# Influence of the kind of wood (chestnut and Limousin oak) in the extractives and Klason lignin contents of wood fragments used in the ageing of wine brandies.

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## Abstract

Traditionally, the ageing of brandy involves the storage in wooden barrels, during which the brandy acquires the desired chemical characteristics and organoleptic properties (colour, aroma and flavour) due to the contact with the wood (Canas et al., 1999; Caldeira et al. 2002, Caldeira et al., 2006, Caldeira et al., 2010), which deliver on increased overall quality of the final drink (Caldeira et al., 2006).
Concerning the botanical species used for the ageing of brandies, the scientific research has been focused on species like *Quercus robur* L. and *Quercus sessiliflora* Salisb. from France and *Quercus alba* L. from the USA, while other species of oak and chestnut have been less studied. Recent works (Canas et al. 1999; Canas et al., 2000; Caldeira et al., 2002) revealed the suitability of chestnut (*Castanea sativa* Mill.) and Portuguese oak (*Quercus pyrenaica* Willd.) for this purpose.
Ageing systems of wine brandies have been a target of deep investigation in order to reduce the costs and the ageing period associated with them. In this study it were evaluated the extractives and Klason lignin contents of wood fragments used in the ageing of brandies in stainless steel tanks. It were used two types of fragments (staves and tablets), and two botanical species (Limousin oak and Portuguese chestnut), with the same toasting level. The wood extractive and Klason lignin contents were analysed before and 30 months after the ageing process
The results showed that chestnut had significantly influenced the extractives and Klason and total lignin contents of the aged brandies. The tablets had a highly significant effect on the extractives and Klason lignin contents, while the staves had more influence on the soluble lignin content.

**Key words:** Portuguese chestnut, Limousin oak, wood extractive, lignin contents

Canas, S., Leandro, M. C., Spranger, M. I., Belchior, A. P. (1999). Low molecular weight organic compounds of chestnut wood (*Castanea sativa* L.) and corresponding aged brandies. J. Agric. Food Chem., 47: 5023-5030.
Canas, S., Leandro, M. C., Spranger, M. I., Belchior, A. P., (2000). Influence of botanical species and geographical origin on the content of low molecular weight phenolic compounds of woods used in Portuguese cooperage. *Holzforschung*, 54, 255-261.
Caldeira, I., Belchior, A. P., Clímaco, M. C., & Bruno-de-Sousa, R. (2002). Aroma profile of Portuguese brandies aged in Chestnut and Oak woods. Anal. Chim. Acta, 458: 33-62.
Caldeira, I., Mateus, A. M., & Belchior, A. P. (2006). Flavour and odour profile modifications during the first five years of Lourinhã brandy maturation on different wooden barrels. Anal. Chim. Acta, 563: 264-273.
Caldeira, I., Anjos, O., Portal, V., Belchior, A. P., & Canas, S. (2010). Sensory and chemical modifications of wine-brandy aged with chestnut and oak wood fragments in comparison to wooden barrels. Anal. Chim. Acta, 660: 43–52.