

Tocopherol analysis of almond oils produced in eastern Morocco

Melhaoui R^{ab}, Fauconnier M-L^b, Sindic M^c, Addi M^a, Abid M^a, Mihamou A^a, Serghini-Caid H^a, Elamrani A^a

^a Laboratoire LBPM, Faculté des Sciences, Université Mohammed Premier, BP 717, Oujda 60000, Morocco,

^bQSPA Laboratoire, Gembloux Agro Bio-Tech, Université de Liège, Gembloux 5030, Belgium

^cLaboratoire de Chimie Générale et Organique, Gembloux Agro Bio-Tech, Université de Liège; Belgique

Contact : reda_melhaoui@hotmail.fr

Introduction

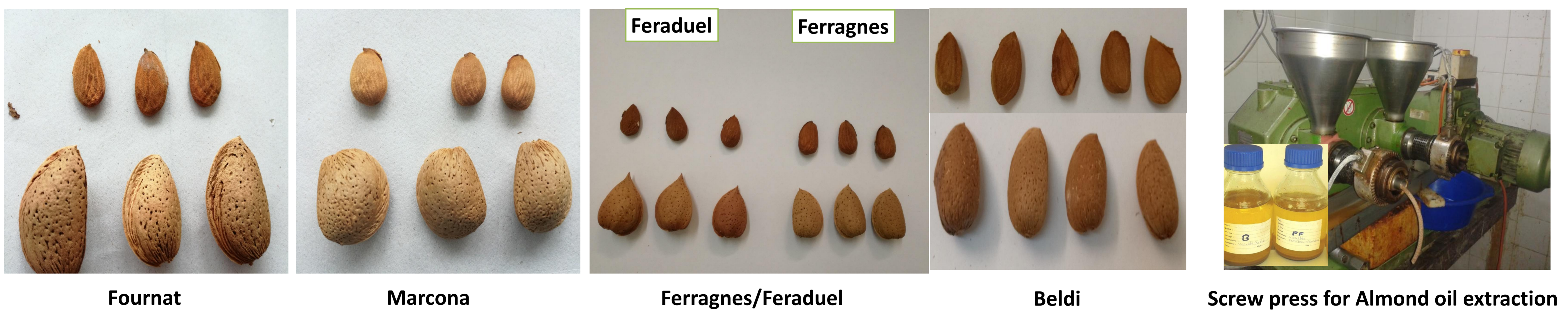
Almond is the most important tree nut crop in Morocco in terms of acreage and production value. The almond plantations cover a total area of 151,000 ha with an estimated average annual production of 99,000 tons of shelled products. 9% of this area which provides up to 14% of Moroccan production of almonds is located in eastern Morocco [1]. Recently, this region was supported by the Belgian development agency "BTC" through the "PROFAO*" project for the planting of 6000 ha of new orchards as well as the improvement of the almond value chain at the post-harvest level particularly the evaluation of almonds and products derived from almonds such as oil and other co-products. The main objective of this study concerns tocopherol profiles analysis in almond oils produced in eastern Morocco.

*PROFAO: Projet Filière Amandes de L'Oriental, "The almond value chain in eastern Morocco", Pillar II of the Moroccan Green Plan, supported by Belgian development agency (BTC 2011-2017)

Materials and Methods

Sweet Almond oil (AO) extraction by pressing (screw press) becomes the best option to achieve high oils quality at an affordable price. To determine tocopherols profiles as a quality parameter of almond oils produced in eastern Morocco, AO of five main varieties grown in this region (Fournat, Marcona, Ferragnes/Feraduel couple and Beldi which is an local ecotype) were analyzed by HPLC-FLD.

- ✓ Almond oil extraction: Almonds were triturated using an oil screw press (KOMET Modèle DD85G).
- ✓ Tocopherols profile analysis was performed by HPLC-FLD according to the official method, AOCS, Ce 8-89, using a mixed solution of tocopherols (α -tocopherol, β -tocopherols, γ -tocopherols, δ -tocopherols) as an internal standard



Results

Total tocopherols content and proportions of the different tocopherols' homologues content (α -tocopherol, β -tocopherols, γ -tocopherol) of analyzed almond oils by HPLC-FLD (fig 1) are summarized in Table 1.

Table 1: Total content and proportions of main tocopherol homologues in five screw-pressed almond oils (mg/Kg Oil)

Variety	Fournat	Marcona	Ferragnes/ Feraduel	Beldi
Tocopherols mg/Kg oil				
α-tocopherol	483,98 ^{ab} ±7,83	456,44 ^{bc} ±2,87	425,03 ^c ±7,59	517,02^a±8,56
β-tocopherol	3,17 ^a ±0,78	1,77 ^c ±0,01	2,28 ^b ±0,25	2,95^a±0,33
γ-tocopherol	14,27 ^a ±0,82	2,75 ^b ±0,01	5,80 ^c ±0,14	9,01^d±1,01
Total tocopherols	501,43 ^{ab} ±8,05	460,96 ^{bc} ±2,88	433,11 ^c ±7,88	528,98^a±9,71

Discussion and conclusion

Analyzed almond oils of four introduced varieties and one local ecotype cultivated in eastern Morocco are characterized by a high content of the tocopherols specially α -tocopherol as the dominant compound [2]. This study shows for the first time tocopherols richness of five studied almond oils particularly the Beldi ecotype almond oil which is considered as an add value for the local production of almonds Beldi. This local genotype could be exclusively orientated toward virgin almond oil extraction by screw press to preserve natural antioxidants and fat-soluble bioactive compounds that make it an oil with interesting nutritional and cosmetic properties.

[1] "Ministère de l'agriculture et de la pêche maritime Veille-économique-secteur-amandier -Note strategique, N°99. Available from: <http://www.agriculture.gov.ma/pages/veille/veille-economique-secteur-amandier-juillet-2014>."

[2] Kodad, O., Estopañán, G., Juan, T., Socias i Company, R., 2014. Tocopherol concentration in almond oil from Moroccan seedlings: Geographical origin and post-harvest implications. J. Food Compos. Anal. 33, 161–165. <https://doi.org/10.1016/j.jfca.2013.12.010>