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Using Hot Water and Chitosan for Controlling Green and Blue Moulds of Navel Orange Fruits

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Abstract : Evaluating of hot water and chitosan alone or in combination applied as curative or protective effect on green and blue moulds incidence of navel orange fruits was tested. *In vitro,* studies were carried out on agar disk and spore suspensions of both *P. digitatum* and *P. italicum.* The lethal temperatures to *P. digitatum* and *P. italicum* were 56.0 and 54 ^{o}C when were exposed to temperatures for 10 seconds as agar disks or growth suspension respectively. Data also showed that chitosan at different concentrations, *i.e.* 2 , 4 and 6 g / L were effective in reducing the growth of both pathogens. Complete inhibition of linear mycelial growth and spore germination of both pathogens was obtained with chitosan at 6.0 g / L. *In vivo* studies, single applications of hot water and chitosan were applied to artificially inoculated citrus fruits to test their efficacy in the control of *Penicillium digitatum* and *P. italicum*. Treated fruits were stored at 20±2^{o}C° and 90-95% relative humidity for 15 days. Results revealed that hot water and chitosan showed high curative effects against both green and blue moulds. The highest reduction in the disease incidence was obtained with hot water at 60^{o}C for 30 seconds, being 87.5 and 86.0 % reductions for green and blue moulds respectively. Dipping navel orange fruits in hot water plus coating with chitosan showed high protective effects against both green and blue moulds. A remarkable decrease in the incidence of both mould incidence and rotted part tissues was observed when navel orange fruits were dipped in hot water at 60^{o}C for 30 seconds followed by chitosan coating at the concentration of 6.0 g / L , being 88.0 & 86.0 and 90.0 & 88.0 % reduction for both green and blue moulds respectively. Meanwhile, orange fruits dipping in hot water only showed less protective effect against both green and blue moulds.
Key words. Hot water, chitosan , green and blue moulds , navel orange fruits.

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