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Investigation of Antibacterial Activity of Actinomycetes

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ABSTRACT: Due to fast emerging resistance to antibiotics among pathogens, there is increasingly greater need to discover new and effective antibiotics for treating infections caused by drug-resistant pathogens. Actinomycetes have come as a potential resource to discover new antibiotics. In our study of investigating actinomycetes for the production of antibacterial compounds, various strains of actinomycetes were selected from the culture collection of our laboratory. The strains were analyzed for their colony characteristics and cell morphology before screening them for antibacterial activity against a panel of pathogenic bacteria. Positive strains were further tested for production of 10 industrially important enzymes. Antibacterial production was initiated and checked on different media. Then, the activities were noted by screening of the selected strains against pathogenic gram positive and gram negative bacteria, using agar well-diffusion method. Enzyme profiling of the cultures was done for 10 industrially important enzymes. Of the total isolates screened, 50% isolates showed positive results for antibacterial activity. Out of them, only 2 showed activity against gram negative bacteria whereas 4 were potential candidates against gram positive bacteria, so were taken up for further characterization. Amongst them, 2 strains showed broad spectrum of activity. Present study suggests that actinomycetes are highly potential candidates for antibacterial drug discovery which can be of significant help in the area of infectious bacterial diseases and their eradication. This study can further be expanded by extracting the active compound responsible for antibacterial activity and checking their spectrum against other pathogenic bacteria; in accordance with CLSI guidelines; before finally identifying the compound.

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