Effects of Ethanolic Extract of *Metracaria chamomela* on Some Physiological Parameters in Male Rabbits

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Accepted: 25/3/2015

**Summary**

The aim of this study is to explain the effect of Ethanolic extract 70% of *Metracaria chamomela* on some physiological parameters in male rabbits. Twelve adult male rabbits were used in this study and were divided equally into two groups: First group was control (C) and received normal saline for four weeks, the second group (Treated group) was intubated orally with ethanolic extract of *Metracaria chamomela* in a dose 70 mg/kg B.W. for four weeks. Blood samples were collected by heart puncture from each animal at the end of experiment. Blood sample was divided into a part for hematological study and a part for biochemical analysis. The value of serum urea, and creatinine were reduced in animals that received *Metracaria chamomela* extract at dose of 70 mg/ kg B.W. as compared with the control group. Significant decrease in serum activity of aspartate aminotransferase alanine aminotransferase and alkaline phosphatase activity was observed in *Metracaria* treated animal as compared with the control group. This study explained that there was significant increase in serum total protein, serum albumin and serum globulin in treated animals as compared with the control group. The value of total cholesterol, serum triacylglycerol, serum low density lipoprotein cholesterol and very low density lipoprotein cholesterol concentration were reduced significantly in animal received *Metracaria chamomela* extract while the high density lipoprotein cholesterol was elevated significantly as compared with control group. While the effect of *Metracaria chamomela* extract on blood picture showed no changes in red blood cell count, hemoglobin concentration and hematocrit value but showed significant decrease in platelet count, and significant increase in white blood cell count as compared with control group. Over all this study explained that *Metracaria chamomela* extract had Reno protective and hypolipidemic effect in male rabbit.

**Keywords:** *Metracaria chamomela*, Urea, Creatinine, Liver enzymes, Lipid profile, Blood picture.

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**Introduction**

Chamomile *Matricaria chamomilla* (MC) is a medicinal plant species from the asteraceae family. Chamomile has calming and smoothing properties. It is used for nervousness, headaches, anxiety and hysteria. It is anti-spasmodic, laxative, analgesic, carminative properties (1 and 2). It is a highly favored and much used medicinal plant in Folk and traditional medicine. It contains a large groups of therapeutically interesting and active compounds. Sesquiterpenes, flavonoids, coumarins and polyacetylenes are considered the most important constituents (3) *M. chamomella* exercised a marked stimulatory action on the secretory function of liver (4). The other pharmacological properties include anti-inflammatory, anti-septic and sedative. *M. chamomella* applied to wounds slow to heal and for skin eruption and infection such as boils and for inflammation of mouth, throat and the eyes. The coumarins are represented in *M. chamomilla* by herniarin, umbelliferone, and other minor ones (5 and 6). *Matricaria chamomilla* contain glucopyranosylxy-4-methoxycinnamic acid (GMCA), the glucoside precursor of herniarin, were described as native compounds in chamomile (7). Eleven bioactive phenolic compounds (8) such as herniarin and umbelliferone (coumarin), chlorogenic acid and caffeic acid (phenylpropanoids), apigenin, apigenin-7-O-glucoside, luteolin and luteolin-7-O-glucoside (flavones), quercetin and rutin (flavonols), and naringenin (flavanone) are found in chamomile extract. (9). Therefore, the aim of this study was to explain the effect of ethanolic extract of *Metracaria chamomela* in a dose of 70 mg / Kg B.W. on some hematological and biochemical parameters in male rabbits.
Materials and Methods

Chamomile flowers after grinding the dried flowers the plant material was extracted with 70 % ethanol the extract was filtered and evaporated in vacuum rotatory evaporator to yield extract according to (10). The experiment was conducted at the animal house of Biology Department, College of Science for women/ Baghdad University. Twelve adult male rabbits weighting 1000-1250 gm. were used in this study. The animals were housed for two weeks for adaptation, they were housed in cages in a room with controlled temperature and humidity. They were kept under good hygienic conditions. Animals were maintained on a natural 12h light and 12h dark cycle, received a balanced diet, water and libitum throughout the experimental period. Rabbits were divided into two groups (n=6) and treated for four weeks as follows: Control group(C) received normal saline orally daily for four weeks and treated group (T) received orally ethanolic extract of Metracaria chamomella (MC) at a dose of 70 mg/Kg B.W (11). At the end of the experimental period, overnight fasting, blood samples were collected by heart puncture in tubes containing EDTA anticoagulant for hematological study. Serum was separated from coagulant blood by centrifugation at 5000 rpm for 10 minutes and stored at - 20°C for studying the following: Serum urea, creatinine concentration.

According to Diamond enzyme kit (12 and 13), serum aspartate aminotransferase (AST), serum alanine aminotransferase (ALT) and alkaline phosphatase activity (AP) using enzymatic kit (14 and 15). Total proteins were estimated by using Biuret method as described (16), serum albumin gm/dl was estimated by albumin kit (17) and serum globulin concentration g/dL was estimated in directly by measuring of albumin in serum and then it was subtracted from total protein. Determination of serum total cholesterol (TC) concentration using enzymatic assay kit (18), triacylglycerol TAG by using enzymatic assay kit (19) high density lipoprotein cholesterol (HDL-C) concentration using enzymatic assay kit (20), low density lipoprotein cholesterol (LDL-C) concentration and very low density lipoprotein cholesterol (VLDL-C) concentration according to (21). Blood with EDTA anticoagulant used for hematological study. Estimation of hemoglobin (Hb) concentration was according to (22), white blood cell count was according to (23), red blood cells and hematocrit (PCV) using the technique of (24). Total platelets count was according to (25). The data were analyzed using the statistical package for social since program (S.P.S.S.). For comparison between different experimental groups analysis of variance ANOVA was used. The results were expressed as means ± SE and (P<0.05) was conceded to be statistically significant (26).

Results and Discussion

The results (Table, 1) showed that oral administration of ethanolic extract of MC for four weeks on serum urea caused significant (P<0.05) decrease in the serum urea concentration as compared with control group. As well as, significant (P<0.05) decrease in serum creatinine concentration was observed in T1 group as compared with control. A significant (P<0.05) decrease in serum albumin and globulin concentration in treated animals as compared with control group. (Table, 2) There was a significant (P<0.05) increase in total serum protein in treated animals as compared with control group with significant (P<0.05) elevation in serum albumin and globulin concentration in treated animals as compared with control group. The results in (Table, 3) oral administration of Metracaria chamomella (Mc) alcoholic extract (70 mg / kg B.W.) caused significant (P<0.05) decline in serum total cholesterol (T.C.), STAG, LDL-C and VLDL-C concentrations as compared with control group. Besides There was significant (P<0.05) increase in serum high density lipoprotein cholesterol concentration (HDL-C) in treated animals as compared with control.

Table (4) oral administration of ethanoic extract Metracaria chamomella 70 mg/ kg for four weeks on blood picture. There were no changes on red blood cell count, hemoglobin concentration, hematocrit value with significant (P<0.05) decrease in platelet count as compared with the control group. Also there was a significant (P<0.05) increase in white blood cell count in treated group as compared with control.

Table, 1: Effect of ethanolic extract from *Metracaria chamomella* on some serum biochemical parameters in male rabbits.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Serum urea</th>
<th>Serum creatinine</th>
<th>Aspartate amino transaminase (AST)</th>
<th>Alanine amino transaminase (ALT)</th>
<th>Alkaline phosphates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Groups</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (C)</td>
<td>89 ± 0.75</td>
<td>1.3 ± 0.30</td>
<td>35 ± 1.48</td>
<td>41 ± 1.02</td>
<td>63 ± 0.79</td>
</tr>
<tr>
<td>Treated (T)</td>
<td>72.8±1.96</td>
<td>0.47±0.44</td>
<td>21 ± 2.26</td>
<td>19.8 ± 1.98</td>
<td>43 ± 1.32</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SE, n=6
T: Rabbits received 70 mg / Kg B.W. of ethanolic extracted from *Metracaria chamomella*
Capital letters denoted difference between groups P<0.05 vs control.

Table, 2: Effect of ethanolic extract from *Metracaria chamomella* (Mc) on serum total protein, albumin and globulin concentrations (gm/dL) in male rabbits.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Total protein</th>
<th>Albumin</th>
<th>Globulin</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Groups</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (C)</td>
<td>42.40 ± 0.54</td>
<td>24.80 ± 0.83</td>
<td>17.8 ± 0.62</td>
</tr>
<tr>
<td>Treated (T)</td>
<td>68.60 ± 0.98</td>
<td>32.25 ± 1.14</td>
<td>31.6 ± 1.50</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SE, n=6
T: Rabbits received 70 mg / Kg B.W. of ethanolic extracted from *Metracaria chamomella*
Capital letters denoted difference between groups P<0.05 vs control.

Table, 3: Effect of ethanolic extract from *Metracaria chamomella* on Serum lipid profile concentration (mg/dl) in male rabbits.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>TC</th>
<th>STAG</th>
<th>HDL-C</th>
<th>LDL-C</th>
<th>VLDL-C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Groups</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (C)</td>
<td>71.6 ± 1.22</td>
<td>88 ±7.07</td>
<td>27 ± 0.38</td>
<td>27 ± 1.22</td>
<td>17.6 ± 0.70</td>
</tr>
<tr>
<td>Treated (T)</td>
<td>68.3±2.55</td>
<td>66.3±6.17</td>
<td>32±0.69</td>
<td>22.4 ± 1.89</td>
<td>13.6±1.67</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SE, n=6
T: Rabbits received 70 mg / Kg B.W. of ethanolic extracted from *Metracaria chamomella*
Capital letters denoted difference between groups P<0.05 vs control.

Table, 4: Effect of ethanolic extract from *Metracaria chamomella* on some hematological parameters in male rabbits.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Red blood cell count</th>
<th>Hemoglobin (gm/dl)</th>
<th>PCV (%)</th>
<th>Platelet count</th>
<th>White blood cell count</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Groups</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (C)</td>
<td>5.7±0.11</td>
<td>13.2±0.47</td>
<td>37.15±3.39</td>
<td>1208.75±3.4</td>
<td>6.6±1.13</td>
</tr>
<tr>
<td>Treated (T)</td>
<td>5.8±0.66</td>
<td>12.75±1.24</td>
<td>36.0±3.16</td>
<td>971.5±2.43</td>
<td>7.98±1.24</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SE, n=6
T: Rabbits received 70 mg / Kg B.W. of ethanolic extracted from *Metracaria chamomella*
Capital letters denoted difference between groups P<0.05 vs control.

The use of natural products due to natural available is a general trend now (27). The decrease in serum level of urea and creatinine in animals treated with chamomile might be due to the anti-oxidant activity of chamomile (28). In the present study the significant (P<0.05) decrease of serum AST, ALT and AP activity, the assay of these enzymes were important in the diagnosis of liver function and considered as a markers of liver dysfunction (29). The decrease of liver enzymes in animals that received chamomile indicates the hepatoprotective effect of chamomile (4). Liver is an important organ for protein synthesis, so the increase in serum level of total protein, albumin and globulin indicate the hepatoprotective effect of *Metracaria chamomella* (30). *Metracaria chamomella*
contain polyphenolic compounds had benefit by several mechanisms including direct free radical quenching protection and regeneration of liver cells (31) flavonoid accelerate regeneration process and production of liver cells which were responsible for protein synthesis (32). In the current study there were significant decrease in serum TC, TAG, LDL-C and VLD-L with significant increase in HDL-C concentration follows MC treatment indicating its hypolipidemic effect. (33) mentions that chamomella extract contain high content of flavonoid (63.3 %) most of them are apigenin and total phenolic compounds (23.2 %), bio active compounds reported to act as free radical scavenger (34). *Metracaria chamomella extract* as a natural material, lower blood cholesterol by two mechanisms by the presence of flavonoids that enhance the phosphorylation of HMG CoA reductase enzyme indirectly thus diminish endogenous cholesterol production. Also *Metracaria chamomella extract* appeared to protect LDL against oxidation and protected α tocopherol and other endogenous antioxidant in LDL from oxidation (35), which may be useful in alleviating the adverse effects associated with low density lipoprotein LDL cholesterol oxidation in atherosclerosis (36). Besides, (MC) Ethanolic extract caused significant elevation in serum HDL-C concentration that play an important role in plasma lipid transport of cholesterol from peripheral cells to the liver for excretion and catabolism (37) indicating its anti-atherosclerotic effect.

In this study *Metracaria chamomella* extract contained a flavonoid that declined platelet count which may be due to the inhibition of arachidonic acid metabolism by cyclooxygenase (38). Flavanoids of *Metracaria chamomella* extract (apigenin) were potent inhibitor for platelet aggregation, also *Metracaria chamomella* ethanolic extract had anti-oxidant effect (39), particularly (MC) had anti-thrombotic effect. It was direct scavenging free radical by maintaining proper concentration of endothelial prostacyclin and nitric oxide (40).

**References**

chamomile extract on biochemical and clinical parameters in rat model of polycystic ovary syndrome. J. Reprod. Infert. 3:169-174


تأثر المستخلص الكحولي الأثلي لنبات البابونج
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الخلاصة

هدفت الدراسة لمعرفة تأثير المستخلص الكحولي 70% لنبات البابونج
ذكور الأرانب
الفسيولوجيا Metracaia chamomella

وبجرعة 70ملغم/ كغم Metracaia chamomella
من وزن الجسم في بعض المعايير الفسيولوجية لذكور الأرانب. استُعملت في التجربة اثناعشر من ذكور الأرانب البالغة والتي قسمت
إلى مجموعة معالجة (معالجة) مجموعة السيطرة (السلسلة) وثاني الموظف بالكامل، فحص العينة ونقطة من الثانية. وفي مجموعة المعالجة والتي أعطيت المخلص الكحولي لنبات البابونج وجرعة 70ملغم/ كغم من وزن الجسم لمدة أربعة أسابيع وفي نهاية التجربة حيث عينت عينات من اللمب لمجموعة السيطرة والمعالجة. جزء من الدمن ورمي في النايف حاوية على ماعل تختير

دراسة مواد الإدمان والرضا الآخر قبل فصل من مصل الدم للدراسة البالوبوكيميائية. وقد أوضحنت نتائج الدالة حصول انخفاض

معنوي في مستوى الفسيولوجيا والكربونات والكربونات والكربونات والأيونات أمينترانسفيراز والكربونات والكربونات

فوق مستوى البروسيل والكلورين والكربونات والكربونات والكربونات بالأيونات في مستوى البروسيل والكلورين والكربونات والأيونات، والكربونات في مجموعتي السيطرة وا

بمعدلات معنوية. كما بنيت النتائج حصول انخفاض معنوي في مستوى البروسيل والكلورين في الدمن والأيونات، والكربونات في مجموعتي السيطرة وا

وغير مستوفين بلزام الدم، ولم تكن كليسترول الدم، ولا تلميذات الكلي في مستويات البروسيل والكلورين، وكليسترول عالي

هذا مع حصول انخفاض معنوي في عدد الصفائح الدموية ويرتفع معنوي في عدد خلايا الدم البيض بالمقارنة مع مجموعة

السيطرة. فضلا عن أن المستخلص الكحولي لنبات البابونج له تأثير خفيف هذوح ونشيط للكلوي في ذكور الأرانب.

الكلمات المفتاحية: نبات البابونج، البوريا، الكربونات، انزيمات الكبد، صوره الدهن، صورة الدمن.