

# Gum Arabic: A Sustainable Biotechnological Solution to Prolong the Shelf Life and Improve Post-Harvest Quality of Fruits

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## Abstract

Gum Arabic, a natural biopolymer extracted from Acacia trees, represents an innovative and environmentally friendly alternative for developing bio-based packaging in the food industry. Used as an edible coating, it extends the shelf life of fruits while preserving their post-harvest quality. With its film-forming properties, gum Arabic creates a natural barrier that limits water loss, reduces the respiratory activity of fruits, and inhibits microbial growth. Compared to traditional plastic packaging, gum Arabic offers a biodegradable solution, contributing to the reduction of plastic waste and environmental preservation. By incorporating this biopolymer into the production chain, this approach supports sustainable development and the transition toward green technologies in the food sector. However, the sensitivity of gum Arabic to humidity requires further research to improve its stability, particularly under real storage and transportation conditions. As a bio-based material, it has considerable potential to address ecological challenges, reduce post-harvest losses, and offer a sustainable alternative to conventional packaging, thereby meeting the needs of a more responsible industry.

## Keywords

Gum Arabic, Bio-based Coating, Fruit Preservation, Sustainable Development, Green Technologies, Eco-friendly Food Packaging, Microbial Inhibition