

**EFFECT OF *JASMINUM SAMBAC* LEAVES EXTRACTS ON SERUM  
GLUCOSE AND LIPID PROFILE IN RATS TREATED WITH ALLOXAN**

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**Summary**

Different extracts viz. ethyl acetate (EAE) and water extract (WTE) of leaves of *Jasminum sambac* Linn (family: Oleaceae) were tested against alloxan induced diabetic rats. Water extract (300mg/kg, p.o) for 21 days showed significant ( $p < 0.01$ ) change in plasma glucose level and also a significant improvement in other parameters like Total cholesterol(TC), Triglyceride(TG), High density lipoproteins(HDL-c), Low density lipoprotein (LDL-c), Very low density lipoproteins (VLDL) and serum urea. Glibenclamide (10mg/kg) was used as positive control. The result suggests the antidiabetic and lipid lowering activity of *Jasminum sambac* leaves extracts.

**keywords:** *Jasminum sambac*, glucose, lipid profile

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### **Introduction**

*Jasminum sambac* Linn (family: Oleaceae) commonly known as “mogra”. Plant is considered cool and sweet; it is used as remedy in case of insanity, in weakness of sight and affections of mouth. The root is purgative, expectorant, anthelmintic, intoxicant cures headache, paralysis, rheumatism (1). The flowers act as lactifuge and are said to arrest the secretion of milk in puerperal states in case of threatened abscess. In Bourneo, Africa, the decoction of leaves was used for lowering the blood glucose level. It is also reported to possess angiotensin converting enzyme inhibitory activity (2). *J. sambac* leaves contain major phytoconstituents as glycosides, saponins, flavonoids and terpenoids. Mainly the Iridoid glycosides are present. These include sambacin (I) (3), Jasminin, Sambacoside A, Sambacoside A, Sambacolingoside (4). Flavonoids include quercetin, isoquercetin (3), rutin, kempferol and luteolin (5). The objective of the present study was to investigate the antidiabetic activity of ethyl acetate and water extract of *J. sambac* leaves.

### **Materials and methods**

The leaves of *Jasminum sambac* Linn were collected from Wardha District, Maharashtra, India and were authenticated from, Post Graduate Teaching Department of Botany. A voucher specimen (No.9100) was deposited for further reference. The shade dried and powdered leaves of *Jasminum sambac* Linn, were subjected to successive extraction in a soxhlet apparatus with ethyl acetate and finally macerated with water so as to get respective extracts. All extracts were individually filtered, through Whatmann filter paper # 42 and evaporated to dryness at 50°C in oven. The extracts were then stored in desiccators till further use. Percentage yield of the extracts was found to be 5.8%, and 18.3% respectively. Diagnostic kits for estimation of Glucose, Cholesterol, Triglyceride, HDL-C, and urea were obtained from MERCK LTD Mumbai. Alloxan hydrate was obtained Loba Chemicals.

### **Animals**

The albino rats (Wistar strain) of either sex weighing 200-250g were housed in polypropylene cages at a temperature of  $25 \pm 2^\circ$  C with relative humidity of 40-60% and 12 hours light dark cycle. Animals were fed with a balanced diet and water *ad libitum* during the complete experimental period. All animal experiments were approved by the Institutional Animal Ethical Committee (Registration No.535 /02 /a/CPCSEA / Jan 2002) of the Institute. All the extracts were tested for there acute toxicity (if any) in male mice.

### **Experimental Protocol**

Rats with fasting blood glucose level more than 140 gm/dl were selected for further activity. Treatment with extracts of *Jasminum sambac* was started 48 hours after alloxan injection. The animals were grouped as follows with six animals in each group. Group I Normal control received daily dose of 0.3 ml of 2.5 % Tween 80 (vehicle) p.o. Group II Diabetic control with single dose of 70 mg/kg alloxan i.p. Group III Glibenclamide control with daily dose of 10 mg/kg glibenclamide. Group IV and V received EAE and WAE (300mg/kg/day, p.o) respectively for 21 days.

Fasting blood glucose estimation (by glucometer) and body weight measurement of the animals were done on day 1, 7 and 21 of the study. On the day 21, blood was collected by retro orbital puncture under mild ether anesthesia and was centrifuged at 2000 rpm to get serum. Serum was analyzed for cholesterol (6), triglycerides by enzymatic DHBS colorimetric method (7), HDL (8), LDL (9), creatinine (10) and urea (11). The biochemical parameters were analyzed using auto analyzer (Merck microlab-300).

### **Statistical Analysis**

One way analysis of variance (ANOVA) followed by Dunnett's *t*-test, was carried out and  $P < 0.05$  was considered as significant.

**Results and Discussion**

Effect of different extracts viz. ethyl acetate (EAE) and water extract (WTE) of leaves of *Jasminum sambac* at a dose of 300mg/kg, p.o on blood glucose level for 21 days were evaluated in alloxan induced diabetic rats (Table 1). WTE showed significant ( $p < 0.01$ ) reduction of elevated blood glucose level. EAE was found to be less active as compared to WTE at 300mg/kg dose level. Glibenclamide (10mg/kg) was found to reduce blood glucose level significantly ( $p < 0.01$ ) compared to diabetic rat. Diabetic mellitus is an oxidative stress generated disorder (12). Numerous plant constituents including phenolics compounds are reported for their antioxidant activity (13).

**Table 1: Effect of *Jasminum sambac* leaves extracts on blood glucose level of diabetic rats**

Treatment	Blood glucose level (mg/dl)			
	Day 1	Day 7	Day 14	Day 21
Vehicle control	95 ± 3.5	101 ± 2.9	90 ± 5.1	97 ± 6.5
Diabetic control	228.3 ± 3.5 <sup>#</sup>	268 ± 4.1 <sup>#</sup>	292 ± 2.0 <sup>#</sup>	286 ± 4.1 <sup>#</sup>
Glibenclamide control	226.6 ± 4.7 <sup>#</sup>	205.6 ± 4.5 <sup>#</sup>	156.0 ± 3.0 <sup>#</sup>	124.6 ± 3.5 <sup>#</sup>
EAE	223.6 ± 2.0*	215 ± 3.6*	207 ± 2.0*	199.3 ± 5.5*
WTE	224.3 ± 4.1 <sup>#</sup>	190.3 ± 4.1 <sup>#</sup>	185.6 ± 4.0 <sup>#</sup>	156.0 ± 3.6 <sup>#</sup>

Values expressed as mean ± S.D., n=6

Diabetic control was compared with vehicle control and extract & glibenclamide treated groups were compared with diabetic control, <sup>#</sup> P < 0.01 and \* P < 0.05

Water extract of *J. sambac* contains more amounts of polyphenolic compounds as proved by their quantitative estimation and may be responsible for maximum antioxidant activity. All the other parameters like TC, TG, HDL-c, LDL-c, VLDL, and urea showed

significant ( $p < 0.01$ ) improvement with water extract, which was however less than that with glibenclamide (Table 2). It has been found that at the dose of 300mg/kg *J. sambac* water extract exhibited good antidiabetic activity. Further studies are necessary to elucidate in details the mechanism of action of *J. sambac* and isolation of active constituents responsible for antidiabetic activity.

**Table 2: Effect of *Jasminum sambac* leaves extracts on lipid profile in rats treated with alloxan**

Treatment	TC	TG	HDL-c	LDL-c	VLDL
Vehicle control	162.9 ± 3.3	96.9 ± 2.6	34.5 ± 2.8	99.6 ± 4.1	19.6 ± 0.9
Diabetic control	268.3 ± 4.7 <sup>#</sup>	195.3 ± 3.1 <sup>#</sup>	37.6 ± 2.7 <sup>#</sup>	183.5 ± 3.6 <sup>#</sup>	37.8 ± 2.4 <sup>#</sup>
Glibenclamide control	178.1 ± 5.4 <sup>#</sup>	119.1 ± 3.0 <sup>#</sup>	54.1 ± 1.6 <sup>#</sup>	84.7 ± 5.3 <sup>#</sup>	24.5 ± 0.8 <sup>#</sup>
EAE	205.1 ± 3.2 <sup>*</sup>	156.1 ± 3.2 <sup>*</sup>	40.0 ± 1.3 <sup>*</sup>	154.8 ± 19.3 <sup>*</sup>	32.6 ± 1.4 <sup>*</sup>
WTE	187.7 ± 2.6 <sup>#</sup>	164.0 ± 2.6 <sup>#</sup>	47.7 ± 1.6 <sup>#</sup>	123.7 ± 4.5 <sup>#</sup>	32.3 ± 1.1 <sup>#</sup>

Values expressed as mean ± S.D., n=6

Diabetic control was compared with vehicle control and extract & glibenclamide treated groups were compared with diabetic control, <sup>#</sup> P < 0.01 and \* P < 0.05

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