

# Biosurfactant production by bacteria isolated from automobile repair shop and its potential applications

Shariy Elgal N<sup>1\*</sup>, Shyam SS Stalin<sup>1</sup>, Preyenga R<sup>1</sup> & Kayalvizhi B<sup>2</sup>

<sup>1</sup>Department of Biotechnology, Bishop Heber College (Autonomous), (Affiliated to Bharathidasan University, Tiruchirappalli) Tiruchirappalli, Tamil Nadu, India

<sup>2</sup>Evolvute Bioscience, Woraiyur, Tiruchirappalli, Tamil Nadu, India

*Received 03 October 2024; revised 19 May 2025*

## Abstract

Biosurfactants are surface-active compounds produced by microorganisms, primarily during the stationary phase of growth and are necessary for industrial applications, and eco-friendly alternatives to synthetic surfactants. These biodegradable surfactants emulsify hydrocarbons and have diverse applications, including environmental cleanup. This study focuses on microbial-derived biosurfactants from bacteria isolated from soil samples in automobile repair zones. Four bacterial colonies (BS1, BS2, BS3, and BS4) were isolated and screened for biosurfactant production. The selected colony underwent microscopic and biochemical identification. Biosurfactants were produced in a mineral salt medium (MSM) at 37°C for seven days, optimizing incubation time (3, 5, and 7 days), pH (5, 7, and 9), and carbon sources (glycerol, glucose, and petrol). The highest production occurred with petrol at pH 7 after seven days. Fivefold biosurfactant yield of 4 g/L was observed after optimization of biosurfactant production process. Biosurfactants were recovered through acid precipitation and tested for stain removal and oil degradation, demonstrating promising bioremediation applications.

**Keywords:** Surfactants, Hydrocarbon, Enviromental pollution, Mineral salt medium, *Bacillus*