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Preliminary investigation into antibacterial and antifungal activity of a species of *Trichoderma* isolated from Soil

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Fungal metabolites are important source of wide variety of drugs including the antibiotic penicillin and popular cholesterol lowering agent lovastatin.

Soil samples collected were cultured in yeast malt agar using standard procedures to isolate fungi which were later purified. To determine the bioactivity of these fungi, pure cultures were grown in the same medium in large scale. Extracts of cultures were made using methanol followed by separation with ethyl-acetate to obtain low molecular weight compounds. Crude ethyl-acetate extracts in methanol were used to determine antibacterial and antifungal activity against several bacteria spp, (*Bacillus* sp*, E. coli, Staphyloccocus* sp and *Klebsiella* sp.) and several yeast strains (*Saccharomyces* strains, and a *Shizosaccharomyces* strain) using Kirby-Bauer method. Each disc contained 500 µg of the crude extract. Discs containing Amoxicillin (25 µg), Polymyxine B (20 µg) and methanol separately were used as positive and negative controls respectively. All assays were done in duplicate and average diameters of clear zones were recorded. Out of the seventeen extracts tested, one showed antibacterial activity against *Bacillus* sp. Both sample and Amoxicillin gave 11 mm clear zone. Same extract showed antifungal activity against S*accharomyces* strain giving clear zones of 15 mm. The positive control, Polymyxine B gave only 12 mm clear zone. By studying colony characters, fungal morphology and asexual reproductive characters, the bioactive fungal culture was identified as a species of *Trichoderma*.

The above fungus was grown in different media to select the best medium for growth and to determine any change in bioactivity in different media. Potato dextrose broth (PDB) was found to be the best medium. To study changes in bioactivity and chemical diversity in the presence of the different metal ions, an experiment was also set up where fungus was grown in PDB medium containing different metal ions (Mg^{2+}, Cd^{2+}, Al^{3+}, Ni^{2+}, Fe^{2+}, Cr^{2+}, Ca^{2+}, Zn^{2+} and Co^{2+}) at concentration of 1 mg/100 mL. The ethyl acetate extracts of above cultures were tested for antibacterial activity using *Bacillus* sp.
The yield and antibacterial activity of the fungal extract had increased when the fungus was grown in the presence of Mg^{2+}, Cd^{2+}, Al^{3+} and Ni^{2+} while in the presence of Ca^{2+} and Zn^{2+} only the yield of extract increased.

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