
Characterization of ω 3-docosapentaenoic acid (DPA) production by *Aurantiochytrium* sp. T7

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Abstract

ω 3-docosapentaenoic acid (DPA) is an ω 3-polyunsaturated fatty acid that has a wide range of human health benefits. Despite its benefits, its natural occurrence is limited in several natural oils such as those obtained from harp seal with its content being no more than 5% in total lipid. Therefore, this study's aim was to find a novel source of ω 3-DPA, such as oleaginous microorganisms. It was found that the newly isolated strain *Aurantiochytrium* sp. T7 showed an ω 3-DPA production of 23.5% of the total fatty acids. The cultivation conditions of *Aurantiochytrium* sp. T7 were characterized, and it was found that the strain grew optimally and showed highest ω 3-DPA production with 2% glucose as a carbon source, 1% yeast extract as a nitrogen source and 1.8% salinity at 28C and a pH below 5.5. Moreover, ω 3-DPA production was observed to increase in the later stage of the cultivation. The characterization of *Aurantiochytrium* sp. T7 indicated the involvement of a novel metabolic pathway for fatty acids production other than the common fatty acid synthase (FAS) or polyketide synthase (PKS) pathways. Thus, *Aurantiochytrium* sp. T7 was considered to be promising as a tool for unraveling a novel fatty acid synthetic pathway as well as a producer of ω 3-DPA-containing lipids.

Keywords: ω 3, docosapentaenoic acid, *Aurantiochytrium*, Polyunsaturated fatty acids

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