

Anthocyanin Complex: Characterization and Cytotoxicity Studies

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Abstract : Complexation of anthocyanins to mimic natural copigmentation process was investigated. Cyanidin-rich extracts from *Zea mays* L. CeratinaKulesh. and delphinidin-rich extracts from *Clitoria ternatea* L. were used to form 4 anthocyanin complexes, AC1, AC2, AC3, and AC4, in the presence of several polyphenols and a trace metal. Characterizations of the ACs were conducted by UV, FTIR, DSC/TGA and morphological observations. Bathochromic shifts of the UV spectra of 4 formulas of ACs were observed at peak wavelengths of about 510-620 nm by 10 nm suggesting complex formation. FTIR spectra of the ACs indicate shifts of peaks from 1,733 cm⁻¹ to 1,696 cm⁻¹ indicating interactions and a decrease in the peak areas within the wavenumber of 3,400-3,500 cm⁻¹ indicating changes in hydrogen bonding. Thermal analysis of all of the ACs suggests increases in melting temperature after complexation. AC with the highest melting temperature was morphologically observed by SEM and TEM to be crystal-like particles within a range of 50 to 200 nm. Particle size analysis of the AC by laser diffraction gave a range of 50-600 nm, indicating aggregation. This AC was shown to have no cytotoxic effect on cultured HGEp0.5 and HGF (all $p > 0.05$) by MTT. Therefore, complexation of anthocyanins was simple and self-assembly process, potentially resulting in nanosized particles of anthocyanin complex.

Keywords : anthocyanins, complexation, purple corn cobs, butterfly pea, physicochemical characteristics, cytotoxicity

Conference Title : ICBEB 2015 : International Conference on Biochemical Engineering and Bioengineering

Conference Location : Istanbul, Türkiye

Conference Dates : February 16-17, 2015