**Technical Specifications**

**Geographical indication to be registered – ‘Aguardente de Vinho Lourinhã’**

Language in which the application is submitted: Portuguese (PT)

1. **Name of geographical indication to be registered**

‘Aguardente de Vinho Lourinhã’

1. **Category of the spirit drink**

Wine spirit

1. **Applicant**

Instituto da Vinha e do Vinho, I.P.

Rua Mouzinho da Silveira, 5

1250-165 Lisbon – PORTUGAL

Public Institution – independent administratively and financially

1. **National and EU Protection**

Primary Protection in Portugal: Decree-Law No 8/1985 of 4 June 1985

Primary Protection in the European Union: Regulation (EEC) No 1576/1989 of 29 May 1989

1. **Description of the spirit drink**

**Physical, chemical and/or organoleptic characteristics**

The designation of origin ‘Aguardente de Vinho Lourinhã’ may only be used for wine spirits distilled from wines made from grapes produced in the Lourinhã demarcated region, produced and aged there and conforming to the physical, chemical and organoleptic characteristics laid down in the legislation applicable to the region.

**Physical and chemical characteristics**

‘Aguardente de Vinho Lourinhã’ must have a minimum alcoholic strength by volume of 38% vol., and possess the chemical and organoleptic characteristics defined in the legislation and internal rules of the certifying body.

Wines intended for the production of ‘Aguardente de Vinho Lourinhã’ must be distilled within the region and, depending on the distillation method used, the distillate, before ageing, must have a maximum alcoholic strength by volume of 78% vol. when obtained by continuous column distillation, or a maximum alcoholic strength by volume of 72% vol. when obtained by discontinuous distillation.

Quantitative descriptive analysis of wine spirits is done using a scale in which the following figures are used in describing colour, aroma and taste: 0 (zero) for none, 1 for very weak, 2 for weak, 3 for medium, 4 for strong and 5 for very strong.

‘Aguardente de Vinho Lourinhã’ is available in the following colours: citrine, straw-coloured, golden, topaz and greenish (sometimes in association with golden and/or topaz).

**Organoleptic characteristics:**

The minimum requirement in terms of the aroma of ‘Aguardente de Vinho Lourinhã’ is that it should be free of any defect. The descriptors which may be used are as follows: alcohol, fruity, vanilla, woody, rancidity (in a positive sense), spicy, caramel, burned/roasted, dried fruit, smoke/ash, coffee, mellow, others.

The minimum requirement for the taste of ‘Aguardente de Vinho Lourinhã’ is that it should be free of any defect. The following descriptors may be applied to ‘Aguardente de Vinho Lourinhã’: sweet, smooth, piquant, astringency, roughness, bitter, body, unctuousness, evolution, complexity, in-mouth aroma, persistence, others.

The use of the descriptive assessment serves as support for the final grading on a scale from 1 to 20 as regards aroma and taste, and the general assessment should reflect the average of both: the analysis sample must reach a minimum overall assessment of 13 points, while a minimum of 50% of the characteristics required by the Chamber must also have been awarded an equal or higher mark.

Several published studies show that the sensory descriptors most closely associated with the overall quality of ‘Aguardente de Vinho Lourinhã’ are: roasted, woody, vanilla, in-mouth aroma, body, complexity, persistence, spices, nuts and smoke, and those which have a negative association with quality are stalks, herbal and rubber. Some of the compounds with most effect on the aroma of ‘Aguardente de Vinho Lourinhã’ are also identified.

**Specific characteristics** (in comparison with spirit drinks in the same category)

‘Aguardente de Vinho Lourinhã’, when evaluated in comparison with other wine spirits which have been aged, reveals a considerable wealth of phenol compounds and high antioxidant activity, influenced mainly by the type of wood used and the extent of charring of the cask.

Total polyphenols and antioxidant activity values for ‘Aguardente de Vinho Lourinhã’ aged four years:

• Rate of total polyphenols: 0.63 - 9.34 mg of gallic acid/litre

• Antioxidant activity: 45.7 - 93.5% DPPH inhibition

• Relative correlation: r = 0.9573.

(Source: Canas S., Casanova V., Belchior A. P., 2008 “Antioxidant activity and phenolic content of Portuguese wine aged brandies", in the Journal of Food Composition and Analysis, 21, 626-633)

In sensory terms, ‘Aguardente de Vinho Lourinhã’ is characterised by various descriptors closely associated with ageing in wood, such as vanilla, wood, rancidity (in a positive sense), spices, nuts, toasting, smoke, body, smoothness, sweetness, persistence, unctuousness and complexity.

The intensity of these descriptors is considerably affected by the conditions under which ageing takes place (type of wood, extent of cask charring, cask dimension and ageing time).

Compared with other spirits, there are considerable differences as regards the wood and spice descriptors, which were more intense in ‘Aguardente de Vinho Lourinhã’, and the caramel, sweetness and smoothness descriptors, which were at lower levels in ‘Aguardente Vínica da Lourinhã’.

Type of oenological practice: **Cultivation practices**

Vines intended for the production of wines suitable for ‘Aguardente de Vinho Lourinhã’ must be pure crop and trained to grow close to the ground, pruned in the bush or cordon style.

Wines suitable for the production of ‘Aguardente de Vinho Lourinhã’ must come from vines with at least four years of grafting.

1. **Geographical area concerned**

The geographical area of production of ‘Aguardente de Vinho Lourinhã’ covers the following:

1. In the Municipality of Lourinhã, the civil parishes of Lourinhã, Atalaia, Ribamar, Santa Bárbara, Vimeiro, Marteleira, Miragaia, Moita dos Ferreiros, Reguengo Grande, Moledo and São Bartolomeu;
2. In the Municipality of Peniche, the civil parishes of Atouguia da Baleia and Serra d’El-Rei;
3. In the Municipality of Óbidos, the civil parish of Olho Marinho;
4. In the Municipality of Bombarral, the civil parish of Vale Covo, and
5. In the Municipality of Torres Vedras, the civil parish of Campelos.

**Map of the Region**

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**Key to the map above:**

**OCEAN**

**Scale: 1/500 000**

**(All other words are place names)**

1. **Method for obtaining the spirit drink**

**Vinification**

The wines intended for the production of ‘Aguardente de Vinho Lourinhã’ are produced in the region, in wineries registered and approved by the certifying body to whose supervision they are subject; the maximum natural alcoholic strength of the wines to be distilled must be 10%; wines unfit for consumption may not be used for the production of ‘Aguardente de Vinho Lourinhã’; vinification is carried out without adding sulphur dioxide, and the oenological methods and practices which are legally authorised and traditional to the region must be followed, with the specific features defined in the certifying body's internal rules.

White varieties and red varieties may be vinified; red varieties must be fermented off skins. In either case, vinification must be carried out without adding sulphur dioxide.

**Storage and distillation**

Wines intended for the production of ‘Aguardente de Vinho Lourinhã’ must be distilled within the demarcated winegrowing region, at the latest by the end of April following vinification.

The systems used in distillation may be:

a) Continuous distillation, in a copper column no more than 18" in diameter, which may be fitted with plates of a single tray or plates of multiple trays, for continuous feed, without any additional rectification device; if a steam generator is used, heating cannot be done using direct steam; the alcoholic strength of the distillate may not be higher than 78% vol.;

b) Discontinuous distillation, in a copper still consisting of a boiler with a maximum capacity of 30 hectolitres. Heated by direct flame, through a column head with or without a wine heater (a heater for liquids) and through a (cooling) coil; on first distillation by this process a distillate is obtained with alcoholic strength ranging from 27 to 30%, the subsequent distillation of which produces the 'core spirit' with an alcoholic strength which must not exceed 72% vol.

**Ageing**

Following distillation, the spirit has to be placed in wooden barrels before it is marketed. During this period, known as ageing, a number of physical and chemical reactions take place, leading to changes in the sensory characteristics of the drink and enhancing its overall quality.

Ageing is carried out in the region, in oak casks with a capacity of up to 800 litres. ‘Aguardente de Vinho Lourinhã’ may only be put on the market after 24 months' ageing.

Various studies which have been done show that the heat treatment applied to the cooperage known in common parlance as charring, and which involves burning the inside surface of the casks, affects the physical and chemical sensory characteristics of ‘Aguardente de Vinho Lourinhã’.

The results obtained have shown that casks subjected to medium or strong charring have to be used to give the greatest development properties (maximising quality and speeding up ageing).

As for oak wood, comparative tests have also been run on casks made from oak wood of different species, and it turned out that Lourinhã spirits show the greatest development properties when they have been aged in Portuguese oak (*Quercus pyrenaica* Willd.), although spirits aged in French oak from the Limousin region (*Quercus robur* L.) have also produced interesting results. If other types of oak, such as American oak (*Quercus alba* L./*Quercus stellata* Wangenh.+ *Quercus lyrata* Walt./*Quercus bicolor* Willd.) or French oak from the Allier region (*Quercus sessiliflora* Salisb.), are used, the spirits acquire less pronounced development properties.

Very interesting results have also been obtained using casks of Portuguese chestnut (*Castanea sativa* L.), and the region has been expecting a recommendation to use that type of wood from the intergovernmental wine industry organisation, OIV (International Organisation of Vine and Wine).

**Other operations prior to marketing**

No additives of any kind may be used apart from distilled water to reduce the alcohol content and caramel up to a maximum of 2%. Alcoholic strength is reduced to the minimum figure of 38% vol. laid down in law.

The spirit to be put on the market may be the outcome of a mixture of several lots, known as blending, and it has been found that in the case of ‘Aguardente de Vinho Lourinhã’ the blending of quality spirits helps enhance the quality of the final spirit.

1. **Link with the geographical environment or origin**

**Details of the geographical area or origin relevant to the link**

The Lourinhã region has been associated with vine growing for a long time, as can be seen from the Charter granted by Dom Jordão, with authorisation from His Majesty King Afonso, to the inhabitants of Lourinhã in which the inhabitants of Lourinhã are exempted from the 'relego[[1]](#footnote-1)', contrary to the usual practice of the time, because *'this was never part of our law or custom*'. There are also references to the production of spirits in Lourinhã in various documents relating to the history of vine cultivation and winegrowing in Portugal, due partly to the qualities imparted to the wines by the influence of the Atlantic.

Ferreira Lapa (1868) writes in his second treatise on the Processes of Vinification, '*In our country the Tagus and the Douro, so exquisitely bedecked with vines, contrast with the ocean coastline. Colares, Mafra, Ericeira, Lourinhã, Peniche and from there upwards to the Minho the vine becomes rarer, and what there is produces thin, sharp wines, which may still here and there be of some considerable quality...*'.

As early as 1912, in the Winegrowing Studies of the Report by the Directorate-General for Agriculture, No 5, tenth year, by João Marques de Carvalho, there was interest in the 'wines of the South' for the production of spirits. ‘*In 1906 there was discussion of the question of grubbing up vineyards in Portugal and France, in order to remedy the wine surplus. Once the cause is removed... It is worth noting, however, that in Portugal industrial alcohol was used in the production of wines and in France they hit on beet sugar as a way of raising the alcoholic strength of thin wines (...)'*

'*(…)The Decree of 10 May 1907 legalised the fortified types of wines: Porto, Madeira, Carcavelos and Moscatel de Setúbal (…) The wines from the south were forbidden to go beyond Aveiro and, as a consolation prize to the winegrowers in the south, they were granted the exclusive right to manufacture spirit…*'

In 1942, the Contribution to the register of Portuguese wines of the JNV (National Wine Board) (1st volume) said: '*The municipality of Lourinhã is economically dependent on wine production, although local factors have, in their turn, created the distillation industry.*'

For the municipality of Lourinhã, that document registered 651 winegrowers with an area of 16 176 ha and total production of 16 711 barrels of wine, of which 76% were for distillation, 17% for white wine production and 7% for red wine production.

**Specific characteristics of the spirit drink attributable to its geographical area**

**Data about the product**

‘Aguardente de Vinho Lourinhã’ is the outcome of the production practices which lie at its source – it is aromatic not just because it comes from grape marcs which have not deteriorated and are therefore ‘cleaner’ from a chemical and organoleptic point of view; but because they successfully pass on the personality of the varieties from which they are distilled and also the character of the region, which is greatly influenced by the soil and climate conditions, and also because of the human factor.

The characteristics of the wines which can be used to make ‘Aguardente de Vinho Lourinhã’ owe their origin to the complexity of the natural and human factors of that region.

As a consequence of this historical background, the first studies leading to the evaluation of the quality of wine spirits from Lourinhã were launched by the then Centro Nacional de Estudos Vitivinícolas (CNEV), the National Centre for Winegrowing Studies, in Dois Portos in 1970.

The first results, which were systematised in 1975, soon showed that the region's wines had qualities which made them suitable for the production of wine spirits, especially '*the fact that white wines of low alcohol content and high total acidity, coming from vines planted in a zone with a cool climate and chalky soils, predominate*'.

The Lourinhã region, according to the description of Portugal's climatic regions by Deveau *et al.*, has a predominantly west-coast maritime climate characterised by, among other features, sea breezes, frequent fogs and mists and low temperatures.

Vines intended for the production of wines suitable to be used to make ‘Aguardente de Vinho Lourinhã‘ must now, or in the future, be planted in brown or red Mediterranean soils, normal or clay soils of fine sandstone, clays or argillites and brown chalky soils, normal or clay soils of marls and interstratified fine sandstones, as well as in red chalky marl soils, litholic sandstone soils, modern alluvial soils and podzols.

The varieties to be used are as follows:

White Varieties: Alicante Branco, Alvadurão, Boal Espinho, Marquinhas, Malvasia-rei (Seminário), Tália Cercial, Fernão Pires, Rabo de Ovelha, Síria (Roupeiro) Seara Nova and Vital; Red Varieties: Cabinda, Carignan, Periquita and Tinta Miúda.

**Causal link between the geographical area and the quality or characteristics of the product or a particular quality, the reputation or other characteristics of the product**

The climate, which generally features low temperature ranges and is heavily influenced by the proximity of the Atlantic and by sea breezes, helping to cause the frequent fogs and mists, in association with the varieties suitable for producing wines which can used to make ‘Lourinhã Wine Spirit’, are factors which determine the quality characteristics of these wines, especially in terms of aroma and taste, and are an expression of the special terroir of the region.

The maintenance and keeping of the region's native varieties, together with their diversity, have contributed substantially to the uniqueness and typical character of the wines which can be used to make ‘Lourinhã Wine Spirit’.

The human factors which interact in this tie-in between territory and product undoubtedly contribute to the quality of the wine spirits from the Lourinhã region, an area traditionally viewed as a producer of wine spirits whose quality has been recognised since the middle of the last century, as proven by various studies which have shown that it has been possible to adopt, on a scientific basis, the most appropriate forms of technology which have proved the viability of obtaining old wine spirits of excellent quality in this region.

1. **Supplement to the geographical indication**

All the requirements put forward above are based on various scientific studies carried out on ‘Aguardente de Vinho Lourinhã’. These are listed below, as are papers in which a certain amount of information about the history and climate of the region has been collected.

**Books/monographs:**

Belchior A.P., 1991. *Contributos da EVN para o Progresso da Vitivinicultura. (EVN Contributions to the Progress of the Winegrowing Industry) Investigação com Aplicação Imediata* (A Study for Immediate Application), 80 p., Estação Vitivinícola Nacional, Dois Portos.

Canas S. (2003). *Estudo dos compostos extraíveis de madeiras (Carvalho e Castanheiro) e dos processos de extracção na perspectiva do envelhecimento em Enologia. (A study of the compounds extractable from woods (oak and chestnut) and of the extraction processes, with a view to ageing in wine making).* Dissertation for a doctorate in Agro-industrial Engineering, Instituto Superior de Agronomia, Universidade Técnica de Lisboa, Lisbon, 303 pp.

Caldeira I. (2004) *O aroma de aguardentes vínicas envelhecidas em madeira (The aroma of wine spirits aged in wood). Importância da tecnologia de tanoaria (Importance of cooperage technology).*  Dissertation for the award of a doctoral degree in Agro-industrial Engineering, Instituto Superior de Agronomia, Universidade Técnica de Lisboa, Lisbon.

Mira R.B.A., 2009 *Actividade Antioxidante de Aguardentes Vínicas Envelhecidas Portuguesas e Francesas* (Antioxidant Activity of Aged Wine Spirits from Portugal and France). Master's in Food Engineering from the Escola Superior Agrária of the Instituto Politécnico de Beja.

**Chapters of books:**

Belchior A.P., Spranger M.I., Carvalho E.C.P., Leandro M.C., 1992. Identification par l'analyse chimique du vieillissement en bois de chêne des eaux-de-vie de vin vieillies. *In: Élaboration et Connaissance des Spiritueux*, Cantagrel R. (ed.), 479-483, Lavoisier - Tec & Doc, Paris.

Caldeira I.,Bruno de Sousa R., Belchior A. P., ClímacoM. C. *2011* Odorant Compounds of Aged Wine Brandies – The Wooden Barrel Role in Logan E. Weiss and Jason M. Atwood (eds) *The Biology of Odors: Sources, Olfaction and Response ISBN: 978-1-61122-952-3* *Nova Science Publishers, Inc.*

Canas S., Caldeira I., Belchior A. P., Spranger M. I., Clímaco M. C., Bruno-de-Sousa R. *2011 Chestnut Wood: A Sustainable Alternative for the Aging of Wine Brandies in:* Daniel A. Medina D.A. and Laine A.M. (eds.) Food Quality: Control, Analysis and Consumer Concerns ISBN: 978-1-61122-917-2 Nova Science Publishers, Inc.

Caldeira I., Canas S., MateusA., ClímacoM. C., SprangerI., Bruno de SousaR., Belchior A. P. 2008 Une approche de la traçabilité de l’origine du bois dans les eaux de vie de vin vieillies, in Bertrand A. (ed) *Les eaux-de vie traditionelles d´origine viticole*, Editions TEC&RDO Lavoisier p147-150

**Articles in scientific journals and magazines:**

Belchior A.P., Almeida T.G.T., Mateus A. M., Canas S., 2003. Ensaio laboratorial sobre a cinética de extracção de compostos de baixa massa molecular da madeira pela aguardente. (Laboratory testing of the kinetics of extracting compounds of low molecular mass from wood by means of spirit). *Ciência Téc. Vitiv.,* 18(1), 29-41.

Belchior A.P., Carvalho E.C.P., Borges M., 1990. Estudo inicial da interacção rolha de cortiça - aguardente velha (Initial study of cork stopper interaction with old spirit), *Ciência Tec. Vitiv.*, **9**(1-2), 161-168.

Belchior A.P., 1982. Elementos para a caracterização da cromatografia em gel de ‘Sephadex LH 20’ de aguardentes velhas (Factors in describing the chromatography in 'Sephadex LH20' gel of old wine spirits), *Ciência Tec. Vitiv*., **1**(1), 37-45.

Belchior A.P., 1986. Aguardentes velhas. Aspectos gerais do seu fabrico (Old spirits. General aspects of their manufacture), *O Escanção,* **3**, 15-16.

Belchior A.P., 1987. Aguardentes Velhas (Old Spirits). II O vinho (Wine), *O Escanção*, **5**, 22.

Belchior A.P., 1987. Aguardentes Velhas (Old spirits). III A Destilação (Distillation), *O Escanção*, **7**, 21.

Belchior A.P., 1989. Aguardentes Velhas (Old spirits). IV O Envelhecimento (Ageing), *O Escanção,* **12**, 25-26.

Belchior A.P., 1991. Estação Vitivinícola Nacional, Organismo Dedicado à Investigação Vitivinícola em Portugal (Estação Vitivinícola Nacional, Organisation Devoted to Winegrowing Research in Portugal),*Cadernos Agro-Pecuários*, **2**(6), 15-17.

Belchior A.P., 1999. Madeiras portuguesas no envelhecimennto de aguardentes e vinhos (Portuguese woods in the ageing of spirits and wines). *Revista de Vinhos*, September 1999, No 118: 74-82.

Belchior A.P., Almeida T.G.T., Mateus A.M., Canas S., 2003. Ensaio laboratorial sobre a cinética de extracção de compostos de baixa massa molecular da madeira pela aguardente. (Laboratory testing of the kinetics of extracting compounds of low molecular mass from wood by means of spirit). *Ciência Téc. Vitiv.*, 18, 29-41.

Belchior A.P., Caldeira I., Costa S., Lopes C., Tralhão G., Ferrão A.F.M., Mateus A.M., Carvalho E., 2001. Evolução das características físico-químicas e organolépticas de aguardentes *Lourinhã* ao longo de cinco anos de envelhecimento em madeiras de carvalho e castanheiro (Development of the physical, chemical and organoleptic characteristics of Lourinhã spirits through five years of ageing in oak and chestnut wood casks). *Ciência Téc. Vitiv.*, 16, 81-94.

Belchior A.P., Caldeira I., Tralhão G., Costa S., Lopes C., Carvalho E., 1998. Incidência da origem e queima da madeira de carvalho (Effect of the origin and charring of oak wood) (*Q. pyrenaica, Q. robur, Q. sessiliflora, Q. alba/Q. stellata* *+Q. lyrata/Q. bicolor*) e de castanho (and chestnut wood) *(C. sativa*) em características físico-químicas e organolépticas de aguardentes Lourinhã em envelhecimento (on physical, chemical and organoleptic characteristics of Lourinhã spirits undergoing ageing). *Ciência Tec. Vitiv*., **13** (1-2):71-105.

Belchior A.P., Carneiro L.C., 1972. Identification de substances extraites du bois neuf de chêne du Limousin par des eaux-de-vie de vin, *Conn. Vigne et Vin,* **6**(4), 365-372.

Belchior A.P., Carneiro L.C., 1994. A Quinta d'Almoímha na Ciência e Técnica Vitivinícola (The Quinta d'Almoímha Estate in Winegrowing Science and Technology). Um Percurso de 85 Anos (An 85-Year Journey). *Actas do* *Congresso ‘O Vinho. A História e a Cultura Popular.’ (Proceedings of the Congress on Wine. History and Popular Culture) pp. 411-427*. Instituto Superior de Agronomia. Lisbon.

Belchior A.P., Carvalho E.C.P., 1988. As perdas em volume e teor alcoólico das aguardentes em envelhecimento (Losses in volume and alcoholic content in spirits undergoing ageing), *Enologia*, **11**,65-66.

Belchior A.P., Clímaco P., Soares Franco J.M., 1979. Emprego de cromatografia em coluna de gel de ‘Sephadex LH20’ na caracterização de aguardentes vínicas envelhecidas (Use of chromatography in 'Sephardex LH20' gel column in describing aged wine spirits), *Vin. Port. Doc.* Series II, **9**(1), 1-8.

Belchior A.P., Garcia A.S., 1971. Comportamento de alguns constituintes voláteis das aguardentes tipo ‘Cognac’ no decurso da destilação (Behaviour of certain volatile constituents of 'Cognac' type spirits in the course of distillation), *Vin. Port. Doc.*, Série II, **6**(2), 1-14.

Belchior A.P., Mateus A. M., Caldeira I., 2002. Efeitos das Lotagens em Aguardentes Velhas de Lourinhã (Effects of Blending on Old Lourinhã Spirits). *Ciência Téc. Vitiv.* 17 (2) 53-59.

Belchior A.P., Mateus A., Canas S., Caldeira I. 2004. Prova de consumidor versus prova técnica de aguardentes velhas (Consumer testing versus technical testing of old spirits), *Ciência Téc. Vitiv.,* 19, 77-87.

Belchior A.P., Mateus A.M., Caldeira, I.M.J., 2002. Efeitos das Lotagens em Aguardentes Velhas de Lourinhã (Effects of Blending on Old Lourinhã Spirits). *Ciência Téc. Vitiv.*, 17, 53-59.

Belchior A.P., MateusA.M., Soares A.M. 2005. Comparação do envelhecimento de aguardente Lourinhã em vasilhas de madeiras de Castanheiro e de Carvalho e em dois volumes (Comparison of the ageing of Lourinhã spirits in chestnut and oak wood casks and in two volumes) . *Ciência Téc. Vitiv.*, 20, 91-103.

Belchior A.P., Mateus A.M., Soares A.M., 2006. Importância do volume da vasilha no envelhecimento de aguardentes (Importance of the volume of the cask in the ageing of spirits) (Lourinhã). *Vida Rural*, December 2006-January 2007, 44-45.

Belchior A.P., MateusA.M., Soares A.M.. 2005. Comparação do envelhecimento de aguardente Lourinhã em vasilhas de madeiras de Castanheiro e de Carvalho e em dois volumes (Comparison of the ageing of Lourinhã spirits in chestnut and oak wood casks and in two volumes). *Ciência Téc. Vitiv.* 20 (2), 91-103.

Belchior A.P., Puech J.-L., 1983. Caractéristiques de la composition phénolique du bois de chêne portugais et de quelques eaux-de-vie de vin, *Ciência Tec. Vitiv*., **2**(2), 57-65.

Belchior A.P., San Romão M.V., 1982. Influence de l'oxygène et de la lumière sur l'évolution de la composition phénolique des eaux-de-vie vieillies en bois de chêne, *Proceedings of the XIth International Conference of the Groupe Polyphenols*, **11**, 598-604.

Belchior, A.P., 2000. Aguardente e aguardente. *In: A talha e a sertã (The earthenware pot and the frying pan). Beber e comer no Alentejo (Eating and drinking in the Alentejo)*. 81-82. Alva – Associação de Alimentação e Vinhos (ed.), Évora.

Caldeira I., Belchior A.P., Clímaco M.C., Bruno de Sousa R. (2002) Aroma profile of Portuguese brandies aged in chestnut and oak woods. *Analytica Chimica Acta*, 458, 55-62.

Caldeira I., Bruno de SousaR., Belchior A. P., ClímacoM. C. 2008 A sensory and chemical approach to the aroma of wooden aged *Lourinhã* wine brandy. *Ciência Tec. Vitiv 23(2) 97-110.*

Caldeira I., Canas S., Costa S., Carvalho E. Belchior A.P. 1999. Formação de uma câmara de prova organoléptica de aguardentes velhas e selecção de descritores sensoriais (Establishment of an organoleptic test chamber for old spirits and selection of sensory descriptors) . *Ciência Téc. Vitiv.*, 14, 21-30.

Caldeira I., ClímacoM.C., Bruno de Sousa R., Belchior A.P. 2006 Volatile composition of oak and chestnut woods used in brandy ageing: Modification induced by heat treatment. *Journal of Food Engineering*,76, 202-211.

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. *Analytica Chimica Acta*,563, 264-273.

Caldeira I., Pereira R., Clímaco M.C., Belchior A.P., Bruno-de-Sousa R., 2004. Improved method for extraction of aroma compounds in aged brandies and aqueous alcoholic wood extracts using ultrasound. *Analytica Chimica Acta,* 513, 125-134.

Canas S., 2008. Impacto da queima da vasilha de madeira na qualidade de aguardentes *Lourinhã* envelhecidas (Impact of wood cask charring on the quality of aged *Lourinhã* spirits). *Enologia*, 51/51, 25-30.

Canas S., 2009.A aguardente velha e a saúde (Old spirit and health). *Revista de Vinhos*, 230, 108-112.

Canas S., Belchior A. P., Caldeira I., Spranger M.I., Bruno de Sousa R., 2000. La couleur et son évolution dans les eaux-de-vie *Lourinhã* pendant les trois premières années du vieillissement. *Ciência. Tec. Vitiv.*, 15, 1-14.

Canas S., Belchior A.P., Falcão A., Gonçalves J.A.,Spranger M.I., Bruno de Sousa R., 2007. Effect of heat treatment on the thermal and chemical modifications of oak and chestnut wood used in brandy ageing. *Ciência Téc. Vitiv.*, 22, 5-14.

Canas S., Belchior A.P., Mateus A. M., Spranger M. I., Bruno de Sousa R., 2002. Kinetics of impregnation/evaporation and release of phenolic compounds from wood to brandy in experimental model. *Ciência Téc. Vitiv.* 17 (1), 1-14.

Canas S., Belchior A.P., Spranger M.I., Bruno de Sousa R. (2003). High-performance liquid chromatography method for analysis of phenolic acids, phenolic aldehydes and furanic derivatives in brandies. Development and validation. .*J. Sep. Sci.*, 26, 496 -502.

Canas S., Caldeira I., Mateus A.M., Belchior A. P., Clímaco M.C., Bruno de Sousa R., 2006. Effect of natural seasoning on the chemical composition of chestnut wood used for barrel making. *Ciência. Tec. Vitiv.*, **21** (1), 1-16.

Canas S., Casanova V., Belchior A.P., 2008. Antioxidant activity and phenolic content of Portuguese wine aged brandies. *Journal of Food Composition and Analysis*, 21, 626-633.

Canas S., Grazina N., Spranger M.I., Belchior A.P., Bruno de Sousa R., 2000. Modelisation of heat treatment of Portuguese oak wood (*Quercus pyrenaica* L.). Analysis of the behaviour of low molecular weight phenolic compounds. *Ciência Téc. Vitiv.*, 15, 75-94.

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 (12), 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.

Canas S., Quaresma H., Belchior A.P., Spranger M.I., Bruno de Sousa R., (2004). Evaluation of wine brandies authenticity by the relationships between benzoic and cinnamic aldehydes and between furanic aldehydes. *Ciência Téc. Vitiv.*, 19, 13-27.

Canas S., Silva V., Belchior A. P. (2008). Wood related chemical markers of aged wine brandies. *Ciência Téc. Vitiv.*, 23, 45-52.

Canas, S., Belchior, A. P.; Caldeira, I.; Spranger, M.I.; Bruno de Sousa, R., 2000. Évolution de la couleur des eaux-de-vie de Lourinhã au cours des trois premières années de vieillissement. *Ciência. Tec. Vitiv*. **15** (1), 1-14.

Canas, S.; Leandro M.C. Spranger M.I.; Belchior A.P., 1999. Low molecular weight organic compounds of chestnut wood and corresponding aged brandies. *J. Agric. Food Chem.*, **47**(12),5023-5030..

Carvalho E.C., Belchior A.P., 1986. Elementos disponíveis dos estudos sobre aguardentes da Região de Lourinhã (Available parts of studies of spirits from the Lourinhã Region), *Enologia*, **8**, 32-34.

E.C., Belchior A.P., 1983. Influência do aquecimento do alambique ‘charentais’ no rendimento e qualidade da aguardente (Effect of heating the 'charentais' still on spirit yield and quality) *Ciência Tec. Vitiv*., **2**(2), 67-72.

Mateus A.M., Belchior A.P., (2003). A Lotagem – Uma mais valia na qualidade de aguardentes de *Lourinhã (*Blending – An added value in the quality of Lourinhã spirits*). Vida Rural*, 1687, 12-14.

Patrício I, Canas S, Belchior A.P., 2005. Effect of Brandies’ Agitation on the Kinetics of Extraction/Oxidation and Diffusion of Wood Extractable Compounds in Experimental Model. *Ciência Téc. Vitiv.* 20 (1), 1-15.

**Reports:**

Belchior A.P. 1975. Relatório sobre os estudos em aguardentes da Lourinhã (Report on studies of Lourinhã spirits) Grupo de Trabalho de Aguardentes e Subprodutos (Working Party on Spirits and By-products). EVN.

Belchior A.P., Carvalho E.C.P., 1994. Os 24 Anos de Estudo de Aguardentes de Lourinhã na Quinta d'Almoínha (24 Years of Study of Lourinhã spirits at the Quinta d'Almoínha Estate). *Colóquio organizado pela Comissão de Apoio à Região Demarcada de Aguardente Vínica de Qualidade da Lourinhã . (Symposium organised by the Support Committee for the Designated Lourinhã Quality Wine Spirit Region),* Lourinhã.

Belchior A.P., 1994. A Qualidade e Alguns dos seus Factores em Aguardentes Velhas (Quality and some of its factors in old spirits). *Colóquio VII ‘Contributos da Investigação para a Produção de Aguardentes de Qualidade’ (Symposium VII 'Contributions by Research into the Production of Quality Wine Spirits').* Estação Vitivinícola Nacional. Dois Portos.

**Documents with information (history, geography and climate) about the Lourinhã region:**

Carvalho, João Marques, 1912. Estudos Ampelográficos (Wine Growing Studies). Bulletin of the Directorate-General for Agriculture. Tenth year, No 5.

Daveau, S; Ribeiro, O; Lautensach, H., 1998. Geografia de Portugal (Geography of Portugal). II – O Ritmo Climático e a Paisagem (The Climate Cycle and the Landscape). Sá da Costa. Lisbon.

Ferreira-Lapa J.I., 1868. Segunda Memória sobre os processos de vinificação empregados nos principais Centros Vinhateiros do Continente do Reino, apresentada ao Illustríssimo Senhor Ministro das Obras Públicas, Comércio e Indústria em resultado da excursão mandada fazer pela portaria de 24 de Agosto de 1867 (Second Report on the vinification processes used in the principal Wine-Making Centres of the Mainland of the Kingdom, presented to His Excellency the Minister of Public Works, Trade and Industry following the tour ordered to be undertaken by the Order of 24 August 1867).

Ghira, J. Carvalho 2004 Os Vinhos de Estremadura-Enciclopedia Dos Vinhos De Portugal (The Wines of Estremadura - Encyclopaedia of the Wines of Portugal) Editora Chaves Ferreira.

JNV 1942 Contribuição para o cadastro dos vinhos Portugueses na área de influência da JNV Contribution to a land register of Portuguese wines in the area of influence of the JNV)., Volume I., Ministry for Economic Affairs, Lisbon.

1. **Specific labelling rules**

The labelling of 'Aguardente de Vinho Lourinhã' has to be done in accordance with legal standards and those laid down by the certifying body to which it is first submitted for approval.

**Sales denominations**

Aguardente Vínica da Lourinhã

‘Aguardente de Vinho Lourinhã’

1. **Body which checks compliance with the provisions of the product specification**

Comissão Vitivinícola da Região de Lisboa

Registered Office: Rua Cândido dos Reis, 1

2560-312 TORRES VEDRAS, Portugal.

1. *A privilege enjoyed by the lords of certain lands whereby they could sell their wine before small landowners.*  [↑](#footnote-ref-1)