The commercially promising plant volatile of acetaldehyde in controlling the growth of green mould on Valencia oranges

I Made S. Utama[1], Ronald B. H. Wills[2]

[1]Dept. of Agricultural Engineering, Faculty of Agriculture, Udayana University, Campus Bukit, Jimbaran, Badung, Bali. Telp/fax: +62 361 467 137, Email: made_utama@hotmail.com
[2]School of Environmental and Life Sciences, Faculty of Science and Information Technology, Newcastle University, Ourimbah Campus, NSW-Australia, Email: Ron.Wills@newcastle.edu.au

Key words: Acetaldehyde, green mould, *Penicillium digitatum,* Valencia orange, postharvest disease, decay microorganisms, plant volatile.

ABSTRACT

Acetaldehyde is well known as a natural plant volatile compound which has an important role in sensory quality of fruits and wide array antimicrobial activities. This article reports the important role of exogenously applied acetaldehyde diffuse into the fruit rind of Valencia oranges in inhibition of green mould (*Penicillim digitatum)* growth and its consequent effects on quality of the fruits. The investigation clearly shows that the degree of growth inhibition on the green mould strongly correlated to the concentration of acetaldehyde in the fruit rind. The acetaldehyde in the rind was absorbed from the surrounding atmosphere in the sealed plastic bag in which different amounts of liquid acetaldehyde were vaporized and exposed to the green mould inoculated oranges for 48 hrs. The present of the acetaldehyde in the fruit rind plays an important role in preventing the mould growth. The decrease of the acetaldehyde in rind of the oranges during storage led to the highly increase of the mould growth. Symptom of fruit injury was observed after 7 day storage on the fruit treated with the highest experimental application level of acetaldehyde (36 mmole/bag). This level was equivalent to approximately 1.39 μmole of acetaldehyde per g fruit rind measured after the 48 hr exposure. The lower concentration did not cause any injury and did not affect the total acidity and total soluble solid of the juice and texture of the fruits. This investigation guides for further research for commercially used of this promising plant volatile.