

Suthinee Leelahemaratana 2013: Determination of Phenolic Compounds, Antioxidant Capacity and Stability of Anthocyanins in Mulberry Pomace Extract. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Mrs. Sasitorn Tongchitpakdee, Ph.D. 120 pages

The objective of this research was to determine the effect of drying method on phenolic compounds of mulberry pomace. Major phenolic compounds were also identified and quantified using high performance liquid chromatography (HPLC). Furthermore, optimum concentration of ethanolic solvent for mulberry pomace extraction was also determined and stability of anthocyanins in mulberry pomace extract also investigated. The results showed that there was no significant difference in proximate analysis (ash, fiber, protein, fat, moisture and carbohydrate) between mulberry pomace dried using freeze drying and tray drying ( $p > 0.05$ ). However, the freeze-dried sample had higher total monomeric anthocyanin content, total phenolic contents and 2, 2-diphenyl-1-picrylhydrazyl radical (DPPH) scavenging capacity than tray dried sample ( $p \leq 0.05$ ). Freeze-dried sample had total monomeric anthocyanin content 1,927.6 mg cyanidin-3-glucoside/100 g dry weight (DW) basis, total phenolic content 4,067.4 mg gallic acid equivalents/100 g DW basis, total flavonoid content 625.0 mg catechin equivalents/100 g DW basis and DPPH radical-scavenging capacity 1,360.8 mg vitamin C equivalents antioxidant capacity (VCEAC)/100 g DW basis. The HPLC and Mass Spectrophotometry (MS) results showed that major phenolic compounds in mulberry pomace were cyanidin-3-glucoside (346.5 mg/100 g DW), cyanidin-3-rutinoside (273.0 mg/100 g DW) and quercetin-3-rutinoside (40.3 mg/100 g DW). The results also showed that 50% ethanol is an optimum solvent for extraction of phenolic compounds from mulberry pomace. The results of stability study of anthocyanins in mulberry pomace extract adjusted pH to 2.5-7.5 and heated to 70-90 degree celcius showed that the degradation of anthocyanins followed a first-order reaction model. Increasing temperature resulted in an increase of the degradation rate constant (k) and a decrease of half-life periods ( $t_{1/2}$ ). At pH 2.5, half-life periods of anthocyanins at 70, 80 and 90 degree celcius were 11.6, 7.3 and 4.0 hours, respectively. Among pH tested in this study, anthocyanins were most stable at pH 2.5 followed by 4.0, 6.0 and 7.5, respectively.

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