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Effects of *Trigonella Foenum*—Graecum (Fenugreek) Different Concentration Seed Extact to Diabtic and High Cholestrol Patient.

Rasha Khalid Abbas[1], Fatma S.Elsharbasy[2] and Abdalfatah Abdalla Fadlelmula[3]

[1]Depratment of Biochemistry, Faculty of Applied and Industerial Science University of Bahri Sudan.

[1]Department of Chemistry, Faculty of Science and Arts in Mukhwa, University of Albaha, 65931 Saudi Arabia.

[2]Department of Chemistry of Natural and Microbial Products, National Research Center, Dokki 12622, Egypt.

Department of Chemistry, Faculty of Science and Humanity studies, Sattam bin Abdul Aziz University, Alkharj City 11942, Saudi Arabia.

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ABSTRACT

The experiments were conducted to studied the effect of the different percent of *Trigonella foenum*--graecum (Fenugreek) seed extract by water and have been taken as syrup for the diabetic and high cholesterol patients, Amino acid analyzer are used in this study also saponin test.In this study there was a significant different effect of different seed extract concentration of Fenugreek (10%, 15% and 20%) in the diabetic and high cholesterol patient, at concentration 10% seed extract of Fenugreek have the low effect to decreased blood glucose(mg/dl)and cholesterol(mmol/L), but at concentration 15% seed extract of Fenugreek have the high effect to decreased blood glucose(mg/dl) and cholesterol(m mol/L),also at concentration 20% seed extract of Fenugreek have the highest effect to decreased blood glucose(mg/dl)and cholesterol(m mol/L) the normal range of blood glucose in human is 74-106(mg/dl) the normal range of cholesterol(m mol/L) in human is 0-5.2(m mol/L). It was found that the high effect of Fenugreek seed extract to reduce blood glucose, and saponin to reduce cholesterol.

Introduction

Trigonella foenum-graecum fenugreek.

Family**:** Fabaceae , habitat; Fenugreek is native to India and northern Europe. Parts used: Seeds, fresh leaves[1,2]. P*lants*, as a source of medicinal compounds and have components of high nutritive value such as protein, amino acids, carbohydrate minerals vitamin and organic acids.[3,4]. Useful components: Polysaccharide, saponins (diosgenin, yamogenin, gitogenin, tigogenin, neotigogens), mucilage, volatile oils, alkaloids (choline and trigonelline)[5,6] Medicinal use: Fenugreek is one of the oldest medicinal plants, Anti-diabetic activity, Antispasmodic activity, antioxidant activity immunological activity, antibacterial activity, anthelmintic activity, anti-inflammatory and analgesic activity[7,8,9,10]. It has been used for centuries for different female conditions, brain and nervous system ailments, skin, liver and metabolic disorders. It is also considered highly beneficial for respiratory and gastrointestinal problems. It is a highly potent female herb, since it helps relaxing the uterus and relieving menstrual pains, and is an excellent stimulator of milk production in nursing mothers. As for the gastrointestinal tract, Fenugreek is usually suggested in treatments of poor digestion, gastric inflammations, enteritis, especially for convalescents. [11,12]. It can also be used in cases of weight loss, poor appetite and even in treatment of anorexia nervosa [13]. Different blood conditions, such as anemia, and nervous system disorders (neurasthenia) can also be successfully treated with Fenugreek. As for the respiratory conditions, Fenugreek is excellent in treatment of bronchitis, mucous congestions, different infections, tuberculosis. Used externally, it can help curing abscesses, boils, carbuncles, fistulas, sciatica, various skin irritations, sores and wounds. [14,15.16] This plant has gained an interest for study because of the high demand in the world market and is expected to replace chemical products in many industries.

Objectives of the study

Determination the percent of the amino acid content of *Trigonella foenum graecum* seed extract by amino acid analyzer.

Determination the peresent of the saponin content of *Trigonella foenum – graecum* seed extract

Effect of *Trigonella foenum – graecum* hot water seed extracts to reduce blood glucose in the diabetic patients and Cholesterol-lowering effects in patients.

Material and methods

The experimental part of this research was carried out using very simple materials and equipment's. Fenugreek seeds purchase in herbiest in the super market and identified in the department of plant Botany Faculty of Agriculture, Khartoum University. Diabetes patient type II noninsulin-dependent diabetes mellitus(NIDDM).Most NIDDM (patients typically have enough insulin but it is not used effectively) and high cholesterol level patient.

Method

Determination of amino acids

5g of the test samples were macerated in 50% alcohol until all pigment was extracted and concentrated under reduced pressure at 40°C. 10 ml NaCl (10%) was added to the extract, stirred for one hour then 10 ml of trichloro acetic were added and filtrated. The precipitate was collected by centrifugation, washed and dried in desiccator 20 mg of protein were refluxed with 6N HCl (10ml) for 20 hrs. and the

Tele:

E-mail address: rashakhalid09@gmail.com

acid removed by evaporation under reduced pressure, the residue was dissolved in 10% isopropanol for amino acids identification using the method, (Eppendorf-Germany Lc 3000) Amino acid analyzer[17]

Test for saponins

10 ml of distilled water was added to (0.5 g) of test plant sample in stopper test tube and the contents were vigorously shaken for 30 seconds and allowed to stand undisturbed. Formation of froth indicates the presence of saponins[18]

Method of seed extract by water

10g, 15g, 20g, weight of *Trigonella Foenum-graecum* seed were macerated in 100ml hot distilled water at 100°C[16].

Patient Treatment

The extract treated with diabetic and hyper cholesterol patient as syrup.

Statistical Analysis

Statistical analysis was done according to Duncan, Multiple Range Test[19]

Result and Discussion

Table (1) shows the results of essentials amino acid (threonine (34.97 ug/ml),valine (18.00 ug/ml) ,methionine (4.48ug/ml), leucine (14.60 ug/ml), isoleucine (36.62 ug/ml),phenylanaline (28.40), histidine (33.89 ug/ml), lycine (28.71 ug/ml) and arginine (19.61 ug/ml), these results were in conformity with those obtained in previous studies found that Insulin atrophic and anti-diabetics properties also have been associated with the amino acid 4-hydroxyisoleucine that occurs in fenugreek at concentration of about 0.55%. In vitro studies have indicated that this amino acid causes direct pancreatic β-cell stimulation. Delayed gastric emptying and inhibition of glucose transport also have been postulated as possible mechanisms.[11] Fenugreek have high amount of saponin so that reduced the cholesterol percent this result agree with the result obtained in previous studies found that the reaction between the bile acids and fenugreek-derived saponins causing the formation of micelles too large for the digestive tract to absorb.[12] Table (2) shows that the results of blood glucose(mg/dl) and the cholesterol(mmol/L) in the diabetic and hyper cholesterol patient spontaneously before treated with Trigonella Foenum-graecum seed extract, patient (1) 263.5(mg/dl), 5.3(m mol/L), patient (2)142.5(mg/dl), 6.6(m mol/L), patient (3) 389.7(mg/dl) , 7.7(m mol/L), patient (4) 227.9, (mg/dl) 7.5(m mol/L), show high blood glucose and cholesterol. Table (3) shows that there was highly significant difference among the different seed extract of Trigonella Foenum-graecum in the blood glucose, at concentration 10% seed extract of Trigonella Foenum-graecum have the low effect to decreased blood glucose 211.3(mg/dL) but at concentration 15% seed extract of Trigonella Foenum-graecum have the high effect to decreased blood glucose121.6 (mg/dL), at concentration 20% seed extract of Trigonella Foenum-graecum have the highest effect to decreased blood glucose 84.9(mg/dL) the normal range of blood glucose in human is 74-106(mg/dL) these results were in conformity with those obtained in previous studies.11 Table (4)

shows there was highly significant difference among the different seed extract ofTrigonella Foenum-graecum in the hyper cholesteramia patient, at concentration 10% seed extract of Trigonella Foenum-graecum have the low effect to decreased cholesterol 6.3(m mol/L) but at concentration 15% seed extract of Trigonella Foenum-graecum have the high effect to decreased cholesterol 4.6(m mol/L), at concentration 20% seed extract of Trigonella Foenum-graecum have the highest effect to decreased cholesterol 3.5 (m mol/L) the normal range of cholesterol(m mol/L) in human is 0-5.2(m mol/L) these results were in conformity with those obtained in previous studies[12.]

Table 1. amino acids of Trigonella Foenum-graecum seed extract.

Essential Amino acids	(ug/ml)
Threonine	34.97
Valine	18.00
Methionine	4.48
Leucine	14.60
Isoleucine	36.62
Phenylanaline	28.40
Histidine	33.89
Lycine	28.71
Argnine	19.61

Table 2. Result of blood glucose(mg/dL) and cholesterol(mmol/L) in the diabetic patient before treated with Trigonella Foenum-graecum extract.

Patient Number		Test
	Blood	Cholesterol
	Glucose	level
Patient 1	263.5	5.3
Patient 2	142.5	6.6
Patient 3	389.7	7.7
Patient 4	227.9	7.5
Mean test	256	6.8

Table 3. Result of blood glucose (mg/dL) in the diabetic patient after treated with Trigonella Foenum-graecum seed extract.

blood glucose in patient	Trigonella Foenum-graecum seed Extract(concentration l)			Mean% of Blood glucose in patient
	10%	15%	20%	
Patient 1	* 225.2	105.5	80.6	137.1
Patient 2	128.9	90.4	77.5	98.9
Patient 3	300.3	187.5	105.5	197.8
Patient 4	190.9	103.1	75.9	123.3
Mean seed extract	211.3	121.6	84.9	

Table 4. Result of cholesterol (m mol/L) in the diabetic patient after treated with Trigonella Foenum-graecum seed extract.

cholesterol(m mol/L) in	Trigonella Foenum-graecum seed extract (concentration g/ml)			Mean% of cholesterol(m mol/L) in patient
	10%	15%	20%	
Patient 1	5.2	3.3	2.6	3.7
Patient 2	6.1	4.8	3.3	4.7
Patient 3	7.1	5.2	4.1	5.5
Patient 4	6.9	4.9	3.9	5.2
Mean seed extract	6.3	4.6	3.5	

Conclusion

This work comes to conclude that Fenugreek. is one of the primary supplements used to support type II diabetics or noninsulin-dependent diabetes mellitus (NIDDM). Most NIDDM patients typically have enough insulin but it is not used effectively. Fenugreek Seed reducing blood sugar levels with its high concentrations of amino acids but it has also helped reduce low density cholesterol's and triacylglycerol by high amount of saponin.

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