

www.pharmaerudition.org

ISSN: 2249-3875



International Journal of Pharmaceutical Erudition

Research for Present and Next Generation

Nov. 2014

**Vol: 04 Issue: 03
(70-73)**





Research Paper

Phytopharmacological Evaluation of Hydro-Alcoholic Extract of *Anogeissus Latifolia* Bark for their Anti Hypoglycemic Activity

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The anti-diabetic Activity of the hydroalcoholic extract of *Anogeissus latifolia* bark was studied in normal fasted rats at a dose of 150 mg and 300 mg/kg body weight. Blood glucose level was observed at 60 minutes, 120 minutes and 180 minutes of treatment with Gilbendamide, ALBE-I and ALBE-II. The results indicate that the plant extract produces a dose dependent hypoglycemia in normal fasted rats, the ALBE-II (300 mg/kg body weight) possess more hypoglycemic activity (58.88 i.e. 33.54%) than ALBE-I. Even though both doses show significant reduction of blood glucose level after 3 hours of treatment. The present study clearly indicates a significant antidiabetic activity with the hydroalcoholic extract of *Anogeissus latifolia* bark and support the traditional usage of the plant for the control of diabetes.

Key Words: Diabetes, Alloxan, Hypoglycemia, *Anogeissus latifolia*.

INTRODUCTION

The growing awareness of the harmful effects of chemotherapy made people to explore the time tested remedies from traditional alternative medicine. However, in order to make these remedies acceptable to modern medicine, there is need to evaluate/screening^{1, 2} them to identify the active principles and to understand their mechanism of action for particular diseases. Among the many metabolic disorders, prevalence of diabetes has been increased. Diabetes mellitus is a major endocrine disorder affecting nearly 10% of population all over the world³. Since time immemorial, patient with non-insulin dependent diabetes have been treated orally with a variety of plant extracts. All though many drugs are available in the market to control the symptoms /diseases, still, efforts are needed to find a remedy from natural herbs which may prove more effective and safe drug to combat the disorders.⁴

The plant *Anogeissus latifolia*⁵⁻¹² has a long

history to use in traditional form of oriental medicine and it has enjoyed popular use in diabetes for a century. It has wide range of biological activities. It has been shown many pharmacological activities like anti-oxidant, anti inflammatory, analgesic, CNS depressant, anticonvulsant, diuretic and insulinogenic.

In order to continue this research, effect of *Anogeissus latifolia* bark's hydro-alcoholic extract in normal fasted rats was evaluated for Antidiabetic activity. The encouraging results of this study substantiate the use of herbal medicines as complimentary medicines in control of such diseases.

Material and Methods

Collection of Drugs :

The fresh bark of *A. latifolia* was collected from forests of "Kewdda Ki Nai" situated on the way of Udaipur (Rajasthan) to Jaisamanad (Rajasthan) and the plants was authenticated by department of botany, University of Rajasthan, Jaipur and a voucher (RUBL20612) specimen was deposited.

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The collected bark was dried in the shade and stored in airtight glass container for further studies.

Preparation of Extract:

200g of air dried and cleaned plant drug was ground in the grinder and sieved in 60 mesh sieve and macerated with 1lit. of 70% ethanol for 72 hours with occasional stirring. The obtained extracts were filtered through muslin cloth and were further concentrated using vacuum evaporator. The percent extractive values were calculated and stored in airtight glass containers. Extracts obtained from *A. latifolia* was subjected to preliminary phytochemical screening for identification of various chemical constituents.

Experimental Animals:

Healthy, 8-12 weeks young Albino (Rates norvegicus) rats (150-180 g) of either sex were used for present study and obtained from B.N. College of Pharmacy, Udaipur. The animals were maintained as per CPCSEA regulations and the studies were approved by institutional Animal Ethical Committee (IAEC) at Bhupal Nobles' College of Pharmacy, Udaipur (Rajasthan) with approval number-33/ACR/BNCP-08/IAEC. The animals were housed in polypropylene cages individually at 22°C (\pm 3°C), relative humidity 30%, lighting sequence being 12 hours light and 12 hours dark cycle. The animals were housed individually for 5 days in cages. For feeding, conventional rodent laboratory diets were used with unlimited supply of drinking water.

Acute toxicity Study:

The acute toxicity of the extracts obtained from *A. latifolia* was determined by up and down procedure of OECD guideline 425. One animal was dosed with 2000mg/kg of test drug solution. The animal

survived, therefore main test was conducted to determine LD₅₀. Then four additional animals were dosed sequentially and total five animals were tested. After dosing, animals were observed for 48 hours, no animal was died.

Hypoglycemic study:

The effect of hydroalcoholic extract on fasting blood glucose was studied in normal rats. Animals were divided into four groups of six rats each. Group I received 0.5% CMC solution served as control, Group II received Standard reference drug Glibendamide (10 mg/kg body wt.), Group-III received plant extract of *A. latifolia* bark (ALBE-I, 150 mg/kg body wt.), and Group- IV received extract of *A. latifolia* bark (ALBE-II, 300 mg/kg body wt.). The blood was collected at 60, 120 and 180 minutes after drug administration, by retro orbital method to estimate blood glucose level.¹³

Statistical analysis:

All data were expressed as mean \pm SEM. Statistical analysis was made using one-way analysis of variance (ANOVA) followed by student t-test. P<0.05 was considered as significant.

Results:

Results of phytochemical investigation of extract obtained from *A. latifolia* bark showed the presence of carbohydrates, glycosides, gums, flavonoids, tannins, and aminoacids and the findings are in accordance to the database on medicinal plants used in Ayurveda.

Result of the acute toxicity studies suggested that the extracts obtained from bark of *A. latifolia* was well tolerated up to the dose of 2000mg/ Kg body weight. A dose of 150 and 300 mg /Kg body weight were selected for different pharmacological activities. During the acute toxicity study, the

behavioral activities were observed and were found normal. The hydroalcoholic extract of *A. latifolia* bark produced a dose dependent results in normal fasted rats at a dose of 150 mg and 300 mg/kg body weight when compare to control group. It produced a significant hypoglycemic effects at 60, 120 and 180 minutes after treatment of Glibenclamide, ALBE-I and ALBE-II. The ALBE-II (300 mg/kg body weight) possesses higher

hypoglycemic activity (58.88 i.e. 33.54%) at 180 minutes than ALBE-1. Results are summarized in **Table-1 and Figure- 1**

Summary and conclusion:

Among the many metabolic disorders, prevalence of diabetes has been increased. All though many drugs are available in the market to control the disease. Still, efforts are needed to find a remedy from natural herbs which may prove more effective

Table 1: Effect of hydro- alcoholic bark extract of *A. latifolia* on blood glucose level in normal fasted Rats.

Group	Treatment	Dose mg/kg	Blood Glucose Level : mg /dl ± SE				Percent Reduction in blood glucose level after 180 min.
			Zero hour	60 min	120 min	180 min	
I	Control	Vehicle	90.81±0.65	87.68±1.15	87.22±1.09	87.66±1.07	-
II	Glibenclamide	10	90.50±0.79	65.56±0.94**	55.30±0.40***	52.36±0.64***	42.34%
III	ALBE-I	150	91.26±1.08	74.02±0.79*	68.36±0.39*	64.86±0.24*	28.92%
IV	ALBE-II	300	88.60±1.18	70.65±0.56*	60.90±0.53**	58.88±0.52***	33.54%

All values are represented as Mean ± SE (n=6)
 * <0.05, ** < 0.01, *** < 0.001; when compared with Control.
 ALBE – *A. latifolia* bark extract

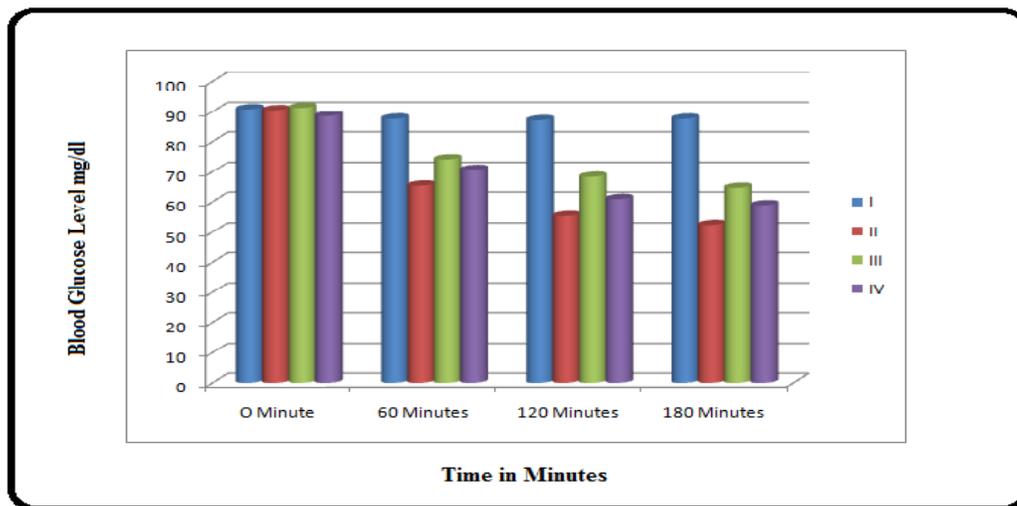


Fig.1: Effect of hydro- alcoholic bark extract of *A. latifolia* on blood glucose level in normal fasted Rats.

- Group I** 0.2 ml of 1% CMC Solution, served as control.
- Group II** Glibenclamide (10 mg/kg), served as standard.
- Group III** ALBE-I (150 mg/kg)
- Group IV** ALBE-II (300mg/kg)



and safe drug to combat the disorders. Diabetes mellitus is possible the world's largest growing metabolic disorder, and as the knowledge on the heterogeneity of the disorder is advanced, the need for more appropriate therapy increases. Traditional plant medicines are used throughout the world for a range of diabetic complications. The study of such medicine might offer a natural key to unlock a diabetologist's pharmacy for the future.

Our study clearly indicates a significant reduction in blood glucose level in normal fasted rats with oral administration of the hydro alcoholic extract of the bark of *Anogeissus latifolia* and supports the traditional use of plant for the control of diabetes.

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