



Research article

## Isolation and screening of promising oleaginous *Rhizopus sp.* and designing of Taguchi method for increasing lipid production

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**Key words:** *Rhizopus sp.*, Taguchi method, SFAs, USFAs, PUFAs,  $\gamma$ -lenolenic acid.

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### Abstract

Oleaginous Zygomycetes have the ability to accumulate large amounts of lipids rich in polyunsaturated fatty acids. A total of 62 isolate from oleaginous Zygomycetes were isolated. 27 out of 62 identified as *Rhizopus* spp and screened for production of high quantity of lipid. 9 out of 27 have the capability of lipid production in high amount. *Rhizopus sp. Strain GB2* was selected for further optimization where it produces lipids equal to 1.01g l<sup>-1</sup> with lipid content 34.21%. Taguchi method was used to increase lipid production where many factors at different levels were selected for optimization process. Sucrose, peptone and temperature have a direct effect on lipid production with contribution percentage (25.8, 25.33 and 25.26%) respectively, in contrast pH and time have weak effect on lipid production. GC profile showed that saturated fatty acid (SFAs) more than unsaturated fatty acid (USFAs), where palmitic acid and oleic acid were dominant 43.68 and 18.36, respectively. On the other hand, when *Rhizopus sp. GB2* incubated at 15°C for three days after full incubation period, GC profile shifted to USFAs more than SFAs, where palmitic acid decreased to 40.55% and oleic acid increased to 44.43%, also  $\gamma$ -lenolenic acid (2.79%) and linoleic acid (0.10%) were appeared as polyunsaturated fatty acid (PUFAs). Therefore, *Rhizopus sp. GB2* is considered as promising oleaginous filamentous fungi that can be used in industrial application for PUFAs production.