

Physical location of the carotenoid biosynthesis genes *Psy* and β -*Lcy* in *Capsicum annuum* (Solanaceae) using heterologous probes from *Citrus sinensis* (Rutaceae)

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ABSTRACT. Carotenoids are responsible for a range of fruit colors in different hot pepper (*Capsicum*) varieties, from white to deep red. Color traits are genetically determined by three loci, *Y*, *C1*, and *C2*, which are associated with carotenogenic genes. Although such genes have been localized on genetic maps of *Capsicum* and anchored in *Lycopersicon* and *Solanum*, physical mapping in *Capsicum* has been restricted to only a few clusters of some multiple copy genes. Heterologous probes from single copy genes have been rarely used. Fluorescent *in situ* hybridization was performed in *Capsicum annuum* varieties with different fruit colors, using heterologous probes of *Psy* and β -*Lcy* genes obtained from a BAC library of the sweet orange (*Citrus sinensis*). The probes hybridized in the terminal portion of a chromosome pair, confirming the location of these genes in

previous genetic maps. The hybridized segments showed variation in size in both chromosomes.

Key words: Bacterial artificial chromosomes; *In situ* hybridization; Chromosome variation; Pepper