 to 0.5% DWFA (dry weight free ash), and chlorophyll *a*, on the contrary, was increased from 0.3 to 0.85% DWFA. After exhaustion of mineral nutrients in the medium, crop growth stopped. At the stage 2 of the experiment after increasing of illumination by diluting the culture and increasing environmental salinity, content of carotenoids in *D. salina* cells increased and by the end of the experiment was 4.5% DWFA.

Thus, a two-stage system approbation of industrial cultivation of *D. salina* was conducted. The possibility of its natural population usage as inoculum was demonstrated. Transition from *Dunaliella*'s "red form" to its "green", actively growing form was successfully implemented. It was experimentally proved that increasing in water salinity and illumination at the same time with nutrient deficiency in the industrial cultivation of *D. salina* causes its transition to carotenogenesis step with 5 times increasing in relative content of carotenoids.