

Effect of Washing Treatment with Chlorine Dioxide Improves the Marketable Quality of Long-term Stored Sweet Potatoes

Hyunjung Jin¹, Ho Jung Kum¹, Yoon Hee Jung¹, Gyeong-Dan Yu², Wook Kim^{1*}

¹Department of Biosystems and Biotechnology, Korea University, Seoul 02841, KOREA

²Bioenergy Crop Research Institute, National Institute of Crop Science, RDA, Muan 58545, KOREA

[Introduction]

Eastern Asia, which has a apparent seasonal change, accounts for 68.8% of the world's sweet potato production. In most cases, sweet potatoes harvested from late September to mid-October are stored in a proper storage condition (13°C, 83%RH) for winter season and then shipped to markets until the following year. The sweet potato skin consists of a thin cork layer is vulnerable to physical damage, so sweet potatoes are kept for up to six months without removing soil after harvest. Immediately before transport to the market, it is treated with water washing and UV irradiation to improve marketable quality. In this study, we examined whether chlorine dioxide (ClO₂) can be used for surface cleaning and sterilization as pre-treatment for selling of long-term stored sweet potatoes.

[Materials and Methods]

Sweet potatoes 'Pungwonmi' stored for more than 6 months were used in the study. Long-term stored sweet potatoes were washed for 5 min in the solutions of tap water and ClO₂ (20, 40 ppm). In addition, some sweet potatoes washed with tap water were fumigated with ClO₂ gas (20, 40 ppm x 10 min) and compared to other treatment groups. The sterilization effect of sweet potato surface was confirmed by colony forming units (CFU) measurement of remaining solution and peeled sweet potato skins. The weight loss and incidence of fungal infections were investigated in marketable condition.

[Results and Discussions]

The log CFU/mL values in the remaining water after washing the control sweet potatoes was more than 3.12 but no colonies of several fungal species were formed in the remaining ClO₂ solution. Also, the value of the log CFU/mL of fungi associated with sweet potato storage rot such as *Penicillium* sp., *Fusarium* sp. and *Aspergillus* sp. decreased by 0.66-1.65, with no significant difference in weight loss during storage. This suggests the possibility of ClO₂ solution, which can be used as an alternative to the washing treatment with tap water.

[Acknowledgements]

This work was carried out with the support of “Cooperative Research Program for Agriculture Science & Technology Development (Project No. PJ01133203)” Rural Development Administration, Republic of Korea.

*Corresponding author: Tel. +82-2-3290-3046, E-mail. kwook@korea.ac.kr