Biomass and lipid production of *Chlorella protothecoides* under heterotrophic cultivation on a mixed waste substrate of brewer fermentation and crude glycerol

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PII: S0960-8524(14)00425-8
DOI: http://dx.doi.org/10.1016/j.biortech.2014.03.120
Reference: BITE 13251

To appear in: *Bioresource Technology*

Received Date: 30 January 2014
Revised Date: 20 March 2014
Accepted Date: 22 March 2014

Please cite this article as: Feng, X., Walker, T.H., Bridges, W.C., Thornton, C., Gopalakrishnan, K., Biomass and lipid production of *Chlorella protothecoides* under heterotrophic cultivation on a mixed waste substrate of brewer fermentation and crude glycerol, *Bioresource Technology* (2014), doi: http://dx.doi.org/10.1016/j.biortech.2014.03.120

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Abstract

Biomass and lipid accumulation of heterotrophic microalgae *Chlorella protothecoides* by supplying mixed waste substrate of brewer fermentation and crude glycerol were investigated. The biomass concentrations of the old and the new *C. protothecoides* strains on day 6 reached 14.07 g/L and 12.73 g/L, respectively, which were comparable to those in basal medium with supplement of glucose and yeast extract (BM-GY) (14.47 g/L for old strains and 11.43 g/L for new strains) (P>0.05). Approximately 81.5 % of total organic carbon and 65.1 % of total nitrogen in the mixed waste were effectively removed. The accumulated lipid productivities of the old and the new *C. protothecoides* strains in BM-GY were 2.07 g/L/day and 1.61 g/L/day, respectively, whereas in the mixed waste, lipid productivities could reach 2.12 g/L/day and 1.81 g/L/day, respectively. Our result highlights a new approach of mixing carbon-rich and nitrogen-rich wastes as economical and practical alternative substrates for biofuel production.

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