

Anti-hyperglycemic Effect of *Paeonia Lactiflora* Pall Roots Extract on normal rat model

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Abstract:

In the present study antihyperglycemic activity was evaluated in ethanolic root Extract of *Paeonia lactiflora* in normoglycemic Rats. Extract at Dose 250mg/Kg had Effect non significant different ($p < 0.05$) to glimepiride at Dose 8mg/Kg, 90 minutes after Glucose Load *Peonia Lactiflora* Pall a significant blood sugar lowering Effect The antihyperglycemic activity of of *Peonia Lactiflora* Pall was designed in normoglycemic Rats .preparatory qualitative chemical screening Indicate the presence of "saponins,tannins, ,triterpens,flavonoids, and glycosides in ethanolic Root Plant". LD₅₀ doses ethanolic root Plant was studied Results this study showed no mortality rate from ascending doses until 2gm/kg B.Wt. was occurred.

Key word: *Paeonia Lactiflora* Pall,anti-hyperglycemic Effect,Glyburide.

الخلاصة :

في هذه لدراسه تمت معرفه التأثير الوقائي للمستخلص الكحولي لجذور عود الصليب في الجرذان او الحد منها ومقارنه تأثيره مع عقار غلومبيرد وكلوكوفيج المخفضان للسكر ودرست ايضا الكشوفات الاولييه لهذه الجذور حيث استنتج انها تحتوي على صابونين ،تانينات ،فلافونيدات ،تربينات،وكلاكوسيدات وشملت الدراسه ايضا دراسه للجرعه النصف قاتله (LD₅₀) لجذور عود الصليب على الجرذان المختبريه اذ اعطيت خمس جرع من المستخلص الكحولي لجذور عود الصليب وتمت مراقبه الحيوانات لمدة 24ساعه واستنتج ان المستخلص لم يسبب أي تغير بسلوك الحيوانات لهذا ليس له تأثير سمي 0

(INTRODUCTION)

Diabetic mellitus (DM) is metabolic illness accompanying Rising Sugar Blood level⁽¹⁾. The illness characterizes defect and a lack of insulin in the body (Type 1) and 2 Tracking⁽²⁾. Type 2 Diabetes mellitus is currently managed by oral hypoglycemic agents.

Paeonia Lactiflora Pall belongs to the family paeoniaceae and is used as a classic drug in the treatment of diabetes mellitus. *Paeonia Lactiflora* Pall, Chinese herb commonly known as "white peony"⁽³⁾. Paeoniflorin, the major active monoterpene glucoside from *Paeonia*, is characterized by a neutral synthesis (M.Wt 428.47) with good solubility indicating low lipophilicity. Clinical studies show that paeoniflorin has anti-inflammatory properties and its derivatives^(4,5). A number of studies have recorded the function genes in "*Paeonia Lactiflora*", "*Paeonia suffruticosa*". For instance, "mitochondrial phosphate transporter" is an isolate of subtractive DNA library from "burst buds" of *Paeonia suffruticosa*, "it is expressed in response to chilling treatment during break of bud dormancy"⁽⁶⁾. "In oriental medicine, peony is used to treat depression-like symptoms, shown to possess antidepressant properties in many models using laboratory animals". Modern articles work mines pharmacokinetics, establishes the toxicological applications⁽⁷⁾. "It is also used for viral hepatitis, liver cirrhosis, upset stomach, muscle, hardening of the arteries" (atherosclerosis) to cause vomiting. Peony is also used for spasms, epilepsy, neuralgia, chronic fatigue syndrome". Peony (*Paeonia Lactiflora*) is known by other names: Baishao, chi shao, Chinese peony, common peony, European peony, *Paeonia arborea*.

"Molecules in *Paeonia pall* inhibit nuclear (factor kappa) expression in chronic hypoperfusion rats"⁽⁸⁾.

Materials and methods:

Plant and Extraction:

The roots of *paeonia lactiflora pall* collected during 2016 of basra local market. The plant was identified in college of science /basra university.

100 gm of dride root from *paeonia lactiflora pall* was Extracted by 80% Ethanol use soxhlet device. Then under the temperature at low. It is Was distilled to elemination Ethanol from the Extract. At end removed of Ethanol. The Extract Was stored in desiccator for use in experiments.

Chemicals:

Glucose was obtained from plasmatec laboratory .Glucophage XR (code no.45400 SE MOY-France) and Glimpiride (code no.D-65926) Italy,, Reference Standards" obtained of astron pharmaceutical ,Basra.

(Animals)

The male wistar albino Rats weigh about (255 -306) gram bred in the animal house basra university. The animals feeding on standard Diet. All animals keep , maintained under laboratory conditions" of Appropriate temperature (25c) maintain 12 hours cycle night, day.

(Experimental design for Oral Glucose Tolerance Test(OGTT)).

Townty four Rats were used. The Rats were divided into four Groups including Six animals per group as in the following: "group" 1, the Control (treated 1ml distilled water orally); Group" 2, the treatment of Glucophage XR at dose 100mg/kg, dissolve in 1 ml of distill. water; Gr. 3, are fed of Glimpiride at dose of 8 mg/kg, dissolved in 1 ml of distilled water ; Group 4, treated with plant Extract when a dose 200 mg/Kg, dissolve in 1ml distilled water. Animals were fasting for 18 hours before administrate the Extract but allow water ad libitum." A glucose Solution" (1ml) dose of 2.5 gr/Kg⁽⁹⁾ orally 30 minute after each Treatment.

Preliminary phytochemical screening:

The dride root of *Paeonia lactiflora* (9g) were Extracted with Ethanol (50ml) reflux two hours. The Solvent remove in vaccum for give concentrat

Extract, which was detected for presence of different types of phytochemicals corresponding to⁽¹⁰⁾.

Medium lethal dose (LD₅₀) of ethanolic root Extract of *Peonia Lactiflora* Pall.

Medium lethal dose is the dose that is likely to cause the death of 50% of the animals. LD₅₀ test in Rats for the ethanolic root Extract of *Peonia Lactiflora* Pall.

The results of this test as shown in table (3). The values of LD₅₀ for the ethanolic root Extract of *Peonia Lactiflora* Pall was in range (0.25-2.00 gm/kg B.Wt).

Thirty male wister albino Rats dividing into "Six groups each group" contain (6) Rats were housed in standard cage" (30×15×13 Cm)". First group, ((Control group)) "receive orally (one ml) normal Saline use plastic disposable syringe, blunt needle cut to length 5mm"., fitted with plastic Tube, Other groups giving orally ascending Doses from alcohol Extract *peonia lactiflora* ethanolic Extract root (0.25, 0.50, 0.75, 1, 2 Gm/Kg Body Weight). Groups were left in their cages, under the control for two hours for the indicate any sign of toxicity, after 24 hours for mortality rate.

Determination of blood Glucose concentration:

Glycemia was determined by using glucose oxidase peroxidation enzymatic colorimetric GOD-PAP method⁽¹¹⁾. "Blood Glucose Levels determination before the administration of each treatment".

statistical analysis:

Data analyzed by one-way ANOVA and independent T-test by using SPSS (special program for statistical system) version 9.0. "Data are expressed as Mean±S.D" ⁽¹²⁾

(Results And Discussion)

The orally of the ethanolic Extract of *peonia lactiflora* pall root was used to elevate the antihyperglycemic Effective in Rats, by use " OGTT". The plant make antihyperglycemic Activity in Rats at dose 250mg/Kg. The highest efficiency

observation at 90 minute. It reduce the level of sugar to mean value of 98.2 comparison with the Mean Value of 152.3 obtained from Control group (Table 1).

" Our study ,the Effect of Paeonia lactiflora ethanolic Extract was compare with Glucophage XR , Glimpiride, two of the commonly oral Hypoglycemic factors the daily use" . "Glucophage XR dose not reduce blood Glucose levels in Normoglycemic subject" ^(13,14) it didn't have significant ,Antihyperglycemic, Effect as expected confirme the validity of model. whereas Glimpiride, 8mg/Kg brought about significant (p value < 0.05) lower of "blood glucose". In time of the highest efficiency (90min). there was no significant (p value < 0.05) different Between the activities Glimpiride at 8mg/Kg , Paeonia lactiflora root extract at 250mg/kg. Results the phytochemical detected showing in table 2. Paeonia lactiflora ethanolic Extract presence of alkaloids, flavonoids, glycoside as major constituents. From results of the acute oral toxicity study of the the ethanolic root Extract of paeonia lactiflora pall , it can be concluded that the LD₅₀ of the ascending doses of ethanolic root Extract of paeonia lactiflora pall on mortality rate. There was no mortality rate appeared in these doses, from these results it can be suggested that this plant is not toxic and safe for administration up to adose of 2000mg/kg B.Wt.

Table 1: "Effect Ethanolic Extract of Paeonia lactiflora, on fasting blood glucose levels (mg/DL) in Normoglycaemic Rats (mean ± SEM)"

		"Blood Glucose Levels ((mg/dl))"			
groups		Initial	30min	90min	
150min	180min				
Group 1: control (distilled water)	92.4 ± 2.7	122.1 ± 3.0	152.3 ± 3.2	120.6 ± 1.6	100.3 ± 2.2
Group 2: Glucophage XR	86.2 ± 2.9	119.4 ± 2.4	130.6 ± 3.0	110.2 ± 4.2	96.1 ± 3.3
Group 3: Glimpiride	102.2 ± 5.2	103.2 ± 4.9	97.2 ± 6.3 ^(a)	87.2 ± 4.1 ^(a)	101.7 ± 3.9

Paeonia lactifloraG 4:	102.2±1. 7	114.9±2. 1	98.3±2.5 ^(a))	100.1±2.0 ^(a))	101.5±4. 1
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(number of Rats, Per group=6, ^(a)p<0.05 when compared to control (distilled water))

Table2.phytochemical detected in roots of Paeonia lactiflora pall.

Chemical Constituent	Triterpenes	Tannins	Flavonoides	Carbohydrate	Protein	Glycosides	Alkaloids	Saponine
Results	+	+	+	-	+	+	-	+

-,Not detected;+,present .

Table (3) Number of dead Rats during (24 hr.) from oral administration of different doses of alcoholic Extract of Paeonialactflora on albino wistar Rats (n=6).

Groups	Dose gm/ kg B.W.	No. of Rats used	No. of dead Rats	Mortality rate
1	0.25	6	0	0%
2	0.50	6	0	0%
3	0.75	6	0	0%

4	1.00	6	0	0%
5	2.00	6	0	0%

From the results of the acute oral toxicity study of the ethanolic root Extract of *Paeonialactflora* it can be concluded (LD_{50}) of the drug is greater than(2000mg/Kg) body weight on ethanolic Extract of root powder is "safe for administration up to; dose of 2000mg/Kg Body.Weight".

Conclusion :

The result of the study strongly refer to antihyperglycemic activity to *Paeonialactflora* comparision with other drug such as Glucophage XR, Glimpiride in the present study.

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