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The oleaginous *Ettlia* sp. YC001 producing high lipid contents and a wide variety of carotenoids for industrial application

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The oleaginous microalga, *Ettlia* sp. YC001 was isolated from Daejeon, South Korea and was classified to class Trebouxiophyceae based on 18S rRNA gene sequences. The average lipid content was found to be 20-30%. However, maximum lipid contents were increased upto ~55% under the stress conditions. The whole genome of the strain has been sequenced with Illumina and PGM machine and annotated by Augustus, Glimmer HMM and PASA as Ab initio gene predictors and pipeline, respectively. The genome was about ~170 Mbp with ~20,658 genes. The complete mitochondrial genome was 52,490 bp with GC contents of 48% and 58 genes. Through physiological characterization and transcriptome analysis we found that the carotenoids composition and quality depended on stress condition such as highlight, deficiency of nitrogen, magnesium, calcium and iron. We also identified the expression of different genes and key enzymes involved in the carotenoid synthesis pathway in young and senescent cells. The dominant carotenoids were lutein and neoxanthin. However, these were gradually decreased with time whilst cantaxanthin and antheraxanthin were steadily accumulated. Thus, *Ettlia* sp. YC001, a natural source of carotenoids as well as high accumulated lipid seems to be suitable for industrial application to produce both biodiesel and high-value compounds. Additionally, genomic information will provide valuable clues to drive commercialization of microalgae for the maximum production of lipid and carotenoids through genetic modification.

Biography

Hee-Mock Oh is currently a Senior Research Scientist at the Korea Research Institute of Bioscience and Biotechnology (KRIBB). His research has centered upon ecophysiological and molecular aspects of microalgae, notably control of cyanobacterial bloom, monitoring of cyanobacterial toxins and biodiesel production by mass-cultivation of microalgae. He is President of the Korean Society of Phycology (2014-2015) and a Fellow of the Korean Academy of Science and Technology (KAST).

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