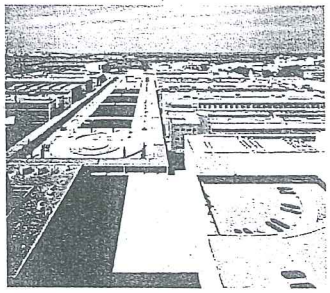
COST 927 Action

Thermally processed foods: possible health implications

Analytical and chemical aspects related to thermally processed foods

Abstract Book



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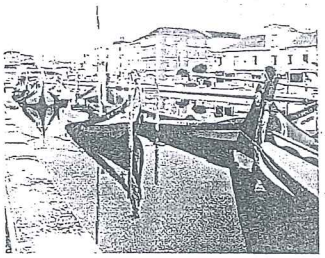

Effect of candying on volatiles and cell wall polysaccharides of "Ameixa d'Elvas" plums

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Plums (*Prunus domestica* L.) of a special type of 'Green Gage' variety, "Rainha Cláudia Verde", from Alto Alentejo (South-East of Portugal) can be utilised to obtain a traditional candied plum, "Ameixa d'Elvas" (Fig. 1). This product has a Protected Designation of Origin (PDO) recognized by the European Union. The candying process consists in boiling the intact plums in water for 15 min and then put them in sucrose syrup, which is successively concentrated until 75 ºBrix (75 g of sucrose per 100 g of solution). The plums can be consumed with this syrup or, alternatively, can be stored in the syrup until being washed and packed in a solid state.

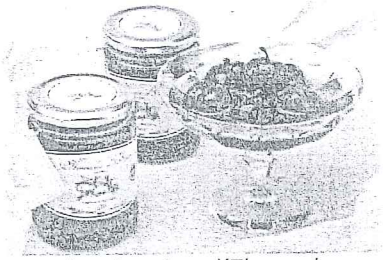
Fig. 1 – Ameixa d'Elvas plums

The volatile composition of "Ameixa d´Elvas" candied plums includes compounds from 10 chemical groups: acids, esters, furans, aldehydes, alcohols, phenols, ketones, terpenoids, lactones, and alkanes. Nineteen compounds were identified as having a potential individual contribution to the aroma, since the concentration found in the plum pulp is higher than the sensory perception limit for the compound. From these 19 compounds, 11 compounds were detected in "Ameixa d'Elvas" plums headspace: ethyl octanoate, nonanal, 2-methoxy-4-(2-propenyl)phenol, 2-phenylethylacetate, linalool, ethyl benzoate, benzaldehyde, 2-heptenal, hexadecanoic acid, 3-methyl butanoic acid, and β-citronellol. Therefore, these are the would-be impact odourants of "Ameixa d'Elvas", which are associated with sweet, cooked, and fruity odours. This volatile composition reflects the complexity of the reactions and rearrangements that happen during the fruit ripening plus those occurring due to the thermal processing in presence of sucrose. All would-be impact odourants of "Ameixa d'Elvas" fruits, except 2-heptenal, were also detected in the sucrose syrup headspace where the fruits have been submersed. These indicate the occurrence of transference of volatile components from the processed fruits to the syrup during storage, revealing that syrup contribute to the aroma of candied fruits [1].

Plum cell wall polysaccharides are composed mainly by pectic polysaccharides and cellulose. During the boiling step of the processing to "Ameixa d'Elvas" these polymers are degraded and solubilised, which is related with the decrease of cell wall adhesion and loss of firmness of the fruit tissues. However, surprisingly, candied plums showed recovery of the microstructure and texture properties. This recovery might be related to pectic polysaccharides, since they are highly esterified and their gelification inside the fruits in the presence of sucrose seems to be the reason for the recovery of the fruits consistency upon candying. Analysis of the syrup showed also the presence of highly methylesterified pectic polysaccharides, which confirms the diffusion of the cell wall polysaccharides from the fruits to the sucrose syrup during candying [2]. The presence of these pectic polysaccharides increases the syrup viscosity, which explains the retention of the fruit volatile compounds that contribute to its aroma.

[1] Nunes, C.; Rocha, S.M.; Saraiva, J.; Coimbra, M.A. *Food Chemistry*, 111 (2008), 897-905.
[2] Nunes, C.; Saraiva, J.A.; Coimbra, M.A. *Food Chemistry*, 111 (2008), 538-548.

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