



Psychrophilic Microalgae Cultivation in Outdoor Thin Layer Systems for High-Value Products

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Cold-adapted microalgae can grow under 20°C and generate high-value compounds like polyunsaturated fatty acids and pigments. Therefore it owns the potential of off-season cultivation for industrial application.

Tribonema sp. (Xanthophyceae) was cultivated outdoor in a thin-layer raceway pond from March to April in 2021 in a weather-protected greenhouse for four weeks long. Three cultivation conditions were tested consequently after each other, e.g. natural illumination, the combination of natural and artificial illumination and nitrogen deprivation with mixed illumination. Photosynthetic oxygen evolution, as well as two chlorophyll fluorescence techniques, were used for monitoring the activity of the culture. Temperature, irradiance, pH, dissolved oxygen and carbon dioxide concentration were monitored and recorded to describe the environment of the culture. Fatty acid and pigment profiles were analysed regarding the utilization aspects. Biochemical methane potential was investigated to reveal the biorefinary potential of biomass utilization.

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