



Plant Based Extracts to Improve the Shelf Life of Banana

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Banana (*Musa spp.*) is the most widely cultivated and consumed fruit in the tropical and subtropical regions of the world where they constitute a major staple food crop for millions of people. India is the largest producer of fruits in the world and banana tops the list with respect to production and area of cultivation. Unfortunately, India also occupies the top position in harvest and post-harvest losses of horticultural produce. It is estimated that about 25 per cent of fruits and vegetables, are lost annually. This is due to improper post-harvest handling during storage, packaging and transportation, incidence of diseases and limited storage facilities are some of the major reasons for such high post-harvest losses. So, improving their shelf-life period is crucial.



Being a climacteric fruit, it is also highly perishable in nature. The rapid degradation of fruits is due to their direct contact with atmospheric moisture and the exchange of Oxygen. When they coated with chemicals or any plant extract it forms a layer around it. This kind of coatings will restrict the movement of air and also prevents the contact of pathogens to some extent. In general, chemicals are used to coat the fruits. Chemical forms coating around the fruits which restrict the biological activity. But they are harmful to both environment and humans. Consumers of fruits have raised concerns about their health and also the quality of fruits and also rapid change in the environment increases health concern among people.

Post-harvest loss of fruits is increasing due to reasons like delayed harvesting, long transportation, and careless packing. Which not only affect their quality but also their shelf-life. Quality of fruits decides the market price. After harvesting fruits lose their shelf life due to biological activities like respiration as well as pathogenic activity. Studies on different fruits shown that they have pathogenic activity on their surface. Pathogen such as *Staphylococcus spp.* and *pseudomonas spp.* was found on the surfaces of banana.

As an alternative, plant extracts are extracted from specific plants that have some medicinal properties like Neem, Aloe Vera, Turmeric, Cinnamon, Rosemary etc., Then they applied as a coating around the fruits which forms a protective coating and acts as a barrier and prevents direct contact with the atmosphere. And also, they are edible in nature. The plant extracts are extracted from the plant parts like fruits, bark, leaves, and roots. Drying them is followed process after extraction to make them fine powder. Then this powder mixed with equal amounts of water to make a thick paste to apply as a coating around the fruits. The main advantages of using plant extracts are:

- It can be used for organic produce without concern.
- Increases shelf life of fruits equal to chemical coatings.
- Eco-friendly.

- They require less skill in applying than chemicals.

The plant-based extracts are highly rich in antioxidants. Plant-based extracts can be used successfully as a source of natural antioxidants to prevent the harmful effects and are a good alternative to synthetic preservatives. Compounds derived from plants are largely phenols or their derivatives. These secondary metabolites have various benefits, including antimicrobial properties. In addition, there are studies that have evaluated the antibacterial effects of aromatic plants against food-borne bacteria. The different types of plant-based extracts are:

Sources	Plant	Scientific Name	Part Used
Aromatic Herbs	Basil	<i>Ocimum basilicum</i>	Leaves
	Curry	<i>Murraya koenigii</i>	Leaves
	Fennel	<i>Foeniculum vulgare</i>	Leaves
	Lemon grass	<i>Cymbopogon citratus</i>	Leaves
	Mint	<i>Mentha spicata</i>	Leaves
	Oregano	<i>Origanum vulgare</i>	Leaves
	Rosemary	<i>Rosmarinus officinalis</i>	Leaves
	Watercress	<i>Nasturtium officinale</i>	Leaves and Flower
Fruits	Aloe	<i>Aloe vera</i>	Leaves
	Grapes	<i>Vitis vinifera</i>	Seed Pomace
	Pomegranate	<i>Punica granatum</i>	Flower and Fruit Peel
	Papaya	<i>Carica papaya</i>	Seeds
	Banana	<i>Musa spp.</i>	Peel and Fruit
Spices	Pineapple	<i>Ananas comosus</i>	Peel
	Clove	<i>Eugenia caryophyllata</i>	Bud
	Fenugreek	<i>Trigonella foenum-graecum</i>	Seeds
	Cinnamon	<i>Cinnamomum verum</i>	Bark
	Turmeric	<i>Curcuma longa</i>	Rhizomes

The use of natural coatings might be a good alternative to synthetic fungicides, which in turn fulfils the consumer requirements for more natural and healthy foods. Protective edible coatings and waxes are applied as part of the post-harvest to fresh fruits for their preservation. Plant based natural coatings as an effective preservative aiming at the safety, quality and functionality of fresh fruits. Edible coatings have long been known to protect perishable food products from deterioration by retarding dehydration, suppressing respiration, improving textural quality, helping retain volatile flavour compounds and reducing microbial growth.

References

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