Studies Towards the Isolation of Antibacterial Compounds from Endophytic Fungi of *Cyperus rotundus*

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Endophytic fungi are a relatively new source for the isolation of antibiotics effective against resistant pathogenic bacterial species. The main aim of this study is to investigate the antibacterial producing potential of endophytic fungi of *Cyperus rotundus* with a view to isolating novel antibiotics. Initially, antibacterial activities of the crude ethyl acetate extracts of endophytic fungi isolated from surface sterilized *C. rotundus* were evaluated using an agar disc diffusion assay against *Staphylococcus aureus, Bacillus cereus, Pseudomonas aeruginosa* and *Escherichia coli.* Next the fungus with the most promising overall activity, identified using molecular techniques, was grown in 200 PDA Petri dishes and bioassay guided fractionation of its crude extract was conducted to isolate the active compound/s. Out of the 13 isolated endophytic fungi 11 fungal extracts were active against at least one bacterium tested while the highest activity (15 mm zones of inhibition against *B. cereus* and *S. aureus)* was shown by an endophytic *Agrocybe* sp. The ethyl acetate (EtOAc) crude extract (280 mg) of cultured *Agrocybe* sp. was partitioned between hexane, chloroform, EtOAc and water and the resulting fractions were subjected to antibacterial assay at 200 μg disc^{-1} which revealed hexane as the most active fraction. Next, the hexane fraction (100 mg) was further purified by normal phase silica chromatography using a gradient elution. Bioassay for the fractions combined according to the TLC profile, showed that fraction B and D to be active with 16 and 20 mm inhibition zones respectively against *S. aureus* at 400 μg disc^{-1}. TLC of fraction D showed the presence of a single compound while fraction B consisted of more than one compound. Continued research towards further purification of fraction B is in progress. Spectroscopic data will reveal the structures of the active compounds. This study has shown that there is a good potential for the discovery of antimicrobial compounds from endophytes of *C. rotundus* which may in turn contribute towards developing new clinically useful antibiotics.

Keywords: Cyperus rotundus, Endophytic fungi, Antibacterial, *Agrocybe* sp.

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