

P6-21

Irradiation Effect on Bioactive Compounds from Citrus Peel Extract during Storage

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Citrus peel extract was prepared using 70% ethanol solution using two extraction conditions (room temperature (20°C) for 72 hours and 85°C for 3 hours). Effect of gamma-irradiation treatment (0, 5, 10 and 20 kGy) and storage (at 4°C and room temperature) on color characteristics, DPPH radical scavenging, tyrosinase inhibition and nitrite scavenging activities of citrus peel were studied. There were dose dependent changes in Hunter color values. L*- and a*-values increased but b*-values decreased with increase in absorbed irradiation dose. DPPH radical scavenging, tyrosinase inhibition and nitrite scavenging activities were not affected by irradiation treatment. Nitrite scavenging activity was the highest in the extract at pH 1.2 followed by pH 4.2 and 6.0. Storage did not affect the color values. However upon storage DPPH radical scavenging and tyrosinase inhibition activity reduced significantly. Nitrite scavenging activity increased slightly upon storage. Results suggest that gamma irradiation treatment improved color without adversely influencing the biological activities of citrus peel extracts. There is scope to develop freeze-dried powder, which could be used as functional component in food or cosmetic industry.

P6-22

Physiological Activity and Potential Use of Lyophilized Citrus Peel Extract

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Citrus peel powder was prepared by lyophilizing 70% ethanol extract of citrus peel. Extraction was carried out at room temperature (20°C) for 72 hours. Extract was subjected to gamma-irradiation treatment (20 kGy). Powders as well as aqueous solutions were examined for color characteristics. DPPH radical scavenging, β -carotene bleaching and nitrite scavenging activities of the aqueous solutions were determined. There were significant changes in Hunter color values due to irradiation. The a*-values and b*-values decreased due to radiation treatment. DPPH radical scavenging, β -carotene bleaching and nitrite scavenging activities were not affected by irradiation treatment. Nitrite scavenging activity was the highest in the extract at pH 1.2 followed by pH 4.2 and 6.0. These functional properties of aqueous solution were found to be stable to heat treatment. Results suggest that gamma irradiation treatment improved color without adversely influencing the biological activities of citrus peel powder. When the powder was incorporated into meat system it improved oxidative stability. There is scope to use citrus peel powder as functional component in food processing industry.