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Archive of SID

(*citrus sinensis*)

(*Citrus unshiu*)

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2 . Satsuma  
e-mail: Mahmoodgh2000@yahoo.com

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1 . Thompson Navel

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- 4 . Conditioning
  - 5 . *Citrus auratiu*

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- 1 . Curing
  - 2 . Hot Water Rinsing and Brushing
  - 3 . Heat Shock Protein (HSP)

$$CI = \frac{\sum(n_i \times i)}{N}$$

$n_i$  (Chilling injury) CI

$i$   $i$

-

N.

.(Cond)

.(HWT)

.( )

.(HWT+Cond)

.(HWT+CaCl<sub>2</sub>)

.( )

.(WT+ CaCl<sub>2</sub>)

(Control)

(C<sub>1</sub>)

.(C<sub>2</sub>)

.( )

$$\frac{C_1}{EC_2} \times 100$$

.( ) pH= /

2 . *Penicilium digitatum*

3 . *penicellium italicum*

4 . *Brown rot*

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1 . Hot Water Treatment

MSTATC SAS

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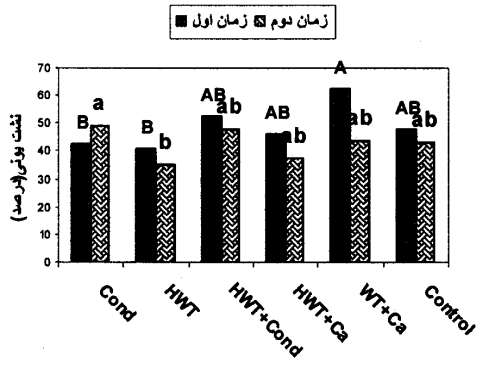
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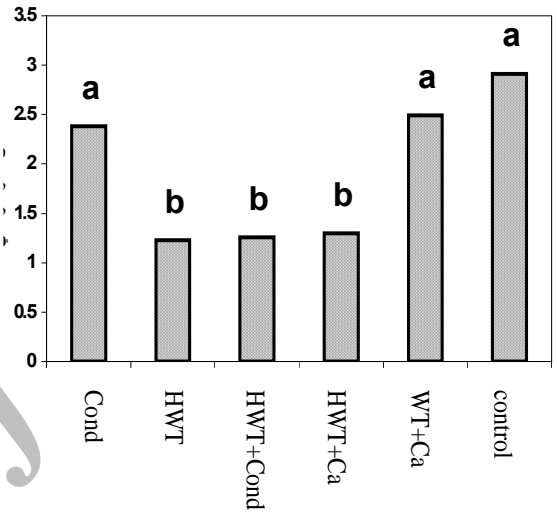
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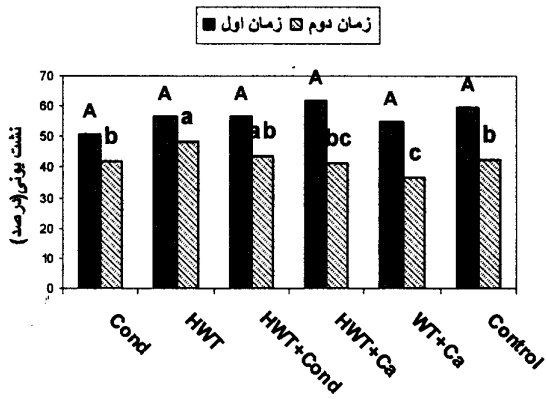


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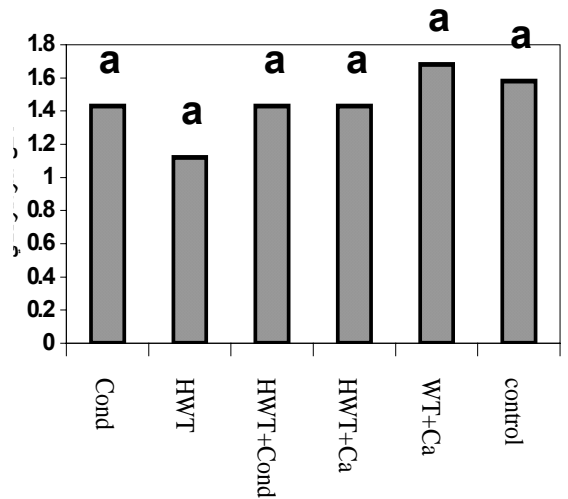
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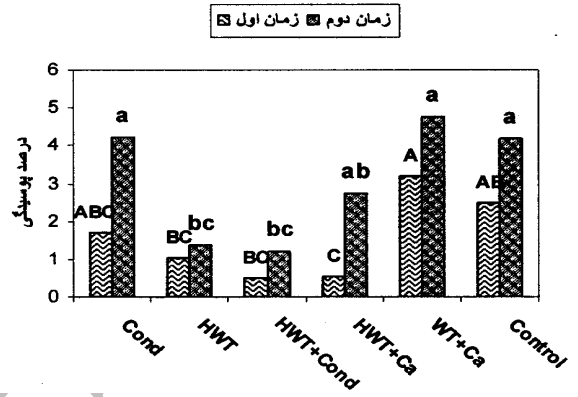
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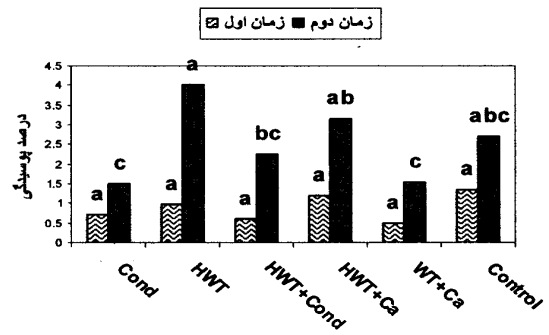
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- 2 . Methyl Jasmonate (MeJA)
- 3 . Methyl Salicylate (MeSA)
- 4 . Ethylene Forming Enzyme (EFE)

1 . Cellular Compartmentalization



## REFERENCES

1. Agar, I. I., & S. J. Bongerth. 1997. Effects of high CO<sub>2</sub> and controlled atmosphere (CA) on the Ascorbic acid and Dehydro ascorbic acid on some berry fruits. *Postharvest Biology and Technology*. (11): 47-55.
2. Andrew, P.k. 2002. How foliar applied nutrients affect stresses in perennial fruit plants. *Proc. Is. on Foliar Nutrition*.
3. Aquino, D.S., A.Palma, F.Fronedda & M.Tedde. 2004. Effect of preharvest and postharvest treatment on chilling injury and decay of cold stored fortune mandarins. 5<sup>th</sup> International conference of Postharvest, Verona, Italy.
4. Artes, F., A. J. Tudela, & R. Villaescusa. 2000. Thermal postharvest treatment for improving Pomegranate quality and shelf life. *Postharvest Biology and Technology*. (18): 245-251.
5. Chang, K. D., C.Y. Wang, K.C. Gross, & D. L. Smith. 2001. Reduction of chilling injury and transcript accumulation of heat shock proteins in tomato fruit by methyle Jasmonate and methyle salicylate. *Plant Science*. (161): 1153-1159
6. Fallik, E. 2004. Prestorage hot water treatments (immersion, rinsing and brushing). *Postharvest Biology and Technology*. (32): 125-134.
7. Gonzalez- Aguilar, G.A., L. Zacarias, M.A. Perez-Amador, J. carbonell, & M.T. lafuenta. 2000. Polyamine content and chilling susceptibility are affected by seasonal changes in temperature and by conditioning temperature in cold stored fortune mandarin. *Physiol. Plant*. (108): 140-146.
8. Gonzalez-Aguilar, G.A., J.G. Buta & C.Y. wang. 2003. Methyle jasmonate and modified atmosphere packaging (MAP) reduce decay and maintain postharvest quality of papaya 'Sunrise'. *Postharvest Biology and Technology*.(18): 131-141.
9. Gonzalez-Aguilar, G.A., M.E.Tiznado-Hernandez, R. Zavaleta-Gatica, & M.A. Martinez-Tellez. 2004. Methyle jasmonate treatments reduce chilling injury and activate the defense response of guava fruits. *Biochemical and Biophysical Research Communication*. (313): 694-701.
10. Gozalez-Aguilar, G.A., L.Gayosso, R. Cruz, J.Fortiz, R, Baez, & C.Y.Wang. 2000. Polyamine induced by hot water treatments reduces chilling injury and decay in pepper fruit. *Postharvest Biology and Technology*. (18): 19-26.
11. Grantly, R., R. Champlin & K.J.Scott. 1980. Association of calcium in chilling injury susceptibility of stored Avocados. *Hortscience*. (15): 514-525.
12. Guzman, I. L., M. Cantwell, & D. M. Barrett. 1999. Fresh-cut cantaloupe: Effect of CaCl<sub>2</sub> dips and heat treatments on firmness and metabolic activity. *Postharvest Biology and Technology*. (17): 201-213.
13. Hewajulige, I.G.N., R.S.Wilson Wijantnam, R.L.C. Wijesandera & M. Abeysekere. Fruit calcium concentration and chilling injury during low temperature storage of pineapple. 2003. *Journal of the Science of Food and Agriculture*. (83): 1451-1454.
14. Hilali, E.L., F. Ait-oubahout, A. Remah, & O. Akhayar. 2003. Chilling injury and Peroxidase activity changes in 'Fortune' Mandarin fruit during low temperature storage. *Bulg. J. Plant. Physiology*. (29): 44-54.
15. lafuenta, M.T., N. Holland & H.C, Menezes. 2001. Carbohydrate as related to the heat induces chilling tolerance and respiratory rate of Fortune Mandarin fruit harvested at different maturity stage. *Postharvest Biology and Technology*. (25): 181-191.
16. Manning, K. 1995. *Biochemistry of fruit ripening*. London. Chapman and Hall. 347-377.
17. Maria, J.G., L. Zacarias, & M.T. Lafuenta. 2004. Characterization of the expression of an oxygenase involved in chilling induced damage in citrus fruits. *Postharvest Biology and Technology*. (33): 219-228.
18. Martinez, T. M. A., M.G. Ramos Clamont, A.A. Gardea. & O.I.VargasAgispur.2002. Effect of infiltrated polyamines on polygalacturonase activity and chilling injury responses in Zucchini Squash (*Cucurbita pepo* l.). *Biochemical and Biophysical research communication*. (295): 98-101.



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19. Paull, R. E., & N. J. Chen. 2000. Heat treatment and fruit ripening. *Postharvest Biology and Technology*. (21): 21-30.
20. Porat, R., D. Pavoncello, J. Pretez, S. Ben-Yahushoa & S. Lurie. 2000. Effect of various heat treatments on the induction of cold tolerance and on the postharvest qualities of Star Ruby grape fruit. *Postharvest Biology and Technology*. (18): 159-165.
21. Porreta, S., Poli, & G. L. Palmieri. 1995. Optimization of the addition of calcium chloride to canned diet tomatoes. *Science Des Aliments*. (15): 99-112.
22. Raymond, W.M.F., C. Y. Wang, D. L. Smith, K.C. Gross & T. Meisheng. 2004. Methyl Salicylate and Methyl Jasmonate increase steady state transcript levels of alternative oxidase and resistance against chilling injury in sweet peppers (*Capsicum annuum* L.). *Plant Science*. (166): 711-719.
23. Sala, J.M., & M.T. Lafuente. 2000. Catalase enzyme activity is related to tolerance of mandarin fruits to chilling. *Postharvest Biology and Technology*. (20): 81-89.
24. Saltviet, M. 2002. The rate of ion leakage from chilling sensitive tissue does not immediately increase upon exposure to chilling temperature. *Postharvest Biology and Technology*. (26): 295-304.
25. Schirra, M., M. Mulas, A. Fadda, & E. Cauli. 2004. Cold quarantine responses of blood oranges to postharvest hot water and hot air treatment. *Postharvest Biology and Technology*. (31): 191-200.
26. Schirra, M., & G. D. Hallewin. 1997. Storage performance of mandarin, following hot water dip. *Postharvest Biology and Technology*. (10): 229-238.
27. Woolf, A. B., K. A. Cox, A. White & I.B. Fergusson. 2003. Low temperature conditioning treatments reduce external chilling injury of 'Hass' Avocados. *Postharvest Biology and Technology*. (28): 113-122.
28. Yahia, E.M., Cintrecede, M & G. Gonzalez-Aguilar. 2001. Ascorbic acid content in relation to Ascorbic acid oxidase activity and polyamine content in tomato and bell pepper fruits during development, maturation and senescence. *Lebensm-Wiss u-Technol*. (34): 452-457.

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