

SPACE LIFE SCIENCES SYMPOSIUM (A1)
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Author: Mr. Weidang Ai

China Astronaut Research and Training Center, China, ismeaiwd@sina.com

Prof. Shuangsheng Guo

China Astronaut Research and Training Center, China, guoshuangsheng@tom.com

Mr. Yongkang Tang

China Astronaut Research and Training Center, Chile, weidangai@126.com

Mr. Lifeng Qin

China Astronaut Research and Training Center, China, kangyongtang@163.com

STUDY OF SELECTING ON LIGHT SOURCE USED FOR MICRO-ALGAE CULTIVATION IN SPACE

Abstract

Abstract: Objective To select suitable light source for micro-algae cultivation in future space station. Method The selected Spirulina were cultured under different lightening qualities, including six light sources that were made up of different combinations of red and blue light-emitting diode(LED). The growth, photosynthetic efficiency and nutrition quality of the Spirulina, were analyzed. Result The red light may promote the cumulating of biomass of the Spirulina, and the rate was the highest under the red in all light sources. But the synthesis of protein, phycobiliprotein, -carotene, VE and other nutrients needs a certain portion of blue light; yet, the complete blue light condition is not favorable to the growth of Spirulina, and may bring pollution by chlorella and other kinds of micro-algae. Conclusion The LEDs can be used as the light resource of micro-algae culturing. The normal growth and development of micro-algae needs two light sources of red and blue LED. The comprehensive analyses of the various factors that affect the growth of Spirulina, such as nutrition quality and photosynthetic activities, etc., showed that the combination of 80 percent red and 20 percent blue LED is the optimum one among those tested combinations. Key word: light-emitting diode; micro-algae; controlled ecological life support system (CELSS); space cultivation