

**Title** Combination of *Kluyveromyces marxianus* and sodium bicarbonate for controlling green mold of citrus fruit

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### Abstract

Biocontrol efficacy of an antagonistic yeast *Kluyveromyces marxianus* was evaluated individually or in combination with sodium bicarbonate (SBC) against green mold of citrus fruit caused by *Penicillium digitatum*. Their effects on postharvest quality of citrus fruit were also investigated. The results indicated that the antagonistic activity of *K. marxianus* at  $1 \times 10^8$  CFU/mL on green mold of citrus fruit was enhanced by 2% SBC treatment. In artificial inoculation trials, disease control after 3 and 6 days, respectively, with the mixture of *K. marxianus* and 2% SBC (18.33%, 58.33%) was significantly improved over that obtained with *K. marxianus* (41.67%, 70.00%) or SBC (43.33%, 81.67%) alone. The combination of *K. marxianus* with SBC was as effective as the imazalil treatment in natural infection trials, which gave about 90% control of green mold. Addition of 2% SBC significantly stimulated the growth of *K. marxianus* in citrus fruit wounds after 72 h. Moreover, *K. marxianus*, SBC and their combination did not impair quality parameters including weight loss, fruit firmness, total soluble solids, titratable acidity and ascorbic acid at 4 °C for 30 days followed by 20 °C for 15 days. These results suggested that the use of SBC is a useful approach to improve the efficacy of *K. marxianus* for the postharvest green mold of citrus fruit.