ANTIMICROBIAL ACTIVITY OF MACROFUNGAL BASIDIOMYCETOUS MYCELIA AGAINST *Vibrio* spp.

JAN FELNESH EXE V. BAGACAY

An Undergraduate Special Problem Presented
to the Division of Biological Sciences
College of Arts and Sciences
University of the Philippines Visayas

In Partial Fulfillment of the Requirements
for the Degree of
Bachelor of Science in Biology

JUNE 2023

ABSTRACT

Aquaculture is vital for global food security, producing 50% of the world's fish. However, infectious diseases caused by fish pathogens like *Vibrio* species can lead to significant production losses. To address this issue, antimicrobial agents are commonly used. Macrofungal fruiting bodies and mycelia produce bioactive compounds with antimicrobial properties. This study aims to: (a) assess antimicrobial activity in isolated macrofungal samples against the fish bacterial pathogens *Vibrio parahaemolyticus* and *Vibrio cholerae*, (b) compare two methods (agar plug and crude extracts) for antimicrobial activity, (c) determine the minimum inhibitory concentration (MIC) using agar well diffusion and the agar plug methods, and (d) identify the macrofungal isolate with the highest antimicrobial activity. Ten morphospecies were collected from the University of the Philippines Visayas Miagao Campus. The samples were evaluated using the agar plug and agar well diffusion methods. The results showed antimicrobial activity against *Vibrio cholerae* and *Vibrio parahaemolyticus*. The activity index ranged from 0 to 0.83 and 0.22 to 0.78 for agar wells, and 0 to 1.00 and 0.70 to 1.30 for agar plugs, against *V. cholerae* and *V. parahaemolyticus*, respectively. *Termitomyces globulus* and *Trametes* sp. 1 exhibited the highest activity indices using the agar plug and agar well diffusion methods, respectively. Statistical analysis confirmed significant differences in antimicrobial activity against both test organisms. These findings demonstrate the potential of macrofungi as a valuable source of antimicrobial compounds for controlling fish pathogens in aquaculture. Further research could lead to the identification and utilization of these compounds to minimize production losses and improve disease management in aquaculture.