Proceedings International
Platinum Open Access Journal (ISSN 2668-6384)

Proceedings, Abstract
Volume 3, Issue 5, 2021, 26
https://doi.org/10.33263/Proceedings35.026

Synthesis and Characterization of Biosurfactants from Non-edible Feedstocks: Comparative Assessment and their Applications in Biodiesel †

Neha Rawat [1,2], Aman Kumar Bhonsle [1,2], Jayati Trivedi [1,2], Raj Kumar Singh [2,3], Neeraj Atray [1,2,*]

[1] Biofuel Division, CSIR-Indian Institute of Petroleum, Dehradun, India;
[2] Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, India;
[3] Analytical science division, CSIR-Indian Institute of Petroleum, Dehradun, India;
* Correspondence: neeraj@iip.res.in (N.A.);
† International Conference on Advanced Materials for Next Generation Applications, 29th – 30th September, 2021 (AMNGA-2021)

Received: 10.09.2021; Revised: 20.09.2021; Accepted: 21.09.2021; Published: 29.09.2021

Abstract: Surfactants are one of the versatile products of the chemical industry owing to their inherent nature to lower the surface and interfacial tension and interface layer stabilization but restricted due to non-degradability issues and hazardous effects. For combating such problems, bio-based surfactants (biosurfactants) could be a potential alternative. The biosurfactants are an integral part of life as they have been explored in pharmaceutical sectors, therapeutics, health, food products, health and beauty products, and agriculture, creating sustainable economics and promoting sustainable development goals. Therefore, researchers have been interested in producing, optimizing, and utilizing biosurfactants for various applications. In the present work, biosurfactants were prepared from three different feeds, namely *Jatropha carcus*, *Sapium sebiferum*, and used cooking oil (UCO) using $NaHSO_3$ as sulfonating reagent and Al_2O_3 as the heterogeneous catalyst to yield 70 %, and comparative assessment was done. The biosurfactant production involved a two-step process viz. biodiesel production and biosurfactant production thereof. The biodiesel produced in the first steps met all the BIS 15607:2016 specifications, and products were confirmed through analytical techniques like Fourier transform infrared (FTIR) and Nuclear magnetic resonance (NMR) spectroscopy. Further, the synthesized biosurfactants were employed to reduce the biodiesel-glycerol layer separation time, and significant time reduction in the biodiesel-glycerol separation was observed.

Keywords: biodiesel; transesterification; Sapium oil; Jatropha oil; biosurfactant; solvent.

Funding

The first author is thankful for the financial support (Project no-OLP-1110) from the Council of scientific and industrial research (CSIR), India.

Acknowledgments

We are thankful to Dr. Anjan Ray, Director, CSIR-IIP, for giving the permission and opportunity to present this work.

Conflicts of Interest

The authors declare no conflict of interest.