

# Chemical Components Essential Oil from Syrian Rosmarinus Officinal L

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## Abstract

The essential oil isolated from the air - Rosmarinus officinalis L was analyzed by gas chromatography-mass spectrometry (GC-MS). The main components have been identified were 3,5,5-trimethyl-1-Hexene (51.30%), Borneol (8.22%), Camphor (7.67%), VerBenone (5.95%), 1,8 CINEOLE (3.69), cis-Myrtaol (2.64%), Isoaromadendrene epoxide (2.18%), alpha-TERPINEOL (2.01%), BORNYL ACETATE (1.98%), L-LINALOOL (1.46%).

**Keywords:** Essential oil, GC-MS, Rosmarinus officinalis L, Clevenger apparatus.

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## 1. Introduction

Rosemary has been used since ancient times. Its flowers were used by the Greeks and Romans to decorate it, and it was also grown in the gardens of kings as an aromatic and ornamental plant. It was also used in the medical field as a memory tonic. [1,2]

Its antioxidant activity was discovered in 1950 and rosmarinic acid was isolated from it by two scientists Oriente. Scarbati 1960

The plant was used as a nocturnal plant, as well as a treatment for its medicinal benefits, as a nerve tonic, anti-rheumatic, wound-healing, circulatory-stimulant, and anti-fungal [3,4].

Rosemary contains phytochemicals, including rosmarinic acid, camphor, caffeic acid, ursolic acid, betulinic acid and the antioxidants carnosic acid and carnosol [5].

### 1.1 Morphological description of the plant:

Rosemary is an herbaceous semi-shrub plant, perennial evergreen, with a wild shrub and a small horticultural branch, with a strong aromatic smell and a slightly bitter camphor taste. It grows in all soils, especially limestone. It is found in the dry rocky hills of the Mediterranean countries, and it also tolerates temperatures. 01 (° C, its height reaches 90 cm and may reach 2 meters. - Low and grows in warm regions)

In this research, the essential oil was extracted from the leaves of the rosemary plant using a Clevenger apparatus, where the percentage of essential oil was 1.3%. The chemical components of the extracted essential oil were analyzed by chromatography connected to a mass spectrometer

## 2. Experimental

Plant material the leaves of (Rosmarinus officinalis L.). were collected in Septamper2021, at Homs city in Syria, the samples were dried in a shad ventilated place

### 2.1 Oil isolation

250 g of dried (Rosmarinus officinalis L.) leaves was subjected to hydro distillation with a Clevenger-type apparatus as described by the European Pharmacopoeia and extracted with 1L of water for 180 min at 100°C. The essential oil was collected and analyzed by GC-MS.

Gas chromatography-mass spectrometry analysis of oils was carried out by GC-MS chromatography (GC-Agilent 7986, indicator: inert-MS) in Atomic Energy Commission (AECS)-Qattinah, Syria. This instrument was fitted with an HP-5MS capillary column (30cm×0.25mm i.d., film thickness 0.25µm). The temperature injector and indicator are 250 °C. The oven temperature program was 60-270°C (2.5°C per min.). The identity of components was ascertained based on the spectra and compared with library and literature data. Also, the identification of each compound was confirmed by comparison of its retention index with those of authentic compounds

### 2.2 Results and discussion

The yield of the essential oil was (1.3%) and the chemical composition is shown in the following table (1).

Table 1. The chemical composition of the essential oil

Peak	Area%	Name
1	4.077	1-Hexene, 3,5,5-trimethyl-
2	7.076	Heptane, 5-ethyl-2,2,3-trimethyl
3	8.068	1,8 CINEOLE
4	8.750	gamma.-Terpinene
5	10.065	L-LINALOOL
6	10.703	Bicyclo[3.1.1]hept-2-en-6-one, 2,7,7-trimethyl
7	11.646	Camphor
8	12.558	1-BORNEOL \$\$ Bicyclo[2.2.1]heptan-2-ol, 1,7,7-trimethyl-, (1S-endo)- (CAS) Linderol
9	13.318	alpha.-TERPINEOL
10	13.803	VERBENONE
11	15.139	cis-Myrtanol
12	15.940	2-Cyclohexen-1-one, 3-methyl-6-(1-methylethenyl)-,
13	16.552	BORNYL ACETATE
14	17.092	Phenol, 2-methyl-5-(1-methylethyl)
15	18.589	PIPERITENONE
16	19.125	Phenol, 2-methoxy-5-(1-propenyl)
17	19.846	Bicyclo[3.1.1]heptane-2-methanol, 6,6-dimethyl-, acetate
18	20.893	3,5-Heptadienal, 2-ethylidene-6-methyl
19	21.913	beta.-CARYOPHYLLENE
20	23.332	alpha.-Humulene \$\$
21	24.283	gamma.-curcumene
22	25.900	DELTA.-CADINENE
23	28.538	Caryophyllene oxide
24	28.992	Cyclohexene, 6-ethenyl-6-methyl-1-(1-methylethyl)-3-(1-methylethylidene)-
25	29.628	12-Oxabicyclo[9.1.0]dodeca-3,7-diene, 1,5,5,8-tetramethyl-, [1R-(1R,3E,7E,11R
26	30.741	2(1H)-Naphthalenone, 4a,5,6,7,8,8a-hexahydro-4a,8a-dimethyl-, cis-
27	31.560	Isoaromadendrene epoxide
28	32.769	alpha.-Bisabolol
29	39.318	1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester
30	41.852	Hexadecanoic acid, methyl ester
31	44.216	Phosphonous dichloride, (1,7,7-trimethylbicyclo [2,2,1] hept-2-yl)
32	44.625	Naphthalene,1,2,3,4,4a,5,6,8a-octahydro-4a,8-dimethyl-2-(1-methylethenyl)-, [2R(2.alpha.,4a.alpha.,8a.beta.)]-
33	45.479	BORNYL ESTER OF 3-ISOPROPYLIDENE-CYCLOPENTANECARBOXYLIC ACID
34	47.058	Bicyclo[3.3.1]nonan-9-one, 2,4-dimethyl-3-nitro- (exo)-
35	47.485	Cyclopentanecarboxylic acid, 3-methylene-, 1,7,7-trimethylbicyclo[2.2.1]hept-2-yl ester
36	47.952	n-Tetracosane
37	51.268	n-Octacosane
38	54.443	Tricosane
39	57.482	N-NONADECANE
40	60.401	N-EICOSANE
41	61.019	1,2-Benzenedicarboxylic acid, dioctyl ester
42	63.085	Pentacosane
43	66.067	HENEICOSANE
44	69.718	n-Hexatriacontane
45	74.199	n-Tetratetracontane
46	79.958	Dotriacontane

### 2.3 Results and Discussion

The composition of the leaves oil from Rosemary are presented in Table -1- Forty-six constituents were identified, which represented 100 % of the total composition of the essential oil The most prominent compounds were 3,5,5-trimethyl-1-Hexene (51.30%), Borneol (8.22%), Camphor (7.67%), Ver Benone (5.95%), 1,8-Cineole (3.69), cis-Myrtanol (2.64%), Isoaromadendrene epoxide (2.18%), alpha-TERPINEOL (2.01%), Bornyl Acetate (1.98%), L-Linalool (1.46%).

While the main component in the essential oil extracted from the leaves of the plant growing in Patras,

Greece is eucalyptol (40.1%) [6]. The main constituents of the essential oil from Pakistan were 1,8-cineol (38.5%), Camphor (17.1%) [7].

### 3. Conclusion

Forty-six compounds of the essential oil extracted by steam dredging method were identified from the *Rosmarinus officinalis* Syrian and the yield of the essential oil was (1.3%), The main components of the essential oil were 3,5,5-trimethyl-1-Hexene (51.30%), Borneol (8.22%), Camphor (7.67%), Ver Benone (5.95%), 1,8 Cineole (3.69), cis-Myrtanol (2.64%), Isoaromadendrene epoxide (2.18%), alpha-TERPINEOL (2.01%), Bornyl Acetate (1.98%), L-Linalool (1.46%).

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