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Health Benefits of Argan Oil on heart, skin and Bone health

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Abstract

Argan oil contains 80% unsaturated fatty acids. It is of the oleic-linoleic type and contains between 29 and 35% essential fatty acids: linoleic acid (29 to 34%) (Vitamin F). This acid is considered necessary because the body cannot synthesize it and must be obtained through diet.

Unsaturated fatty acids play a vital role in the prevention of cardiovascular disease, while the omega-6 family, such as linoleic acid, is essential for a child's growth. Its oleic acid content makes argan oil particularly beneficial for regulating cholesterol. Ongoing studies suggest that consuming 2 tablespoons of argan oil daily for one month could significantly reduce blood cholesterol levels.

Keywords: Argan oil, cardiovascular disease, fatty acid, prevention, vitamin E

Introduction

The argan tree (Argania spinosa (L.) Skeels) (Figure 1) is endemic to Morocco, where it is the second most common tree species in the country, after the holm oak and just before the thuya. It can live up to 200 years. Some specimens have been observed to be 250 years old. The argan forest covers approximately 800,000 hectares and contains more than 20 million trees [1]. This tree, belonging to the Sapotaceae family, is particularly resistant to the dry conditions of southwestern Morocco. It can withstand temperatures ranging from 3 to 50°C and thrives with very low rainfall.

The argan forest has a significant impact on socio-economic progress and ecological sustainability [2] in diverse geographical areas, predominantly across southwest Morocco. To illustrate, it plays a prominent role in conserving biodiversity, preventing desertification, along supporting rural communities across southwestern areas by producing argan oil for commercial purposes.

Argan oil is rich in unsaturated fatty acids, tocopherols (including vitamin E), and polyphenols, which are natural antioxidants [3]. These play a vital role in preserving the oil and in preventing several diseases, including cardiovascular risk, and in strengthening bones because they are free radical scavengers.

The Argan oil obtained from the kernel is also utilized in human nutritional use as well as traditional medicine, such as skin care or allergic reactions, because of its anti-inflammatory properties. The argan oil contains 80% unsaturated fatty acids and tocopherols. Therefore, it can reduce cardiovascular risk and strengthen bones [4].

Despite all the benefits discussed earlier, argan forests are experiencing an alarming decline in both area and density. In less than a century, more than two-thirds of the forest has disappeared, with 600 hectares lost each year, not to mention the influence of climate change, marked by prolonged drought periods that southwest Morocco has experienced in the last decade.

Faced with these issues, the Laboratory of Plant Chemistry and Organic and Bio-organic Synthesis at the Faculty of Sciences in Rabat has set itself the objective of promoting argan tree products for the benefit of rural communities, thereby motivating them to protect and replant the argan tree.

This work is part of a series of ongoing research carried out by the Laboratory of Plant Chemistry and Organic Synthesis at the Faculty of Sciences in Rabat on the argan tree, aimed at enhancing and promoting argan tree products to ultimately preserve and conserve the species.

Materials and methods

2.1. Analysis of cis fatty acids [5].

Operating mode

The experiment was conducted following the steps detailed below. The test sample of argan oil, 1g, is supplemented with 0.5 ml of methanolic

KOH for HPLC (minimum 98%) and 10 ml of methanol in a 100 ml flask. The mixture is refluxed for 15 minutes until the solution is clear. Following this, 1 ml of heptane is added to the reaction mixture after cooling.

The heptanic phase containing the methyl esters is transferred to a test tube; subsequently, a solution of sodium carbonate Na_2CO_3 is added. This neutralizes all free acids by giving sodium salts with the release of carbon dioxide.

The methyl esters, which are in the organic phase, are removed using a 2 ml cone pipette and placed in a test tube. The methyl esters undergo a series of washings. 20 ml is taken from the esters, which are placed in a tube of nominal capacity of 2 ml and then filled with heptane.

The fatty acid methyl esters are analyzed by GC gas chromatography.

The HP Hewlett Packard 6890 GC Series GC chromatograph is equipped with a divider (T: 240°C) and an FID (T: 260 °C) injector. The carrier gas is nitrogen (PE: 12.4 bar). The analysis is carried out in temperature programming (140 °C to 200 °C with a speed of 10 °C / min and an isotherm at 200°C for 40 min) on a capillary column (polyethylene glycol) (30 m × 0,32 *mm, DI: 0.25 µm).* The analysis of tocopherol is presented below.

2.2. Tocopherol Analysis [6].

Procedure

In a 25 mL volumetric flask, 2 g of argan oil is diluted with 2,2,4-trimethylpentane. The sample is then added to 2,2,4-trimethylpentane up to the calibration mark and thoroughly mixed.

Tocopherols are analyzed by HPLC on a silica column (25 cm × 4 mm) according to the AOCS method, official method EC8-89 revised 1990 updated 1992 [7]. The SHIMADZU instrument is equipped with a fluorimetric detector (excitation wavelength 290 nm, emission wavelength 330 nm). Elution was performed with a 99:1 isooctane/ isopropanol mixture at a flow rate of 1.2 mL/min for the duration of the analysis (20 min).

Results and Discussion

3.1. Fatty Acid Analysis

The fatty acid composition of the different oils was determined after oil methylation and analysis of the methyl esters by capillary column gas chromatography. Table 1 summarizes the results obtained for the sample.

Sample	$C_{14:0}$	$C_{15:0}$	$C_{16:0}$	$C_{16:1}$	$C_{17:0}$	$C_{18:0}$	$C_{18:1}$	$C_{18:2}$	$C_{18:3}$	$C_{19:1}$	$C_{20:0}$	$C_{20:1}$	$C_{22:0}$
Argan	0.12	0.04	12.45	0.04	0.08	5.44	47.11	33.53	0.09	-	0.36	0.44	0.11

Table 1: Fatty Acid Composition (in %).

An unsaturated fatty acid is a type of fatty acid that has one or more carbon-carbon double bonds in its chain. They are known for their health benefits, including reducing "bad" cholesterol (LDL cholesterol) and supporting cardiovascular health. They are found primarily in vegetable oils [8].

Argan oil is considered one of the oils richest in unsturated fatty acids, as it cotais a high percentage of 80% unsaturated fatty acids), primarily oleic acid (omega-9) and linoleic acid (omega-6), which are essential for healthy skin, hair, and nails. These fatty acids help to moisturize, nourish, and protect the skin, improve elasticity, and prevent skin aging [9].

with its distinctive chemical properites, argan oil play a vital role in the prevention of cardiovascular disease. Besides, the omega-6 family (such as linoleic acid) is essential for bone growth [10].

The other fatty acids present are : myristic acid (C14:0, 0.10–0.15%), palmitic acid (C16:0, 11–13%), and stearic acid (C18:0, 5–7%). The percentage of linolenic acid (C18:3) in argan oil does not exceed 0.1% [11].

3.3. Tocopherol Analysis

Tocopherols were analyzed by HPLC, and the results are summarized in Table 2.

Sample Argan	γ-tocopherol	δ-tocopherol	α-tocopherol	β-tocopherol	total
	631.3	59.5	26.6	-	717.4

Table 2: Tocopherol Composition (mg/kg)

Argan oil is rich in tocopherols (vitamin E) compared to some other oils, such as olive oil and sunflower oil. It contains a high amount of tocopherols, particularly γ-tocopherol (631.3 mg/Kg) and δ –tocopherol (59.5 mg/Kg) [12].

Tocopherols have vitamin E activity. This vitamin is a powerful antioxidant that scavenges free radicals and neutralizes destructive oxidation [13].

Tocopherols are natural antioxidants; gamma-tocopherol has the highest antioxidant capacity [14]. Rich in gamma-tocopherol, argan oil is a highly valuable nutraceutical.

Tocopherols (vitamin E) and polyphenols are natural antioxidants. Polyphenols play a prominent role in the prevention of several diseases [15] because they are free radical scavengers.

Furthermore, thanks to its high antioxidant content, argan oil may protect LDL cholesterol from oxidation, a key step in the pathogenesis of atherosclerosis.

Conclusion

Based on the findings of previous research and this study, it is evident that argan oil is rich in tocopherol and fatty acids. These properties have led to its use in traditional medicine for skin care, and its consumption may reduce cardiovascular risk and strengthen bones.

Argan oil is also used for body care, to treat juvenile acne, chickenpox, and rheumatism. Due to its cholesterol-lowering properties, it may be indicated for the prevention of atherosclerosis.

It may soothe rheumatism and joint pain, stimulate and enhance brain function, prevent miscarriage, and stimulate sperm production in the treatment of azoospermia.

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