CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME II

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INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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EXTRACTION AND CHARACTERIZATION OF ASTAXANTHIN FROM MARINE SOURCES

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ABSTRACT

A study has been conducted to extract and to characterizecarotenoid astaxanthin from tiger shrimp (*Penaeus monodon),* one of most commercial marine sources in Malaysia. Astaxanthin is a red pigment belonging to the family of the xanthophylls, the oxygenated derivatives of carotenoids and is widely used as a pigmentation sources in aquaculture and poultry industries, nutraceutical and pharmaceutical industries. Results showed the carotenoid yield for all combinations of extraction condition ranged from 65-138 μg/g. The optimum solvent to waste ratio and the percentage of hexane in solvent mixtures were 1:5.553 and 32.105% which gave the highest yield of 141.474 μg/g. The percentage purity of the astaxanthin (predicted as 13-*cis*-astaxanthin monoester) was about 86.907%. Astaxanthin, astaxanthin monoester , astaxanthin di-ester, α-carotene are the major pigments in *Penaeus monodon.*

Keywords: astaxanthin, red pigment, crustaceans, carotenoids

INTRODUCTION

Astaxanthin is a red pigment, belongs to the family of the xanthophylls, the oxygenated derivatives of carotenoids (Kachik, 2009). Most crustaceans are tinted in red by accumulation of this pigments. Astaxanthin are widely used as a pigmentation sources in aquaculture and poultry industries, nutraceutical and pharmaceutical industries (Kachik, 2009).

In Malaysia, shrimp processing industry generates quantities of waste. However, not much attention has been given towards the recovery of other valuable products like carotenoids. Studies on extraction of carotenoid in crustaceans are restricted to species from temperate waters. The scientific data on qualitative and quantitative distribution of carotenoid in crustaceans from Malaysian waters is lacking.

Hence, growing demand for natural carotenoid and high cost of synthetic carotenoids will force the industry players to maximize its economic use and link extraction process with chitin production.