ประสิทธิผลของน้ำสกัดจากกากชาในการลดสภาพความมันบนใบหน้าและหนังศีรษะ
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บทคัดย่อ
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บทนำ: สวนแทนนินมีคุณสมบัติทางอนุมูลอิสระ, ฝาดสมานและการกักมัน
วัตถุประสงค์: เพื่อศึกษาประสิทธิภาพของน้ำสกัดจากกากชาในการลดความมัน, ลดสิว
วนไประน้าและหนังศีรษะ.
วิธีการ: รูปแบบการวิจัยเป็นการศึกษาเปรียบเทียบความแตกต่างของกลุ่มแบบก่อนและหลังการทดลอง.
ประชากรที่ศึกษาเป็นผู้มีสภาพผิวหน้ามัน, มีสิวเสี้ยน, ผด, อายุต่ำกว่า 33 ปี.
ใช้น้ำสกัดจากกากชาด้วยเครื่องวัดปริมาณความมัน.
วิธีการวิเคราะห์: ใช้วิธีการวิเคราะห์ความแตกต่างของค่าปริมาณความมัน
โดยใช้สถิติ t-Test.

ผลการศึกษา:
ความมันบนใบหน้าและหนังศีรษะของกลุ่มทดลองลดลงอย่างมีนัยสำคัญทางสถิติ (p<0.05).
นอกจากนี้, ยังพบการลดของสิวจากการสังเกตจากภาพถ่าย.

ผลการทดสอบความพึงพอใจของผู้และหนังศีรษะของผู้มีสิว
ได้รับน้ำสกัดจากกากชาลดลงในวันที่ 28 และ 56 อย่างต่อเนื่อง.

สรุปผล:
น้ำสกัดจากกากชาสามารถช่วยลดความมันบนใบหน้าและหนังศีรษะได้.

ค่าสัคคัญ: ที่, แทนนิน, สิว

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Abstract

The Efficacy of Aqueous Extract from Tea Leaf Residue to Reduce Grease on the Face and the Scalp

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Introduction: Tannin shows properties of antioxidant, astringent and oil reduction. It still remains high content in the tea leaf residue after a few infusions of the drink. Objective: This research was to study the efficacy of the aqueous extract from tea leaf residue to reduce oiliness on the face and the scalp. Materials and Methods: Eight volunteers of both genders, aged 18-33 years old who had oily face, small pimples, and acnes, had never received any medical treatment for the oily face or facial pimple prior to the beginning of the study were asked to use the aqueous extract from tea leaf residue to wipe their faces and rinse their scalps after cleaning their faces and scalps for a period of eight weeks. Analysis was conducted by 1) measuring the oil quantity of the foreheads and scalps of the volunteers prior to starting the experiment on day zero and then on the 28th and 56th days by “Sebumeter”, 2) checking the reduction of pimples from photographs, and 3) conducting assessment of the volunteers satisfaction after using the tea extract with a “Visual Analog Scale”. Results: The oiliness of the volunteers’ faces and scalps was gradually reduced by the 28th and 56th day after application of the aqueous extract from tea leaf residue. There was a statistically significant difference (p<0.05) when the results were compared from the start to the 56th day of the experiment. In addition, the amount of pimples was reduced after visual inspection of the photos. Most of the volunteers agreed that the aqueous extract from tea leaf residue reduced the oiliness on the face and the scalp, but the volunteers were not satisfied with the smell and color of the extract. Conclusion: The aqueous extract from tea leaf residue can reduce oiliness on the face and the scalp with statistically significant difference after a period of 56-days continuous use.

Keywords: tea leaf residue, tannin, acnes

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Introduction

A pimple is a type of acne, the main result of excess sebum getting clogged in the pores of sebaceous glands. Acne is common in adolescents, who have oily face and scalp because of high levels of hormones. Causes of acne can be from the hormonal change, stress, bacterial growth in the pores of sebaceous gland, allergy to medication or cosmetics, etc. It can be treated by a wide variety of treatments, including eradication of the bacteria using medications, comedone extraction, light therapy, laser dermabrasion, etc. Reducing facial sebum may be another method to unclog the pores of sebaceous glands.

Tea [Thea sinensis L. or Camellia sinensis (L.) Kuntze var. assamica (Mast.) Kitam.] is one of the most favorite drinks. It is composed of polyphenols, caffeine and related compounds, protein and amino acids, carbohydrates, organic acids and vitamins. The most common flavonoid-type polyphenols in tea are the flavan-3-ols, which are present in relatively large amounts in tea compared to their levels in other foods. The flavan-3-ol subclasses are ranked by the degree of polymerization. The catechins are monomers [(+) catechin, (-)-epicatechin, (-)-epicatechin 3-gallate, (-)-epigallocatechin, (-)-epigallocatechin 3-gallate and
(+)-gallocatechin); the theaflavins are dimers [theaflavin, theaflavin-3, 3’-digallate, theaflavin-3’-gallate and theaflavin-3-gallate], and the derived tannins, thearubigins, are oligomers. Other flavonoids, including the flavonols (quercetin, kaemperol, myricetin) and flavones (apigenin and luteolin), are also present but in lesser amounts than the flavan-3-ols (Peterson et al., 2005). According to a report released by USDA (2011), in a 200-ml cup of tea (infusion from 2 g of dry tea), the mean total content of flavonoids is 238.64 mg for black tea. It is difficult to compare flavonoid contents for teas obtained from different sources. The tea drink characteristics are affected by tea particle size, weight, tea/water ratio, time and temperature. Adjustment for infusion time was not so important since most of flavonoid compounds are extracted rapidly. The infusion time of 4 minutes is satisfactory for most drinking purposes (Lakenbrink et al., 2000). After a few infusions, the residue of tea leaves was usually thrown away as waste. High content of a polyphenolic compound, tannin, still remains in the tea leaf residue. Tannin shows strong antioxidant property and gives astringency (Reynolds, 1989; Ding et al., 1992; Lesschaeve and Noble, 2005). It is a potential antiviral (Lü et al., 2004), antibacterial (Akiyama et al., 2001) and gives antiparasitic effects (Kolodziej and Kiderlen, 2005). Tannin is also good for oil reduction. However, the use of tea leaf residue has limited study. Therefore, to increase the value of the tea leaf residue, the property for reducing oil of tannin, which remains in tea leaves, was used in this study. The objective of this study was to study the efficacy of the aqueous extract from black tea leaf residue to reduce grease on the face and the scalp.

**Methods and Equipment**

*Preparation of the aqueous extract from black tea leaf residue*

Twenty-five grams of black tea leaves were placed in a 500-ml beaker, infused with 200 ml boiling water for 2 min, and the aqueous solution discarded. The tea leaf residue was boiled with 1 L water for 25 min and filtered through a cotton sheet. The aqueous solution was reheated to boil. It was left to cool to room temperature then poured into a 150-ml plastic bottle with closure, using aseptic technique. The solution was kept at -10 °C until use.

*Experimental design*

This research study was conducted to compare the differences in an experimental group before and after using the extract for 8 weeks. This study gained approval from the Khon Kaen University Ethics Committee in Human Research, HE 512083, February 4, 2009.

*Subjects*

**Inclusion criteria**

The study subjects were 8 healthy volunteers of both genders, aged 18-33 years old, who had oily face, small pimples and non-inflammatory acnes. The volunteers had never received any medical treatment for oily face or facial pimple prior to the beginning of the study. The study was conducted after they had signed a consent form.

**Exclusion criteria**

1. Subjects who had inflammatory acnes or acne caused by allergy.
2. Subjects who had sensitive skin.
3. Subjects who could not follow the procedure of the research methodology.

*Termination criteria*

Subjects who developed an allergy from the product.

*Procedures*

The volunteers were asked to continually use the aqueous extract from tea leaf residue to wipe their faces and rinse their scalps after cleaning their faces and scalps for a period of 8 weeks (56 days). The product was asked to throw before use and to keep frozen after each use.
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**Analysis was conducted by**

1. Measuring the oil quantity of the foreheads and scalps of the volunteers prior to starting the experiment on day zero and then on the 28th and 56th days with a sebumeter (Skin-pH-meter Sebumeter Corneometer, Derma Unit SSC3, Courage-Khazaka Electronic, Cologne, Germany),

2. Checking the reduction of pimples from photos (digital camera, image resolution of 6 megapixels), and

3. Conducting assessment satisfaction of the volunteers after using the tea extract with a “Visual Analog Scale”.

**Statistical analysis**

Amounts of oil are expressed as means ± standard deviations of the 8 subjects. The significance of differences between before and after the treatment was determined using paired t-test. The p-value less than 0.05 indicated a statistically significant difference.

**Results and Discussion**

The efficacy study of the aqueous extract from tea leaf residue to reduce the oil quantity from the foreheads and scalps of the volunteers as measured by Sebumeter showed that the oiliness of the volunteers’ faces and scalps was reduced by the 28th and 56th days after applying. There was a statistically significant difference (p<0.05) when the results of either on the face or scalp were compared from the start to the 56th day of the experiment as shown in Figure 1.

![Figure 1](image.png)

**Figure 1.** Oil levels on the face and scalp before and after applying the aqueous extract of tea leaf residue.
The effectiveness of the aqueous extract of tea leaf residue to reduce the number of pimples was observed by visualization and inspection of the photos as shown in Figure 2. The reduction of the number of pimples was correspondent to the reduction of the amount of oil on forehead and scalp. However, the variation of measuring number of pimples was high in individual subject due to the cause of the pimples such as emotional stress, hormonal change during the cycle of the menstruation, etc.

![MS02(Day 0)](image1)
![MS02(Day 56)](image2)

Amount of oil on forehead was 138 mg/cm²
Amount of oil on forehead was 69 mg/cm²

![FS06(Day 0)](image3)
![FS06(Day 56)](image4)

Amount of oil on forehead was 107 mg/cm²
Amount of oil on forehead was 94 mg/cm²

Figure 2. The photos show the foreheads of the subjects no. MS02 and FS06, comparing before and after applying the aqueous extract from tea leaf residue.

Most of the volunteers agreed that the tea extract reduced the oiliness on the face and the scalp, but the volunteers were not satisfied with the smell and color of the extract. Dry hair and the difficulty of hairstyles setting were also disadvantages of the product. The volunteers suggested that more research was necessary to develop more practical and proper product designs. Alternatively and perhaps more suitably, tea leaf residue may be used as a household remedy, where its aqueous extract is kept frozen and then used directly whenever needed.

The reduction in the amount of oil and the number of pimples on the face by the aqueous extract from tea leaf residue is similar to the results of the extract of fruit rind of Guttiferae (Garcinia mangostana Linn.), reported by Pothitirat et al., 2009. Both extracts contain high levels of flavonoids and tannins.

**Conclusion**

The aqueous extract from tea leaf residue can reduce oiliness on the face and the scalp with statistically significant difference after a period of 56-days continuous use.

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