Abstract

Yellow peaches (*Prunus persicu* L. Batsch.) were stored under controlled atmosphere (CA) of 2% O_2 plus 5%CO_2, 5% O_2 plus 10% CO_2, 2% O_2 plus 10% CO_2, 5% O_2 plus 5% CO_2 and regular atmosphere (RA) at 2°C, in order to investigate the effects of storage conditions and time on the structure of single pectin molecule, including water-soluble pectin (WSP), chelator-soluble pectin (CSP) and sodium carbonate-soluble pectin (SSP). The ultra-structural changes of the branches and widths of pectin were studied by atomic force microscopy (AFM) on the initial, the 15th and the 45th day under the assigned atmosphere. The probability of small width pectin increased with time in both groups, but the probability was larger in the RA group. The ultra-structure of WSP and SSP molecules and polymers showed that the aggregate separation increased with storage time. The degradation of WSP and SSP molecules were inhibited by controlled atmosphere storage. A majority of the chains for WSP were composed of four basic units with widths of 11.719 nm, 15.625 nm, 19.531 nm and 35.156 nm, which could be visualized and calculated exactly by AFM. For SSP, the values were 11.719 nm, 15.625 nm, 19.531 nm and 17.578 nm, only different were 17.578 nm in SSP and 35.156 nm in WSP. The AFM images can vies the process of CSP dissolved from the solutions directly. These results indicate that parallel linkage or intertwists between the basic units are fundamental for WSP and SSP molecules.