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Antibacterial Activity Of Agent Produced By *Streptomyces* Spp. Against Clinical Bacterial Isolates

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Abstract

Twenty soil samples were collected from Hilla City. Six *Streptomyces* spp. isolates were identified. Antibacterial activity of *Streptomyces* spp. isolates were estimated against *S.aureus*. *Streptomyces* spp.4 showed higher activity with (20mm)inhibition zone compared with other isolates *Streptomyces* spp.4 was selected for extraction of antibacterial agent. *Streptomyces* spp.4 agent showed that higher activity against *S.aureus* with (22)mm inhibition zone,(14)mm against *E.coli* and lower activity against *P.aeruginosa* (12mm). FT-IR spectrum for agent had a peak between (3387-3369 cm-1) indicate to presence (N-H) stretching in primary, secondary amine and amide, peak at 2928.04 indicate to presence of (C-H) stretching in aliphatic compound,1649.19 indicate to presence of (N-H) bend in primary amine compound, and a peak at 1026.16 (=C-H) bending in aliphatic compound.

Background

Streptomyces are prokaryotic which having great importance in producing of chemically different metabolite for drug industry. Many types of antibiotic classes produced by *Streptomyces* such as aminoglycosides, anthracyclines, glycopeptides, β-lactams, macrolides, nucleosides, peptides and others.

Methods

1- *Streptomyces* isolation

Twenty soil samples were collected from Hilla city . Six *Streptomyces* spp. isolates were identified.

2- Test isolates

Test isolates was isolated from clinical samples from Babylon Maternity and Children Hospital which includes (*S.aureus* , *E.coli*, and *P.aeruginosa*)

3-Antibacterial activity of *Streptomyces* spp isolates was measured by Agar block Method

4-Extraction of bioactive compounds

Extraction of bioactive metabolite was made by growing of *Streptomyces* spp.4 on yeast malt extract agar. Highly active isolates with high inhibition zone was cultured on ISP2(International *Streptomyces* project) broth and incubated in shaker incubator at 28 °C for 7 days. After that these isolates were centrifuged at 8000 rpm for 15 minutes .The supernatant was collected and mixed with equivalent amount from ethyl acetate 1:1(v/v).

5-Activity of agent against pathogenic bacteria

Activity of product was evaluated against *S.aureus*, *E.coli* and *P.aeruginosa* by using well diffusion method.

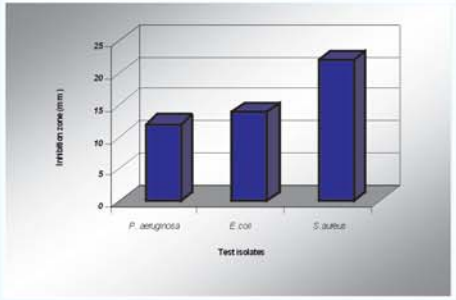
6-FT-IR spectrum of agent

FT-IR spectrum was detected by using Shimadzu FTIR-8400 and scanned at 400 to 4000 cm-1.The potassium bromide technique was used.

Results

Table (1) :Antibacterial activity of *Streptomyces* spp. isoltes against *S.aureus*

Streptomyces spp. isolates	Inhibition zone(mm)
Str spp.1	18
Str spp.2	12
Str spp.3	15
Str spp.4	20
Str spp.5	16
Str spp.6	13



Figure(1):Antibacterial activity of agent produced by *Streptomyces* spp.4 against test pathogens.

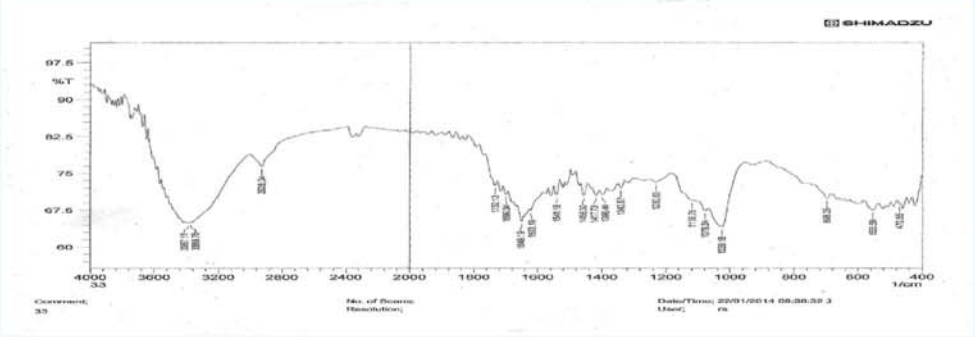


Figure (2): FT-IR spectrum of antibacterial agent produced by *Streptomyces* spp.4

FT-IR spectrum for agent had a peak between (3387-3369 cm-1) indicate to presence (N-H) stretching in primary, secondary amine and amide, peak at 2928.04 indicate to presence of (C-H) stretching in aliphatic compound,1649.19 indicate to presence of (N-H) bend in primary amine compound, and a peak at 1026.16 (=C-H) bending in aliphatic compound.

Conclusions

Streptomyces is a rich source for producing of antibacterial agent.

References

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