SEASONAL VARIATION IN THE ESSENTIAL OIL COMPOSITION OF *ORIGANUM SYRIACUM* L. SUBSP. *SINAICUM* GREUTER AND BURDET; EVALUATION OF ITS TOCOLYTIC ACTIVITY

BY

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ABSTRACT

*The essential oil of **Origanum syriacum** L. subsp. **sinaicum** Greuter and Burdet obtained by hydrodistillation during four seasons was analyzed by GC-MS. The composition of the oil showed qualitative and quantitative variation. Carvacrol was the major component (64.71%, 36.50%) in summer and spring oils, respectively. The next major components in these seasons were sabinene hydrate<trans> (18.28%) and γ-terpinene (13.50%) in spring, and γ-terpinene (9.30%) and p-cymene (7.60%) in summer. The oil prepared in autumn revealed thymol as the major component (19.55%), followed by sabinene hydrate <trans> (18.32%) and sabinene (14.85%),while that prepared in winter showed sabinene hydrate<trans> as the major component (32.96%) followed by thymol (30.80%). **In vitro** study of the tocolytic activity of the essential oil and 70% ethanol extract of **O. syriacum** L. subsp. **sinaicum** Greuter and Burdet on rat uterus was carried out. Essential oil (18 μg/ml) and 70% ethanol extract (200 μg/ml) produced marked inhibitions in the uterine contractility of non-pregnant rats (50% and 65% in the normal frequency and 36% and 48% in the normal amplitude, respectively); the area under the curve was also decreased (60% and 82% respectively). Oxytocin-and KCL-induced uterine contractions were significantly decreased following addition of either the essential oil or the 70% ethanol extract.*

INTRODUCTION

The genus *Origanum* (Family Lamiaceae) comprises about 30 species of perennial herbs native to the countries bordering the Mediterranean Sea (Bailey, 1953). Members of the genus have been used medicinally since antiquity (Ibn Sina, 1935 and Ibn El Bitar, 1980). Uses in folk medicine include respiratory problems, coughs, rhinitis, colic, headache, upset stomach and painful menstruation. (Batanouny *et al.*, 1999 and Der Marderosian and Beutler, 2002). Some *Origanum*s may have antioxidant effects due to the phenols carvacrol and thymol, hydroxycinnamic acid derivatives, and flavonoids (Baricevic and Bartol, 2002).

Components of the essential oil of *Origanum* species show great variation according to the plant habit; thymol, carvacrol, *p*-cymene, sabinene hydrate and *γ*-terpinene were identified as major constituents of these oils (Komaitis *et al*., 1992, Baser *et al*., 2003, and Schulz *et al.,* 2005).

Origanum syriacum L. is represented by three varieties (Ietswaart, 1980), among which subsp. *sinaicum* Greuter and Burdet is native to Sinai, Egypt. It is commonly used by Bedouins (Batanouny *et al*., 1999 and Boulos, 2002). A previous study of the chemical composition of the oil of these varieties revealed the existence of thymol, thymol-carvacrol and carvacrol-thymol chemotypes (Figuérédo *et al.,* 2005).

In this study, the effect of seasonal variation on the chemical composition of the essential oil of *Origanum syriacum* L. subsp. *sinaicum* Greuter and Burdet cultivated in Egypt is investigated. In addition, the study was planned to examine the effects of the essential oil, as well as, the 70% ethanol extract on the uterine contractility of non-pregnant rats *in vitro* and to explore the possible mechanism of actions of the resultant uterine effect. Further work on the species is under way.

EXPERIMENTAL

Plant Material:

Samples of aerial parts of *O. syriacum* L. subsp. *sinaicum* were obtained at different time intervals, covering the four seasons, during 2006/2007 from plants cultivated in the Experimental Station of Medicinal Plants, Pharmacognosy Department, Faculty of Pharmacy, Cairo University, Giza. Original plant samples were collected from Saint Catherine area and had been successfully propagated since 1989 in the Experimental Station. The identification of the plant was kindly confirmed by Prof. Dr. Lotfy Boulos, Professor of Plant Taxonomy, Faculty of Science, Alexandria University. Voucher specimens are deposited at the Museum of the Pharmacognosy Department, Faculty of Pharmacy, Cairo University. Air-dried samples (in shade) were coarsely powdered and packed in dark-colored, tightly closed containers before use.

Preparation of the Oil:

The oil was prepared by hydro distillation of 500 g of the air dried aerial parts. The oil in each case was dried over anhydrous sodium sulfate and kept refrigerated until analysis. Percentage yield was determined according to the Egyptian Pharmacopœia, 1984.

Material for Pharmacological Study:

1-Experimental animals: Forty-two adult female non-pregnant rats weighing 120-140 g were obtained from the animal facility, Faculty of Pharmacy, Al-Azhar University, Cairo, Egypt. The animals were kept on standard laboratory diet; water was given *ad libitum*. They were housed at standardized conditions of temperature and humidity.

2-Drugs and chemicals: Oxytocin (Syntocinon ampoule, 10 I.U./ml = 20 μg/ml): Sandoz Company (Switzerland), diluted with Krebs solution to obtain a

concentration of 10^{-11} M in the organ bath (Hamada *et al*., 1989), and KCl: Merck Company (Germany), dissolved in distilled H_2O to yield a final bath concentration of 6.7 mM were used for induction of uterine contractions. Ritodrine HCl (Yotopar ampoule, 50 mg/5 ml): Pharco Pharmaceuticals Company, Alexandria., Egypt, was diluted with distilled H_2O and used at a concentration of 1.2 x 10^{-7} M as a standard tocolytic agent (Ikeda *et al*., 1984).

3-Test solutions: were prepared as follows; the essential oil (summer season) was prepared in a concentration of 1/1000 by levigating 0.1 ml of the oil with 0.2 ml tween 80 (El-Nasr Chemical company, Abu-Zaabal, Egypt) and the volume adjusted to 100 ml with distilled H_2O. The ethanol extract was prepared by cold percolation of 500 g air-dried powder with 70% ethanol (yield=18.9%). A 0.1% w/v solution of the solvent-free extract in distilled water containing 1 ml of Tween 80 and 0.1 ml dimethylsulphoxide (BDH, England) and completed to 10 ml with distilled water was used.

Investigation of the Essential Oil:

GC-MS analysis: The essential oils obtained at different seasons were subjected to GC/MS using Thermo Trace GC 2000 (Thermo quest, Texas, USA)/MS Finnigan mat SSQ 7000 system. The instrument was equipped with DB-5 column, 30 m x 0.25 mm i.d., 0.25µm film thickness (J&W Scientific, USA); carrier gas: Helium; injection temperature: 220°C; oven temperature program, initial temp: 40 °C isothermal for 3 min., then heating to 160 °C at 4°C/min, followed by10 °C/min to 280 °C; ionization mode EI; ion source 70 ev.; mass range: 40-500 amu.

Identification of the oil constituents: was achieved by library search on a Willey 275 L GC-MS and by comparing their retention indices and mass fragmentation pattern to those of the available references as well as of published data (Kovat, 1965, Davis, 1990 and Adams, 1995). The quantitative estimation was carried out by relative peak area measurement. A series of authentic *n*-alkanes was subjected to GLC under the same conditions. The retention time of each *n*-alkane was observed and the Kovat's index of each oil constituent was calculated.

Pharmacological Methods*:*

The animals in the dioestrus stage (as detected by vaginal smears) were sacrificed. The abdomens were dissected and the two uterine horns from each rat were exposed avoiding stretching of uterine smooth muscles. One horn from each rat was freed from its surrounding fat and mesenteric attachments. A myometrial strip of length about 3 cm was cut longitudinally and transferred to a petri dish containing Krebs solution. Silk threads were tied at both the top and the bottom of the uterine strip. The bottom thread was attached to a hook connected to an aeration tube in the organ bath. The top thread was attached to T_3 isotonic transducer connected to a strain gauge coupler FC117 placed on the oscillograph (Washington 400 MD_2 oscillograph, Bioscience, England). After an equilibrium period of 30 min, different concentrations of the oil (9, 18, 27 and 36 µg/ml) as well as the 70% ethanol extract (100, 200, 300 and 400 µg/ml) were separately added followed by twice washing (after 5 min) with

Krebs solution during 6 min period. Oxytocin and KCl were separately added after incubation of the uterine muscle with either the oil or the 70% ethanol extract for 5 min. The recordings were analyzed by measuring the frequency (number of cycles), amplitude (average peak height in cm) and the area under the curve (AUC; in cm^2) which were taken as measures of the force of uterine contraction (Moustafa *et al.*, 1999).

The isolated uteri were classified into 7 groups, 6 rats each, as follows:

Groups 1 and 2: were used for studying the effect of the oil and the 70% ethanol extract at concentrations of 9-36 μg/ml and 100-400 μg/ml respectively on the normal uterine contractions.

Group 3: was used for studying the uterine relaxant effect of Ritodrine at a concentration of 40 ηg/ml ($1.2x10^{-7}$ M) and served as a standard group.

Groups 4 and 5: were used for studying the uterotonic effects of oxytocin (10^{-11} M) and KCl (6.7 mM) and served as control groups.

Groups 6 and 7: were used for studying the effect of the oil (18 μg/ml) and the 70% ethanol extract (200 μg/ml) on the uterine response to each of oxytocin (10^{-11} M) and KCl (6.7 mM).

Statistical Analysis

Statistical analysis of the data was performed using paired Student's t test as well as one way ANOVA followed by Tukey-Kramer multiple comparison test. $P<0.05$ was chosen as a criterion for significance (Sendecor, 1971).

RESULTS AND DISCUSSION

The essential oil prepared from the plant under investigation varied quantitatively and qualitatively according to the time of collection. The yield showed the highest percentage during the flowering period (summer, 5 %); the percentage yield was considerably less before and after the flowering period (3.5 % in spring and autumn and 2.5 % in winter).

GC/MS analysis of the prepared oils (Table1) revealed qualitative differences. Twenty seven, twenty three, twenty four and twenty six components were identified, representing 99.19%, 99.39%, 98.58% and 98.4% in spring, summer, autumn and winter respectively. It was worthy to note that carvacrol, thymol, sabinene hydrate<trans>, as well as, γ-terpinene were the major constituents of the oil.

Oxygenated monoterpenes represented the highest percentage of all the tested oils, 60.43%, 72.20%, 51.76% and 77.34% in spring, summer, autumn, and winter respectively. Carvacrol was the major oxygenated component in summer and spring (64.71% and 36.50%). However, it was not detected in the oil of the other two seasons; instead thymol was detected as a major component in the samples collected in winter (30.80%) and autumn (19.55%).

Sabinene hydrate<trans> showed its highest content in winter (32.96%) and decreased gradually in summer (2.93%), while its percentage was almost the same in spring and autumn (18.28% and 18.32% respectively). It was interesting to point out that the lowest percentage of sabinene hydrate<trans> (2.93%) was contrasted by the highest percentage of carvacrol (64.71%).

Concerning monoterpene hydrocarbons, γ-terpinene was the major component in all the tested oils, 13.50%, 9.30%, 10.54%, and 6.02% in spring, summer, autumn, and winter respectively. In addition, sabinene showed a high percentage (14.85%) only in the autumn oil where sabinene and γ-terpinene represented the major components of this class while *p*-cymene was 3.19%. However, in spring and summer oils, γ-terpinene (13.5% and 9.3%) and *p*-cymene (9.21% and 7.60%) constituted the major terpene hydrocarbon fraction. In the winter oil, γ-terpinene and *p*-cymene (6.02% and 1.86%) were associated with a high content of sabinene hydrate<trans> (32.96%).

On the other hand, sesquiterpene hydrocarbons and oxygenated sesquiterpenes represented minor constituents in all the tested oils.

In fact, the detection of carvacrol, thymol, *p*-cymene and γ-terpinene as major constituents in the essential oils under investigation, is in agreement with the previous report that these constituents are closely connected by a biogenetical process (Poulose and Croteau, 1978). In addition, the results revealed that *O. syriacum* L. subsp. *sinaicum* could be considered a carvacrol-thymol chemotype (Guenther, 1952 and Figuérédo *et al.,* 2005).

It is noteworthy to mention that this is the first report on the seasonal variation in the essential oil composition of *O. syriacum* L. subsp. *sinaicum*. In addition, our results are in agreement with the previous data concerning the other components of the essential oil (Arnold *et al.*, 2000 and Figuérédo *et al.,* 2005); quantitative variation might be attributed to the difference in environmental growth conditions (Pino *et al.*, 1997, Vera and Chane-Ming, 1999, and Baser *et al*., 2003). These findings could be of analytical and chemo taxonomical interest.

Tables (2 and 3) and Fig. (1) showed that addition of the essential oil and the 70% ethanol extract of *O. syriacum* L. subsp. *sinaicum* to the organ bath at concentrations of 9, 18, 27 and 36 µg/ml and 100, 200, 300 and 400 µg/ml, respectively produced significant reduction in the uterine contraction of non-pregnant rats. The decrease in the normal frequency of contraction was 38%, 50%, 72% and 67% and 32%, 65%, 39% and 67% respectively. The reduction in the normal amplitude of contraction was 33%, 36%, 80% and 71% and 48%, 45% and 60% (200, 300 and 400 µg/ml of 70% ethanol extract) respectively. The decrease in the normal AUC of uterine contraction amounted to 50%, 60%, 80% and 80% and 65%, 82%, 63% and 76% respectively.

Data in Figs. (2- 4) revealed that oxytocin (10^{-11} M)-induced contraction of rat uterus preincubated with the essential oil (18 µg/ml) and the 70% ethanol extract (200 µg/ml) of *O. syriacum* L. subsp. *sinaicum* was markedly decreased by 79% in

frequency with the 70% ethanol extract and 54% and 80% in amplitude upon addition of the 70% ethanol extract and oil respectively as compared to control ones. Also, the decrease in AUC was amounted to 80% and 98% respectively. On the other hand, KCl (6.7 mM) -induced uterine contraction was significantly reduced (40% and 77% in AUC) with the oil and 70% ethanol extract respectively.

Fig. (5) showed that addition of the essential oil (36 μg/ml) and the 70% ethanol extract (400 μg/ml) of *O. syriacum* L. subsp. *sinaicum* exhibited nearly the same uterine relaxant effects as ritodrine HCl (40 ηg/ml), the standard tocolytic drug.

Data of the present study revealed that the essential oil and the 70% ethanol extract of *O. syriacum* L. subsp. *sinaicum* produced significant reduction in the normal uterine contraction. In addition, they caused marked inhibitions of oxytocin and KCl-induced uterine contractions. The results are in agreement with those obtained by Aydn and Seker (2005) who found that the aqueous extract of *O. onites* L. inhibited acetylcholine-induced contractions of isolated rat fundus, duodenum and ileum.

It is known that oxytocin-induced contraction is mediated through a typical class of IG protein-coupled receptor that is primarily coupled via Gq proteins to phospholipase c-beta (Kiss and Mikkelsen, 2005). Moreover, oxytocin-induced uterine contraction in rats is inherently related to an increase of cytosolic free calcium originating from inositol triphosphate (IP_3)- sensitive intracellular stores and calcium influx via receptor-operated channels (Phillippe and Chien, 1995; Trujillo *et al*., 2000). On the other hand, KCl-induced uterine smooth muscle contraction is attributed mainly to calcium influx via voltage-sensitive calcium channels. Meanwhile, different factors are described to contribute to this contraction such as increase of intracellular concentration of IP_3 or arachidonic acid production (Phillippe and Chien, 1995).

In view of what mentioned one can suggest that the essential oil and the 70% ethanol extract of *O. syriacum* L. subsp. *sinaicum* may contain one or more tocolytic ingredients that might inhibit IP_3 production and/or block oxytocin receptors in the rat uterus. On the other hand, the increased inhibitory potency of the 70% ethanol extract against both oxytocin- and KCl-induced contractions might be related to the presence of more potent tocolytic ingredients that may cause synergistic blocking activities of oxytocin receptors and voltage-sensitive calcium channels.

In conclusion, it is clear that the essential oil and 70% ethanol extract of *O. syriacum* L. subsp. *sinaicum* exhibited powerful tocolytic effects in the rat uterus possibly through antagonizing receptor-dependent mechanism (oxytocin-induced contraction) and independent mechanism (KCl-induced contraction). Further studies are needed to determine which one (or more) of the active ingredients in the essential oil and 70% ethanol extract of *O. syriacum* L. subsp. *sinaicum* are of potential uterine relaxant effects that could be beneficial for women with dysmenorrhea or in premature labor.

Table (1): Results of GC/MS analysis of the essential oil of the aerial parts of *O. syriacum* L. subsp. *sinaicum* at the four seasons

Peak No.	Identified component	Rt**	KI***	M^+	Base Peak	Percentage in			
						Spring (Pre-flowering)	Summer (Flowering)	Autumn (Fruiting)	Winter (Fruiting)
1	*α*-Thujene	8.05	931	136	91	1.18	0.91	2.79	0.94
2	*α*-Pinene	8.26	939	136	93	1.91	1.77	2.26	0.88
3	Fenchene	8.76	951	136	93	-	tr.	tr.	tr.
4	Sabinene	9.72	976	136	93	3.96	2.21	**14.85**	4.38
5	Myrcene	10.13	991	136	41	1.82	1.99	4.42	1.48
6	*δ*-2-Carene	10.70	1001	136	93	-	-	0.24	-
7	*α*-Terpinene	11.30	1018	136	121	2.20	0.74	2.51	1.92
8	*p*-Cymene	11.40	1026	134	119	9.21	**7.60**	3.19	1.86
9	*β*-Phellandrene	11.58	1031	136	67	-	-	2.73	1.7
10	*γ*-Terpinene	12.22	1062	136	93	**13.50**	**9.30**	**10.54**	6.02
11	Sabinene hydrate (cis)	13.13	1068	154	43	0.31	0.10	1.48	2.24
12	Terpinolene	13.54	1088	136	93	1.36	1.41	2.37	0.52
13	Sabinene hydrate <trans>	15.00	1097	154	43	**18.28**	2.93	**18.32**	**32.96**
14	*p*-Menth-2-en-1-ol	15.50	1140	154	43	-	-	-	0.67
15	Terpin-4-ol	17.40	1177	154	71	3.94	3.94	5.59	**7.29**
16	*α*- Terpineol	17.90	1189	154	59	-	-	6.60	3.25
17	Thymol, methyl ether	19.10	1235	164	149	-	-	-	0.13
18	Thymol	21.00	1290	150	135	-	-	**19.55**	**30.80**
19	Carvacrol	22.88	1298	150	135	**36.50**	**64.71**	-	-
20	Thymyl acetate	23.90	1355	192	135	-	-	-	tr.
21	Neryl acetate	24.10	1365	196	41	0.21	-	0.22	tr.
22	Carvacrol acetate	24.90	1371	192	135	0.79	0.52	tr.	-
23	Geranyl acetate	25.24	1383	196	41	0.40	-	-	tr.
24	*trans*-Caryophyllene	25.90	1418	204	41	1.94	0.68	0.62	0.59
25	*α* -Humulene	26.57	1454	204	93	0.12	tr.	tr.	tr.
26	Bicyclogermacrene	27.62	1494	204	121	0.94	0.10	0.30	0.59
27	*β*-Bisabolene	28.29	1509	204	41	tr.	tr.	tr.	-
28	*γ*-Cadinene	28.68	1513	204	161	tr.	tr.	-	tr.
29	Spathulenol	30.26	1576	220	43	0.10	0.10	-	-
30	Caryophyllene oxide	30.40	1581	220	41	0.13	0.17	tr.	0.18
31	Viridiflorol	30.75	1590	222	43	tr.	-	-	-
32	Carotol	31.35	1594	222	41	tr.	-	-	-
33	Cubenol	31.97	1614	222	41	tr.	-	-	-
34	Cadinol	32.32	1640	222	41	0.39	0.21	tr.	tr.
35	*α* -Muurolol	32.85	1645	222	41	tr.	tr.	-	-

*tr. < 0.1%, **Rt; retention time in min., ***KI; Kovat's index according to Adams, 1995.

Table (2): Effect of the essential oil of the aerial parts of *O. syriacum* L. subsp. *sinaicum* on the contractility of the isolated uterus of non-pregnant rats

Concentration (μg/ml) / Contractility	9		18		27		36	
	Before	After	Before	After	Before	After	Before	After
Frequency (cycles/5min)	3.50 ± 0.67	2.17* ± 0.70	3.00 ± 0.26	1.50* ± 0.50	3.00 ± 0.45	0.83 * ± 0.31	2.00± 0.26	0.67* ± 0.21
	38%*		50%*		72%*		67%*	
Amplitude (cm)	3.15 ± 0.18	2.12* ± 0.54	3.29 ± 0.28	2.11* ± 0.42	3.46 ± 0.23	0.70 * ± 0.39	3.17± 0.26	0.92* ± 0.42
	33%*		36%*		80%*		71%*	
AUC (cm^2)	3.69 ± 0.57	1.86* ± 0.67	3.85 ± 0.44	1.53* ± 0.58	3.35 ± 0.46	0.67 * ± 0.27	2.71± 0.73	0.53* ± 0.25
	50%*		60 % *		80%*		80%*	

The results are expressed as means ± S.E.M. of 6 uteri isolated from 6 rats in the dioestrus stage.
The uterine contractions were recorded for 5 min immediately before and after addition of the oil to the bath.
*: significantly different from its respective value prior addition of the oil at $P < 0.05$ using paired Student's t test.

Table (3): Effect of 70% ethanol extract of the aerial parts of *O. syriacum* L. subsp. *sinaicum* on the contractility of the isolated uterus of non-pregnant rats

Concentration (μg/ml) / Contractility	100		200		300		400	
	Before	After	Before	After	Before	After	Before	After
Frequency (cycles/5min)	3.67 ± 0.42	2.50* ± 0.42	2.83 ± 0.16	1.00* ± 0.36	2.17 ± 0.16	1.33 * ± 0.21	2.50± 0.22	0.83 * ± 0.47
	32%*		65%*		39%*		67%*	
Amplitude (cm)	3.60 ± 0.24	2.82 ± 0.44	3.76 ± 0.16	1.96* ± 0.64	3.35 ± 0.33	1.83 * ± 0.16	3.51± 0.17	1.39 * ± 0.72
	22 %		48%*		45%*		60%*	
AUC (cm^2)	4.69 ± 0.46	1.66* ± 0.41	3.78 ± 0.30	0.69* ± 0.36	2.03 ± 0.19	0.75 * ± 0.24	1.76± 0.29	0.43 * ± 0.24
	65%*		82%*		63%*		76%*	

The results are expressed as means ± S.E.M. of 6 uteri isolated from 6 rats in the dioestrus stage.
The uterine contractions were recorded for 5 min immediately before and after addition of the alcoholic extract to the bath.
*: significantly different from its respective value prior addition of the alcoholic extract at $P < 0.05$ using paired Student's t test.

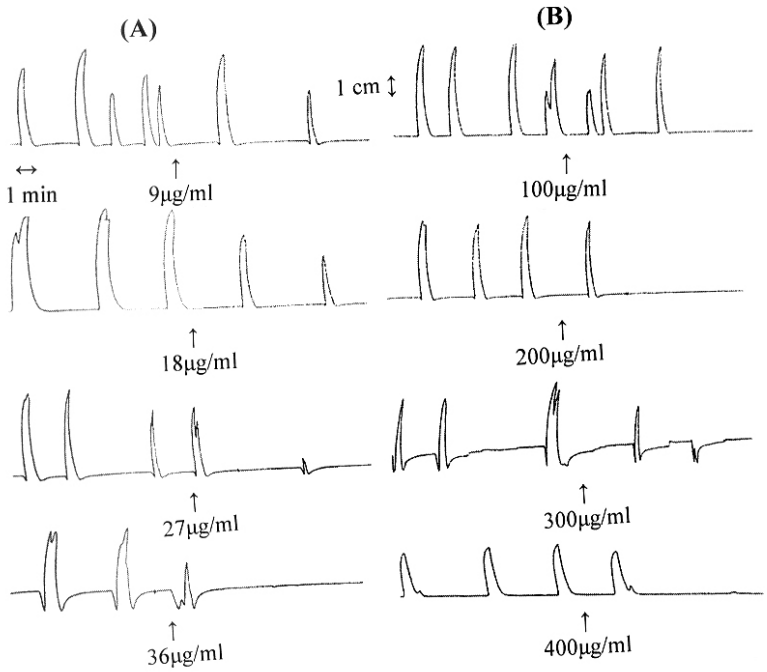

Fig. (1): Representative tracings showing the effect of the essential oil (A) and 70% ethanol extract (B) of *O. syriacum* L. subsp. *sinaicum* on the contractility of the isolated uterus of non-pregnant rats.

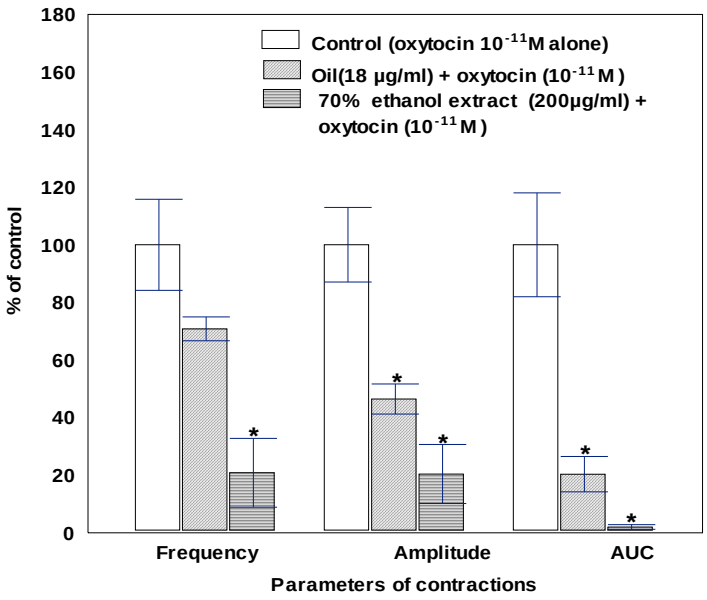

Fig. (2): Effects of the essential oil and 70% ethanol extract of *O. syriacum L.* subsp. *sinaicum* against oxytocin-induced uterine contractions of non-pregnant rats *in vitro.*

The results are expressed as mean ± S.E.M. of 6 uteri isolated from 6 rats in the dioestrus stage in each group. *: Significantly different from oxytocin alone at P* < 0.05 using one way ANOVA followed by Tukey-Kramer multiple comparison test.

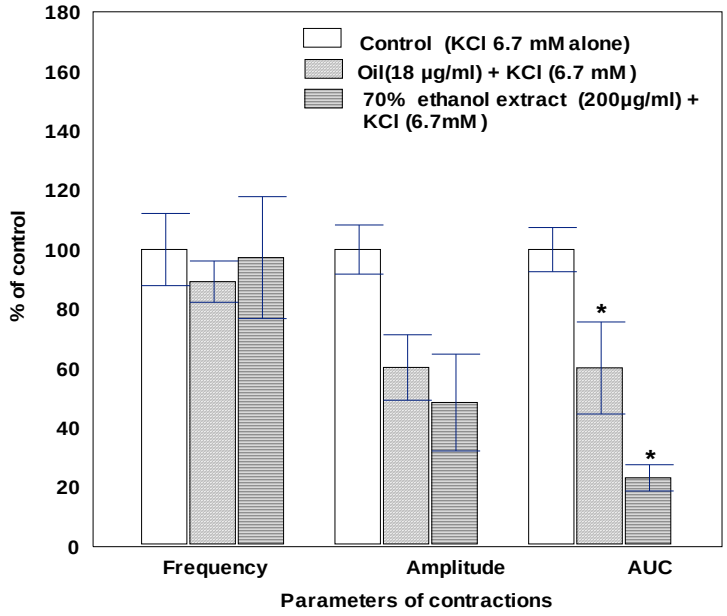

Fig. (3): Effects of the oil and 70% ethanol extract of *O. syriacum L.* subsp. *sinaicum* against KC1-induced uterine contractions of non-pregnant rats *in vitro.*

The results are expressed as mean ± S.E.M. of 6 uteri isolated from 6 rats in the dioestrus stage in each group. *: Significantly different from KC1 alone at $P < 0.05$ using one way ANOVA followed by Tukey-Kramer multiple comparison tests.

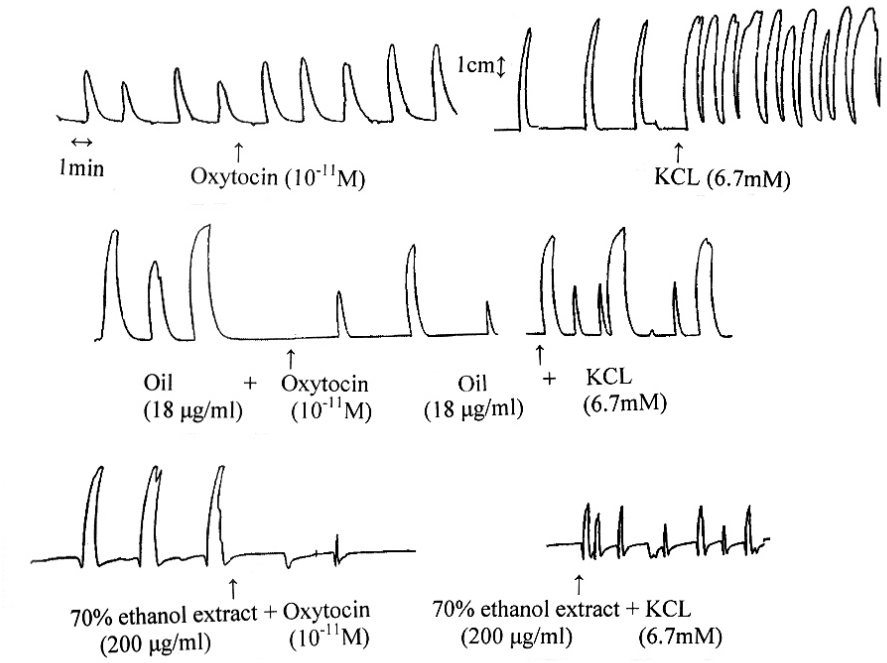

Fig. (4): Representative tracings showing the effect of the essential oil and 70% ethanol extract of *O. syriacum* L. subsp. *sinaicum* on the uterine response of non-pregnant rats to oxytocin and KCL.

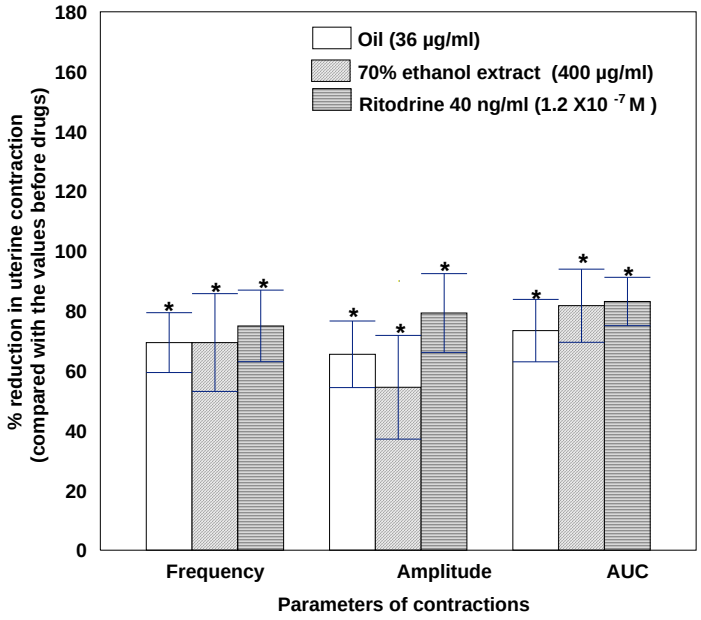

Fig. (5): Comparative inhibitory effects of oil and 70% ethanol extract of *O. syriacum L.* subsp. *sinaicum* and ritodrine on the uterine contractions of non-pregnant rats *in vitro*

The results are expressed as mean ± S.E.M. of 6 uteri isolated from 6 rats in the dioestrus stage in each group. *: Significantly different from the normal uterine contractions at $P < 0.05$ using paired Student's "t" test.

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ARABIC SUMMARY

التغيرات الموسمية فى تركيب الزيت الطيار لنبات أوريجانم سيرياكم ل. تحت نوع سينايكم جروتر و بردت ، تقييم فعاليته المثبطة لانقباضات عضلات الرحم

للسادة الدكاترة

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اشتملت هذه الدراسة على فحص مكونات الزيت الطيارالمقطر من عينات مختلفة من نبات أوريجانم سيرياكم ل. تحت نوع سينايكم جروتر و بردت تم جمعها على مدار الفصول الأربعة (الربيع والصيف والخريف والشتاء) وأشارت نتائج تحليل العينات الأربع بواسطة كروماتوجرافيا الغاز السائل المقترن بمطياف الكتلة إلى وجود اختلافات كيفية وكمية بينها. وقد أمكن التعرف على 99.19 % و 99.39 % و98.58 % و98.4 % من مكونات زيوت كل من الربيع و الصيف و الخريف ، والشتاء على التوالى. وقد وجد أن كارڤاكرول هو المكون الأساسى (64.71 % و 36.50 %) فى عينتى زيوت فصلى الصيف و الربيع يتبعه مركبى سابينين هيدرات < ترانس> (18.28 %) و*جاما*– تربينين(13.5 %) فى عينة فصل الربيع،ومركبى *جاما*– تربينين (9.30 %) و*بارا*– سيمين (7.60 %) في عينة فصل الصيف.أما عينة الزيت الطيار لفصل الخريف، فقد تميزت بوجود الثايمول (19.55 %) وسابينين هيدرات< ترانس> (18.32 %) وسابينين (14.85 %) ، فى حين أن العينة الشتوية أظهرت أن سابينين هيدرات< ترانس> هو المكون الرئيسى لها (32.96 %) يليه الثايمول (30.80 %).

كما تم فى هذا البحث دراسة تأثير كل من الزيت الطيار وخلاصة الكحول 70 % للنبات على الرحم المفصول للجرذان غير الحوامل. وقد وجد أن أضافة كل من الزيت الطيار (18 µg/ml) والخلاصة الكحولية (200 µg/ml) على حده الى الحمام المائى المحتوى على الرحم المفصول قد أحدثت انخفاضا ملحوظا فى انقباضات عضلات الرحم قدرت بحوالى 50 % و 65 % فى التردد و 36 % و 48 % فى الأرتفاع و60 % و 82 % فى المساحة تحت المنحنى على التوالى.

كما تضمنت الدراسة فحص تأثير كل من الزيت الطيار وخلاصة الكحول 70 % للنبات على انقباضات عضلات الرحم المحفذة بواسطة كل من الأوكسيتوسين (10^{-11} M) ومحلول كلوريد البوتاسيوم (6.7 mM) . وقد وجد أن العينتين تحت الفحص قد أحدثتا تناقصا ملحوظا فى الانقباضات عند استخدامها بنفس الجرعات السابقة .