

***Arbutus unedo* L. fruit distillates and the requirement for further quality specifications**

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Arbutus unedo L. fruit distillates (Aguardente de medronho) are produced in few countries/regions in Europe, namely Greece, Sardinia, Galicia (recently) and Portugal [1-3]. Portugal is the only possessing two protection geographical indications: “Medronho do Algarve” and “Medronho do Buçaco” [4]. Furthermore, Portugal has a specific law to protect the authenticity of arbutus fruit distillates [5]. This distillate is important from the economic point of view, particularly in the mountain areas, and is also of great historical importance for the entire Algarve region. In the last 20 years several projects have been developed in order to optimize the production process, first on a laboratory scale and later directly by several local producers [6]. Currently, over one hundred traditional producers optimized their processes, by implement HACCP systems and by legalizing the production, which led to the preparation of high quality spirits in Algarve. In the centre of Portugal, the other protected geographical area, many producers are implementing similar systems as well. Alcohol degree content, total acidity, copper and macro-volatile components are the parameters required for the quality control of distillates by current legislation. However other parameters are needed in order to differentiate high quality spirits and to create an identity for each geographical origin or country.

The evaluation of volatile macro-components from the aromatic fraction of distillates was performed by GC-FID and/or GC-MS techniques, after direct injection. The volatile micro-components need a pre-concentration step before analysis. This has been achieved by HS-SPME-GC-FID and HS-SPME-GC-MS and/or using direct injection after liquid-liquid extraction with pentane, mixture of pentane and ethyl ether or pentane and dichloromethane.

The volatile macro-components, namely acetaldehyde and ethyl acetate, which were present in excess in most distillate samples studied in the nineties [7], show now a strong decrease. In fact, the monitorization of these two parameters in more than 300 samples over the last four years showed a significant decrease. The values of acetaldehyde and ethyl acetate, which in the early nineties were 57.3 ± 44.7 g/hl of pure alcohol (p.a.) and 494.0 ± 563.2 g/hl p.a., respectively, decrease to 40.9 ± 12.8 g/hl (p.a.) and 200.2 ± 78.9 g/hl p.a. Furthermore, the scattering of their levels is much narrower, revealing a greater knowledge and care during the preparation process. The total higher alcohols (1-propanol, 2-butanol, 2-methyl-1-propanol, 1-butanol, 2-methyl-1-butanol and 3-methyl-1-butanol) content, 160.6 ± 40.2 g/hl p.a., is lower than the observed in the early nineties (193.1 ± 45.0 g/hl p.a.) and is significantly lower than the reported for Sardinia or Greece spirits [2] (~ 300 g/hl p.a.). Methanol, a compound formed after enzymatic hydrolysis of pectin during fermentation, also shows a slight average decrease from 898.3 ± 77.9 to 827.2 ± 132.9 g/hl p.a. Distillates prepared with arbutus fruits from the centre region of Portugal have more pronounced herbaceous aroma due to higher levels of C₆ alcohols and aldehydes.

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