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Identify the compounds in the oils of peppermint essential oil using Spectrometry, GC and G2C / MS

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ABSTRACT: Scientific name Mentha piperita Peppermint is one of the most widely used medicinal plants in addition to therapeutic effects as a flavoring in various food products used. In this study, after collecting and drying of leaves to water distillation (Hydro distillation) by Clevenger ((Clevanger apparatus essential oils extraction plant and identification of compounds was performed by GC-MS system. The resulting oil by GC and GC / MS were analyzed. Chemical components of each oil by spectroscopy, MS and comparable indicators with reliable sources revealed. 20 combinations were identified. compounds with the highest essential oil plant, Mentha piperita L comprised of Pecanol (kI = 1196) (3/30), Cripton (kI = 1185) (84/11), Trypene (kI = 1177) (76/20), respectively.

***Keywords*:** Oil, Peppermint, Clevenger, Essential oil compounds.

INTRODUCTION

Lamiaceae family with 187 genera and 3,000 species. This particular species of dark spread almost all over the world. Scientific name and common name Peppermint Peppermint Mentha piperita plant since ancient times as an aromatic plant and appetizing been used. The medicinal properties of mint can be anti-spasm, prevention of vomiting, carminative and cooling, it noted. Peppermint is one of the most popular herbs in the world oil annual consumption of about 7,000 tons. The essence of this plant varies depending on culture conditions Byn3-1%. Pyrmynt essential oil menthol, which is called a matter of creating the sensation in the mouth. As a result of this essential oil as a flavoring and aromatic in medicines, toothpaste, chocolate mint and gum are used. The antimicrobial activity of essential oils on microorganisms crops has long been recognized and many studies on the plant species and the impact on microorganisms they carried oil or extract (Tylor, 1993). Peppermint essential oils of the mint family with a rich source of food that has a major cost. Home peppermint leaves its ingredients and components by TLC, was investigated in 1994 by Guedon and Pasquier. Despite Because studies of peppermint is one of Iran's native plants and every year huge amounts of it are exported to foreign countries. You can use many of the plant's value. despite of essential constituents also very dependent on weather conditions and geographical location, extraction, packaging and storage conditions, and so on, and since the antimicrobial effect of essential oil constituents depending on it. It can be expected that Iran peppermint essential oil made from plants have different characteristics. Thus, according to the material purpose of the study and identification of compounds in the essential oil of Mentha piperita plant using spectroscopy GC and GC / MS was.

MATERIALS AND METHODS

Tools and Methods

Preparation plants: peppermint plant located in the city of Jiroft were collected from the farm. As we tried to collect Plants healthy and completely without injury. An example of a new plant in Pharmaceutical Research Institute (SID) compared with herbarium specimen, a new on-site laboratory was dry within 5 days.

Extraction of essential oils

Peppermint essential oil extracted by steam distillation (Hydodistilation) and moved Clevenger extraction device and a value of 1 liter of distilled water were added. Extraction operation was continued for 4 hours. During the operation, due to the volatility of essential oil with steam distillation and collect Clevenger were collected in the pipes. Because the density of the oil is less dense than water, so the oil was extracted from the aqueous phase and can easily be separated by the drain valve. Since essential oils to light, oxygen and temperature sensitive and their compounds in such circumstances changed. Therefore at this distance of extracted essential oil into a dark glass packaging was transferred to the injection was refrigerated. Then MS- GC injection device and identify compounds were transferred to specialized laboratories.

Identify the essential ingredients

Whereas in the case of antimicrobial properties of essential oil of peppermint should know that the property on which of the components is essential, therefore, to identify compounds also took place. After draining the oil extraction for quantitative and qualitative analysis of the oil was diluted by n-hexane. Samples prepared by gas chromatography combined with mass spectrometry (GC- MS) was injected Since molecular weight and polar compounds in oil are known as volatile. Separation and identification of the essential oils extracted composition by gas chromatography combined with mass spectrometry (GC- MS) was carried out. For this purpose, the mass spectra obtained from devices (GC- MS) with standard mass spectrum in resources (AdamsR.P: 2004) were compared . To confirm the identification carried out by the whole mass of Koats inhibition index was used.

Specifications GC- MS

Hewlett-packard6890 chromatograph coupled with Ms5973hp
Column: Hp-5ms (5% phenyl: 95% dimethil siloxane 30m × 0.25mm film thickness 0.32µm(
Kovadrpol temperature: 180c, interface temperature GC, 280C = Mass
=Helium carrier gas, gas flow rate = 1Ml / min, the ionization energy = 70ev

How to calculate the inhibition Addis Koats (KI)

Koats retention indices (KI) can be any combination of at least two Alkanes Chromatogram mixture of subject matter considered normal retention time is measured. Normal alkanes grading standards that have been established and the index definition Koats a normal Alkanes 100 times more carbon in it. Koats index is independent of temperature and column dimensions friendly.

The relationship between inhibition index Koats:

$$KI = 100n + 100\left(\frac{t_{(x)} - t_{(n)}}{t_{(n+1)} - t_{(n)}}\right)$$

In the above equation, we have:
t (x) retention times unknown sample.
t (n) time to prevent normal inhibition previous Alkanes.
t (n + 1)) retention times normal Alkanes next inhibition.
KI: Koats inhibition index.
n: number of carbon atoms previous normal Alkanes.

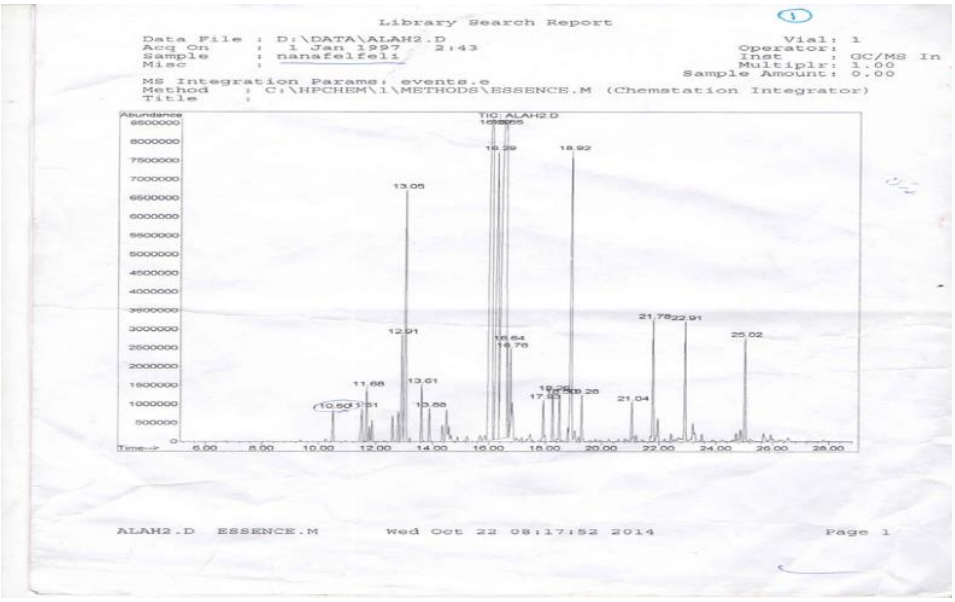
For example, inhibition index Koats the compounds found in the plant Mentha piperita. Obtained using the number combination Nzz comparison with the reference index range (2004, Adames) and compare and evaluate failures in the actual composition of the index Koats we realized.

RESULTS AND DISCUSSION

Results

Identify each oil components by performing spectroscopy (MS) and indices (KI) with (RP Adames,) was found. The composition of the essential oil in the herb Mentha piperita 20, respectively. Identify the components shown in the following table.

Number	Combination	Percent%	KI	Retention time(min)
1	Ethyl tiglate	0/61	935	10/26
2	Ethyl tiglate	0/80	935	11/51
3	Furfural acetate	0/80	989	67/11
4	Santolina alcohol	2/48	1040	12/92
5	Hexalactone	6/37	1046	13/05
6	Tolualdehyde	1/09	1069	13/61
7	Vertoctrol	0/68	1080	13/88
8	Terpinen	20/56	1177	16/1
9	Cryptone	11/84	1185	16/29
10	Pecanoal	30/3	1196	16/55
11	Dihidrocaranon	1/73	1200	16/64
12	Verbinon	1/37	1206	16/76
13	Cinamialcolhl	0/93	1261	17/93
14	Lsopnleglacta	0/99	1277	18/26
15	Bornilacetat	0/98	1288	18/50
16	Guaiacol	8/97	1309	18/9
17	Menta	0/86	1327	19/28
18	Anthranilate	0/77	1415	21/04
19	Jastmonil	2/74	1455	21/08
20	Guaiacol	2/58	1515	22/91
21	Hexsil phenylactat	2/25	1626	25/02



Discuss

Due to the withdrawal of n-alkanes and compare the mass spectrum obtained GC -MS from devices with standard mass spectra of the sources (2004, Adames), it was found that the cost of the whole of crime are closely related to the combination and to confirm the identification by mass spectra, retention indices were Koats the result is considered. Moreia and colleagues reported in 2005, the essential oil of peppermint. The results of this study do not meet Properties. The different findings may be due to intrinsic properties of essential oils such as pre-harvest factors such as variety, environmental conditions and ecological factors .... and differences in methods of extraction of essential oils, different bacterial strains tested with the test conditions.

CONCLUSION

As the essential oil of peppermint plant Since oil different compounds with different concentrations of the plant growth environment culture morphological conditions of use drug that exists According Research conducted previous research results in the need for research Dardta more can be achieved more goals.

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