

CULTURING OF NON CULTIVABLE SOIL BACTERIA AND FUNGI: A DEVELOPED BIOFILM APPROACH

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Fungal-bacterial biofilms (FBBs) are interactive communities of fungi and bacteria in which fungi act as biotic surface for bacteria to adhere. Developed FBB (*Azotobacter* and *Colletotrichum*) exudates contain IAA like substances, amine and amide groups and different organic compounds than their monocultures. The study was carried out to evaluate whether FBB exudates can satisfy the multiple growth requirements of non cultivable bacteria and fungi. Experiment was focused to compare population characteristics of different bacteria and fungi on Nutrient Agar (NA), Disk Diffusion method (DD), NA with 50% FBB exudates added media (BFM) and Potato Dextrose Agar (PDA), DD, PDA with 50% FBB exudates added media (BFM), respectively. *Aspergillus* species was isolated from all three media. *Acremonium* and *Penicillium* species with different morphological characters were isolated from DD and BFM media. Species richness was high in BFM compared to PDA and DD media. Importantly, high numbers of bacterial strains from each species were isolated from BFM media. *Bacillus*, *Clostridium*, *Corynebacterium*, *Micrococcus* and *Staphylococcus* species were found in all three culturing methods. Additionally, *Enterobacteriaceae* was isolated from DD and BFM media. According to classification scheme for functional groups expressed in FTIR spectra, (performed using the first derivatives of the spectra considering the spectral ranges 500-4000 cm⁻¹) bacterial strains from NA, DD and BFM media were different and bacterial strains from BFM medium gave significantly different spectrum compared to others. Biofilm exudates added media enhanced the growth of different bacterial consortia. Therefore, BFM media can be used for culturing of non cultivable bacteria.

Key words: FBB Exudates, FTIR, Fungal-Bacterial Biofilms (FBBs), Non cultivable bacteria and fungi