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Comparison of the responses of two *Dunaliella* strains, *Dunaliella salina* CCAP 19/18 and *Dunaliella bardawil* to light intensity with special emphasis on carotenogenesis

Seunghye Park¹, Yew Lee¹ and EonSeon Jin^{1,*}¹Department of Life Science, Hanyang University, Seoul 133-791, Korea*Corresponding Author Email: esjin@hanyang.ac.kr

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ABSTRACT

Dunaliella salina and *Dunaliella bardawil* are well known for carotenogenesis, the overproduction of carotenoids, under stress conditions. The effect of high light (HL) and low light (LL) on the growth, morphology, photosynthetic efficiency, and the β -carotene and zeaxanthin production of *D. salina* CCAP 19/18 and *D. bardawil* was investigated and compared. Both strains showed similar growth kinetics under LL growth condition, but *D. salina* CCAP 19/18 was faster. As the light intensity increased, *D. salina* CCAP 19/18 cells were elongated and *D. bardawil* cells became larger. Both strains showed decrease of the maximum quantum yield of PSII (Fv/Fm) and electron transport rate (ETR) under HL growth condition and *D. salina* CCAP 19/18 was less liable to the light stress. Both strains had about 1.8 and 5 times difference in the O₂ evolution rate at LL and HL conditions, respectively. The β -carotene and zeaxanthin production were increased as the light intensity increased in both strains. *D. bardawil* was more sensitive to light intensity than *D. salina* CCAP 19/18. The possible application of *D. salina* CCAP 19/18 as a carotenogenic strain will be discussed.

Key words: β -carotene; *Dunaliella*; electron transport rate; Fv/Fm; growth; light intensity; O₂ evolution; zeaxanthin

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