Oral Session | Postharvest/Food Technology and Process Engineering
[4-1330-A] Postharvest/Food Technology and Process Engineering (2)
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[4-1330-A-06] Quality Characteristics of Thai Coconut Candy as Affected by Rice Starch-Based Film Enriched with Dragon Fruit Peel Extract

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Keywords: Rice starch-based film, Dragon fruit peel extract, Coconut milk candy, Lipid oxidation, Antioxidant

Thai coconut candy or *Kalamae*, a soft and luscious caramel candy, typically made from glutinous rice flour, palm sugar, and coconut milk. The Thai coconut candy short shelf life, due to lipid oxidation and starch retrogradation of the Thai coconut candy, has affected its quality and subsequently limited its market growth. In addition, the use of bio-based plastic instead of petroleum-based plastic packaging is now a good practice as the latter is harmful to the environment and sea life. So, the objectives of this study are *i)* to apply the starch-based (RS) film with dragon fruit peel extract (DPE) as a packaging of the Thai coconut candy and *ii)* to determine the quality attributes of the Thai coconut candy as affected by the RS-DPE film. The dragon fruit peel was extracted and freeze-dried to obtain the DPE powder. The rice starch-based film with DPE of 2 %w/w solid was prepared by the air-dried casting method. The thickness, color, appearance, water vapor permeability (WVP), total phenolic content (TPC), total betacyanin content (TBC), and DPPH scavenging activity (%DPPH) of the RS-DPE film were determined. Film appearance was smooth. The lightness (*L**) of the RS-DPE film, as compared to the RS film without DPE, was lowered but *a** and *b** values were increased toward redness and yellowness, respectively. The thickness of the film was also increased while the WVP was not altered. The RS-DPE film exhibited a significantly higher amount of TPC and TBC with the higher %DPPH than the RS film. The Thai coconut candies were wrapped in the RS-DPE films and kept in the control chamber at 25 ºC, 50% RH. The commercial polypropylene plastic was used as a control. The quality characteristics of the Thai coconut candy were assessed at day 1, 3, 5, 7, and 9, respectively. There was no significant difference ($p < 0.05$) in the a_w and moisture content (MC) of the candies packaged in both film treatments. As the storage time progressed, the aw and MC were reduced. The results were confirmed by the significant increase in hardness (N) and springiness (%) of the candies wrapped in both film types as time increased. However, hardness and springiness of the candies wrapped in the RS-DPE film were higher than that packed in the commercial film. The lipid oxidation expressed as Thiobarbituric acid reactive substance (TBARS) was increased in all treatments over time. However, the candies wrapped in RS-DPE film showed a significant lower in TBARS values. Thus, this could be implied that the RS-DPE film helps delay lipid oxidation in the candy but the water barrier needed to be improved in order to retain the soft and springy texture of the Thai coconut candy.

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ABSTRACT

Thai coconut candy or *Kalamae*, a soft and luscious caramel candy, typically made from glutinous rice flour, palm sugar, and coconut milk. The Thai coconut candy short shelf life, due to lipid oxidation and starch retrogradation of the Thai coconut candy, has affected its quality and subsequently limited its market growth. In addition, the use of bio-based plastic instead of petroleum-based plastic packaging is now a good practice as the latter is harmful to the environment and sea life. So, the objectives of this study are *i)* to apply the starch-based (RS) film with dragon fruit peel extract (DPE) as a packaging of the Thai coconut candy and *ii)* to determine the quality attributes of the Thai coconut candy as affected by the RS-DPE film. The dragon fruit peel was extracted and freeze-dried to obtain the DPE powder. The rice starch-based film with DPE of 2 %w/w solid was prepared by the air-dried casting method. The thickness, color, appearance, water vapor permeability (WVP), total phenolic content (TPC), total betacyanin content (TBC), and DPPH scavenging activity (%DPPH) of the RS-DPE film were determined. Film appearance was smooth. The lightness (*L**) of the RS-DPE film, as compared to the RS film without DPE, was lowered but *a** and *b** values were increased toward redness and yellowness, respectively. The thickness of the film was also increased while the WVP was not altered. The RS-DPE film exhibited a significantly higher amount of TPC and TBC with the higher %DPPH than the RS film. The Thai coconut candies were wrapped in the RS-DPE films and kept in the control chamber at 25 ºC, 50% RH. The commercial polypropylene plastic was used as a control. The quality characteristics of the Thai coconut candy were assessed at day 1, 3, 5, 7, and 9, respectively. There was no significant difference ($p < 0.05$) in the a_w and moisture content (MC) of the candies packaged in both film treatments. As the storage time progressed, the aw and MC were reduced. The results were confirmed by the significant increase in hardness (N) and springiness (%) of the candies wrapped in both film types as time increased. However, hardness and springiness of the candies wrapped in the RS-DPE film were higher than that packed in the commercial film. The lipid oxidation expressed as Thiobarbituric acid reactive substance (TBARS) was increased in all treatments over time. However, the candies wrapped in RS-DPE film showed a significant lower in TBARS values. Thus, this could be implied that the RS-DPE film helps delay lipid oxidation in the candy but the water barrier needed to be improved in order to retain the soft and springy texture of the Thai coconut candy.

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