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**SHORT COMMUNICATION** **OPEN ACCESS**

# Isolation and Characterization of Lipase-Producing Fungus from Onion

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**ABSTRACT**

*Lipase is an enzyme that catalyses the hydrolysis of triglycerides into fatty acids and glycerol. The present study was aimed to optimize the cost-effective fermentation media for the maximum production of lipase by Aspergillus niger isolated from a contaminated onion. For the production of lipase enzyme, Aspergillus niger was inoculated in minimal media containing soybean oil, olive oil cake and ground nut oil cake and solid-state fermentation. After 8 days of incubation, the enzyme was harvested from fermentation cake in phosphate buffer, filtered through Whatman filter paper and the filtrate was assayed for lipase activity by the titrimetric method.*
***Key words**: Lipase, Aspergillus niger, Soybean oil cake, Ground nut oil cake*

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## INTRODUCTION

Lipases are serine hydrolase that catalyse both hydrolysis and synthesis of long chain triacylglycerols [1]. They are carboxylic esters currently attracting an enormous attention due to their versatile wide biotechnological applications. Lipases are produced by bacteria, fungi, plants and animals. *Aspergillus niger* is the well-known lipase producers [2]. It is considered to be safe production organism. It is highly aerobic organism found in almost all oxygen rich environments, where they commonly grow as Molds on the surface of substrate, as a result of the high oxygen tension. Recently, cheap agricultural by-products like ground nut oil cake, soybean oil cake and olive oil cake have been going a great interest as substrates in solid state fermentation for fungi.

## MATERIAL AND METHODS [3]

### 1) Isolation and Screening of Lipase Producing Mold

Onion sample was collected and the black, powdery growth aws transferred to saline water with 0.001% Sodium Dodecyl Sulphonate (SDS) detergent and spread on the Potato Dextrose agar in triplicates and plates were incubated at $30^0$ C for 72-96-h.The black colonies typical of *Aspergillus* were subjected to the Morphological testing and on the basis foot cell in the base of conidiophores were observed and the isolate was taken as *Aspergillus niger* isolate.

### 2) Optimization of Lipase Production [4, 5]

The three-fermentation media were prepared with minimal media containing 100-g each of soybean oil cake, ground nut oil cake and olive oil cake, in triplicates and solid-state fermentation. Incubated at 300 C for 10- days. The mouldy cakes were harvested and sprinkled with 100 mL (for each of sets) phosphate buffer pH 6.0 and then all aliquots are filtered through Whatman filter papers and the filtrates were subjected to estimation of lipase activity. by titrimetrically using olive oil hydrolysis [4].

Lipase activity: One unit of lipase activity was defined as the amount of enzyme releasing one mole of free fatty acids in one min under standard assay condition. [6].

## RESULTS AND DISCUSSION

The isolate of fungus showed black coloured big colonies with profused mycelia and foot cell, non-septate conidiophores and hence identified as *Aspergillus niger* isolate. The solid-state fermentations results showed that average (of triplicates) yield of lipase with soybean cake substrates was maximum (18 U/mL) followed by olive oil cake(13 U/ mL) and lowest activity was found with ground nut oil cake(11.0 U/mL)(Table-1).

**Table-1: Yield of lipase production by *Aspergillus niger* isolate with different substrates**

| Sr. no | Medium | Average yield of triplicates (lipase U/ mL) | Yield /100-g cake Units |
|---|---|---|---|
| 1 | Medium A-Soybean oil cake | 18.0 | 1800.0 |
| 2 | Medium B-Olive oil cake | 13.0 | 1300.0 |
| 3 | Medium C-Ground oil cake | 11.0 | 1100.0 |

## CONCLUSION

The *Aspergillus niger* isolate is promising isolate having capacity to produce lipase using soybean oil, olive oil cake and ground nut oil cake and solid-state fermentation.

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