عنوان مقاله:

In vitro identification of antimicrobial hemolytic lipopeptide from halotolerant Bacillus by Zymogram, FTIR, and GC mass analysis

محل انتشار:

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خلاصه مقاله:

Objective(s): The multi-drug resistant bacteria and clinical infections are some of the biggest global concerns, so new drugs are needed. Antimicrobial peptides and lipopeptides are new bioactive agents with great potential that can become a new strategy for clinical applications.Materials and Methods: Some Bacillus strains were isolated based on hemolytic antimicrobial production from the soil. The extracellular proteins were extracted by acidic precipitation and chloroform/methanol method and analyzed by SDS-PAGE electrophoresis and stained with Sudan black. The black fragment was purified and characterized by FTIR, GC/MS, and HPLC analysis to demonstrate the presence of lipids and proteins. The anti-microbial ability and stability of the purified lipopeptide were assayed by the Kirby-Bauer method. Also, it was examined for metal removal.Results: A new Bacillus halotolerans strain SCM ۰۳۴ with hemolytic antimicrobial production was isolated. According to GC/MS (detecting C۱۶, C۱۷) and HPLC (detecting leucine, glutamic acid, valine, arginine, glycine, and aspartic acid) data, the black fragment was lipopeptide. Polyacrylamide hydrogel containing lipopeptide and gel purified lipopeptide showed anti-microbial activities against S. aureus and S. cerevisiae that were stable for a few months. Also, the lipopeptide was useful for cation removal and decreased cobalt, nickel, and calcium by ۱۰.۸۱ %, ۲۴.۳۹ %, and ۳۴ %, respectively.Conclusion: Production of antibacterial lipopeptide hemolysin from this strain is reported for the first time and according to the results, lipopeptides have unique properties with biomedical and pharmaceutical applications. Also, polyacrylamide hydrogel lipopeptide is a promising candidate for wound healing.

کلمات کلیدی:

Antimicrobial, Bacillus halotolerans, Hemolysin, Hydrogel, Lipopeptide, Polyacrylamide Gel