SCREENING AND IDENTIFICATION OF THERMOPHILIC MICROORGANISMS THAT PRODUCE EXTRACELLULAR LIPASE FROM HULU LANGAT HOT SPRING

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ABSTRACT

EXTRACELLULAR LIPASE FROM THERMOPHILIC MICROORGANISMS

Lipolytic thermophilic bacteria was successfully isolated from Hulu Langat hot spring water. Molecular biological technique based on 16SRNA analysis revealed that the isolated bacteria species was *Bacillus subtilis*. Selective isolation of bacteria from hotspring water is performed using Rhodamine-B Tween 80 agar in which lipase producer is identified based on presence of orange fluorescence halos around colonies when plate is irradiated with UV light. Further characterisation of isolated bacteria is performed based on the colony characteristics on media as well as Gram staining. *Bacillus subtilis* isolated from hotspring appeared as clear looking colony with reddish tint. It was irregular in shaped, flat, mucoid and big. It was also motile and catalase positive. Under Gram staining, it was arranged in chains and was big long rods. The isolated lipase producer grew best at 55^0C at alkaline pH of 8.1.

CHAPTER 1

INTRODUCTION

1.1 Background

Hot springs are natural phenomenon that occurs when water seeps into the earth and is heated by magma. The increase of pressure causes water to emerge from the earth as heated pool. As the water flows, minerals are infused into water (Martinko & Madigan, 2006). Due to this, hot springs are believed to possess therapeutic values that may have positive effects on human health disorders especially involving nervous system, digestive system, blood circulation and organs function. Many hot springs have extremely high temperature, sometimes reaching boiling temperature. However, Malaysian hot springs are mostly in the range of 40 to 65^0C.

In addition to temperature differences, hot springs differ in their chemical or mineral composition, pH values and level of nutrients. In Malaysia, most hot springs are alkaline in pH. Thus, most thermophiles from these hot springs are alkalinophiles. Thermophiles are microorganisms which grow well at 45 to 80^0C (Martinko & Madigan, 2006).