SENSORY EVALUATION AND ANTIOXIDANT EFFECT OF A NEW RED GINSENG MARC-ADDED GREEN TEA

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Summary

Red ginseng marc. is made from the by-product of red ginseng, however, it still retains the flavor of red ginseng. This study was carried out to investigate the sensory evaluation and physiological effect of a red ginseng marc-added green tea. To make a new tea with a pleasing flavor and functional property, red ginseng marc. powder (40%) was added to green tea (60%) and semi-fermented tea (60%), respectively. The red ginseng marc.+green tea and red ginseng marc.+semi-fermented tea scored higher than green tea in the sensory evaluation of tea infusions, aroma, taste and overall acceptability. The antioxidant activity as a physiological function of tea infusions was tested by using the DPPH method. When mixed with red ginseng marc., both the green tea and the semi-fermented tea showed a synergistic effect of antioxidant.

Key words
Red ginseng marc., sensory evaluation, antioxidant activity, synergistic effect

Introduction

Nowadays green tea is known worldwide. It has been consumed mainly in Asian countries because along with its good flavor and pharmacological functions. The root of ginseng has been used in traditional oriental folk medicine for a long time. This study was carried out in order to investigate the sensory and physiological effect of a new red ginseng marc.-added green tea. If this new red ginseng marc.-added green tea scores high in the sensory evaluation, and if its pharmacological effect are verified, mass production of red ginseng marc.-added green tea in teabags would be a possibility.

Materials and Methods

Materials. Korean semi-fermented tea (Hwa-Gae, Korea, 2003) and parched green tea (Bo-Sung, Korea, 2003) were used. Red ginseng marc. powder was obtained from Oriental Biotec Co.(Busan, Korea). DPPH (1,1-diphenyl-2-picrylhydrazyl, 90%) was purchased from Sigma Chemical Co.(St. Louis, MO, USA).

Sample preparation. Three treatments were made, namely, red ginseng marc. powder (40%) + parched green tea (60%) (I), red ginseng marc. powder (40%) + semi-fermented tea (60%) (II), and green tea (100%) (III).

Sensory evaluation. The infusion of respective tea is used for sensory evaluation. Twenty five trained panel members evaluated the samples (I, II and III) using a scoring method (line scale, 9 points) for evaluating color, aroma, taste, overall acceptability.

Measurement of antioxidative activity. Preparation of test sample solutions: Respective material powder was extracted with water of 150 mL at 80°C for 3min. After filtering, the extracts were used. A test sample solution 1mL was added to 2x10^{-6}M DPPH ethanolic
solution (4mL). After voltexing, the mixture was measured. The DPPH radical scavenging activity of sample was compared with that of BHT and BHA (100 ppm in MeOH).

Results and Discussion

Sensory evaluation. Table 1 describes the sensory evaluation results of infusion of red ginseng marc. + green tea (I), red ginseng marc. + semi-fermented tea (II) and green tea (III). The scores for the aroma and taste of red ginseng marc. + green tea had higher value than those of green tea, though there were no significant changes. Overall acceptability also showed higher score by red ginseng marc. + semi-fermented tea (II) > red ginseng marc. + green tea (I) > green tea (III).

Table 1. Sensory score of red ginseng+green tea (I), red ginseng+semi-fermented tea (II) and green tea (III)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>6.12±0.30</td>
<td>6.36±0.30</td>
<td>6.56±0.34</td>
</tr>
<tr>
<td>Aroma</td>
<td>5.88±0.37</td>
<td>5.44±0.35</td>
<td>4.96±0.35</td>
</tr>
<tr>
<td>Taste</td>
<td>5.56±0.38</td>
<td>5.04±0.38</td>
<td>4.72±0.27</td>
</tr>
<tr>
<td>Overall acceptability</td>
<td>5.52±0.33</td>
<td>5.64±0.28</td>
<td>5.24±0.28</td>
</tr>
</tbody>
</table>

1) I : red ginseng+green tea  2) II : red ginseng+semi-fermented tea  3) III : green tea
4) Value and Mean±SE for n=25

The response distribution tendency for each sample by frequencies of acceptance test is shown in Fig. 1. Since the general responses were "moderate" in overall acceptability, color, aroma and taste for samples(I), (II), and (III), it may be worth producing new products with ginseng.

Comparision of antioxidant activity. The DPPH test to measure antioxidant activity showed that red ginseng had inhibition measurement of 24.3% and green tea had inhibition measurement of 91.6%, and semi-fermented tea had inhibition measurement of 93.9%. On the other hand, the red ginseng marc.+green tea had inhibition measurement of 94.0% (theoretical value 64.64%) and red ginseng marc.+ semi-fermented tea had inhibition measurement of 94.40% (theoretical value 64.02%).

Acknowledgement

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