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HEPATOPROTECTIVE EFFECTS OF TURMERIC AND MILK THISTLE SEED FLOUR AGAINST ETHANOL LIVER DAMAGE IN WISTER RATS

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ABSTRACT: Chemical composition of milk thistle seed flour (MTSF) and turmeric (T) were investigated, for milk thistle seed flour, moisture (8.0%), protein (13.0 %), carbohydrates (27.55%), crude lipid (15.0%), ash (10.45%), and crude fiber (26.0%), while turmeric has moisture (8.1%) , protein (9.3 %), carbohydrates (57%), crude lipid (17.0%), ash (6.0%) and crude fiber (2.6%). For total phenol, the highest value in turmeric (11.57mg GAE/g) while milk thistle seed flour (3.39 mg GAE/g)) also total flavonoid for turmeric (4.9mg) while and in milk thistle seed flour (2.34mg). DPPH for milk thistle recorded the highest percent of (FRSA) 98.5 % and turmeric recorded lowest present 82.2% in concentration 100 µg/ml. Reducing power for milk thistle recorded 0.651 but turmeric (T) recorded 0.502 in concentration 100 µg/ml . The identification of phenolic compounds for plant extracts were investigated by HPLC ,the highest content in milk thistle seed flour (MTSF) was Benzoic acid (103.33 ppm) while the lowest content was Caffeine(1.07 ppm) but in turmeric(T) the highest content was Benzoic acid (208.41 ppm), while the lowest content was quercitin (3.08 ppm).The level of plasma aspartate aminotransferase (AST) , alanine aminotransferase (ALT) , alkaline phosphatase (ALP) , total bilirubin , total protein and albumin and plasma antioxidant state SOD , CAT, GPx and MDA were determined to assay hepatotoxicity.

Key words: Milk thistle seed flour, disorder, Biochemical analyss

INTRODUCTION

Milk thistle (Silybum marianum L. Gaertn) is one of the most ancient known herbal medicines, it is an annual or biennial plant belongs to the family Asteraceae (Compositae). The plant is native to Mediterranean area and now has cultivated in other warm and dry regions (Li et al., 2012). Now Silybum marianum is one of the most medicinal plants. The plant has many common names such as, bull thistle, heal thistle, holy thistle, lady's thistle, pig leaves, royal thistle, snake milk, so thistle, St. Mary's thistle, Venus thistle, Marian thistle, Mary thistle, mild thistle, milk ipecac, our lady's thistle (Corchete, 2008). Milk thistle seed contained 20-30% oil, 25-30% protein, 0.038% tocopherol and 0.63% sterols. Wichtl and Bisset (1994).

Abu Jadayil *et al.,* (1999) reported that milk thistle contained 5.8, 19.1, 26.3, 25.4, 4.8, and 24.3 % for moisture, protein, crude fat, crude fiber, ash and nitrogen-free extract, respectively. Silymarin extracted from milk thistle seed consists of 70-80% flavonolignans and 20-30% polyphenolic compounds. It was reported that the world demand of silymarin is about 18-20 tons per year (Ram *et al.,* 2005). Milk thistle seed involved 0.48% total phenols based on seed dry weight. Khalil (2008) Curcuma naturally found in India to Thailand, Indochina, Malaysia, Indonesia, and finally spreads to northern Australia. Curcuma is extensively cultivated in tropical and subtropical regions of Asia, Australia, Western Africa and South America (Ravindran *et al.,* 2007). The nutritional

compositions of the rhizomes are crude protein (19.44%), lipid (2.5%), and carbohydrate (97.5%). The rhizomes also have a moisture content of 19% and an ash content of 3.21% (Jain and Parihar, (2017). Curcumin (diferuloylmethane) is the compound responsible for the yellow colour, and comprises curcumin I (94%), curcumin II (6%) and curcumin III (0.3%) (Xiang *et al.,* 2018).The total phenolic content of the rhizome extracts of *C. aromatica* is reported in the range of 151.33 ± 13.9 µg/mg eq to gallic acid (Jain and Parihar, 2017) to 265 ± 1.08 mg/g of ascorbic acid (Srividya *et al*., 2012), and the total flavonoids content ranges from 106.8 ± 2.76 µg/mg eq to quercetin (Jain and Parihar, 2017) to 175 ± 1.56 mg/g of rutin (Srividya *et al*., 2012). Curcuma phaeocaulis rhizome has 8,9-dehydro-9-formyl- cycloisolongifolene (15.6-46.2%), germacrone (8.9- 21.2%), and curlone (0.8-20.2%) as the main constituents (Zhang *et al.,* 2017).Curcumin increases the intestinal lipase, sucrase, and maltase activity (Su *et al.,* 2017). Curcumin also suppresses the intestinal fibrosis (Lin *et al.,* 2006). Moreover, it has been reported that curcumin has significant effect on dyspepsia and gastric Ulcer and a study showed defensive effects of male Sprague–Dawley (pylorus-ligated) rats treated with curcumin (Kim *et al.,* 2005).

MATERIALS AND METHODS

Family name and different nams (English and Scientific)

Milk thistle seed flour and turmeric rots samples were collected from local markets and were indentifed by Plant Department, Faculty Agriculture, Menoufia

English name	Scientific name	Family
Milk thistle	*Silybum marianum L. Gaernt*	Asterace
Turmeric	*Curcuma aromatica, rhizomes*	Zingiberaceae

Chemical composition :

Determination of moisture content: according to (A.O.A.C. 2000).

Determination of crude protein : Total nitrogen was determined (dry basis) according to the modified micro-kjeldahl Pirjo and Pekka (1996).

Determination of ash: according to (A.O.A.C. 2000).

Determination of crude fiber: Crude fiber was determined according to (A.O.A.C.2000).

Determination of crude lipid: according to A.O.A.C. (2000).

Determination of total carbohydrate. Total carbohydrate was determined using the following equatio Difference = 100 – (Ash % + Protein % + Fat %+ % Fiber%

Determination of free phenolic compounds. The concentration of free phenolic compounds in methanol extract was determined colorimetrically by the method of Folin as described by (ulcin, *et al.,* 2002)

Determination of total flavonoid compounds. The total flavonoid content were determined using the method reported by Dewanto *et al.,* (2002).

Quantitative Determination of phenolic compounds by HPLC .

Phenolic compounds of *Silybum marianum* or *Turmeric* samples were extracted according to the method describe by Duke *et al. , (*2003). in which a known weight of dried samples was extracted by methanol. Each of phenolic compounds for the two extracts were identified and performed on JASCO HPLC using hypersil C° -18 reversed phase column (250 x 4.6) with 5 µ particle size. Injection by means of Rhcodyne injection value with 50 PJ fixed loop was used . A constant flow rate of one ml /min was used with two mobile phases solvent (A) 0.5 % acetic acid in distilled water at PH 2.65; solvent (B) 0.5% acetic acid in pure (99.5 %) acetonitrile , the elution gradient was

linear starting with (A) and ending with (B) over 35 min using UV detector set at wavelength 254 nm. Phenolic compounds of the samples were identified by comparing their retention times with those of standard mixture. The concentration of an individual compound was calculated on the basis of beak area measurements and then converted to mg/100g dry weight.

Determination of reducing power :

A spectrophotometric method of (Oyaizu 1986) was used for the measurement of reducing power . For this determination 2.5 ml of each extracts (25µg/ml -50 µg/ml -75 µg/ml -100 µg/ml) were mixed with 2.5 ml of 200 mmol/L sodium phosphate buffer (PH6.6) and 2.5 ml of 1% potassium ferricyanide . The mixture was incubated at 50C° for 20 min. After adding 2.5 ml of trichloroacetic acid (w/v), the mixture was centrifuged at 650 rpm for 10 min. The upper layer (5 ml) was mixed with 5 ml deionized water and 1 ml of 1% of ferric chloride, and the absorbance was then measured at 700 nm. Higher absorbance indicates higher reducing power, where vitamin C was used as standard .

Determination of free radical scavenging activity by DPPH

Effect of different extracts on DPPH (2, 2 diphenyl-1-pircrylhydrazyl) free radical was measured according to (Lee *et al.,* 1996). Positive control (standard) was prepared by mixing 4.0 ml of ascorbic acid (0.05 mg/ml) and 1.0 ml of DPPH (0.4g/ml) for aqueous extract, and negative control as a blank, was prepared by mixing extract base (water and methanol) with 1.0 ml of DPPH. Four different concentration of extract were mixed with 4.0 ml DPPH , the volume mad up to known volume , mixed well and left to stand at room temperature in a dark place for 30 min. Absorbance was read using a spectrophotometer at 520m. The ability of extract to scavenge DPPH was calculated using the following aquation : Radical scavenging activity% = (Blank OD-Sample OD)/(Blank OD)×100

Experimental design

The experimental animals were divided into 4 groups , each having 6 rats as follows (for 45 days).The first group was used as normal (negative control) and received tape water as drinking water . The other three groups , received tape water and ethanol (40%v/v) at a dose of (3.76 g/kg body weight) by stomach tube , daily for 45 days, from which the second group (positive control) doesn't have any other treatment drink only ethanol (40%v/v) at a dose of (3.76 g/kg body weight). The third group (ethanol+ aqueous extract of milk thistle seed flour (MTSF)or at dose of 200 mg/kg b.w).The fourth group (ethanol + aqueous extract of *Turmeric* at dose of 200 mg/kg b.w.

Biochemical analysis :

Liver function tests:

Determination of alanine transaminase (ALT) activity: according to the method of Reitman and Frankle (1957).

Determination of aspartate: transferase (AST) activity: according to the method of Reitman and Frankel (1957).

Determination of Bilirubin (Total) : Bilirubin was determined in plasma as described by (Tietz,1990)

Determination of total protein: Total protein was determined in plasma as described by Schultze and Heremans, (1966) .

Determination of globulin and A/G Ratio

Globulin and A/G ratio were calculated according to the formula of (Doumas *et al*.,1971). A/G Ratio was calculated according to the formula A/G

Ratio = $\frac{\text{Albumin}}{\text{Globulin}}$

Antioxidant biomarker in vivo :

Determination of Superoxide dismutases (SODs). Superoxide dismutases (SODs) activity was determined in plasma as described by (Nishikimi *et al.,*1972)

Determination of catalase (CAT) activity. Catalase activity was determined in plasma according to (Aebi 1984).

Determination of glutathione peroxidase (GPX) activity. Glutathione peroxidase (GPx) activity was determined in plasma as described by (Paglia and Valentine , 1967).

Determination of lipid peroxidation (LPO level). Lipid peroxide was determined according to the method (Bulakova *et al.,* 1975).

Statistical analyses:

Collected data were subjected to analysis of variance (ANOVA),. Mean's differentiation were compared using Duncan tested at $p<0.05$

RESULTS AND DISSECTION

Proximate analysis of milk thistle seed flour and turmeric :

Data in Table (1) showed the proximate analysis of milk thistle and turmeric. It is clearfrom such data that , our result were in the same line with those found by Anjusha and Gangaprasad A (2014). Who found that, turmeric is the major species subjected to many studies. It contains protein (6.3%), fat (5.1%), minerals (3.5%) and carbohydrates (69.4%). Also the result were in the same line with those found by Abu Jadayil *et al* ., (1999). Milk thistle seed flour is the major species subjected to many studies. It contains protein (19.1%), fat (26.3%), fiber (25.4%), ash (4.8%), moisture (5.8%) and carbohydrates (18.6%).

Total phenolic and total flavonoid of different extracts

Data in Table (2) showed total phenol and total flavonoids methanolic extract of milk thistle seed flour (MTSF) and turmeric (T). It is clear from such data that, the highest mean of turmeric (11.57) while the lowest mean in milk thistle seed flour (3.39) content while total flavonoid, the highest mean of Turmeric (4.9) while the lowest content in milk thistle seed flour (2.34). The above data of turmeric were in the accordance with that obtained by S.W Qader *et al* (2001). In which they mentioned that polyphenol content from 6.15 to 16.07 in ethanolic extract.As for Flavonnoid content:Our result of Turmeric were in the accordance with the data obtained by J.C.*Tilak et al (2004).* In which they indicated that it raning from 3.58 to 7.86 in ethanolic extract. Mean while our result of flavonoid content milk thistle seed flour (MTSF) were in the accordance with that obtained by Bruneton, (1995), who stated that the flavonoids rang from 1.5 to 3%.

Table (1): proximate analysis (w/w%) of milk thistle seed flour and turmeric.

	Parameters (%)					
Materials	**Protein**	**Carbohydrates**	**Crude lipid**	**Ash**	**crude fiber**	**Moisture**
Milk thistle seed flour (MTSF)	**13**	**27.55**	**15**	**10.45**	**26**	**8**
Turmeric(T)	**9.3**	**57**	**17**	**6**	**2.6**	**8.1**

Table (2): Total phenol compounds, total flavonoid of milk thistle seed flour and turmeric.

	Total Phenol (mg GAE/g)	Total flavonoids (mg catchin /g)
Milk thistle seed flour(MTSF)	3.39	2.34
Turmeric(T)	11.57	4.9

Free radical scarvenging level by DPPH of all extracts of milk thistle seed flour and turmeric

Data in Fig. (1) showed the result of Free radical scavenging level by DPPH assay % in different concentration 25mg/ml, 50 mg/ml, 75 mg/ml and 100 mg/ml, milk thistle recorded the higher percent of (FRSA) 98.5 % then Turmeric recorded present 82.2% in concenteration 100 mg/ml. Our result were in the accordance with the obtained by Khalil,(2008) which DPPH radical scarvenging activity of methanol extracts of milk thistle seed flour MTSF was found to be (95.09).

Reducing power and total antioxidant capacity

Data in Fig. (2) showed the result of reducing power level assay % in different concentration 25µg/dl, 50 µg/dl, 75 µg/dl, 100µg/dl, milk thistle seed flour (MTSF) and turmeric (T) . It is clear from such data that the reducing power of milk thistle seed flour (MTSF) and turmeric increased by increasing the concentration and reach the maxium in milk thistle (0.651) in concentration 100 Mg/dl, while in turmeric (T) reach (0.52) Our result were in the accordance with the obtained by (Shaker *et al.*, 2010). which reported that flavonoids of Milk thistle seed flour (MTSF) had a potent antioxidant effect due to scavenging of free radicals, superoxide anions, and oxygen radical

HPLC analysis for phenolic compounds on milk thistle seed flour methanolic extract and methanolic extract of turmeric.

From data given Tables (3 and 4) , it can deduce that Benzoic acid represent the main compound in both milk thistle seed flour (MTSF) and turmeric (T) (103.33) ppm and (208.41) ppm respectirely .On the other hand , milk thistle seed flour contain (21) phenolic compounds wher Turmeric contain (16). Phenolic compounds , analysis of milk thistle seed flour showed that benzoic acid , Myricetin , kampherol , Neringein, Salicylic acid and Ellagic acid are the major phenolic compounds mean while benzoic acid, kampherol, Rosemariric and Myricetin are the major phenolic compounds in Turmeric. The plant phenols , because of their diversity and extensive distribution are considered to be the most important group of natural antioxidants. They posses several common biological and chemical properties , namely antioxidant activity, due to their ability to scavenge active oxygen species or chelate metal ions , as well as their capability to modulate certain cellular enzyme activities (Helser and Hotchkiss 1994).

Effect of all extracts of milk thistle seed flour (MTSF), tureric on Liver function in rates plasma.

Plasma ALT, AST and ALP enzymes

Data in Table (5) showed (ALT) level in plasma in all studied groups for 45 days of treatment. It can be noticed that negative control group recorded (37.16 U/L) while the positive control group (which treated with ethanol 40%v/v in drinking water) recorded (84.83 U/L) have the highest values comparing with negative control (37.16 U/L). but the group which treatment with methanol extract milk thistle seed flour (MTSF) at

200mg/kg b.w. decreased to (45.83 U/L) . In groups which treated with methanol extract of turmeric at 200mg/kgb.w. decreased to (55 U/L) .

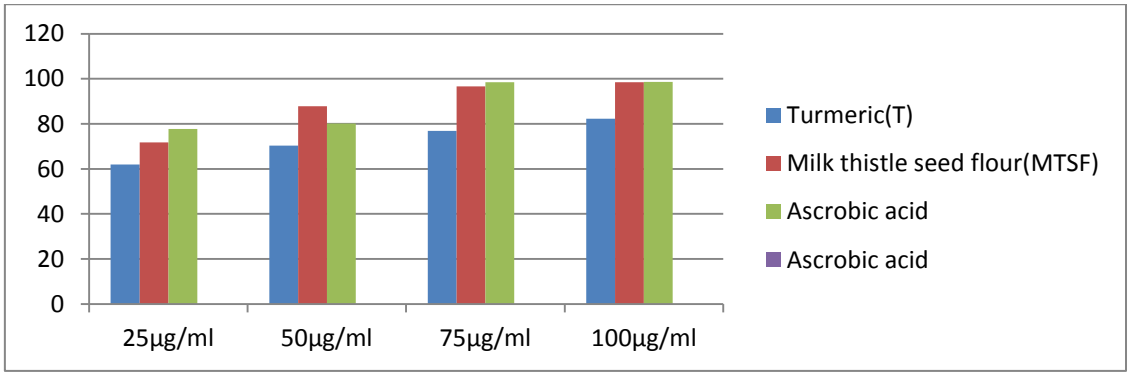

Fig. (1): Free radical scarvenging level by DPPH of milk thistle seed flour and turmeric

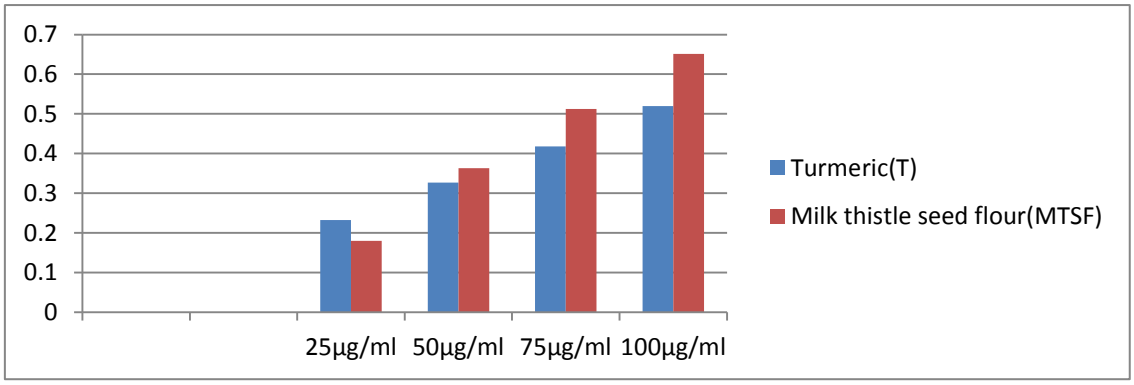

Figure (2): Reducing power of milk thistle seed flour and turmeric

Table (3): HPLC of milk thistle seed flour.

Compounds	ppm	Compounds	ppm
Pyrogallol	2.23564	Benzoic acid	103.33696
Quinol	ND	Rutin	5.50555
Gallic acid	9.57633	Ellagic	22.44046
Catechol	ND	O-Coumaric acid	1.77572
P-Hydroxy benzoic acid	ND	Salicylic acid	31.16560
Caffeine	1.07233	Myricetin	95.60416
Chlorogenic	6.96801	Cinnamic acid	1.73047
Vanillic acid	10.63546	Quercitin	2.95785
Caffeic acid	4.12392	Rosemarinic	7.23908
Syringic acid	1.13271	Neringein	31.72992
Vanillin	4.22284	Kampherol	68.65241
P-Coumaric acid	3.10603	Total	394.47703
Ferulic acid	7.51458		

ND= Not detected

Table (4): HPLC of turmeric.

Compounds	ppm	Compounds	ppm
Pyrogallol	3.02391	Benzoic acid	208.41824
Quinol	4.23620	Rutin	8.29178
Gallic acid	4.46560	Ellagic	13.60961
Catechol	3.01135	O-Coumaric acid	9.34567
P-Hydroxy benzoic acid	ND	Salicylic acid	6.63558
Caffeine	ND	Myricetin	17.99695
Chlorogenic	3.57219	Cinnamic acid	ND
Vanillic acid	ND	Quercitin	3.08968
Caffeic acid	8.49539	Rosemarinic	19.64714
Syringic acid	ND	Neringein	12.23942
Vanillin	ND	Kampherol	94.51375
P-Coumaric acid	ND	Ferulic acid	ND
		Total	388.24070

ND= Not detected

Table (5): effect of milk thistle seed flour and turmeric on ALTand AST and ALP.

Groups	ALT(U/L)	AST(U/L)	ALP(U/L)
	Mean ± S.D	Mean ± S.D	Mean ± S.D
Negative control	37.16±2.86^{d}	108±4.77^{d}	199.16±2.85^{c}
Positive control	84.83±2.32^{a}	145±5.44^{a}	262±8.34^{a}
Milk thistle seed flour(MTSF)	45.83±2.13^{c}	133.8314.5^{c} ±	198.33±4.55^{c}
Turmeric (T)	55±2.82^{b}	139.67±19^{b}	209.66 ±3.44^{b}

Table (5) Values represent mean ± S.D obtained from 6 rats , means in the same column followed by the same letters do not differ significantly , and when the means followed by different letters differ significantly at ($p \leq 0.05$).

Plasma AST enzyme

Data in Table (5) showed (AST) level in plasma in all studied groups for 45 days of treatment. It can be noticed that negative control group recorded (108 U/ml) while positive control group (which treated with ethanol 40%v/v in drinking water) recorded (145 U/L have the highest values comparing with negative control (108U/ml). but the group which treatment with methanol extract of milk thistle seed flour (MTSF) at 200mg/kg bw decreased to (133.83 U/L). In groups which methanol extract of turmeric at 200mg /kgb.w. decreased to (139.67 U/L) Our results were in the accordance with the obtained by Shaker *et al.* (2010) which found that the ethanolic extract of *s. marianum* significantly decreased the elevated liver enzymes caused by CCL_4., and in the sam line with khajhdehp, *et al*, (2012).

Alkaline phosphatase (ALP) activity.

Data in Table (5) showed alkaline phosphatase level in plasma for all studied groups after 45 days of treatment. It can be noticed that negative control group recorded (199.16 U/L) while, positive control group (which treated with ethanol 40%v/v in drinking water) recorded (262 U/ml) have the highest values comparing with negative control (199.1U/L). The group which treatment with

methanol extract milk thistle seed flour 200mg/kg b.w. decreased to (198.33U/L). In groups which methanol extract of turmeric 200 mg/kgb.w. decreased to (209.66U/L). The present result are going in the same line with khajhdehp, *et al*., (2012).

Plasma albumin level

Data in Table (6) showed total protein level in plasma for all studied groups after 45 days of treatment. It can be noticed that negative control group recorded (3.88 mg/dl) while, positive control group (which treated with ethanol 40%v/v in drinking water) recorded (3.83 mg/dl). The group which treatment with methanol extract of milk thistle seed flour at 200/kg b.w. increased to (3.97 mg/dl) . In group which treated with methanol of extract turmeric at 200mg/kgb.w. decreased to (3.85 mg/dl) compared with negative control.

Total protein level

Data in Table (6) showed total protein level in plasma for all studied groups after 45 days of treatment. It can be noticed that negative control group recorded (6.8 mg/dl) while, positive control group (which treated with ethanol 40%v/v in drinking water) recorded (6.65 mg/dl), have the lowest value comparing with negative control (6.8mg/dl). but the group which treatment with methanol extract of milk thistle seed flour at 200mg/kg b.w. increased to (7.28 mg/dl). In groups which methanol extract of turmeric 200 mg/kgbw increased to (7.07 mg/dl).

Total bilirubin

Data in Table (6) showed total bilirubin level in plasma for all studied groups in 45 days of treatment. It can be noticed that negative control group recorded (0.253 mg/dl) while, positive control group(which treated with ethanol 40%v/v in drinking water) recorded (0.275 mg/dl) have the highest values comparing with negative control (0.253mg/dl). but the group which treatment with methanol extract of milk thistle seed flour at 200mg/kg b.w. decreased to (0.235U/ML) . In group which treated with methanol extract of turmeric 200 mg/kgb.w. decreased to (0.198mg/dl). The present result are going in the same line with Suja, *et al* , (2004) and khajhdehp, *et al* , (2012) .

Antioxidant parameters

Super oxide dismutases (SODs)

Data in Table (7) showed SOD level activity in plasma for all studied groups in 45 days of treatment. It can be noticed that negative control group recorded (79.16 U/L) while, positive control group (which treated with ethanol 40%v/v in drinking water) recorded (124.66 U/L) have the highest values comparing with negative control (79.16 U/L). The group which treatment methanol extract of milk thistle seed flour at 200mg/kg b.w. decreased to (117.5 U/L) . In group which treated with methanol extract of turmeric at 200mg/kgb.w. decreased to (112.5 U/L).

Table (6): Eeffect milk thistel seed and turmeric on albumin, t.protein, globulin and A/G .

Groups	Albumin	T.protein (mg/dl)	T. bilirubin (mg/dl)
	Mean±SD	Mean±SD	Mean±SD
Negative control	3.88±0.1 [a]	6.8±0.26 [a]	0.253±0.07 [a]
Positive control	3.83±0.33 [a]	6.56±0.63 [b]	0.275 ±0.10 [a]
Milk thistle seed flour	3.97±0.19 [a]	7.28±0.45 [a]	0.235±0.04 [a]
Turmeric (T)	3.85±0.23 [a]	7.07±0.6 [a]	0.198 ±0.04 [a]

Table (6) Values represent mean ± S.D obtained from 6 rats , means in the same column followed by the same letters do not differ significantly , and when the means followed by different letters differ significantly at ($p \leq 0.05$).

Table (7): Effect of milk thistle seed flour and turmeric on SOD , CAT , GPx ,MDA.

Groups	SOD(U/L)	CAT(U/L)	GPX(U/L)	MDA(U/L)
	Mean ± S.D	Mean ± S.D	Mean ± S.D	Mean ± S.D
Negative control	79.16±5.23^{d}	27.33±3.3^{d}	41.33±2.42 ^{c}	4.28±0.4 ^{c}
Positive control	124.66±8.6 ^{a}	48.5±1.87 ^{a}	62.33±3.88 ^{a}	6.96±0.69 ^{a}
Milk thistle seed flour	117.5±2.17 ^{b}	44± 2.82 ^{b}	50.16±4.2 ^{b}	6±0.22 ^{b}
Turmeric (T)	112.5±52.3 ^{c}	37.33±2.16 ^{c}	48.33±4.5 ^{b}	5.59±0.28 ^{b}

Table (7) Values represent mean ± S.D obtained from 6 rats , means in the same column followed by the same letters do not differ significantly , and when the means followed by different letters differ significantly at ($p \leq 0.05$).

Catalase level

Data in Table (7) showed Catalase level in plasma for all studied groups after 45 days of treatment. It can be noticed that negative control group recorded (27.33 U/L) while, positive control group (which treated with ethanol 40%v/v in drinking water) recorded (48.5 U/L) have the highest values comparing with negative control (27.33 mg/dl). but the group which treatment methanol extract milk thistle seed flour at 200mg/kg b.w. decreased to (44.0 U/L). In group which treated with methanol extract of turmeric 200 mg/kgb.w. decreased to (37.33 U/L).

Glutathione peroxidase (GPx) activity

Data in Table (7) showed GPx activity level in plasma for all studied groups after 45 days of treatment. It can be noticed that negative control group recorded (41.33 U/L) while, positive control group (which treated with ethanol 40%v/v in drinking water) recorded(62.33 U/L) have the highest values comparing with negative control (41.33) U/L. but the group which treatment with methanol extract of milk thistle seed flour200 at mg/kg b.w. decreased to(50.16 U/L) . In group which teated with methanol extract of turmeric at 200mg/kgb.w. decreased to (48.33 mg/dl).

Malondialdehyede level :

Data in Table (7) showed MDA level in plasma for all studied groups after 45 days of treatment. It can be noticed that negative control group recorded (4.28 U/L) while, positive control group (which treated with ethanol 40%v/v in drinking water) recorded (6.96 U/L) have the highest values comparing with negative control (4.28 U/L). but the group which treatment with methanol extract milk thistle seed flour at 200 mg/kg b.w. decreased to (6.0 U/L) . In group which treaded with methanol extract of turmeric 200 mg/kgb.w. decreased to (5.59 U/L). The result are in the same line with Toklu *et al* (2008) they stated that MDA recorded in negative control 0.96 and positive control recorded 6.64 mean whil methanol extract milk thistle seed flour recorded 5.01 due to the antioxidant properties of flavonoids which present in the plant.

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دراسة تأثير بذور شوك الجمل وجذور الكركم على السمية الكبدية التي يسببها الإيثانول في الفئران البيضاء

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الملخص العربى

يما يلي ملخص للنتائج التي تم الحصول عليها:

التركيب الكيميائي الإجمالي النباتات المختبَره: محتويات دقيق بذور شوكه الجمل ، البروتين (13.0٪) ، الكربوهيدرات (27.55٪) ، الدهن الخام (15.0٪) ، الرماد (10.45٪) ، الألياف الخام (26.0٪) ، الرطوبة (8.0) ٪) لكن بروتين الكركم (9.3٪) ، كربوهيدرات (57٪) ، دهون خام (17.0٪) ، رماد (6.0٪) ، ألياف خام (2.6٪) ، رطوبة (8.1٪).إجمالي الفينولات الكلية يمكننا أن نستنتج أن أعلى متوسط للكركم (11.57 مجم GAE / جم) بينما أدنى متوسط في دقيق بذور شوك الجمل (3.39 مجم GAE / جم)). مجموع الفلافونويد يمكننا أن نستنتج أن ، أعلى متوسط للكركم (4.9 مجم GAE / جم)) بينما أدنى متوسط في دقيق بذور شوك الجمل (2.34 مجم GAE / جم).في حين أن فحص DPPH الجذري بتركيزات مختلفة 25 مجم / ديسيلتر ، 50 مجم / ديسيلتر ، 75 مجم / ديسيلتر ، 100 مجم / ديسيلتر من شوك الجمل سجل أعلى نسبة (98.5) FRSA٪ وسجل الكركم أقل نسبة 82.2٪ في التركيز 100.نتيجة فحص مستوى القدرة٪ بتركيزات مختلفة 25 مجم / ديسيلتر ، 50 مجم / ديسيلتر ، 75 مجم / ديسيلتر ، 100 مجم / ديسيلتر ، سجل دقيق بذور شوكه الجمل (MTSF) أعلى نسبة (انخفاض مستوى الطاقة) 0.651٪ لكن الكركم سجلت (T) أقل 0.502٪ في التركيز 100٪. يمكن أن نستنتج أن أعلى محتوى لدقيق بذور شوكه الجمل (MTSF) كان حمض البنزويك (103.336) جزء في المليون بينما أقل محتوى كان الكافيين (1.072) ولكن في الكركم (T) أعلى محتوى كان حمض البنزويك (208.41) جزء في المليون تمت دراسة تأثير بذور شوكة الجمل وريزومات الكركم على السمية الكبدية المستحثة في الفئران البيضاء بالجرعة الحادة من الإيثانول ، وقسمت الحيوانات إلى 4 مجموعات: قسمت حيوانات التجربة إلى 4 مجموعات ، كل منها 6 فئران على النحو التالي (لمدة 45 يومًا) .تم استخدام المجموعة الأولى كالمعتاد (المجموعة السلبي) وحصلت على ماء للشرب. أما المجموعات الأربع الأخرى فقد تلقت المياه والإيثانول (40٪ حجم / حجم) بجرعة (3.76 مل / كجم من وزن الجسم) عن طريق أنبوب المعدة ، يوميًا لمدة 45 يومًا ، ولم يتم الحصول على المجموعة الثانية (المجموعة الإيجابي). تناول فقط الإيثانول (40٪ حجم / حجم) بجرعة (3.76 مل / كجم من وزن الجسم).المجموعة الثالثة (إيثانول + مستخلص مائي من دقيق بذور شوكه الجمل (MTSF) بجرعة 200 ملجم / كجم من وزن الجسم) المجموعة الرابعة (إيثانول + مستخلص مائي من الكركم بجرعة 200 ملجم / كجم من وزن الجسم) تم قتل الفئران ودماء. تم جمع العينات من تقنية أوردة الجيوب الأنفية المدارية باستخدام أنابيب الشعر الهيبارين في نهاية الفترة ويمكن تلخيص النتائج التي تم الحصول عليها على النحو التالي:أوضحت النتائج الحالية أن الإيثانول تسبب في ارتفاع مستويات ALT و AST و ALP والبليروبين الكلي والجلوبيولين في البلازما. كما تسبب في انخفاض معنوي (P <0.05) في البروتين الكلي ، الألبومين. .أدت التغذية على بذور شوكةالجمل أو الكركم إلى تقليل ALT و AST و ALP و البيليروبين الكلى. أيضا زيادة في تركيز البروتين الكلي والألبومين.قد يكون هذا التأثير بسبب نشاطاته القوية المضادة للأكسدة والمضادة للالتهابات لكل من بذور شوكه الجمل والكركم. أوضحت النتائج الحالية أن الإيثانول تسبب في ارتفاع نسبة الجلوكوز في البلازما.أدت التغذية على بذور شوكه الجمل أو الكركم إلى انخفاض نسبة الجلوكوز.وضحت النتائج الحالية أن الإيثانول تسبب في ارتفاع كل ما يلى في البلازما SOD و CAT و GPx و MDA. كما تسبب في انخفاض كبيرفى كل مايلى (p <0.05) في SOD و CAT و GPx و MDA

التاثيرات الواقية للكبد من الكركم ومسحوق بذور شوكة الجمل ضد تلف الكبد الناتج عن الايثانول فى الجرذان الوليدية

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