

Physico-Chemical and Biochemical Properties of Oil Extracted from *Pistacia lentiscus*

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A physico-chemical study and biochemical properties of the oil extracted from *Pistacia lentiscus* is presented. This shrub of Mediterranean the maquis type is established in the area El Kala. The extracted oil was carried out by two modes of extraction, the parameters of the fat content are given. According to the results this oil is comparable with the olive-tree, it is composed by unsaturated fatty acids and a rather low content of vitamin E of the order 6.6 mg/100 g.

Key Words: Oil, Extraction, Acid fat, *Pistacia lentiscus*.

INTRODUCTION

The fruit of the *Pistacia lentiscus* is a shrub of mediterranean the maquis type. Its presence is marked in the wet stage, sub-humid is strongly answered in the area of El Kala. The fat content is consumed by the local populations after a technological treatment not including understanding hydrogenation. The oil extracted the fruit of the *Pistacia lentiscus* is of an interest paramount in the Algerian campaigns. It is used in traditional medicine with knowing the treatment of asthma, however its use remains empirical and did not have to our knowledge is the subject of detailed work. In this article we present the parameters physico-chemical on the fruit, its content of vitamine E we analyze the fat content and we determine his composition in fatty acid.

EXPERIMENTAL

The fresh fruit are collected in the area El Kala in the Algerian east are dried with the sun for their conservation.

Separation pulpe-seed: Realized by a sifting (sieve of the domestic type) of the fruit while rubbing with the hand to collect the maximum of pulp, the second sifting is carried out after passage to the drying oven with 80 °C for one 0.5 h duration. The total lipids are extracted on the one hand with a mixture CH₃OH/CH₃Cl (1/2) according to the method of Floch *et al.*¹, in addition using oil ether (40-60 °C) using an extractor with the Soxhlet. The cachterization of the fat content is made according to Wolff². The cellulose is proportioned according to the method

of Weende after-degreasing of the fruit. The proportioning of nitrogen is carried out by the method Kjeldhal. Concerning the biogenic salts one made a delipidation by a double extraction then one proportioned using a spectrophotometer of atomic absorption Perkin-Elmer, on the other hand, for phosphorus it was determined by a visible spectrophotometer UV on a spectrophotometer Shimadzu U.V 2000 (Tables 1-3), the proportioning of methyl esters is carried out by gas chromatography after tranferication of oil by methanol in the presence of soude³.

TABLE-1
CHARACTERIZATION OF THE FRUIT

Parameters	Results
Water (%)	9.95
Ashes (%)	3.75
Fat content (extracted with the petroleum ether 40-60 °C) (%)	64.50
Total proteins (N × 6.25) (%)	10.90
Cellulose (% the gross product)	22.70

TABLE-2
CHARACTERIZATION OF THE MINERALS ELEMENTS (µg/g M.S)

Elements	K*	Ca	Mg	Fe	Zn**	Na*	P	Mn	Cu
Results	8.081	2.283	1.301	173	15.4	92	10.359	30.5	12.3

*By emission of the flame. **By absorption with the furnace of graphite.

TABLE-3
DETERMINATION OF THE PHYSICO-CHEMICAL PARAMETERS OF GREASE

Parameters	Results
Point fusion (°C)	27
Note of drop (°C)	23.4
η^{40}	1.3995
Index saponification (mg KOH/g) (T60206 standard)	192.87
Iodine index (wijs)	69.64
Acid value (AOCS) (mg KOH/g of oil)	2.345
Colour band	Blue Red Yellow
	0.3 1.7 70.7
% Insaponifiable (m/m) (Method hexane)	0.75
Vitamin E (mg/100 g)	6.6

The methyl esters are identified by comparison of the retention time. The percentage of fatty acid is calculated by the internal normalization method using methyl palmitoleate as internal standard.

The proportioning of the vitamin E was carried out by known method⁴. According to the experimental protocol (Fig. 1), the extract is recovered in *n*-heptane is concentrated in a drying oven up to 1 mL and then added 1 mL of ferric chloride. The reading is carried out with the spectrophotometer with a wavelength 510 nm.

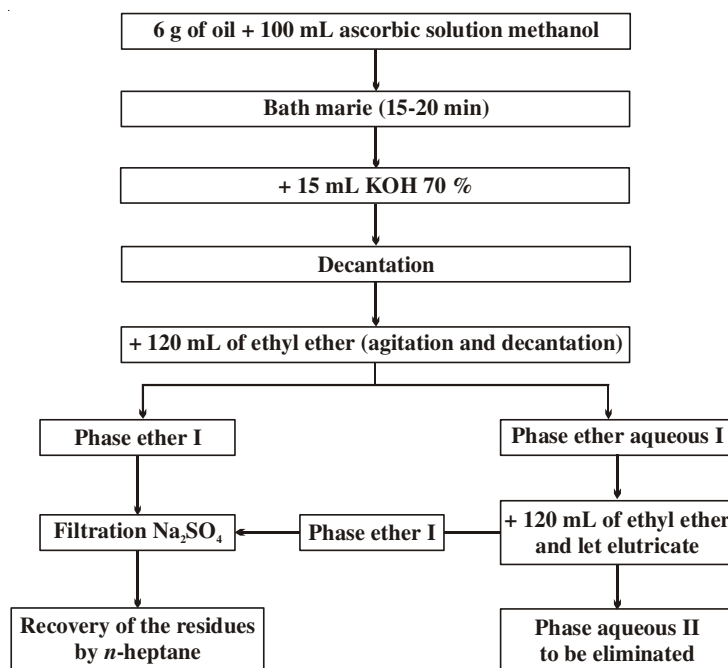


Fig. 1. Extraction of the vitamin E

RESULTS AND DISCUSSION

While following the mode of extraction recommended by Floch *et al.*¹ on five tests we obtained a yield 64.7 %. While by using the Soxhlet extraction an average result of 64.5 % was obtained. It is noted that no significant difference between these two methods. The characteristics and the chemical composition of the olive *Pistacia lentiscus* are comparable with that of the olive tree⁵. The low value on the acid value shows that the fruit of *Pistacia lentiscus* did not undergo oxidized and hydrolytic deterioration during storage. The survey of the composition in fatty acid of oil extracted of *Pistacia lentiscus* (Table-4 and Fig. 2 and 3) shows that these results have some differences meadows. However, in absence of the pinoleic acid and the presence of high concentration of the oleic acid at the French species. On the other hand, the characterization of Algerian species showed a high concentration upto 18:2. This oil shows a high rate 16:1 contrary to other oils present in trace or in small quantity. Gas chromatography analysis revealed that this oil does not contain erucic acid (considered to be undesirable because of its pathological effect on the cardiac muscle)⁷. Thus, present oil is acceptable from toxic point of view and can be consumed without any risk. This assumption is in agreement with the use of this oil in the Algerian campaigns. Indeed, this oil is remarkable by its high percentage of required linoleic acid for various industrial applications.

TABLE-4
COMPOSITION OF THE OIL OF *Pistacia lentiscus*

Composition fatty acids % in relation of the fatty acids	
Palmitic acid C16:0	2.039
Palmitoleic acid C16:1	27.189
Oleic acid C18:1	19.832
Linoleic acid C18:2	49.163
Linolenic acid C18:3	1.775

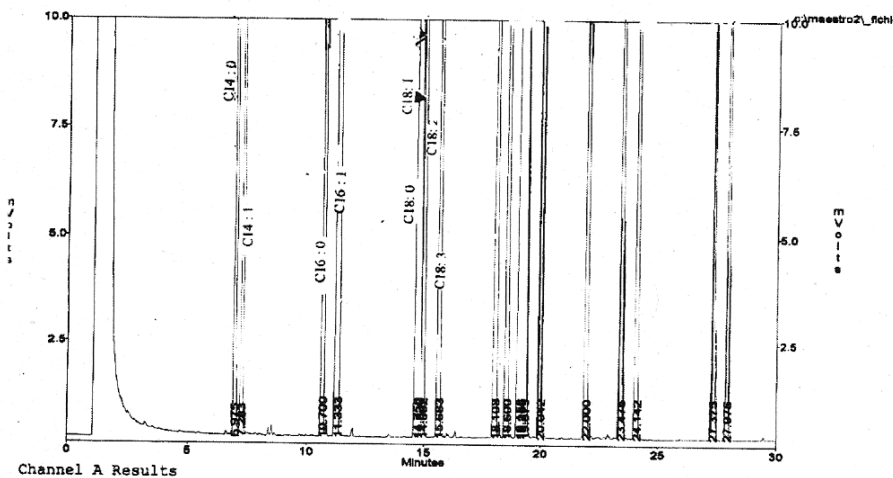


Fig. 2. Composition of the standard oil

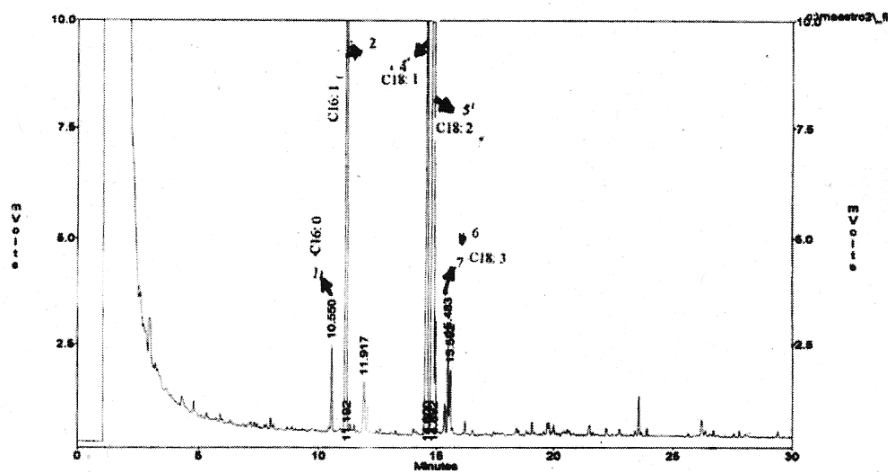


Fig. 3. Methyl esters of the fatty acids of the oil *Pistacia lentiscus*
1 = Palmitic acid, 2 = Palmitoleic acid, 4 = Oleic acid, 5 = Linoleic acid
6 = Linolenic acid

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