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PHARMACOLOGICAL SCREENING OF SYNERGISTIC ANTIDIABETIC EFFICACY OF *TAGETES ERECTA* AND *FOENICULUM VULGARE*

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ABSTRACT

The present study deals with comparative study on anti-diabetic effect of the two ethnomedicinally important plants, *Tagetes erecta* belongs to the family *Compositae* and *Foeniculum vulgare* belongs to the family *Umbelliferae* in streptozotocin induced diabetic rats. *Tagetes erecta* and *Foeniculum vulgare* were collected from local areas, shade dried and made into powder by mechanical grinding. The powder was subjected to extraction by hot percolation method using methanol as solvent. The extract was subjected first to preliminary phytochemical screening, acute toxicity studies and pharmacological screening of anti-diabetic activity in streptozotocin induced diabetic rats. The blood samples were collected at regular intervals and assessed for the blood glucose levels. The rats from all the groups were also studied for the body weight and the lipid profiles. Plant extracts shown a significant effect on the blood glucose levels in both the individual groups and also the combined group at the two dose levels. The effect of the plant extracts was also significant at the lipid profile and the body weights of the animals from the tested groups. From the present work, it can be concluded that it is the effect of synergism between both the plant extracts, which are having the higher significant effect on the blood glucose levels at the two tested doses. The work supports folklore claim of use of *Tagetes erecta* and *Foeniculum vulgare* for treatment of diabetes.

Key words: *Tagetes erecta*, *Foeniculum vulgare*, Anti diabetic activity, Streptozotocin, Lipid profile.

INTRODUCTION

Diabetes mellitus is a condition, in which the pancreas no longer produces enough insulin or when cells stop responding to the insulin that is produced, so that glucose in the blood cannot be absorbed in to the cells of the body (Bhavana Sharma et al., 2008). Phytochemicals play a significant role in diet based therapies to cure various maladies Consumer's trend is being widened due to awareness, spread and research interventions indicating potential health benefits associated with consumption of plants and their functional components. To date, there are hundreds of herbs and traditional herbal formulas reported to have been used for the treatment of Diabetes mellitus. Traditional plant medicines are used throughout the world for a range of Diabetic presentations. Therefore, investigation on such agents from traditional medicinal plants has become more important. India has a rich history of using various potent herbs and herbal compounds for treating Diabetes. Many Indian plants have been investigated for their beneficial use in different types of Diabetes. (Pullok KM *et al*., 2006) Hypercholesterolemia and hypertriglyceridemia are major risk factors either, alone or together. They

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accelerate the development of coronary artery disease and the progression of atherosclerosis (Lusis AJ, 2000) High levels of low-density lipoprotein (LDL) accumulate in the extracellular sub endothelial space of arteries and are highly atherogenic and toxic to vascular cells thereby leading to atherosclerosis, hypertension, obesity, diabetes, functional depression in some organs, etc (Chattopadhyaya R, 1996).

Tagetes erecta of the family *Compositae* is commonly found in parts of India, Asia, Africa and America. It is known as Marigold. The leaves are reported to be effective against piles, kidney troubles, muscular Pain, ulcers, wound and earache. The herbs are used for the treatment of inflammatory conditions as a household remedy on experimental basis. The chief chemical constitutions of *Tagetes erecta* is volatile oils, tri terpenoids and saponins (Lokesh JS, 2009 & Basavaraj VC, 2011)

Fennel (*Foeniculum vulgare*) is a plant species in the genus *Foeniculum*. It is a member of the family Umbelliferae. It is a hardy, perennial, umbelliferous herb, with yellow flowers and feathery leaves. It is indigenous to the shores of the Mediterranean but has become widely naturalized in many parts of the world, especially on dry soils near the sea-coast and on riverbanks. It is a highly aromatic, flavour full herb with culinary and medicinal uses, along with the similar-tasting anise, is one of the primary ingredients of absinthe. Florence fennel or finocchio is a selection with a swollen, bulb-like stem base that is used as a vegetable.

Fennel contains anethole, which can explain some of its medical effects: It, or its polymers, acts as phytoestrogens. The essence of fennel can be used as a safe and effective herbal drug for primary dysmenorrhoea, but could have lower potency than mefenamic acid at the current study levels (Albert PM, 1980).

The need is to make health care affordable for all, and the perception that natural remedies are somehow safer and more efficacious than remedies that are pharmaceutically derived. Synergistic combinations of more than one hypoglycemic were used by many physicians for proper glycemic control. So, it is valuable to pharmacologically screen any such combinations. Hence, the in the present study an attempt was made to study *Foeniculam vulgare* and *Tagetes erecta* individually and also in combination against Streptozotocin induced diabetes. The antidiabetic activity of *Foeniculum vulgare* was reported previously (Neveen A E, 2011). Earlier we reported the antidiabetic activity and Anti hyperlipidemic activity of *Tagetes erecta* (Raghuveer R *et al*., 2011). But there is no scientific literature is available with reference to the synergistic effect of the antidiabetic and anti hyperlipidemic efficacy of these both ethnomedicinally important plants which have their pronounced use in the treatment of diabetes. Hence, in the present work, an attempt was made to screen the combined effect of *Foeniculam vulgare* and *Tagetes erecta* in a scientific way.

MATERIALS AND METHODS

Collection of plant material

Tagetes erecta whole plant was collected from Kosigi village, Kurnool District of Andhra Pradesh, India and botanically identified and authenticated by Dr. K. Madhava Chetty, taxonomist, Department of Botany, Sri Venkateshwara University, Tirupati, A.P., and a voucher specimen (RRV/2011/01) was stored in Department of Pharmacology, Vagdevi college of Pharmacy and Research centre, Brahmadevam, Nellore, A.P., India, for future references. *Foeniculum vulgare* fruits were collected from the local market and identified by its morphological and microscopical characters. A voucher specimen (RRV/2011/02) was stored in Department of Pharmacology, Vagdevi college of Pharmacy and Research centre, Brahmadevam, Nellore, A.P., India, for future references. Both the samples were shade dried, powdered by mechanical grinding and the powder obtained so was used for further studies.

Extraction

About 750 gm of *Tagetes erecta* powder Whole plant was extracted using 90% methanol by continuous hot percolation method in Soxhlet apparatus. The extract was concentrated on rotary flash evaporator to semisolid consistency. To it 1-2 drops of chloroform was added and stored at 8 degree centigrade in screwed glass vials which was designated as METE**.** About 750 gm of *Foeniculum vulgare* fruit powder was extracted using 90% methanol by cold maceration for 72 hours. After 72 hours, the whole contents were filtered and the extract was concentrated on rotary flash evaporator to semisolid consistency. To it 1-2 drops of chloroform was added and stored at 8 degree centigrade in screwed glass vials which was designated as MEFV (Goyal and Shah, 2001 & Vinod RD, 2004)**.**

Preliminary phytochemical screening

Both the extracts, METE and MEFV were subjected to preliminary phytochemical screening using standard battery of procedures to identify the phytoconstituents present in them (Khandelwal KR, 2001 & Kokate CK, 2002).

Acute toxicity studies

Acute toxicity study was performed according to OECD guideline 423. Animals were fasted prior to dosing, food but not water should be withheld overnight. Following the period of fasting, the animals were weighed and METE and MEFV were administered. Three animals are used for each step. The dose levels of METE and

MEFV to be used at the starting dose of 500, 1000, 1500, 2000, 3000 and 4000 mg/kg body weight. The starting dose level should be that which is most likely to produce mortality in some of the dose animals. After administration of extract, the animals were observed continuously for first 4 hrs for behavioural changes and at the end of 24 hr for mortality rate if any (CPCSEA, 2003).

Pharmacological studies

Male Wister albino rats weighing 150-200 gm were used in the present study. They were housed in individual polypropylene cages under standard laboratory conditions of light, temperature, and relative humidity. Animals are given standard rat pellets (Pranav Argo's Ltd) and drinking water *ad libitum* (OECD, 1996). The experimental protocol was approved by the institutional Animal Ethical Committee of Vagdevi College of Pharmacy And Research Centre, Brahmadevam, Nellore-524346.

Oral glucose tolerance test (OGTT)

Rats are fasted overnight and divided into four groups with 6 animals each group. Group-1 received distilled water, to serve as control. Group-II animals were treated with Glibenclamide (0.5 mg/kg) to serve as standard. Group –III animals treated with METE (100 mg/kg b.w) and group IV animals treated with MEFV (100 mg/kg b.w) and group V animals treated with both METE and MEFV. The control, standard and test were treated with drugs 30 min prior to the glucose load (2.5gk/kg). Blood samples were collected at 15, 30, 45, 60, 75, 90 and 120 min after glucose loading. Serum was separated and glucose levels were measured immediately. (Gayatri M and Krishna K, 2008)

Anti-diabetic study

In the present study, diabetes was induced by single intra peritoneal injection of streptozotocin (60 mg/kg b.w). The streptozotocin was freshly prepared by using citrated buffer. The animals are allowed to drink 5% glucose solution over night to overcome drug induced hypoglycaemia. 48 hours after injection of streptozotocin, fasting plasma blood glucose levels are estimated. Animals with plasma glucose level of > 140 mg/dl were used for the study. The rats were divided into seven groups consisting of six rats in each group; the animals were treated for 28 days. The blood samples were drawn on 7th, 14th, 21st and 28th day from the tail vein with the help of tuberculin syringe after a fast of 12 hrs and the blood was centrifuged (2,500 rpm/10min) to get serum. The serum was used for biochemical estimation of blood glucose (Mohammed B *et al*., 2003 & Hnatyszyn O, 2003) (Table No: 1).

Biochemical Estimations

Serum analytical methods for serum glucose, triglyceride (TG), total cholesterol (TC), high density lipoprotein (HDL)**,** Low density lipoprotein (LDL) and body weight were measured using standard methods reported earlier (Adeneye AA and Olagunju AJ, 2009 & Pankaj N, 2011).

Statistical analysis

The results are expressed as mean ± SEM. Statistical analysis was performed by one-way analysis of variance (ANOVA) test for multiple comparison followed by Turkey- Karmer test. Statistical significance was set accordingly.

RESULTS AND DISCUSSION

Extraction

About 6.85% w/w of METE and 9.83% w/w of MEFV were obtained.

Preliminary phytochemical screening

METE showed presence of carbohydrates, saponins, flavonoids and phenolic compounds. MEFV showed presence of flavonoids and tri terpenoids compounds.

Acute toxicity studies

There was no gross behavioural changes were observed even at the highest dose of both the plant extracts METE and MEFV. Hence, METE at a dose of 500 mg/Kg and MEFV at a dose of 100 mg/kg was selected for the pharmacological screening.

Anti-diabetic activity

Effects of *Foeniculum vulgare & Tagetes erecta* on glucose tolerance in normal fasted rats

OGTT test was studied by administration of glucose (5 mg / kg, p.o) to control (G – II) animals, a significant increase in blood glucose levels were noticed after 60 min which was followed by a reduction after 120 min. Treatment with standard drug glibenclamide (group – III), blood glucose raised at 30 min followed by subsequent fall up to 120 min. It was observed from present study that administration of *Foeniculum vulgare & Tagetes erecta e*xtracts increased the glucose levels were seen after 30 min and hypoglycaemia effect was observed only after 120 min. Rats treated with combination of both *Foeniculum vulgare & Tagetes erecta* extracts showed an increase in blood glucose levels at 30 min followed by decrease in blood glucose levels from 60 min onwards (Table 2).

Effect of *Foeniculum vulgare & Tagetes erecta* on serum glucose levels

In animals treated with Streptozotocin (G – I) (60 mg / kg i.p) a significant increase in the serum glucose levels was observed on the $7^{th,}$ 14^{th}, 21^{st} and 28^{th} day, when compared to the normal group (G – I). Group – III treated with standard drug (glibenclamide – 0.5 mg / kg p.o) showed a significant decrease in serum glucose levels on 7^{th} , 14^{th} , 21^{st} and 28^{th} day, when compared to the diabetic control group (G – II). On administration of *Foeniculum vulgare & Tagetes erecta* extracts alone and in combination groups (G – IV, V and VI), the blood glucose levels were decreased on 7^{th} , 14^{th} , 21^{st} and 28^{th} day, when compared to the control group (G – II) (Table 3)

Effect of *Foeniculum vulgare & Tagetes erecta* on serum triglyceride levels

Group – II animals receiving Streptozotocin showed a significant increase in triglyceride levels on 14^{th}, 21^{st} and 28^{th} day, when compared to the normal group (G – I). Rats treated with standard drug (G – III) had significantly lowered triglyceride level on 14^{th}, 21^{st} and 28^{th} day, when compared to the control group (G – II). A significant decrease in serum triglycerides was observed in animals treated with *Foeniculum vulgare & Tagetes erecta* extracts alone and in combination (G – IV, V and VI), when compared to the control group (G – II) (Table 4).

Effect of *Foeniculum vulgare & Tagetes erecta* on serum cholesterol

The biochemical parameter, serum cholesterol has shown significant increase in Streptozotocin induced group (G – II) when compared with the normal group (G – I). A significant decrease in the levels of serum cholesterol was observed from 14^{th} day onwards on administration of glibenclamide (G – III), when compared with the control group (G – II). *The Foeniculum vulgare & Tagetes erecta* extracts alone and in combination (G – IV, V and G – VI) caused a significant decrease in the serum cholesterol levels from the 14^{th} onwards, when compared to the control group (G – II) (Table 5) .

Effects of *Foeniculum vulgare & Tagetes erecta* on serum HDL level

The rats induced with Streptozotocin (G – II) a significant decrease in HDL levels was observed on 14^{th}, 21^{st} and 28^{th} day, when compared to the normal group (G – I). Group – III, receiving standard drug (glibenclamide – 0.5 mg / kg p.o) showed a significant increase in HDL levels on 14^{th}, 21^{st} and 28^{th} day, when compared to the control group (G – II). Administration of *Foeniculum vulgare & Tagetes erecta* extracts both alone and in combination (G – IV, V and VI) have shown a significant increase in HDL levels on 14^{th} , 21^{st} and 28^{th} day, when compared to the control group (G – II) (Table 6).

Effect of *Foeniculum vulgare & Tagetes erecta* on serum LDL level

The rats induced with Streptozotocin (G – II) a significant increase in LDL levels was observed on 14^{th}, 21^{st} and 28^{th} day, when compared to the normal group (G – I). Group – III, receiving standard drug (glibenclamide – 0.5 mg / kg p.o) showed a significant decrease in LDL levels on 14^{th}, 21^{st} and 28^{th} day, when compared to the control group (G – II). Administration of *Foeniculum vulgare & Tagetes erecta* extracts both lone and in combination (G – IV, V and G – VI) have shown a significant decrease in LDL levels on 14^{th}, 21^{st} and 28^{th} day, when compared to the control group (G – II) (Table 7).

Effects of *Foeniculum vulgare & Tagetes erecta* on body weight

The rats induced with Streptozotocin (G – II) a significant decrease in body weight was observed on 7^{th}, 14^{th}, 21^{st} and 28^{th} day, when compared to the normal group (G – I). Group – III, receiving standard drug (glibenclamide – 0.5 mg / kg p.o) showed a significant increase in body weight on 14^{th}, 21^{st} and 28^{th} day, when compared to the control group (G – II). Administration of *Foeniculum vulgare & Tagetes erecta* extracts both alone and in combination (G – IV, G – V and G – VI) have shown a significant increase in body weight on 14^{th}, 21^{st} and 28^{th} day, when compared to the control group (G – II) (Table 8).

Table 1. Treatment schedule

Group No.	Treatment	Purpose
I	Normal saline	To serve as normal control
II	Streptozotocin + Distilled water (60mg/kg i.p.)	To serve as disease control
III	Glibenclamide (0.5 mg/kg)	To serve as standard
IV	*Foeniculum vulgare* fruit extract (500 mg/kg B. Wt)	To study the anti-diabetic effect of *F.vulgare*
V	*Tagetes erecta* whole plant extract (50 mg/ kg B. Wt)	To study the anti-diabetic effect of *Tagetes erecta*
VI	*Foeniculam vulgare* extract (500 mg/kg) + *Tagetes erecta* (100 mg/kg)	To study the anti-diabetic synergistic effect of *F.vulgare and Tagetes erecta*

Table 2. Effect of *Foeniculum vulgare & Tagetes erecta* on glucose tolerance in normal fasted rats

Group	Treatment	Serum glucose (mg / dl) (mean ± SEM)				
		Time after glucose administration in minutes				
		0	30	60	90	120
I	Control	67.53±4.20	107.81±4.40	137.12±4.12	151.7±4.26	115.27±5.20
II	Standard	61.54±6.87	71.35±6.02[a]	68.12±5.99[a]	73.12±6.30[a]	64.12 ± 5.96[a]
III	MEFV	70.24±4.29	82.12±4.20[a]	94.12±5.60[a]	97.12±4.11[a]	67.43 ± 5.20[a]
IV	METE	57.34±4.91	94.20±5.25[a]	110.12±5.20[a]	94.20±5.01[a]	78.6 ± 4.08[a]
V	F.V + T.E	55.06±5.67	90.74±4.93[a]	80.12±5.12[a]	71.13±5.14[a]	60.14 ± 4.02[a]

a = $p < 0.001$, when compared on control (G – I)

Table 3. Effect of *Foeniculum vulgare & Tagetes erecta* on serum glucose levels in diabetic rats

Group	Treatment	Serum glucose (mg / dl) (mean ± SEM)				
		0^{th} day	7^{th} day	14^{th} day	21^{st} day	28^{th} day
I	Normal	72.40±6.45	86.70±6.45	76.8±5.45	68.57±5.97	81.7±5.45
II	Control	194.7±16.56	198.00±16.46[a]	217.8±16.26[a]	219.6±16.85[a]	222.3±18.44[a]
III	Standard	180.6±16.45	93.75±6.65[b]	92.18±10.74[b]	91±7.26[b]	85.56±9.47[b]
IV	METE	206.20±18.44	159.68±8.78[c]	122.06±6.88[b]	103.07±8.95[b]	95±6.25[b]
V	MEFV	214±19.50	161.87±5.49[c]	133.43±8.35[b]	101.22±10.49[b]	94.23±6.38[b]
VI	T.E+F.V	228.8±19.25	121.62±7.55[b]	107.34±6.45[b]	98.12±6.46[b]	81.34±5.45[b]

a = $p < 0.001$, when compared to normal (G – I), b = $p < 0.001$, when compared to control (G – II), c = $p < 0.05$, when compared to control (Group – II)

Table 4. Effect of *Foeniculum vulgare & Tagetes erecta* on serum triglyceride levels in diabetic rats

Group	Treatment	Serum triglyceride (mg / dl) (mean ± SEM) on				
		0^{th} day	7^{th} day	14^{th} day	21^{st} day	28^{th} day
I	Normal	158.3±12.44	160.2±16.45	158±16.44	169.21±16.83	159.8±15.48
II	Control	190.4±17.45	204±18.48	219±16.15[a]	231±16.25[a]	244±17.23[b]
III	Standard	172.3±13.64	167.2±15.44	160.89±17.48[c]	158.3±14.50[d]	155.3±16.47[d]
IV	METE	174±14.32	177.2±16.42	172.3±14.45[c]	170.2±18.99[c]	169.4±14.42[d]
V	MEFV	172.6±13.40	171.9±16.45	182.7±12.08[c]	170.5±14.38[c]	168±15.86[d]
VI	F.V + T.E	184±14.55	182.1±15.11	180.8±13.09[c]	176.91±19.07[c]	164.1±17.03[d]

a = $p < 0.01$, when compared to normal (Group – I), b = $p < 0.001$, when compared to normal (Group – I) , c = $p < 0.05$, when compared to control (Group – II) , d = $p < 0.01$, when compared to control (Group – II)

Table 5. Effect of *Foeniculum vulgare & Tagetes erecta* on serum cholesterol in diabetic rats

Group	Treatment	Serum cholesterol (mg / dl) (mean ± SEM) on				
		0^{th} day	7^{th} day	14^{th} day	21^{st} day	28^{th} day
I	Normal	57.68±6.51	63±6.45	52±6.45	59±6.45	61±6.45
II	Control	146.6±12.45	154±13.32	168±16.12[a]	161±16.40[a]	159±16.25[a]
III	Standard	160±16.46	119±7.20	96±7.14[b]	88±5.22[b]	80±5.05[b]
IV	METE	151.8±9.45	130±5.23	111±6.45[b]	102±7.46[b]	97±6.25[b]
V	MEFV	143.7±11.25	119±6.30	108±7.04[b]	96±6.35[b]	92±7.85[b]
VI	F.V + T.E	157.7±12.47	123±5.95	77.5±5.28[b]	71±6.26[b]	69±8.45[b]

a = $p < 0.05$, when compared to normal (Group – I), b = $p < 0.001$, when compared to normal (Group – II) , c = $p < 0.001$, when compared to control (Group – II)

Table 6. Effect of *Foeniculum vulgare & Tagetes erecta* on serum HDL level in diabetic rats

Group	Treatment	Serum HDL (mg / dl) (mean ± SEM) on				
		0th day	7th day	14th day	21st day	28th day
I	Normal	54.4±5.54	47.5±5.57	52.73±5.00	49.7±5.56	51.30±5.54
II	Control	49.7±5.56	47.2±8.72	41.4±4.48[a]	37.2±3.60[a]	31.23±3.58[b]
III	Standard	51.35±5.68	57.53±5.56	59.4±4.56[c]	56.3±5.55[d]	57.63±5.55[d]
IV	METE	58.93±4.74	51.53±7.69	58.3±5.05[c]	63.63±6.69[d]	61.3±6.64[d]
V	MEFV	42.63±4.90	54.7±6.85	59.99±4.02[d]	62.58±6.50[d]	61.42±5.58[d]
VI	F.V + T.E	57.40±5.59	58.6±5.57	61.3±5.00[c]	59.32±5.47[c]	57.7±8.51[c]

a = $p < 0.05$, when compared to normal (Group – I), b = $p < 0.001$, when compared to normal (Group – I), c = $p < 0.01$, when compared to control (Group – II), d = $p < 0.001$, when compared to control (Group – II)

Table 7. Effect of *Foeniculum vulgare & Tagetes erecta* on serum LDL level in diabetic rats

Group	Treatment	Serum LDL (mg / dl) (mean ± SEM) on				
		0th day	7th day	14th day	21st day	28th day
I	Normal	43.20±6.39	52.1±6.43	48±6.45	54.4±6.45	53±6.45
II	Control	102±16.45	105±14.45	108.1±12.43[a]	114.2±13.47[a]	118±11.45[a]
III	Standard	65.17±6.46	62±6.45	63.2±6.46[b]	61±6.85[c]	60±5.25[c]
IV	METE	78.40±6.45	82.1±7.44	70.21±4.10[b]	72.1±5.50[b]	71±6.45[c]
V	MEFV	73.40±7.48	74±5.26	80.3±4.46[c]	73.3±5.80[b]	72.3±7.45[c]
VI	F.V + T.E	62.10±6.49	68.3±6.49	62±6.45[c]	66.27±5.93[c]	61±6.58[c]

a = $p < 0.001$, when compared to normal (Group – I) , b = $p < 0.01$, when compared to control (Group – II) , c = $p < 0.001$, when compared to control (Group – II)

Table 8. Effect of *Foeniculum vulgare & Tagetes erecta* on body weight levels in diabetic rats

Group	Treatment	Serum LDL (mg / dl) (mean ± SEM) on				
		0th day	7th day	14th day	21st day	28th day
I	Normal	180±1.76	183.8±0.58	185.4±0.92	188.4±0.77	193.6±1.66
II	Control	176.2±0.80	159.8±0.56[a]	147.2±1.68[a]	142.4±1.43[a]	138.4±1.28[a]
III	Standard	177.4±0.67	174.6±0.50[c]	179.2±0.37[b]	183.2±1.06[b]	191.4±1.40[b]
IV	METE	177.20±0.96	168±0.70	164.6±0.89	169±0.54[c]	175.8±0.58[c]
V	MEFV	176.6±0.67	169.6±0.50	165.8±0.94	168.8±1.49[c]	177.7±0.89[c]
VI	F.V + T.E	177.5±0.92	175.8±0.86[c]	178.8±0.96[b]	182.6±1.20[b]	190.60±1.03[b]

a = $p < 0.001$, when compared to normal (Group – I) , b = $p < 0.01$, when compared to control (Group – II) , c = $p < 0.001$, when compared to control (Group – II)

CONCLUSION

Diabetes Mellitus (DM) is a metabolic disorder resulting from a defect in insulin secretion, insulin action or both. Despite the fact that it has a high prevalence, morbidity and mortality; it is regarded as a non - curable but controllable disease. Herbal formulations are frequently considered to be less toxic and also free from side effects, than synthetic ones. Hence, the present study involves one such combination of herbal drugs, combination of *Foeniculum vulgare & Tagetes erecta* for their antidiabetic potential against alloxan induced diabetes in albino rats. The effect of both individual and combination of *Foeniculum vulgare & Tagetes erecta* on blood glucose, total cholesterol, HDL, LDL, triglycerides and body weight were studied in the diabetic rats. The results of the present study attests significant antidiabetic potential for the selected plants individually and also in combination as a prominent decrease in blood glucose, total cholesterol, LDL, triglycerides, body weight and increase in HDL, was observed in the rats treated with extracts of the selected medicinal plants. Hence, the present study provides a scientific evidence for antidiabetic potential of *Foeniculum vulgare & Tagetes erecta*. Further studies to isolate bioactive compounds will have a path to identify potential lead compounds for developing safe and efficacious anti diabetic agents.

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