Development and Evaluation of the Effectiveness of a *Kappaphycus alvarezii* Seaweed-based Coating Solution for the Shelf-life Extension of Banana (Variety: Cavendish)

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Application of biodegradable coating solutions is a novel approach to extend the shelf life of fresh fruits and vegetables. A variety of raw materials are used to develop cost effective coating materials. Studies focusing on the development of seaweed-based coatings are still scarce in Sri Lanka. Therefore, the aims of the present study are to formulate fruit coating material from *Kappaphycus alvarezii* seaweed using glycerol as the plasticizer and to determine the applicability of formulated coating for the shelf life extension of Cavendish bananas. Seaweed extract(obtained by hot water extraction) and 10%, 15% and 20% (V/W) glycerol concentrations were used to produce three different types of coating solutions (glycerol concentrations were selected based on potential bioplastic strength). Cavendish bananas (ripening index 5) were coated with the prepared coating solutions and percentage weight loss, change in firmness (fruit hardness tester), total soluble solid (TSS) content (refractometer) and the peel browning (visual observation) were evaluated for six days. Percentage weight loss was highest for non-coated bananas compared to coated bananas and the least weight loss was observed in the bananas coated with 20% glycerol added coating solution ($p<0.05$). After six days of storage, total percentage weight loss of non-coated bananas was 23.97% and 11.54% for bananas coated with 20% glycerol added coating solution. A continuous loss in fruit firmness was observed in all the four types of samples. The rate of firmness reduction was highest (32%) in non-coated bananas than coated bananas ($p<0.05$). There was a significant difference in TSS content of non-coated bananas compared to coated bananas during storage ($p<0.05$). The rate of TSS increment was higher (8%) in non-coated bananas than coated bananas. Lowest degree of peel browning was observed in the banana coated with 20% glycerol added film forming solution while peel browning was greatest in control samples. Accordingly, percentage weight loss, loss of firmness and peel browning can be effectively reduced by applying seaweed-based coating solutions. Effectiveness of coating solution increases with the increasing glycerol content. It can be concluded that the 20% glycerol incorporated coating solution is a viable coating material for the shelf life extension of Cavendish bananas

***Keywords**:* Coating solutions; Glycerol; *Kappaphycus alvarezii*; Seaweeds; Shelf life extension