Development of Bacterial Cellulose Film Mixed with Thai blueberries Extract for Monitoring the Spoilage of Seafood.

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Abstract

The problem of seafood waste, accounting for approximately 51-60%, arises from consumers misunderstanding the odor emitted from seafood stored for a period of time as spoilage. One factor contributing to this issue is the incorrect expiration date on packaging or the absence of an expiration date. This project developed a color-changing sensor from bacterial cellulose film. The RGB color values collected from photographs of the sensor tested with ammonia were calculated as ΔRGB for further analysis. The results showed that the bacterial cellulose film sensor coated with Thai blueberries extract powder using 47.5% ethanol by volume and installed on the top of the container had the highest ΔRGB value when tested with ammonia. Additionally, a high linear correlation was found between ΔRGB and various concentrations of ammonia solutions obtained from the bacterial cellulose film sensor with 15 grams of Thai blueberries powder. The development of the bacterial cellulose film sensor tested with white shrimp, squid, and sea crab showed that these seafood began to spoil on average after 3 days when calculated with the obtained ΔRGB values equivalent to the ammonia solution of white shrimp, squid, and sea crab, averaging 0.25 molar. Therefore, the paper-based sensor can be used with the developed program to identify the deterioration of seafood, reducing misunderstandings about seafood quality and helping to reduce seafood waste.

Keywords: paper-based sensor, Thai blueberries extract, freshness of seafood