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Poster Abstract - C.50

MEIOTIC ABNORMALITIES IN PMCS OF DIFFERENT *CITRUS* POPULATIONS

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A cytogenetic study undertaken to determine the mechanisms responsible for reduced fertility in some *Citrus* selections revealed the presence of several meiotic abnormalities in microsporogenesis of genotypes characterized by a different genetic basis. In particular, cytomixis (i.e., chromatin migration between adjacent meiocytes through cytoplasmic channels) was found to occur in pollen mother cells (PMCs) of diploid selections and hybrids and in two tetraploid genotypes obtained by symmetrically interspecific somatic hybridization. Single and double chromatin bridges between two or more adjacent meiocytes were mainly observed at prophase I, but also in the subsequent phases of first division and in the second meiotic division, in the latter case at a low frequency. The percentage of cytomictic microsporocytes varied from 3% in metaphase I to 17.7% in early prophase I in the diploid populations, and to 20% in diakinesis in one of the two tetraploid somatic hybrids. Moreover, in both somatic hybrids several microsporocytes were totally empty as a result of complete chromatin migration either into another meiocyte or occasionally outside the cell. Such meiocytes are very likely to get lost during meiotic division. No evidence of cytomixis was found in the control plant.

In addition to cytomixis, still other meiotic abnormalities were observed in *Citrus* PMCs, in both the first and second meiotic divisions. The most common of such abnormalities were those related to irregular chromosome segregation. Cells with a polyploid chromosome number were also observed as a result of endoreduplication which can lead to the formation of 2n and/or 4n gametes.

The occurrence of cytomixis and other meiotic abnormalities was analyzed in comparison with pollen viability. The plants characterized by a great number of cytomictic microsporocytes showed lower values of pollen viability compared to the plants with little or no trace of cytomixis and to the control. A possible relationship between the occurrence of cytomixis and other meiotic abnormalities, and reduced fertility in the *Citrus* populations is discussed.