

## Abstract

The sensory quality of fruit, including melon, has become a major criterion in making the purchasing decision by consumers. Breeding programs have mainly been directed, from the post-harvest stand point, towards improving shelf-life.

Traditional Charentais melons have a typical climacteric behavior with ethylene playing a major role in the regulation of the ripening process. The generation of recombinant inbred lines by crossing a typical Cantaloupe Charentais melon (cv Vedrantaïs) with a non climacteric melon (PI161375 of the *Agrestis chinensis* group) allowed to demonstrate that the climacteric character is conferred by 2 duplicated loci only (Perin et al., Plant Physiol. 2002, 129:300 ) which are of great importance for the regulation of storability and sensory quality.

Commercial varieties of Charentais melon with long or mid shelf-life have been generated using a non-ripening Charentais genotype (Vauclusien). The introduction of the long shelf-life character resulted in undesirable loss of aroma volatiles . production (Aubert et al., J. Agric. Food Chem. 2004, 52:4522). The inhibition of ethylene synthesis by knocking-down ACC oxidase gene expression has been achieved in Charentais melon (Ayub et al., Nature Biotechnol. 1996, 14:862). It results in a strong inhibition of the synthesis of aroma volatiles (Bauchot et al., J. Agric. Food Chem. 1998, 46:4787) while the accumulation of sugars is not affected or is even improved . The softening of the flesh is strongly affected but not abolished (Flores et al., Physiol. Plant. 113:128). It was also demonstrated that ethylene inhibited fruit exhibited better resistance to chilling injury (Ben Amor et al., Plant Cell and Environment, 1999, 22:1579).

Due to the importance of aroma volatiles in sensory quality and to the strong negative correlation between aroma production and ethylene synthesis, we have developed a research program aimed at isolating genes involved in the synthesis of aroma volatiles (Yahyaoui et al., Eur. J. Biochem. 2002, 269:2359). We will report on the recent advances in the field with special emphasis on the characterization of a family of genes responsible for the synthesis of esters, compounds that are essential for the flavor of Cantaloupe melons.