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P88

## ISOLATION AND CHARACTERIZATION OF POTENTIAL BIOSURFACTANTS PRODUCED BY *Bacillus* STRAINS GROWING ON AGROINDUSTRIAL WASTES

Anna Poliwoda<sup>1</sup>, Ewa Krzosok<sup>1</sup>, Piotr P. Wieczorek<sup>1</sup>, Paweł Kafarski<sup>1</sup>, Grażyna Plaza<sup>2</sup>

<sup>1</sup>Opole University, Faculty of Chemistry, 11a, Kopernika str., 45-040 Opole, Poland; <sup>2</sup>Institute for Ecology of Industrial Areas, Department of Environmental Biotechnology, 6, Kossutha str., 40-844 Katowice, Poland

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### Abstract

Lipopeptides belong to the natural biosurfactants of bacterial origin that consist of a hydrophobic long alkyl chain linked to a hydrophilic polypeptide with cyclic or linear structure. These molecules have received considerable attention as attractive substances used in agriculture (especially as biopesticides in plant disease control), medicine (as pharmaceuticals due to its antimicrobial, antiviral and antitumor activities and enzyme inhibition) and pollution remediation. Unfortunately, the main problem for their widespread use is the fact that these compounds have not been able to compete economically with their chemically synthesized counterparts. The best way to reduce substrate cost for biotechnology at present is to use wastes with the right balance of carbohydrates and lipids to support optimal bacterial growth and biosurfactants production, and which are either free or carry a cost credit for environmental benefit. As known, millions of tons of hazardous and non-hazardous wastes are generated each year throughout the world. There is a great need for better management of these wastes via the concept: reduce, reuse, and recycle.

Therefore, the aim of this work was to isolate and characterise of lipopeptide biosurfactants produced by *Bacillus spp.* cultured on agroindustrial wastes (i.e. molasses and brewery effluents). The surfactants were isolated from the obtained medium (supernatants) by using solvent extraction technique with various organic extrahents (like chloroform, dichloromethane, methanol, hexane, etc.). Mass spectrometry with electrospray ionization and NMR (400 MHz) were used to characterized the purified surfactant. The type of applied solvent (-s) determined the content and type of isolated lipopeptides from analysed supernatants. The fractions rich in lipopeptides were obtained. Characteristic  $m/z$  peaks of surfactins, fengicyns and iturins families were observed. Furthermore, the novel, unknown product was isolated and its chemical structure was proposed.

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