

Antioxidative Maillard Reaction Products Derived from Gelatin Hydrolysate of Unicorn Leatherjacket Skin

Authors : Supatra Karnjanapratum, Soottawat Benjakul

Abstract : Gelatin hydrolysate, especially from marine resource, has been known to possess antioxidative activity. Nevertheless, the activity is still lower in comparison with the commercially available antioxidant. Maillard reactions can be used to increase antioxidative activity of gelatin hydrolysate, in which the numerous amino group could be involved in glycation. In the present study, gelatin hydrolysate (GH) from unicorn leatherjacket skin prepared using glycyl endopeptidase with prior autolysis assisted process was used for preparation of Maillard reaction products (MRPs) under dry condition. The impacts of different factors including, types of saccharides, GH to saccharide ratio, incubation temperatures, relative humidity (RH) and times on antioxidative activity of MRPs were investigated. MRPs prepared using the mixture of GH and galactose showed the highest antioxidative activity as determined by both ABTS radical scavenging activity and ferric reducing antioxidant power during heating (0-48 h) at 60 °C with 65% RH, compared with those derived from other saccharide tested. GH to galactose ratio at 2:1 (w/w) yielded the MRPs with the highest antioxidative activity, followed by the ratios of 1:1 and 1:2, respectively. When the effects of incubation temperatures (50, 60, 70 °C) and RH (55, 65, 75%) were examined, the highest browning index and the absorbance at 280 nm were found at 70 °C, regardless of RH. The pH and free amino group content of MRPs were decreased with the concomitant increase in antioxidative activity as the reaction time increased. Antioxidative activity of MRPs generally increased with increasing temperature and the highest antioxidative activity was found when RH of 55% was used. Based on electrophoresis of MRP, the polymerization along with the formation of high molecular weight material was observed. The optimal condition for preparing antioxidative MRPs was heating the mixture of GH and galactose (2:1) at 70 °C and 55% RH for 36 h. Therefore, antioxidative activity of GH was improved by Maillard reaction and the resulting MRP could be used as natural antioxidant in food products.

Keywords : antioxidative activity, gelatin hydrolysate, maillard reaction, unicorn leatherjacket

Conference Title : ICFSN 2015 : International Conference on Food Science and Nutrition

Conference Location : London, United Kingdom

Conference Dates : June 28-29, 2015