

## Abstract

Sinin rice contains many nutrients that are benefits to health such as zinc, calcium, vitamins, and natural antioxidants (anthocyanin and proanthocyanidin). Recently, extract of sinin rice is popularly used in hair care products and cosmetics. However, use of sinin rice in processed food is rare. In this research, sinin rice flour was used to substitute wheat flour in butter cake at 50 – 100% levels and the qualities of cake batter and final product were determined. It was found that increasing substitution levels resulted in cake batter with decreased emulsion stability but increased specific gravity; and final product with decreased volume and moisture content but increased density ( $p \leq 0.05$ ). In addition, butter cakes with 50 – 80% substitution levels had lower firmness, gumminess, and chewiness values, as determined by texture analyzer, than the control with 100% wheat. However as substitution levels increased to 90 – 100%, those texture parameters increased to the levels that were closed to those of the control. Results from descriptive analysis indicated that butter cakes with sinin rice flour at all levels had more intense black sticky rice and banana leaf flavors; and rougher and harder texture than the control. Consumer acceptance scores tended to decrease as substitution levels increased. The highest substitution level that still yielded an acceptable product for the consumers was 70%. Subsequently, attempts were made to improve the qualities of sinin rice butter cake using gum (mixture of xanthan gum and guar gum), pregelatinized tapioca starch, cellulose powder, and emulsifier. Butter cake with 100% sinin rice flour was used in this experiment since acceptance scores of butter cakes with sinin rice flour ranging from 80 to 100% were not significantly different. Results showed that the mixture of xanthan gum and guar gum was more effective than others in increasing volume, decreasing hardness, and hence increasing acceptance scores of sinin rice butter cake. Therefore, the final formulation of sinin rice butter cake consisted of 18.48% sinin rice flour, 0.18% mixture of xanthan gum and guar gum, 23.91% butter, 21.74% egg, 21.74% sugar, 13.48% milk, 0.35% baking powder and 0.12% salt. Butter cakes with 100% sinin rice flour exerted an antioxidant activity that was 1.6 times greater than butter cake made from wheat flour. Results of shelf life study indicated that sinin rice butter cake could be

kept for 5 days at room temperature (25°C) and at least 7 weeks at 4°C. Results of consumer test revealed that the product was well accepted by 81% of the participants and 46% would buy the product. After the consumer had been told about information regarding health benefits of sinin rice constituted in butter cake, the acceptance and purchase intent increased to 95% and 78.5%, respectively.