Research Article

Pharmacognostic and Volatile Oils Content for Iraqi and Turkish *Pinus halepensis*

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ABSTRACT

The family Pinaceae has many genuses, one of the most important genus of it is *pinus*. The needles of the plant are used in medicine and as food additives due to their different pharmacological properties. The needles of the genus *Pinus* contain essential oils and the components of their essential oils have been established through chromatographic techniques. The needle of pine was collected from Sulaimaniyah in the north of Iraq and Antalya in Turkey, then they are cleaned by distilled water and both microscopic examinations and volatile oil content were studied. The extracted oil was evaporated under pressure and samples were sent to the college of science / Musnasiriyah University for chromatographic identification. Microscopically, the needles of both plants showed similarity under microscope. The leaves showed a large vascular strand that consists of thick walled xylem elements mixed with xylem fibers. The phloem which is present in a thin layer along inner and outer portions of xylem and in the epidermis layer showing the paracytic stomata.

Keywords: Pinus, volatile oils, pinaceae, chromatographic techniques.

INTRODUCTION

The family Pinaceae has many genuses , one of the most important genus of it is pine there are many species belongs the genus pine there are about 115[1]. These plant distributed in different area of conifers occurring naturally in the Northern hemisphere, especially in the Mediterranean region, Caribbean area, Asia, Europe, North and Central American[2]. A large tree, branches more or less whorled; bark dark grey, often reddish, deeply fissured, rough, exfoliating in longitudinally elongated plates; leaves in clusters of three, 20-30 cm, long, triquetrous, finely toothed, light, green, persisting on an average for a year and a half; male flowers about 1.5 cm long, arranged in the form of cones; Pine trees have four different types of leaves.[3] The first one seed leaves that have whorls branches (4 to 24seedling). The second Juvenile leaves which follow immediately on seedlings, and are arranged spirally on the shoots. Alternatively third needle Leaves – similar to bud scales, and are arranged spirally. The fourth Needles the adult leaves, bundled into many clusters, about 2 to 5 needles per bundle, each produced on a small bud of the scale leaves (Figure 1). The needles of the genus *Pinus* are widely used in folk medicine and as food additives due to their different pharmacological properties, such as anti-aging and anti-inflammatory effects [(4]). The leaves of the genus *Pinus* have been used in traditional medicine for liver diseases, skin diseases, and hypertension. Essential oils one of the most important groups of pharmacologically active components of the genus *Pinus.*[5] Essential oils, produced from a plant's secondary metabolism, possess a well-known antioxidant properties.[6] The needles of the genus *Pinus* contain essential oils and the components of their essential oils have been established through chromatographic techniques.[7] This study was designed to compare between the quality and the quantity of volatile oil content of P. *halepensis* in Iraq and Turkey.

Figure 1: Needles of pinushalepensis

MATERIAL AND METHODS

General: The needle of pine was collected from Sulaimaniyah in the north of Iraq and Antalya in Turkey, then they are cleaned by distilled water and microscopic examinations and chemical extraction was done.

GC MS Analysis

Pharmacognostical evaluation of the plant

The present study deals with pharmacognostic examination through screening of the microscopical characters of Pinus needlest which collected from different countries one of them grown in Iraq region and the another from Turkey and dried at room temperature in the shade, then grinded as powder and weighed.

Microscopical study

The anatomical study of leaves of different species of *Pinus* plant under study was powdered after drying. Chloral hydrate is used to obtain clear sections. The

photography was obtained by using digital camera and diagnosis the different cell component

Leaf microscopy

The type of stomata and trichomes were observed by taken The outer epidermal layer of fresh leaf and added few drops of chloral hydrate solution and observed under a microscope.

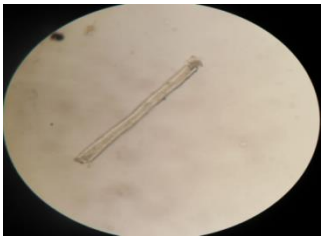
Extractoin of volatile oil

Fresh, clean needle of pine was extracted with hexane by maceration for 5 days, then the extract was evaporated under pressure and samples was sent to the college of science/ Musnasiriyah university.

RESULTS AND DISCUSSION

The needles of both plants showed similarity under microscope**,** both plant needles showed a large vascular strand that consists of thick walled xylem elements mixed with xylem fibers and phloem which is present in a thin layer along inner and outer portions of xylem and in the epidermis layer shows the paracytic stomata.

Powdered microscopy revealed non glandular unicellular trichomes in the ad axial epidermal peelings also shows the calcium crystals common in powder Vessels elements are narrow,. Xylem fibers are thin and long, with thick walls (Fgure 2).



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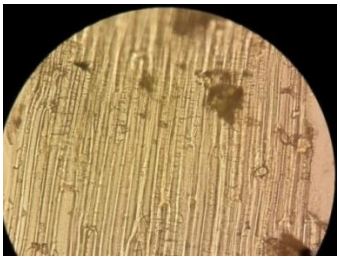

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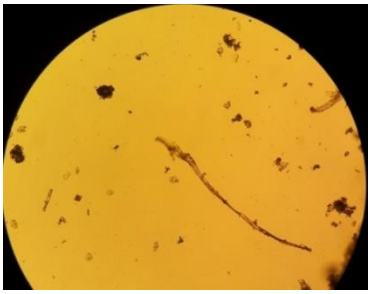

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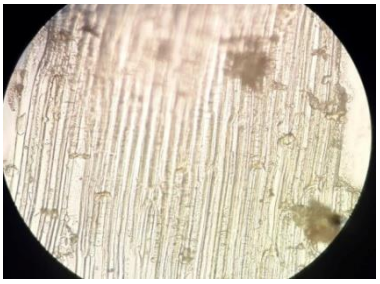

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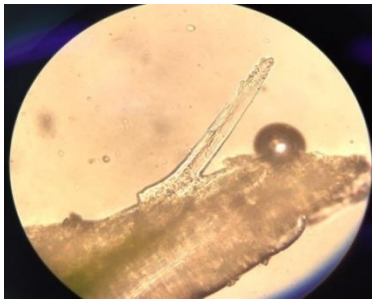

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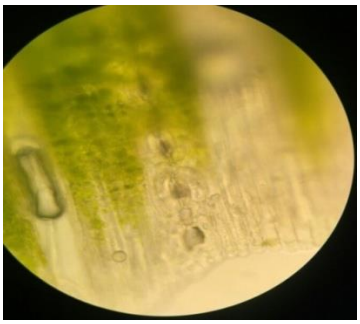

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Figure 2: Powder microscopy of (a) fiber (b) xylem annular vessels

c- fibers with calcium oxalate crystals d-Xylem vessels element with parenchyma

e- covering unicellular trichom ef-paracytic stomata

GC MS analysis of the volatile oils

The result of both plants is as shown in this chromatogram (Figure 3 and 4).

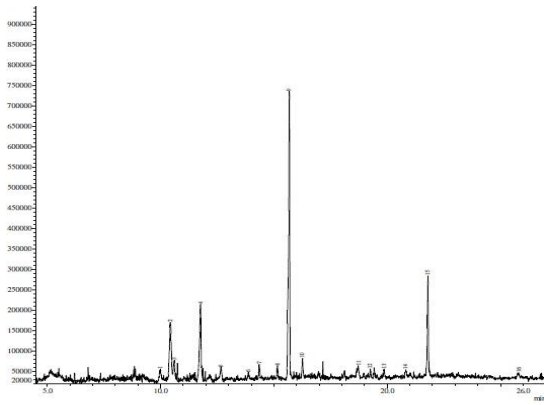

Figure 3: chromatogram of Iraqi *p. halepensis*

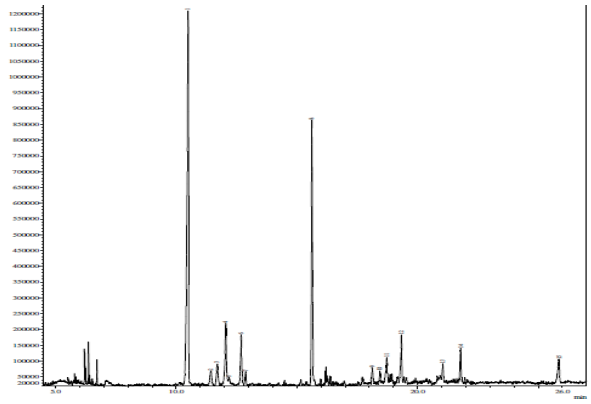

Figure 4: chromatogram of Turkish pine

Iraqi pine

The component of the oil are shown in figures 5, 6, 7, 8, 9 and 10

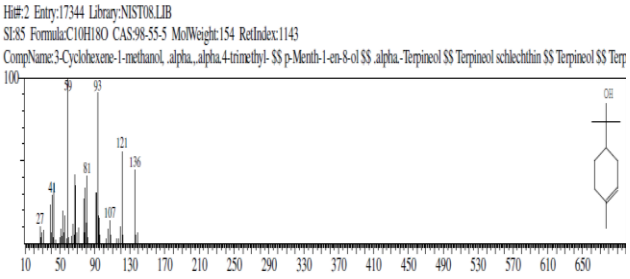

Figure 5: Line 4 retention time 11.76

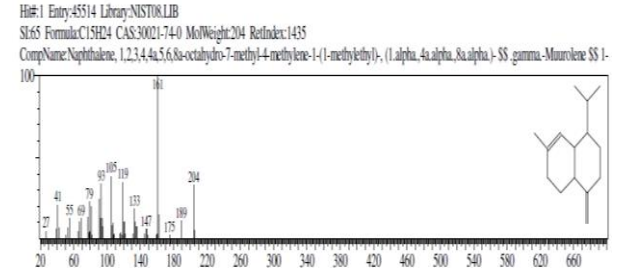

Figure 6: line 5 retention time 12.660

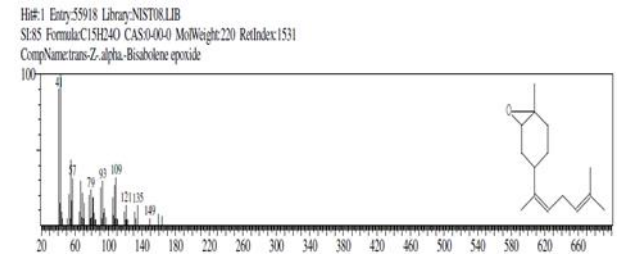

Figure 7: line 9 Major component retention time 15.68

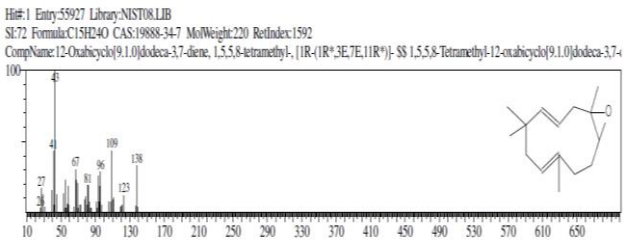

Figure 8: line 10 retention time 16.260

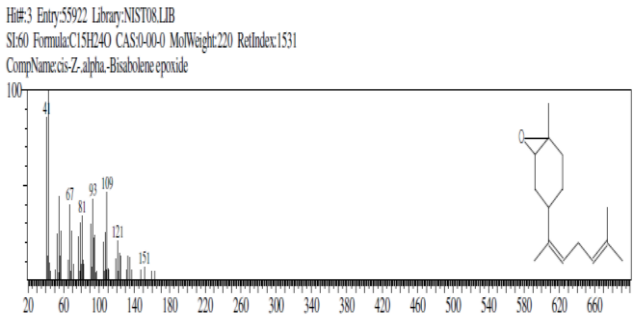

Figure 9: Line 11 retention time 18.72

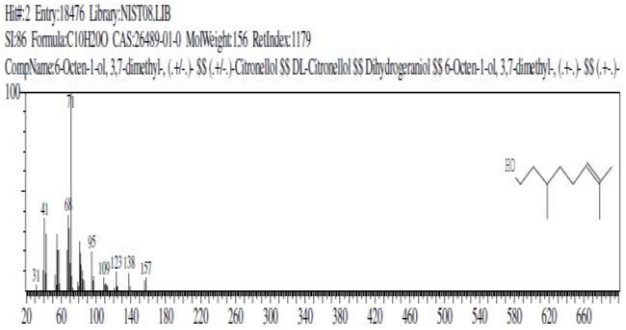

Figure 10: line 15 retention time21.8

Turkish pine:

The components of Turkish oil are shown in figures 11, 12, 13, 14, 15, 16 and 17

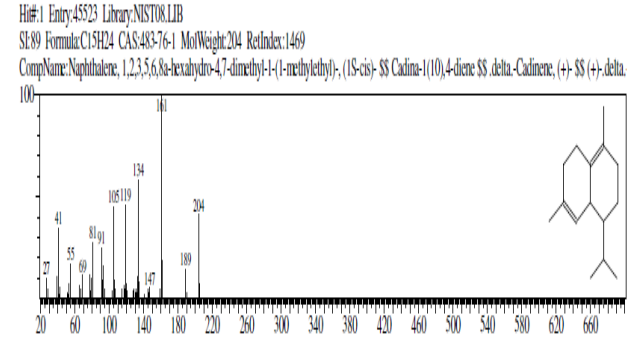

Figure 11: Line 6 retention time12.695

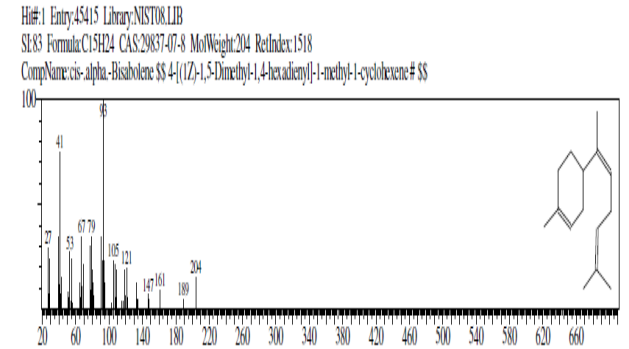

Figure 12: line 7 retention time 12.865

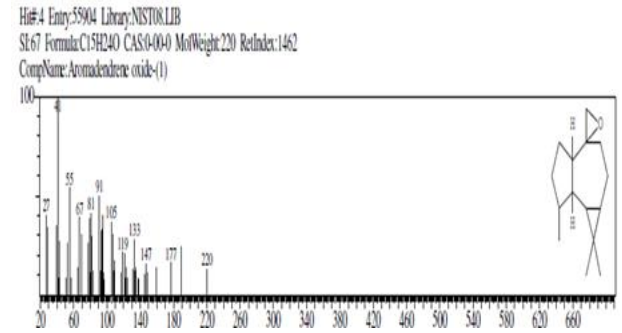

Figure 13: line retention time 9 18.125

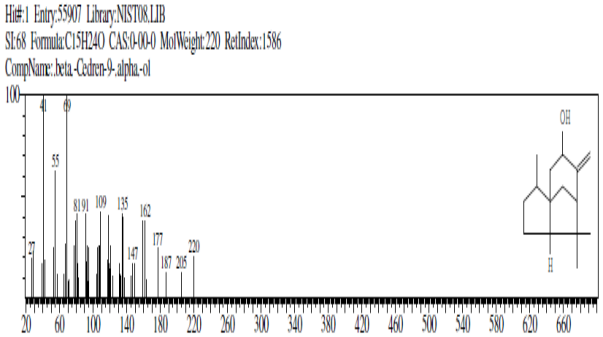

Figure 14: Line 11 retention time 18.72

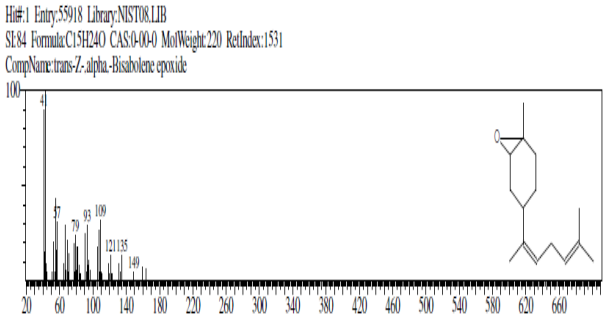

Figure 15: Line 12 retention time 19.330

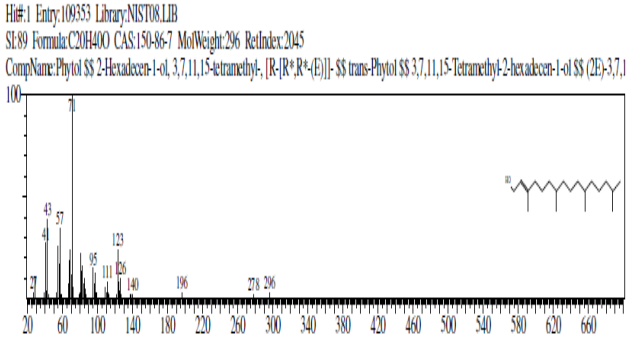

Figure 16: Line 14 retention time 21.780

The component showed little similarity the monoterpene line 5 in the Iraqi plant similar to line 6 in the Turkish. The percentage of the component trans-Z-.alpha.-Bisaboleneepoxidethe in the Iraqi plant, line 9 was 44.16 while in the Turkish, line 12the percentage was 4.85, table 1

Table 1: The major component in the Iraqi and Turkish plants

9	15.68	2645575	41.49	704416	44.16	trans-Z-.alpha.-Bisabolene epoxide
12	19.33	481527	4.00	149981	4.85	trans-Z-.alpha.-Bisabolene epoxide

The differences were in the percentage of the bisabolentogether with the presences of sesqueterpenes like cedren line 14 in the Turkish which were absent in the Iraqi plant [8]

CONCLUSION

The leaves (needle shapes) for both plants showed exactly the same figure under microscope including stomata and calcium oxalate crystals. The component of the volatile oils was varying with little similarity. The monoterpeneterpeneol was present in both plants while many sesquterpenes were present in the Turkish pine only. The percentage of the component was also different. The present study reveals the effect of climates, type of soil on the component of volatile oils.

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