# Adding Value to the Oil Cake as a Waste from Oil Processing Industry: Production of Lipase in Solid State Fermentation

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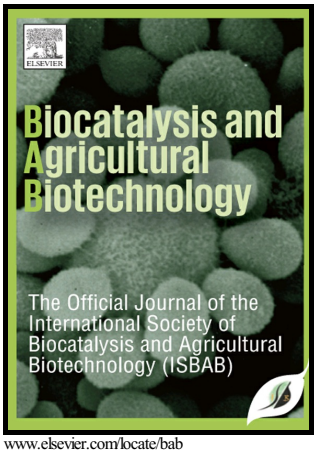


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# Adding Value to the Oil Cake as a Waste from Oil Processing Industry: Production of Lipase in Solid State Fermentation

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**Abstract:**

*Riccinus communis* (castor) seed cake is a by-product generated after oil extraction from the seed. This deoiled seed cake contains a toxic protein ricin that restricts its application in livestock feed. In the present study, solid-state fermentation (SSF) was used to value addition in castor de-oiled cake (CDOC). It was used as a substrate for the production of lipase under SSF using different fungal species. Initially, seven fungal strains were grown on CDOC and out of seven, only four are able to grow on it. From these four strains, only two *Aspergillus oryzae* (NCIM 1212) and *Aspergillus japonicas* (MTCC no. 1975) were observed to produce lipase. The effect of different physical parameter viz., moisture content, pH and incubation time on lipase production were also determined. The maximum lipase yield was determined to be 25 U/gm. Maximum enzyme production was observed at $6^{th}$ day of incubation. The optimum condition for the lipase production was pH 7.0, moisture content 100%. From these results, it can be concluded that CDOC could be a good and cheap substrate for lipase production through SSF.

**Keywords:** Castor de-oiled cake; lipase; *Aspergillus oryzae*; *Aspergillus japonicas,* solid state fermentation

## 1. Introduction

Lipases (triacylglycerol hydrolases E.C. 3.1.1.3) constitute one of the most important groups of industrial enzymes because of their unique ability to hydrolyse fatty acid ester bonds in aqueous environments and synthesize them in non-aqueous medium (Aguieiras et al., 2018; Geoffry and Achur 2018; Contesini et al., 2010). These enzymes also demonstrate regio- and enantio-selectivity (Cai et al., 2018). In many industries viz., biodiesel production, flavour esters formation, surfactant, food, pharmaceutical or wastewater treatment is required in high quantity (Geoffry and Achur 2017; Naik et al., 2018). However, this usually increases the cost because of usage of commercial lipase. This cost can be lowered if microbial lipase is produced by low cost