Effect of facial cosmetic containing Prunus persica L. Batsch leaves extract on men’s skin condition

Hye-Jin Kwon¹, Hye-Rroon Jang²

Abstract

Today, men's appearance is an important part of the global fashion industry, including Korea, with such fashion concepts as the Metrosexual and Ubersexual. Domestic and overseas beauty and cosmetics related organizations are using this phenomenon for marketing and researching to improve the function of cosmetics. The purpose of this study was to investigate the effect of Prunus persica L. Batsch leaf extract on the skin condition after clinical application to male subjects with oily skin to determine the possibility of functional cosmetics utilizing this extract. The cleansing bars were prepared by the MP method and the cleansing packs were prepared using natural ingredients. After 8 weeks of application, moisture, oil, erythema, melanin, pH, elasticity and tactile sensation were measured using MPA5. The results showed that there was a statistically significant difference in T-zone moisture and T-zone oil after using the natural cleansing bar, but there was no significant difference between the two groups for other items. However, the statistically significant changes were found in the individual skin condition change items of the subjects in each group, and it was judged that the two kinds of formulations could be used at the same time to have a higher skin improvement effect. Thus, Prunus persica L. Batsch leaf extract demonstrates potential to be used as a functional cosmetics item.

Keywords : Prunus persica L. Batsch leaves, Extract, natural soap, natural pack, men’s skin condition

1. Introduction

Men who have grown up in an era of women’s rights and compete in society with women have adopted traits that would traditionally be considered to be gender neutral, and are moving away from masculinity as it was defined in the past. Physical appearance has become another area that people compete in and use to demonstrate ability. A new word, "Grooming group," which refers to a man who decorates his work as a reflection of this phenomenon, has been born [1]. "Grooming" refers to the act of investing generously in cultivating oneself and

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has the lexical meaning of the appearance, the behaviors that make skin or hair-style look attractive, or the care and management of the appearance or style. This is a male beauty treatment term that corresponds to a woman’s beauty, and can be seen as an act to enhance appearance, such as shaving, skin care, hair care, dental care, and plastic surgery, in order to enhance oneself [2]. Generalizations about grooming group reflect changes in the men’s cosmetics market. Despite the global economic downturn, sales for the beauty and fashion industries, which are strongly connected with men’s concern with their appearance, are steadily rising. According to Euromonitor, a global market research company, the market for men’s skincare has doubled from 2009 to 2014, and the men’s cosmetics market per capita accounts for one-fifth of the global cosmetics market [3].

Cosmetics are now recognized by many men as an ‘essential consumer product’ rather than an optional consumer product. Consumers’ preference for eco-friendly raw materials has also increased due to the ‘cosmetic ingredient labeling system’ introduced in October 2008. Naturalistic cosmetics have also recently emerged [4]. According to a survey in the domestic media, about 60% of domestic consumers using cosmetics are most concerned about adverse reactions and ingredients when purchasing cosmetics. In recent years, consumers’ safety requirements for cosmetics are growing [5].

Skin is a tissue covering the external surface of the body. It is composed of the epidermis, dermis, and subcutaneous tissue. It protects the body physically and chemically from elements outside of the body, and at the same time it carries out biochemical functions necessary for the metabolism of the whole body [6]. The basic skin structure of men and women is the same. The surface layer of skin of men and women is not very different before puberty, but with the advent of puberty, men begin to make the male sex hormones androgens and testosterone, and women the female sex hormones estrogen and progesterone, [7]. Skin is classified into four types according to the function of the sebaceous glands, the amount of oil, and the amount of water. These four types of skin are normal, dry, oily and complex skin. Skin can be further classified according to tissue state, moisturizing state, sebaceous secretion state, and skin elasticity [8].

In order to keep your skin healthy, it is important to know your skin condition and to plan efficient management accordingly. In general, skin care begins with cleansing to remove dirt on the skin surface [9]. Cleansing products are becoming more advanced, specialized and specific as manufacturing and cosmetic technologies are developed and the evolution of products continues. The use of foam cleansers has become commonplace in cleansing, and the product range that has been devoted to cleansing creams and cleansing foams is expanding to products
that include cleansing oils, gels, lotions, water, and scrubs of various ingredients [10]. The purpose of this study was to investigate the effect of the raw material peach leaf, a natural material, and to investigate the effect of polyphenols contained in peach leaf on the activity of tannin component as an antioxidant and an anti-bacterial. A natural cleansing bar containing a peach leaf extract, and a cleansing pack were prepared to measure any skin improvement effected by self-administration, and to evaluate its effect on skin condition change and its suitability as a raw material for cosmetics.

2. Theoretical background

2.1 Natural soap

In chemistry, “a soap is the salt of a fatty acid. Household uses for soaps include washing, bathing, and other types of housekeeping, where soaps act as surfactants, emulsifying oils to enable them to be carried away by water.” [5:p9] “Soaps for cleaning are obtained by treating vegetable or animal oils and fats with a strong base, such as sodium hydroxide or potassium hydroxide in an aqueous solution.” [5:p9] “Fats and oils are composed of triglycerides; three molecules of fatty acids attached to a single molecule of glycerol.” [5:p9] “The alkaline solution, which is often called lye (although the term “lye soap” refers almost exclusively to soaps made with sodium hydroxide), induces saponification.” [5:p9]

The term natural soap means that natural vegetable oils such as soybean oil, olive oil and palm oil are reacted with potassium hydroxide (KOH) and made by hand [9]. In this process, natural antioxidant and antimicrobial materials were tested in the process of reconstituting soaps to find effective substances for improving skin beauty and skin health, and the strengths and advantages of natural soaps were secured through professional chemical calculation.

MP soap, known as melted swelling soap, a compound of the words Melt (melting) and Pour (pouring), is soap which is made by adding heat, then adding powder, fragrance, moisturizer and functional additives to the soap base already made [10]. Cold Process Soap is produced by soaking the oil and caustic soda (NaOH) at a low temperature (40 ~ 55 °C) in such a way that the nutrients and inherent characteristics of the oil which is the main material of the soap are not denatured by heat. It is poured into a mold, kept warm for 24 ~ 48 hours, cut into a suitable size, and aged for 4 to 6 weeks in a well-ventilated place. Hot Process Soap is a manufacturing method that rapidly induces the saponification process through physical heat treatment in processing process. It mixes natural oil, caustic soda, water at 70 °C or
higher and then adds a solvent. This process takes 4 weeks or more with incense. Rebatching Soap is the process of reprocessing previously made soap, and is another type of cold process soap. It involves grating up the soap in, for example, a steel cheese grater, adding other ingredients such as functional additives and preservatives, then melting and remolding it. This process allows you to minimize the use of expensive additive sand to maximize the natural, soft feeling of the soap. [10]

2.2 Prunus persica L. Batsch leaves

Polyphenols and flavonoids, which are known to have antioxidant properties and antimicrobial activity, are functional ingredients contained in most plants, but their characteristics and contents vary depending on the species of plant. The antioxidants contained in peach leaves are known to have the effect of relieving rashes and eczema when they are put into baths because they have antioxidative, antibacterial and anti-inflammatory reactions with nitrile glycosides, naringenin, quinic acid, lycopene and tannin. [11]

One of the most common food allergies is to peaches, but recently it has been reported[12] that this allergy does not appear to be any more common than allergens such as eggs, milk, buckwheat, peanut, soybean, wheat, mackerel, crab, shrimp and pork. Further, the allergy inducing components are not found in leaves or stems. Peach-related studies have examined areas such as the cholinesterase inhibitory action of cholinesterase-inhibiting cholinesterase inhibitors [11], the mitigation of adverse effects of cisplatin-induced hepatotoxicity [12], the detoxification of tobacco toxins, and the development of peach-containing nicotine-detoxifying anti-cancer functional materials [13].

3. Experiment and result

3.1 Extraction and production of natural additives

In this study, we use Prunus persica L. Batsch leaves, which were harvested at orchards in Gyeonggi province, Korea, before leaf growth stopped. The harvested peach leaves were shredded to a shade of 250mesh (about 65㎜) or less after shading. 10 g of the powder was suspended in either 500 mL of purified water or 99.9% ethanol, and the mixtures were allowed to stand at 15 ℃ for about 48 hours and then extracted. The ethanol-extracted filtrate was vacuum-dried to remove ethanol, and then dissolved in tertiary distilled water to adjust
the final volume to 100 mL. The water-extracted filtrate was lyophilized, and dissolved in tertiary distilled water.

The cleansing bar containing peach leaf extract was prepared by the dissolution method (MP) using the method of Lim (2007). 96 g of the soap base which had already been prepared was boiled, and 2 g of glycerin and 2 g of ethanol extract of peach leaf were poured into a soap frame to be hardened and then used. The natural pack containing the extract was prepared by mixing 4 g of leaf extract powder, 4 g of domestic wheat flour (Baekseoul, Kyungnam) and 12 g of distilled water using the method of Kang [3].

3.2 the preparation from leaf Extract

The Prunus persica L. Batsc leaves used in this study were harvested immediately after fruit harvest and before leaf growth was stopped from orchards in Guan county, Gyeonggi Province in October. The harvested peach leaves were shredded to a shade of 250 mesh (about 65 mm) or less after shading. 10 g of the powder was suspended in both 500 mL of purified water and 99.9% ethanol respectively, and the mixture was allowed to stand at 15 DEG C for about 48 hours. The ethanol-extracted filtrate was vacuum-dried to remove ethanol, and then dissolved in tertiary distilled water to adjust the final volume to 100 mL. The water-extracted filtrate was lyophilized and dissolved in tertiary distilled water to give a final volume of 100 mL.

The cleansing bars containing peach leaf extract were prepared by the dissolution method (MP) using Lim’s method (2007) [7]. 96 g of the soap base already prepared was boiled in water, 2 g of glycerin and 2 g of ethanol extract of peach leaf were added, and the mixture was poured into a soap frame and then taken out. The preparation of the cleansing pack containing the extract was prepared by mixing 4 g of leaf extract powder, 4 g of domestic wheat flour (Baeksong, Kyungnam) and 12 g of distilled water using Seoseun’s method (2010) [7].

3.3 Measuring and evaluating changes in skin condition

The study selection criteria for any subjects included being able to explain any side effects, skin moisture, any erythema, that the melanin and the pH of the face are in the normal range and that the skin oil fraction is in the range of the oily skin. Between the 14th August 2014, and September 23rd, 2014 (about 8 weeks), 14 people agreed to participate in the
experiment peeling peach leaf extract containing 2% peach leaf. A skin cleansing pack containing 20% of the extract was prepared and applied to the skin to measure changes in skin condition. To receive preliminary approval from the IRB (subject to deliberation, human research that can exempt the deliberation of the institutional committee in accordance with article 15, paragraphs 2 or 13 of the Enforcement Rule) post-treatment. Changes in skin conditions were measured with a Multi probe Adapter System MPA5 instrument from Courage & Khazaka (C + K electronic GmbH, Cologne, GERMANY). All the measurements obtained in this study were expressed as mean ± SD. The significance between the mean values was analyzed using the SPSS 21.0 program (SPSS Institute, KOREA). The statistical significance was analyzed at 5% level.

3.4 Experiment Result

3.4.1 Homogeneity validation and skin condition change

Fourteen adult male subjects with oily skin were randomly divided into two groups, and homogeneity was verified based on T-zone moisture, oil, U-zone oil, erythema, melanin, pH and elasticity. There was no statistically significant difference in skin condition.

3.4.2 Skin condition changes with use of natural cleansing bar

T-zone moisture, T-zone oil, U-zone oil, pH, and tactile sensation changes are shown in Table 1 for the use of the natural cleansing bar. Results show that there was no significant difference in the items T-zone moisture, T-zone oil, U-zone oil, pH, and tactile sensation.

The results of Lee’s study (2009) using adult soap for 5 weeks with natural soap were consistent with the results of this study showing statistically significant changes in oil and moisture in the forehead region [5]. Lee’s study (2009) demonstrated the superior efficacy of natural soaps by comparing natural and synthetic soaps [5]. In Ahn’s study (2010), which examined consumers’ perception of natural soap, 67.1% of male respondents answered ‘heard’ when asked about natural soap, 57.5% of respondents answered ‘I do not know’, to a question asking them if they knew of the existence of male soap, indicating that knowledge of the existence of male soap was very low [12]. However, male skin is thicker than female skin, sebaceous glands are more developed, and frequent shaving may result in a rougher skin texture, so it is very important to use the correct cleanser. Resultantly, it is considered that the use of a cleansing bar containing Prunus persica L. Batsch extract is very effective in improving male skin having oily characteristics and to help properly maintain the water
content of the skin.

[Table 1] Result of using natural soap (Prunus persica L. Batsch leaves extract)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control group (N=14)</th>
<th>E group (N=14)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>U-zone Sebum</td>
<td>65.26</td>
<td>24.14</td>
<td>58.43</td>
<td>22.01</td>
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<td>T-zone Sebum</td>
<td>187.07</td>
<td>26.18</td>
<td>153.14</td>
<td>28.51</td>
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<tr>
<td>Moisture (AU)</td>
<td>66.84</td>
<td>9.81</td>
<td>75.56</td>
<td>6.93</td>
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<tr>
<td>Friction (AU)</td>
<td>248.80</td>
<td>84.92</td>
<td>209.82</td>
<td>77.51</td>
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<td>pH (AU)</td>
<td>6.08</td>
<td>0.50</td>
<td>6.43</td>
<td>0.43</td>
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</table>

**p<0.01

3.4.3 Skin condition change with use of a natural cleansing pack

Table 2 shows changes in skin condition with and without natural cleansing packs. The T-zone moisture of the subjects using the control pack containing no leaflet powder on the right side was 79.70 AU and 78.97 AU, while the T-zone oil was 135.57 μg/cm² and 139.43 AU on the right side. Skin elasticity was 224.50 AU and 233.79 AU, while the U-zone fraction was 61.29 μg/cm² and 58.71 μg/cm², the erythema was 407.10 AU and 397.84 AU, the melanin was 205.37 AU and 211.59 AU, the tactile sensitivity of AU was 202.89 AU and 222.30 AU, indicating that there was no significant difference between the two groups in most items.

In Song's Research (2012) into the use of natural soaps and natural packs containing mulberry leaf extract, the greatest skin improvement effect was observed in the experiment group using both the natural soap and the natural pack, and the group using only natural soap and only the natural pack. In this study, there was no significant improvement after using only the natural packs. However, use of the cleansing bar and the cleansing pack at the same time appears to be very effective in improving the oil and moisture of oily skin.

[Table 2] Result of Differences with natural soap and Pack (Prunus persica L. Batsch leaves extract)

<table>
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<th>Before C group (N=7)</th>
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<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
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<td>T-zone Moisture</td>
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<td>78.97</td>
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<tr>
<td>zone</td>
<td>Sebum (μg/cm²)</td>
<td>Erythema (AU)</td>
<td>pH (AU)</td>
<td>Friction (AU)</td>
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<tr>
<td>-------------</td>
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<tr>
<td>T-Zone</td>
<td>153.14</td>
<td>423.77</td>
<td>6.43</td>
<td>209.82</td>
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<td>T-Zone</td>
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<td></td>
<td>139.43</td>
<td>397.84</td>
<td>5.92</td>
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<td>407.10</td>
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<td></td>
<td>.550</td>
<td>.801</td>
<td>.512</td>
<td>.642</td>
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</table>

### 4. Conclusion

The results of the 8-week final test on the use of the natural cleansing bar and the natural cleansing pack showed statistically significant differences in the items of T-zone moisture and T-zone oil after using the natural cleansing bar, but there was no significant difference between the groups for the other items. Additionally statistically significant changes were found in the individual skin condition change items of the subjects in each group, and when the two formulations were used at the same time, it was considered that they would have a higher skin improvement effect, thus showing the possibility to be used as a new natural raw material. Therefore, it is necessary to elucidate the effect of Prunus persica L. Batsch extract and its mechanism of action on changes in oily skin condition through further analysis of specific factors affecting skin condition change in the future.

### References


[9] S.E. Kim, Metrosexual trend and body image of male adults according to the level of skin care, (2008), Kohshin University Master's Thesis.


