

EFFECTS OF CHITOSAN-BASED COMBINED WITH NANOSILVER FILMS AT THREE DIFFERENT DEACETYLATION DEGREES ON THE QUALITY OF HOA LOC MANGO (*Mangifera indica* L.) DURING POSTHARVEST STORAGE

Nguyen Huynh Dinh Thuan^{1,2*}, Nguyen Le Phuong Lien³, Pham Thi Quyen¹, Nguyen Duc Vuong¹, Duong Quoc Dat¹, Nguyen Ngoc Tuan¹, Ly Nguyen Binh^{2*}

¹ Institute of Biotechnology and Food Technology, Industrial University of Ho Chi Minh City, Viet Nam.

² College of Agriculture, Can Tho University, 3 Thang 2 street, Ninh Kieu district, Can Tho city, Viet Nam

³ Institute of Food Science and Technology, Hungarian University of Agriculture and Life Sciences, Budapest, Hungary

* corresponding author: nguyenuyhdinhthuan@iuh.edu.vn ; lnbinh@ctu.edu.vn

ABSTRACT

This study investigated the effects of films made by chitosan-based at Three deactylation degrees(70, 80, and 90%) combined with nanosilver for Coating on the quality of Hoa Loc mango (*Mangifera indica* L.). After treated by water washing at room temperature, the mangoes were coated with the films made by natural. Evaporation of solution of chitosan 1% (w/w) and 75ppm of silver-nano 0.001M. Then mangoes were stroed at 12°C. Determination mango quality evaluation during the time of storage (The respiration and ethylene productions rate, weight loss, color change of peels, total of sugar, total of soluble solids content, C - vitamin content, total acid, and hardness of mangoes

1. INTRODUCTION

In terms of quality, Hoa Loc mangoes are ranked first among mangoes. The fruit weight around 350 - 400 grams. Mango is sudden respiratory fruit, with 20-30% loss each year due to short storage time and rapid ripening. The main disadvantage of Hoa Loc mango variety is that the fruit skin is thin, ripe quickly, so it difficult to preserver after harvest as well as transport and export In this study, we researched the effect chitosan-based combined with nano-silver films at three deacetylation degrees (70%, 80%, and 90%) on the quality of Hoa Loc mango during postharvest storage by coating.

2. MATERIALS AND METHODS

Chitosan 70%, 80% and 90% deacetylation was purchased from Nha Trang University. Hoa Loc mango (*Mangifera indica* L.) was purchased from mango garden in Tien Giang province, Viet Nam. The mango fruits were selected with VietGAP standard has uniform size, weight from 350 to 450 grams.

Nano-silver making:

Dissolve AgNO₃ in 50 ml of deionized water to get a solution of 0.001M concentration, boil the solution and add 5ml of 1% citric acid drop by drop until a pale yellow color appears.

Chitosan 1% (w/w) making:

Soak 1% (w/w) chitosan of 70% deacetylation in a flask containing 100ml of 1% acetic acid solution at pH 3.6, and pH 3.8 for chitosan of 80% and 90% deacetylation degrees in 2 days, the stir the mixture by magnetic stirrer at 50°C for 30 minutes.

4. CONCLUSION

The results of the preservation process showed that the films of chitosan-based combined with nanosilver at three deacetylation degrees, including 70, 80 and 90%, was able to extend the mango storage time by up to 35 days while the uncoated control lasted 25 days only. In addition, it also helps stabilizing the mango quality, inhibiting the respiration, limiting the ethylene gas production, prolonging the ripening process of mango fruit. However, with higher deacetyl degrees chitosan-based films, the respiration of mango was controlled better than that of lower deacetylated concentration. For the 70% chitosan -based with nano-silver, experimental data showed that is worse than 80% and 90% chitosan-based with the same nanosilver. It revealed that the chitosan-based films with high deacetylation showed high ability to apply in the preservation of mangoes fruit belonging to climacteric fruit group.

REFERENCES

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- Zhu, X., Wang, Q., Cao, J., Jiang, W. (2008). Effects of chitosan coating on postharvest quality of mango (*Mangifera indica* L. cv. Tainong) fruits. Journal of Food Processing and Preservation, 32(5): 770-784.

3.RESULTS

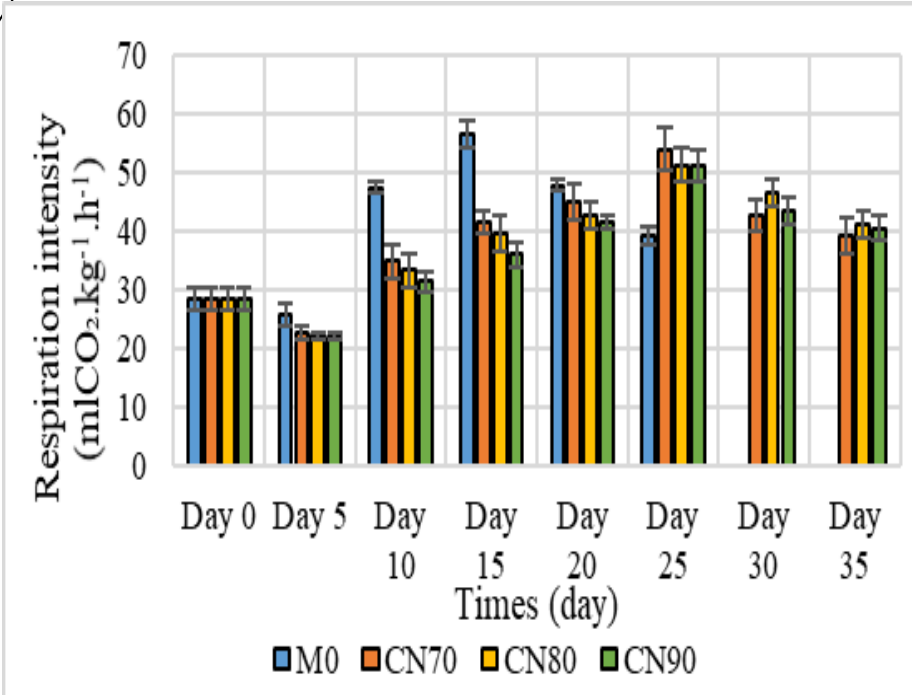


Fig 1. The respiration intensity of Hoa Loc mango

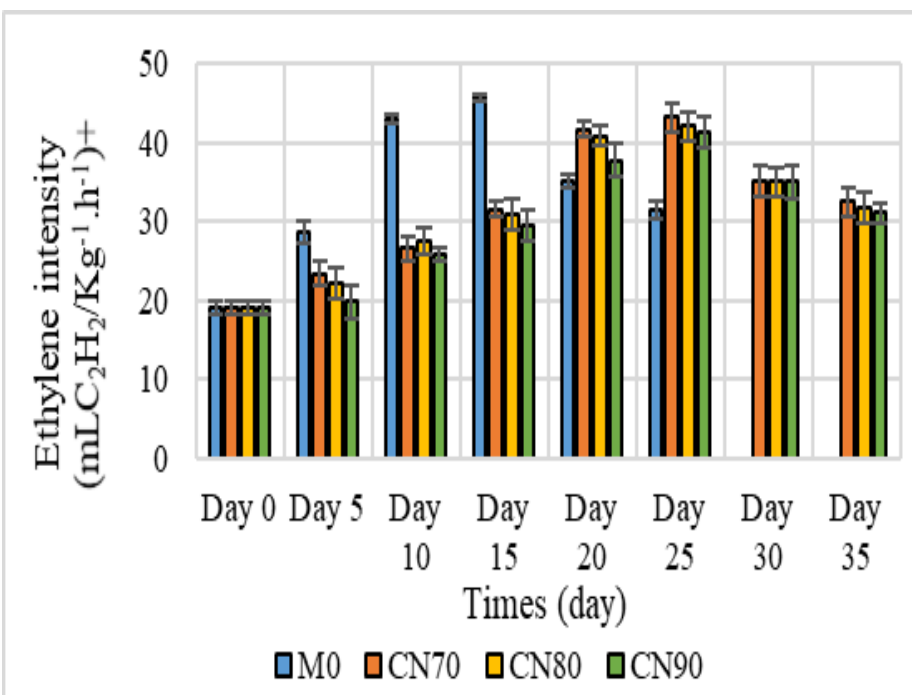


Fig 2. The ethylene intensity production of Hoa Loc mango

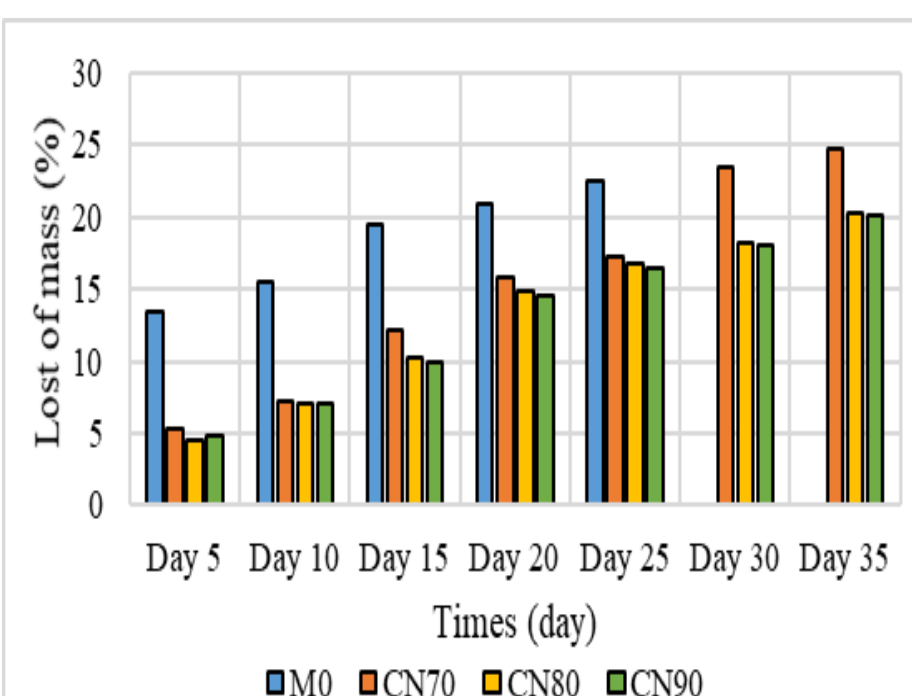


Fig 3. Loss of weight content of Hoa Loc mango

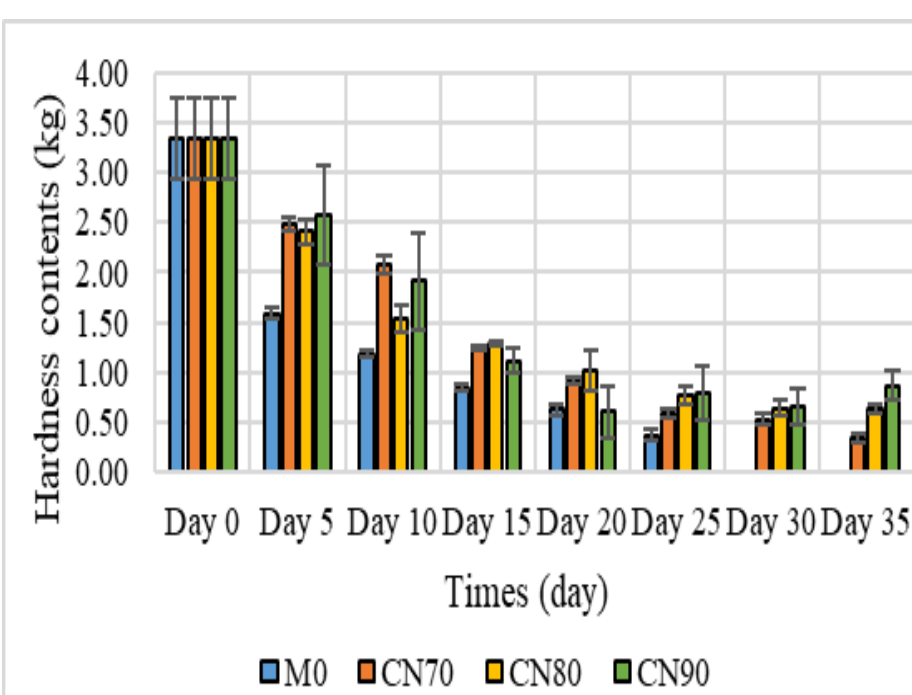


Fig 4. Changes in the hardness content of Hoa Loc mango

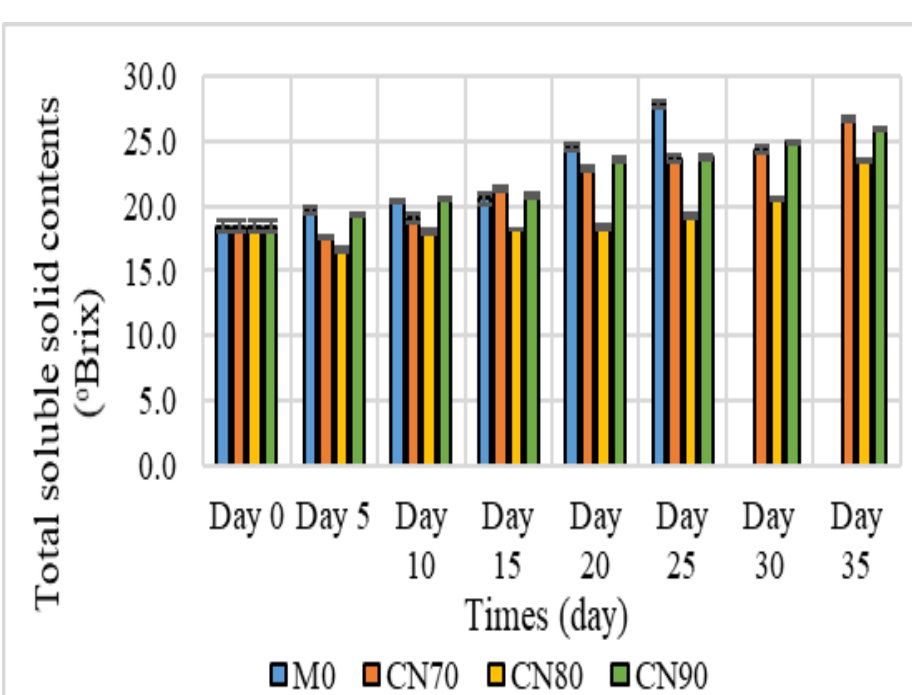


Fig 5. Changes in soluble solids content of Hoa Loc mango

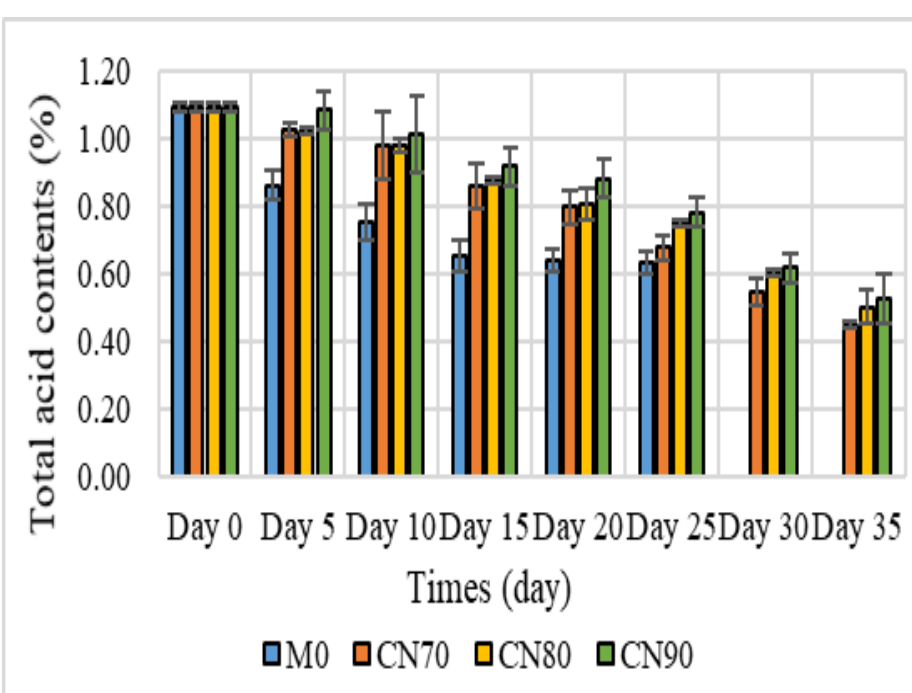


Fig 6. Changes in the total acid content of Hoa Loc mango

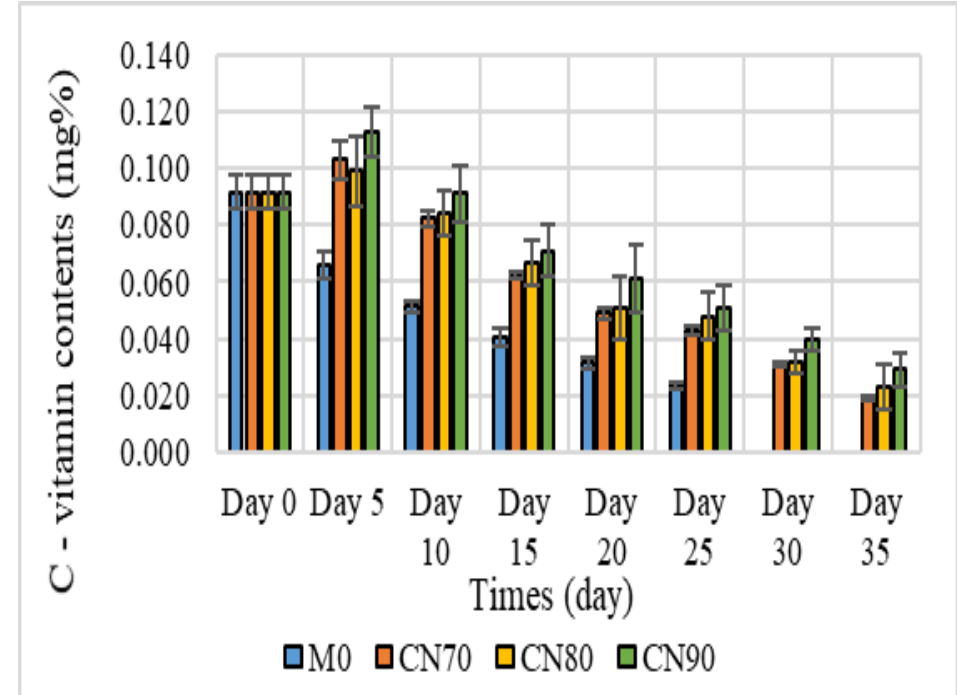


Fig 7. Changes in the vitamin C contents of Hoa Loc mango

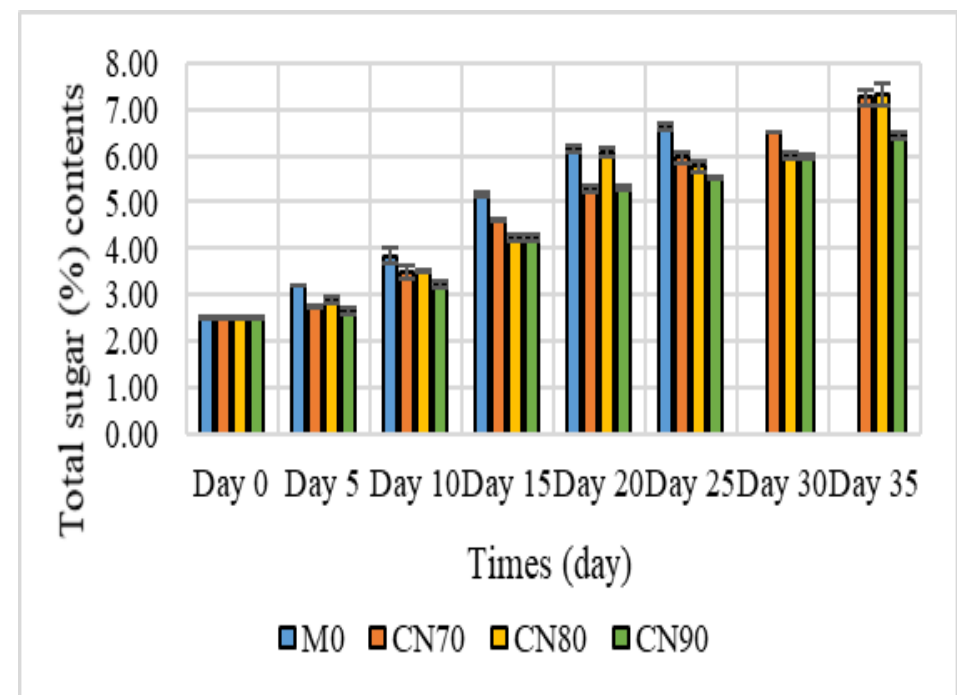


Fig 8. Changes in total sugar of Hoa Loc mango

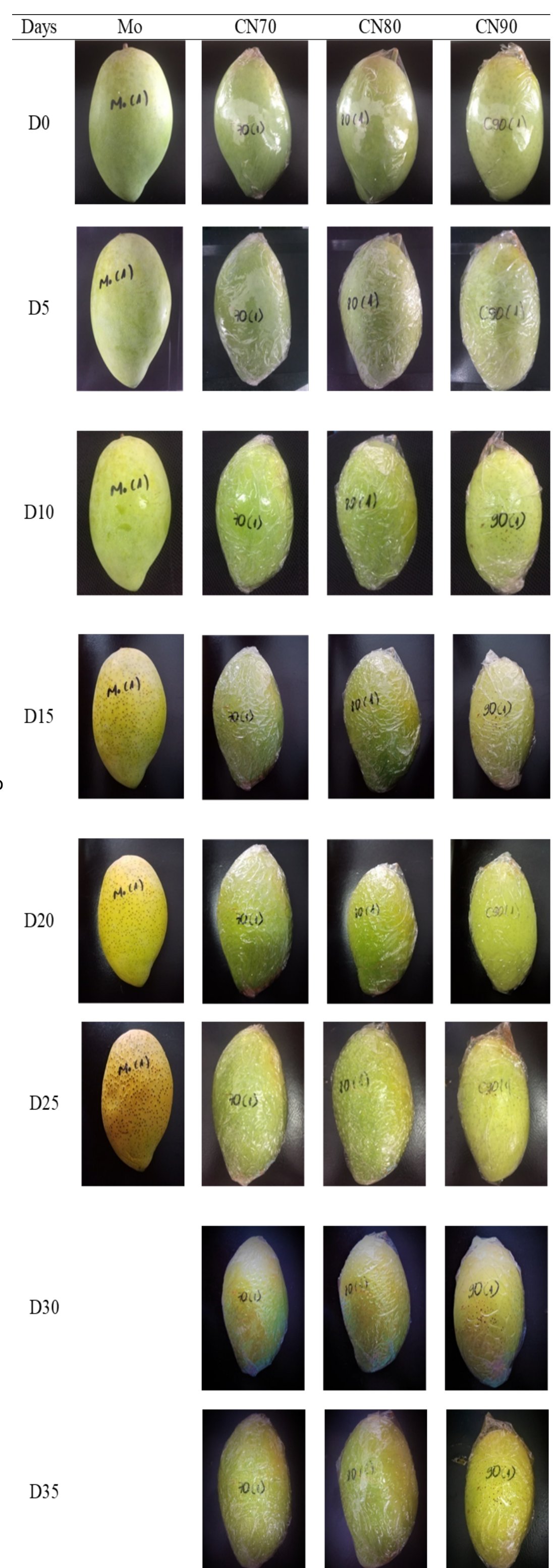


Fig 9. Changes in color peels of Hoa Loc mango