THE IMPACT OF VARYING CONCENTRATIONS OF HAWTHORN (CRATAEGUS OXYACANTHA) ON CARDIOVASCULAR HEALTH IN ADRIAMYCIN-INDUCED CARDIOVASCULAR DISEASES RATS

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ABSTRACT: Since the 1st century, Hawthorn, a Crataegus plant, has been used to treat heart disease. Both leaves and blossoms are used in modern medicine. Hawthorn may help manage mild to moderate heart failure, so the current study aims to Promote cardiovascular health using different levels of Hawthorn (Crataegus oxyacantha) in heart disorder rats. Thirty (30) Male albino rats of the Sprague-Dawley strain weighing 150±10g, ten weeks old were separated into four groups, one of them as negative control (normal), and other groups were treated with adriamycin (ADM) for two days a week by intraperitoneal injection (five mg/kg) two time per week throughout two weeks, to induce CVD. One of the adriamycin-induced CVD groups was assigned as a positive control group and fed the standard diet, and the remaining three groups were fed 7%, 10%, and 15% Hawthorn for twenty-eight days. Upon completion of the investigation, the blood samples were collected for biochemical analysis. The results indicate that exposure rats to ADM that fed on basal diet +15 % Hawthorn led to a significant increase in the levels of TC, TG, LDL, and VLDL in the blood serum, as opposed to HDL. Also Rats were fed a diet supplemented with a distinct concentration of Hawthorn resulting in a significant reduction (P below 0.05) the level of creatinine & urea serum.

Key words: Crataegus species - Heart disorder – Bio Cemical Analysis- Hawthorn.

INTRODUCTION
Hawthorn (Crataegus species) is a widespread thorny rose family shrub that can attain a maximum height of 5 cm and is found in sunny woodlands and slopes worldwide. They develop into pink, red, or white clusters. Hawks, which are diminutive berries, emerge subsequent to the blooms. When mature, they are typically red, but can also be black. The glossy foliage of hawthorn trees exhibit a diverse array of shapes and sizes. (Cloud et al., 2019). Since the 1st century, people have been using hawthorn, which is a plant of the Crataegus genus, to cure heart problems. By the early 1800s, it was being used as a treatment for circulatory diseases and respiratory ailments by medical professionals in the United States. Historically, the berries were utilized to treat a wide range of cardiovascular conditions, Such as but not restricted to irregular heartbeat, high blood pressure, chest discomfort, hardening of the arteries, and heart failure. Presently, both the flowers & foliage are utilized for medicinal purposes. Research findings even indicate that hawthorn may exhibit potential efficacy in the management of modest to moderate heart failure. (Corte et al ., 2016). According to laboratory and animal studies, hawthorn is rich in antioxidants, such as quercetin and oligomeric procyanidins (OPCs), which are also present in grapes. Hawthorn's antioxidants may prevent a portion of the damage caused by free radicals, particularly in relation to cardiovascular disease. (Daiber et al., 2017). Many of the substances found in hawthorn may be beneficial to the heart. OPCs & other antioxidant flavonoids have the potential to aid in vasodilation, enhance blood circulation, and prevent damages.for medicinal purposes, the fruit, foliage, and flowers of the hawthorn plant have been utilized. The foliage and flowers are utilized in the majority of contemporary preparations because they are thought to contain a greater quantity of flavonoids compared to the...
fruit (Dehghani et al., 2019). Hawthorn is utilized to aid in protection against heart disease, as well as the management of hypertension and lipids. Research on both animals and humans indicates that hawthorn enhances circulation, reduces blood pressure, and increases coronary artery blood flow. Additionally, it has been applied topically to address abscesses as well as skin ulcers. (Dong et al., 2017) and (Du et al., 2019) exhibited that further research is required to determine its potential efficacy. Several studies have reached the conclusion that hawthorn enhanced heart function markedly. Additionally, research indicates that the herb may improve an individual's capacity to engage in physical activity subsequent to experiencing cardiac failure. According to the accounts of study participants, hawthorn significantly alleviated disease symptoms (including fatigue and shortness of breath), discovered that modest doses of captopril (a prescription heart medication) were just as efficacious as 900 mg per day of hawthorn extract for two months in alleviating symptoms of heart failure. (Ferrucci., et al., 2018).

Aim of study
The purpose of this research was to determine the impact of varying Hawthorn (Crataegus species) concentrations on rats’ biochemical markers of cardiovascular disease.

MATERIALS & METHODS

1- Materials

1.1- preparation of Hawthorn (Crataegus species): Crataegus species of hawthorn were purchased from the local market in Jeddah, Saudi Arabia. After being washed and dried in an oven designed explicitly for drying at fifty degrees Celsius for three days, the hawthorn was pulverized and milled into a fine powder.

1.2- Experimental animals: In the experiment, we employed thirty male albino Sprague Dawley rats that weighed 150 plus or minus 10 grams.

1.3- Adriamycin injectable solution: A bottle of Adriamycin injectable solution with a concentration of twenty-five mg per ml was obtained from Mina pharm Co. in Cairo, Egypt. El-Gomhoreya Company in Cairo, Egypt provided all of the additional chemicals, kits, and reagents that were used in this study.

2- Methods

2.1- Biological experiment
Basal diet composition of rats
The basal diet comprised the following components: five percent cellulose, ten percent maize oil, 0.25 percent choline chloride, one percent vitamin mixture, 0.35 percent methionine, & four percent salt mixture (Morsi, 1992).

CaCO3 (600 mg), MgSO4.2H2O (204 mg), K2HPO4 (645 mg), CaHPO4.2H2O (55 mg), ZnCl2 (0.5 mg), MnSO4.4H2O (10 mg), NaCl (334 mg), CuSO4.5H2O (0.06 mg), as well as KI (1.6 mg) comprised the composition of salt mixture utilized in the experiment, (Hegsted, Mills, Elvehjem, & Hart, 1941).

The vitamin mixture of the standard diet composed of: , Vitamin E (10 Iu), Calcium pantothenic acid (0.40 mg), Thiamin (0.50 mg), Vitamin A (200 Iu), Vitamin K (0.50 Iu), Pyridoxine (1.00 mg), Niacin (4.00 mg), Par- aminobenzoic acid (0.02 mg), Vitamin D (100 Iu), Folic acid (0.02 mg), Choline chloride (200 mg), Inositol (24 mg), Vitamin B12 (2.00 g) (Campbell, 1963).

2.2- Induction of Cardiovascular disease
According to Young et al. (2002), cardiovascular disease groups were given adriamycin (ADM) via intraperitoneal injection (five mg/kg) twice a week for a total of two weeks to induce CVD.
Table (1): The components of the fundamental & experimental diets.

<table>
<thead>
<tr>
<th>Component (g)</th>
<th>Basal diet</th>
<th>7% Hawthorn</th>
<th>10% Hawthorn</th>
<th>15% Hawthorn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawthorn</td>
<td>---</td>
<td>7</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Casein</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Corn oil</td>
<td>4.7</td>
<td>4.7</td>
<td>4.7</td>
<td>4.7</td>
</tr>
<tr>
<td>Mineral mix</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Vitamin mix</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cellulose</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Choline chloride</td>
<td>2</td>
<td>2</td>
<td>72</td>
<td>2</td>
</tr>
<tr>
<td>Sucrose</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Corn starch</td>
<td>Up to 100</td>
<td>Up to 100</td>
<td>Up to 100</td>
<td>Up to 100</td>
</tr>
</tbody>
</table>

2.3- Design of Experiments & Animal Groups

This experiment was conducted on a cohort of 30 fully matured male Sprague-Dawley albino rats aged between fourteen and sixteen weeks. These rats had an average weight of 150±10 g. The animals were housed in strain-free metallic coverings secured to plastic cages, and stringent hygiene protocols were adhered to. The rats were given the basal diet for seven days prior to the start of the experiment to allow for adaptation. Specialized non-scattering feeding containers were utilized to administer diets to rats in order to prevent food loss and contamination. Ad libitum water was supplied through a narrow mouth container equipped with a metallic tube securely fastened to its mouth using a rubber tube. As previously stated, rats were acclimated to the experimental protocol by being exposed to a twelve hour light & twelve hour dark cycle for a duration of seven days prior to its commencement. Rats were classified into five equal groups (6 in each group) as follows:

- Group one: provided with a basal diet (negative control).
- Group two: (positive control)
- Group three: CVD group fed the basal diet comprising 7% Hawthorn.
- Group four: CVD group fed the basal diet consisting of 10% Hawthorn.
- Group five: CVD group fed the basal diet consisting of 15% Hawthorn.

2.4- Biological evaluation

Daily feed consumption was documented, while body weight was assessed on a weekly basis for the duration of the 28-day experiment. In accordance with Chapman et al, 1959.

Blood sampling

After fasting for 12 hours, blood samples in initial times were obtained from retro orbital vein, while it obtained from hepatic portal vein at the end of each experiment. Blood samples were collected into a dry clean centrifuge glass tubes and left to clot in water bath (37°C) for 28 minutes, then centrifuged for 10 minutes at 4000 rpm to separate the serum, which were carefully aspirated and transferred into clean Eppendorf tube and stored frozen at -20°C till analysis according to the method described by T by Curry and Wallington (1967).
2.5) Biochemical analysis

2.5.1) Quantification of Lipids in Serum:

2.5.1.1) Triglycerides: Triglycerides were determined by enzymatic calorimetry in accordance with Fassati and Prencipe's (1982) methodology.

2.5.1.2) Total Cholesterol: primary application of TC measurement, as described by Allain (1974).

2.5.1.3) HDL-cholesterol: According to Lopez (1977), phosphotungstic acid & magnesium ions selectively precipitating all lipoproteins other than the HDL fraction-cholesterol contained in the supernatant may be measured via similar procedure utilized for TC.

2.5.1.4) V-LDL & LDL-cholesterol: The technique developed by Lee & Nieman (1996) was utilized for the measurement of both very low density lipoproteins (VLDL) & low density lipoproteins (LDL).

2.5.1.5) Total Lipids: According to schmit 1964, the colorimetric approach was used to determine the amount of total lipids.

2.5.2) Estimation of liver functions

2.5.2.1) Estimation of Alanine transferase (ALT): The approach proposed by Tietz (1976) was utilized for the analysis necessary to establish the ALT. Pyruvate & L-Glutamate are produced as a byproduct of the reaction that ALT catalyzes, which involves the amino group transfer from L-alanine to a-ketoglutarate.

2.5.2.2) Estimation of AST: The approach developed by Henry (1974) & Yound (1975) was utilized throughout the process of determining the (AST).

2.5.3) Estimation of Kidney functions

2.5.3.1) Estimation of Creatinine: The kinetic method developed by Henry (1974) was utilized to ascertain creatinine.

2.5.3.2) Estimation of urea: Urea was quantified utilizing enzymatic technique described by Patton and Crouch in 1977.

2.5.3.3) Statistical Analysis: All data were presented as mean and standard deviation. One-way classification was employed to compute statistical analyses. In accordance with Snedcor & Cochran (1967), analysis of variance (ANOVA) as well as least significant variance (LSD) are utilized.

RESULTS & DISCUSSION

The objective of this research was promoting cardiovascular health using different levels of Hawthorn (Crataegus species) in CVD rats

1) Biological effects

1.1) The impact of various levels of Hawthorn (Crataegus species) on Lipids Profile and Atherogenic Index in Negative Control and CVD

The effect of (Crataegus species) on lipids profile of control negative & adriamycine groups are illustrated in the Table (2). Injection of rats with ADM resulted in a considerable rise in the levels of TC, total fat, LDL & VLDL in the serum, in contrary to HDL, that demonstrated a significant decrease compared with negative control (P less than 0.05). The identical outcomes were achieved by (Corte et al., 2016). According to what they claimed, hawthorn (a species of Crataegus) has been utilized to treat cardiovascular conditions as long back as the 1st century. By the early 1800s, it was being used as a treatment for circulatory diseases and respiratory ailments by medical professionals in the United States. Historically, the berries were utilized to treat a wide range of cardiovascular conditions, containing, but not restricted to, irregular heartbeat, high blood pressure, chest discomfort, hardening of the arteries, & heart failure. In modern times, both the leaves and the flowers have been employed in medical preparations. There is also data that suggests...
The impact of varying concentrations of hawthorn (Crataegus oxyacantha) on cardiovascular factors could be useful when taken in the management of mild to severe heart failure.

The effect of (Crataegus species) on the atherogenic index of control negative & adriamycine groups is illustrated in Table (3). Injection rats by ADM caused a significant rise in concentrations of CRR, AC & Al compared with negative control (P less than 0.05). In accordance with Gao et al., (2019) Al can be utilized on a daily basis in clinical Procedures as a routine monitoring index for CVD. Furthermore, de Quadros et al. (2017) demonstrated, hawthorn is rich in antioxidants, such as quercetin and oligomeric procyanidins (OPCs). The impact of (Crataegus species) on the atherogenic index of the control negative and adriamycin groups is demonstrated in Table (3). The injection of rats with ADM resulted in a notable increase in CRR, AC, and Al concentrations compared to the negative control (P < 0.05). Quadros et al. (2017) proved that hawthorn contains many antioxidants, specifically quercetin and oligomeric procyanidins (OPCs). Thus, the atherogenic index of rats treated with hawthorn may be enhanced due to their content of antioxidants.

1.2) Impact of distinct levels of Hawthorn (Crataegus species) on Liver Functions in CVD rats.

Table 4 presents the impact of Hawthorn (Crataegus species) on the liver functions of the negative control as well as adriamycine groups. ADM injection resulted in a statistically significant elevation of AST & ALT concentrations in the serum of rats, as Compared with negative control group (P less than 0.05). Alp et al. (2015) reported similar findings, stipulating that hawthorn (Crataegus oxyacantha) is a botanical remedy renowned for its diverse array of polyphenolic compounds that exhibit antioxidant as well as hypolipidemic properties.

### Table (2): Impact of distinct levels of Hawthorn (Crataegus species) on lipids profile in CVD rats

<table>
<thead>
<tr>
<th>Variables</th>
<th>TC (mg/dl)</th>
<th>TG (mg/dl)</th>
<th>HDL (mg/dl)</th>
<th>LDL (mg/dl)</th>
<th>VLDL (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative control</td>
<td>57.50 ± 5.69</td>
<td>67.94 ± 7.19</td>
<td>27.00 ± 0.82</td>
<td>16.91 ± 4.08</td>
<td>13.59 ± 1.44</td>
</tr>
<tr>
<td>Positive Control</td>
<td>239.00 ± 6.48</td>
<td>187.50 ± 1.90</td>
<td>23.75 ± 1.71</td>
<td>77.75 ± 8.54</td>
<td>37.50 ± 2.80</td>
</tr>
<tr>
<td>7% Hawthorn</td>
<td>102.00 ± 1.63</td>
<td>61.75 ± 3.69</td>
<td>25.25 ± 1.50</td>
<td>64.40 ± 2.83</td>
<td>12.35 ± 0.74</td>
</tr>
<tr>
<td>10% Hawthorn</td>
<td>105.75 ± 3.20</td>
<td>62.25 ± 1.71</td>
<td>25.50 ± 2.08</td>
<td>67.80 ± 2.28</td>
<td>12.45 ± 0.34</td>
</tr>
<tr>
<td>15% Hawthorn</td>
<td>108.25 ± 9.25</td>
<td>62.00 ± 2.94</td>
<td>25.25 ± 1.50</td>
<td>70.60 ± 8.87</td>
<td>12.40 ± 0.59</td>
</tr>
</tbody>
</table>

All data are presented as mean and standard deviation. Means in the same column subscribed with different levels indicate significant differences between these values at P less than 0.05 as calculated by ANOVA and LSD follow-up test.

### Table (3): Impact of distinct levels of Hawthorn (Crataegus species) on atherogenic coefficient (AC), cardiac risk ratio (CRR) and atherogenic (AI) in CVD rats.

<table>
<thead>
<tr>
<th>Variables</th>
<th>AC (mg/dl)</th>
<th>CRR (mg/dl)</th>
<th>AI (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative control</td>
<td>2.0 ± 0.18</td>
<td>1.09 ± 0.18</td>
<td>0.40 ± 0.05</td>
</tr>
<tr>
<td>Positive Control</td>
<td>8.99 ± 0.75</td>
<td>9.99 ± 0.75</td>
<td>0.90 ± 0.05</td>
</tr>
<tr>
<td>7% Hawthorn</td>
<td>3.05 ± 0.25</td>
<td>4.05 ± 0.25</td>
<td>0.39 ± 0.02</td>
</tr>
<tr>
<td>10% Hawthorn</td>
<td>3.16 ± 0.26</td>
<td>4.16 ± 0.26</td>
<td>0.39 ± 0.03</td>
</tr>
<tr>
<td>15% Hawthorn</td>
<td>3.29 ± 0.26</td>
<td>4.29 ± 0.26</td>
<td>0.39 ± 0.04</td>
</tr>
</tbody>
</table>

All data are presented as mean and standard deviation. Means in the same column subscribed with different levels indicate significant differences between these values at P less than 0.05 as calculated by ANOVA and LSD follow-up test.
Table (4): The impact of distinct levels of Hawthorn (Crataegus species) on Liver Functions in Compared rats.

<table>
<thead>
<tr>
<th>Variables</th>
<th>ALT(U/L)</th>
<th>AST(U/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative control</td>
<td>34.99±2.16</td>
<td>39.90±3.99</td>
</tr>
<tr>
<td>Positive Control</td>
<td>59.99±6.85</td>
<td>55.89±4.89</td>
</tr>
<tr>
<td>7% Hawthorn</td>
<td>54.50±1.29</td>
<td>58.00±4.69</td>
</tr>
<tr>
<td>10% Hawthorn</td>
<td>53.50±4.04</td>
<td>45.50±6.03</td>
</tr>
<tr>
<td>15% Hawthorn</td>
<td>48.00±4.24</td>
<td>63.50±3.87</td>
</tr>
</tbody>
</table>

All data are presented as mean and standard deviation. Means in the same column subscribed with different levels indicate significant differences between these values at P less than 0.05 as calculated by ANOVA and LSD follow-up test.

1.3) The impact of distinct levels of Hawthorn (Crataegus species) on kidney functions in heart disorder rats.

Table (5) illustrates the influence of Hawthorn (Crataegus species) on renal functions in the negative control and adriamycin groups. The administration of ADM to rats significantly elevated creatinine and urea levels in the bloodstream (P< 0.05). The rats were provided with a diet containing a certain concentration of supplements, which led to a noteworthy decrease (P < 0.05) in the creatinine and urea levels in their blood. These results correspond to the findings of Kurkin et al. (2022), who found that the shoot-thick extracts of Crataegus sanguinea Pall and Crataegus submollis Sarg affect the excretion of creatinine through increased diuresis. In contrast, they found that the concentrated extract of Crataegus monoline Jacq did not impact the kidney's excretory function.

Furthermore, Crataegus sanguinea Pall. and Crataegus submollis Sarg. bloom during the flowering season. Shoots can be harvested as a raw material for drugs that enhance renal excretory function. Crataegus submollis Sarg., akin to many hawthorn species, exhibits therapeutic characteristics.

1.4) Effect of different levels of Hawthorn (Crataegus species) on Antioxidant Activity in heart disorder rats.

The effect of Hawthorn on antioxidant activity of negative control & adriamycin groups are illustrated in Table (6). When ADM was administered into rats, malonaldiadehyde (MDA), and glutathione peroxidase (GPx) levels significantly higher in contrast to negative control (P below 0.05). The identical outcomes were achieved by Dehghani et al., (2019). They showed that ADM produce substantial quantities of reactive oxygen species (ROS) and causes oxidative stress in the body. Hawthorn is also found to contain numerous substances that may have cardiovascular benefits. OPCs & other antioxidant flavonoids have the potential to aid in vasodilation, enhance blood circulation, and prevent vasodamage. The results reported by Dehghani et al. (2019) were found to be identical. They demonstrated that ADM generates significant amounts of reactive oxygen species (ROS) and induces oxidative stress in the body. Hawthorn has also been discovered to possess various compounds that could offer advantages for cardiovascular health. OPCs and other antioxidant flavonoids can facilitate vasodilation, augment blood circulation, and avert vasodamage.
The impact of varying concentrations of hawthorn (*Crataegus oxyacantha*) on cardiovascular function

### Table (5): The impact of distinct levels of Hawthorn (*Crataegus species*) on kidney functions in CVD rats.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Creatinine (mg/dl)</th>
<th>Urea (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative control</td>
<td>0.87±0.04</td>
<td>6.94±0.83</td>
</tr>
<tr>
<td>Positive Control</td>
<td>1.78±0.09</td>
<td>27.00±1.41</td>
</tr>
<tr>
<td>7% Hawthorn</td>
<td>0.88±0.09</td>
<td>17.50±1.29</td>
</tr>
<tr>
<td>10% Hawthorn</td>
<td>1.16±0.11</td>
<td>20.00±1.41</td>
</tr>
<tr>
<td>15% Hawthorn</td>
<td>0.84±0.09</td>
<td>15.88±1.65</td>
</tr>
</tbody>
</table>

All data are presented as mean and standard deviation. Means in the same column subscribed with different levels indicate significant differences between these values at P less than 0.05 as calculated by ANOVA and LSD follow-up test.

### Table (6): The impact of various levels of Hawthorn (*Crataegus species*) on Antioxidant Activity in heart disorder rats.

<table>
<thead>
<tr>
<th>Variables</th>
<th>MDA (nrol/mL)</th>
<th>GPx (mu/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative control</td>
<td>15.62^d=fc 1.55</td>
<td>5.22^d±1.55</td>
</tr>
<tr>
<td>Positive Control</td>
<td>38.90±4.23</td>
<td>15.94±1.28</td>
</tr>
<tr>
<td>7% Hawthorn</td>
<td>35.35^ab±3.01</td>
<td>14.54±1.44</td>
</tr>
<tr>
<td>10% Hawthorn</td>
<td>31.58^bc±3.24</td>
<td>28.32±3.11</td>
</tr>
<tr>
<td>15% Hawthorn</td>
<td>34.73^abc±2.37</td>
<td>16.41^abc±9.8</td>
</tr>
</tbody>
</table>

All data are presented as mean and standard deviation. Means in the same column subscribed with different levels indicate significant differences between these values at P less than 0.05 as calculated by ANOVA and LSD follow-up test.

### Conclusion

It is recommended to utilize hawthorn (*Crataegus species*) for heart cases. Also various concentrations of hawthorn (*Crataegus species*) could potentially be recommended for the reduction of LDL & atherogenic index levels.

### REFERENCES


Young Mi Hong, Hae Soon Kim & Hye-Ran Yoon (2002). Serum Lipid and Fatty Acid Profiles in Adriamycin-Treated Rats after Administration of L-Carnitine.J. Food and Chemical Toxicology; 51(1): 249-255.
The impact of varying concentrations of hawthorn (Crataegus oxyacantha) on cardiovascular ……

تأثير التركيزات المختلفة من نبات الزعرور (Crataegus oxyacantha) على صحة القلب والأوعية الدموية لدى الفئران المصابة باضطرابات القلب نتيجة حقنها بادراميسن.

مقبلة سالم هلال الزهري
قسم الأحياء، كلية العلوم، جامعة الباحة، المملكة العربية السعودية

الملخص العربي

استخدم الأنسان الزعرور منذ القدم، وهو نبات من جنس Crataegus، لعلاج مشاكل القلب. وفي بداية القرن التاسع عشر كان الزعور يستخدم بالفعل كعلاج لمجموعة متنوعة من أمراض الدورة الدموية والجهاز التنفسي حيث كان يتم استخدام كل من الأوراق والأزهر في الممارسات الطبية الحديثة. كما تشير نتائج الأبحاث إلى أن الزعرور قد يظهر فعالية محتملة في علاج فصوص القلب البطيء إلى المتوسط، لذا تهدف الدراسة الحالية إلى تعزيز صحة القلب باستخدام مستويات مختلفة من الزعور (Crataegus oxyacantha) المختلفة في الفئران التي تعاني من اضطرابات القلب. تم استخدام ثلاثين (30) فأر أبيض ابيض ذكور من سلالة سيراج دايلي بوزن 150±5 جم، بعمر عشرة أسابيع ثم تقسم الفئران إلى مجموعتين أساسيتين: المجموعة الاساسية الأولي، مجموعة فئران طبيعية (المجموعة الضابطة السلبية) و المجموعة الاساسية الثانية و التي تم تقسيمها إلى اربع مجموعات فرعية. تم حقنها بالأدوية (ADM) مرتين أسبوعيا لمدة أسبوعين عن طريق الحق تحت الجلد (خمسة ملغم/كم). لتحفيز الإصابة بأمراض القلب والأوعية الدموية وتم تقسيم هذه المجموعة إلى ثلاث مجموعات تجريبية و التي تتغذى على الوجبة الاساسية بجانب ثلاث مستويات مختلفة من نبات الزعور (2% و 1% و 0.5%) لمدة ثمانية وعشرين يوما وأيضاً مجموعة مشابهة موجبة هي التي تتغذى على الوجبة الاساسية فقط. وبعد الانتهاء من التجربة تم نزع الفئران و اخذ عينات الدم لإجراء التحليل البيوكيميائي. وقد أوضحت النتائج إلى أن مجموعة الفئران المصابة و VLDL و LDL و VLDL و TG و TC و HDL، تغير في مصل الدم، مقابل HDL، مما أظهر انخفاضاً ملحوظاً مقارنة مع مجموعة الكتلة السلبية (P<0.05).

الكلمات المفتاحية: - نبات الزعرور- التركيزات المختلفة - اضطرابات القلب