

Development of axenic mixotrophic culture system of *Haematococcus pluvialis* utilizing Ca^{2+} - mediated biomineralization

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The aim of this work is to cultivate astaxanthin producing *H. pluvialis* using axenic mixotrophic culture system. The biggest problem facing humanity at present is climate change, glacier melting and ocean acidification due to the increase of CO_2 . To solve this problems, biological conversion process is required. However, the culture time of *H. pluvialis* was at least 60 day. We can use mixotrophic culture system for decreasing culture time. But bacteria, fungi and golden algae grow together. The contamination factors attack the *H. pluvialis* and the cell was inhibited or die. In this study, the biomass was obtained by using microalgae for the reduction of large amount of CO_2 , and CaCO_3 was obtained through biomineralization of contamination factors during the induction stage. The contamination factors have carbonic anhydrase enzyme, which catalyze the biomineralization at pH 7.7 to 8. The zeta potential of *H. pluvialis* was so low that biomineralization was not occur effectively. Using this system, we can reduce the culture time up to 40 day. Consequently, we can culture *H. pluvialis* using axenic mixotrophic culture system in short period.