

**Title** Studies on core browning in cucumber fruits during storage and distribution  
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**Citation** Abstracts of 27th International Horticultural Congress & Exhibition (IHC 2006), August 13-19, 2006, COEX (Convention & Exhibition), Seoul, Korea. 494 pages.  
**Keywords** browning; cucumber; storage disorder; peroxidase

#### **Abstract**

The mechanism for the appearance of core browning (CB) in cucumber fruit during storage and distribution was investigated. Fruit were stored at 5°C, 10°C, 20°C and periodically observed and evaluated for core brown occurrence. To elucidate the mechanism of core browning in fruit, changes in polyphenol content and oxidized enzyme activities, such as polyphenol oxidase (PPO), peroxidase (POX), catalase (CAT), and also superoxide dismutase (SOD) and hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) content were determined in core areas including the placenta of cucumber fruit during storage. CB was found only in fruits stored at 10°C for 7 to 15 days. Total phenolic compounds in cucumber core tissues gradually increased during storage in all treatments. PPO activities temporarily increased on day 13 in the fruit tissues at 5 and 10°. POX activity in cucumber fruit stored at 5° and 20°C maintained the initial activity level until the end of storage. On the contrary, POX activity of cucumber fruits stored at 10°C rapidly increased during nine days in storage from which appeared CB and was higher by about six times than the other treatments. By day 15, POX activity was about sixteen times greater than in other treatments. H<sub>2</sub>O<sub>2</sub> content of cucumber fruit stored at 5°C and 10°C were higher than those at 20°C. PAL activity, a key enzyme of phenylpropanoid metabolism, rapidly increased within three days at 10°C and continued to increase until 13 days in storage. The H<sub>2</sub>O<sub>2</sub> content at 10°C continued to increase during five days at 4°C before the appearance of CB, and SOD activities were higher than at 20°C. Using the Wiesner reagent for detecting lignin, dye was very obvious in cucumber maintained at 10°C for 17 days, but little was observed in fruit at 5°C and 20°C. It is suggested that the POX oxidized phenol compound was derived from intermediate lignin synthesis with peroxide made by SOD in the cucumbers stored at 10°C and was involved in the appearance of core browning in cucumber fruit.