Effect of Aqueous extracts of Ocimum basilicum L., Urtica dioica L. and their mixture on Rats Suffering from kidney stones

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Abstract: Kidney stones are common urinary tract disorders worldwide, especially in industrialized countries. This study aimed to evaluate the therapeutic effects of aqueous extracts of O. basilicum L and U. dioica L and U. dioica L and their mixture on rats induced with kidney stones. 35 albino male rats were divided into two main groups: the first main group (5 rats) was fed a basal diet as a negative control group. The second main group (30 rats) served as a positive control was induced to form stones by administering (75% v/v) ethylene glycol and (1% w/v) ammonium chloride in drinking water for 15 days, followed by 43-days The first subgroup was fed the basal diet as a positive control group, and the remaining (5 groups) underwent a treatment period, during which they were fed a basal diet supplemented with aqueous extracts of O. basilicum L. (10% and 15%), aqueous extracts of U. dioica L. (10% and 15%), and a mixture of both (15%) as a treatment group. Biochemical parameters, including sodium, potassium, creatinine, glucose level, blood urea, urinary calcium, and oxalate levels were measured. Histopathological analyses of kidney and ureter tissues were also performed. The results showed significant reduction in stone formations and improvement in kidney functions in all groups which treated with O.basilicumand U.dioica L extracts and their mixture compared to positive control group. Groups treated with aqueous extract mixture demonstrated high therapeutic efficacy comparable to positive control group. These findings suggest that O. basilicum L and U. dioica L may serve as effective natural alternatives or complementary treatments for patients with kidney stones.

Key Words: Kidney stones, Ocimum basilicum L, Urtica dioica L., Biochemical analysis, Histopathological examination.

Introduction:

Kidney stones, nephrolithiasis, is a common disease in the World. In industrialized countries, the prevalence of upper urinary tract stones has persistently increased in the twentieth century, yet there are significant contrasts among countries and furthermore inside a similar countries **(Aiumtrakul et al.,2024)** . Most of people usually can have renal stones at any phase of life. The rate of prevalence of renal calculi is mostly high in males as well as in females **(Ziemba and Matlaga.,2017)**. The basic pathophysiology for stone formation is super saturation of components of stones in urine; elements influencing solubility of these components include pH and volume of urine, and total excretion of solute **(Rossi et al., 2021)**. Majority of the calculi is chemically composed of calcium oxalate **(Abbas et al.,2019).**

These stones, crystalline in nature and hard, are raised in kidney. The pathogenesis mechanisms of nephrolithiasis are complex and involve both environmental and metabolic risk factors. Increasing prevalence rate suggests that kidney stones are associated with systemic diseases like cardiovascular disease, obesity, and diabetes **(Sakhaee.,2008)** Ecological factors along with lifestyle contribute in calculus formation. Renal pain, colic, is a common presentation and consequently the management should not be delayed. Therefore, in the absence of any anticipatory measures, renal calculi recurrence rate is >50% **(Aggarwal,2017)**. Further research of the pathophysiological linkage between kidney stone formation and these systemic disorders is necessary for the development of new therapeutic strategies. Over the past decade, major advancements have been made in the understanding of the pathophysiology, diagnosis, and treatment of renal stones. Treatment strategies for the renal stones are extracorporeal shock wave lithotripsy (ESWL) and conservative medical treatment. Data evidence suggests that therapeutic doses of shock waves may cause acute renal trauma, decrease in physiological functions of kidney, and an increase in recurrence rate of stones. Furthermore, there is no drug that can be satisfactorily used in the treatment of nephrolithiasis. Data collected from In vivo, In vitro, and clinical trials suggest that medicinal plants could be used as an alternative therapeutic strategy in the management of nephrolithiasis. The present review of literature critically evaluates the prospective use of medicinal plants in the treatment of nephrolithiasis **(Abbas, et al.,2019).**

Various medicines, including thiazide as diuretic and alkali- citrate, are applied to prevent the frequency of hypercalciuria and hyperoxaluria which cause calculi formation but they are not promising enough due to their limited effectiveness and low tolerability. Because of the disadvantages of surgical techniques and limited choice in pharmacotherapy, exploring

new pharmacological therapies for the management of kidney stones is worthwhile. Various medicinal plants with diuretic, antispasmodic, and antioxidant activities exert inhibitory effects on crystallization, nucleation, and aggregation of crystals, making them useful for treatment of urolithiasis **(Nirumand et al., 2018).**

On the other hand, there is a growing research to apply the use of herbal medicine in the treatment of urolithiasis. Herbal remedies are known to contain beneficial constituents, acting through several pathways, for example, antispasmodic, diuretic and pain relieving with no side effects associated with maximum benefits that needed for treating urolithiasis **(Ushakiran, et al, 2017).** Sweet O.basilicum(Ocimum basilicum) is a herbal plant from Lamiaceae family and is known as Holy O.basilicumin English and Rehan in Egypt. O.basilicumleaves have been recognized as a food additive and spice but some evidence shows that these leaves can also be used to overcome different human diseases. This may be due to their phytochemical contents, including antioxidants, polyphenols and flavonoids. Essential oils as well as the most active constituents of O.basilicumare dominantly found in the leaves **(Ushakiran, et al 2019).**

O. basilicum L (Ocimum basilicum L) is one of the most important crops with essential oils as well as polyphenols, phenolics, flavonoids and phenolic acids **(Mostafavi et al.,2019)** . This annual plant belongs to mint family, and indigenous to tropical regions. O.basilicumleaves also has tremendous pharmaceutical benefits and it is common to use in rice, meat, stews and soups. Traditionally, it has been used in kidney problems **(Shahrajabian et al., 2020)**

U. dioica L (Urtica dioica L) or Stinging U.dioica L is widely spread globally but is common in Europe, North America, North Africa, and some parts of Asia **(Bhusal et al., 2022).** Medicinal applications consider fresh leaves and extracts for treating flailing arthritic or paralytic limbs, stimulating blood circulation, and warmth of joints and extremities **(Upton.,2013).** The stinging U.dioica L's extracts showed different biological activities such as antioxidant, antimicrobial, anti-inflammatory, anti-ulcer, and analgesic **(Durovic et al., 2023 and Kukric, et al., 2012)** .This plant is also used as a medicament against anemia, gout, eczema, and urinary, bladder, and kidney problems **(Orcic , 2014 and Leporatti and Carrdi, 2001, Pinelli, 2008).**

The current study aims to study the biological extracts of aqeous extract of Ocimum basilicum L, aqeous extract of Urtica dioica L and their mixture on experimental rats

suffering from kidney stones.

Materials and Methods:

Materials:

- **Plants :** Ocimum Basilicum and Urtica Dioica were obtained from Al-shaarawi Farm in sinaniya , Damietta, Egypt.
- **Chemicals :** Casein, all vitamins, minerals, cellulose and choline chloride were obtained from X-Premix company from local supplier , Cairo, Egypt.
- Ethylene glycol and ammonium chloride were obtained from sigma chemical company, Cairo.
- **Animals :** Thirty five male albino rats (Sprague Dawley Strain) their weight 100 ± 5 gm were obtained from the laboratory animals of faculty of Medicine Mansoura University , Egypt.

Methods:

Experimental design

This study was carried out on 35 adult male Sprague Dawley rats weighing (100 gm ± 5 gm). Rats were housed under standard conditions (8 rats per 1500 cm^2 cage in 22±3 C°) for twelve days to acclimate before experimental study, during this period, rats were feding on standard diet with freely access to food and water .The experiment on rats was carried out according to the national regulations on animal welfare and institutional Animal Ethical Committee according to **(Reeves et al., 1993).**

The basal diet consists of 14 % casein (protein > 80 %) corn oil (4 %) , cellulose (5 %) , vitamins mixture (1 %) , salt mixture (3.5 %) choline chloride (0.25%) and the remainder is corn starch **(Reeves et al., 1993)** and the composition of salt and vitamins mixture according to **(Reeves et al., 1993)** .

Plants extract preparation:

Ocimum Basilicum extract and Urtica Dioica extract were prepared fresh at the beginning of every experiment and always form the same batch.

(A) Aqueaus extract of ocimum basilicum leaves: 20 grams of grounded ocimum basilicum leaves were soaked in 80 ml distilled water (20%WT/V) overnight and crushed in blender for 30 second at room temperature the extract was then passed through a (0.22dm) filter and the filtrate was used fresh. **(Bagul et al.,2015)**

(B) Aqueaus extract of Urtica Dioica leaves: 20 grams of grounded U.dioica L leaves were soaked in 80 ml distilled water (20%WT/V) overnight and crushed in blender for 30 second at room temperature the extract was then passed through a (0.22dm) filter and the filtrate was used fresh**. (Bagul, et al.,2015)**

After the period of adaptation on basal diet (twelve days). Rats were divided into two main groups as follows:

The first main group (5 rats): fed on basal diet and tap drinking water (as a control negative group) as shown in table (4)

The second main group (30 rats): fed on basal diet and received Ethylene glycol (EG) (0.75% v\v) and ammonium chloride (AC) (1%w\v) in drinking water and libitum for 15 days according to **(Fan et al., 1999)** which used to induce urolithiasis.

After 15 days, the formation of kidney stones was confirmed by conducting biochemical tests on rats urine of the experiment the increase of urea, uric acid and creatinine in the blood

was confirmed Kidney stones which formed in the second main group. Rats in the second main group were divided into six groups each include (5 rate)followed by a 43-day The first subgroup was fed the basal diet as a positive control group, and the remaining (5 groups) underwent a treatment period, during which they were fed a basal diet supplemented with aqueous extracts of O. basilicum L. (10% and 15%), aqueous extracts of U. dioica L. (10% and 15%), and a mixture of both (15%).

Grouping of animals:

Table (1): The animals administrations for working groups.

Groups	Diet and symbol	Description
NC	Negative control	Fed on basal diet as negative control group and tap drinking water ,
PC	Positive control	Fed on basal diet as positive control group and received Ethylene glycol (EG) (0.75 % v/v) amnd ammonium chloride (AC) (1 % w/v) in drinking water and libitum ,
B1	10 % aqueous extract of O. Basilicum L leaves	Positive rats fed on basal diet and treated with 10 % of aqueous extract of Ocimum Basilicum leaves
B2	15 % aqueous extract of O. Basilicum L leaves	Positive rats fed on basal diet and treated with 15 % of aqueous extract of Ocimum Basilicum leaves
U1	10 % aqueous extract of U. Dioice L leaves	Positive rats fed on basal diet and treated with 10 % of aqueous extract of Urtica Dioice leaves . .
U2	15 % aqueous extract of U. Dioice L leaves	Positive rats fed on basal diet and treated with 15 % of aqueous extract of Urtica Dioice leaves . .
BU2	Mix 15 % (aqueous extract of O. Basilicum L and U. Dioice L. leaves)	Positive rats fed on basal diet and treated with 15 % (aqueous extract of Ocimum Basilicum and Urtica Dioice leaves. .

NC: Negative control, PC: Positive control , B: Ocimum Basilicum, U: Urtica Dioice, 1: Extract concentration 10%, 2: Extract concentration 15%, B1: Ocimum Basilicum 10%, B2: Ocimum Basilicum 15%, U1: Urtica Dioice 10%, U2: Urtica Dioice15%, BU2: Mix 15 % of O. Basilicum L and U. Dioice L.

Biological determination:

During the experiment period (43 days) the quantities of diet which were recorded every day. In addition, rats weights was recorded weekly They were fed ad Libitum and all procedures were conducted in respect of the acceptable humane methods in the use of laboratory animals in medical research.

Biological Evaluation:

- Feed intake : diet which were recorded every day.
- Body weight gain was determinates using the following equation:

$$\text{Body weight gain} = \frac{\text{final weight (g)} - intitial\ wight\ (g)}{intitial\ wight} \times 100$$ **(Chapman et al., 1959).**

- Feed Efficiency Ratio (FER)g:

$$\text{Feed Efficiency Ratio (FER)} = \frac{bady\ wight\ gain(g)}{\text{feed intake(g)}}$$ **(Chapman et al., 1959).**

- Organs: Each rat's kidney and liver were removed, cleaned, and, and weighed using the procedure outlined by.

$$\text{Organ weight / body weight \%} = \frac{\text{Organ weight}}{\text{body weight}} \times 100.$$ **(Chapman et al., 1959).**

Biological analysis:

Biological analysis of blood serum:

At the end of experiment period , rats were fasted over night then rats were anaesthetized and sacrificed .Blood samples were collected from the aorta the blood samples were centrifuged for 10 minutes at 3000 rpm to separate the serum . Serum was carefully separated into dry clean Wasserman tubes by using a Pasteur pipette and kept frozen until analysis at 20C according to the method described by (**Drury and Wallington (1980) .** Parameters measured included serum sodium **(Schoenfeld et al., 1964 and Terri et al., 1958)**, serum potassium **(Schoenfeld et al., 1964 and Terri et al., 1958)** . serum calcium **(Hadjzadeh at. al.,2007)**, serum chloride (**Gumaih at. al., (2017)** and serum creatinine **(Bohmer, 1971) ,** serum uric acid **(Fossati et al.,(1980),** serum urea**(Patton and Crouch , 1977)** and glucose level **(Trinder, 1969)** .

Biological analysis of urine:

All animals were fasted overnight then urine samples were collected from each rat only the first and last days . before and after treatment respectively . These animals were kept in individual metabolic cages , urine samples of 24 h were collected and drops of concentrated hydrochloric acid was added to the urine samples to analyze calcium and protein Parameters measured included urine calcium (**Werness et al., 1985) .** urin oxalate **(werness et al., 1985)** and urine protein **(Gumaih et. al., 2017).**

Histopathological examination :

Specimens from kidney and ureter were taken immediately after sacrificing animals and fixed in 10 % buffered neutral formaline solution . The fixed specimens were then trimmed washed and dehydrated imbedded in paraffin cut in sections of 46 microns thickness and stained with haematoxylin and cosin stain , according to **Sheenan and Hrapchak (1980).**

Statistical analysis :

The obtained data were statistically analyzed by using computer . The results were expressed as mean standard deviation " S.D" and tested for siginificancy using one way analysis of variance " ANOVA" test to compare among groups of numerical (parametric) data followed by post-hoc tukey. P value ≤ 0.05 was considered statistically significant , according to **(Armitage and Berry , 2008) .**

Results and Discussion:

Biological Evaluation

Effect of aqueous extract of O.basilicum L., U.dioica L leaves and their mixture on Feed intake and body weight gain of rats suffering from kidney stones:

Feed intake:

Data in table (٢) showed that, the mean values of feed intake of healthy rats (negative control group) was 56 g/day/rat, while the mean values of feed intake in rats which suffer from kidney stones diseases was 19 g/day for each rat..The mean values of feed intake of induced rats with EG and AC decreased It seems that induced rats with kidney stones decreased the appetite of rats.

All treating rats, which suffer from kidney stones diseases with aqueous extract of leaves O.basilicum L., leaves U.dioica L and mixture of them led to increase in the mean value of feed intake, as compared to the positive control group(19 g/day/rat) While, the mean values of feed intake in all treated groups increased compared to control positive group The highest increase in the mean values of feed intake (47 g/day/rat)recorded for group which had mix of aqueous extracts of leaves O.basilicum L., leaves and U.dioica L 15%.

Body weight gain %:

Data in table (٢) and fig (1) revealed that, body weight gain % of the positive control group (kidney stones) decreased significantly $p<0.05$, as compared to the negative control group (healthy rats) (15.92±1.96 and 29.09±1.78) respectively. Treated groups with aqueous extract of leaves O.basilicum L., 10%,15%, aqueous extracts of leaves U.dioica L 10% , 15% ,mix aqueous extract of leaves O.basilicum L. and leaves U.dioica L.15% led to significant increase changes in BWG% as compared to positive control .On the other hand, the highest increase in body weight gain % of all group treated recorded for the group which had mix aqueous extract of leaves O.basilicum L. and leaves U.dioica L.15% as compared to other treated groups.

Table (2) : Effect aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on Feed intake and body weight gain of rats suffering from kidney stones:

Groups	Parameters		
	BWG%	Feed intake (g/day/rat)	Feed Efficiency Ratio(g)
(-) control	29.09±1.78^{a}	56	0.52±0.03^{c}
(+) control	15.92±1.96^{d}	19	0.84±0.10^{a}
Aqueous extract of O.basilicum L 10%	16.38±2.86^{d}	20	0.82±0.14^{a}
Aqueous extract of O.basilicum L 15%	17.45±2.20^{d}	23	0.76±0.96^{ab}
Aqueous extract of U.dioica L 10%	21.40±1.77^{c}	31	0.69±0.06^{b}
Aqueous extract of U.dioica L 15%	24.66±2.02^{b}	37	0.67±0.05^{bc}
Mix 15% (Aqueous extract of O.basilicum L + U.dioica L)	26.37±3.89^{a}	47	0.56±0.80^{c}

O.basilicum L (Ocimum basilicum L leaves), **U.dioica L** (urtica dioica L leaves), **BWG**: body weight gain
Data expressed as mean ±SD.
Different letters indicate significance in means (significance ≤ 0.05).

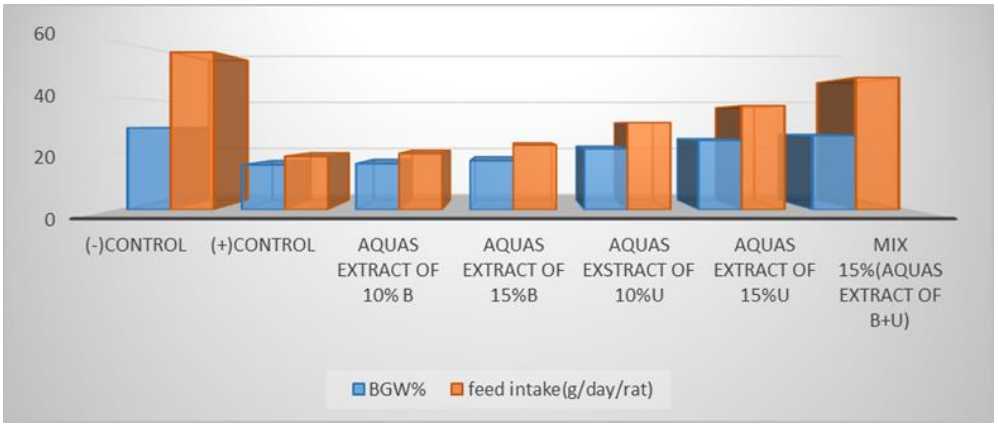


Fig (1) : Effect aqueous extracts of O.basilicum L, U.dioica L leaves and their mixture of feed intake and body weight gain % of rats suffering from kidney stones.

Effect of aqueous extracts of O.basilicum L., U.dioica L leaves and their mixture on organs weights of rats suffering from kidney stones:

Table (٣) and in fig (2) showed that kidney weights/body weight % of positive control increased as compared to the negative control group. Rats received (EG) and (AC) in drinking water were used to induce urolithiasis led to increased in percent weight of kidney comparing with negative control group.

It was also found that liver weights/body weight % of positive control decreased significantly as compared to the negative control group. Rats received (EG) and (AC) in drinking water were used to induce urolithiasis led to decreased in percent weight of kidney comparing with negative control group on the other hand…..

Kidney weight/body weight %:

The results in table (٣) and in fig (2) showed that, all treated kidney stonses diseases groups which had aqueous extract of leaves O.basilicum , leaves U. dioica and their mixture15% led to significant decrease in kidney weight /body weight as compared to the positive control group.

The highest improvement in Kidney weight / body weight % recorded for the groups treated with (Mix aqueous extract of leaves O.basilicum and U. dioica 15%) recording the best result followed by (aqueous extract of leaves U. dioica 15%) with (1.10±0.20 and 1.14±0.18) respectively.

on the other hand oral administration of U. dioica extract to rats was found to induce a significant decrease in urine excretion, as well as a decrease in oxalate and calcium deposition in the kidneys. Furthermore, U. dioica extract was found to reduce kidney weight and urinary creatinine levels, and restore urine pH levels **(Zhang, et al.,2014).**

This study aimed to investigate the effects of administering an aqueous extract of basil for seven days on blood glucose levels and antioxidant activity in vivo in both healthy and diabetic animals. The results demonstrated a significant anti-reductive effect on blood glucose in both healthy and diabetic animals. Treatment with basil extract also demonstrated protective effects on blood glucose levels in both healthy and diabetic animals **(Teofilovic et al., 2025).**

Liver weight /body weight %:

The results in table (٣) and in fig (2) showed that, all treated kidney stonse diseases groups which had aqueous extracts of O.basilicum , U. dioica leaves and their mixture led to increase in liver weight /body weight % as compared to the positive control group.

The highest improvement in liver weight / body weight % recorded for the groups treated with (Mix aqueous extract of leaves O.basilicum and U. dioica 15%) followed by (aqueous extract of leaves U. dioica 15%) with (3.74±0.30 and 3.62±0.14) respectively.

Table (٣): Effect aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on organs weight/ body weight % of rats suffering from kidney stones :

Parameters / Groups	kidney/ body weight %	liver/ body weight%
(-) control	1.10±0.20^{b}	3.80±0.22^{a}
(+) control	1.32±0.16^{a}	3.20±0.14^{b}
Aqueous extract of O.basilicum L 10%	1.28±0.23^{ab}	3.22±0.13^{b}
Aqueous extract of O.basilicum L 15%	1.24±0.13^{ab}	3.30±0.26^{b}
Aqueous extract of U.dioica L 10%	1.18±0.13^{ab}	3.50±0.33^{ab}
Aqueous extract of U.dioica L 15%	1.14±0.18^{ab}	3.62±0.14^{a}
Mix 15% (Aqueous extract of O.basilicum L + U.dioica L)	1.10±0.20^{b}	3.74±0.30^{a}

O.basilicum L (Ocimum basilicum L leaves), **U.dioica L** (urtica dioica L leaves)

Data expressed as mean ±SD.

Different letters indicate significance in means (significance ≤ 0.05).

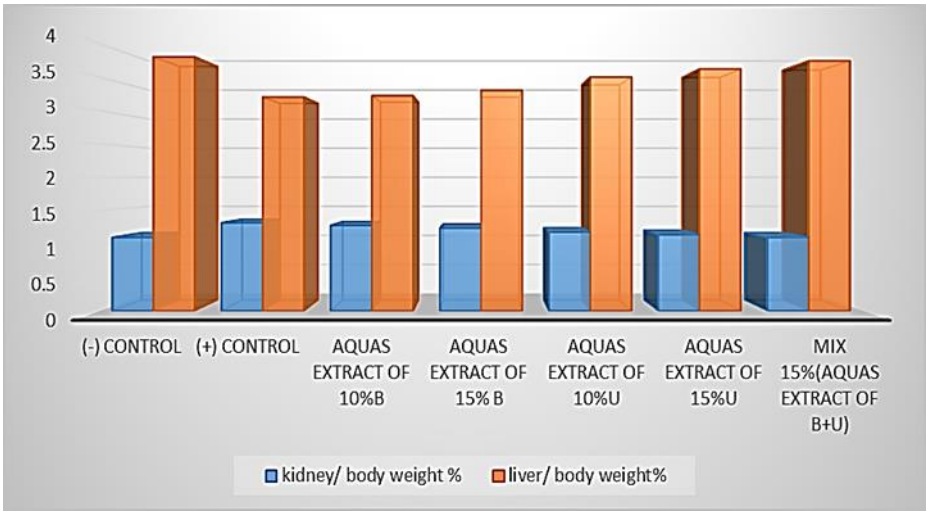


Fig (2): Effect aqueous extract of O.basilicum L. , U.dioica L. leaves and their mixture on organs weight/ body weight % of rats suffering from Kidney Stones.

Biochemical analysis:-

Effect Aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on some minerals in serum of rats suffering from kidney stones

Table (٤) showed the effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on serum sodium (mmol/L), serum potassium (mmol/L), serum calcium (mmol/L) and serum chloride (mmol/L) of rats suffering from kidney stones. It could be observed that serum of (sodium, potassium, calcium and chloride) (mmol/l) in the positive

control group (136.60±9.41, 6.16±0.19 , 2.82±0.14 and 109.22±2.76 respectively) the mean values of these parameters increased significantly ($p<0.05$) as compared to the negative control group (125.30±4.93 , 3.54±0.34, 1.90±0.14 and 91.38±3.07 respectively).

Serum sodium (mmol/l)

The results in (Table ٤ and in figure 3) showed that the mean serum sodium values in rats that received (EG) and (AC) in the drinking water used to induce urinary tract stones were increased compared to the negative control group. The mean values were (136.60±9.41mmol/l, 125.30±4.93 mmol/l), respectively. On the other hand, groups of rats suffering from kidney stones decreased which treated with (mixture of aqueous extract of O.basilicum L leaves and U. dioica L leaves at 15%) followed by (aqueous extract of U. dioica leaves at 15%) at (125.30±3.12 mmol/l and 125.52±2.94 mmol/l), respectively.

Serum potassium (mmol/L)

Results in (Table ٤ and in figure 4) showed that the means of serum potassium values in rats that received (EG) and (AC) in the drinking water used to induce urinary tract stones were increased compared to the negative control group. The means values were (6.16±0.19 mmol/l, 3.54±0.34 mmol/l), respectively. On the other hand, groups of rats suffering from kidney stones which treated with (mixture of aqueous extract of O.basilicum L leaves and U. dioica L leaves at 15%) followed by (aqueous extract of U. dioica leaves at 15%) at (3.87±0.13 mmol/land3.94±0.09 mmol/l), respectively.

Serum calcium (mmol/L)

Results in (Table 4 and in figure5) showed that the mean serum calcium values in rats that received (EG) and (AC) in drinking water used to induce urinary tract stones were increased compared to negative control group. The mean values were (2.82±0.14 mmol/l, 1.90±0.14 mmol/l), respectively. On the other hand, groups of rats suffering from kidney stones was treated with mixture of aqueous extract of O.basilicum L leaves and U. dioica L leaves at 15% followed by (aqueous extract of U. dioica leaves at 15%) at (2.00±0.14 mmol/l and 2.12±0.32 mmol/l), respectively.

Serum chloride (mmol/L)

The results in (Table 4 and in figure 6) showed that the mean serum chloride values in rats that received (EG) and (AC) in the drinking water used to induce urinary tract stones were increased compared to the negative control group. The mean values were (109.22±2.76 mmol/l, 91.38±3.07 mmol/l), respectively. On the other hand, the group of rats suffering from kidney stones was treated with (a mixture of aqueous extract of O.basilicum L leaves and U. dioica L leaves at 15%) followed by (aqueous extract of U. dioica leaves at 15%) at (93.00±3.03 mmol/l and 93.04±4.74 mmol/l), respectively.

On the other hand, this result is consistent with the study (.Al-saeed., 2021) in which mice were given parsley extract, which led to a significant decrease in serum chloride compared to the negative control group.

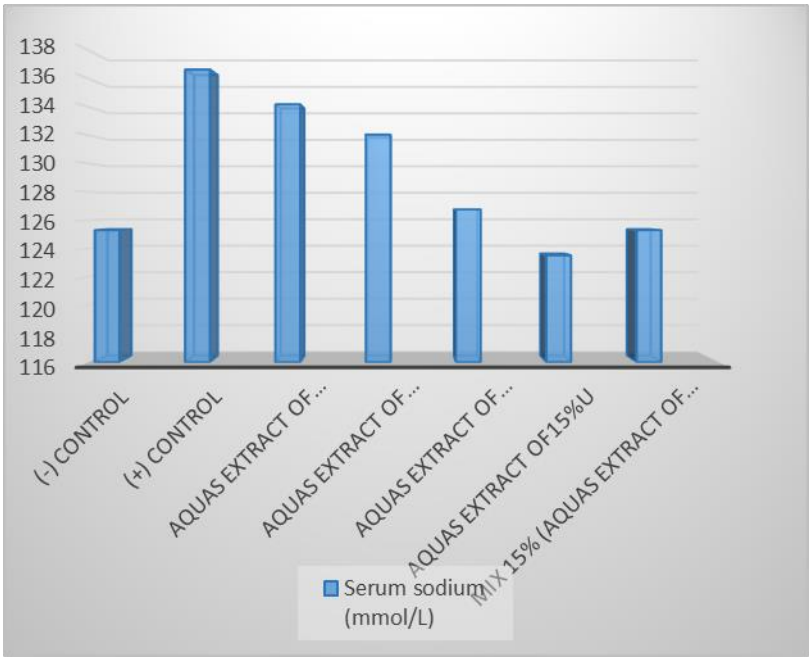
Table (4): Effect aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on some minerals in serum of rats suffering from Kidney Stones

Parameters / Groups	Serum sodium (mmol/L)	Serum potassium (mmol/L)	Serum calcium (mmol/L)	Serum chloride (mmol/L)
(-) control	125.30±4.93^{b}	3.54±0.34^{d}	1.90±0.14^{d}	91.38±3.07^{c}
(+) control	136.60±9.41^{a}	6.16±0.19^{a}	2.82±0.14^{a}	109.22±2.76^{a}
Aqueous extract of O.basilicum L 10%	134.16±5.01^{ab}	5.93±0.43^{ab}	2.52±0.22^{b}	100.06±5.39^{b}
Aqueous extract of O.basilicum L15%	132.02±5.29^{ab}	5.63±0.47^{b}	2.32±0.16^{b}	98.24±3.88^{bc}
Aqueous extract of U.dioica L10%	126.76±7.61^{b}	4.45±0.23^{c}	2.16±0.08^{bc}	94.38±4.80^{c}
Aqueous extract of U.dioica L 15%	125.52±2.94^{b}	3.94±0.09^{d}	2.12±0.32^{bcd}	93.04±4.74^{c}
Mix 15% (Aqueous extract of O.basilicum L+ U.dioica L)	125.30±3.12^{b}	3.87±0.13^{d}	2.00±0.14^{cd}	93.00±3.03^{c}

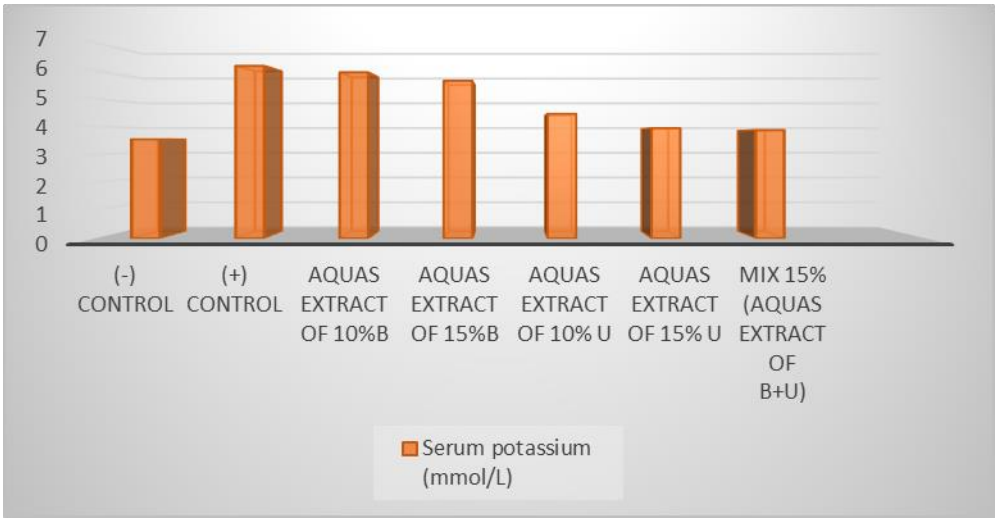
O.basilicum L (Ocimum basilicum L leaves), **U.dioica L** (urtica dioica L leaves),

Data expressed as mean ±SD.

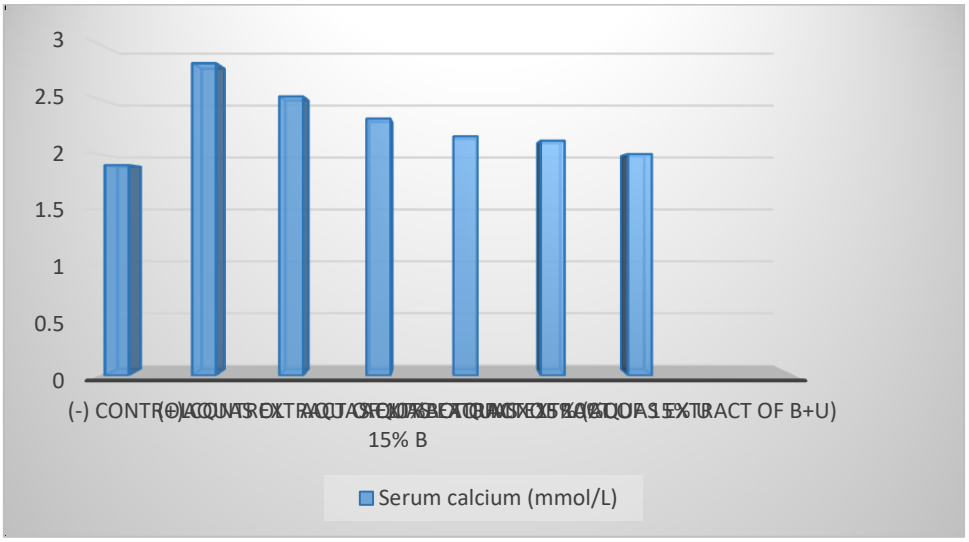
Different letters indicate significance in means (significance ≤ 0.05).



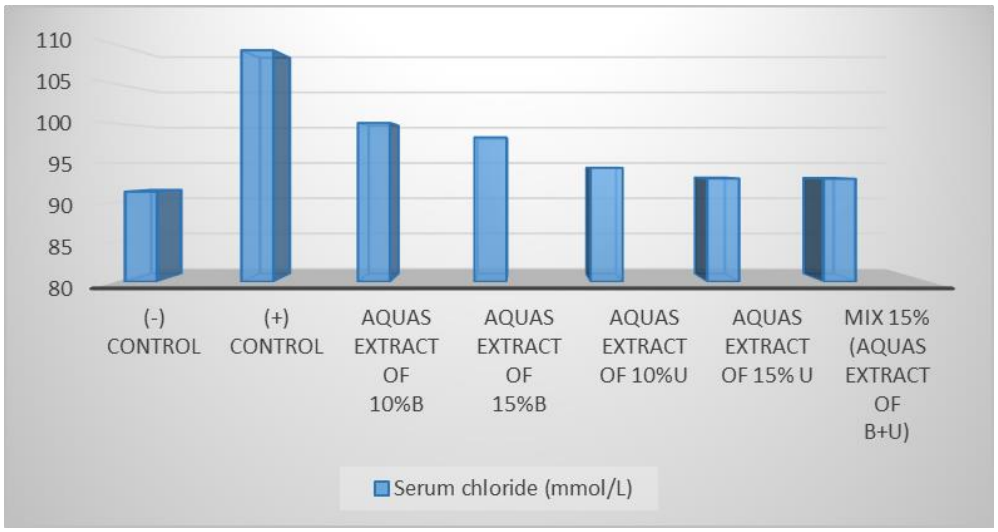
Fig(3): Effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on serum sodium of rats suffering from Kidney Stones.



Fig(4): Effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on serum potassium of rats suffering from Kidney Stones.



Fig(5): Effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on serum calcium of rats suffering from Kidney Stones.



Fig(6): Effect aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on serums chlorides of rats suffering from Kidney Stones

Effect aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on kidney functions of rats suffering from Kidney stones

Effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on serum creatininev(mg/dl), serum uric acid (mg/dl), and Serum urea (mg/dl) of rats suffering from kidney stones are given in table (5) and illustrated .

From table (5) it could be observed that the effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on kidney functions of rats suffering from kidney stones, (creatinine, uric acid and urea) (mg/dl) in the positive control group (1.90±0.02, 1.91±0.07 and 51.03±1.31 respectively) increased significantly ($p<0.05$) as compared to the negative control group (0.30±0.01 , 0.40±0.0 and 15.99±0.91 respectively).

In this regard, in mice in the control group (Group 2), a significant increase in urinary oxalate, calcium, and creatinine levels was observed after 30 days of ethylene glycol and ammonium chloride administration, compared to mice in the first group. Furthermore, compared to healthy mice, an increase in calcium oxalate deposition in the kidneys of the control group was observed, as revealed by phase-contrast analysis. A significant decrease in urine pH and an increase in kidney weight were also observed in the control group compared to healthy mice. Furthermore, histopathological studies using phase-contrast microscopy revealed renal tubular inflammation and glomerular atrophy, as well as the deposition of calcium oxalate crystals within and between the renal tubules in the kidneys of mice in the control group compared to the healthy group**(Zhang, et al.,2014).**

Serum creatinine (mg/dl):

Table (5) and in figure 7 showed significant decrease in ($p<0.05$) in all treated groups had aqueous extracts of (O.basilicum L 10%, O.basilicum L 15% , U.dioica L10% , U.dioica L15% and Mix at 15% (O.basilicum L+ U.dioica L)). Treated groups with mix 15% (O.basilicum L+ U.dioica L) extracts recorded the best results in serum creatinine. The creatine level increased to (1.90+0.02) in the positive control group, and the best results were recorded in the group treated with Mix 15% (Aqueous extract of O.basilicum L+ U.dioica L) (0.38+0.02), followed by the group with 15% O.basilicum L aqueous extract (0.60+0.02) .

This is consistent with a study **(Zhang, et al.,2014)** in which serum creatinine levels in all experimental groups, except the normal control group, increased significantly after oral administration of ethylene glycol until the 14th day. From the onset of kidney stone formation, a significantly higher serum creatinine level was observed in the positive control group compared to normal control animals ($P < 0.001$). In the positive control group, serum creatinine levels rose to the maximum measurable value and were found to be significantly elevated ($P < 0.001$) compared to the control animals. Serum creatinine levels remained normal throughout the 35-day test period.

In this regard, in mice in the control group (Group 2), a significant increase in urinary oxalate, calcium, and creatinine levels was observed after 30 days of ethylene glycol and ammonium chloride administration, compared to mice in the first group. Furthermore, compared to healthy mice, an increase in calcium oxalate deposition in the kidneys of the control group was observed, as revealed by phase-contrast analysis. A significant decrease in urine pH and an increase in kidney weight were also observed in the control group compared

to healthy mice. Furthermore, histopathological studies using phase-contrast microscopy revealed renal tubular inflammation and glomerular atrophy, as well as the deposition of calcium oxalate crystals within and between the renal tubules in the kidneys of mice in the control group compared to the healthy group.

Serum uric acid (mg/dl):

Data in Table (5) and in figure (8) showed a significant decrease ($p<0.05$) in uric acid between the positive control group and the groups treated with aqueous extracts of (O.basilicum L 15%, U.dioica L 10%, U.dioica L 15% and a 15% mixture (O.basilicum L + U.dioica L)), while the O.basilicum L 10% group recorded an insignificant decrease, and the groups treated with a 15% mixture (O.basilicum L + U.dioica L) recorded the best results in serum uric acid.

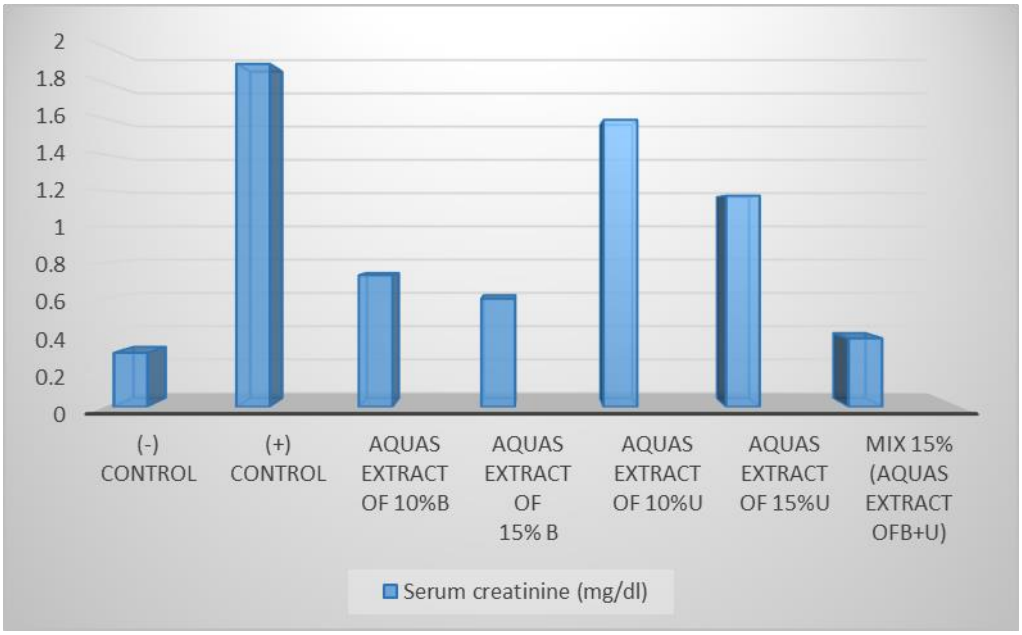
Serum urea (mg/dl):

Data in Table (5) and in figure (9) showed a significant decrease ($p<0.05$) in urea between the positive control group and the groups treated with aqueous extracts of (O.basilicum L 15%, U.dioica L 10%, U.dioica L 15% and a 15% mixture (O.basilicum L + U.dioica L)), while the O.basilicum L 10% group recorded an insignificant decrease, and the groups treated with a 15% mixture (O.basilicum L + U.dioica L) recorded the best results in serum urea.

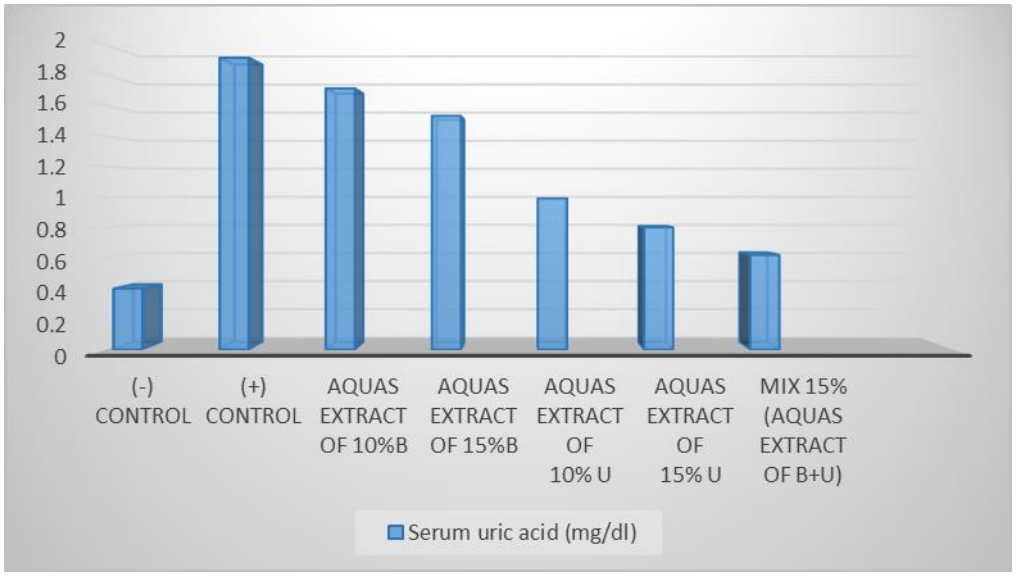
Table (5) :Effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on kidney functions of rats suffering from Kidney Stones

Parameters / Groups	Serum creatinine (mg/dl)	Serum uric acid (mg/dl)	Serum urea (mg/dl)
(-) control	0.30±0.01^{f}	0.40±0.0^{d}	15.99±0.91^{f}
(+) control	1.90±0.02^{a}	1.91±0.07^{a}	51.03±1.31^{a}
Aqueous extract of O.basilicum L 10%	0.73±0.04^{d}	1.71±0.14^{ab}	49.05±2.82^{ab}
Aqueous extract of O.basilicum L15%	0.60±0.02^{e}	1.53±0.14^{b}	47.38±2.18^{b}
Aqueous extract of U.dioica L10%	1.59±0.23^{b}	0.99±0.20^{c}	24.89±1.17^{c}
Aqueous extract of U.dioica L 15%	1.17±0.13^{c}	0.80±0.45^{cd}	22.24±1.45^{d}
Mix 15% (Aqueous extract of O.basilicum L+ U.dioica L)	0.38±0.02^{f}	0.62±0.17^{d}	18.83±2.28^{e}

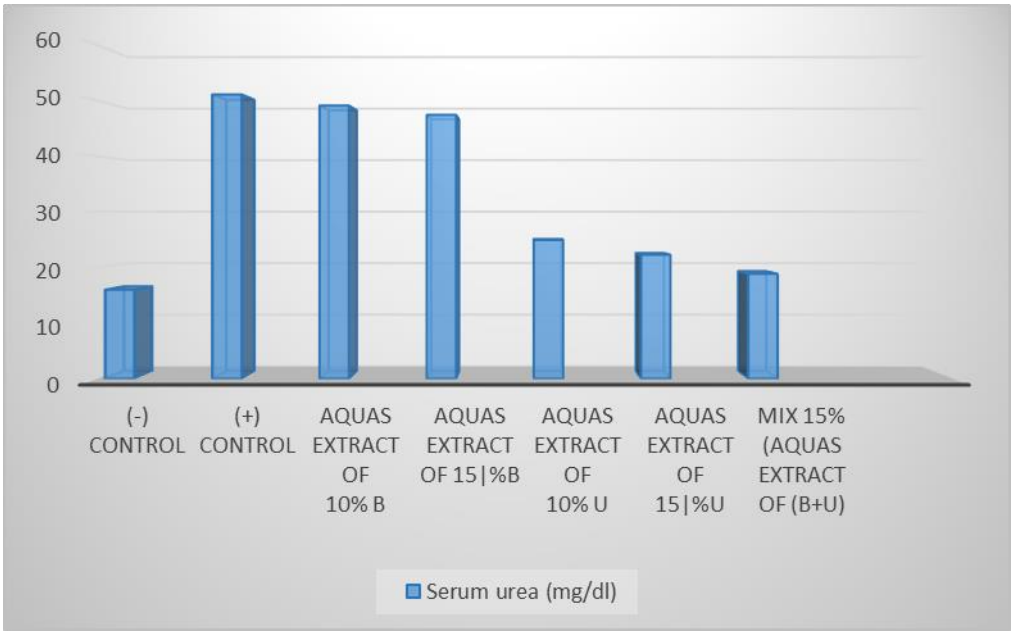
O.basilicum L (Ocimum basilicum L leaves), U.dioica L (urtica dioica L leaves),, mg/dl: Milligrams per deciliter.
Data expressed as mean ±SD.
Different letters indicate significance in means (significance ≤ 0.05).



Fig(7): Effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on serum creatinine of rats suffering from Kidney Stones



Fig(8): Effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on Serum uric acid of rats suffering from kidney stones



Fig(9): Effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on serum urea of rats suffering from kidney stones

Effect Aqueous extract of O.basilicum L. , U.dioica L. leaves and their mixture on glucose level of rats suffering from Kidney stones:

Results in (table 6 and in figure 10) illustrated the mean values of glucose in which rats received (EG) and (AC) in drinking water were used to induce urolithiasis which led to increase as compared to negative control group . The mean values were (137.20±10.30 mg/dl , 94.80±2.94 mg/dl) respectively

On the other hand treating group of rats which suffering from kidney stones with (Mix aqueous extract of leaves O.basilicum and U. dioica at 15%) followed by (aqueous extract of leaves U. dioica 15%) (110.40±3.04 mg/dl and 118.60±1.81 mg/dl) respectively.

The prevention of nutrition-related diseases is of great importance to human health. Another study aimed to examine thee effects of administering an aqueous extract of O.basilicumfor seven days on blood glucose and antioxidant activity in vivo in both healthy and diabetic animals. After the treatment period, serum analyses were performed to assess fasting blood glucose levels and biochemical parameters. This study aimed to investigate the effects of administering an aqueous extract of basil for seven days on blood glucose levels and antioxidant activity in vivo in both healthy and diabetic animals. The results demonstrated a significant anti-reductive effect on blood glucose in both healthy and diabetic animals. Treatment with basil extract also demonstrated protective effects on blood glucose levels in both healthy and diabetic animals **(Teofilovic, et al.,2025)** and In a study to evaluate the effect of U. dioica L. on diabetes in diabetic rats, fasting blood glucose levels and renal parameters were determined. The results of this research showed that upon receiving the aqueous extract of U. dioica leaves, the fasting serum glucose (FBG) level was significantly ($P < 0.05$) decreased. results showed that the aqueous extract of U. dioica L. led to improvements in hyperglycemia and renal function **(Gharbia and Lina ,2024).**

Several studies have investigated the effect of U.dioica consumption on metabolic profiles in patients with type 2 diabetes mellitus Results: thirteen clinical trials were found to be eligible for the current metaanalysis. consumption significantly decreased levels of fasting blood glucose (FBG) **(Tabrizi et al.,2022)**

Table (6): Effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on glucose level of rats suffering from kidney stones.

Parameters / Groups	Glucose (mg/dl)
(-) control	**94.80±2.94^{e}**
(+) control	**137.2±1.30^{a}**
Aqueous extract of O.basilicum L 10%	**130.40±4.82^{b}**
Aqueous extract of O.basilicum L15%	**120.40±4.03^{c}**
Aqueous extract of U.dioica L10%	**135.20±5.63^{a}**
Aqueous extract of U.dioica L 15%	**118.60±1.81^{c}**
Mix 15% (Aqueous extract of O.basilicum L+ U.dioica L)	**110.40±3.04^{d}**

O.basilicum L (Ocimum basilicum L leaves), U.dioica L (urtica dioica L leaves), mg/dl: Milligrams per deciliter.
Data expressed as mean ±SD.
Different letters indicate significance in means (significance ≤ 0.05)., expressed as mean ±SD.

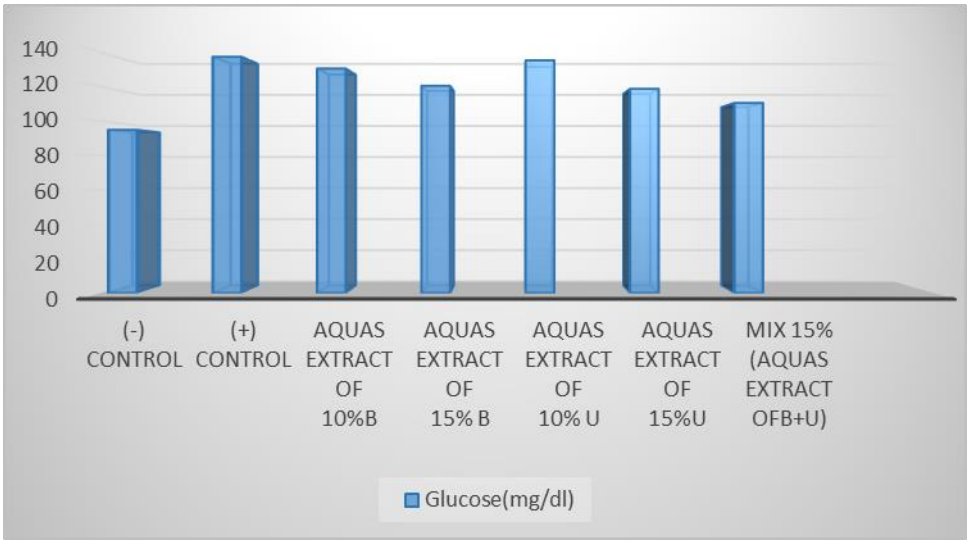


Fig (10): Effect of aqueous extracts of leaves basilicum , leaves urtica dioica and their mixture on glucose level of rats suffering from kidney stones.

Effect aqueous extract of O.basilicum L. , U.dioica L. leaves and their mixture on some minerals in urea of rats suffering from Kidney Stones.

The effect aqueous extract of O.basilicum L. , U.dioica L. leaves and their combination on urine calcium (mmol/L) , urine oxalate (mg/day) and urine total protein (mg/ dl) of rats suffering from kidney stones are given in table (7) and illustrated in figures (11,12 and13).

From table (7) it could be observed that the effect of the aqueous extracts of O.basilicum L., U.dioica L. leaves and their mixture on some minerals in urine of rats suffering from kidney stones . The results declared that, urine calcium (mmol/L) , urine oxalate (mg/day) and urine total protein (mg/ dl) in the positive control group (0.79±0.20, 0.19±0.19

and17.70±0.83 respectively) increased significantly ($p<0.05$) as compared to negative control group (0.08±0.00, 0.03±0.03 and 5.44±0.18, respectively).

These nephro-protective herbs, were found to be effective inhibitors of the formation and growth of calcium hydrogen phosphate dihydrate (Brushite) crystals, calcium hydrogen phosphate dehydrate **(CHPD)** crystals, calcium oxalate monohydrate crystals, and cysteine and uric acid stones **(Joshi et al., 2005 and Byahatti, et al.,2010)** Chemicals used to prevent and treat kidney stones, such as catechin and rutin (found in U.dioica L), have been shown in experiments on mice induced by ethylene glycol to reduce calcium crystallization and inhibit calcium oxalate stones **(Zhai, et al.,2013 and Ghodasara, et al., 2010 and Nirumand, et al., 2018)** In study titled " Evaluation of Effect of Ocimum Basilicum Leaves on Ethylene Glycol Induced Kidney Stone in Rats", a significant effect of O.basilicum(Ocimum basilicum) on rats was observed. This significant effect can be attributed to the synergistic/effective effect of O.basilicumextract, given its diverse range of active components capable of targeting multiple mechanisms involved in the pathophysiology of kidney stones. O.basilicumextract demonstrated a reduction in urinary creatinine, urea, uric acid, calcium, and protein. This suggests its protective role against kidney stones **(Kushwaha., 2024).** Previous studies have shown that long-term exposure to oxalate is toxic to renal epithelial cells and results in oxidative stress. In the present study, extract of aerial parts of Urtica dioica was screened for antiurolithiatic activity against ethylene glycol and ammonium chloride-induced calcium oxalate renal stones in male rats. In the control rats, ethylene glycol and ammonium chloride administration was observed to cause an increase in urinary calcium, oxalate and creatinine levels, as well as an increase in renal calcium and oxalate deposition**.(Zhang et al., 2014).**

Numerous studies have reported the presence of flavonoids, saponins and anthocyanins in *U. dioica*, thus the decrease in the renal deposition of calcium and oxalate in the *U. dioica* extract-treated rats observed in the present study, may be induced by these phytochemicals **(Basaran et al., 2001 and Fu et al., 2006)**. Saponins and flavonoids prevent calcium and oxalate deposition through disintegrating mucoproteins, which have a high affinity for calcium oxalate crystal surfaces and thus promote the growth and deposition of crystals **(Leal and Finlayson ., 1977).**

There was a significant increase in urinary creatinine was observed after 48 h in the control rats, suggesting the occurrence of hyperoxaluria-induced renal damage, which may cause decreased urine out-put and subsequent supersaturation of lithogenic promoting agents. Furthermore, hyperoxaluria-induced renal damage and stone formation was found to be associated with calcium oxalate crystal deposition and damage to the kidney. Urinary pH has been reported to affect crystaluria, with alterations to urinary pH found to induce urinary stone dissolution. A urinary pH between 5.0 and 6.3 promotes calcium oxalate stone formation **(King., 1967).** In the present study, the decrease in the urinary pH from 7.0–7.3 to 5.0–5.4 supports the formation of calcium oxalate calculi. Furthermore, restoration of the urinary pH (5.4–7.3) was found to support the dissolution of preformed calcium oxalate crystals.

Urine Calcium (mmol/L):

Data in table (7) and in figure (11) showed significant decrease in all treated groups in urine calcium comparing to positive control group in urine calcium. The best results in urine calcium was in the group treated with mix 15% (O.basilicum L+ U.dioica L) extracts ($p<0.05$) as compared to all groups.

Contaminated drinking water caused a significant decrease in urine volume and a significant increase in pH, calcium and oxalate levels. Consuming aqueous extract of basil improved calcium and oxalate levels. This is due to the fact that aqueous extracts of basil treated renal oxidative stress and inflammation and inhibited the formation of urinary stones due to their active components including flavonoids and polyphenols **(Gabal.,2020)**

Urine Oxalate (mg/day):

Data in table (7) and in figure (12) showed significant decrease in all treated groups in urine oxalate comparing to positive control group in urine oxalate. The best results in urine calcium was in the group treated with (mix 15% O.basilicum L+ U.dioica L) extracts ($p<0.05$) followed by (aqueous extract of U.dioica L.15%).In kidney stone study, Ethylene glycol disturbed oxalate metabolism by way of increasing the substrate available that increase the activity oxalate synthesizing enzymes in rats **(Kushwaha., 2024).**

Urine Total protein (mg/ dl):

Data in table (7) and in figure (13) showed decrease in all treated groups in Urine Total protein (mg/ dl) comparing to positive control group in urine oxalate. The best results in Urine Total protein (mg/ dl) was in group treated with (mix 15% O.basilicum L+ U.dioica L) extracts ($p<0.05$) Followed by (aqueous extract of U.dioica L.15%). In ethylene glycol induced kidney stones in rats showed decreased in serum protein level and increased in urine protein level in disease control group. After the treatment with standard group and with extract of Ocimum Basilicum, blood protein level was near of normal level. The negative control group showed the loss of blood protein level may be due to its metabolic and excretion rat from the urine. The present work has detected the evaluation the effect of Ocimum Basilicum on ethylene glycol induced kidney stone in rats **(Kushwaha., 2024).**

Table (7): Effect aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on some minerals in urea of rats suffering from Kidney Stones.

Parameters / Groups	Urine Calcium (mmol/L)	Urine Oxalate (mg/day)	Urine Total protein (mg/ dl)
(-) control	0.08±0.00^{c}	0.03±0.03^{f}	5.44±0.18^{e}
(+) control	0.79±0.20^{a}	0.19±0.19^{a}	17.70±0.83^{a}
Aqueous extract of O.basilicum L 10%	0.40±0.04^{b}	0.17±0.17^{b}	17.10±0.69^{a}
Aqueous extract of O.basilicum L15%	0.36±0.04^{b}	0.13±0.13^{c}	15.66±0.72^{b}
Aqueous extract of U.dioica L10%	0.17±0.05^{c}	0.09±0.09^{d}	10.58±1.12^{c}
Aqueous extract of U.dioica L 15%	0.11±0.02^{c}	0.06±0.06^{e}	8.56±0.29^{d}
Mix 15% (Aqueous extract of O.basilicum L+ U.dioica L)	0.08±0.02^{c}	0.05±0.05^{e}	6.30±0.51^{e}

O.basilicum L (Ocimum basilicum L leaves), U.dioica L (urtica dioica L leaves),, mg/dl: Milligrams per deciliter.
Data expressed as mean ±SD.
Different letters indicate significance in means (significance ≤ 0.05)., expressed as mean ±SD.

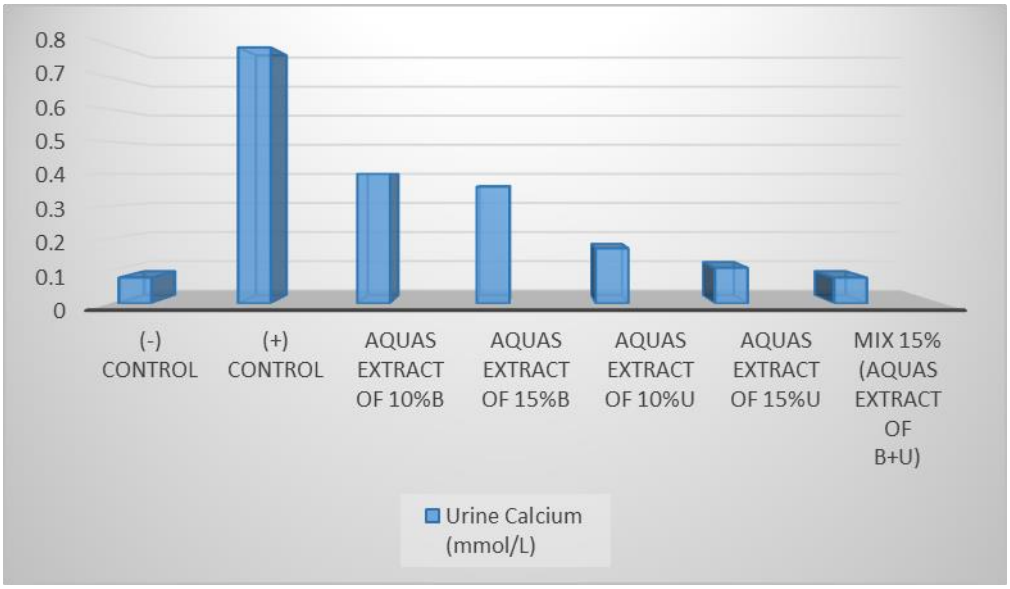


Fig (11): Effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on urine calcium of rats suffering from kidney stones

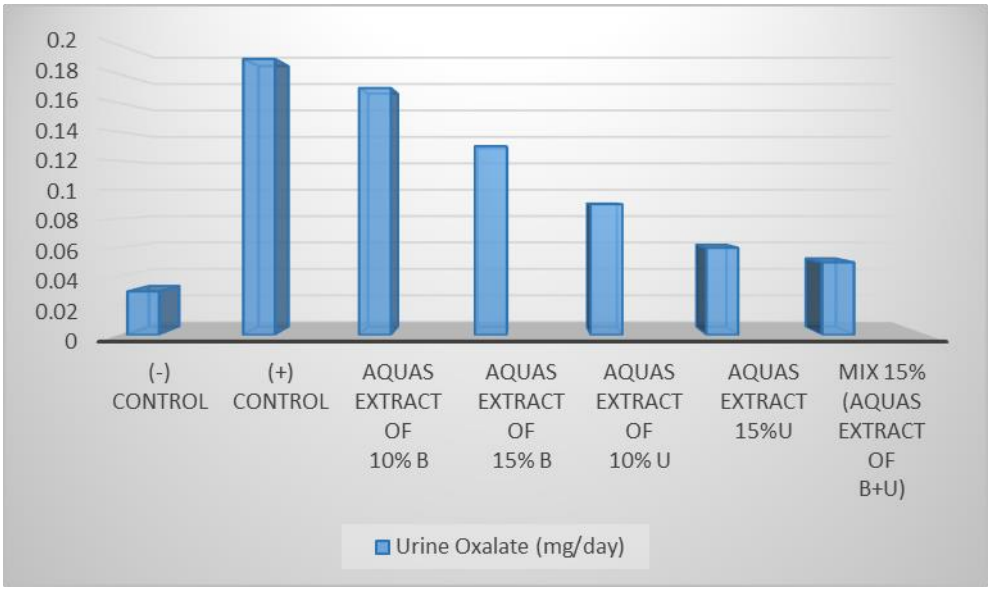


Fig (12): Effect aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on urine oxalat of rats suffering from Kidney Stones.

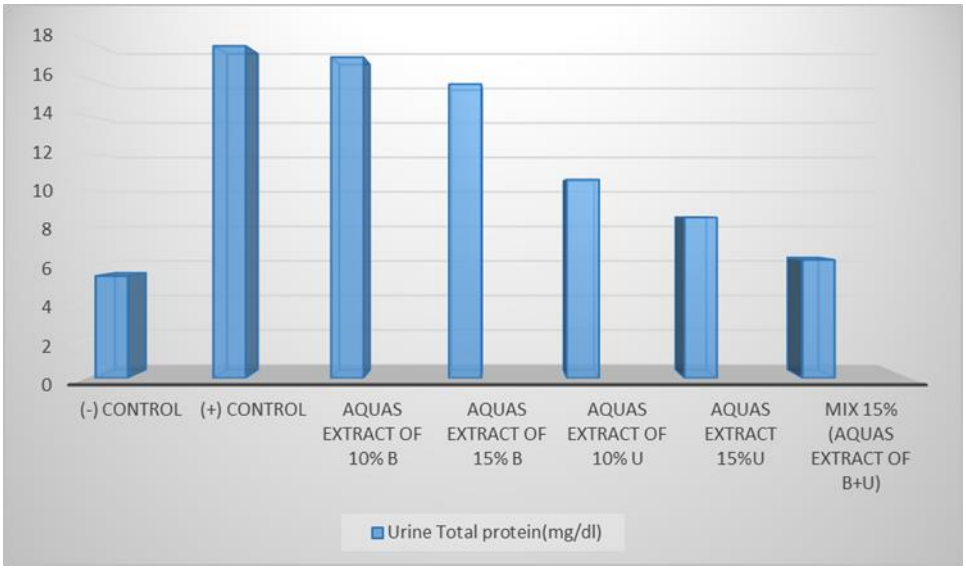


Fig (13): Effect aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on urine total protein of rats suffering from kidney stones

Histopathological examination:

1- kidney :

Data presented in photo (C-D-E-F-G) illustrated the effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture.

Aqueous extracts of leaves basilicum 10% - 15% and aqueous extracts of leaves urtica dioica 10%-15% and Mix 15% (Aqueous extract of basilicum + urtica dioica leaves) on histopathological examination of kidney.

Photo.A: (control normal group) Normal control kidney rats shows normal histology architecture (H&E, x400).

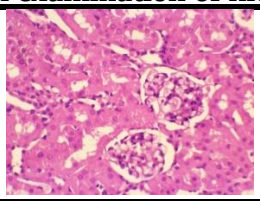
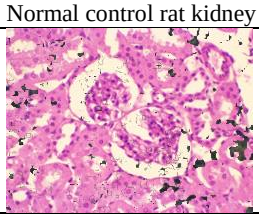
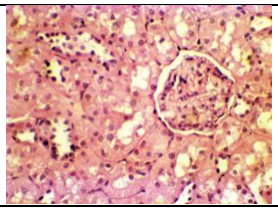
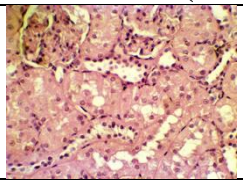
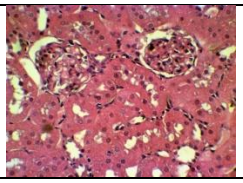
Photo. B: Positive control rat kidney Upon histopathological examination, the kidneys of rats displayed distinctive features indicative of renal impairment. The sections revealed tubular atrophy, interstitial fibrosis, and glomerular sclerosis, collectively suggesting progressive damage to the renal tissue, calcium oxalate crystals appeared clearly in the section.

Photo.C and E: kidney of rats treated with Aqueous extract of 10% leaves O.basilicum L. and Aqueous extract of 10% leaves U. dioica respectively showing slight enhancement in renal architecture. (H&E, x400).

Photo.D and F kidney of rats treated with Aqueous extract of 15% leaves basilicum and Aqueous extract of 15% leaves urtica dioica respectively showing moderate enhancement in renal architecture. (H&E, x400).

Photo(H) kidney of rat treated with Mix 15% (Aqueous extract of O.basilicum L. and U.dioica L. leaves showing best enhancement in renal architecture (H&E, x400).

Effect of aqueous extracts of O.basilicum L. , U.dioica L. leaves and their mixture on histopathological examination of kidney

photo. A: (control normal group)	
	Normal control rat kidney shows normal histology architecture (H&E, x400).
photo. B: (positive control group)	
	Positive control rat kidney Upon histopathological examination, the kidneys of rats displayed distinctive features indicative of renal impairment. The sections revealed tubular atrophy, interstitial fibrosis, and glomerular sclerosis, collectively suggesting progressive damage to the renal tissue, calcium oxalate crystals appeared clearly in the section
photo. C : (Aquas extract of 10% leaves O.basilicum L)	
	kidney of rats treated with aqueous extract of 10% leaves O.basilicum showing slight enhancement in renal architecture. (H&E, x400).
photo. D : (Aqueous extract of 15% leaves O.basilicum L)	
	kidney of rats treated with aqueous extract of 15% leaves O.basilicum respectively showing moderate enhancement in renal architecture. (H&E, x400).
photo. E: (Aqueous extract of 10% leaves U.dioica L)	
	kidney of rats treated with Aqueous extract of 10% leaves U. dioica slight enhancement in renal architecture. (H&E, x400).
photo. F: (Aqueous extract of 15% leaves U.dioica L)	
	kidney of rats treated with aqueous extract of 15% leaves U.dioica respectively showing moderate enhancement in renal architecture. (H&E, x400).
photo. G: Mix 15% (Aqueous extract of O.basilicum L + U.dioica L leaves)	
	kidney of rat treated with Mix 15% (aqueous extract of O.basilicum and U.dioica leaves) showing best enhancement in renal architecture (H&E, x400).

2- Ureter:

Photo. H: Normal control rat ureter section shows normal histology architecture (H&E, x100).

Photo. I: Positive control Pathological changes of ureter. The ureter was dilated. Endothelial cells were disorderly arranged and connective tissues were edema.(H&E, x100).

Photo. J : ureter of rats treated with aqueous extract of 10% leaves O.basilicum respectively showing no enhancement. (H&E, x400).

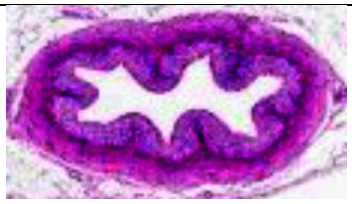
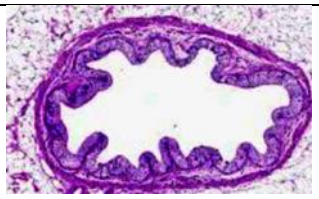
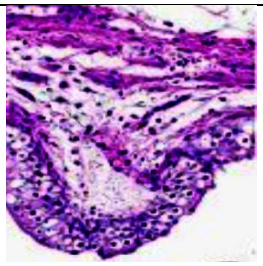
Photo. L: Uretr of rats treated with aqueous extract of 15% leaves O.basilicum respectively showing slight enhancement. (H&E, x400).

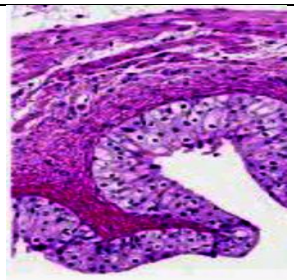
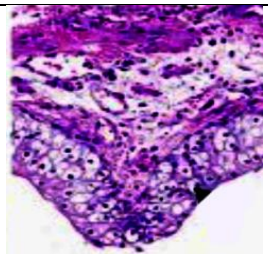
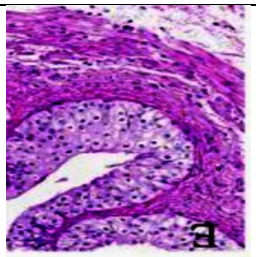
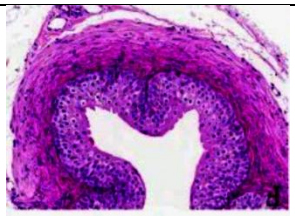
Photo. M: ureter of rats treated with aqueous extract of 10% leaves U. dioica respectively showing no enhancement. (H&E, x400).

Photo. N: Uretr of rats treated with aqueous extract of 15% leaves U. dioica respectively showing slight enhancement. (H&E, x400).

Photo. O: ureter of rat treated with Mix 15% (aqueous extract of O.basilicum + U. dioica leaves showing best enhancement. (H&E, x400).

Effect of Aqueous extracts O.basilicum L. , U.dioica L. leaves and their mixture on histological examination of the ureter

photo. H : (control normal group)	
	Normal control rat ureter section shows normal histology architecture (H&E, x100).
photo. I: (positive control group)	
	Positive control Pathological changes of ureter. The ureter was dilated. Endothelial cells were disorderly arranged and connective tissues were edema. (H&E, x100).
Photo. J : (Aqueous extract of 10% leaves O.basilicum L)	

	ureter of rats treated with Aqueous extract of 10% leaves O.basilicum respectively showing no enhancement. (H&E, x400).
photo. L : (Aqueous extract of 15% leaves O.basilicum L)	
	Uretr of rats treated with Aqueous extract of 15% leaves O.basilicum respectively showing slight enhancement. (H&E, x400).
photo. M: (Aqueous extract of 10% leaves U.dioica L)	
	ureter of rats treated with aqueous extract of 10% leaves U. dioica respectively showing no enhancement. (H&E, x400).
photo. N: (Aqueous extract of 15% leaves U.dioica L)	
	Uretr of rats treated with aqueous extract of 15% leaves U. dioica respectively showing slight enhancement. (H&E, x400).
photo. O: (Mix 15% (Aqueous extract of O.basilicum L + U.dioica L leaves)	
	ureter of rat treated with Mix 15% (Aqueous extract of O.basilicum + U. dioica leaves showing best enhancement. (H&E, x400).

Conclusion:

In conclusion, this study demonstrated that O.basilicum L and U.dioica L extracts are an important source of several bioactive compounds. They improve diuresis and blood glucose levels, maintain kidney function, and reduce oxidative stress. In general, improvements increased with increasing concentrations of the tested plant extracts. Therefore, people with kidney stones and recurring kidney stones may benefit from incorporating aqueous extracts of O.basilicum L and U.dioica L into their diet during treatment and to prevent recurrence. The study recommended using of O.basilicum L and U.dioica L extracts and their mixtures as additives in the pharmaceutical industry and various food applications.

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تأثير المستخلصات المائية لنباتي الريحان والقراص وخليطهما على الفئران المصابة بحصوات الكلى

تعد حصوات الكلى من أهم الاضطرابات الشائعة في الجهاز البولي في العالم. و بخاصة في البلدان الصناعية. هدفت هذه الدراسة إلى تقييم التأثيرات العلاجية للمستخلصات المائية للريحان والقراص وخليطهما على الفئران المستحثة بحصوات الكلى. تم تقسيم خمسة وثلاثين فأرًا ذكورالألبينو أوزانهم (100 ± 5 جرام) إلى مجموعتين رئيسيتين: تم تغذية المجموعة الرئيسية الأولى (٥ فئران) على نظام غذائي أساسي كمجموعة ضابطة سلبية. و بالنسبة للمجموعة الرئيسية الثانية تم تحفيز تكوين الحصوات عن طريق إعطاء (٧٥٪ حجم / حجم) إيثيلين جلايكول و كلوريد الامونيوم (١% وزن/حجم) في مياه الشرب لمدة ١٥ يومًا ، ، ثم قُسِّمت إلى ست مجموعات فرعية (٥ فئران لكل مجموعة). تم تغذية المجموعة الفرعية الأولى على نظام غذائي أساسي كمجموعة ضابطة إيجابية. كما تم تغذية المجموعتان الفرعيتان الثانية والثالثة على نظام غذائي أساسي بالإضافة إلى المستخلص المائي للريحان (١٠% و١٥%) على التوالي. وأيضا المجموعتان الفرعيتان الرابعة والخامسة تم تغذيتهم على نظام غذائي أساسي بالإضافة للمستخلص المائي للقراص (١٠ و١٥%) على التوالي. بينما المجموعة الفرعية السادسة تم تغذيتهم على نظام غذائي أساسي وخليط المستخلص المائي للريحان و للقراص بنسبة (١٥%) كمجموعة علاجية كما تم أيضا قياس المعايير الكيميائية الحيوية بما في ذلك مستويات الصوديوم و البوتاسيوم والكرياتينين واليوريا و الجلوكوز في الدم والكالسيوم في البول والأكسالات. كما أجريت تحاليل نسيجية مرضية لأنسجة الكلى والحالب. كما أظهرت ايضا نتائج انخفاضًا كبيرًا في تكوين الحصوات وتحسنًا في حالة الكلى في جميع المجموعات المعالجة بمستخلص الريحان والقراص و خليطهما مقارنة بالمجموعة الضابطة. كما أظهرت ايضا نتائج المجموعة المعالجة بمزيج المستخلص المائي فعالية علاجية عالية تضاهي المجموعة الضابطه. تشير هذه النتائج إلى أن الريحان والقراص قد يكونان بمثابة بدائل طبيعية فعالة أو علاجات تكميلية للمرضى الذين يعانون من حصوات الكلى.

الكلمات المفتاحية : حصوات الكلى، المستخلص المائي لنبات الريحان ، المستخلص المائية لنبات القراص ، التحليل الكيميائي الحيوي، الفحص النسيجي للكلى والحالب.