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Effect of two levels of olive leaf and doum powder and their mixture in female rats suffering from acute nephritis using CCL_4

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Abstract

Olive leaves and doum are two of several herbal medicines that are used either as food or adrink.This study was designed to explore the potential protective effect of doum, olive leaves and a mixture of them using percentages (4% and 8%) during infecting female rats With acute kidney injury using carbon tetrachloride with paraffin oil (v/v 1ml/kg of body weight) three-time/week for 4 weeks, where the duration of the experiment was 5 weeks, one week of them was to rehabilitate the rat. The rats weighing an average of (190±10) forty of rats were divided into eight groups (n=5 rats). G_1 was fed on the basal diet and kept as a negative control group.The other 7 groups were injectedintraperitoneally with CCL_4 and paraffin oil(v/v) 1ml/kg of body weight)three time/week for 4 weeksto induce acute damage in the kidney.G2 was fed on a basal diet and left as a positive control group and group (3 and 4),(5 and 6) and (7 and 8) were fed on supplemented diet with(4% and 8%) olive leaves,doum and mixture of them,respectively.The obtained results revealed that the treating groups with olive leaves,doum and a mixture of them had significantly reduced serum levels of (lipid profile, except HDL-c) andkidney functions,liver enzymes, while these treatments induced no significant in feed intake (FI),body weight gain(BWG),feed efficiency ratio (FER) and a significant increase in serum levels of

HDL-c,glutathioneperoxidase(GPX),superoxide dismutase (SOD) and catalase (CAT) enzymes ,as well as partially improvements in kidneys structures compared to those of positive control group.The best improvements in all the biochemical parameters and histological structures of the liver and kidneys which were tended toward normal results were observed in protective groups(7&8).

Key words:olea europaea L. leaves – hyphaene thbaica L. - acute nephritis - kidney function,liver function - antioxidant enzymes - lipid profile .

Introduction

The olive tree (Oleaeuropaea L.) leaves have been widely used in traditional remedies in European and Mediterranean countries, and they contain many potentially bioactive compounds that may have antioxidant, antihypertensive, antiatherogenic, anti-inflammatory, hypoglycemic, and hypocholesterolemic properties as an extract, a herbal tea, and a powder in the human diet.Secoiridoids, flavonoids&triterpenes are some of the other bioactive components present in olive leaves. The evidence for olive leaves' possible positive impacts on human health is given ***Sedef & SibelKarakaya.,(2009).***

Olive leaf has a high antioxidant activity owing to the presence of phenolic substances such as hydroxytyrosol, oleuropein, verbascose, luteolin-7-glucoside, and diosmetin in its structure***Benavente- Garcia et al.,(2000)&Visioli et al.,(2002).***

The phenolic component of Oleaeuropaea L., has garnered scientific attention due to its antioxidant, anti-inflammatory, cardio- and neuroprotective, and anti-cancer activities. the effect of oleuropein's purported antioxidant and anti-inflammatory properties in

non-communicable diseases (NCDs), such as neuro- and cardiovascular illnesses, diabetes mellitus, chronic kidney disease, and cancer***Chiara Nediani et al.,(2019).***

The antioxidant components of olive leaves, particularly oleuropein, may be responsible for these therapeutic benefits. Despite the fact that olive leaves appear to provide health advantages in humans, there are still several obstacles to overcome, such as a better knowledge of the potential interactions between olive leaf bioactive components and other dietary elements, as well as finding the best effective dose of olive leaves for a variety of therapeutic benefits ***Sedef & Sibel Karakaya,(2009).***

Oleuropein and hydroxytyrosol, two phenolic chemicals found in olive leaves, have a wide range of biological effects on both the organism and the cells ***Sedef & Sibel Karakaya,(2009).***
Hyphaenethebaica (L) Mart is a member of the palmae family and the Borassoideae subfamily. A doum is the popular name for this plant ***Amin & Paleologu, (1973).***Egypt, Senegal, Sudan, Central Africa, Nigeria, Tanzania, and Mauritania are among the nations where the tree may be found ***Walter,(1971).***

Egypt, Sub-Saharan Africa, and West India are home to the Doum Hyphaene (H.) thebaica desert palm ***Cook et al.,(2000)*** Doum plants have been shown to contain nutritious trace elements, proteins, and fatty acids, particularly the physiologically important linoleic acid, according to research. The fruit contains considerable levels of saponins, coumarins, hydroxycinnamates, essential oils, and flavonoids, as determined by thin-layer chromatography, and it significantly decreases blood pressure in animal models ***Hsu et al ., (2006).***

Hyphaenethebaica contains a large amount of water-soluble phenolic flavonoids, Hyphaenethebaica possesses antioxidant

potential. These ingredients are o-glycoside conjugates, such as quercetin, chrysoeriol, luteolin, and isorhamnetin H. Hyphaenethebaicais alsorecognised to have anti-inflammatory properties due to its capacity to inhibit cyclooxygenase (COX-1), an enzyme implicated in inflammation ***Shehu et al.,(2014).***

Saponins, coumarins, hydroxycinnamates, essential oils, flavonoids, alkaloids, reducing sugars, glycosides, and water-soluble phenolic compounds with significant antioxidant activity are all found in Hyphaenethebaica ***Hsu et al.,(2006).***

The treatment by Hyphaenethebaica resulted in a reduction in indicators of kidney injury ***Hsu et al.,(2006).***
In the prevention and treatment of kidney illnesses, medicinal plants and herbs play an essential role ***Awe & Banjoko,(2013).***

Carbon tetrachloride (CCL_4) creates free radicals in different body organs notably the kidneys. High exposure to CCl4 can cause kidney damage ***Azab et al.,(2019).***

This study was conducted to evaluate the potential advantage that can be obtained by using olive leaf and doum powder as a preventive effect on female rats with CCL4-induced acute nephritis.

Materials and Methods

Materials:
Dried samplesof olive leaves &doumwere obtained from National Research Center (NRC) in Dokki,Cairo,Egypt.
Casein, vitamins, minerals, cellulose, choline chloride andcarbon tetrachloride(CCL_4) were purchased from El-Gomhoreya Company, Cairo, Egypt.

Oil and starch were purchased from the local market, Cairo, Egypt. Forty female albino rats (Sprague Dawley Strain) 190±10g were obtained from Food Technology Res. Institute, Giza.

Methods:

Chemical analysis

Chemical analysis of olive leaves &doumpowder including protein, fats, moisture and ash were conducted in Food Technology Res. Institute according to the method described by the ***AOAC (2005).*** Carbohydrate value was calculated according to ***FAO (1982)*** by difference as follows:

Total carbohydrates (%) = 100 – (protein % + ash % + fat % + moisture %). Total phenolic and total flavonoid content of olive leaves &doumpowder were determined according to the method described by ***Saeed et al., (2012*)** and ***John et al., (2014),*** respectively.

Biological Experiment

Basal diet

Diet was given in non-scattering feed cups to minimize food loss. Water was provided to the rats by means of a glass tube projecting through the cage wire. The basal diet was prepared from fine ingredients (100 g) according to ***Reeves et al., (1993).***

Experimental design

Forty rats were housed in well-aerated cages under a hygienic condition and fed on a basal diet for one week for adaptation. After this week, rats were divided into eight groups including protective groups (five rats each).

The 1st was kept as a negative control groupwhich fed on a basal diet and tap water for 4 weeks.

The 2nd positive control group was injected intraperitoneally with CCl_4 and paraffin oil (50 % v/v 1 ml/kg of body weight) three time/ a week to induce acute damage in the kidney ,**the(3rd&5th)** protective groups

were injected intraperitoneally with CCl_4 and paraffin oil (50 % v/v 1 ml/kg of body weight) three time/week concurrently with receiving (olive leaves&doumpowder4%),**the(4th &6th)**protective groups were injected intraperitoneally with CCl_4 and paraffin oil (50 % v/v 1 ml/kg of body weight) three time/week concurrently with receiving (olive leaves &doum powder 8%), **the (7th &8th)** protective groups were injected intraperitoneally with CCl_4 and paraffin oil (50 % v/v 1 ml/kg of body weight) three time/week concurrently with receivingmixed(olive leaves2%&4%&doum powder 2%,4%) respectively for 4 weeks ***Marsillach et al.,(2009)& El-Baz et al., (2015).*** During the feeding period, the initial and final body weights of rats were recorded and changes in body weight and feed efficiency were calculated. Thebody weight gain and food efficiency ratio % (FER) were calculated by ***Chapman et al., (1959)*** as following:

$$(\text{BWG}\%) = \frac{\text{Final Weight} - \text{Initial Weight}}{\text{Initial Weight}} \times 100$$

$$(\text{FER}) = \frac{\text{Daily body Weight gain(g)}}{\text{Feed intake (g/d)}}$$

At the end of the experiment, blood samples were collected for biochemical analyses.

Biochemical analyses

Serum was separated and stored at -20°c for biochemical analysis i.e serum total cholesterol (TC) and triglycerides(TG) ***Schettler & Nussel, (1975),*** high density lipoprotein cholesterol **(**HDL-c) ***Lopes Virella et al., (1977),*** low density lipoprotein cholesterol (LDL-c) and very low density lipoprotein cholesterol (VLDL-c) ***Fried wald et al., (1972),*** aspartate amino transferase (AST) and alanine amino transferase (ALT) ***Reitman &Frankel, (1957),*** serum alkaline phosphates (ALP) ***Belfield & Goldberg, (1971),*** serum uric acid ***Fossati et al., (1980),*** urea ***(Marsch et al., 1965),*** Creatinine ***Bartels & Bohmer, (1971).***

Serum activity of glutathione peroxidase (GPX),superoxide dismutase (SOD) and catalase (CAT) enzymes were assayed according to the method of ***Hissin and Hiff (1976), Kakkor et al., (1984)*** and ***Sinha(1972),*** respectively.

Histopathological Examination

Kidney tissue was separated from each rat and examined histopathologically***(Drury & Wallington,1980).***

Statistical analysis

The results were expressed as means ±SDand statistically evaluated using a one-way (ANOVA) test with a significance level of $p<0.05$ ***(Steel &Torri, 1980).***

Results and Discussion

Chemical composition of doum& olive leaves powder:

Doum and olive leaves powder were analyzed for chemical composition on the dry weight basis g / 100g(moisture , protein , ash , fat and total carbohydrates) were (7.444 & 7.286 %) , (15.390 & 27.672 %) , (7.149 & 7.991 %) , (3.46 & 0.8 %) and (66.557 & 56.251 %), respectively.The results showed that powder of doumincludes a substantial quantity of total carbohydrates & fat.In contrast, the powder of olive leaves contains a low amount of total carbohydrates(57.251%) and fat (0.8%).Our results agreed with ***Auwal et al.,(2013)*** stated thatdoum fruit has a high-quality protein varied between 2.86 and 5.01%, crude fat varied between 1.2 and 8.4%, crude fiber varied between 52.26 and 66.5%, the most important carbohydrates component was mannose varied between 13 and 75.9%.Additionally,***Boudhrioua et al., (2009)*** reported that the chemical composition of olive leaves (on a dry weight basis) components %moisture, crude protein , ash , crude fiber , total

carbohydrates and available carbohydrates(50.5 , 10.6 , 6.8 , 14.5 , 74·7 & 60·2)(Table 1).

Total (phenols &flavonoids) contents in of (doum& olive leaves) Powder:

Table (2) Shows that the total phenolic and total flavonoidcontents in doum powder recorded(15.43 and 58.24 mg/g) were the highest concentration than olive leaves powder which recorded (7.86 and 54.78 mg/g), respectively.***Makris et al.,(2007)***found thatolive tree leaves had total polyphenol and total flavonoid content of 2,058 mg GAE (gallic acid equivalent) per 100 g and 858 mg CTE (catechin equivalent) per 100 g, respectively.***Amal et al., (2010)***Confirmed that, the total phenolic content of 64.9 mg/g dry weight in doum powder.***(Mohamed et al.,2010)*** reported that, different total soluble phenolvalues in doum were published in different studies; they ranged from 45.08 to 64.90 mg GAE/g DW.Another study by ***Aboshora et al.,(2014)*** doum is one of themost commonly consumed traditional beverages in Egypt and is rich in polyphenolic compounds, several studies have recorded doum powdercontains a high amount of flavonoids and phenols.

Effect of two levels of olive leaves, doum powder and a mixture of them onnutritional parameters in female rats suffering from acute nephritis.

The obtained data in Table (3) revealed a marked no significance in feed intake (FI),body weight gain (BWG) and feed efficiency ratio (FER) inthe positive control group compared with those of the normal rats(negative control group).Also showed no significance in FI , BWG & FER in all treating groups(3,4,5,6,7&8)when compared with both normal and positive rats(groups 1&2).While protective group(4) in FER showed a significant decrease compared with the positive and normal groups.These findings were confirmed by ***Omidi et al., (2014),*** who

found no significant changes in feed intake or body weight gain between the control and treatment groupsduring the trial.

Effect of two levels of olive leaves &doum powder and a mixture of them onserum lipid profile in female rats suffering from acute nephritis.

Table 4showed a marked significant increase in serum TC, TG, VLDL-c and LDL-c levels and a significant reductioninserum high density lipoproteincholesterol **(**HDL-c) levels ofthe positive control group compared to normal rats.Comparinginfected rats(positive group) with those protected with olive leaves , doum and a mixture of them revealed a marked significant decrease in serum levels of (TC , TG , low density lipoprotein cholesterol (LDL-c)& very low density lipoprotein cholesterol (VLDL-c) and significant increase at serum HDL-c,that nearly returned toward the normal levels. The best results in serum lipid profile parameters recorded in group 8 which was treated with mixed (olive leaves 4% &doum powder 4%).Results are inagreement with ***(Hetta &Yassin, 2006)*** who reported that doum was also observed to lower total cholesterol and HDL lipoproteins.Additionally, ***(Modu et al., 2001)*** revealed that, When compared to the control, there was a substantial decrease in triglycerides, cholesterol, and total lipids, as well as total proteins and albumin, after three weeks of daily oral treatment from hyphaenethebaica (L). ***Murotomi et al.,(2015)*** found thatMany in vivo animal research and human clinical trials have shown that oleuropein has lipid-lowering, anti-hypertensive, and hypoglycemic characteristics in addition to its antioxidant and anti-inflammatory capabilities.***Susalit et al.,2011***reported thatthe action of olive leaves in decreasing BP, and level improvement lipid profiles, is helpful for reducing the risk for CVD.Another study by ***(Hadrich et al.,2016)*** revealed that the Olive leaf has the ability to lower blood glucose and cholesterol levels while also enhancing glucose tolerance and insulin sensitivity in the mouth.

Effect of two levels of olive leaves &doum powder and a mixture of them onserum liver enzymes and kidney functions in female rats suffering from acute nephritis.

Tabulated data in Table 5 showed that positive rats have a significant increase in serum levels of alanine amino transferase (ALT), aspartate amino transferase (AST), alkaline phosphates (ALP), creatinine, urea and uric acid compared with those of normal control rats.In contrast, rats feeding on a supplemented diet with olive leaves ,doum powder and a mixture of them had significantly decreased serum levels of ALT, AST, ALP, creatinine,urea&uric acid when compared to positive rats.

Our results agree with ***(Shallby et al.,2012),***who cleared thatdoum, herbs dramatically improved kidney function. In comparison to animals injected.Also ***(Shallby et al.,2012)***said that dietary supplementation using doum shows a promising anti-inflammatory effect in the treatment of renal dysfunction consequences. ***(Azab et al., 2019)*** reported thatthe serum urea, creatinine, and uric acid levels in rats injected with CCl4 were significantly higher in the control group**.**Another study by***(Makni et al., 2012)*** revealed that the current study's findings revealed a considerable increase in urea, creatinine, and uric acid levels in the control group given 1 ml/kg of body weight of carbon tetrachloride.

Al-Masri & Riyadh (2012), showed that the doum fruit extract had no negative effects on the liver and might even enhance liver function enzymes. ***Abd el Halim, (2020)*** also discovered that doum fruit extract therapy reduced ALP levels considerably.Confirmed that**,** ***Zari & Al-Attar, (2011)*** Various total olive leaf extracts or their components have been shown to exhibit hypoglycemic, hypotensive, antiarrhythmic, antiatherosclerotic, vasodilator, antihepatotoxic, and antinephrotoxic properties in animal experiments.***AbdEl-moniem et al.,(2015)*** reported that,In both the preventive and curative groups,

Hyphaenethebaica treatment resulted in a considerable reduction in blood urea and creatinine levels.Ourresultsagreed with***(Wang et al.,2011)*** stated thatrenal function parameters were lowered when Hyphaenethebaica was administered.Another study confirmed thatsimilar effects were reported with luteolin, one of the active flavonoids contained in Hyphaenethebaica, which decreases the rate of urea and creatinine levels **(*Saravanan & Leelavinothan., 2012)* and *Wang et al.,(2011).***The results non-agreement with ***Ebtehal et al.,(2016)*** Many research have looked at the effects of H. thebaica on the renal system, with some finding the plant to be nephrotoxic.

Effect of two levels of olive leaves &doum powder and a mixture of them onserum of superoxide dismutase,catalase and glutathione peroxidase enzymes in female rats suffering from acute nephritis.

Results of serum superoxide dismutase(SOD), catalase(CAT) and glutathione peroxidase(GPX) enzymes in female rats are presented in Table 6.It showed that SOD, CAT and GPX for infected rats(positive control group) were decreased significantly,compared with those of the normal rats.Onthe other hand,protective groups which fed on supplemented diet with olives leaves anddoum powder(4%, 8% and a mixture of them had significantly increased in SOD ,CAT and GPX compared with those of positive rats.Moreover,protective groups(3,4,5,6,7&8) had non- significant in SOD ,CAT and GPX except in SOD of group 5, in CAT of groups(3 and 4) and in GPX of groups(3,5,6&7) compared to normal rats.The current outcome was in line with expectations. ***Majid Tavafi et al.,(2012)***demonstrated that olive leaf may protect against nephrotoxicity by inhibiting lipid peroxidation, increasing kidney glutathione levels, and increasing antioxidant enzyme activity. The findings imply that olive leaf might be used as a novel nephroprotective treatment for acute renal failure caused by

nephrotoxins. Another study, confirmed that olive leaf reduces nephrotoxicity by increasing renal glutathione concentration and the activity of renal antioxidant enzymes, with the exception of glutathione peroxidase ***Majid Tavafi et al.,(2012).*** The findings corroborated those of ***Abd el Halim (2020),*** who found that doum fruit extract can boost CAT and SOD levels in rats. In comparison to the treatment group, olive leaf dramatically reduced serum creatinine, malondialdehyde, and renal malondialdehyde, while increasing renal glutathione, catalase, and superoxide dismutase ***Majid Tavafi et al.,(2012).***

Histopathology Examinations

Histopathological examination of the kidneys

Microscopically,ratkidneys at negative rats (G1)histological structure was found to be normal. of renal parenchyma (renal cortex and Medulla) (Fig. 1). On contrary, kidneys of rats from PositiveControl (G2) showed vacuolar degeneration of epithelial lining renal tubules and focal inflammatory cells infiltration (Figs. 2). Otherwise, renal tissues of rats with 4% olive leaves powder protective (G3) Some renal tubules revealed vacuolar epithelial degradation. (Figs. 3). Moreover, sections with 8% olive leaves powder protective (G4)described vacuolar degeneration of epithelial lining of some renal tubules and congestion of glomerular tuft (Figs. 4).

Meanwhile, some sections with 4% doum powder protective (G5)exhibited slight vacuolar degeneration of epithelial lining of some renal tubules (Fig. 5), whereas, a few sections revealed intertubularInfiltration of inflammatory cellswhile, rat's kidneyswith 8% doum powder protective (G6) manifested slight vacuolar degeneration of epithelial lining some renal tubules and slight congestion of glomerular tuft (Fig. 6).

Improved picture was noticed in sections from groups(7&8)4% mix of(doum& olive leaves) powder protectiveand 8% mix of(doum& olive leaves) powder protective. Kidneys of rats froma 4% mix of(doum& olive leaves) powder protective(G7) showed slight vacuolar degeneration of epithelial lining few renal tubules (Figs. 7). Furthermore, kidneys of rats from an8% mix of (doum& olive leaves) powder protective(G8) exhibited no histopathological alterations (appeared apparently normal) (Fig. 8) .Our results agreed with ***Shallby et al.,(2012*)** stated that the kidney morphological structure of histopathological groups fed doum, showed a significant improvement**.**Additionally,***Shu et al.,(2009)***reported that the structural structure of the kidneys improved dramatically in doum-fed groups.

Carbon tetrachloride has a negative impact on the kidney, resulting in significant pathophysiological alterations ***Azab et al.,(2019).*** In CCl4-injected rats, histological sections of the kidney revealed glomerular enlargement and tubular dilatation ***Adewole et al., (2007).*** When compared to the untreated group, treatment with Hyphaenethebaica resulted in a considerable reduction in renal corpuscle diameter ***AbdEl-moniem et al.,(2015)***

Conclusion

In conclusion,the present work showed the protective effects of doum,olive leaves and a mixture of them against suffering from acute nephritis in rats at both levels of supplementation of doum,olive leaves and mixture of them(4% & 8%).

Recommendations

The study recommends using the powder of both doum, olive leavesand a mixture of them in food products such as cakes, baked goods and biscuits to benefit from the health benefits.

Table (1): Chemical composition of (doum& olive leaves) Powder

Content (%) / Samples	Moisture	Protein	Ash	Fat	Total Carbohydrates	Total
Doum Powder	7.444	15.390	7.149	3.46	66.557	100
Olive leaves Powder	7.286	27.672	7.991	0.8	56.251	100

Table (2): The active component of total phenols &flavonoidsin (doum& olive leaves) Powder

Content / Samples	Total phenols (mg/g)	Total Flavonoids (mg/g)
Doum Powder	15.43	58.24
Olive leaves Powder	7.86	54.78

Table (3): Effect of two levels of olive leaves, doum powder and a mixture of them on nutritional parameters in female rats suffering from acute nephritis.

Parameters / Groups		Feed intake (FI) (g/day) (Mean±S.D)	Body weight gain % (BWG %) (Mean±S.D)	Feed efficiency ratio (g) (Mean±S.D)
(G_1) Control (-ve)		19.22^{a} ± 0.38	13.12^{a} ± 12.79	0.05^{a}±0.03
(G2)Control(+ve)		18.93^{a} ± 0.24	13.64^{a} ± 17.53	0.04^{ab}±0.04
Protective groups	Group (3)	18.53^{a}±0.59	10.66^{a}±7.70	0.03^{ab}±0.02
	Group (4)	19.02^{a} ± 0.74	7.45^{a}±1.76	0.01^{b}±0.01
	Group (5)	18.47^{a} ± 0.30	10.60^{a} ± 4.57	0.02^{ab}±0.01
	Group (6)	18.97^{a} ± 0.46	7.39^{a} ± 2.88	0.02^{ab}±0.01
	Group (7)	19.10^{a}±0.47	15.42^{a}±6.62	0.04^{ab}±0.02
	Group (8)	19.05^{a} ± 0.64	6.96^{a} ± 2.75	0.02^{ab}±0.01
LSD		0.74	12.78	0.03

Values are expressed as means ± SD.

Values at the same column with different letters are significant at P<0.05.

Table (4): Effect of two levels of olive leaves &doum powder and a mixture of them on serum lipid profile in female rats suffering from acute nephritis.

Groups \ Parameters		Total cholesterol (mg/dl) (Mean±S.D)	Triglycerides (mg/dl) (Mean±S.D)	HDL-C (mg/dl) (Mean±S.D)	LDL-C (mg/dl) (Mean±S.D)	VLDL-C (mg/dl) (Mean±S.D)
(G_1) Control (-ve)		66^{d} ± 4.58	53.66^{e} ± 4.04	46.56a ± 4.57	8.70e ± 1.01	10.73e ± 0.80
(G2)Control(+ve)		135^{a} ± 12.48	109^{a} ± 10.53	19.80d ± 4.62	93.40a ± 5.98	21.80a ± 2.10
Protective groups	Group (3)	89.33bc ± 5.68	88.33b ± 7.76	32.46c ± 3.80	39.20bc ± 3.43	17.66b ± 1.55
	Group (4)	90^{bc} ± 5.00	69.66d ± 8.14	41.90a ± 2.04	34.16c ± 4.36	13.93^{d} ± 1.62
	Group (5)	101^{b}±6.08	81.66^{bc}±2.08	39.76^{ab}±0.83	44.90^{b}±5.28	16.33^{bc}±0.41
	Group (6)	74.66^{d} ± 4.04	88^{b} ± 6.00	34.40^{bc} ± 2.23	22.66 ^{d}± 1.42	17.60b ± 1.20
	Group (7)	100.33b ±4.50	91^{b} ± 1.73	45.90a ± 3.74	36.23c ± 1.10	18.20^{b} ± 0.34
	Group (8)	86.66^{c} ± 8.62	73.33^{cd} ±	39.66^{ab} ±	32.33^{c}± 3.51	14.66^{cd}
LSD		11.96	10.97	6.36	6.45	2.19

Values are expressed as means ± SD.

Values at the same column with different letters are significant at P<0.05.

Table (5): Effect of two levels of olive leaves &doum powder and a mixture of them on serum liver enzymes and kidney functions in female rats suffering from acute nephritis.

Groups \ Parameters		ALT (U/L) (Mean±S.D)	AST (U/L) (Mean±S.D)	ALP (U/L) (Mean±S.D)	Creatinine (mg/dl) (Mean±S.D)	Urea (mg/dl) (Mean±S.D)	Uric acid (mg/dl) (Mean±S.D)
(G_1) Control (-ve)		36b ± 3.46	114b ± 11.53	228.33d ± 5.50	0.46c ± 0.02	24.00f ± 1	1.24c ± 0.05
(G2)Control(+ve)		150a ± 18.98	230a± 20.72	514a ± 23.25	1.33a ± 0.15	63.33a ± 1.52	2.8a ± 0.1
Protective groups	Group (3)	60.66b ± 8.50	139.33b±13.05	282.66bc±3.78	0.56bc ± 0.05	39.00de ± 2.64	1.66b ± 0.25
	Group (4)	53b ± 3	131.33b ± 21.45	244.33cd ±4.72	0.50c ± 0.1	37.33e ± 3.78	1.66b ± 0.25
	Group (5)	61b ± 8.71	136.33b ± 5.13	320b ± 61.94	0.56bc ± 0.05	42.33bcd ± 2.51	1.66b ± 0.05
	Group (6)	40.33b ± 6.65	109.33b ± 7.76	280.33bc±12.70	0.50b± 0.03	41.00cde ± 2.64	1.2c ± 0.1
	Group (7)	52.33b ± 5.68	120b ± 2.64	239.66cd±21.22	0.56bc ± 0.05	44.33bc ± 1.52	1.6b ± 0.17
	Group (8)	57.33b ± 8.38	119.66b ± 2.51	253.33cd ± 8.02	0.53c ± 0.05	46.00b ± 3.61	1.6b ± 0.2
LSD		25.66	42.94	43.79	0.13	4.46	0.28

Values are expressed as means ± SD.

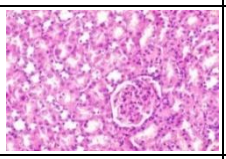
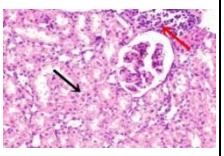
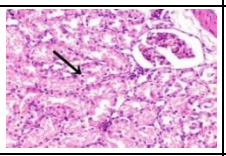
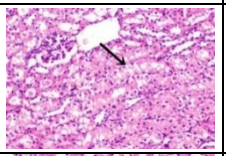
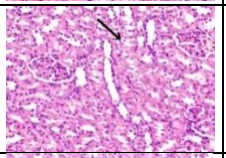
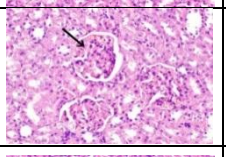
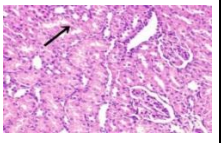
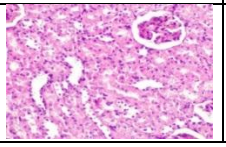
Values at the same column with different letters are significant at P<0.05.

Table (6): Effect of two levels of olive leaves &doum powder and a mixture of them on serum of superoxide dismutase, catalase and glutathione peroxidase enzymes in female rats suffering from acute nephritis.

Groups \ Parameters		SOD (u/ml) (Mean±S.D)	CAT (ng/ml) (Mean±S.D)	GPX (u/ml) (Mean±S.D)
(G_1) Control (-ve)		143.60^{a} ± 2.00	212.73^{a} ± 12.51	456.63^{a} ± 2.45
(G2)Control(+ve)		124.96^{c} ± 8.02	85.40^{c} ± 4.08	255.73^{e} ± 33.80
Protective groups	Group (3)	136.96^{ab} ± 1.27	164.30^{b} ± 3.08	426.53^{bc}±6.52
	Group (4)	139.13^{ab} ± 7.91	169.30^{b} ± 8.18	432.30^{abc} ± 2.77
	Group (5)	128.93^{bc} ± 9.79	207.66^{a} ± 0.70	356.63^{d} ± 2.45
	Group (6)	137.63^{ab} ± 3.40	207.66^{a} ± 3.51	410.66^{c} ± 9.47
	Group (7)	134.00^{abc} ± 3.15	206.30^{a} ± 7.27	421.50^{bc} ± 4.33
	Group (8)	141.70^{a} ± 4.00	213.13^{a} ± 3.92	437.43^{ab} ± 13.85
LSD		9.98	11.13	23.74

Values are expressed as means ± SD.

Values at the same column with different letters are significant at P<0.05.

Groups \ Organ		Photomicrograph of kidneys	Discussion
(G_1) Control (-ve)			**photo. (1):** Photomicrograph ofrat's kidney G_1displaying normal histological structure of renal parenchyma (H & E X 400).
Positive Control (+ve)	Group (2)		**photo. (2):** Photomicrograph of rat's kidney G_2displaying vacuolar degeneration of epithelial lining renal tubules (black arrow) and focal inflammatory cells infiltration (red arrow) (H & E X 400).
	Group (3)		**photo. (3):** Photomicrograph of rat's kidney G_3displaying vacuolar degeneration of epithelial lining renal tubules (black arrow) (H & E X 400).
	Group (4)		**photo. (4):** Photomicrograph of rat's kidney G_4displaying vacuolar degeneration of epithelial lining renal tubules (black arrow) (H & E X 400).
	Group (5)		**photo. (5):** Photomicrograph of rat's kidney G_5displayingslight vacuolar degeneration of epithelial lining some renal tubules (black arrow) (H & E X 400).
	Group (6)		**photo. (6):** Photomicrograph of rat's kidney G_6 displaying slight congestion of glomerular tuft (black arrow) (H & E X 400).
	Group (7)		**photo. (7):** Photomicrograph of rat's kidney G_7displayingslight vacuolar degeneration of epithelial lining few renal tubules (black arrow) (H & E X 400).
	Group (8)		**photo. (8):** Photomicrograph of rat's kidney G_8displaying apparent normal renal parenchyma (H & E X 400).

G1: Negative control group, **G2** Positive control, **G3:** 4% olive leaves powder (protective), G4: 8% olive leaves powder (protective), **G5:** 4% doum powder(protective), **G6:** 8% doum powder (protective), **G7:** 4% mix of(doum& olive leaves) powder(protective), **G8:** 8% mix of(doum& olive leaves) powder(protective).

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تأثير مستويين من أوراق الزيتون ومسحوق الدوم والمخلوط منهما في إناث الفئران المصابة بألالتهاب الكلوى الحاد باستخدام رابع كلوريد الكربون

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زميل (مدرس) التغذية وعلوم الأطعمة ، مستشفى أحمد ماهر التعليمي ، مصر

الملخص العربى

أوراق الزيتون والدوم نوعان من العديد من الأدوية العشبية التي تستخدم إما كغذاء أو كمشروب ، وقد صممت هذه الدراسة لاستكشاف التأثير الوقائي المحتمل للدوم وأوراق الزيتون ومزيج منها باستخدام نسب (4٪ و 8٪) خلال فترة الدراسة. إصابة إناث الجرذان بإصابات الكلى الحادة باستخدام رابع كلوريد الكربون مع زيت البارافين (حجم / حجم 1 مل / كجم من وزن الجسم) ثلاث مرات / أسبوع لمدة 4 أسابيع ، حيث كانت مدة التجربة 5 أسابيع ، أسبوع منها كان لإعادة تأهيل الفئران. تم تقسيم الفئران عدد أربعين فأر التي يبلغ وزنها المتوسط (190 ± 10) إلى ثماني مجموعات في كل مجموعة (5 جرذان). تم تغذية المجموعه (1)على الوجبهالمثالية وتم الاحتفاظ به كمجموعة الضابطهالسالبه. تم حقن المجموعات السبع الأخرى داخل الغشاء البريتونى مع رابع كلوريد الكربون وزيت البارافين (حجم / حجم) 1 مل / كجم من وزن الجسم) ثلاث مرات / أسبوع لمدة 4 أسابيع (الحقن مع أخذ وجبه غذائيه مكمله) للحث على تلف حاد في الكلى. تم تغذية المجموعه(2) على الوجبه الغذائيهالمثاليه وتركت كمجموعة ضابطهالموجبه ومجموعة (3،4) ، (5،6) ، (7،8) تم تغذيتها على وجبه غذائيه مكمله بـ (4٪ ، 8٪) أوراق زيتون ،الدوم ومزيج منها على التوالي ، وأظهرت النتائج المتحصل عليها أن المجموعات الوقائيه المتغذيه بأوراق الزيتون والدوم والمزيج منها قد انخفضت معنوياً في مستويات مصل الدم من الكوليسترول الكلي ، والدهون الثلاثية ، LDL-c، VLDL-c ، يوريا المصل ، حمض البوليك ، الكرياتينين ، مصل

الأسبارتات أمينوترانسفيراز (AST) ، ألانين أمينوترانسفيراز (ALT) وإنزيمات الفوسفاتيز القلوية (ALP) ، وليس لها فروق معنويه فى(زيادة وزن الجسم (BWG) ، نسبة كفاءة التغذية (FER) ،الطعام المأخوذ, زيادة كبيرة في مستويات المصل من HDL-c ،وانزيمات الجلوتاثيون بيروكسيديز (GPX) ، (SOD) و(CAT)، بالإضافة إلى التحسينات التركيبات النسيجيهللكلى مقارنة بتلك المجموعة الضابطة الإيجابية ، ولوحظت أفضل التحسينات لجميع التقديرات البيوكيميائية والتركيبات النسيجية للكبد والكلى التي تميل نحو النتائج الطبيعية في المجموعات الواقية (7 و 8).

الكلمات الدالة: أوراق الزيتون - الدوم – التهاب الكلوى الحاد – وظائف الكلى – وظائف الكبد – انزيمات المضاده للاكسدة – دهون الدم.