

CO₂ fixation to valuable carotenoids by photosynthesis using green microalga
Haematococcus pluvialis

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Increased carbon dioxide (CO₂) concentration in the atmosphere has become of worldwide concern in recent years. As one of the CO₂ reduction strategies, a biological method has been proposed to convert CO₂ to useful biomass by plants or photosynthetic microorganisms. One of the photoautotrophs, *Haematococcus pluvialis* is a freshwater green microalgae and accumulates the secondary carotenoid astaxanthin including other related carotenoids. Compared to β-carotene, astaxanthin has two additional oxygenated groups on each ring structure and it has extraordinary antioxidant capability, ten times activity greater than other carotenoids such as β-carotene and lutein. It is a pigmentation source of biological importance with applications in the nutraceutical, pharmaceutical and food industries. In this study, production of astaxanthin using *H. pluvialis* was conducted by photoautotrophic culture in the CO₂ supplemented incubator. Three kinds of strains of *H. pluvialis*, CCAP 34/7, NIES 144, and UTEX 16 were cultivated and the astaxanthin productivity from *H. pluvialis* NIES 144 was 0.238 mg/g·day higher than other two strains.