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Anti diabetic activity of stem of casearia *Esculenta Roxb*

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ABSTRACT

The alcoholicand aqueous extract of stem of casearia esculenta was screened for anti diabetic activity in alloxon induced diabeties in albino rats at the dose level of 200mg/kg and compared to the standard drug glibenclamide.The result were found to be significant (P<0.01)when compared to control.

KEYWORDS

Casearia *Esculenta;*
Anti Diabetic activity;
Alloxon;
Glibenclamide.

INTRODUCTION[1,2,3]

The plant Casearia esculenta (Samydaceae) is a shrub or a tree of 6 m in height frequently met with in Penisular India in the eastern and western ghats up to 1,200 m in the coastal plains, and in the hill of north-eastern India. The bark of Casearia esculenta is Pale yellow, rather smoothand 4 mm thick. The main active constituents of this plant are phytosteroids, carbohydrate, glycosides, tannins, flavanoids and triterpenes. The root also contains gutta-percha like substance (m.p.59-60^0) and another sterol having (m.p.120-121^0) and two resinous substances having hypoglycemic activity. The fruits are edible and leavesand shoots are cooked. The rootand and root bark (trade-saptrangi) are extensively used in the indigenous system of medicine as an antidiabetic drug. In recent investigations, the crude aqueous extract of the roots has shown hypoglycemic activity.

EXPERIMENTAL

The stem of plant of Casearia esculenta were collected from the local areas of Kaladungi (Nainital) and were authenticated by National Herbarium of Cultivated Plants, New Dehli,voucher no NHCPNBPGR/92/8053,Where a voucher sample has been deposited. .

Fresh stem of Casearia esculenta was collected shade dried at room temperature, pulverized and 2 kg of the drug was extracted with 95% ethanol in a soxhlet extraction. The extract was concentrated in a rotary flash evaporator. Alcoholic and Aqueous extract of stem of Casearia esculenta emulsified with 1% acacia was employed for assessing antidiabetic activity.

Fresh stem of Casearia esculenta was collected, shade dried at room temperature, pulverized and 2 kg of the drug macerated with 3% chloroform water for 7 days with occasional shaking to get the aqueous extract. The aqueous extract was concentrated in a rotary flash evaporator and dried in desicator over sodium sulfite. Alcoholic and Aqueous extract of stem of Casearia esculenta emulsified with 1% acacia were employed for assessing antidiabetic activity.

Anti diabetic activity[4,5]

Animal selection

The complete course of experiment was carried out using 3 months old healthy albino wistar strain male rats weighing between 125-200gm, obtained from COP, I.F.T.M., Moradabad were used for the experiment.

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Throughout the study animals were maintained at normal laboratory conditionsand were given standard animal feed.

Dose

Oral administration of Casearia esculenta stems extract at a dose of 200 mg/kg for 21 days[6,7]

Standard

Glibenclamide tablet (Dionil brand) Manufactured by Aventis Pharmaceuticals was used as a standard drug. It was purchased from local market.

Induction of diabetes

The animals were kept for fasting for 24 hrs and rendered Diabetic by injecting a single dose of Alloxon 150mg/kg body weight (manufactured by Loba Company) administered as a 5% w/v in distilled water by IP route. It produces diabetes by selective necrosis of β-cells of islets of langerhans of pancreas.

After one week, diabetes was confirmed by testing blood glucose by using o-toluidine method[36]. The animals with sugar level more then 200mg/dl were selected. Animals were maintained for four days in diabetic condition for well establishment of diabetes.

Experimental design

Several groups of rats were used to study the effect of aqueous and alcoholic extracts of *Casearia esculenta*. The rats were divided in to 5 groups each consisting of six rats.

Group-I: Group I received only the vehicle (1% gum acacia) served as normal control.

Group-II: Untreated diabetes induced animals served as a negative control.

Group-III: Diabetes induced animals were treated with standard drug (10mg/kg body weight) served as positive control.

Group-IV: Diabetes induced animals were treated with aqueous extract of Casearia esculenta.

Group-V: Diabetes induced animals were treated with alcoholic extract of Casearia esculenta.

After an overnight fasting each group were treated for 21 days as above; Blood samples were collected for the measurement of blood glucose, from the tail vein puncture. The blood glucose levels were determined by using o-toluidine method[8].

RESULT AND DISCUSSION

Blood glucose level (mg/dl) after drug treatment at various time intervals

TABLE 1: Normal control group

S.no.	Wt.of animals	0 DAY	7 DAY	14DAY	21 DAY
1	130 g	110.47	109.23	110.56	111.42
2	125 g	111	109.89	111.2	110.26
3	120 g	108.24	111.24	110.62	108.35
4	135 g	110.52	110.62	109.23	110.64
5	130 g	112.34	111.53	111.42	111.29
6	125 g	109.25	108.35	110.29	110.35
	MEAN	110.3033	110.1433	110.5533**	110.385
	SEM	0.5795	0.4989	0.3159	16.491

P>0.05 ns - not significant , P< 0.01 ** - considered extremely significant

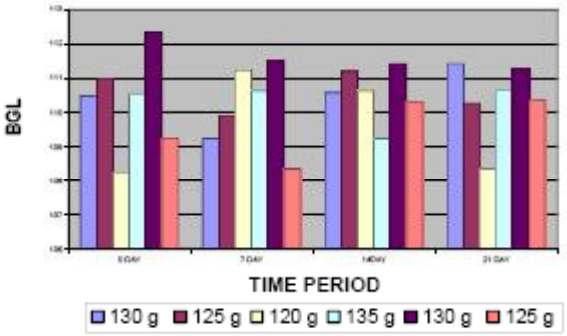

Figure 1

TABLE 2: Positive control group

S.no.	Wt.of animal	0 Day	7 Day	14 Day	21 Day
1	130 g	298.09	302.71	306.66	309.04
2	125 g	299.25	301.24	306.02	307.7
3	120 g	298.29	301.62	304.94	309.81
4	135 g	296.62	300.92	303.26	307.24
5	130 g	300.02	302.64	304.29	310.31
6	125 g	299.64	303.07	305.32	308.2
MEAN		298.6517**	302.0333**	305.0817**	308.7167**
SEM		0.5093	0.3568	0.4964	0.4940

P>0.05, ns - not significant ; P< 0.01, ** - considered extremely significant

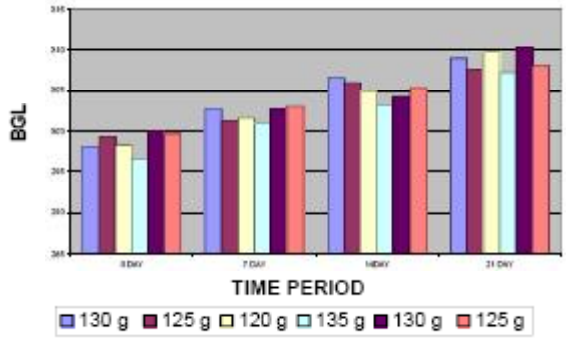

Figure 2

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TABLE 3: Animal treated with standard drug group

S.no.	Wt.of animal	0 DAY	7 DAY	14DAY	21 DAY
1	130 g	300.47	245.23	182.85	118.56
2	125 g	304.24	245.92	182.02	119.25
3	120 g	302.69	243.07	184.24	118.61
4	135 g	300.51	246.35	180.35	120.91
5	130 g	301.09	246.93	183.01	118.31
6	125 g	301.29	244.39	180.62	117.76
MEAN		301.715**	245.315**	182.1817**	118.9^{ns}
SEM		0.6028	0.5759	0.6107	0.4476

P>0.05, ns - not significant ; P< 0.01, ** - considered extremely significant

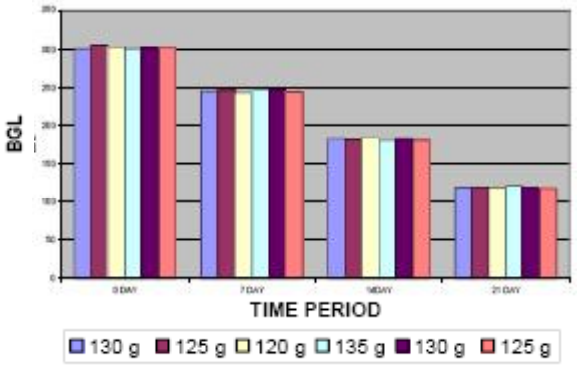

Figure 3

TABLE 4: Animal treated with alcoholic extract group

S.no.	Wt.of animal	0 DAY	7 DAY	14 DAY	21 DAY
1	130 g	299.29	260.28	202.35	110.21
2	125 g	300.69	258.04	201.24	109.25
3	120 g	302.24	260.21	205.01	115.52
4	135 g	300.41	258.52	201.85	110.53
5	130 g	301.29	259.61	203.2	108.42
6	125 g	301.21	258.15	201.21	109.23
MEAN		300.865**	259.13	202.476**	110.526^{ns}
SEM		0.4024	0.4179	0.5911	1.045

P>0.05, ns - not significant ; P< 0.01, ** - considered extremely significant

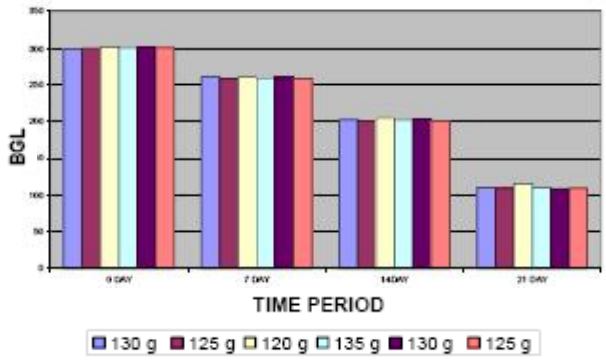

Figure 4

The results of anti diabetic activity of both the extracts was shown in TABLE 1-5. The results were analysed using one way analysis of variance(ANOVA)

TABLE 6 : Comparative antidiabetic activity of all the extract

Group	Treatment	0 Days	7 Days	14 Days	21 Days
1	NCG	110.3±0.58	110.14±0.32	110.55±0.32	93.72±16.5
2	POSI	298.65±0.51	302.02±0.36	305.08±0.5	308.72±0.49
3	STD	301.72±0.6	245.32±0.58	182.18±0.61	118.9±0.45
4	ALC	300.87±0.4	259.14±0.42	202.48±0.59	110.53±1.04
5	AQ	300.19±0.82	253.66±0.96	203.29±0.96	105.86±1.19

NCG - Negative Control Group; POSI - Positive Control ; STD - Standard Drug; ALC - Alcoholic Extract; AQ - Aqueous Extract

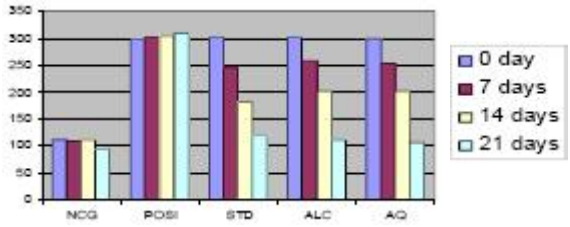

Figure 5

and Dennett's t test. P value less than 0.01 were considered as significant.

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