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EXTRACTION OF ASTAXANTHIN ESTERS FROM SHRIMP WASTE BY CHEMICAL AND MICROBIAL METHODS

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Abstract:

The carotenoid pigments specifically astaxanthin has many significant applications in food, pharmaceutical and cosmetic industries. The goal of this research was the extraction of Astaxanthin from a certain Persian Gulf shrimp species waste (Penaeus semisulcatus), purification and identification of the pigment by chemical and microbial methods. Microbial fermentation was obtained by inoculation of two Lactobacillus species Lb. plantarum and Lb. acidophilus in the medium culture containing shrimp waste powder by the intervention of lactose sugar, yeast extract, the composition of Both and the coolage (-20oC). The carotenoids were extracted by an organic solvent system. After purification of astaxanthin with the thin layer chromatography method by spectrophotometer, NMR and IR analysis the presence of astaxanthin esters was recognized in this specific species of Persian Gulf shrimp. Results obtained from this study showed that the coolage at –20 oC not only does not have an amplifying effect on the production of astaxanthin but also slightly reduces this effect. Also the effect of intervention of lactose sugar showed more effectiveness in producing astaxanthin than yeast extract or more than with the presence of both. The results also indicated that there is not much difference in the ability of producing the pigment by comparing both Lb. plantarum and Lb. acidophillus. Also results showed the microbial method of extraction of astaxanthin is more effective than chemical method. The pigment extracted from certain amount of shrimp powder, 23.128 mg/g, was calculated.

Keywords:

Astaxanthin ، shrimp waste

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