Biotechnologies towards Sustainable Development in Malaysia

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Review on marine actinomycetes

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Introduction

Bacteria within the order of *Actinomycetales* (actinomycetes) are gram positive bacteria with high G+C content. Actinomycetes are common soil inhabitants and they are renowned for their capabilities of producing structurally diverse and biologically active small organic molecules commonly referred to as secondary metabolites. Among the medical and industrial important genera include *Streptomyces, Amycolatopsis, Saccharopolyspora,* and *Micromonospora.* Marine actinomycetes had to adapt to a variety of living conditions, ranging from extremely high pressure and anaerobic conditions at a very low temperature on the deep sea floor, to high acidic conditions at temperatures over 100°C near the hydrothermal vents. Thus, it is surmised that these living conditions will influence the genetic and metabolic diversity of the marine actinomycetes. Some strains of marine actinomycetes showed specific adaptation to the marine environment and some appeared to be metabolically active the marine sediment (Lam, 2006).

Early evidence supporting the existence of marine actinomycetes came from the description of *Rhodococcus marinonascenes* which was the first marine actinomycete species to be characterized (Helmke and Weyland. 1984). However, there is still a skepticism regarding the existence of indigenous marine actinomycetes, that marine actinomycetes are probably washoff spores originated from the terrestrial. Nevertheless, the discovery of the first obligate new marine