

## Accepted Manuscript

Evaluation of alkaline, thermotolerant lipase from an indigenous isolated *Bacillus* strain for detergent formulation

Rashmi Saraswat, Vijeshwar Verma, Srinivas Sistla, Indu Bhushan

PII: S0717-3458(17)30053-2  
DOI: doi:[10.1016/j.ejbt.2017.08.007](https://doi.org/10.1016/j.ejbt.2017.08.007)  
Reference: EJBT 273

To appear in: *Electronic Journal of Biotechnology*

Received date: 8 May 2017  
Accepted date: 28 August 2017



Please cite this article as: Saraswat Rashmi, Verma Vijeshwar, Sistla Srinivas, Bhushan Indu, Evaluation of alkaline, thermotolerant lipase from an indigenous isolated *Bacillus* strain for detergent formulation, *Electronic Journal of Biotechnology* (2017), doi:[10.1016/j.ejbt.2017.08.007](https://doi.org/10.1016/j.ejbt.2017.08.007)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Electronic Journal of Biotechnology  
EJBT-D-17-00073  
Research article  
Received: May 8, 2017  
Accepted: August 25, 2017  
Areas: Microbial Biotechnology;

## Evaluation of alkaline, thermotolerant lipase from an indigenous isolated *Bacillus* strain for detergent formulation

Rashmi Saraswat<sup>a</sup>, Vijeshwar Verma<sup>a</sup>, Srinivas Sistla<sup>b</sup>, Indu Bhushan<sup>a,\*</sup>

<sup>a</sup> Department of Biotechnology, Shri Mata Vaishno Devi University, Kakryal, Katra 182320, Jammu and Kashmir, India

<sup>b</sup> GE Healthcare-Life Sciences, John F. Welch Technology Centre, Whitefield Road, Bangalore 560 066, India

\*Corresponding author: sharmasmvdu92@gmail.com

### Abstract

**Background:** Lipases are utilised in detergent industries to minimise usage of phosphate-based chemicals in detergent formulations. The use of lipase in household laundry reduce environment pollution and enhances the ability of detergent to remove tough oil or grease stains.

**Results:** A lipase producing indigenous *Bacillus subtilis* strain [accession no. KT985358] was isolated from the foothills of Trikuta mountain in Jammu and Kashmir, India. The lipase (BSK-L) produced from this strain expressed alkaline and thermotolerant characters. Lipase has a optimal activity at pH 8.0 and at temperature 37°C, whereas it was found to be stable at pH range 6.0 to 9.0 and showed active lipolytic activity at temperature range 30°C to 60°C. Furthermore, lipase activity was found to be stimulated in the presence of metal ions, Mn<sup>2+</sup>, K<sup>+</sup>, Zn<sup>2+</sup>, Fe<sup>2+</sup> and Ca<sup>2+</sup>. This lipase was observed to be resistant to surfactants, oxidising agents and commercial detergents, suggesting it as a potential candidate for detergent formulation. BSK-L displayed noticeable capability to remove oil stains when used in different washing solutions containing buffer, lipase and commercial detergent. The maximum olive oil removal percentage obtained was 68% when the optimum detergent concentration (Fena) was 0.3%. The oil removal percentage from olive oil soiled cotton fabric was found to be increased with 40 U/ml of lipase.

**Conclusions:** This BSK-L enzyme has the potential for removing oil stains by developing a pre-soaked solution for detergent formulation and was found compatible with surfactants, oxidising agents, and commercial detergents.

**Keywords:** Activity, *Bacillus subtilis*, environment pollution, Fabric, GRAS, lipolytic activity, Oil, Removal, Surfactant, thermotolerant.

### 1. Introduction

Download English Version:

<https://daneshyari.com/en/article/6618590>

Download Persian Version:

<https://daneshyari.com/article/6618590>

[Daneshyari.com](https://daneshyari.com)