Studying phytochemical and Biological for Bean clover poisonous plant and knowing its Medicinal Properties

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Abstract

This study was conducted at the laboratories of pharmacy college in tikrit University from July 2017 till J+anuary 2018 to study phytochemical and medicinal properties for Anagyrus foetida poisonous plant or Bean clover, Bean clovor fruit was collected from Hawija area of Kirkuk governarate and also from the same area and seeds were gained after cleaning and drying. pot experiment was conducted, included using aquatic extracts of rooting and vegetative parts for rice and yellow corn (5,10 and 15%) to seedling of Bean clovor poisonous plant, experiment was included 16 treatments with comparison treatments (addition distel water only). The experiment was designed according to complete randomized design (C.R.D.) with three replicates.

The aim of study to know the concentration of active substances in the poisonous bean clover plant and to benefit from its therapeutic properties We calculated concentration of active compounds (Kaloids) for each leaves and seeds and the results were: -

1- Aquatic exracts for rice and sorghum affected on quantity of (kaloids) in leaves for poisonous plant bean clovor and reduce its activity.

2- Aquatic exracts for rice and sorghum affected on quantity of (kaloids) in seeds for poisonous plant bean clovor and reduce its activity.

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3-Root system for yellow con showed significant effect on concentration on aporphen kaloid, it reached 0.56 mg/ml compare with control that reached 3.34 mg/ml thus, we can take advantage of the medicinal properties of aporphine ,wich showedits therapeutic effect in range 0.6.

4-aquatic extract for rooting and vegetative parts of rice did not gave higher effect on quantity Aporphen kaloid in seeds thus it is not possible to take aadvantage of its medicinal properties to retain its toxic property because of its high concentration.

***Keywords**: Kaloids, Aporphene.*

دراسة الكيمياء النباتيه والبيولوجيه لنبات خروب الخنزير السام ومعرفة خصائصه العلاجيه

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الخلاصة

اجريت هذه الدراسه في مختبرات كليه الصيدله في جامعه تكريت من شهر تموز 2017 الى كانون الاول 2018 لغرض دراسه المواد الفعاله والخواص الطبيه لنبات خروب الخنزير السام , تم جمع ثمار خروب الخنزير من قضاء الحويجه من محافظه كركوك ثم تم االستخراج البذور منها بعد تنظيفها وتجفيفها هوائيا .

طبقت تجربه حقليه تضمنت اضافه المستخلصات المائيه لنباتي الرز والذره الصفراء بتراكيز 15,10,5% الى بادرات خروب الخنزير السام ، التجربه تضمنت 16 معامله مع معاملات السيطره ، صممت التجربه وفق التصميم العشوائي الكامل وب3 مكررات.

تهدف هذه الدراسه الى معرفه تركيز المواد الفعاله في نبات خروب الخنزير السام والاستفاده من الخصائص العلاجيه لهذا النبات

تم حساب تراكيز المواد الفعاله (القلويدات) لكل من الاوراق والبذور وكانت النتائج مايلي:-

1-المستخلصات المائيه للرز والذره الصفراء اثرت بشكل معنوي على نسبه القلويدات في الاوراق وقللت من فعاليتها

2-المستخلصات المائيه للرز والذره الصفراء اثرت بشكل معنوي على نسبه القلويدات في البذور وقللت من فعاليتها

3- المجموع الجذري للذره الصفراء اثر بشكل معنوي على قلويد الابورفين في البذور حيث بلغ **0.56** ملغم/مل مقارنه مع معامله السيطره التي بلغت **3.34** ملغم/مل وبذلك نتمكن من الاستفاده من الخصائص الدوائيه للابورفين التي تظهر تاثيراتها العلاجيه عند مستوى **0.6** ملغم/مل.

4-المستخلصات المائيه للمجموع الجذري والخضري للرز لم تظهر تاثير معنوي على نسبه قلويد الابورفين في البذور وبذلك لايمكن الاستفاده من الخصائص الدوائيه له لاحتفاضه بالخاصيه السميه بسبب التركيز العالي له

الكلمات المفتاحيه *: القلويدات, الابورفين .*

Introduction

Apoisonous plant is aplant type that may cause humans and various animals when fed with it, to cause disease symptoms accompanied by irritation, nervousness, malaise or skin sensitivity [1], which may result in various health consequences, which appear immediately or after a while, as aresult of the accumulation of toxic substances in the tissues of the organism [2].

Poisonous plants have acetrain percentage of activity substances and its producer in normal condition , it affect badly on human and animals[3] some of them known for along time , it given nouns derived of scientific noun for plant such as Hhederin that located in Convolvulus that derived of scientific noun fo Hedera helix , and others mixture of several compounds[4] the most important toxic compounds in plant is alkaloids, glycosides , chemical irritants , phenols and oxalates etc [5] toxic compouns are believed to have formed through development of plant as defensive way against insects and micro organisims and its toxic effect in biology is casual effect [4] , it is the plant that contain high percentage of poisonous compound is Anagyrus foetida [6].

Anagyrus foetida is small perennial tree with hight range between 1 meter to 2 meter , its stem is green [8] , covered with white bristles and leaf is composite contain 5-12 leaves [3] the leaves are lanceolate and flowers are yellow , its length reach to 5.2 cm and the fruit is horn , it blooms in march and spread in Iraq , turkey and medetrian sea [8] ,this plant contain high concentrations of poisonous kaloids such as cytisene anagyrine [3] and recently aporphene chemichaformula is C17H17N , its molecular weight 235.324 g/ml [9].

Pharmacological and medical effect for aporphene

Aporphine and its related alkaloids bulbocapnine, boldine, glaucine, and corytuberine are antipsychotic, exert naloxone- reversible antinociceptive activity and with the exception of corytuberine are anticonvulsant [8] Some derivatives of aporphine such as (*S*)-(+)-*N*-propylnorapomorphine have potential as low side effect profile antipsychotics.(*S*)-(+)-*N*-Propylnorapomorphine is highly selective for *meso*-limbic dopaminergic tracts and function as efficacious partial agonists, with no elevation in prolactin.[9] Aporphine is hydroxylated in the body to form apomorphine[11].

Apomorphine is used in advanced Parkinson's disease intermittent hypomobility ("off" episodes), where a decreased response to an anti-Parkinson drug such as L-DOPA causes muscle stiffness and loss of muscle control [10] While apomorphine can be used in combination with L-DOPA, the intention is usually to reduce the L-DOPA dosing, as by this stage the patient often has many of dyskinesias caused by L-DOPA and hypermobility periods.[8,10] When an episode sets in, the apomorphine is injected subcutaneously or applied sublingually,[8] and signs subside. It is used an average of three times a day.[6] Some people use portable mini-pumps that continuously infuse them with apomorphine, allowing them to stay in the "on" state and using apomorphine as an effective monotherapy[13].

Phytochemical effect for some plant

Study indicated that the some of crops have ahigh inhibition in growth of some plant due to it containing several of secondary metabolismc compounds which is one of the most famous phenolic acids that have knoun allelopathy such as benzoic acid , comarins , kaloids and tatins [14] which prompted researchers to use these crops in biological control on jungles and unwanted plant and reduse their damage [15] , it is the crops rice and yellow corn , as some of phenolic acid diagnosed of aquatic extracts for their residue (p-hydroxybenzoic, syringic, vallinic, ferulic) [16] so 18 compound separated of residue for yellow corn that most of them are organic compounds [17].

Materials and methods

anagyrus foetida fruit were harvested during the ripening stage in November 2017 from Hawiga area in Kirkuk governorate, the seeds were taken out, washed well and all traces of the valuable tissues were removed and kept in aplastic bottle until using

Collecting of botanical samples

Rice and yellow sorghum residuesis were collected during March 2017 , the growth stage of plants was the stage of flowers growth where they were uprooted with roots (vegetative system and root system) , plants were washed well to remove impurities after that the root system was separated from the shoot system and flowers system and dried under the sun rays and cut into small pieces after that dried in electric oven in 70 c for 3 days then, the samples were crushed by electric grinder of the type molix and kept in closed plastic cans until using and kept in cold and dry place

Aquatic extracts preparation

Aquatic extracts were prepared in concentration (5,10,15%) for each treatment of used in experiment by take 2 gram of different plant parts and mixed with 100 ml of distal water as way [18] and mixture put (distal water and plant powder) in electric

mixer for 15 minute then the sample filtered by 3 layer from the quaze after that solution filtered by filter paper of type whatman no.1, special solution with all concentration kind of plant kinds and with all plant part put in glass bottle inside black sac and kept in refrigerator in degree 5c until using.

Anvil experience

experience were applicated used anvils during agriculture season 2017 in plastic house of pharmacy college of Tikrit university, experement encloded using these extracts as vegetative spray substance after germination, the treatment that applicated in experement was: -

1-aquatic extracts for root system of rice in (5,10,15%)

2-control

3-aquatic extracts for vegetative system of rice in (5,10,15%)

4-control

5-aquatic extracts for root system of yellow corn in (4,8,12%)

6-control of yellow corn in (5,10,15%)

7-aquatic extracts for vegetative system

8-control anvils used for agriculture in diameter 20 cm and fulled with clean mixture soil, the seed put in anvil, the number of seed amount 25 seeds for each treatment, then the plants were loosened to 5 plants for each treatment aquatic extracts for treatment was added to the anvils after germination after that the anvil were irrigated.

Diagnose poisonous compound in *Anagyrus foetida*

1 gm of leaves and seeds were weighted for all treatments by sence electric scale then they were crashed by using mortar into fine powder after that it dissolved in 10 ml of methanol kaloid by using KOH until reach PH to 8.2then the sample taken and shaked in ultrasonic wave bath device for 10 minute then the sample filtered to remove the fiber after that that filterate was collected by evaporation the solvent by liquefying nitrogen until reach near of 0.5 ml then injected into acylinder High Performance Liquid Chhromatoghraphy [HPLC] then quantity of concentration for each compound selected by balancing the highest peak of the measuring package for that sample under the same circumstances [19].

Calculate poisonous substance concentration

Kaloid concentration were calculated for leaves and seeds according to the equation: -

Concentration of sample mg/ml= sample space/measuring space x measuring concentration x light factor for measuring space as table [20]

Measuring constrationentration Mg/ml mMg/ml	Measuring package area kage area	Hold time permminute hoTime hold	Material namerial name	sequenseseq uence
15 mg/ml 5mg/ml	59437	1.22 11.22	cytisineCytisin e	1 1
	87383	2.39 22.39	aporpheneorph rine	2 2
	82563	3.57 3.57	Anagyrine	3 33

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Statistic analysis

Experience was conducted as Completely Randomize Design (C.R.D.) by used analysis of variance (ANOVA) the different between the arithmetic means were tested at probability level 0.05 by use dankin test polynomial [21].

Results and discussion

1-results of separate and diagnosis kaloids in leaves

Results of chemical analysis showed the root system for *rice* in concentration 5% lead to decrease sighnificantly aconcentration of ctisene kaloid as it reached 5.25mg/ml compare with control treatment that reached 29.25mg/ml but vegetative system for *rice* in concentration 5% lead to decrease sighnificantly aconcentration of cytisene kaloid as it reached 3.17mg/ml compare with control treatment that reached 29.25mg/ml (table 1). root system for*yellow corn* in concentration 5% lead to decrease sighnificantly aconcentration of cytisene kaloid as it reached 3.60mg/ml compare with control treatment that reached 29.25 mg/ml but vegetative system for yellow corn in concentration 5% lead to decrease sighnificantly aconcentration of cytisene kaloid as it reached 6.44 mg/ml compare with control treatment that reached 29.25 mg/ml (table1).

Root system for *rice* in concentration 5% lead to decrese sighnificantly aconcentration of aporphene kaloid as it reached 3.20mg/ml compare with control treatment that reached 13.12 mg/ml but vegetative system for *rice* in concentration 5% lead to decrese aconcentration of aporphene kaloid sighnficant as it reached 3.86 mg/ml compare with control treatment that reached 13.12 mg/ml (table1).

Root system for*yellow corn* in concentration 5% lead to decrese sighnificantly aconcentration of aporphene kaloid as it reached 2.48mg/ml compare with control treatment that reached 13.12 mg/ml, vegetative system for yellow corn in concentration 5% lead to decrese sighnificantly aconcentration of aporphene kaloid as it reached 3.56mg/ml compare with control treatment that amountreached 13.12mg/ml (table1). Root system for*rice* in concentration 10% lead to decrease sighnificantly Anagyrine kaloid as it reached 7.87 mg/ml compare with control treatment that reached 16.10 mg/ml but vegetative system for *rice* in concentration 5% lead to decrease sighnificantly anagyrine kaloid as it reached 4.11 mg/ml compare with control treatment that amount 16.10 mg/ml (table1). root system for *yellow corn* in concentration 10% lead to decrease sighnificantly concentration of anagyrine kaloid as it reached 8.21 mg/ml compare with control treatment that reached 16.10 mg/ml (table1) but vegetative system for yellow corn in concentration 10% lead to decrease sighnificantly concentration of anagyrine kaloid as it reached 6.43 mg/ml compare with control treatment that amount 16.10 mg/ml (table1) , as the rice have allelopathy effect in growth of crops such as lentil and wheat [22] and in growth of kinds of jungles [23] aperiod of stay free plant toxins of rice residuese keep activity for 4 months [17,14] where it contain many phenolic acids (p-hydroxybenzoic, syringic, vanillic, ferulic) [14,15] that have effect in reducing the toxic substance but but aquatic extracts of root and vegetative parts for yellow corn enhibit germination and growth for wheat plant [24] where a lot of production compound by analysis of yellow corn residuese had separated and diagnosis by different techinic (PC) , (GC), (TLC) including organic acids and phenolic acids [16] so it affected on concentration of toxic substance in plant , and allelopathy effect for plant residuese such as yellow and white corn and oat in field can be last for 41 weeks [16].

Table (1): effect of aquatic extracts for rice and yellow corn in *Anagyrus foetida* kalods leaves

Anagyrine (mg/ml)	Aporphine (mg/ml)	Cytisene (mg/ml)	Concentration	Kind of extract	Kind of plant
10.65c	3.20d	5.25d	5%	Root system	rice
7.87d	9.80b	7.40c	10%		
11.80b	7.23c	12.20b	15%		
16.10a	13.12a	29.25a	control		
4.11d	3.86d	3.17d	5%	Vegetative system	
8.90c	6.98c	12.45c	10%		
11.84b	10.11b	22.44b	15%		
16.10a	13.12a	29.25a	control		
12.50c	2.48d	3.60d	5%	Vegetative system	Yellow corn
8.21d	9.22c	8.87c	10%		
12.53b	10.55b	26.18b	15%		
16.10a	13.12a	29.25a	control		
12.32b	3.56c	6.44d	5%	Vegetative system	
6.34c	11.34b	12.76c	10%		
16.09a	11.46b	23.71b	15%		
16.10a	13.12a	29.25a	Control		

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2-Diagnosis of kaloids in seeds

Root system for *rice* in concentration 5% lead to decrease significantly concentration of cytisene kaloid as it reached 2.12 mg/ml compare with control treatment that reached 11.14 mg/ml but vegetative system for *rice* in concentration 10% lead to decrease sighnificantly concentration of cytisene kaloid as it reached 4.23 mg/ml compare with control treatment that reached 11.14 mg/ml (table2). Root system for*yellow corn* in all concentration lead to decrease sighnificantly concentration of cytisene kaloid as it reached 37.71 compare with control treatment that reached 11.14 mg/ml but vegetative system for yellow corn in concentration 10% lead to decrease significantly concentration of cytisene kaloid as it reached 1.96 mg/ml compare with control treatment that reached 11.14 mg/ml (table2).

Root system for *rice* in all concentration don't show any differet significant effect on concentration of aporphene kaloid compare with control treatment that reached 3.34 mg/ml but vegetative system for*rice* in all concentration don't show any different sighnificant compare with control treatment that reached 3.34mg/ml (table2) root system for yellow corn in concentration 10% lead to decrease aporphene kaloid sighnificant , it reached 0.56 mg/ml compare with control treatment that reached 3.34 mg/mlis (table 2) that used in advanced Parkinson's disease intermittent hypomobility ("off" episodes), where a decreased response to an anti-Parkinson drug such as L-DOPA causes muscle stiffness and loss of muscle control[10] as the therapeutic effects of apomorphine derived from aporhene range 0.5-0.6 mg/ml[11] thus, it is possible to benefit from its therapeutic properties at this concentration.

Vegetative system for yellow corn in all concentration lead to decrese aporphene kaloid sighnificant compare with control treatment that reached 3.34 mg/ml (table2).

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Root system for *rice* in concentration 15% lead to decrease sighnificantly aconcentration of anagyrine kaloid as it reached 3.21 mg/ml compare with control treatment that reached 8.70 mg/ml but vegetative system for *rice* in concentration 10% lead to decrease sighnificantly aconcentration of anagyrine kaloid as it reached 2.12mg/ml compare with control treatment that reached 8.70 mg/ml (table2) . root system for *yellow corn* in concentration 5% lead to decrease sighnificantly aconcentration of anagyrine kaloid as it reached 1.34 mg/ml compare with control treatment that reached 8.70 mg/ml , Vegetative system for yellow corn in concentration 10% lead to decrease sighnificantly aconcentration of anagyrine kaloid as it reached 2.31 mg/ml compare with control treatment that reached 8.70 mg/ml (table2) . the varieties of rice with alellopathy effort can be used in jungle organization and the plant overlap in stage of early growth explain negative effect in jungle and allelopathy compounds have additional effect [25] rice residuese that in field after harvest and mix with soil after plowing analyse by rain special in region with bad drainage that lead to release phytoxin that effect in plant growth [17,26] so when quantity of rice residuese increase lead to increasing of quantity for realized phenolic compounds [26] so that effect on concentration of activity substance in anagyrus foetida plant , as for the yellow corn the results of experiments for green house and field showed yellow corn residuese lead to shorthand two classes of bread wheat [24] that inhibition lead to it have a lot of organic and phenolic acids that effect on quantity activity substance in anagyrus foetida , he indicated [18] the resulting phenolic acids of crops residues have elector effect and show it effect depending on concentration and environment factors addition to reponsing of resepter plant and part of plant.

Table (2): effect of auatic extracts for rice and yellow cornin *Anagyrus foetida* seeds kaloid

Anagyrine Mg/ml	Aporphine (mg/ml	Cytisine (mg/ml	Concentration	Kind of extract	Kind of plant
5.23b	1.12b	2.12c	5%	Root system	rice
5.60b	1.00b	5.34b	10%		
3.21c	1.01b	11.12a	15%		
8.70a	3.34a	11.14a	control		
5.23c	3.34a	6.34c	5%	Vegetative system	
2.12d	3.31a	4.23d	10%		
4.31b	3.00a	8.12b	15%		
8.70a	3.34a	11.14a	control		
1.34d	.45b 1	1.40b	5%	Root system	Yellow corn
4.42c	0.56c	1.19b	10%		
6.650b	1.23b	1.54b	15%		
8.70a	3.34a	11.14a	control		
4.12c	1.34b	4.78b	5%	Vegetative system	
2.24d	1.22b	1.96d	10%		
6.23b	1.12b	3.76c	15%		
8.70a	3.34a	11.44a	control		

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