World Academy of Science, Engineering and Technology
International Journal of Nutrition and Food Engineering
Vol:9, No:12, 2015

Untargeted Small Metabolite Identification from Thermally Treated Tualang Honey

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Abstract : This study investigated the effects of thermal treatment on Tualang honey sample in terms of honey colour and heat-induced small metabolites. The heating process was carried out in a temperature controlled water batch at 90 °C for 4 hours. The honey samples were put in cylinder tubes with the dimension of 1 cm diameter and 10 cm length for homogenous heat transfer. The results found that the thermal treatment produced not only hydroxylmethylfurfural, but also other harmful substances such as phthalic anhydride and radiolytic byproducts. The degradation of honey protein was reported due to the detection of free amino acids such as cysteine and phenylalanine in heat-treated honey samples. Sugar dehydration also occurred because fragmented di-galactose was identified based on the presence of characteristic ions in the mass fragmentation pattern. The honey colour was found getting darker as the heating duration was increased up to 4 hours. Approximately, 60 mm PFund of increment was noticed for the honey colour with the colour change rate of 14.8 mm PFund per hour. Based on the principal component analysis, the chemical profile of Tualang honey was significantly altered after 2 hours of heating at 90 °C.

Keywords : honey colour, hydroxylmethylfurfural, thermal treatment, tualang honey
Conference Title : ICFND 2015 : International Conference on Food, Nutrition and Diagnostics
Conference Location : Bangkok, Thailand
Conference Dates : December 17-18, 2015