

ABSTRACT

The cuticle layer is very important for maintaining the quality of tomatoes. It maintains water content and protects the fruit from biotic and abiotic stresses. If the cuticle layer is cracked, either macroscopically (Real Cracking; RC) or microscopically (Micro-cracking; MC) the fruit becomes easier to damage. MC fruits are more difficult to be detected and this is a problem in tomato fruit production. Fruit size is one of the factors that influence MC. The size is affected by the position of the fruit on the same truss. This study was conducted to determine the MC severity at various fruit positions on the same truss and the effect of MC severity on its post-harvest quality. In addition, this study was also conducted to determine how deep MC can occur on the fruit skin. The tomato fruits used in this study were cherry tomato cultivars Chica (C) and Mini Carol (M). Various positions of fruit from proximal to distal positions of a truss were measured for weight, size, and MC severity as an index (MCI). Afterward, the fruits were stored in a room with a controlled environment (Temperature 20°C; RH 40%) and analyzed periodically for Water Loss (WL; 0, 2, 4, and 6 days of storage) and Firmness (F; 0, 3, and 6 days of storage). Furthermore, fruits with MCI 3 and/or 4 were randomly sampled for MC depth analysis using a Scanning Electron Microscope (SEM). The position of the fruit on the truss affected the size. The C formed a descending pattern up to the middle position and slowly increased until the final position, while the M formed a pattern of considerably larger size in the initial three fruits and then smaller in the next position with almost the same size. Meanwhile, MC severity was affected by fruit size with a negative correlation, which means that MC severity was also indirectly affected by fruit position. Furthermore, the depth of MC in both cultivars can be observed to penetrate the epidermal cell layer although the condition in the next layer is unclear. In addition, the MC characteristics of each cultivar were different and affected the F value, while not affecting the WL value, whereas the F value of C was higher than M under the same MC severity level. The WL value is directly comparable to the MC severity of both cultivars, as well as the loss of F value in C.

Keywords: Firmness, fruit position, micro-cracking, tomato, water loss