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STUDY ON EFFECTS OF THE COMBINED RED LED LIGHT WITH BLUE AND GREEN LIGHT ON GROWTH AND OXYGEN-RELEASING CAPACITY OF SPIRULINA PLATENSIS

Abstract

Abstract: Spirulina can be used as a biological components for the atmosphere controlled and food stably supply in controlled ecological life support system, as for it's superiority that high photosynthetic efficiency, rapid growth, high nutritional value and rich in antioxidants. In this paper, spirulina platensis was cultivated under six radio of red and blue and green LED mixture light,8R2B,8R2G,8R1B1G,7R1B2G,7R2B1G and 6R2B2G,measuring and analysing the filaments morphology,growth index, photosynthetic pigments composition and oxygen-releasing capacity, to study the effects of mixture light on growth and material synthesis of Spirulina.Result showed that, combined red light with blue or green light induced the length of the filaments to grow shorter. 8R:1B:1G treatment showed fastest growth rate and maximal dry weight of 1.44 g•L-1. Combined red light with green improved the photosynthetic pigment content of spirulina remarkably, and the total photosynthetic pigment content of 6R:2B:2G was 123.21mg•g-1, which was 65.43% higher than 8R:2B. 8R:1B:1G treatment showed the highest oxygen-releasing capacity, which up to 7 mgO2•L-1•h -1. As a conclusion, 8R:1B:1G is the efficient light quality that can promote the growth and photosynthetic oxygen of spirulina markedly.