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ANTIDIABETIC EFFECT OF ETHENOLIC EXTRACT OF ROOT OF *ALSTONIA SCHOARIS* LINN IN ALLOXAN INDUCED DIABETIC RAT

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ABSTRACT
Diabetes is very common disorder developd by harmonal imbalance of endocrine gland i.e islet of langrhance of pancrease in developed and developing countries, and the disease is sprading very rapidly in all over the world. *Alstonia Scholaris* is a plant of family apocynaceae and has a great medicinal value. From ancient time this plant is widely used by people to treat different type of diseases and ailments. This plant has been used in popular medicine for the treatment of the diabetes. it is native to the Indian subcontinent (especially in west Bengal, west-coast forests of south in india), Indomalaya, Malaysia and Australasia. Blood glucose level were increased significantly by using alloxan. Ethenolic root extract of plant was given to the diabetic rats in daily dose of 110mg\kg, 200 mg\kg body weight for 21 days. The significant alteration in fasting blood glucose level and body weight of diabetic rat were seen. So that the this study suggestd the potential effect of root in diabetes.

KEYWORD: Diabetes, Alstonia scholaris, Ailment.

INTRODUCTION
From the ancient time, medicinal herbs, Plants & Trees have been used to treat all type of health ailments. Even today in the time advanced technology, medical Science still depend on the plants for their curing./all these medicinal plants are consider as a rich source of chemical constituents which can be used in drug development & synthesis. The use of plants as a food supplement & as a medicines started ever since man started life on the earth. From the last decades use of traditional medicine has brodly sprade in the world & gained popularity. Herbal products play a important role in pharmaceutical industry as a drug or as a drug carrier or bioenhancer or excipients.[1,5] Diabetes mellitus is a very common endocrines, metabolic disorder. It is characterized by a loss of glucose, carbohydrate, fat & protein metabolism duet to disbalance in insulin secretion & action. Diabetes mellitus is characterized by hyperglycemia, hyperlipidaemia & oxidative stress. The metabolic disturbance causes most neurological cardiovascular, retinal & renal diabetic complications. From the estimation approximately 300 million people will affects by diabetes by the year 2025.[6,8] That shows the special attention to the improvement in the treatment aspects of this chronic metabolic disorder. *Alstonia scholaris* is an important medicinal plant in folklore medicine. The plant belongs to family apocyaceas & is native to india. It grows throughout India in deciduas & evergreen forests & in plains. It is commonly known as saptaparna. The plant have valuable medicinal properties but most of the advantages are still confined to tribal areas because of raw knowledge & absences of proper Scientific standardization.[9,12]

The Bark is useful in malerial fevers, abdominal desorders, dyspepsia, & in skin diseases. The bark is bitter astringent, digestive & laxative, anthalmentic, antipyretic, stomachic, cardiotonic. The bark extract has been reported to posses antiplamodial, immunostimulant, anticancer effect & is also hepatoprotective.[13,14] Ethanolic extract of alstonia scholaris Lin were subjected to the preliminary phytochemical investigation which showed presence of alkaloid tannins, flavonoids, saponins, glycosides, triterpinoids.[15,18] These photochemical are indicative of its potential in the treatment of diabetes mellitus, hence we undertook the present work to study the chronic antidiabetic effect of the root extract in healthy & Alloxan diabetic rat with on objective to focus on mechanism underlying the activity.

MATERIAL AND METHODS
Collection & authentication of plant[19,23]
The root of *Alstonia scholaries* family Apocyanacea were collected in the july 2017 from the local area of Phaphamau, Allahabad Uttar Pradesh, India. The plant was taxonomically identified by Dr. G.P.Sinha botanical survey of India CRC, 10 chatham lines Allahabad 211002 the voucher spicemen is retained in the herbarium of BSI, Allahabad for future reference. Preparation of Ethananeolic extract of root of *Alsotnia*

scholaris. The dried powdered root were defated using petrolium ether and further placed to extraction in soxhlet apparatus by using ethanol. The solvent was removed from extract under reduced pressure to obtain a semisolid mass and was vacuum dried to yield solid mass. The extract showed positive test for alkaloid, tannins, saponins, glycosides, tripinoid & flavonoids.

Chemical and Reagent

Alloxan, glibenclamide, glucose extimation kit were used and other chemical & reagents used for the study were of analytical grade procured from approved organization.

Animal

Male albino Rat 150-180gm procured from CDRI Lucknow. Before & during experiments rat were fed with standard diet. After dividing into various groups & before starting the experiment the rats were kept in quarantine period for 7 days under standard environmental condition of temp, relative humidity dark & light cycle. Animals were kept at starvation for 16 hr before starting experiment. All the procedure were performed according to institutional animal ethical committee.

Acute and Short Term Toxicity Study[24,15]

The ethanolic extract of root was tested for its acute & short term toxicity in mice. For determination of acute toxicity of the drug, over night fasted rat were orally fed with extract in increasing dose level. 50,110, 200, 300 mg/kg body weight. The mortality & general behavior of the animals were observed continuously for the period of 4 hr, 6 hr, then again at 24 hr & 48 hr following drug administration.

Determination of Dose

After the preliminary toxicity study, there was no adverse effect on mortality was observed in experimental animals with oral administration of root extract. Hence the dose of 110, 200 mg / kg were secleted as a test dose.

Animal Models of Diabetes Mellitus

1) Spontaneous or genetically derived diabetic animal.
2) Diet induced diabetic animals.
3) Chemical induced diabetic model, i.g Alloxan, STZ.
4) Surgical diabetic animal, i.g pancreatomized animal.
5) Transgenic diabetic animal (K.Srinivasan and P.ramarao; 2007)

Experimental Induction of Diabetes

Diabetes was induced by using alloxan monohydrate at dose of 200 mg / kg body weight produced symptoms of diabetes in mice among with increasing blood glucose level (fasting & Random) more than 150 mg/dl from o to 21 days post induction.

Experimental Group

(i) Group (i) administered vehicle serve as normal control 1% tween 80 (diabetic)
(ii) Group (ii) diabetic rat received 110 mg /kg ethanolic extract of EEAS (P.O)
(iii) Group (iii) diabetic rat recived 200 mg/kg ethanolic extract of EEAS (P.O)
(iv) Group (iv) diabetic rat recived 0.25 mg/kg of glibenclamide. (P.O)

Experimental Procedure[26,29]

On the test day of experimentation all the animal were weighed and Blood sample Collected, for estimation of Blood glucose level. Effect of chronic administration of ethanolic extract of *Alstonia Scholar*is root on fasting blood glucose level in alloxan induced diabetic rat. Values expressed as mean±SEM, n=6, in each group, statistical analysis by one way ANOVA, experimental group compared with diabetic group, and values of p*<0.00001moderatly significant value p**,0.001.

Effect of chronic administration of ethanolic extract of *Alstonia Scholar* is root on body weight in Alloxan diabetic Rat. All Values expressed as mean±SEM, n=6,in each group,statistical analysis by one way ANOVA ,experimental group compared with diabetic group, and values of p*<0.00001moderatly significant value p**,0.001.

RESULT AND DISCUSSION

All the phytochemical screening of the ethenolic extract of root was performed and reported in table no. 1**.**

Treatment of diabetes with ethenolic extract of root of *Alstonia scholaris* at dose of 110 mg/kg, 200mg/kg body weight for 28 days show little bit decrease (p<0.0001) in the fasting blood glucose level in allaxon induced diabetic rats in comparision to normal group rats. The blood glucose level of diabetic rats stared fall down from first week of continue drug treatment till six week which was comparable to normal group rats. It was observed that in the complete drug treatment period the animals were not show any type of restlessness or irritation after drug administration. Alloxan induced permanent diabetes mellitus in animal, show triphasic response. Table 1 & 2 and Fig. 1-4.

Table 1: Phytochemical analysis of extract of root of alstonia scholaris.

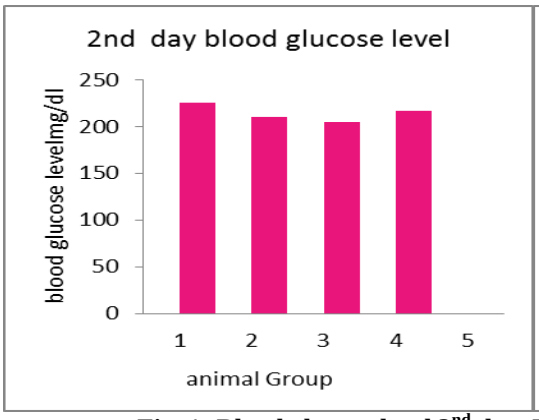
Analytical parameter	Water extract	Ethyl acetate extract	Butenol extract	Ehtenol extract
Alkaloid				
1) Dragendroff reagent	+	+	-	+
2) Wagner's reagent	--	-	-	-
3) Mayer's reagent	-	-	-	-
Tannin	++	+	++	+
Saponin	+	+	+	+
Glycoside	+	+	+	+
Protein	++	+	+	+
Charbohydrate	++	+	+	++

Table 2: Estimation blood glucose level.

Experimental group	Fasting Blood glucose mg%			
	2 day	7 day	14 day	28 day
1) Diabetic control	225.4630+0.111	235.77+0.176	265.21+0.135	249.61+0.221
2) Diabetic + 110 mg/kg EEAS	210.413±0.116	185.57±0.163	156.49±0.176	110.591±0.163
3) Diabetic +200 mg/kg EEAS	205.308±0.281	180.586±0.116	148.573±0.140	90.39±0.105
4) Glibenclamide 0.25mg/kg	217.51±0136	210.66±0.071	130.64±0.104	80.57±0.117

Table 3: Variation in body weight of animals.

Experimental group	Body weight (gm)	
	Initial	Final
Diabetic control	177.14±0.231	167.47±0.153
Diabetic+110mg/kg EEAS	176.53±0.081	175.876±0.245
Diabetic+200mg/kg EEAS	178.212±0.258	172.48±0.113
Glibenclamide 0.25mg/kg	179.395±0.139	169.135±0.279



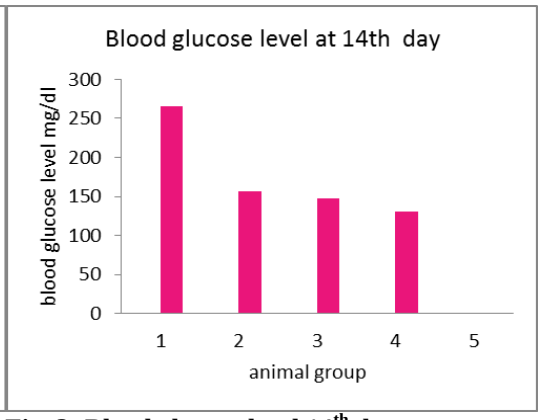


Fig. 1: Blood glucose level 2nd day. Fig. 2: Blood glucose level 14th day.

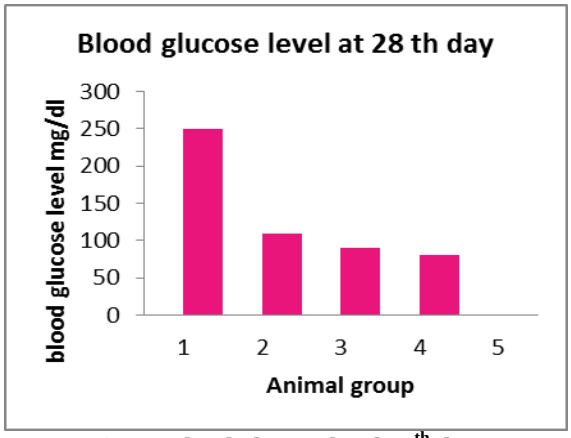


Fig. 3: Blood glucose level 28th day.

Where 1 (diabetic control group), 2 (lower dose), 3 (Higher dose), 4 (Std.)

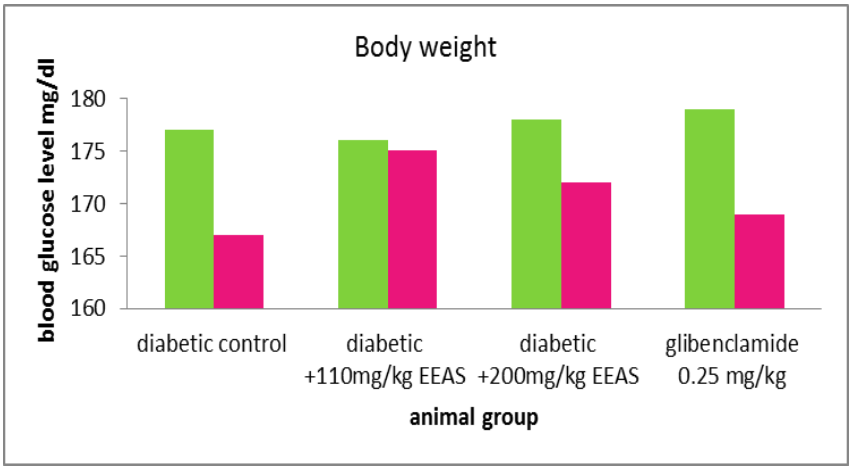


Fig. 4: Variation in body weight in various dose.

CONCLUSION

This study showed that ethanolic extract of root reduced high blood glucose level in allaxon induced diabetic rats. Alloxan destroy pancreatic beta cells and cause persistent hyperglycemia, the mechanism of action of plant show actions on other than pancreatic beta cells insulin release.

The antidiabetic effect of root extract is due increased uptake of glucose by the peripheral tissues and improved sensitivity of target tissues for insulin. The antidiabetic activity is showed by the components such as flavonoids, teriterpinoids and alkaloids.

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