SCREENING AND MOLECULAR ANALYSIS OF ENDOPHYTIC FUNGI WITH BIOACTIVE COMPOUND-PRODUCING ABILITY

ANGSANA KEERATIJIARUT 4837141 SCBT/M

M.Sc. (BIOTECHNOLOGY)

THESIS ADVISORS: THIPA ASVARAK, Ph.D., CHUENCHIT BOONCHIRD, Ph.D., JEERAPUN WORAPONG, Ph.D., JIRARUT WONGKONGKATEP, D.Eng

ABSTRACT

Recently, the emergence of resistant microbial strains has become a major concern. The search for novel antibiotics is necessary to overcome this problem and to achieve effective treatment. Fungi are well known as sources for production of various useful metabolites and antibiotics. The objectives of this research were isolation of fungal endophytes from Thai forest, and determination of their ability to produce antimicrobial compounds. In this study, a total of 459 isolates were isolated from 45 plants. From these, 391 isolates of different morphology were recorded. Preliminary screening of 317 selected fungal isolates (from Nam Nao National Park), using co-culture method, resulted in 80 fungal isolates with the ability to inhibit growth of Escherichia coli ATCC25922 and/or Staphylococcus aureus ATCC25923, and 169 isolates with the ability to inhibit Pythium ultimum. Isolates with antibacterial activity were selected for partial extraction. By disc diffusion assay, of 80 fungal crude extracts, 53 extracts showed the ability to inhibit growth of at least one of the seven bacterial strains: E. coli ATCC25922, S. aureus ATCC25923, MRSA-1302, MRSA-2, Pseudomonas aeruginosa-6, E. coli-7 or Acinetobacter-1275. Disc diffusion assay for antifungal activity resulted in 40 extracts with the ability to inhibit the growth of Pythium, and 71 with the ability to inhibit the growth of at least one of the three Colletotrichum spp. Molecular identification of the selected 53 isolates with antibacterial activity suggested that these isolates belong to fungi in 19 genera. Isolates of interest were selected for upscale extraction. Antimicrobial assay showed that these extracts still retain their antimicrobial activity. Isolates with high antimicrobial activity will be selected for future investigation.

KEY WORDS: FUNGI/ ENDOPHYTE/BIOACTIVE COMPOUND/ANTIBACTERIAL ACTIVITY/ ANTIFUNGAL ACTIVITY

10 pp