EFFECT OF CORNELIAN CHERRY (CORNS MAS L.) EXTRACT ON SERUM T₃ AND T₄ LEVELS IN RAT MODEL

Mohammad Narimani-Rad and Alireza Lotfi
Department of Sport Science, Ilkhchi Branch, Islamic Azad University, Ilkhchi, Iran
(Corresponding: Mohammad Narimani-Rad, Department of Sport Science, Ilkhchi Branch, Islamic Azad University, Ilkhchi, Iran)

ABSTRACT
The aim of present experiment was to investigate the possible effects of Ip-injected cornelian cherry extract on serum T₃ and T₄ levels of experimental rat model. Animals were assigned into 6 experimental groups; group 1 as control 1 or intact group (without any injection treatment), group 2 as control 2 or placebo group (injected with solvent without cornelian cherry extract), and 4 groups with injection respectively with 50, 100, 200, and 400 mg/kg BW cornelian cherry extract. Blood samples were taken from heart after anesthesia. Next, blood samples were centrifuged and serums were analyzed for determination of T₃ and T₄ values. There was no any significant difference for T₃ and T₄ levels among experimental groups, whereas dosage increase had cause minor decline (not significant) in T₃ level. In conclusion, infusion of cornelian cherry extract in different dosages has not any effect on serum T₃ and T₄ levels, during 21 d experimental period. Present findings are in agreement with previous studies with cornelian cherry fruit (supplement) which there was no any considerable effect on thyroid hormones in short-term experimental period.

KEYWORDS: Cornelian cherry, ip-injection, rat, thyroid hormones.

INTRODUCTION
Cornelian cherry (Cornus mas L.) is a wild fruit from the Cornaceae family (Hassanpour et al., 2011). Cornus mas L. is a species of dogwood, native to southern Europe and Asia (Güleyüz et al., 1998; 4). Cornelian cherries are typically olive-shaped single-seeded fruits, and 10-23 mm long, originating from an inferior ovary (Hassanpour et al., 2011; Koyuncu et al., 2007). In Iran, cornelian cherry fruits are consumed freshly, dried whole, and pickled like olives (Hassanpour et al., 2011). The glucose and sucrose contents of fruit are in low concentration, and Fe, Ca, vitamins (α-tocopherol, biotin, riboflavin and ascorbic acid) are in high concentration in fresh cornelian fruit (Zargari, 1997). The nutrients contents of CCF are presented as table1.

Table1: Concentrations of some nutrients in cornelian cherry fruit (CCF), based on Craita-Maria et al., (2011) analysis.

<table>
<thead>
<tr>
<th>Compound</th>
<th>Moisture (% DM)</th>
<th>Ascorbic acid (mg/100g DM)</th>
<th>Carotenes (mg/100g DM)</th>
<th>Total sugar (mg/100g DM)</th>
<th>Total protein (mg/100g DM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh fruit</td>
<td>327.53</td>
<td>419.08</td>
<td>6.58</td>
<td>48.41</td>
<td>0.5</td>
</tr>
<tr>
<td>Dried fruit</td>
<td>9.12</td>
<td>228.82</td>
<td>0.77</td>
<td>63.22</td>
<td>0.27</td>
</tr>
</tbody>
</table>

DM: dry matter.

Determination of the amount of the thyroid hormones T₃ (triiodothyronine) and T₄ (thyroxine) in the plasma are considered an evaluation of thyroid function. Herbal medicine for treating thyroid dysfunction or disorders is common medical aspect in china (Dharmananda, 2013). Also, in this regard, effect of some medicinal plants extract such as Dorema acheri (Azarneushan et al., 2010), caraway (Dehghani et al., 2010) and is well studied.

Recent studies conducted with dietary form or extract of cornelian cherry were in relation to the metabolic and hormonal responses of laboratory models (Rasoulian et al., 2012; Narimani-Rad et al., 2013; Abdollahi et al., 2014; Lotfi et al., 2014), and there is no any available report on effect of infused cornelian cherry extract on thyroid hormones. In present study, effect of hydro-methanolic extract of cornelian cherry on serum T₃ and T₄ has been studied.
MATERIAL AND METHODS
96 wistar rats with 200±20 g body weight were selected for present study. Experiment was conducted in animal room with 40-60 Rh and 22±2 ºc temperature. Animals were assigned into 6 experimental groups; group1 as control 1 or intact group (without any injection treatment), group 2 as control 2 or placebo group (injected with solvent without CCF extract), and 4 groups with injection respectively with 50, 100, 200, and 400 mg/kg BW CCF extract.

After one week adaptation period, hydro-methanolic extract of CCF were injected to animals due to IP(Intra-Protaneal)-injection. Group placebo had received solution (saline) without CCF. After 48h, the blood samples were taken from heart, following anesthesia. Blood samples were centrifuged and serums were analyzed with Elisa kits (Pars Azmoon Kit, Pars Azmoon Company, Tehran) for determination of T3 and T4 concentrations.

Obtained data analyzed with SAS software Ver. 9.1 was subjected to Duncan multiple range tests to detection on possible significant differences between means of groups. Experiment was conducted in according to animal ethics.

RESULTS AND DISCUSSION
Data presented in table 2 shows that there is no considerable changes in any groups for any thyroid hormones. Different dosages of CCF extract didn’t have effect T3 and T4 values.

Table2. Effect of infused hydro-methanolic extract of CCF on thyroid hormones level

<table>
<thead>
<tr>
<th>Variable</th>
<th>T3 ng/ml</th>
<th>T4 µg/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control; intact</td>
<td>0.76</td>
<td>1.06</td>
</tr>
<tr>
<td>Control; placebo</td>
<td>0.74</td>
<td>0.90</td>
</tr>
<tr>
<td>50 mg/kg BW CCF</td>
<td>0.64</td>
<td>1.30</td>
</tr>
<tr>
<td>100 mg/kg BW CCF</td>
<td>0.60</td>
<td>1.08</td>
</tr>
<tr>
<td>200 mg/kg BW CCF</td>
<td>0.56</td>
<td>1.30</td>
</tr>
<tr>
<td>400 mg/kg BW CCF</td>
<td>0.80</td>
<td>1.20</td>
</tr>
<tr>
<td>P value</td>
<td>0.1041</td>
<td>0.3077</td>
</tr>
<tr>
<td>SEM*</td>
<td>0.1301</td>
<td>0.2211</td>
</tr>
</tbody>
</table>

* Standard error of means.
- Different letters (a, b, and c) shows significant difference, p<0.05.

Cornus mass L. is included in herbal mixtures in the article entitled “Treatments for thyroid diseases with Chinese herbal medicine” (Dharmananda, 2013), but its direct effect of CCF extract was not investigated in any published literature.

Only, Lotfi et al., (2014) had a study on dietary supplementation of whole CCF beside daily meals. In Lotfi et al., (2014), the dietary supplementation of CCF has considerable effect on some metabolic and hormonal indices, but there was no any effect on thyroid hormones in CCF-fed hamsters. Our results (table 2), is in agreement with Lotfi et al., (2014) study with whole CCF.

CONCLUSION
In conclusion, peripheral infusion of cornelian cherry extract (in 50, 100, 200, or 400 mg/kg BW dosages) have no considerable effect on T3 and T4 hormones in rat model.
REFERENCES