

## **Abstract**

At room temperature, broccoli florets turn yellow rapidly after harvest. Ethanol vapor treatment for broccoli delays yellowing in florets. We investigated the effects of ethanol vapor treatment on ultrastructure of sepal parenchyma cells in broccoli florets with a transmission electron microscope. With 0.3 and 3 g of alcohol powder, the changes from chloroplasts to chromoplasts in sepal parenchyma cells was retarded and organelles seemed not to be modified. With 12 g of alcohol powder, cytological and ultrastructural modifications, including false plasmolysis and rupture of the plasma membrane, the vacuolar membrane, and the envelope of organelles, occurred, which caused extensive degradation of broccoli florets. Although the chloroplast envelope was disrupted, the thylakoid membrane, containing chlorophyll, remained to maintain florets green. These ultrastructural observations revealed that the change from chloroplasts to chromoplasts is retarded by appropriate ethanol vapor treatment without any modifications and that excessive ethanol vapor treatment damages the cell structure of broccoli florets and causes their degradation.