

UNIVERSITI TEKNOLOGI MARA

**THE ANTIBACTERIAL ACTIVITY OF MALAYSIAN
MARINE ENDOPHYTIC FUNGI FRACTIONS AGAINST
GRAM POSITIVE BACTERIA**

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ABSTRACT

Marine endophytic fungi was proven to have a promising biological activity. Their unique and active metabolites lead to the research to search for a new potent bioactive metabolites. Most of the endophytes are capable in producing active metabolites such terpenoids, alkaloids, phenylpropanoids, aliphatic compounds and peptide. This study was conducted to determine the antibacterial properties of active fractions from marine endophytic fungi, *Gracilaria coronopifolia* (CN), *Gracilaria arcuata zanadini* (MV) and *Chaetomorpha minima* (UF) against the gram-positive bacteria (*Staphylococcus aureus*, *Enterococcus faecalis*, *Bacillus subtilis*, and *Micrococcus luteus*). These three seaweeds were collected from Teluk Kemang, Port Dickson and undergo extraction process by acetyl acetate extraction. The antibacterial activity against gram-positive bacteria was identified by conducting bioassay guided fraction and antibacterial quick screening assay. Gram-positive infection contribute to disease such urinary tract infection, bacteremia, endocarditis, Intra-abdominal, wound infection and pelvic infections. Current critical issue is the development of resistance against antibiotics. Commonly, two type of bacteria that keep develop resistance are *Enterococcus faecalis* and *Staphylococcus aureus*. Meanwhile from result obtained, all the active fractions of marine endophytic fungi were selectively against different bacteria. *Gracilaria arcuata zanadini* (MV) exhibited the highest bacterial inhibition percentage against *S.aureus* (79.2%). While *Gracilaria coronopifolia* (CN) highest percentage of inhibition against *E. faecalis* (53.6%). Further study need to be continued in order to isolate the potential active fractions of the marine endophytic fungi against gram-positive bacteria.

CHAPTER ONE

INTRODUCTION

Research have been conducted on marine natural product since five decades back and the fact that from 250,000 of the marine species that had be recognize only 1% have been studied (Blunt et al., 2013). Microbial natural products represent an extensive area for new therapeutic compound search (Berdy, 2012). The marine fungi are rich in secondary metabolites with great potential as medicinal value components. Marine endophytic fungi possess variant bioactivity such antibiotic, antiviral, antifungal (Priya, 2016) and anti-yeast activities through their unique structure of the secondary metabolites.

Marine endophyte fungi have the promising antibiological activities form their active metabolites that lead to the isolation of bacteria, fungi, actinomycete, cyanobacteria and diatoms to be explore to become the new source for a new potent bioactive metabolites. Not only been used for decades as the traditional medicine but at the same time become the main sources for pharmaceutical substances such algin, carrageenan and agar. Different with the terrestrial fungi, marine endophytic fungi also produce the same metabolites but somehow due to the environment and stress such as temperature, nutrients, competitive and the salinity the secondary metabolic pathway by the marine fungi is more specific. Most of the endophyte are capable in producing active metabolites such terpenoids, alkaloids, phenylpropanoids, aliphatic compound