

## Screening of bacillus species with potentials of antibiotics production

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**Background and Aims:** screening of soil samples to isolate microorganisms able to produce antibiotic is the first step in novel antibiotic production. In the present study isolation of a bacterial strain capable to show antimicrobial activity on 6 bacterial and 3 fungal standard strains was aimed.

**Methods:** soil samples were collected from different green places and parks in Kerman, Iran. After spreading of each soil extract on agar plate containing standard bacterial and fungal strains incubation was done to observe inhibition zone. The antibiotic producing strains were then identified using biochemical and 16S rDNA methods. After cultivation of selected strains in nutrient broth the obtained supernatants were tested for inhibitory activity using the standard cylinder-plate method. Optimization study was done to choose the best medium for antibiotic production. After treatment of obtained supernatant with trypsin and proteinase K the ethyl acetate fraction of produced culture broth was subjected to bioautography using chloroform:methanol, 60:40 as mobile phase and Rf were calculated for inhibition spots.

**Results:** The highest inhibition zone on *Aspergillus niger* belonged to culture broth of isolate FAS1 by 25 mm, and this isolate was the most efficient microorganism to inhibit standard bacterial and fungal species. Based on morphological and biochemical properties as well as 16S rDNA gene analysis, the selected isolate (isolate FAS1) belonged to *Bacillus* genus. Treatment of the culture broth of the isolate FAS1 using typical protease didn't decrease the antimicrobial activity of the supernatant. After extracting of culture broth of the selected isolate by ethyl acetate as an organic solvent, the inhibitory effect was mainly increased.

**Conclusions:** In the present study, the culture broth of a soil bacterial isolate, identified as *Bacillus* sp., was subjected to antimicrobial studies due to its ability to inhibit 6 bacterial and 3 fungal indicator strains.

**Keywords:** Antimicrobial activity; *Bacillus*; Bioautography; Cylinder-plate method; Screening