Quantitative study of the volatile oil extracted from *Rosmarinus officinalis* L. growing in Karbala region as comparison with equivalent leaves imported from Jordan.

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Abstract:

A field study was conducted at the research station of medicinal plants of pharmacognosy branch/pharmacy college of Kerbala'a University to quantify evaluation of volatile oil from plants were planting at deferent spaces between plants and comparison with rosmary leaves were imported from Jordan. The experiment consisted of four treatments included rosmary plants were planted at 20, 40, 60 and 80 cm between plants and the trial was carried out by using randomized complete block design (R.C.B.D.) with three replicates. The results were referred to volatile oil content was increased with increasing of spaces between plants. The results were referred that treatment at (80 cm) as space planting between plants was gave a highest quantity of volatile oil compare with other treatments. The percentage of volatile oil of all treatments was reached to 1.90%, 2.20%, 2.30%, 2.80% respectively. The percentage of volatile oil of leaves was imported from Jordan its reached to 2.1% of volatile oil.

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Introduction :

The Rosmarinus officinalis L. is considered as one of the most important medicinal plants belonging to the Labiate family. It is a perennial plant, reaching about 1-2 meters in height with small and needle leaves. This plant is grown in houses, gardens in Jordan, Syria, and Plastain. The aqueous infusion of leaves for urinary tract infection (1), cough, asthma, and tonic for red blood cells is used in anemia patients (2). The aqueous infusion also used as gargle for mouth and tonsillitis (3).

The leaves of this plant contain about 2-3% of volatile oil that includes many active compounds such as camphor, pinene, and boraneol. The volatile oil is used in medical ointments production, especially for gout or rheumatism as muscles pain reliever (4).

Today Iraq is considered a good consumer for both dry leaves and volatile oil of this plant and imports from other countries for food, spice, and medical uses. The present work or this study was carried out to investigate the possibility of rosemary cultivation under the semi-arid environment at Karbala region.

Material and Methods :

The induction experiment of rosemary plant was carried out in the medicinal plant garden of pharmacognosy department of pharmacy college of Karrbala university during winter season (2009-2010). All field practices were carried out such as irrigation, fertilization, and weed removal, the leaves had been cut to extraction the volatile oil after four months from cultivation and were dried at room temperature (20-30°C) in a labrotary to prevent any fermentation. The rosemary plants were planted at different spaces (20, 40, 60, 80 cm) between plants. The extraction of volatile oil from both fresh and dry leaves was imported from Jordan by distillation method (5). Dried and powdered leaves from rosemary (25g) were infused into 250 ml of distilled water to obtain the volatile oil by steam using clavenger equipment (6).

All data provided were expressed as mean standard error of the mean (SEM). Analysis of statistical significance was performed using the t-test and only values with p < 0.05 were accepted as significant.

Result and Discussion :

The results of volatile oil extraction were referred to adaptation of all rosemary plants were cultivation in medicinal plant station to environmental condition at Karbala region. The adaptation of this plant may belong to the rosemary plant have small and needle leaves and covered by hairs with dark green color (8).

The morphological characteristic of this plant helps to resist drought conditions and prevents water loss from leaves surface during transpiration (9). The form of leaves with strong roots of rosemary plants increases the adaptation and resistance for semi-arid condition such as Karbala region (10), (11).

The results at table (1) were referred to increasing the percentage of volatile oil by increasing the spaces planting between plants. The space at 80 cm was obtained a higher value of volatile oil percentage and reached to about 2.80%. Other spaces (20, 40, 60) cm between plant were gave (1.90, 2.20, 2.30)% respectively.

The increasing of volatile oil percentage of rosemary leaves with increasing of spaces planting may be belong to decreasing competition effect of plants in a small area on nutrient element and other growth factors such as light and water etc (12). The increasing of quality of volatile at 80 cm space between plants may be belong to increasing the rate of photosynthesis process and increasing the dry matter production that lead to increasing secondary metabolites, such as volatile oil production (13).
Also the results were referred to the dry leaves were imported from Jordan gave less quantity of volatile oil compared with leaves from cultivation plants in this study, this results may be belong to many field practices such as method of cultivation spaces planting and cutting time with drying methods. Finally these results consider as good indicator to continue research of cultivation with chemical studies in Iraq.

References:

Table(1) Effect of space planting on volatile oil percentage(%) of rosmary leaves

<table>
<thead>
<tr>
<th>Space planting (cm)</th>
<th>Percentage of volatile oil (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>2.80</td>
</tr>
<tr>
<td>60</td>
<td>2.30</td>
</tr>
<tr>
<td>40</td>
<td>2.20</td>
</tr>
<tr>
<td>20</td>
<td>1.90</td>
</tr>
</tbody>
</table>
|                     | 1.126                          | L.S.D. 0.05

Figur(1) Relation ship between volatile oil quantity (%) and spaces planting (cm)