

## Effects of use grape seeds oil (*Vitis vinifera*) on blood picture and some physiological parameters in local male rabbits

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(Received 4 April 2016, Accepted 10 October 2016)

### Abstract

Study was conducted to investigate the efficacy of grape seeds (*Vitis vinifera*) oil on the levels of total protein, albumin, globulin, and some hematological parameters in local male rabbits. Twenty four rabbits (weight between 1450-1550 grams) were divided into three equal groups; G1 the control group, gives only 0.2 ml tap water orally, while G2 and G3 were gives orally grape seed oil (0.1ml/kg and 0.2ml/kg respectively) for one month. Results were designate that the administration of grape seed oil at 0.1ml/Kg. BW produces significance  $P<0.05$  increase in values of Hb, PCV, total protein and globulin. In the dose of 0.2 ml/Kg. BW, there was significance  $P<0.05$  decrease in values of WBCs, Hb and PCV, while there was no significance in both doses to RBCs and Albumin. In conclusion that the administration of grape seed oil in low dose produce good effects whereas administration of it in high dose produce bad effects on the body functions.

**Key words:** Grape seed oil, hematology, total protein, globulin.

### تأثير استعمال زيت بذور العنب (*Vitis vinifera*) على الصورة الدموية وبعض الصفات الفسلجية في ذكور الأرانب المحلية

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### الخلاصة

أجريت هذه الدراسة لبحث تأثير زيت بذور العنب على بعض المعايير الدموية وبعض الصفات الفسلجية كقياس البروتين الكلي ، و بروتين الألبومين و بروتين الكلوبولين في ذكور الأرانب المحلية. تم استخدام 24 أرنب ذكر تراوحت اوزانها ما بين (1450-1550) غرام وقسمت إلى ثلاث مجاميع متساوية ، وكانت المجموعة الأولى مجموعة السيطرة وجرعت 0.2 مل من ماء الحنفية ، وجرعت المجموعة الثانية والثالثة فمويًا لمدة شهر واحد بزيت بذور العنب وجرعة 0.1 ملغم/كغم و 0.2 ملغم/كغم على التوالي. أظهرت نتائج التجربة إن إعطاء زيت بذور العنب إلى الأرانب أدى إلى زيادة معنوية  $P<0.05$  عند الجرعة 0.1 مل / كغم / وزن الجسم في قيم Hb و PCV و البروتين الكلي و الكلوبولين ، كذلك وجد انخفاض معنوي  $P<0.05$  عند الجرعة 0.2 مل / كغم / وزن الجسم في قيم WBCs و Hb و PCV في حين لم تسجل فروقات معنوية عند الجرعتين في قيم RBCs و الألبومين. نستنتج من ذلك إن إعطاء جرعة منخفضة من زيت بذور العنب تعطي نتائج جيدة وإن زيادة الجرعة قد أعطى نتائج سلبية في الجسم. الكلمات المفتاحية: زيت بذور العنب ، المعايير الدموية ، البروتين الكلي ، الكلوبولين.

### Introduction

The oil of grape seeds (grape oil) is produced from crushing and pressing of seeds of grape, and so on product in large amount (by product) as from making of wine. Grape seeds oil use commonly to protect moisture of skin from bad effects to high temperature and light. Its act as glossy layer covered the skin when used in aromatherapy

which includes other essential oils. It's used before shaving as lubricant and use as reinforced treatment and protect of hair (1). Also use for incremental effect on wound healing (2).The plant of grape one from the important fruit groups which grown in most countries around the world, so 46% from fresh grapes inter in the industry of wine (3,

4). Grape seeds include 20 to 26 % from pomades (5) and have high protein content (4). The seeds of grape have oil constitutes about 10 to 20 % (6). Also they have high level of vitamin E which plays important effects for human health. The grape seeds oil generally consists from triglycerides (TG). It's a source rich with unsaturated fatty acids like linoleic and oleic acids if it compared with other kinds of seeds rich with oil (7). The important characteristic of grape seeds oil is high level of polyunsaturated fatty acids like linoleic acid which include (70 to 72 % W.W). It's increasingly compared with other types of vegetable oils like soybean oil (50 to 55 %), sunflower oil (60 to 62 %), and safflower oil (70 to 72) (8). So this explain why use for pharmaceutical and cosmetic industries, in addition grape seeds oil is high-quality of nutrition oil which use for preparing of food to human consumption because it's have properties working to prevent of the thrombosis of heart and arteries diseases by reducing the level of cholesterol in the blood serum, through regulate of autonomic nerve and expansion of blood vessels (9). Grape seeds oil has high density lipoprotein (HDL-C) good cholesterol in high level and has low density lipoprotein (LDL) in low level (10). They are having biologically active and high level of anti-oxidants compounds (11). Grape seeds oil has negligible amounts due to their insolubility in lipids when pressed in cold (12). Also it have nutritional and medicinal value known from long time, so the people believed the parts seeds of grape have powerful as anti-oxidant properties, so it's a rich source of polyphenol compounds which include (60 to 70 %) compared only (10 %) in fruits and (28 to 35 %) in peels (13, 14). The large components found in grape seeds are poly phenol which include; favan-3ols, flavonoids monometric, epicatechin, and catechin. All this compounds are very important in food and pharmaceutical industries for human health supplement and medical treatment (15). Poly phenol compounds act as a demand to use natural anti-oxidants like (GSEs) have large increased in modern years, the GSEs are essentially constituted with

proanthocyanidins which led to react with catalyzed metal ions and free radicals for the success reaction of oxidation then terminate chain reaction by remove radical intermediente or inhibit other reactions of oxidation processes by oxidizing them self (15). They also recorded that GSEs associated with other anti-oxidants to increase the reaction of oxidation (16). GSEs are use for inhibiting of rancidity when the beef cooked (8). In the last years uses of medical plants for medicine treatments are increasing because of their properties for curing many diseases. Grape seeds oil have pharmaceutical properties include anti-inflammation, immuno-modulation activities, antipruritic effects, anti-allergic activities, crcaricadal properties, treatment of gastrointestinal diseases, anti-bacterial activities and anti-solar agents (17). The grape seeds oil have few amount of vitamin E, also the cotton seeds oil, sunflower seeds oil and rice bran oil contains large amounts (18). Grape seeds oil has low in saturated fatty acids and high with poly unsaturated fatty acids, they also not have trans fatty acids or cholesterol. It play important roles to reduce the risk of coronary heart diseases because it have high level of good cholesterol (HDL) and low level of (LDL) bad cholesterol (19) . The goal of this study is reveals of grape seeds oil on hematological parameters and the levels of total protein, albumin and globulin in local male rabbits.

## Materials and methods

The study was conducted from December 2015 to January 2016 in physiology department of Veterinary Medicine of AL-Qassim Green University. Twenty four (24) healthy male rabbits weighing (1450-1550) grams obtained from the local markets were used. Animals were divided randomly into three equal groups (control G1, and two treated groups G1 and G2), and were kept for one week as acclimatization period before the start of the experiment. Experiment were involved the use of two concentrations using the following materials; Grape oil plant (*Vitis vinifera*) natural concentration 100% (Imad Company for Vegetable Oils / Mosul) and special modified syringe for oral

administration of the oil. After acclimatization period, rabbits in (G1) control group; administered tap water daily. Second group (G2) and third group (G3); was administered orally grape seed oil (0.1 and 0.2 ml/kg BW) respectively for one month using modified stomach tube. Rabbits has feed on concentrated feed (pellets) and were given plain water, room temperature at (19-23) C°, and the humidity (45 -50 %). At the end of the experiment, rats were fasted for (10) hrs., anesthetized using diethyl ether and blood samples were collected from heart

## Results

### Grape seed oil effect on hematology:

Results were displayed no significant differences ( $P>0.05$ ) between RBCs count in G2 ( $5.19\pm 0.16$ ) and G3 ( $4.44\pm 0.1$ ) when compared with G1 ( $5.30\pm 0.12$ ). The WBCs count were presented significant decrease ( $P<0.05$ ) in G3 ( $9.50\pm 0.004$ ) when compared with G1 ( $11.25\pm 0.01$ ), and no significant difference between G2 ( $11.18\pm 1.03$ ) and G1. The Hb values show significant increase ( $P<0.05$ ) in G2 ( $12.76\pm 0.35$ ) compared with G1 ( $10.91\pm 0.37$ ) and there was significant decrease ( $P<0.05$ ) in G3 ( $9.67\pm 0.06$ ) compared with G1, and G2. The PCV show significant increase ( $P<0.05$ ) in G2 ( $33.89\pm 0.70$ ) compared with G1 ( $31.48\pm 0.005$ ) and there was significant ( $P<0.05$ ) decrease between G3 ( $28.21\pm 1$ ) and

puncture in non-heparinized tubes for obtaining blood serum and heparinized tubes for blood picture, collecting blood tubes were centrifuged at (3000) rpm for (15) min for total protein, albumin and globulin levels and use anticoagulant tubes for blood picture.

### Statistical analysis

Result are expressed as mean $\pm$  standard error (SE), and analyzed by using SPSS Version 5. The mean different between groups was determined by revised least significant different (RLSD), and ( $P<0.05$ ) was used to criterion of the statistically significant.

G1, and significant decrease ( $P< 0.05$ ) between G3 compared with G2 (Table 1).

### Grape seed oil effect on physiological parameters:

The total protein level exhibited significant increase ( $P<0.05$ ) in G2 ( $6.29\pm 0.30$ ) compared with G1 ( $5.88\pm 0.21$ ) and no significant differences between G3 ( $6.08\pm 0.12$ ) and G1. The albumin level show no significant differences between G2 ( $3.81\pm 0.18$ ) and G3 ( $3.76\pm 0.19$ ) compared with G1 ( $4.25\pm 0.12$ ). The globulin level showed significant increase ( $P<0.05$ ) in G2 ( $2.48\pm 0.33$ ) when compared with G1 ( $1.63\pm 0.52$ ) and no significant difference between G3 ( $2.32\pm 0.08$ ) compared with G1 (Table 2).

**Table (1): Grape seed oil effect on hematological parameters; RBC, WBC, Hb and PCV (Means  $\pm$  SE).**

Groups Parameter	G1 Control	G2 (0.1 ml/ Kg.BW)	G3 (0.2 ml/ Kg.BW)
RBCs	$5.30\pm 0.12$ A	$5.19\pm 0.16$ A	$4.44\pm 0.1$ A
WBCs	$11.25\pm 0.01$ A	$11.18\pm 1.03$ A	$9.50\pm 0.004$ B
Hb	$10.91\pm 0.37$ A	$12.76\pm 0.35$ B	$9.67\pm 0.06$ C
PCV	$31.48\pm 0.005$ A	$33.89\pm 0.70$ B	$28.21\pm 1.00$ C

Different letters means significant ( $P<0.05$ ) between groups in the same row.

**Table (2): Grape seed oil effect on physiological parameters; Total protein, Albumin, Globulin (Means  $\pm$  SE).**

Groups Parameter	G1 Control	G2 (0.1ml/ Kg.BW)	G3 (0.2ml/ Kg.BW)
Total protein	$5.88\pm 0.21$ A	$6.29\pm 0.30$ B	$6.08\pm 0.12$ A
Albumin	$4.25\pm 0.12$ A	$3.81\pm 0.18$ A	$3.76\pm 0.19$ A
Globulin	$1.63\pm 0.25$ A	$2.48\pm 0.33$ B	$2.32\pm 0.08$ A

Different letters means significant ( $P<0.05$ ) between groups in the same row.

## Discussion

Results revealed that the erythrocytes count show no significant differences

between G2 and G3 in compared with G1, this result in agreement with (20) when given

grape seed extract to the mice in a dose (100 mg/Kg. BW). The observed low WBC count in G3 in a dose (0.2 ml/Kg. BW) may be due to inhibition or defective hematopoiesis, these findings are agreed with those obtained from other studies (21) and (22). And this result agreement with (20) whom recorded the immunopathological response of internal organs with amelioration of hematological and cytological parameters when given grape seed extract in mice at a dose (100 mg/Kg. BW). But there is negative effect on leukocytes count at dose (200 and 300 mg/Kg. BW) respectively. (23) Recorded negative effect on leukocytes count when used grape seed in common carp at a dose (8g/Kg diet), but there is no effect on the leukocytes count at dose (0,1.5, 4.5 and 8g/Kg diet) respectively. The increased Hb value in G2 at dose (0.1 ml/Kg. BW) may be due to bioactive compounds like (pectin, resveratrol, tannins, polyphenols and polyunsaturated fatty acids) and presence of vitamins C and E (24) lead to increase of hemopoiesis in the bone marrow (25), this result in agreement with (20) which recorded there was increase in Hb value when given grape seed extract in mice at a dose (100 mg/Kg. BW). But Hb value in G3 at a dose (0.2 ml/Kg. BW) showed decrease in the value of Hb and this result agrees with (20). (23) Saied there was no effect on the Hb value when given grape seed in common carp at dose (0,1.5, 4.5 and 8g/Kg diet) respectively. Increased of PCV % seen in G2 at dose (0.1 ml/Kg. BW) may be due to bioactive compounds which lead to increase of hemopoiesis in bone marrow (25), this

result in agreement with (20) showed increase of PCV% , but when increased the grape seed oil in G3 (0.2 ml/Kg. BW) lead to decrease of PCV% and this result in agreement with (20). The total protein show increase in G2 at a dose (0.1ml/Kg. BW) and this result may be through stimulation of protein synthesis accelerates the regeneration process and the production of liver cells (26) beside GSE caused inhibition of gluconeogenesis and prevents catabolism of protein and its conversion to glucose (27). This may lead to increase level of total protein in serum. This result is in agreement with (23) whom recorded increase in the total protein level when given grape seed in common carp at a dose (8g/Kg diet). The albumin level show no change in G2 and G3 with G1 may be due to this effect of extract of grape seed supports the idea that is bioavailable and exhibits potent antioxidant and anti-inflammatory effects (28). Which lead to keep of the albumin in normal value to keep osmotic pressure inter organ of body, this result in agreement with (29) when use grape seed extract on the T.2 toxicity in mice. The globulin show increase in G2 at dose (0.1ml/Kg. BW) and this result may be due to effects of bioactive compounds (pectin, resveratrol, tannins, polyphenols and polyunsaturated fatty acids and vitamins E and C) (27), and this compounds act antioxidant and anti-inflammatory effects support the immune system. In conclusion; the administration of grape seed oil in low dose produces good effects whereas administration of it in high dose produce bad effects on body function.

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