

(28)

Effect of pH and Light Intensity on the Growth of *Dunaliella Salina*

Dilshan W.L.T.<sup>1</sup>, Asanthi H.B.<sup>1\*</sup>, Maithreepala R.A.<sup>1</sup>, Atapaththu K.S.S.<sup>1</sup>, Costa A.M.K.C.J.<sup>1</sup>,  
Suranga D.K.A.I.<sup>2</sup>

<sup>1</sup>Department of Limnology and Water Technology, University of Ruhuna, Matara, Sri Lanka

<sup>2</sup>Lanka Salt Ltd., Hambantota, Sri Lanka

\* asanthi@fish.ruh.ac.lk

Abstract

*Dunaliella salina* is a unicellular halophilic green alga dominantly found in salt lakes, and high saline ponds in slatterns all over the world. A rigid cell wall is absent in *D. salina* while the cells are covered by mucous materials that are enclosed by a thin elastic plasma membrane. This species has both environmental and economic validity as they are capable of producing  $\beta$ -carotene during photosynthesis. Synthesis of  $\beta$ -carotene in *D. salina* is a function of environmental factors, and thus, the present study was designed to study the effect of pH of the medium and light intensity on the growth of *D. salina*. The Algae sample was collected from a crystalizing pond of Hambantota Saltern, Sri Lanka, and a monoculture was maintained under suitable laboratory conditions. The seawater sample with pH 7.66 was used to prepare a series of pH using sodium carbonate anhydrous. These cultures were exposed to a series of pH (7.66, 8.0, 8.50, and 9.0) at two light intensities (885 lux and 200 lux). All experimental setups were maintained at 25°C with the photoperiod of 12h light and 12h dark. Four replicates of each pH medium were arranged into a 4×4 setup of flasks for each light intensity and the experiment was conducted for four weeks. At the end of the fourth week, the pH level of all flasks ranged from 8.27 to 8.53 due to the self-adjustment of the pH level in the culture medium in parallel to algal growth. The maximum growth was reflected by the highest absorbance of 1.46 at 750 nm. Taken together, our findings revealed that the optimum pH range and light intensity for culturing *D. salina* is 8.27-8.53 and 885 lux respectively. This study recommends further research on culturing of *D. salina* for extracting the bioproduct of  $\beta$ -carotene at various light intensity levels.

**Keywords:** Cell density,  $\beta$ -carotene, Light intensity, Self-adjusted