

## ABSTRACT

**YASSER SAMIR GAMIL ABD ELAZIZ: Studies on Sex compatibility and Fruit Set of Some Plum Cultivars. Unpublished M. Sc. thesis, Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2005.**

This investigation was carried out during 2001, 2002 and 2003 seasons on three-plum *Prunus saliciana* cultivars (Santa-Rosa, Durado and Eldorado) in order to determine the degree of self-and cross-compatibility or incompatibility between these cultivars and find out the most proper pollinizer for each cultivar by comparing the pollen tube growth (after intraspecific hybridization), fertilization process, embryo sac development and the fruit set obtained by means of self-and cross pollination. Pollen tube growth was examined by using the fluorescence microscopy and the percentage of fruit set in the orchard was recorded.

The results confirmed that Eldorado and Durado cvs are self-incompatible while, Santa-Rosa cv is considered partially self-compatible. Durado cv when pollinated by either Santa-Rosa or Eldorado showed varying degrees of cross-compatibility. No cross-compatibility was found in the other cross-combinations. Therefore, the good fruiting percentages (>5%) of Durado X Santa-Rosa, Durado X Eldorado and Santa-Rosa (selfing) combinations could be taken as a reflection for the high degree of sex compatibility between these combinations. The reverse was true, low fruiting percentage (<5%) was achieved by other cross-combinations.

Moreover, histological studies indicated that embryo with suspensor was formed in the embryo sac of compatible crosses 10 days after pollination. The reverse was true, since the embryo sac of self incompatible as well as incompatible crosses remained as primary form and cell division was not observed. Therefore,

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premature abscised fruits result from self and cross incompatible combinations had degenerate ovule.

In addition, data indicated that no metaxenic effect on both fruit and stone weight in the pollinated plum fruits as well as T.S.S in fruit juice was observed. However, pollen grains from different cultivars had various effects on the shape of plum fruits. In addition, The pollen source had significant effect on acidity and sugar/acid ratio.

**Key words:** *Prunus saliciana, compatibility, incompatibility, pollen tube growth, intraspecific hybridization, fertilization process, embryo sac development, fruit set, ovule, metaxenia*

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