

**UNIVERSITI TEKNOLOGI MARA**

**ISOLATION AND CULTIVATION OF  
MALAYSIAN MICROALGAE FOR  
BIOPHARMACEUTICAL APPLICATION**

**NUR NABIHA BINTI RAZAK**

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## ABSTRACT

Microalgae are highly potential natural source of bioactive molecules for biopharmaceutical application. In this regard, work has been conducted to developed methods for the isolation of Malaysian microalgae strain, potentially valuable in biopharmaceutical application. Different microalgae strain may require different isolation strategies to adapt in *in vitro* culture. Four sampling regimes involving culturing of concentrated and non-concentrated water samples on TAP agar and TAP broth were carried out. Culturing onto TAP broth prior culturing onto TAP agar (Regime 3 and 4) were extremely essential for the recovery for microalgae strains from Temoh and Puncak Alam with a total recovery of 12 strains. Meanwhile, direct culturing of water samples onto TAP agar (Regime 1 and 2), resulted in the recovery of no microalgae from Temoh and six microalgae strains from Puncak Alam. Hence, to isolate microalgae from environment, specifically freshwater sources, culturing of collected water samples in both TAP broth and TAP agar simultaneously was proven to be necessary and important to isolate microalgae culture *in vitro*. Employment of all regimes will ensure maximum chance of microalgae recovery from freshwater sources. In obtaining axenic microalgae culture, the use of antibiotics was proven to be necessary. The regime that results in best recovery of axenic microalgae culture is by culturing non-axenic microalgae culture onto TAP-Amp (0.75 mg/mL). Microscopic examination of the isolated microalgae shows cell of different shapes including sphere, oval with tapered end and lanceolate shape. The diameter of microalgae range between 25 - 200  $\mu\text{m}$ . Preliminary work on bioactive compound studies has indicated that there was no UV active bioactive compound detected in HPLC profile. However, the study of bioactive molecule should be continued as bioactive molecules produced by microalgae could potentially be utilized for biopharmaceutical application.

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of Study

The contribution of pharmaceutical industry in the health care system is significant. Aided with scientific and technological advancement, discovery and production of various pharmacologically active molecules are made possible (Young, 1999). Guided with the aims to improve the quality of life of mankind and more importantly to find effective treatment for incurable deadly diseases, the search of new pharmacologically active molecules from natural products are never ending (Lahlou, 2013).

Ever since ancient times, human rely on natural products for treatment of diseases. Natural products are a legendary contributor to the discovery of pharmacologically active molecules (Lahlou, 2013; Young, 1999; Cragg et al., 1997). Well known examples of natural products that are still widely used and available in the market include aspirin as analgesic, codeine as antitussive, quinine as malaria prophylaxis and penicillin as antibiotics (da Rocha et al., 2001).

Natural products are compounds with biological activities that are derived from natural sources including plants, animals, minerals, marine organisms and