Title Characterization of the volatile profile in fruits of the aromatic mandarin hybrid Ortanique

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Abstract

The aroma is an important quality parameter of citrus fruit. Therefore, many studies have focused on the quantitative and qualitative composition of essential oils in the peel of citrus fruits. The main components of essential oils in fruits of most Citrus species are the terpenoids which consisted of a complex mixture of mono- and sesquiterpenes and their derivatives. Ortanique is a mandarin hybrid (mandarin *Citrus reticulate* × sweet orange *Citrus sinensis*) which is characterized by its intense aroma compared with fruits of other mandarins. In this study we have investigated the evolution of the content and the emission of the main volatile compounds in Ortanique fruit during ripening. Furthermore, the aromatic profile of the Ortanique flowers at anthesis was also analyzed. The identification and quantification of the volatiles contained in the peel and emitted by freshly harvested Ortanique fruits and flowers were performed by gas-chromatography-mass spectrometry. The content and emission of volatile compounds of Ortanique fruits was studied at three ripening stages: breaker, colored and full-colored. Totally, 30 and 34 volatiles compounds were identified in peel extracts and in the head-space of Ortanique fruits, respectively, and only 18 were emitted by flowers. In flowers, the main volatiles emitted were linalool (39%) and b-myrcene (37%), followed by ocimene (9%), methyl anthranilate (5%) and nerolidol (1.6%). In fruits, limonene (96-84%) was the mian terpenoid in both the oil glands and the volatile fraction. However, important differences in other terpenoids were observed between the composition in the peel and the emission by intact fruits. In peel extracts, the monoterpenes beta-myrcene (1.7%) alfa-pinene (0.4%), and linalool (0.15%), and the sesquiterpenes alfa-sinensal (0.12%) and valencene (0.08%) were the most abundant, while the main volatiles emitted by freshly harvested fruits were the monoterpenes sabinene by freshly harvested fruits were the monoterpenes sabinene (0.25%), beta-myrcene (1.34%) and ocimene (0.29-0.06%), and the sesquiterpenes valencene (11%), trans-caryophyllene (2.56%), alfa-panasinsene (0.55%) and alfa-selinene (0.53%), aromadendrene (0.21%) and alfa-copaene (0.12%). Interestingly, fully mature Ortanique fruits emitted hexil hexanoate, and aliphatic ester, which was not detected in the peel extracts. Differences in the content and emission of mono and sesquiterpenes during ripening of Ortanque fruits will be presented and discussed.