DYNAMICS OF THE AROMATIC PROFILE DURING THE MATURATION OF THE BLOOD ORANGE ‘TAROCCO IPPOLITO’

ivia Institut Valencià d’Investigacions Agràries

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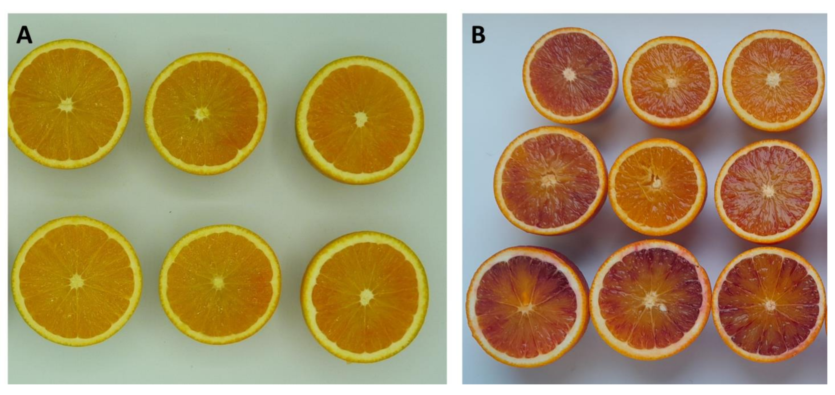
INTRODUCTION

The blood orange ‘Tarocco Ippolito’ has gained popularity in recent years due to the intense red coloration of its flesh and its highly appreciated organoleptic properties. Several studies have shown that flavor is the main reason why consumers choose blood oranges, with aroma being a fundamental component in the overall perception of flavor.

The **aim** of this study was to characterize the volatile compound profile of the ‘Tarocco Ippolito’ variety and to analyze its evolution from the onset of anthocyanin accumulation in the flesh to the maturity stage corresponding to commercial harvest.

MATERIAL AND METHODS



09/12/2023
ONSET ANTHOCYANIN ACCUMULATION

15/01/2024
COMERCIAL HARVEST

VOLATILE COMPOUNDS PROFILE (SPME + GC-MS)

RESULTS

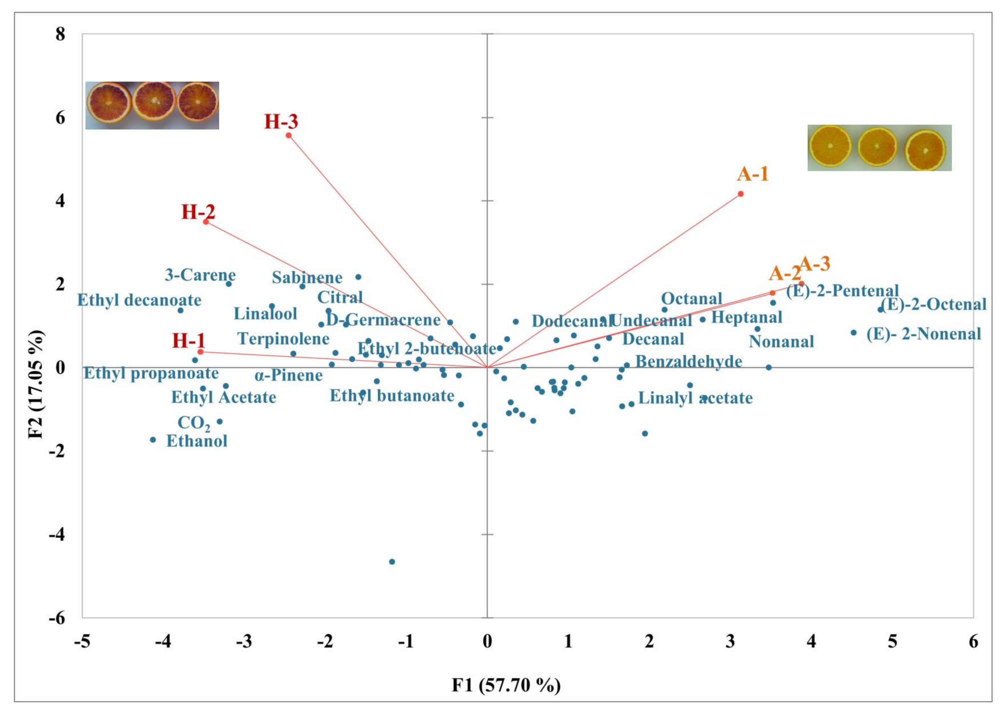


Figure 1. Principal Components Analysis based on normalized peak areas.
A-Anthocyanin accumualtion onset, H-commercial harvest

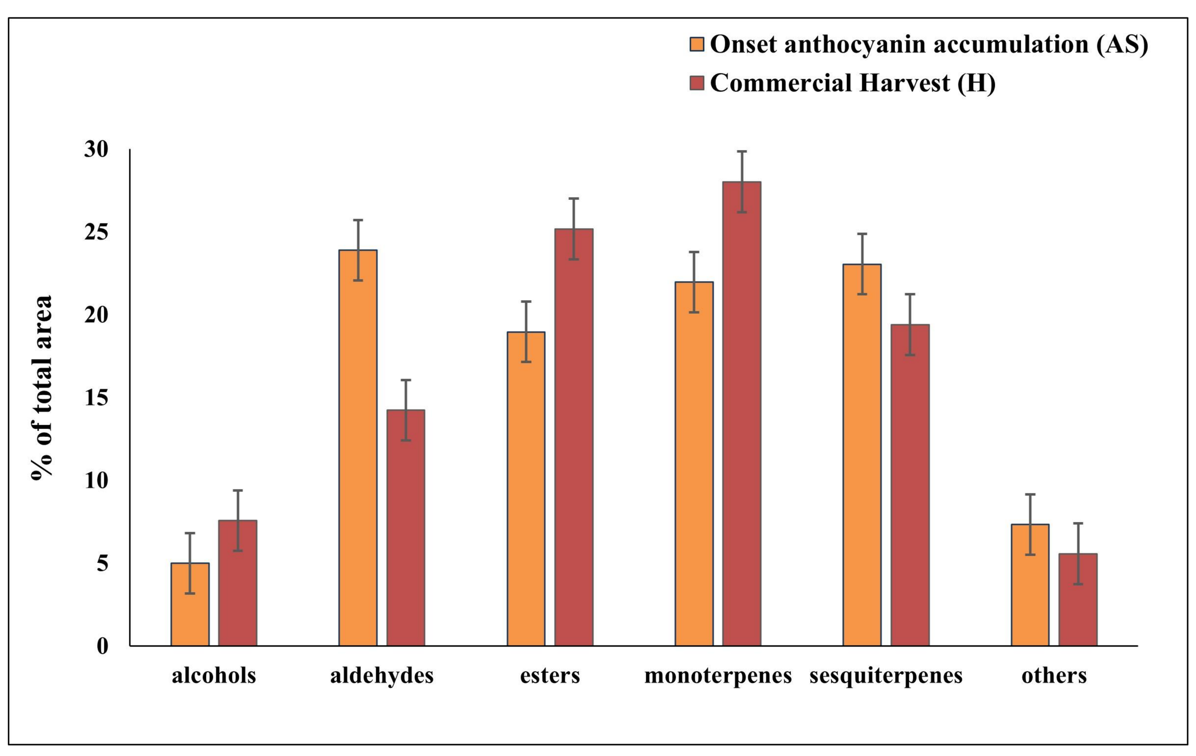


Figure 2. Percentages of each family of volatile compounds.

The volatile profile of samples at the onset of anthocyanin accumulation was characterized by high levels of aldehydes, while samples at commercial maturity stage were associated with elevated levels of terpenes and esters, with the compounds CO_2 and ethanol also present (Figure 1 and 2).

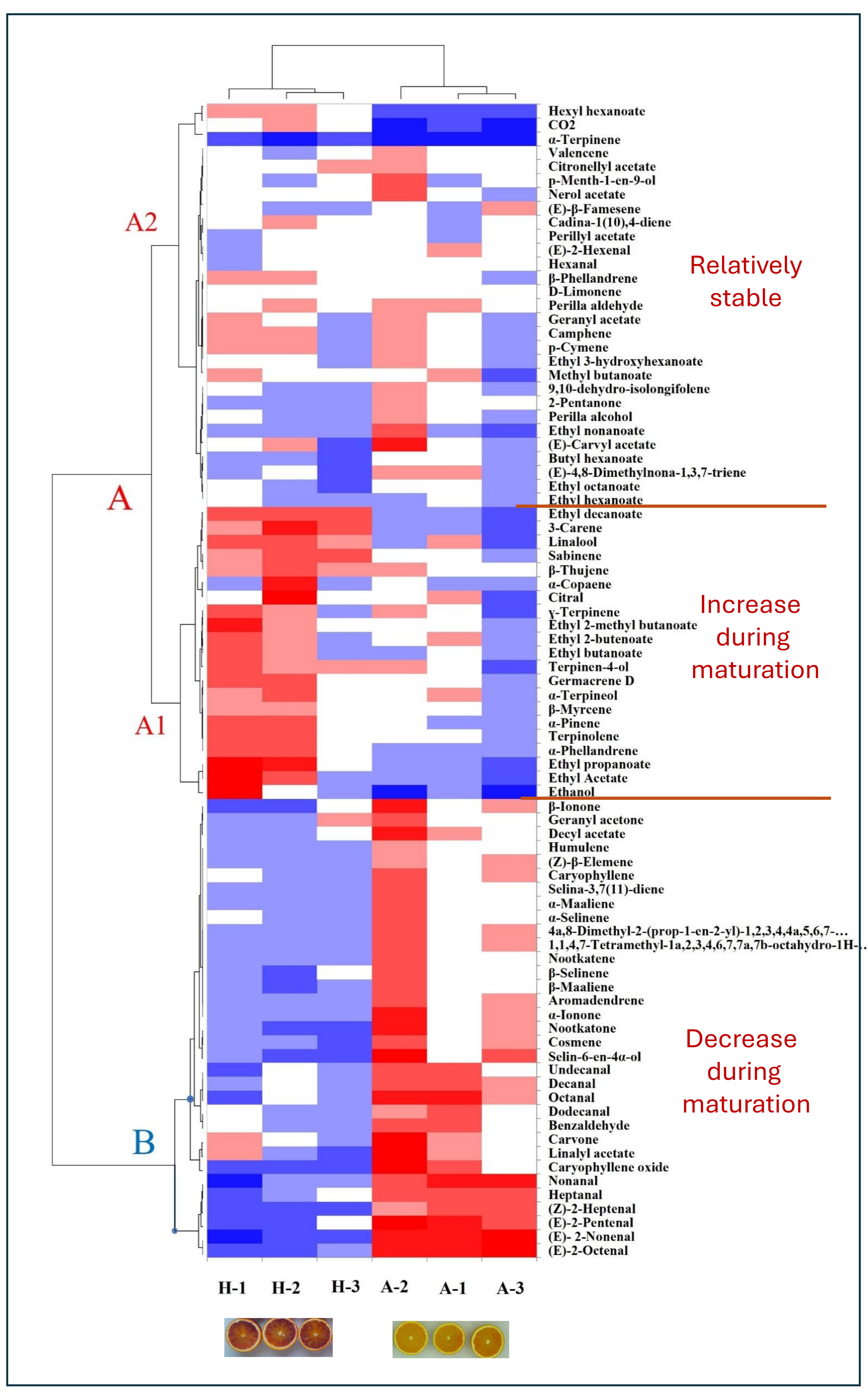


Figure 3. Heat map performed with normalized peak areas

The heat map (Figure 3) revealed three distinct patterns of volatile compound evolution during this period. Aldehydes were the main group of compounds that decreased during the last phases of ripening, what contributes to the decrease in aromatic notes associated with unripe fruit. A significant number of volatile compounds remained stable throughout the ripening including key citrus odor compounds such as valencene and D-limonene. Of the compounds that increased throughout maturation, monoterpenes and esters were predominant, which may contribute to the characteristic aroma of this variety.

CONCLUSION

A total of 81 VOCs were identified in blood oranges ‘Tarocco Ippolito’. Our findings reveal dynamic changes in the volatile composition during the final stages of maturation, from the onset of anthocyanin accumulation in the flesh to full ripeness at commercial harvest. Three patterns of evolution of volatile compounds were identified. Monoterpenes and esters were observed to play a key role in defining the characteristic aroma of these oranges, with their concentrations increasing during maturation.

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