

EFFECTS OF *TEUCRIUM POLIUM* L. LEAVES EXTRACT ON SOME METABOLIC IN BLOOD OF RATS.

تأثير مستخلص اوراق الجعدة (*Teucrium polium* L.) على بعض الفعاليات

الايضية في دم الجرذان

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ABSTRACT

Albino male rats ingested orally with boiled extract of leaves *Teucrium polium* L. plant powder in concentration of 100,200,300,400 and 500 mg/ml per rat two hours after dissolved in distilled water. Significant decrease was found in blood glucose of about 60% relative to control value. No change was found in the level of blood cholesterol but a significant decrease in total blood lipids of about 90% and a significant decrease in the activity of acetyl choline esterase of about 40% were found.

It is suggested that *Teucrium polium* L. leaves contain factor(s) of hypoglycemic and hypolipidemic effects.

المخلص

تم تحضير المستخلص المائي المغلي لمسحوق اوراق نبات الجعدة (*Teucrium polium* L.) وتحويله الى مسحوق صلب ثم اعطاه عن طريق الفم بتركيزات تصاعديّة 100,200,300,400,500 ملغم/مل بعد اذابته بالماء المقطر الى مجاميع ذكور الجرذان البيضاء. وبعد مرور ساعتين من الاطعام ظهر انخفاض واضح في معدل كلوكوز الدم يقرب من 60% مقارنة بكلوكوز الدم للمجموعة الضابطة من الجرذان ولم يظهر هناك تغير ملحوظ بمعدل الكوليسترول, بل ظهر انخفاض معنوي في الدهون الكلية في الدم يقرب من 90% وانخفاض معنوي في فعالية انزيم الاسيتايل كولين استريز في مصل الدم يقرب من 40%.

يستخلص من ذلك بأن مسحوق اوراق نبات الجعدة يحتوي على عوامل مخفضة لسكر الدم والدهون الكلية في الدم.

INTRODUCTION

Medicinal plants were known and used for many centuries and still traditional herbalist for the treatment of several diseases and injuries (1).

The leaves of *Teucrium polium* L. plant suspension were used as antiseptic and cure gout pain (2). Its leaves is used medically for diarrhea and desentry. (3)

Recently, several studies showed that the intragastric and parenteral administration of herteropoly saccharides of *Teucrium polium* L. was found to normalize the development of the immune response upon air cooling and enhance this process upon immersion cooling.(4)

Several plants were known considered as hypoglycemia agent (5). Both cold and boiled aqueous extracts of *Artemisia absinthium* and *Olea europaea* leaves revealed a significant decrease of blood glucose in chicks relative to control values (6).

Another study showed that the *Salvia syriaca* L. extract was a significantly decrease of blood glucose. (7)

Aim of the study in this research an attempt was done to study the effect of the leaves of *Teucrium Polium* L. on glucose, cholesterol, total lipids and the activity of acetyl choline esterase in blood in an attempt. We hope that study may be of great help to find substituents for hypoglycemic drugs.

MATERIALS AND METHODS :

Preparation of boiled extract:

The boiled extract was prepared by weighing 100 gm fresh weight of *Teucrium polium* L. leaves in 300 ml of distilled water, the crude homogenate was boiled for two hours with continuous stirring and then filtered through glass wolle. Finally the mixture was centrifuged for 30 min. at 1200 xg. The filtrate was cooled and freeze dried. The powdered material was used for further investigations.

Ingestion of the rats:

Groups of male albino rats of 4-5 weeks old and average weight of 150 gm per rats were obtained from the animal house of the national center of controlling and research of drugs/ Ministry of Health. The rats were divided randomly into six groups, each contained three rats. Group one was kept as control. Groups two to six were ingested by mouth with suspension of powdered *Teucrium polium* L. leaves in concentration of 100,200,300,400,500 mg/ ml respectively.

After two hours of ingestion, the blood of rats was withdrawn from the eye and collected for further investigation. Blood samples were divided into two portions, the first portion was put into tubes containing NaF as a preservative for measuring blood sugar. The other portion was allowed to clot at (37 C°) in water bath for (15) minutes then centrifuged at (2000) rpm. Each serum sample was kept frozen at (-18 C°) in capped tubes for not more than three weeks before used for analysis.

Methods:

Blood glucose was estimated according to the method of (8). Cholesterol in blood was determined colourimetrically by the method of Kit's cited by (9). Total lipids determined according to the method of Chabrol and Chardonnet cited by (10). Activity of acetyl choline esterase (A ch E) in serum was assayed by the method of Electrometric Techniques (11).

Statistical analysis:

The Wilcoxon rank- sun test statistical analysis was used throughout the study (12).

RESULTS AND DISCUSSION:

Effect of *Teucrium polium* L. leaves extract on the blood glucose level:

Result depicted from (Table 1) indicated that oral ingestion of rats with increasing concentration of *Teucrium polium* L. leaves extract have significantly decreasing effect on blood glucose level specifically to group six of rats of about 60% relative to control value. These results indicated that the plant leaves might contain a compound (Volatile Oil, glycoside Tannins) which might have similar activity to insulin (13).

Similar results were obtained from *Olea europaea* L. leaves (14).

Effect of *Teucrium polium* L. leaves extract on the blood cholesterol level:

The resulting in (Table 2) should that there is no significant increase in the level of blood cholesterol in rats treated with increasing concentration of *Teucrium polium* L. leaves. This may indicated that leaves have no effect on the level of blood cholesterol.

Effect of *Teucrium pollium* L. leaves on the blood total lipids level:

Blood total lipids level significantly decreased of about 97.6% of group three of rats ingestion the rats an increasing concentration of *Teucrium polium* L. leaves (Table 3). This may contain a compound has either lipolytic effect by increasing lipolysis, or might activate lipases which may, otherwise, accelerate the process of lipolysis (15).

Effect of *Teucrium pollium* L. leaves on the acetyl choline esterase activity in blood(AchE):

A significant decrease was seen in activity of AchE (Table 4) of about 41.3% in group two relative to the control value.

This result of inhibition of acetyl choline esterase activity may be due to the change of phospholipids in cell membrane thereby leads to change of permeability and liquidity of the cell and finally decrease the activity of the membraneous enzyme (16).

Finally, more results will be needed in this aspect in order to know the mode of action of this plant in human.

Table (1): Effect of *Teucrium polium* L. leaves extract on the blood glucose level.

No. of group	Concentration of powderd <i>Tecrium pollium</i> L. leaves mg/ml/rat	Level of blood glucose mg/100ml	% decrease
1	0 (control)	100 ± 3.8	
2	100	50 ± 7.6*	50
3	200	63 ± 6.0*	37
4	300	64 ± 19.1	36
5	400	54 ± 24.2*	46
6	500	40 ± 5.0*	60

Values are MEAN ± SE

* Significantly different from control, $p \leq 0.05$

Table (2): Effect of *Teucrium polium* L. leaves extract on the blood cholesterol level.

No. of group	Concentration of powdered <i>Teucrium polium</i> L. leaves mg/ml/rat	Level of blood cholesterol mg/100ml	% Change
1	0 (control)	55 ± 9.1	
2	100	50 ± 1.7	9.0
3	200	56 ± 4.3	1.8
4	300	68 ± 7.3	21.6
5	400	59 ± 3.7	7.3
6	500	56 ± 3.1	1.8

Values are MEAN ± SE

Table (3): Effect of *Teucrium polium* L. leaves extract on the blood total lipids level.

No. of group	Concentration of powdered <i>Teucrium polium</i> L. leaves mg/ml/rat	Level of blood total lipids mg/100 ml	% decrease
1	0 (control)	347.9 ± 1.6	
2	100	144.89 ± 35.1	8.7
3	200	54.9 ± 16.9*	97.6
4	300	125.4 ± 13	63.93
5	400	152.1 ± 45.7	56.28
6	500	71.2 ± 44.3*	79.5

Values are MEAN ± SE

* Significantly different from control, p≤ 0.05

Table (4): Effect of *Teucrium pollium* L. leaves extract on the acetyl choline esterase activity in blood.

No. of group	Concentration of powderd <i>Tecrium pollium</i> L. leaves mg/ ml/ rat	acetyl choline esterase activity PH/ 30 min	% chane
1	0 (control)	0.431 ± 0.031	
2	100	0.249 ± 0.049*	- 41.3
3	200	0.438 ± 0.063	1.62
4	300	0.46 ± 0.048	6.7
5	400	0.405 ± 0.026	- 6.0
6	500	0.389 ± 0.019	- 22.6

Values are MEAN ± SE

* Significantly different from control, P ≤ 0.05

References:

1. Fawzy Taha Kotb Hussein, 1995. Medicinal plant in Libya. Arab encyclopedia house. I. st printed, 576.
2. British Herbal Pharmacopia.(B.H.Ph.). 1992. The pharmceutical press. London.
3. Bruneton, J. 2001. Pharmacognosy, phytochemistry and medical plants. 2nd edition. Intercept LTD. Paris.
4. Uteshv- BB, Laskova- IL, Afanas'ev- VA, 1999. The immunomodulating activity of the heteropolysaccharides from German chamomile atricaria chamomilla) during air and immersion cooling. Russian State Medical University, Moscow, Russia. Eksp- Kin- Farmakol. Nov- Dec, 62(6): 52-5.
5. Evans, W.C. 1998. Trease and Evens pharmacognosy. Swurders compant limited. London.
6. AL-Najafi T.S., Ahmed T.Y., Mustafa L. A., 1993. Hypoglycemic activity of *Artemisia absinthium* L. J. Ed and Sci.14: 34- 37.
7. Ahmed T.Y., AL-Khayat I.K., Mahmood S.Z., 1994. Hypoglycemic activity of proteinous and nonproteinous fractions from aqueous *Salvia syriaca* L. extract. Rafidain J. Sci. 1(12): 23- 28
8. Nelson N., 1944. Aphotometric adaption of somogyi method for the determination of glucose. J. Biol. Chem., 153:375.
9. Kit's method for determination of Bio Chemical indication in different & leaves of Blood glucose.
10. Gelson T., Philip A., 1985. Total lipids by colorimetric method: practical clinical chemistry. Boston : Little Brown and company, 354.
11. Aly , M.S.1990, Biocheical studies one some medicinal plants M.Sc. Agric. Chem. Fac of Agric. , Menofiya. Univ.
12. Tarner J.C., 1970. Modern Applied Mathematics, The English Universities Press LTD, 263-265.
13. Khan M., Singh VK., 1996. Afolklore survey of some plants of bopal district forests. Madhya pradesh. India described as anti diabetics, fitoterapia, LXVII: 416.
14. Ahmed T.Y., AL-Khayat I.K., Mahmood S.Z. , 1994. Hypoglycemic activity of *Olea Europaea* Leaves. J. Ed. And Sci. 15:54-61
15. Chiej R., 1984. The macdonald encyclopedia of medicinal plants. Macdonald and Co(publishers) LTD. Amacdonald.
16. Ubaldo L., George H. 1987. Detection of desmethydiazepan in brain of diffirent species and plants. Biochem. Pharmacol, 36:31-37.