

Influence of electron irradiation factor on haruan traditional extract (HTE) for oral drug delivery

ABSTRACT

Haruan or *Channa striatus* is source of protein that is widely consumed in the region and its extract is well known for having medical values. It is of great advantage if this product could be taken orally rather than by injection because the oral route of drug delivery is still preferred by the vast majority of patients. However protein and peptides can be denatured or degraded by the acidic pH of the stomach and the presence of endogenous enzymes. In order to protect or prevent digestion and degradation of the protein in the stomach and to ensure the protein reaches the gastro intestinal (GI) tract, Carboxymethyl Starch (CMS) nanogel system was developed using electron irradiation method. However stability of HTE during the irradiation process needed to be studied before being developed further. In this study, the HTE was irradiated using electron beams. Its stability was analysed in terms of physical and chemical changes by looking at colour difference, melting point by using Differential Scanning Calorimetry (DSC) and molecular bonds by using Fourier Transform Infrared (FTIR) respectively. The results of this study were that no apparent colour difference was observed with HTE before and after irradiation. These observations were supported by the FTIR and DSC results that showed that there were no changes in molecular bonds and melting point, compared between no irradiation and irradiation HTE during electron irradiation up to 10 kGy. Statistically the test showed no significant difference at $p < 0.005$ between melting temperatures.

Keyword: Electron irradiation; Gastro intestinal (GI) tract; Melting point; Nanogels; Protein