

World Congress on *Biotechnology*

Biochemistry and molecular biology of alphonso mango flavor

Ram Kulkarni, Hemangi Chidley, Keshav Pujari*, Axel Schmidt#, Jonathan Gershenzon#, Ashok Giri and Vidya Gupta

National Chemical Laboratory, India

*Dr. Balasaheb Savant Konkan Krishi Vidyapeeth, India

#Max Planck Institute of Chemical Ecology, Germany

Alphonso, one of the most popular cultivars of mango in India is known to exhibit geographic variation in the flavor of ripe fruits. To get chemical insight into this difference, volatiles were studied in the ripening fruits of Alphonso mangoes from three cultivation locations in India by GC-MS. Ripe fruits from Deogad had lower content of mono- and sesquiterpenes and higher content of lactones and furanones as compared to the fruits from Dapoli; whereas fruits from Vengurle had average quantities of these chemicals in comparison with Deogad and Dapoli fruits. Since the plants chosen were clonally propagated, such variation can be attributed to the variable abiotic conditions in these regions which might exert their effect during fruit development. Biosynthesis of the flavorants was studied with respect to the genes encoding geranyl pyrophosphate synthase (MiGPPS) and farnesyl pyrophosphate synthase (MiFPPS) involved

in terpene biosynthesis and an enone oxidoreductase (MiEO) involved in furanone biosynthesis. Full-length coding sequences of these genes were isolated from ripe fruits of Alphonso mango by homology-based approach and were expressed in *E. coli* as (his)₆-tagged recombinant proteins. MiGPPS1 and MiGPPS2 were found to possess GPP forming activity with traces of FPP formed; MiFPPS clearly exhibited FPP synthase activity as well as MiEO showed furaneol forming activity in *in vitro* assays supporting their role in the mango flavor biogenesis. Expression profiling of these genes in the ripening fruits of Alphonso showed the highest expression in the fruits of 10 days after harvest (DAH). This can be hypothesized as a preparative expression for the next completely ripe stage (15DAH) which shows the highest amount volatiles.