

O9. Valorization Challenges to Almonds and their Co-products: Characterization of Oils Extracted from Broken Almonds Springing from Shelling and Sorting Operations.

Ahmed Elamrani^{1,2}, R. Melhaoui, N. Houmy, M. Addi; M. Abid, A. Mihamou, M-L. Fauconier², M. Sindic³, and Serghini-Caid¹

¹ Laboratoire LBPM, Faculté des Sciences, Université Mohamed Ier, Oujda; Morocco; ² Laboratoire de Chimie Générale et Organique, Gembloux Agro Bio-Tech, Université de Liège; Belgium; ³ Laboratoire, QSPA, Gembloux Agro Bio-Tech, Université de Liège; Belgium. *Corresponding and Presenting Author: ahmed.elamrani@gmail.com.

Abstract

The almond tree (*Prunus dulcis*) is one of the most popular nut trees grown worldwide under arid conditions. In north eastern region of Morocco, after the olive tree the almond tree is the second most important tree crop in this region, due to its resistance and capacity against water shortage and irrigation deficit. During this decade, new orchards of almond trees have emerged, thanks to the program Green Morocco, supported by the BTC (*BTC-PROFAO project). Thus 6.000 hectares of new orchards of almond trees were planted using the association Ferragnes / Ferraduel, which is a couple of French cultivars known for their late blooming. In the aim to improve the income of this rural population, cooperatives and economic interest groups were created; farmers have been trained for good almond cultivation practices as well as almond harvesting and processing. In eastern Morocco, traditionally almonds are hulled and shelled, manually by rural women, but currently, almonds processing machines are under installation. Manually or mechanically, almonds' hulling and shelling operations generate many byproducts which are hulls (thin mesocarp, green shell cover), shells (Hardened endocarp) but also broken kernels from almonds sorting and brown skin as byproduct of almonds' blanching. Taking in consideration the importance of valorization of almond byproduct, this work deals with the agro economical relevance and added value that could be generated by using broken almonds (as a co product) for Almond oils extraction. Thus this oral communication focuses on (i) the characterization of Almond oils produced by cooperatives in this region as an adding value to this almond's co-products (ii) Paths of research for the valorization of the other by-products mainly almonds' shells and hulls. Briefly, almond oils were extracted from broken almond (as a co-product) by screw press, oil yield range between 48 and 56%. Fatty Acids (FA) profile, determined by GC-FID, shows dominance of unsaturated fatty acids fraction [USFA > 85%] which is mainly represented by oleic Acid (61-69%) and linoleic acid (22-27%). Saturated fatty acids fraction (SFA <11%) is represented mainly by palmitic acid (7-8%). and stearic acid (2-3%). Total phenol content range between 40-45 mg/kg-oil, however total tocopherols content is important and range between 510-530 mg/kg-oil with a large dominance of α tocopherol. The presence of these compounds is important in relation to oil stability and as nutritional quality label. Thus, consumption of almond oil is recommended thanks to their beneficial effects on health, but it's also recommended for cosmetic uses. Keywords: Almond Tree, Almonds, almond co-products, Almond Oils.

*BTC- 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).