



Pharmacognostical and Preliminary Investigation of Active Compounds of Iraqi Oleaster (*Elaeagnus angustifolia* L) by Using Different Solvents

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ABSTRACT

Objective: This study was conducted to investigation of Pharmacognostical properties with evaluation the effect of different types of solvents on leaves extraction of *Elaeagnus angustifolia* L. *Method:* Leaves samples were collected from middle region of Iraq (AL-dewaniyah), all samples were washed, separated and dried under shade condition. Pharmacognostical study was included macroscopical and microscopical examination; while phytochemical study was included using different solvents were ethanol 70%, methanol 70%, chloroform, ethyl acetate and diethyl ether. *Results:* The results of this study were referred to anomocytic type of stomata at upper and lower surface of plant leaves. Star shape of trichomes with fibers were presented at upper surface also by microscopical examining the calcium oxalate with starch were presented. Leaf microscopical exam results was referred to 90% and 54.5% as stomata index at upper and lower surface respectively. The extraction results were referred to different active compounds detection according different solvents were ethanol 70% and methanol 70% extract were contained saponin, tannin, flavonoids, coumarin and cardio active glycosides, while chloroform, diethyl ether and ethyl acetate extracts were contained only coumarin and cardio active glycosides. *Conclusion:* From results of this study the conclusion was referred to have this plant different morphological parameters were gave this plant more possibility of adaptation to grown under semi-arid environmental conditions such as anomocytic stomata ant star shape of trichomes and high stomatal index at lower surface. The different organic solvents were depending on polarity of these solvents and active compounds.

Keywords: *Elaeagnus angustifolia*; Oleaster; Active compounds; Solvents

INTRODUCTION

Oleaster plant *Elaeagnus angustifolia* L. is considered among the important food and medicinal plants is belonging to Elaeagnaceae family [1]. It's grown wildly in middle region of Iraq and called tamur ajum and used as a food and in traditional medicine [2]. This plant has different local name such as wild olive or Russian olive, as hyphenated to specify that they are not true olive [3]. The geographical distribution of this plant is including Mediterranean, north area of Asia and Europe. The native region of *E. angustifolia* is central and western Asia with southern Europe [4]. Oleaster plant is a perennial tree or large with multi-stemmed shrub with flexible branches [5]. The height of this plant is reach to about 12 m; the leaves are alternate and petiolate. The stem, leaves, buds and fruits have a dense covering of silvery scales (Figure 1). The long of fragrant flowers reach to 12 mm, with four -lobed creamy yellow calyx, in small axillary clusters. Fruits are berry-like or drupe, oval-shaped, between 1 and 2 cm long, which are edible sweet and fleshy, with a dryish, mealy texture. The plant has deep roots and extensive with various well laterals [6]. The plant have variety of indications in herbal and folklore medicine of different nations, the range of Pharmacognostical and biological activity has been reported for this species [7] (Table 1).

Table 1: Scientific classification

Kingdom:	Plantae
(unranked):	Angiosperms
(unranked):	Eudicots
(unranked):	Rosids
Order:	Rosales
Family:	Elaeagnaceae
Genus:	Elaeagnus
Species:	<i>E. angustifolia</i>

**Figure 1: Leaves of *E. angustifolia***

The phytochemical constituents of this plant are provide a scientific source to plate future natural drugs elicited from this plant for managing various disorders [8-10]. The important active compounds of this plant are flavonoids, fatty acids, sterols glycosides and alkaloids, while the nutritional compounds of this plant are carbohydrates, vitamins and minerals [11,12]. Traditionally uses of this plant were included anti-ulcer remedy for wound healing or sometime gastric disorders, antipyretic, anti-inflammatory, anti-diarrhea, appetizer and diuretics [13,14]. There are no studies about this plant in Iraq, therefore this study was conducted to investigation the Pharmacognostical properties with preliminary investigation of the active compound of this plant.

MATERIALS AND METHODS

Sample collection

The leaves samples were collected from Dewaniyah region at middle of Iraq, then cleaned and dried under shade conditions.

Pharmacognostical study

Macroscopical examination:

Fresh specimens of plant were used to study the morphological character of the plant such as shape of leaves, stems and margins.

Microscopical examination:

Leaf powder microscopy: Shade dried leaves were converted to fine powder and examined under microscope. Small quantity of the powder was placed on slide which then was mounted two drops of chloral hydrate and covered with cover slip and examined under microscope. Different cell components were presented and photography process was done by using digital camera [15].

Fresh leaf examination: The lower and upper epidermal layer of fresh leaf (in fragments) were mounted in chloral hydrate to exam the components of leaves such as stomata, trichomes. Also the stomatal index was carried out by using the following equation

$$\text{Stomatal index} = \frac{\text{No: of Stomata}}{\text{No: of Stomata} + \text{No: of epidermal cells}} \times 100$$

Preliminary investigation of active compounds

Plant extraction:

The Soxhlet extraction processes were carried out by using 350ml from each solvent (ethanol 70%, methanol 70%, chloroform, ethyl acetate and diethyl ether) for 10 hours.

Phytochemical screening:

The screening of active compounds was done by using mayers, dragendroffs, borntegers test, for alkaloids and glycosides. The foam test, lead acetate test, ferric chloride test, alkaline test were used [16].

RESULTS

Pharmacognostical study

The macroscopical examination results were referred to large multi-stemmed shrub with flexible branches of this plant. The height was reached to 11-12 m. The leaves were alternate and petiolate. Stems, leaves, buds and fruits have a dense covering of silvery scales. The long of fragrant flowers 3 to 12 mm, with four-lobed creamy yellow calyx in small axillary clusters, fruits were berry like or drupe, oval-shape between 1 and 2 cm long, which a dryish, mealy texture. The roots were deep or extensive, with various well-developed laterals. The microscopical examination results were referred to anomocytic type of stomata at upper and lower surface of leaves. Star shapes of trichomes with fibers were presented at upper surface. Calcium oxalates with starch were presented. Also the microscopical results were referred to 90% and 54.5% as stomatal index for upper and lower leaf surface respectively (Figures 2-5 and Table 2).

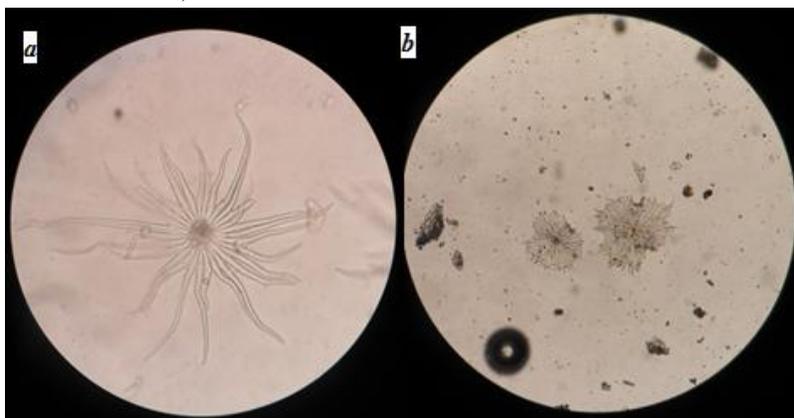


Figure 2: a: Star trichomes shape 40x; b: Star trichomes shape 10x



Figure 3: Fiber 10x



Figure 4: Anomocytic stomata 10x

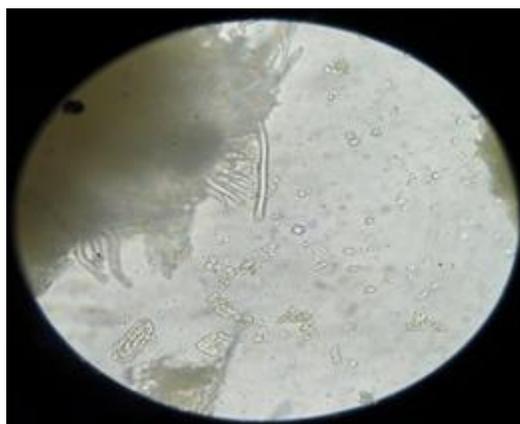


Figure 5: Calcium oxalate with starch

Table 2: Stomatal index

Upper surface		
No. of stomata	No. of epidermal cell	Stomatal index %
2	20	9%
Lower surface		
No. of stomata	No. of epidermal cell	Stomatal index
12	10	54.50%

Phytochemical study

The preliminary investigation results of active compounds were referred to different active compounds were presented according different solvents were used in this study. Methanol 70% and ethanol 70% extract were contained saponin, tannin, flavonoids, coumarin and cardio active glycoside while chloroform, diethyl ether and ethyl acetate extracts were contained only coumarin and cardio active glycosides (Table 3).

Table 3: Qualitative phytochemical analysis of the extracts of leaves of *E. angustifolia* L

Chemical tests	Solvents				
	Methanol 70%	Ethanol 70%	Chloroform	Diethyl ether	Ethyl acetate
Saponin	+	+	-	-	-
Tannin	+	+	-	-	-
Flavonoids	+	+	-	-	-
Coumarin	+	+	+	+	+
Cardio active glycoside	+	+	+	+	+
Alkaloids	Dragendroffs reagents	-	-	-	-
	Mayers reagents	-	-	-	-

CONCLUSION

According to the both results Pharmacognostical and phytochemical studies, the expended of cultivation of this plant in Iraq is very necessary to improve quality and quantity of most important active compounds and the results were referred to methanol and ethanol solvents consider a best solvents to extract most active compounds in this plant.

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