

## Abstract

The organic acids (citric acid, gallic acid and tannic acid) were used as copigments for stabilized anthocyanins extract from black glutinous rice. The studied found that tannic acid was the highest effect on enhancing anthocyanins stability with 88.17 % color retention at pH 5.5. The optimal concentration of tannic acid was investigated by addition of various concentrations of tannic acid (10, 50, 100, 200 and 300  $\mu\text{g/ml}$ ) in different pH buffer solutions (1.5, 5.5, 6.5, 7.0, 7.5, 8.5 and 10.0) of anthocyanin extract which storage the solutions at 45 °C for 18 days. The solution with 10  $\mu\text{g/ml}$  tannic acids was the highest anthocyanins residue. Therefore, this concentration tannic acid was used to stabilize black glutinous rice extract in emulsion formula (formula 1). In order to investigate the stability of extract in emulsion system, two emulsion formulas were formulated with 1% extract. First formula contains free extract (without tannic acid; Formula 2) and a second formula consists of tannic acid stabilized extract (Formula 3). The stability of prepared creams was observed for a 4 weeks period. The results showed that formula 3 showed less color changing with lower  $\Delta E^*$  than that of formula 2. The pH of both formulas was not change, while, the viscosity of both formulas tended to increase. For sensory evaluation of the products, the appearance and color acceptance of both formulas was the same, while, the spreadability, stickiness, wetness/moistness, smoothness and overall were found higher in formula 3. However, the odor of both formulas should be improved by addition of fragrance. The results indicated that the use of tannic acid as stabilizer for black glutinous rice anthocyanin is feasible in emulsion system which also assists cream distribution, non-greasy, moisturizing and softness to the skin.

**Keywords** Anthocyanins, Black glutinous rice, Formulation, Stability, Tannic acid