Antifungal Activity and Metabolites Study of Bacillus Strain Against Aflatoxin Producing Aspergillus

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Abstract

Antifungal activity against four food borne fungi. Forty compounds were present in the essential oil out of which thujone was the major compound followed by γ-curcimene, α- caryophyllene, lavundulol and germacrene. Minimum inhibitory

concentration for Aspergillus flavus, Aspergillus niger, Fusarium oxysporum and

Penicillium notatum was 57.33, 32.66, 87.66 and 13.66 µl/L air respectively.

Results obtained showed that the Essential oil has more potency against P.

notatum followed by other fungal species at a slightly higher concentration localization and exciton generation rate distribution happened to be available in such nanostructures and influence in exciton generation in perovskite absorbing materials deposited atop in tandem configuration. Figure as shown below depicts the evidence of Si-NPys of Si-NWs growth using Si wafer as initial materials. It is noteworthy to mention that the dimension of such silicon nanostructures depends on experimental conditions such as temperature, precursor concentration, etching time etc.FDTD simulation suggested confined exciton generation rate distribution in such nanometric structures and thus active absorbing material such as perovskite would get enormous influence thereof.Authors acknowledge CoRERE, RI, KFUPM, Dhahran 31261, Saudi Arabia. MKH acknowledges Deanship of Scientific Research (DSR) at King Fahd University of Petroleum & Minerals (KFUPM) for funding this work through project No. IN151003.

Achieving metabolomic data with satisfactory coverage is a formidable challenge in metabolomics because metabolites are a chemically highly diverse group of compounds. The knowledge concerning the behavior of these Bacilli as antagonists and metabolite analysis is essential for their effective use and the commercialization. The present study was focused on selection of best biocontrol antifungal Bacillus strain against aflatoxin producing Aspergillus by antagonism on PDA medium. About 16 different strains of bacteria were isolated from healthy and infested rhizosphere of groundnut using N-agar medium. The isolates were identified based on morphological and microscopic characters. Bacterial isolate JND-KHGn- 29-A and JND-KSGn-30-L were recorded to be a best antagonist as of its ability to inhibit most toxic fungus A. flavus JAM-JKB-BHA-GG20 (58.20%) after screening with 16 Bacillus isolates. GCMS analysis of best and least bacterial antagonist Bacillus subtilis (JND-KHGn-29-A, Accession KU984480) inoculated onto N-agar medium identified total 55 and 42 compounds respectively. Whereas GCMS analysis from best bacterial antagonist Pseudomonas isolate no. 14 (JNDKSGn-30-L) inoculated onto N-agar identified total 60 compounds.