

## The Effect of Temperature and Salinity on the Growth and Carotenogenesis of Three *Dunaliella* Species (*Dunaliella* sp. Lake Isolate, *D. salina* CCAP 19/18, and *D. bardawil* LB 2538) Cultivated under Laboratory Conditions

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**Abstract :** In this study, 3 species of *Dunaliella* (*Dunaliella* sp. Salt Lake isolate (Tuz Gölü), *Dunaliella salina* CCAP19/18, and *Dunaliella bardawil* LB 2538) and their optical density, dry matter, chlorophyll *a*, total carotenoids, and  $\beta$ -carotene production were investigated in a batch system. The aim of this research was to compare carotenoids, and  $\beta$ -carotene production were investigated in a batch those 3 species. Therefore 2 stress factors were used: 2 different temperatures (20°C and 30°C) and 2 different salinities (30‰, and 60‰) were tested over a 17-day study. The highest growth and chlorophyll *a* was reported for *Dunaliella* sp. under 20°C/30‰ and 20°C/60‰ conditions respectively followed by *D. bardawil* and *D. salina*. Significant differences were noticed ( $p < 0.05$ ) for the other 3 species. The growth decreased as temperature and salinity increased since the lowest growth was noticed for the 30°C/60‰ group. The chlorophyll *a* content decreased also as temperature increased however when the NaCl concentration increased an augmentation of the content was noticed. In the 17<sup>th</sup> day of experiment the highest carotenoids concentration was reported for *D. bardawil* 20°C/30‰ (65,639 $\pm$ 0,400  $\mu$ g.mL<sup>-1</sup>) and the most important  $\beta$  carotene concentration was for *D. salina* 20°C/60‰ (8,98E-07 $\pm$ 0,013 mol/L).

**Keywords :** *Dunaliella* sp., *Dunaliella salina*, *Dunaliella bardawil*, growth, pigments, stress factors

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