

# The novel edible coating based on chitosan and gum ghatti to improve the quality and safety of 'Rishbaba' table grape during cold storage

Sara Eshghi, Rouhollah Karimi, Azam Shiri, Mostafa Karami and Mohammad Moradi

Journal of Food Measurement and Characterization 15: 3683–3693. 2021.

---

## Abstract

In this research, the effect of edible coatings, based on chitosan with and without gum ghatti to improve biophysical and safety properties of 'Rishbaba' grape (*Vitis vinifera* L.) were investigated. Fruits were coated with postharvest treatments include 9 groups: chitosan 0%-gum ghatti 0% (control: C<sub>1</sub>G<sub>1</sub>); chitosan 0%-gum ghatti 0.5% (C<sub>1</sub>G<sub>2</sub>); chitosan 0%-gum ghatti 1% (C<sub>1</sub>G<sub>3</sub>); chitosan 0.5%-gum ghatti 0% (C<sub>2</sub>G<sub>1</sub>); chitosan 0.5%-gum ghatti 0.5% (C<sub>2</sub>G<sub>2</sub>); chitosan 0.5%-gum ghatti 1% (C<sub>2</sub>G<sub>3</sub>); chitosan 1%-gum ghatti 0% (C<sub>3</sub>G<sub>1</sub>); chitosan 1%-gum ghatti 0.5% (C<sub>3</sub>G<sub>2</sub>) and chitosan 1%-gum ghatti 1% (C<sub>3</sub>G<sub>3</sub>), stored for 60 days under 0 ± 1 °C and 85% relative humidity condition. All coatings controlled positively berry softening, berry discoloration, berry drop and rachis browning (C<sub>3</sub>G<sub>3</sub> changes were between 2.5 to 6 times less than control samples). Furthermore, C<sub>3</sub>G<sub>3</sub> coating treatment improved berry texture and its sensory scores (17 scores higher than control samples). The mixture of chitosan and gum ghatti especially C<sub>3</sub>G<sub>3</sub> showed better effects on delaying weight loss and titratable acidity compared to other treatments. The differences were noticeable in pH and total soluble solids between coated and uncoated grapes. After the 20<sup>th</sup> days of storage all coatings, especially C<sub>3</sub>G<sub>1</sub>, C<sub>3</sub>G<sub>2</sub> and C<sub>3</sub>G<sub>3</sub> delayed changes in ascorbic acid, membrane stability of grapes as well as had positive effects on the antioxidant enzyme activities that preserved the enzymatic browning of fruits. These formulations especially C<sub>3</sub>G<sub>3</sub> showed the greatest effect on all measured parameters and it can be recommended to use as a useful edible coating combination for improving the postharvest properties quality of grape.