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Exploring the antimicrobial, antibiofilm and antioxidant potentials of novel Nocardiopsis dassonvillei GSBS4 strain isolated from a saline desert soil

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Abstract

The emergence and rapid spread of multidrug resistant bacteria such as the ESKAPE pathogens, represents a major problem for the bacterial infections treatment. Screening of novel actinobacteria from the extremobiosphere is one of the main strategies to obtain natural chemical diversity. During our screening program, a total of 273 actinobacteria strains were isolated from a Saharan soil sample (South Algeria) and subjected to antagonistic activity test against human pathogenic germs. The antimicrobial and antibiofilm activities of the ethyl acetate crude extract obtained from the most active isolate GSBS4 was performed as well as the minimum inhibitory concentration (MIC). The antioxidant potential of the extract was also evaluated by defining the total phenolic and flavonoids contents and the free radical scavenging activity along with the reducing power. The active isolated strain showed 100% 16S rRNA gene sequence similarity with Nocardiopsis dassonvillei. It showed a broad activity spectrum where S. aureus and P. aeruginosa exhibited a susceptibility to the ethyl acetate crude extract with MICs estimated at 1.44. 102 mg/L and 11.5. 102 mg/L respectively. 44% biofilm reduction was obtained for S. aureus and 61% for P. aeruginosa. Furthermore, 13.78 ±0.75 mg/GAE/g dry weight of polyphenols and 4.7 ±0.34 mg/QE /g dry weight of flavonoids were recorded in the crude extract exhibiting a significant dose dependent antioxidant activity by scavenging DPPH* (57.21%) and ABTS* (64.29%), respectively. These properties open up promising perspectives for the possible consideration of GSBS4 as a potential source of molecules acting against multidrug resistant bacteria and free radicals

Biography:

Ibtissem DJINNI studied Microbiology at Bejaia University-Algeria and obtained her PhD in Microbiology in 2014 from the same university. She is a lecturer researcher at the Department of Microbiology of University of Bejaia since 2009. From 2007, her research work is focused on isolation, cultivation and characterization of actinobacteria and their secondary active metabolites for generating novel antibiotic scaffolds to combat antimicrobial resistance

Speaker Publications:

1. Actinobacteria Derived from Algerian Ecosystems as a Prominent Source of Antimicrobial Molecules
2. Metabolite profile of marine-derived endophytic Streptomyces sundarbansensis WR1L1S8 by liquid chromatography–mass spectrometry and evaluation of culture conditions on antibacterial activity and mycelial growth

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