

**Title** A possible role and mode of action of UV-C illumination on inducing chilling stress tolerance in banana peel

**Author** N. Pongprasert, Y. Sekozawa, S. Sugaya and H. Gemma

**Citation** ISHS Acta Horticulturae 837:313-320. 2009.

**Keyword** UV-C; chilling injury; DPPH radical scavenging activity; oxidative stress

### **Abstract**

In order to better understand the possible role and mode of action of UV-C illumination on inducing chilling stress tolerance, banana [*Musa* (AAA group), Cavendish subgroup cv. 'Cavendish'] fruits were treated with three UV-C durations (10, 15 and 20 sec) and dosages (0.02, 0.03 and 0.05 kJ m<sup>-2</sup>) prior to storage at 5, 8 and 25°C. As results, different temperatures obviously showed difference responses. The chilling injury (CI) symptom was severe at 5°C as compared with 8°C but UV-C treatment reduced CI, corresponding with lower in IC<sub>50</sub> values of 1-diphenyl-2-picrylhydrazyl (DPPH)-radical scavenging activity in treated fruit when stored at 5 and 8°C rather than control. A higher activity of phenylalanine ammonia lyase (PAL) and total free phenolics also found in treated fruits at 5°C while at 8°C with lower level in comparison with control. In addition, UV-C treatment inhibited the increase of malondialdehyde (MDA) content in fruits stored at 25°C while fruits stored at 5 and 8°C showed higher content of MDA compared with control. Ethylene production and respiration rate of fruits stored at 25°C were activated by UV-C. It is possible that UV-C at 0.03 kJ m<sub>2</sub> may be available for alleviating CI symptom occurrence in banana. Also these results imply that UV-C could play a role in activation of plant defense mechanisms and antioxidant systems, assisting in reducing chilling stress. However, the study of associated mechanisms in response to UV-C should be elucidated.