

Biofilm inhibition and antimicrobial action of lipopeptide biosurfactant produced by thermohalophilic strain *Bacillus* sp. DJ 25

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Surfactants are amphiphilic compounds which can reduce surface and interfacial tensions by accumulating at the interface of immiscible fluids and increase the solubility, mobility, bioavailability and subsequent biodegradation of hydrophobic or insoluble organic compounds. *Bacillus* sp. DJ 25 is a moderate halophilic bacterium, isolated from a soil sample around a lake Domat Al-Jandal Lake, Saudi Arabia. The organism is capable of growing at 60°C and over a wide range of NaCl concentration (0-30 %, w/v), however with an optimum of about 10 % (w/v) NaCl. Isolation and characterization of the surface active components from the crude biosurfactant produced by *Bacillus* sp. was studied. *Bacillus* sp. DJ 25 was found to produce a complex of lipopeptides. The antimicrobial activity of a lipopeptide biosurfactant, DJ25, was tested against different organisms. The results demonstrated that lipopeptides have a broad spectrum of action, including antimicrobial activity against microorganisms with multidrug-resistant profiles. DJ25 was found to be active against several pathogenic bacteria, including *Enterococcus faecalis*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Escherichia coli*. The biosurfactants showed interesting specific anti-adhesion activity being able to inhibit selectively biofilm formation of two pathogenic strains. In particular, *Escherichia coli* and *Staphylococcus aureus* biofilm formation was decreased of 95% and 92%, respectively. The selected isolate was further characterized to determine their optimum lipopeptide biosurfactant production at various ranges of salt, temperature and pH.

Biography

Meshref A. Al-Ruwaili has completed his Ph.D from Jordan University. He is the Dean of College of Applied Medical Sciences, Al-Jouf University, Saudi Arabia. He has published more than 15 papers in reputed journals.

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