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Effects of gibberellin on oil accumulation, fatty acid compositions and expression of fatty acid biosynthetic genes in *Chlorella vulgaris* (Trebouxiophyceae)

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Gibberellin (GA) is a plant hormone that regulates many physiological processes in plants. In microalgae, GA is synthesized through a slightly different pathway from higher plant GA. Recent studies have shown that several plant hormones such as auxin and jasmonic acid influence microalgae growth and fatty acid accumulation. In this study, the effects of exogenously applied GA were investigated on the growth and total oil content of a marine microalga, *Chlorella vulgaris* (Trebouxiophyceae) during early stationary growth phase. Results showed that GA gradually increases the cell density of *C. vulgaris* to up to 42% on days after treatment (DAT)-8 and also capable of delaying the algal senescence. However, the increment in cell density did not enhance the total oil production albeit transient modification of fatty acid compositions was observed for saturated (SFA) and polyunsaturated fatty acid (PUFA). This illustrates that GA only promotes cell division and growth but not the oil accumulation. In addition, application of GA in culture medium was shown to promote transient increment of palmitic (C16:0) and stearic (C18:0) acids from DAT-4 to DAT-6 and this change is correlated with the expression of β -ketoacyl ACP synthase I (KAS I) gene. This result verified the function of this gene in the fatty acid biosynthesis pathway to produce C16:0 fatty acid.

Biography

Malinna completed her MSc from University of Oxford, United Kingdom in 2010 and PhD last year from Universiti Malaysia Terengganu (UMT), Malaysia. Upon graduation, she works as a lecturer at the School of Fundamental Science, UMT and a junior research fellow at the Institute of Marine Biotechnology, also in UMT. Her research interest is on the fatty acid and oil production of microalgae. She has been working on the gene regulations and manipulation of growth conditions to maximize the production of lipids in microalgae.

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