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RESEARCH ARTICLE

Evaluation for Anti-Diabetic Activity of Methanolic Extracts of Apricot Kernal in Animals

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ABSTRACT

Apricots are a sweet summer-fruit staple and an exquisite addition to your polygenic disorder hotel plan. One apricot has simply seventeen calories and four g of carbohydrates. Four contemporary apricots equal one serving and supply over fifty % of your daily vitamin A demand. These fruity jewels are an honest supply of fiber. strive mix some diced contemporary apricots into hot or dry cereal, or toss some in an exceedingly dish. during this study alloxan evoked diabetic activity model rat was used. Alloxan forms associate increased aldohexose levels that generates polygenic disorder. Pretreatment with apricot kernal extract created important decrease in aldohexose levels indicating the protecting result of tissue. On alloxan treatment a dose dependent decrease in aldohexose levels were determined. Pretreatment with apricot kernal extract and antidiabetic created important alteration in levels.

Keywords: apricot kernal, diabetic activity, wistar rats etc.

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CONTENTS

1. Introduction	44
2. Materials and Methods.	44
3. Results and Discussion.	45
4. Conclusion	46
5. References.	46

1. Introduction

Diabetes mellitus is one of the most common endocrine diseases in all populations and all age groups. It is a syndrome of disturbed intermediary metabolism caused by inadequate insulin secretion or impaired insulin action, or both. Diabetes mellitus comprises of heterogeneous group of disorders characterized by hyperglycemia, altered metabolism of carbohydrates, lipids and proteins. Diabetes mellitus is associated with complications such as nephropathy, retinopathy, neuropathy and cardiovascular disease.¹ Thus many different plants have been used individually or in formulations for treatment of diabetes and its complications. One of the major problems with this herbal formulation is that the active ingredients are not well defined. It is important to know the active component and their molecular interaction, which will help to analyse therapeutic efficacy of the product and also to standardize the product. Efforts are now being made to investigate mechanism of action of some of these plants using model systems. Many of the medicinal plants produce the anti-diabetic activity such as *Acacia arabica*, *Aegle marmelos*, *Allium cipa*, *Allium sativum*, Fenugreek seeds, *Aloevera*, *Azadiracta indica*, *Caesalpinia bonducella*, *Papaver somniferous* etc. These medicinal plants are cultivated in india.

Plant Description:

Prunus Armeniaca: *Prunus armeniaca* ("Armenian plum"), the most commonly cultivated apricot species, also called ansu apricot, Siberian apricot, Tibetan apricot, is a species of *Prunus*, classified with the plum in the subgenus *Prunus*. The native range is somewhat uncertain due to its extensive prehistoric cultivation, though almost certainly somewhere in Asia. It is extensively cultivated in many countries and has escaped into the wild in many places.



Fig 1: *Prunus armeniaca*

Scientific Classification:

Kingdom : Plante
Order : Rosales
Family : Rosaceae
Genus : *Prunus*
Sub genus : *Prunus*
Section : *Armeniaca*
Species : *P. armeniaca*

Synonyms:

Amygdalus armeniaca (L.) Dumort, *Armeniaca ansu* (Maxim.) Kostina, *Armeniaca vulgaris* Lam, *Prunus ansu*

(Maxim.) Kom, *Armeniaca holosericea* (Batalin) Kostina, *Armeniaca armeniaca* (L.) Huth

Uses: Seeds or kernels of the apricot grown in central Asia and around the Mediterranean are so sweet, they may be substituted for almonds. The Italian liqueur amaretto and amaretti biscotti are flavored with extract of apricot kernels rather than almonds. Oil pressed from these cultivar kernels, and known as oil of almond, has been used as cooking oil. Kernels contain between 2.05% and 2.40% hydrogen cyanide, but normal consumption is insufficient to produce serious effects.

Apricot kernel:

An apricot kernel is the seed of an apricot. It is known for containing amygdalin, a poisonous compound. Together with the related synthetic compound laetrile, amygdalin has been marketed as an alternative cancer treatment. However, studies have found the compounds to be ineffective in the treatment of cancer, as well as potentially toxic or lethal when taken by mouth, due to cyanide poisoning. Fresh and dried apricots also contributes to their effect on blood sugar for some individuals. Vitamin E functions as an antioxidant, and a diet rich in antioxidants helps improve blood sugar levels for people suffering from Type 2 diabetes, explains the University of Maryland Medical Center.



Fig 2: Dried apricots

2. Materials and Methods

Collection and Authentication of Plant Material:

The Aerial Parts of apricot kernal were collected and authenticated.

Extraction of Plant Material:

The plant is grinded in to a coarse powder with the help of suitable grinder.

Cold Extraction (Methanol Extraction):

In this work the cold extraction process was done with the help of methanol. About 200gms of powdered material was taken in a clean, flat bottomed glass container and soaked in 750 ml of ethanol. The container with its contents were sealed and kept for period of 7 days accompanied by continuous shaking with the shaker. The whole mixture then went under a coarse filtration by a piece of a clean, white cotton wool.

Evaporation of Solvent:

The filtrates (Methanol extract) obtained were evaporated using Rotary evaporator in a porcelain dish. They rendered a gummy concentrate of greenish black. The extract was kept in vacuum dissector for 7 days. % Yield value of ethanol Extract from of apricot kernal

Powder taken for extraction = 200gm

Weight of the empty china dish = 53.70gm

Weight of the china dish with extract = 73.24gm

Weight of the extract obtained = (73.24-48.70) gm = 24.54 gm

% yield of methanol extract = (weight of extract)/(powder taken for extraction) × 100

= 24.54/200 × 100 = 12.27 %.

Preliminary Phytochemical Screening:

Preliminary phytochemical screening of the apricot kernel extract was carried out for the analysis of Alkaloids, Carbohydrates, Tannins, Saponins, Steroids, Phenols, and Flavonoids. as per the standard methods.

Animals:

Healthy Adult Male wistar rats of 8-10 weeks old with Average weight in the range of 150-180gms were selected. Animals are housed 4 per cage in temperature controlled (27 0C ±3 0c) room with light/dark cycle in a ratio of 12:12 hrs is to be maintained. The Animals are allowed to acclimatize to the environment for seven days and are supplied with a standard diet and water ad libitum. The prior permission was sought from the Institutional Animal Ethics Committee (IAEC) for conducting the study.

Experimental Study Design:

Diabetic rats were divided in to five groups with each group four animals.

Group-I: Rats served as normal control group.

Group-II: served as diabetic/disease control.

Group-III: Diabetic rats treated with apricot kernal extract at a dose 100mg/kg (low dose).

Group-IV: Diabetic rats treated with apricot kernal extract at a dose of 200mg/kg (high dose).

Group V: Diabetic rats treated with Metformin (standard drug) at 450mg/kg.

The treatment was given for 14days and blood samples were collected at different intervals.

Acute toxicity studies:

The Acute oral toxicity test of the extracts was determined prior to the experimentation on animals according to the OECD (Organization for Economic Co-operation and Development) guidelines no 423. Female Albino wistar rats (130-200 g) were taken for the study and dosed once with 2000 mg/kg of the extract. The treated animals were monitored for 14 days to observe general clinical signs and symptoms as well as mortality. No mortality was observed till the end of the study revealing the 2000 mg/kg dose to be safe. Thus, 1/10 and 1/20 doses of 2000 mg/kg i.e. 100 mg/kg and 200 mg/kg were chosen for subsequent experimentation.

Induction procedure:

Diabetes mellitus or hyperglycemia was induced in rats by administration of alloxan monohydrate (2,4,5,6-tetraoxypyrimidine; 2,4,5,6-primidinetetrone) at dose of 120mg/kg intraperitoneally in normal saline²³. After one hour of alloxan administration the animals were given feed ad libitum. The animals were kept fasting overnight and blood glucose levels were estimated before and after 72hrs of alloxan treatment. Animals showing blood glucose levels of >200mg/dl is considered as diabetic and were used for study.

Collection of blood samples:

Blood samples were collected from all the groups of animals at 0, 7,15th day intervals through puncture of retro orbital plexus and were centrifuged at 3000 revolutions per minute (rpm) for 15 minutes. Serum was separated and stored at -20 c and then used for estimating blood glucose levels.

Statistical Analysis:

All the values will be expressed as mean ±standard deviation (S.D). Statistical comparisons between different groups will be done by using one way analysis of variance.P value <0.05 will be considered as statistically significant.

Evaluation Parameter:

Glucose

Method: GOD/POD method

Principle:

D-glucose + H₂O + O₂ glucose oxidase (GOD) gluconic acid + H₂O₂

H₂O₂ + 4-AAP + Phenol peroxidase (POD)

Quinoneimine dye + H₂O

Procedure:

- Wavelength/filter : 505 nm (Hg 546 nm) / Green
- Temperature : 37 C / R.T.
- Light path : 1 cm
- Pipette into clean dry test tubes labeled as Blank (B), Standard (S) and Test (T)

Table 1

Addition Sequence	B (ml)	S (ml)	T (ml)
Glucose Reagent L	1.0	1.0	1.0
Distilled Water	0.01	--	--
Glucose Standard S	--	0.01	--
Sample	--	--	0.01

Mix well and incubate at 37 C for 10 min or at R.T. (250 C) for 30 mins. Measure absorbances of the Standard (Abs.S) and Test Sample (Abs.T) compare these against the Blank within 60 mins.

3. Results and Discussion

%Yield value of Ethanolic Extract from apricot kernal(NLE) was found to be 24.2%

Preliminary Phytochemical Screening:

Investigation revealed the presence of steroid, Alkaloid, Tannins & Flavonoid in Ethanolic Extract of apricot kernel.

Table 2: Preliminary Phytochemical Screening

Phytochemical	Results
Steroid	+
Alkaloid	+
Tannin	+
Carbohydrate	-
Phenol	-
Flavonoid	+
Saponin	-

(+) Present

(-) Absent

Acute toxicity studies

As per (OECD) draft pointers 423 feminine unusualperson rats were administered apricot kernal and doses was be

elite within the sequence (1.75- 5000) victimisation the default dose progression issue, for the aim of toxicity study. Animals square measure discovered singly a minimum of once throughout the primary half-hour once dosing, sporadically throughout the primary twenty four hours and daily thenceforth, for a complete of fourteen days,. all told the cases, no death was discovered among fourteen days. Attention was additionally given to observation of tremors and convulsions, salivation, diarrhoea, lethargy, sleep and coma. Overall results urged the LD50 price as 2000 mg/kg. therefore therapeutic dose was calculated as 1/10th and 1/20th. i.e. 100mg/kg and two hundred mg/kg of the dose for the aim of antidiabetic drug investigations.

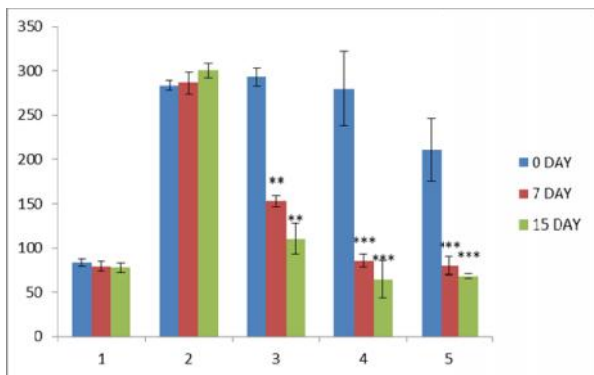


Fig 3: Effect of apricot kernal methanolic extract on serum glucose levels (mg/dl) in diabetic rats

Discussion

The present study was aimed to guage the opposed diabetic, of apricot kernel. The activity was measured by estimating varied biomarkers like blood sugar levels, in experimental rats. Within the previous studies it absolutely was shown that alloxan hydrate evoked to diabetes. once given during a dose of 120mg/kg to rats intraperitoneally as proven in study.23 within the gift study alloxan was administered

during a single dose to induce diabetes in rats at the dose of 120mg/kg.

The apricot kernal has reportable outstanding Aphrodisiac activity and anti-microbial properties however the impact of the plant extract on medicine weren't reportable nonetheless and then the plant was chosen for the study. During this study alloxan evoked diabetic activity model rat was used. Alloxan forms Associate in Nursing inflated aldohexose levels that generates polygenic disease. Pretreatment with apricot kernal extract created important decrease in aldohexose levels indicating the protecting impact of tissue. On alloxan treatment a dose dependent decrease in aldohexose levels were determined. Pretreatment with apricot kernal extract and antidiabetic drug created important alteration in levels.

4. Conclusion

Apricot kernal have many medicinal properties useful to cure anorexia, ulcers etc. apricot kernal have different medicinal properties due to its active phytochemical constituents and may able to treat diabetes & diabetics complications. Ethanolic extract of apricot kernal was prepared from whole plant are subjected to acute oral toxicity studies and found that the ethanolic extract of apricot kernal is safe to use up to the dose of 2000mg/kg .The methanolic extract of apricot kernal was found to be in dose dependent way against alloxan induced diabetes in rats. The reduction of the elevated blood glucose levels in diabetic rats on treatment with the extract at two different concentrations confirmed that methanolic extract of apricot kernal possess Ant diabetic activity & has shown significant effect when compared to Alloxan administration. It needs comprehensive investigations for developing a safe and effective herbal drug. Further research is required to isolate the biomolecules responsible for the antidiabetic and antidiabetic complications.

Table 2:Effect of apricot kernal extract on serum glucose levels (mg/dl) in diabetic rats

Groups/Interval	0 th Day	7 th Day	15 th Day
Normal	83.3±4.23	79.1±5.36	77.7±5.62
Diabetic control	283.8±5.01	286.4±12.4	300.3±8.64
MEAK(100mg/kg)	293.1±9.83	152.9±6.91**	110.1±17.1**
MEAK(200mg/kg)	280.5±42.4	85.5±7.20***	64.7±20.7***
Metformin(450mg/kg)	211.0±34.7	79.7±10.2***	68.3±2.4**

MEAK- Methanolic Extract of Apricot Kernel

All the values of mean ± SD; n=6; ** indicates p<0.01, *** indicates p<0.001 vs diabetic control

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