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INHERITANCE OF SOME FRUIT CHARACTERISTICS AFFECTING SHELF LIFE OF TOMATO FRUITS BY

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ABSTRACT

Crosses were made between cultivars Edkawi, Super Marmand, Beef Steak, Yellow Pear, and line CAL 951/88, which belong to *Lycopersicon esculentum*, and line LA 722, which belongs to *L. pimpinellifolium*, to study the inheritance of fruit characteristics which may have direct and/or indirect effects on fruit shelf life. Such characters were recorded for the individual plants of the different populations of parents, F₁, and F₂. Fruit firmness, physiological weight loss, decay loss, thickness of fruit pericarp-outer wall, and diameter of fruit proximal end, were found to be inherited quantitatively. Partial dominance was observed for high fruit firmness, low percentage of decay loss, thin fruit pericarp-outer wall, and small diameter of fruit proximal end. There was an indication for the presence of maternal effect on the inheritance of physiological weight loss, decay loss, and thickness of fruit pericarp-outer wall. The broad sense heritability estimates for fruit firmness, measured directly after harvesting, ranged from low (34.27%) to above intermediate (70.58%), and that calculated for fruit firmness, after storing period at room temperature (28.5±1.3°C), ranged from below intermediate (44.23%) to relatively high (91.99%), in the different crosses. Relatively high estimates of broad sense heritability for physiological weight loss, and intermediate estimates for decay loss were calculated in the different crosses. Transgressive segregations for low percentage of fruits decay-loss in the cross Yellow Pear x Edkawi were reported. Significant negative correlations were observed between fruit firmness and each of physiological weight loss and decay loss percentages. Thickness of fruit pericarp outer-wall was positively correlated with fruit firmness and average fruit weight, but it was negatively correlated with percentages of physiological weight loss and decay loss. Significant positive correlation was observed between fruit calcium content and fruit firmness whether it was directly measured after harvesting ($r=0.82$) or after two weeks of storing at room temperature ($r=0.59$) in the cross CAL 951/88 x Yellow Pear. Significant negative correlation was found in the same cross between fruit calcium content and each of physiological weight loss ($r=-0.67$) and decay loss ($r=-0.54$) percentages, which indicated the importance of fruit calcium content in the shelf life of tomato fruits.