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Evaluation of Anti-diabetic Activity of Ethanolic Extract of *Ipomoea eriocarpa*

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Abstract

Diabetes mellitus (DM) is a group of metabolic disorders characterized by a chronic hyperglycemic condition resulting from defects in insulin secretion, insulin action or both. Permanent neonatal diabetes is caused by glucokinase deficiency, and is an inborn error of the glucose-insulin signaling pathway. The present study is to evaluate the in-vivo Anti-Diabetic activity of Ipomoea eriocarpa whole plant extract. Assessment of in-vivo Anti-diabetic activity of *Ipomoea eriocarpa* whole plant extract in male wister albino rats. Now a days as human being competing for high-five life along with this we are getting major disorder like diabetis HTN etc.. The selected plant ipomoea eriocarpa is a potential herb having many traditional values and potential activities. So we had selected the plants to work on diabetes.

Keywords

Ipomoea eriocarpa, Glucokinase, Wister Albino Rats, Hyperglycemic

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1. Introduction

The prevalence of diabetes is increasing rapidly worldwide and the World Health Organization (2003) has predicted that by 2030 the number of adults with diabetes would have almost doubled worldwide, from 177 million in 2000 to 370 million. Experts project that the incidence of diabetes is set to soar by 64% by 2025, meaning that a staggering 53.1 million citizens will be affected by the disease. The estimated worldwide prevalence of diabetes among adults in 2010 was 285 million (6.4%) and this value is predicted to rise to around 439 million (7.7%) by 2030. There are two main types of diabetes mellitus Type 1: Diabetes, also called insulin dependent diabetes mellitus (IDDM), is caused by lack of insulin secretion by beta cells of the pancreas. Type 2: Diabetes, also called non-insulin dependent diabetes mellitus (NIDDM), is caused by decreased sensitivity of target tissues to insulin. Gestational diabetes: It is a type of diabetes that develops only during pregnancy. The whole plant of *Ipomoea eriocarpa*is used for fever, ulcer, and rheumatism, how ever there are no reports on the anti diabetic activity of the whole plant. Hence the present study was designed to verify the claims of native medical practioners.

2. Materials and Methods

The leaves of plant *Ipomoea eriocarpa* belonging to the family to Convolvulaceae were collected from surroundings of Yerpedu, Andhra Pradesh, India in the month of June. The plant material was authenticated by Dr. K. Madhavachetty, assistant professor, department of botany, Sri Venkateshwara University, Thirupati. [6]

2.1. Extraction[(1)]

1. The leaves of *Ipomoea eriocarpa* were shade dried for 7 days 350 gms powder was subjected to extraction with aqueous ethanol (1:3) by soxhlet apparatus for 72 hrs.

2. Concentrate each extract by distillating off the solvent and

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then evaporating to dryness on the water-bath.

3. Weigh the extract obtained and calculate its percentage in terms of the air-dried weight of the plant material. Also note the consistency of the extract.

4. Finally we obtained 35 gms of extract from 350 gms of powdered plant

2.2. Preliminary Phytochemical Screening

Preliminary phytochemical screening was carried out by using standard procedure. The ethanolic extract of *Ipomoea eriocarpa* was tested for the presence of phytoconstituents viz. carbohydrates, proteins, alkaloids, flavonoids, saponins and glycosides.

2.3. Test for Carbohydrates

A) Molisch test

To 1mg power, two drops of alcoholic solution of alpha napthol were added. The mixture was shaken and 1mi of concentrate sulphuric acid was added slowly along the sides of the test-tube, the test tube was cooled in ice water and allowed to stand. A violet coloured ring at the junction indicates the presence of carbohydrates.

B) Benedicts test

To 1mg of powdered drug 0.5 ml of benedicts reagent was added. The mixture was heated on boiling water bath for 2 minutes. A red green or yellow colored precipitate indicates the presence of sugar.

Test for proteins

Biuret test:

To the 2 ml of test solution, add 2 ml of biuret reagent is added and development of violet color indicates presence of proteins.

Test for alkaloids:

Dragondroff's test:

To the 2 ml of test solution add 2 ml of Dragondroff's reagent (Potassium bismuth iodide solution) Reddish brown precipitate indicates the presence of alkaloids.

Test for flavonoids:

Shinoda test:

To the test solution add few magnesium turnings and concentrated hyrochloric acid drop wise, pink scarlet crimson red are occasionally green to blue color appears after few minutes.

Test for saponins:

Froth formation test:

Place 2 ml solution of drug in water in a test tube, shake well, stable froth foam is formed.

Test for glycosides:

Borntragers test:

Boil the test material with 1ml of sulphuric acid in a test tube for 5min and filter while hot. Cool the filterate and shake with equal volume of chloroform. Separate the lower layer of chloroform and shake it with half of its volume of dilute ammonia. A rose pink to red color is produced in the ammonical layer.

2.4. Extraction

The leafs of *Ipomoea eriocarpa* were subjected for drying for a period of 7 days. After drying the powder is made extracted with the solvent ethanol and the extract obtained is subjected for the preliminary phytochemical screeing.

2.5. Preliminary Phytochemical Screening

Preliminary phytochemical analysis revealed the presence of phytoconstituents viz. carbohydrates, proteins, alkaloids, flavonoids, saponins and glycosides Table No. 1.

Table No. 1. Preliminary phytochemical screening for *I. eriocarpa:* [2] [3] [4] [5].

S.NO	TEST	ETHANOLIC LEAF EXTRACT OF *I. eriocarpa*
1	Carbohydrates	_
2	Protein	_
3	Alkaloids	+
4	Flavonoids	_
5	Saponins	+
6	Glycosides	_
7	Tannins	+

+ ≡ Presence, – ≡Absence.

3. Dosage Preparation

IPOMEA ERIOCARPA ethanolic aqueous extracts were dispersed in noramal saline and was administered orally at a doses of 250 mg/kg, 500 mg/kg and 800 mg/kg body weight to the experimental rats for 21 days. [7]

4. Results & Discussion

30 male wister albino rats were selected and grouped into 6 groups each group having five rats and checked their blood glucose levels randomly with the help of glucometer. Blood glucose level of all the rats are tested and identified as normal approximately. Out of 6 groups 5 groups are injected with Alloxan to induce the diabetes after they are kept fasting for12hours and remaining sixth group was under control and treated with just normal water. sugar levels are estimated after Alloxan injection is injected and they are as follows:

Table No. 2. Sugar level.

S.NO	GROUP	SUGAR LEVELS
1.	GROUP-1	170-200gm/dl
2.	GROUP-2	180-210gm/dl
3.	GROUP-3	180-200gm/dl
4.	GROUP-4	190-210gm/dl
5.	GROUP-5	190-200gm/dl
6.	GROUP-6(WATER)	100+20gm/dl

The grouped rats are treated as follows:

Group-1: Treated with 250 mg of aqueous extract of plant Ipomeaeriocarpa for 21 days.

Group-2: Treated with 500 mg of aqueous extract of plant Ipomeaeriocarpa for 21 days.

Group-3: Treated with 800 mg of aqueous extract of plant Ipomeaeriocarpa for 21 days.

Group-4: Treated with standard Glibenclamide available drug used for diabetes for 21 days.

Group-5: Treated with normal citrate buffer for 21 days

Group-6: Treated with normal water and sugar levels are estimated.

Note: Glucose levels were checked on day 1,7,14 and 21.

Table No. 3. Glucose levels of all groups.

S.NO	GROUPS	DOSE	GLUCOSE LEVELS		
			Day 7	Day 14	DAY 21
1.	GROUP-1	250mg	150 ± 10	140 ± 10	110 ± 10
2.	GROUP-2	500mg	130 ± 10	120 ± 10	100 ± 10
3.	GROUP-3	800mg	120 ± 10	110 ± 10	90 ± 10
4.	GROUP-4	Glibemclemide	100 ± 20	90 ± 20	90 ± 10
5.	GROUP-5	Citrate Buffer	250 ± 20	270 ± 10	270 ± 10
6.	GROUP-6	water	100 ± 20	100 ± 10	100 ± 20

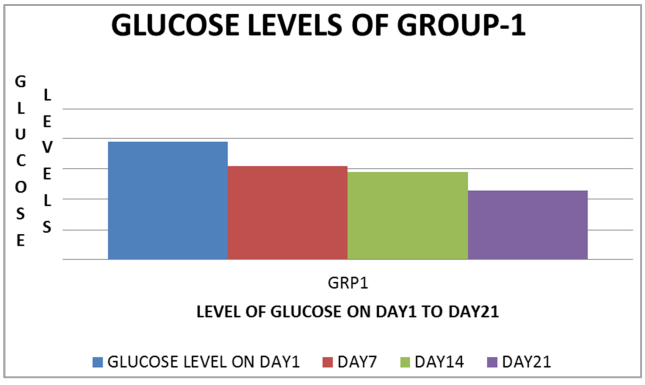

Fig. 1. Glucose levels of group 1 (250mg/kg) from day 1 to day 21.

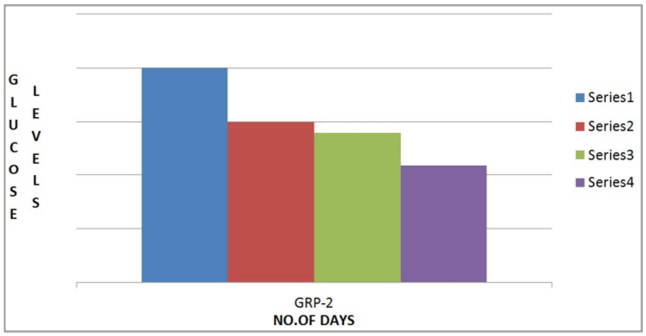

Fig. 2. Glucose levels of group 2 (500mg/kg) from day 1 to day 21.

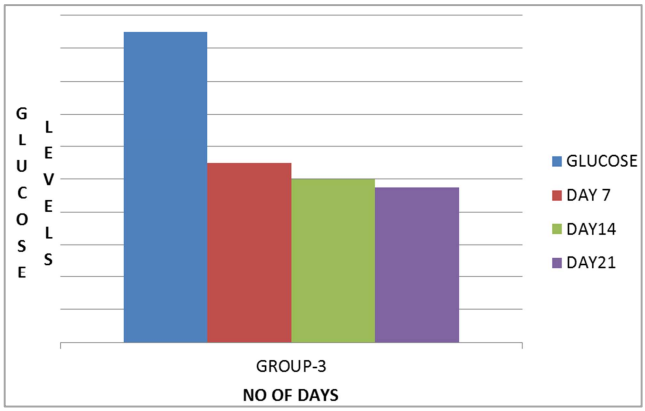

Fig. 3. Glucose levels of group 3 (800mg/kg) from day 1 to day 21.

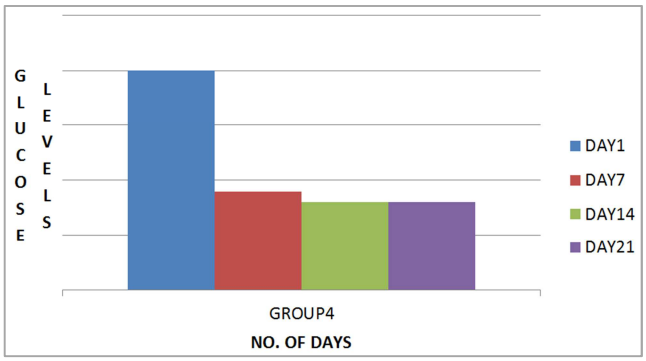

Fig. 4. Glucose levels of group 4 (glibenclamide) from day 1 to day 21.

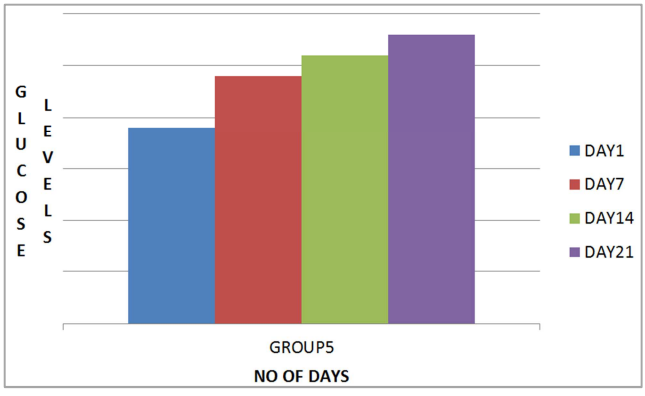

Fig. 5. Glucose levels of group 5(citrate buffer) from day 1 to day 21.

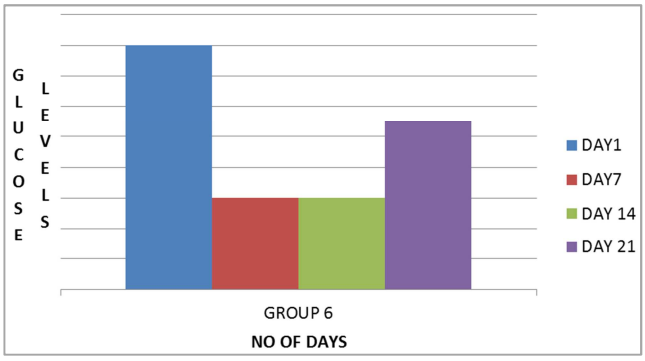

Fig. 6. Glucose levels of group 6(water) from day 1 to day 21.

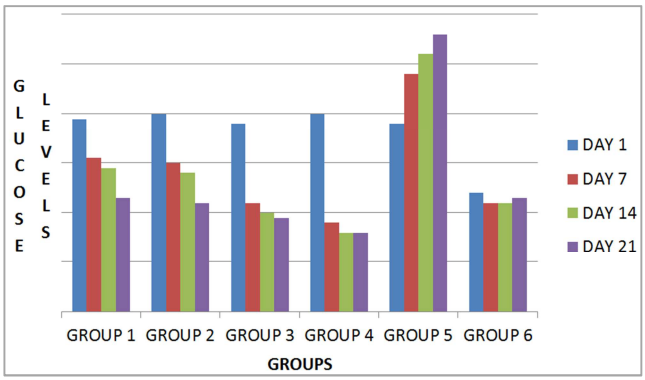

Fig. 7. Comparitive graphs of all groups.

5. Results

The selected plant ipomoea eriocarpa has many other activities apart from diabetic activity. This study on diabetis in alloxan induced wister albino rats states that the selected herb also had anti diabetic activty

The extract of ipomoea eriocarpa when administered in conc of 250 mg/kg gives mild hypoglycemic activity, 500 mg/kg gives moderate, 800mg/kg gives the good hypoglycemic activity

6. Conclusion

The selected plant ipomoea eriocarpa has good potent antidiabetic activity apart from other activities.

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