

#### Abstract:

Ultrastructural changes of the mesocarp cells at different ripening stages and the physiological and biochemical changes which correlated with fruit softening such as respiration, firmness, membrane permeability, pectinase activity and pectic substance contents of persimmon ("Huoshi" and "Shuishi") fruits were studied, and the relationship between the structure and the physiological metabolism of persimmon (*Diospyros kaki* L.) fruits during ripening and senescence was also discussed. Results provided theoretical bases for improving techniques in persimmon fruit storage. Results also indicated that the postharvested respiration variation of "Huoshi" and "Shuishi" have the characteristics of climacteric fruits. With decreasing fruit firmness, the protopectin content decreased, and the membrane permeability and soluble pectin content increased. The activities of PG and PE increased step-by-step, and then led to fruit softening. However, there are many differences between the two cultivars in terms of physiological metabolism related to fruit softening. Compared with "Shuishi", "Huoshi" softens more slowly. Transmission electron microscopy observations showed a series of ultrastructural changes in the cell wall structure, the subcellular structure and the intercellular structure of mesocarp cells of persimmon fruit. These changes occurred at different ripening stages and different cellular locations. There was an interdependence between ultrastructural changes and physiological metabolism. The difference between the two cultivars in structural changes was evident, and "Huoshi" showed higher resistance to senescence than "Shuishi".