

Different salinity effects on the mass cultivation of spirulina (*Arthrospira platensis*) using urea as nitrogen source in Oman and Malaysia

Hafidh Al Mahrouqi¹, Mohamed Amar Naqqiuddin², Jackson Achankunju¹, Hishamuddin Omar² and *Ahmad Ismail²

¹College of Agriculture and Marine Science, Sultan Qaboos University.

²Biology Department, Faculty of Science, Universiti Putra Malaysia 43400, Serdang, Selangor.

*Corresponding author. Tel.: +603 89466617; email address: aismail@upm.edu.my

Mother earth is facing multitude of problems such as desertification, diminishing cultivation land and malnutrition. One way to overcome these problems is through cultivation of Spirulina (*A. platensis*). This paper focused on the different effects of salinity and comparative climate patterns to the mass production of *A. platensis* in Oman and in Malaysia. With extremely contrasting environment, *A. platensis* has unique ability to grow in both tropical (Malaysia) and arid (Oman) outdoor conditions. Mass cultivation has been carried out at different salinity 5, 15, 25 and 35 ppt for 10 days with triplicates in both countries. The total volume of culture in each tank and land photobioreactor was maintained at 100 L and 50L respectively. In Oman, the highest optical density (ABS) was 1.691 ± 0.099 at 5 ppt significantly different and higher than 25 and 35 ppt ($p < 0.05$). Though, the highest biomass (g L^{-1}) achieved with 35ppt, 0.848 ± 0.039 was not significantly different from other salinity concentration ($p > 0.05$). While in Malaysia, the highest optical density (ABS) recorded with Spirulina dry weight was collected from Spirulina culture treatment with 5 ppt, 0.974 ± 0.052 was not significantly different from other salinity treatments ($p > 0.05$) and the dry weight at $0.575 \pm 0.032 \text{ g L}^{-1}$ was significantly different to 25 and 35 ppt ($p < 0.05$). Highest average mean \pm SE of pH in Oman and Malaysia were recorded with salinity treatment of 15 ppt, 10.60 ± 0.058 and 10.20 ± 0.037 .

Keywords: Spirulina, *Arthrospira platensis*, salinity, photobioreactor, climate pattern