

Life ZERO RESIDUES:

Influence of the ripening degree on the odour composition of Early Bigi cherries: study of their aroma potential as ingredient for the juice industry

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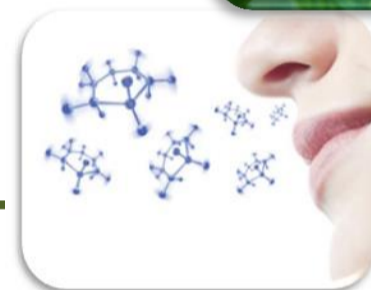
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Introduction

Among pre-harvest parameters, the ripening state is a major factor determining the final aroma quality of the harvested fruit. Little works have addressed the analysis of aromatic compounds in cherry cultivars, which means that the number and nature of the odorants responsible for their aroma is not fully understood yet. Studies carried out on cherry cultivars cultivated in Spain have mainly focused on the physico-chemical and sensory characterization of the fruits, but not on their aroma

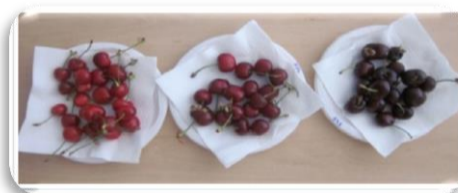
Objectives

1. Monitoring how the odour of cherries is influenced by the ripening stage, in order to check the eventual aromatic potential of cherries discarded for the fresh fruit market which are destined to juices
2. Early Bigi cultivar as a case study due to the commercial importance in Aragon



Materials and Methods

The volatile compounds of Early bigi cherries from three ripening states were extracted by SPME and analyzed by gas-chromatography-olfactometry. Juice from cherries of the low and high ripening degrees was elaborated by pre-centrifugation before clarification and fining and submitted to descriptive sensory analysis by a panel of trained tasters.



Results

LRI	Rt	Aroma Descriptor	Compound	Low	Medium	High
956	7.34	Sweet-fruity	Ethyl propanoate	41	nd	nd
987	8.08	Cream	2,3-butanedione	33	nd	nd
1018	9.07	Grass	ni	27	nd	nd
1031	9.32	Synthetic	ni	43	51	94
1049	10.06	Strawberry	Ethyl butyrate	24	nd	nd
1074	11.15	Pineapple	Ethyl isovalerate	41	nd	nd
1097	11.47	Grass	Hexanal	64	100	94
1117	12.30	Synthetic	2-methylpropanol	41	43	27
1152	13.52	Grass	Z-3-hexenal	30	47	91
1156	14.07	Grass	Z-3-hexenol	75	61	58
1233	16.43	Grass	E-2-hexenal	30	85	67
1255	17.32	Fish	Z-4-heptenal	33	33	30
1317	19.28	Mushroom	1-octen-3-ona	nd	75	85
1393	21.52	Geranium	Z-1,5-octadien-3-one	27	82	91
1430	23.21	Grass	ni	nd	33	67
1518	26.17	Bitter almond	Benzaldehyde	32	37	41
1674	28.08	Cucumber	E-2,Z-6-nonadienal	nd	nd	25
1763	31.15	Grass	ni	nd	nd	25

Cherry volatile profile is deeply influenced by the maturity degree, in terms of both the number and the chemical nature of odour volatiles.

As a general rule, low ripening degrees imply the presence of low volatile compounds (mainly ethyl esters) whose concentration decreases as maturity stage advances.

Sensory data evidences the correlation between the “green/grass” note and the perception of the “characteristic cherry aroma”.

Aldehydes exhibiting “green-like” odours (hexanal, Z-3-hexenal and E-2-hexenal) are much clearly perceived in the high ripen cherries. This could be explained by the complex balance established among the molecules implied in the aroma

Conclusions

- The olfactometric profile of Early Bigi cherry is mainly conformed by chemical compounds from the aldehydes family evoking “green” and “grass” odours.
- The different volatile profiles present in the juice are clearly expressed on the sensory properties of the juice. The olfactometric monitoring allows, therefore, estimating the aromatic potential of the fruit and its sensory implication.
- Knowledge of the specific aromatic potential of cherries discarded to be commercialized as a fresh product is valuable information for manufacturers. Correlation studies between GC-O and sensory data can be a useful technique to predict the aroma properties of novel juice formulations prior to be launched to the market.