19th Intervarsity Biochemistry Seminar

“Science Empowers Change”

22 March 2008
PB Block, Petaling Jaya Campus
Universiti Tunku Abdul Rahman

Jointly Organised By

UTAR
Universiti Tunku Abdul Rahman
19th INTERVARSITY BIOCHEMISTRY SEMINAR

“SCIENCE EMPOWERS CHANGE”

22nd March 2008

Faculty of Engineering & Science,
Universiti Tunku Abdul Rahman

in collaboration with

The Malaysian Society for Biochemistry & Molecular Biology

Venue:
Universiti Tunku Abdul Rahman
Building PB, No. 13 Jalan 13/6
46200 Petaling Jaya, Selangor
MICROBIAL POPULATION IN THE COELOMIC FLUIDS OF LOCAL SEA CUCUMBERS AND THEIR ANTIMICROBIAL-RESISTANCE CAPABILITIES

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Coelomic fluids from two local species of sea cucumber (Holothuroidea), Stichopus chloronotus (gamat/talifan varieti hitam) and Holothuria leucospilota (timun laut/hat punti) were used in this study to isolate and identify the microbes inhabiting the coelomic fluids and subsequently to determine the antimicrobial-resistance capabilities of the microbes. S. chloronotus, among the well-known gamat, has been proven scientifically containing medicinal properties while H. leucospilota is known as the most abundant species in Malaysia. The native bacterial populations were isolated from the coelomic fluids of both species. Conventional total genomic DNA (tgDNA) extraction method using 2X CTAB buffer, Polymerase Chain Reaction (PCR) and phylogenetic analyses of 16S rRNA gene sequences were included as the main molecular methods. The molecular results showed the presence of eight genera of bacteria namely Exiguobacterium, Yibrio, Stenotrophomonas, Pseudomonas, Bacillus, Micrococcus, Kytococcus and an unidentified genus suspected as either Kocuria or Rothia. Through the filter disks diffusion technique, all bacteria were tested for their capabilities to resist several antimicrobial agents such as streptomycin, kanamycin and tetracycline. The strain from genus Pseudomonas suspected to be P. alcaligenes exhibited high resistance towards streptomycin. Another strain from genus Stenotrophomonas suspected to be S. maltophilia showed moderate resistance towards streptomycin and lower resistance towards kanamycin. Tetracycline inhibited the growth of all bacteria tested in this study. Furthermore, the lower diversity level of microbial populations in S. chloronotus compared to H. leucospilota might indicate its antimicrobial properties. Overall, the current findings have provided a better understanding on the microbial diversity and the antimicrobial-resistance capabilities of the isolated microbes in the coelomic fluids of S. chloronotus representing the local valuable gamat and the dominant species, H. leucospilota; that may contribute to the future development of Malaysian medical industries.

KEYWORDS: Stichopus chloronotus, Holothuria leucospilota, coelomic fluids, microbial population, phylogenetic analyses, antimicrobial-resistance capability.
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