

**DETERMINATION OF OPTIMAL TEMPERATURE
FOR EXTRACTION OF CAROTENOID PIGMENTS
FROM SHRIMP WASTE**

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ABSTRACT

Processed shrimps are one of the high demanding products in the sea food processing industry in the world. Shrimp processing industries generate large quantities of wastes consisting huge amount of heads and carapaces. Most of the processing plants discharge their wastes are into the environment without any treatment causing serious environmental problems. On the other hand these waste materials are good sources of proteins, chitin, minerals and natural carotenoids.

Most studies were concentrated on recovery of chitin and protein from shrimp wastes and few workers has focused their attention to recover the carotenoids from shrimp wastes. Present study was carried out to determine the most suitable temperature to extract maximum yield of carotenoid pigments using sunflower oil from the shrimp wastes.

Fresh Shrimp heads and exoskeletons were washed with sterile water then dried in an oven at 60 °C for overnights. Raw materials were ground up to the powder form using a grinder. Twenty one samples were prepared mixing 10 g of raw materials with 20 ml of sunflower oil. The samples were treated for following temperature levels 60 °C, 70 °C, 80 °C, 90 °C, 100 °C, 110 °C, and 120 °C for 150 minutes. Mixture was filtered and filtrate was centrifuged using a centrifuge. Each treatment had three replicates. Absorbance of carotenoids in the pigmented oil was measured spectrophotometrically and analyzed using ANOVA with turkey comparison.

Carotenoid yield was significantly affected by the temperature level ($p \leq 0.05$). Carotenoid yield has progressively increased with the increase of temperature up to 90 °C due to the increasing solubility of carotenoids in the oil with temperatures. Carotenoid yield has gradually decreased after the 90 °C with increasing temperature due to the unstable of carotenoids in sunflower oil at high temperature levels. The highest carotenoid yield 0.172 mg/100 g in pigmented oil, was extracted at 90 °C heating for 150 minutes using 2:1 oil to waste ratio.

Key words: Carapace, Carotenoid, Environment, Sunflower oil, Temperature.