TLC Screening of Rosemary Volatile Oil after Treatment with Macro and Micro Elements Fertilization

Mohsen.A.EL Hassady

***Abstract*--**The present paper concerns with TLC screening of volatile oil obtained from the aerial parts of *Rosemarimus officinalis* herb cultivated in theexperimental farm of horticulture department, faculty of agriculture, El-Beida, Omar El-Mukhtar University,Libya. Twenty samples of volatile oil were prepared by hydro-distillation method using Clevenger's apparatus after treating the plant with graded level of chemical compound fertilizers [macro-elements: NPK sodium ,phosphorus and potassium] and some micro-elementsiron (Fe), zinc (Zn), manganese (Mn) and their mixture.This investigation includes comparison between thenumber of spots [number of the main volatilecompounds] , the colour after spraying with specific reagent [indicating the intensity of each volatile compound] and the retardation factor [Rf values] foreach colored spot in the chromatogram both in day and under UV light for each treatment. This study revealedthat most examined samples showed six main volatile components having nearly the same Rf values.

***Keywords*—**Volatile compounds, micro-elements, macroelements, osemarimus.

I. Introduction

ROSEMARY is Dendritic plant follow oral family (Lamiaceae), his tall 50-200 cm with dense branches leaves sitting linear green leather textures with edges folded out and rough surface of the upper and intertwined with white whiskers in the bottom surface[2]-[5].

His lips the cup 3-4 mm in length and the upper lip is made up of one lobe ovoid either smooth bottom is composed of two lobes are shaft shape green color purple. Corolla 10-12 mm length consisting of the upper lips split into two parts The bottom is composed of three lobes with a pale blue color or purple and some times are pink or white. (tabe1) [14]-[8].Rosemary plant Spreading in Libya within many areas, including (Tripoli, Al-khoms, and janzour) as well as in the Gebel Akhder where resides in (Ras al-Hilal, Marg, Tokrah,and Derna) [1]-[3]. Globally there is naturally in the countries of the Mediterranean basin (France, Spain, Portugal and Morocco, in addition to other countries (such as South Africa, India, China, Australia, Britain and America) (Leung and foster1996).

Mohsen A. EL HASSADY, Department of Botany, Faculty of Art and Sciences, Omar Al-Mokhtar University, Derna, Libya.
(Email: mhras.mhras@yahoo.com or marwan2004h@yahoo.co.uk)

As a result of the foregoing This study aims to: -
Characterization and definition of the chemical components of the volatile oil using a technique TLC (Thin layer chromatography).

II. Materials And Methods

Thin Layer Chromatography (TLC)

In the beginning was activated panels Sulaikajl (2020 cm , 254F, 0.25 mm , E. Merck, Darmstadt, Germany) by heating for one hour at a temperature of 105ºC , then was taken the amount of 100 micro liter of oil and placed at the bottom of the plate (at the starting line) after Leave a distance of about 1.5 cm bottom plate , then transfer pad of silica gel and placed inside a glass aquarium , was the use of a mixture of benzene : ethyl acetate by (5:95 v / v) to separate the components of the volatile oil , and after the completion of the separation process has been spraying the substance Manifesting Vaniline sulfuric acid were examined in packages consisting of visible light have been identified as the color and coefficient delay or disability Retardation factor (Rf) for each package composed . According to method Vekiari [11].

III. Results

The results showed the analysis of volatile oil for the Rosemary initially using this technique table (1) and figures to the disparity in the number of packets phenomenon totals for the main components of the volatile oil to twenty sample studied him, which represent various transactions that have been referred to at the examination in visible light or ultraviolet radiation.

At the level of assay plates using visible light recorded the fourth sample, which represents the element zinc treatment plant only, and the fourteenth, which represents zinc treatment plant is also the second level with the emergence of two packages only factor impeding Rf (0.19, 0.11). Twenty sample also recorded, which represents the treatment plant micronutrients three together with five third-level packages have Rf values ranged (0.63 - 0.14). While the rest of the samples are recorded for different transactions six packs her Rf values ranged (0.63-0.14).

When examining samples of volatile oil above ultraviolet radiation recorded fourth sample packs of three pilot fuel by a factor of obstruction Rf (0.24, 0.19, 0.11). Recorded while the rest of the samples by a factor of three packages and hindering Rf (0.63, 0.48, 0.24).

With reference to participate in some packages valued at Rf her examination of visible light or ultraviolet radiation.

TABLE I
COEFFICIENT VALUES OF DISABILITY (RF) FOR THE PLANT DIADEM ON DIFFERENT LEVELS ON THE TLC PLATES.

Ultraviolet								
Package --------- Sample	1	2	3	4	5	6	7	8
1	-	-	-	0.24	-	-	0.48	0.63
2	-	-	-	0.24	-	-	0.48	0.63
3	-	-	-	0.24	-	-	0.48	0.63
4	0.11	-	0.19	0.24	-	-	-	-
5	-	-	-	0.24	-	-	0.48	0.63
6	-	-	-	0.24	-	-	0.48	0.63
7	-	-	-	0.24	-	-	0.48	0.63
8	-	-	-	0.24	-	-	0.48	0.63
9	-	-	-	0.24	-	-	0.48	0.63
10	-	-	-	0.24	-	-	0.48	0.63
11	-	-	-	0.24	-	-	0.48	0.63
12	-	-	-	0.24	-	-	0.48	0.63
13	-	-	-	0.24	-	-	0.48	0.63
14	-	-	-	0.24	-	-	0.48	0.63
15	-	-	-	0.24	-	-	0.48	0.63
16	-	-	-	0.24	-	-	0.48	0.63
17	-	-	-	0.24	-	-	0.48	0.63
18	-	-	-	0.24	-	-	0.48	0.63
19	-	-	-	0.24	-	-	0.48	0.63
20	-	-	-	0.24	-	-	0.48	0.63

Visible light								
Package --------- Sample	1	2	3	4	5	6	7	8
1	-	0.14	-	0.24	0.32	0.44	0.48	0.63
2	-	0.14	-	0.24	0.32	0.44	0.48	0.63
3	-	0.14	-	0.24	0.32	0.44	0.48	0.63
4	0.11	-	0.19	-	-	-	-	-
5	-	0.14	-	0.24	0.32	0.44	0.48	0.63
6	-	0.14	-	0.24	0.32	0.44	0.48	0.63
7	-	0.14	-	0.24	0.32	0.44	0.48	0.63
8	-	0.14	-	0.24	0.32	0.44	0.48	0.63
9	-	0.14	-	0.24	0.32	0.44	0.48	0.63
10	-	0.14	-	0.24	0.32	0.44	0.48	0.63
11	-	0.14	-	0.24	0.32	0.44	0.48	0.63
12	-	0.14	-	0.24	0.32	0.44	0.48	0.63
13	-	0.14	-	0.24	0.32	0.44	0.48	0.63
14	0.11	-	0.19	-	-	-	-	-
15	-	0.14	-	0.24	0.32	0.44	0.48	0.63
16	-	0.14	-	0.24	0.32	0.44	0.48	0.63
17	-	0.14	-	0.24	0.32	0.44	0.48	0.63
18	-	0.14	-	0.24	0.32	0.44	0.48	0.63
19	-	0.14	-	0.24	0.32	0.44	0.48	0.63
20	-	0.14	-	0.24	0.32	0.44	0.48	0.63

IV. DISCUSSION

The results of the analysis of volatile oil extract from Rosemary above-mentioned initially using this technique and through examination visible light and ultraviolet radiation, to the lack of contrast and a clear difference in the proportion of aggregates major oil pilot with the exception of the sample treatment with zinc or only when you add it to the second level, which resulted in significantly to the difference in these major groups through the low number of packets with the emergence of other groups by a small factor impeding various This variation was clearly evident on examination, visible light or ultraviolet radiation..[6]-[10].

The variation ratio of volatile oil, including the totals for the major as one of the active substances in addition to other materials has indicated previously in many studies. In a study on the plant Itr showed that zinc spray the plant led to an increase in the proportion of the crop and the proportion of volatile oil and alcohols Alstrainellol college where [12].

Also showed plant lemongrass increase in the proportion of crop oil with increased installers citral and Djiranjol when sprayed zinc [7], that the behavior of Zn including seeming Tgieraly quantity and quality of active substances may be extended to include other compounds When sprayed leaf basil (basil) this element cause an increase in the rate and yield of oil Basnavh to the proportion of carbohydrates that enter in the composition of glycosides and nitrogen, which enters in the composition of alkaloids [15].

The spray also fennel plant this element led to an increase in the yield of volatile oil and other elements involved in the installation of active substances Kalkrbuhedrat nitrogen and phosphorus [13]. Workshops this element in various concentrations to plant Alancholesia led to increased material Alkiomaran as one of the active substances. In the opposite of what appeared Tusilna Aleh study Moretti et al [4] The iron key role in changing the ratio of volatile oil, including the totals for the main plant when sprayed by Rosemary.

REFERENCES

[1] Agina, E.A.; Attoa,G.l.; El-Khayat, A.S. and El-Hadad, E.A.E. ((2001)Physiological and chemical response of lemongrass Cymbopogon citratus) plant to some Mineral fertilizers). Annals of Agric. Sci., Moshtohor , Vol. (39) No. (2) PP: 1041-1062.

[2] Ali, M .S . ; Yazdani, D .; Badi , N.H. ; Ahwazi , M . And Nazari, F .(1999) . Effect of N and P fertilizer levels and harvesting schedule on dry matter and oil yields in peppermint (Mentha pipperita) journal of Medicinal and Aromatic Plants Sciences . 21 : 927- 930 .

[3] Amin, I.S. and Abdel- Wahab. M.A. (1999) .Effect of chemical fertilization on (Cuminum cyminum .L). Oil constituents under north Sinai conditions Annals of Agric . Sci. Mshtohor .37 (1) : 487- 502.

[4] Attia, M.M.A.A. (1995) . Effect of some trace elements on growth and essential oil of Geranium, Pelargonium graveolens L. Her. M. Sc. Thesis, Fac. Agric. Cairo Univ.

[5] Baratta, M.T. ; Damies Dorman , H.J. ; Deans , S . G ; Biondi , D. M .and Ruperto , G . (1998) . Chemical composition Antimicrobial and Antioxidative activity of laurel , Sage , Rosemary , Oregano and Coriannder Essential oil J. Ess. Oil .Res .10, 618-627. http://dx.doi.org/10.1080/10412905.1998.9700989

[6] Bidwell,R.G.S.(1980)."Plant Physiolgy" 2nd . Ed . Callier Macmilan publisher , London-New York.

[7] Bruneton , J . (1995) . Pharmacognosy , Phytochemistry , Medicinal Plant . Paris : Lavoisier Publishing .

[8] Budavari, S. (1996). The Merck Index : An Encyclopedia of chemicals , Drugs , and Biologicals , 12thed .Whitehouse station , N . J . Merck and Co , Inc .

[9] Buckman,H.O. and N.C.Brady . (1960).The nature and properties of soil .Mc Millan,N.Y.567p

[10] Clevenger, J.F.(1982). Apparatus for determination oil .- J.amer . Pharmac . Assoc . 17:346.

[11] Del Bano,J.M.; Lorente,J.; Castillo, J., Benavente-Garica, O.,DelRio,J.Aortuno,A.,Quirin,K.Wand Gerard,D.,(2003).Phenolic diterpenes , flavone ,and rosmarinic acid distribution during the development of leaves,flowers ,stems,and roots of(Rosmarinus officinalis L.) Antioxidant activity.J.Agric.Foodchem..51.4247-4253.

[12] Del Campo, J.; Amiot, M.J and Nguyen, C., (2000). Antimicrobial effect of rosemary extracts. J. Food Prod63,1359-136.8

[13] Dzida, K.(2007).Influence of varied nitrogen-potasium fertilization on yield, essential oil content and mineral composition at garden thyme herb (Thyme vulgaris L.)

[14] Dovjak V. (1988). Fertilization effect by NPK-nutrients, molybdenum and boron on the dry matter formation dynamic, nutrient consumption, drug yield and essential oil formation in chamomile (Matricaria chamomilla L.) plant. Poľnohospodárstvo, 34(10): 906–924