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Effect of Edible Coatings to enhancing the Shelf life of Fruit Crops

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Abstract
Fruit consumption has increased in recent decades, resulting in a rise in global fruit production. Fresh produce, on the other hand, is prone to significant losses during manufacturing and storage. Fruits are subjected to a variety of technical procedures during the postharvest preservation stage in order to maintain their quality. The use of edible coatings, which may be put on a variety of fruits to regulate the exchange of moisture and gases between the fruit and its environment, is a widely used technology. Furthermore, edible coatings offer a substantial advantage by permitting the incorporation of various active compounds into the matrix of the coating, implying that these substances will associate with and maybe be consumed alongside the fruit. This would help to improve the fruit's organoleptic and nutritional characteristics.

Introduction
Edible coating increases product storage time by providing a semi-permeable barrier to gas and moisture loss, as well as increased mechanical properties, delaying natural ageing, and maintaining the structure of coated items. Manufacturing and distribution of fresh-cut goods has grown in popularity around the world as a result of rising demand for healthier alternative diets and developments in processing technology. Routine fresh-cut preparation techniques, such as peeling, cutting, chopping, and so on, expose the tissue to moisture loss, microbial activity, and metabolic reactions, resulting in textural degradation, colour change, and loss of quality in the fruit. Colour change, produced by polyphenol oxidases' phenolic oxidation process, is one of the most difficult issues in the preservation of freshly cut fruits.

Edible coating
The fruit were coated with edible materials is a known practice since the 1930s.That is, edible coating is a safe and friendly practice to human and his environment as well. Coating with oils offer fruits protection from bruising by being slippery, shininess and retard maturation. The application of edible coatings is one of the most innovative methods to extend the commercial shelf-life of fruits. The use of fruit coating agents will slow down fruit ripening or lengthen fruit storage period. Several mechanisms are involved in extending the shelf life of fruits and vegetables by film coatings. Edible coatings may contribute in extending the shelf life of fresh fruits by decreasing moisture loss and controlling gas exchange, respiration and oxidative reaction rates, as well as reducing or even suppressing physiological disorders. In addition, they can improve mechanical handling properties, avoid volatiles losses, carrying additives and even contribute to the production of aroma volatiles

Effects of edible coating on fresh-cut fruits

Apple: Apples treated with sodium alginate retain their microbiological and nutritional qualities. Fresh-cut apple coated with an inulin and fructose-rich alginate-based solution is a good probiotic carrier that could be exploited to generate new non-dairy functional food products. Apple slices with prebiotic-alginate are a promising technique for developing novel probiotic bacterium carriers. Aloe vera has anti-browning compounds that help to retain their quality throughout storage.

Banana: When liposomal oil was combined with mucilage, polyphenoloxidase and lipoxygenase activity, fruit softening, and weight loss were all reduced while firmness and soluble solids content were maintained. Free RO in a similar amount of water had less of an influence on the physicochemical parameters than the control, with lesser changes in chroma, L* value, and pH. According to the research, mucilage (Mu) combined with liposomal oil and rosemary oil (LipoRo) has the ability to improve banana quality.

Mango: Edible coatings have been shown to help preserve the quality of sliced mangos by reducing weight, delaying the increase in TSS, and conserving pH, total acidity, and microbial growth. It also demonstrated that there was no sensory difference between the coated and untreated sliced mangoes. When coated with alginate or antioxidant, it was discovered that alginate and an anti-browning chemical improved the colour of cut fruits while also increasing antioxidant capacity. Fresh-cut mangoes can be stored at 4oC for 12 days without compromising nutritional or physicochemical quality, according to the research.

Papaya: It was discovered that a multilayered antimicrobial edible coating improved the microbiological quality of sliced papaya. It extended the storage and quality of fresh papaya for 15 days at 4o Celsius, whereas untreated fruits lasted only 7 days, and this coating reduced total carotenoids and vitamin C content. The Ziploc tray with the Ziploc lid is the best solution for storing fresh-cut papaya at room temperature. Fruit loses quality quickly if not packed (cheesecloth management).

Conclusion

Edible coating technology offers a promising approach for preserving fresh food quality. The application of non-active coating affects the internal environment of fruits by preventing gas and water exchange. This is owing to their capacity to prevent disease development on fruit, which is more effective than a physical barrier. As a result, the interactions of the coating formulation have a major impact on fruit quality preservation. It provides a novel strategy for future study that has the potential to boost the value and application of biopolymers in the food industry. Future research is needed to create biopolymers that are environmentally safe and lucrative while using low-cost processes. Furthermore, large-scale investigations on edible coatings on an industrial scale are required.

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