

A Study on the Bioactive Characteristics of Samdachal Extract as a Cosmetic Material

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Introduction:

Setaria italica (foxtail millet) is the second-most widely planted species of millet, and the most important in East Asia. Samdachal was developed and registered by department of functional crop, NICS (National Institute of Crop Sciences), RDA (Rural Development Administration) in 2011. It is rich in calcium and dietary fiber, so many studies have been conducted as food. However, the effects of samdachal extract (SE) on the bioactive characteristics as a cosmetic material were not investigated. In this study, we investigated identification of anti-bacterial, anti-inflammatory and moisturizing effects from SE. Also, we determined content of *p*-coumaric acid, the chemical composition from the SE.

Materials & Methods:

Materials

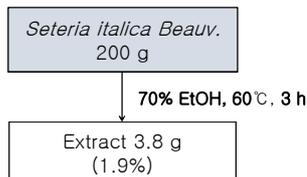


Figure 1. Samdachal and extraction procedures

- ▶ Scientific name : *Setaria italica* Beauv.
- ▶ English name : Samdachal
- ▶ Distribution : Gangwon-do, Gyeongsang-do and Jeju Island, Republic of Korea

Methods

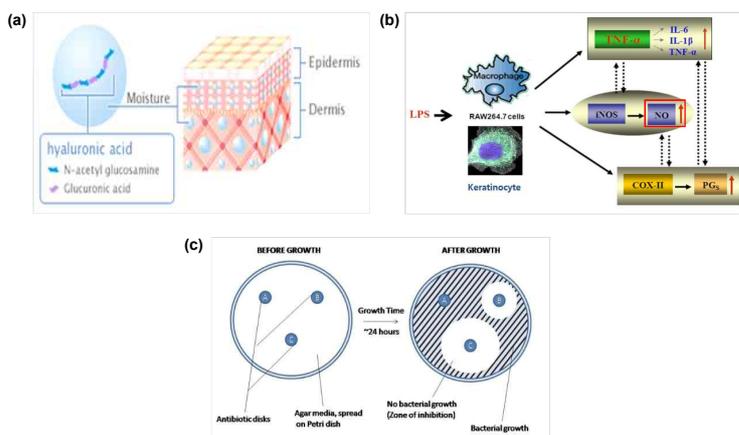


Figure 2. (a) Assay of hyaluronic acid (HA). HA content was determined as the supernatant of SE-treated HaCaT cells using enzyme linked immunosorbent assay (ELISA). (b) Nitric oxide (NO) assay. SE was examined for anti-inflammatory effect using RAW264.7 murine macrophage cells stimulated with LPS. NO production was determined using griess reagent. (c) Paper disc diffusion assay. SE was identified as clear zone by paper disc diffusion method using skin-related *Cutibacterium acnes* (*C. acnes*).

Results & Discussion:

Moisturizing effects

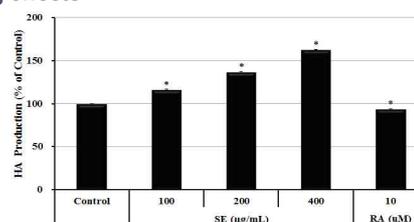


Figure 3. Effects of SE on hyaluronic acid production in HaCaT cells. The cells were treated with various concentrations of SE for 24 h. At the end of incubation, supernatants were analyzed for the presence of HA using an enzyme linked immunosorbent assay (ELISA) kit. Retinoic acid (RA) was used as a positive control for HA production at concentration 10 µM. The data represent the mean ± SD of triplicate experiments. *p < 0.05

Anti-inflammatory Effect

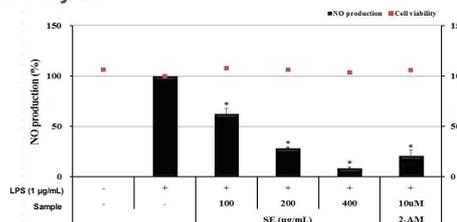


Figure 4. Effect of SE on NO production and cell viability in LPS-induced RAW264.7 cells. The cells were stimulated with 1 µg/mL of LPS only, or with LPS plus SE and 2-amino-4-picoline (Positive control, 10 µM) for 24 h. The data represent the mean ± SD of triplicate experiments. *p < 0.05

Anti-bacterial Effect

Table 1. Anti-bacterial effect of SE from *C. acnes* by disc diffusion assay

	Clear Zone (mm) – <i>C. acnes</i>			
	CCARM 0081	CCARM 9009	CCARM 9010	CCARM 9089
SE	9	8.5	8.5	8.5
Erythromycin	56	-	-	32

Identification

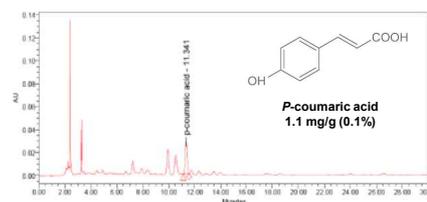


Figure 5. Chromatogram of the SE.

Conclusions:

These results suggest that SE could be a good candidate for moisturizing effects, anti-inflammatory and anti-bacterial cosmetic ingredient. A based on these results, it was suggested that SE could be potentially applicable as cosmeceutical ingredients in cosmetic industries.

References:

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