

# A Review on Organic Edible Coating in Post Harvest Conservation of Tomato

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## Abstract

The study is to evaluate the effect of aloe vera, applied as an edible coating, on the changes in physicochemical parameters related to tomato (*solanum lycopersicum*) fruits quality during storage in ambient condition as well as role in controlling microbial spoilage. Tomato samples were submitted to treatment with aloe vera gel with sago (60% w/v) dip. Aqueous extract is pure aloe vera or diluted (2:1) in distilled water. The following characteristics were analysed; ripening process, peel colour, fruit strength, TSS, durability, transport and mechanical injuries. Peel red colour in fruits treated with antimicrobial coating presented, lower mass loss, whereas the stiffness of fruit and internal pulp quality was preserved for extra 8-10 days in ambient condition.

Keywords: Post harvest losses, organic coating, antimicrobial, aloe vera

## Introduction

Tomato being a climacteric fruit continues to ripen after harvest. This deterioration of tomato is due to ripening process that occurs rapidly in climacteric fruits. Usage of aloe vera in coating, suppresses the production of ethylene. For fresh tomatoes, the quality attributes most important to buyers & customer are texture and skin colour. Hence the sago used in the coating, takes care about the skin firmness and aging problems like wrinkles. Fruit firmness is a quality attribute which is directly related with enhancement of storability potential and shows greater resistance towards decay and mechanical damage. Tomato is a highly perishable fruit that presents accelerated physiological processes; its perishing effects are aggravated by storage conditions during post-harvest process. During the post-harvest period, these fruits rapidly start senescence, that is why the storage period doesn't last. This is a very serious problem, hence a solution to this is an organic edible coating which is harmless and nutritive in nature. These coatings are an alternative for increasing shelf life of fruits, protecting them from humidity and oxygen effects. Since aloe vera is an antimicrobial natural product, it is very effective in inhibiting microorganisms during post-harvest life. And the coating improves food appearance and prevents losses.

## Literature review and related work

N.F.F. SOARES et al [1]: Proposed coating of aloe vera gel formulation with cassava starch and chitosan (PADETEC-Brazil) with a diacetilaion degree higher than 85% . Two fruits <sup>1</sup>Guava <sup>2</sup>Papaya were observed under 2.5% of cassava , 2% of glycerol and chitosan (1.0% & 1.5%). As well as dissolved 0.4% glacial acetic acid (w/v) were heated at 10 °C until starch gelatinized. The effect of this coating, peel colour remained green for 12 days of storage.

BASSETO et al., 2005 [2]: An increase of the enzymatic activity is generally associated with ethylene production during ripening. It showed that the loss of green colour of peel is due to a break in chlorophyll molecule structure, involving the chlorophylase enzyme.

RAYBAUDI- MASSILIA et al., 2007[3]: Similar experiment using aloe vera and chitosan as main components, were carried upon apples and strawberries. The result on colour changes and ripening effect was observed.

Scanavaca Junior et.al., 2007[4]: Studying the “Supresa” mango variety, treated with 0,10,20 and 30 gm per litre of cassava starch coating, reported that the fruits treated with 0 gm per litre of cassava became yellow in 12 days and treatment using 20 & 30 gm per litre of cassava starch changed from green to greenish-yellow during some period.

K.A.Athmalsevl et.al.,2012[5]: Formulated effect of aloe vera based edible coating on mass loss, colour firmness, pH, acidity, TSS, ascorbic acid and lycopene on the coated tomato. The material used in the experiment included glycerol (2%), oleic acid (3ml), thickening agent (20 gm) and aloe vera extract (500 ml). The result impressively covered all the effect mentioned above, under certain controlled conditions.

Castillo S. and Serrano M.,2005[6]: The novel edible coating based on aloe vera gel to maintain table grape quality and safety.

Serial no.	Title of Research Paper	Name of Author	Remark
1.	Antimicrobial edible coating in post harvest conservation of guava	N.F.F. SOARES et al	With the formulation of chitosan and cassava starch , some biochemical wax was prepared for shelf life improvement of guava.

2.	Delay of ripening of 'Pedro Sato' Guava with 1-methylcyclopropene	BASSETO et al.	Enzymatic activity in ethylene production, showing loss of colour and break down of chlorophyll.
3.	Shelf life extension of fresh cut 'Fuji' apples at different ripening stages using natural substances	RAYBAUDI- MASSILIA et al	Costly fruits with major demands were coated with aloe vera the fruits like apple and strawberries showed great ripening effectiveness.
4.	Post harvest maintenance of major fruits	Scanavaca Junior et.al	Study of 'Supresa' mango variety showing inhibition of ethylene in post harvest stages.
5.	Development of aloe vera based edible coating for tomato	K.A.Athmalsevi et.al	Impressively maintain firmness, pH, TSS, Colour etc., and kept shelf life very long.
6.	Novel edible coating based on aloe vera to maintain table grape quality and safety.	Castillo S. and Serrano M.	Coating on table grape showed its rigidity maintain for extremely well days.

## Proposed work

The organic edible coating includes the materials like, aloe vera gel, sago, starch i.e., corn starch for the experimentation.

Wash the tomato well, remove all the dust and dirt from the skin and let dry at room temperature. Preparation of coat includes aloe vera gel, sago and corn starch for gelatinizing.

The tomato is deep into the composition for 3 mins. To enable the surface coating on tomato. The coat reduces the physiological activities like ripening, mass loss, water retention etc. As well as the coat improves the skin stiffness, rigidity, tightening and aging too.

Ripening process suppressed by the oxidase enzyme present in the aloe vera gel that leads to slow colour change and less ethylene production in the fruit.

## Conclusion

The coat prepared is totally organic and not harmful at all. Whereas the component used for the preparation of coat are nutritious and can be processed. The basic need for coating was to reduce the post harvest losses, and hence was done by increasing the shelf life of tomatoes. As well as the quality and standard measures were maintained as per expectation of public.

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