



Anti-Diabetic Activity of Some Medicinal Plants

KEYWORDS

Anti-diabetes, Serum, Plant Extract and Solvent

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ABSTRACT Plant serves as important natural medicinal resources responsible for various purposes for mankind problems, the current investigation are forced on these property for diabetic patients from three plant extracts. The dried plant material are subjected to extraction in different solvent with and treated to adult albino rats for serum glucose level study. Results were recorded after subsequent interval of time for each plant extract. It is noted that *Aegle marmelos* (L.) Corr. methanolic extract is more effective to decreases serum glucose among all other solvents.

Introduction

Plants serve as a reservoirs of important medicinal components and they help to recover not only different disease of mankind only but also for animals. They provides man with his needs of interims of shelter, clothing food flavors, fragrance and even various medicine (Essiett et al 2011). Plants are used for socio cultural practices, diabolic, nutritional and therapeutic purposes. Medicinal plants play an appreciable role in the development of modern herbal medicines as many diseases even like cancer, liver diseases and arthritis find no complete cure in allopathy. The bio-active compounds of medicinal plants are used as anti-diabetic, chemotherapeutic, anti-inflammatory, anti-arthritis agents where no satisfactory cure is present in modern medicines (Tanko et al., 2012).

Diabetes is a chronic metabolic disorder, which can characterized with high blood glucose coaled as hyperglycemia, associated with impaired carbohydrate, fat and protein metabolism, resulting from either insufficient or no release of insulin by pancreas in the human body (ADA 2012). It has been projected that by 2020 -2025, the number of people in the developing world with diabetes will increase by more than 2.5 fold; from 84 million in 1995 to 228 million in 2025 (WHO 2003). A etiological classification of diabetes are broadly two type includes diabetes mellitus and Diabetes insipidus were Diabetes mellitus is a chronic life-long disease, which has been known to mankind for over 2000 year (WHO 2008), Includes type I diabetes (immune-mediated and idiopathic), type 2 diabetes, gestational diabetes and other specific types (ADA 2012). Diabetes mellitus is increasing major health problem from its complications. In traditional methods, the indigenous hypoglycemic medicinal plants have been in use in fresh paste, juice or dry powder forms, which contain both the organic and inorganic constituents. A number of plants have been screened for possible anti-diabetic activity by various workers (Narendran et al, 2002)

Plants have potent sources of hidden phyto-constituents which can be responsible to solve various potent health problems. Medicinal plants have curative properties due to the presence of various complex chemical substance of different composition, which are found as secondary plant metabolites in one or more parts of plants. Many therapeutic approach are to prevent postprandial hyperglycemia is to retard the digestion and absorption of carbohydrates

in the gastrointestinal tract through inhibition of enzymes such as α -amylase and α -glycosidase (Patil 2013). The aim of the current study was to find out the anti-diabetic activity of some medicinal plant including

***Aegle marmelos* (L.) Corr.** A moderate sized slender tree, growing throughout the deciduous forest of India. The root is sweet, cures fever, pain in abdomen, palpitations of heart and urinary troubles. The unripe fruit is regarded as astringent, digestive and stomachic. It is also used in cases of diarrhoea and dysentery.

***Boerhaavia diffusa* L** A herbs having 45 known species distributed in the tropics, out of which only seven are recorded in Indian flora. The extensive reference of Punarnava in Ayurvedic literature has attracted many scientific workers and several pharmacogonostical studies have been carried out this drug.

***Phyllanthus amarus* Schu. & Thonn.** A plant is used for the treatment of jaundice and other diseases have widely used the plants in traditional medicine. The plant originated in India, usually occurring as a winter weed throughout the hotter parts (2015)

Material and Methods:

The parts of above plant species have been used in the experiment for the clinical scrutiny of anti-diabetic potential with pharmacological methods (Harborne, 1998, Kokate, 1994 and Patil and Khan 2014).

Collection of material: The plant materials used for clinical scrutiny of antidiabetic potential is collected from the field, which are used as ethnomedicine in the district viz. fruits of *Aegle marmelos* (L.) Corr. Family Rutaceae, leaves of *Boerhaavia diffusa* L. Family Nyctaginaceae. And whole plant of *Phyllanthus amarus* Schumach. and Thonn. Family Euphorbiaceae. The material is air dried under the shade for 15 days and ground through a grinding mill for solvent extraction. The powder then percolated in 80% cold ethanol. Percolation was repeated for 3 to 4 times. The combined extract was evaporated on water bath at 50 ° C. Concentrated extract was then dried in vacuum desiccators.

Experimental animals: Adult Albino rats of either sex weighing between 125-150 gm animals were housed in

groups of six each. They were fasted 18 hours but during the experiment were allowed to have free access to water.

Induction of diabetes: The animals selected for the study were kept in the laboratory for 15 days. The rats were fasted for 18 hours before the beginning of the experiment and water was given ad libitum. Alloxan (100mg/kg) was injected subcutaneously on the abdominal region. The animal was then left for a week to stabilize blood glucose level. Rats with blood sugar level of 200-400mg/100ml were considered as diabetic and were employed to study.

Administration of extracts and test for its effect: Since Alcohol, aqueous and methanol extract were tested for hypoglycemic property on alloxan induced diabetic rats. Experimental animals receiving extracts as well as control were fasted for 18 hours. Water was allowed ad libitum. Blood samples were collected at the beginning of the experiment. Solution of extract was prepared in distilled water administered orally per force using feeding tubes; blood samples were collected at 0.5, 1, 2 and 4 hours interval by partial tail amputation. Sugar glucose level in the blood was estimated, with the help of Glucometer.

Results and Discussion:

Aegle marmelos (L.) Corr.: Alcohol, methanol and aqueous extracts were tested for anti-diabetic property on alloxan induced diabetic rats (Table). In the present studies, the methanol extract of fruit of *Aegle marmelos* (L.) Corr. exhibited significant anti-diabetic activity in alloxan-induced rats.

Boerhaavia diffusa L.: Alcohol, methanol and aqueous extracts were tested for antidiabetic property on alloxan induced diabetic rats (Table). Only the aqueous extract of leaves *Boerhaavia diffusa* L. exhibited significant antidiabetic activity. 400gm/kg dose caused a maximum % reduction in glucose level at 6 hours in the present work.

Phyllanthus amarus Schu. & Thonn.: Alcohol, methanol and aqueous extracts were tested for hypoglycemic property on alloxan induced diabetic rats (Table). In the present studies, the alcoholic extract of whole plant of *Phyllanthus amarus* Schu. & Thonn. was found to be show significant anti-diabetic activity in alloxan-induced rats (200mg/kg).

Conclusion:

From the current experiment *Aegle marmelos* methanolic extract are more effective to decreases Serum glucose level in successive time among all extract of same plant.

Were it also recorded that aqueous extract of leaves of *Boerhaavia diffusa* L. are also gives significant result in aqueous extract to control serum glucoses level in experimental animal. In the experiment of *Phyllanthus amarus* Schu. & Thonn. plant extract it was recorded that there is least significant result among all plant but alcoholic extract gives better result than the other solvent for same plant.

Table. Serum Glucose Level for Each Plant Extract in mg/100mL

Sr. no.	Extract	Serum glucose level (mg/100ml)				
		Initial	0.5 Hour	1 Hour	2 Hours	5 Hours
Plant 1 Activity of extracts of fruits of <i>Aegle marmelos</i>						
i	Control	257 ± 34	258 ± 16	266 ± 22	269 ± 19	288 ± 13
ii	Aqueous	259 ± 24	247 ± 31	243 ± 28	268 ± 11	234 ± 11
iii	Alcohol	241 ± 36	257 ± 19	263 ± 15	251 ± 19	201 ± 9
iv	Methanol	263 ± 38	221 ± 25	190 ± 27	143 ± 16	98 ± 12
Plant 2 Activity of extracts of leaves of <i>Boerhaavia diffusa</i> L.						
i	Control	265 ± 23	269 ± 26	258 ± 22	261 ± 14	267 ± 14
ii	Aqueous	250 ± 27	237 ± 14	189 ± 19	162 ± 21	107 ± 11
iii	Alcohol	253 ± 38	231 ± 18	236 ± 27	232 ± 19	229 ± 9
iv	Methanol	247 ± 33	240 ± 21	243 ± 23	229 ± 18	219 ± 16
Plant 3 Activity of extracts of whole plant of <i>Phyllanthus amarus</i> Schu. & Thonn.						
i	Control	279 ± 31	280 ± 27	291 ± 21	275 ± 29	295 ± 20
ii	Aqueous	253 ± 34	246 ± 25	207 ± 19	203 ± 14	189 ± 12
iii	Alcohol	267 ± 27	243 ± 16	229 ± 18	196 ± 22	108 ± 10
iv	Methanol	293 ± 33	273 ± 24	257 ± 21	247 ± 28	201 ± 16

All values are given in mean ± SE (no. - 6).

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