

KOSÉ Corporation, in Collaboration with One of the World’s Leading Botanical Research Institutes, Announces the Development of *Magnolia champaca* Flower Extract that Enhances the Skin Barrier

Fragrance of *Magnolia champaca* Flower Also Found To Have Positive Effect On Mind

Tokyo, Japan, August 29, 2023: KOSÉ Corporation (Headquarters: Chuo-ku, Tokyo; President: Kazutoshi Kobayashi), in collaborative research with South China Botanical Garden of the Chinese Academy of Sciences, one of the world’s leading botanical research institutes, has developed *Magnolia champaca* flower extract that enhances the skin barrier function. The fragrance of the *Magnolia champaca* flower has also been found to have the effect of increasing positive feelings (Fig. 1). Some of the results of the collaborative research were initially presented at the 142nd Annual Meeting of the Pharmaceutical Society of Japan held in Nagoya in March 2022 and the 66th Symposium on the Chemistry of Terpenes, Essential Oils and Aromatics held in Okinawa in November 2022.

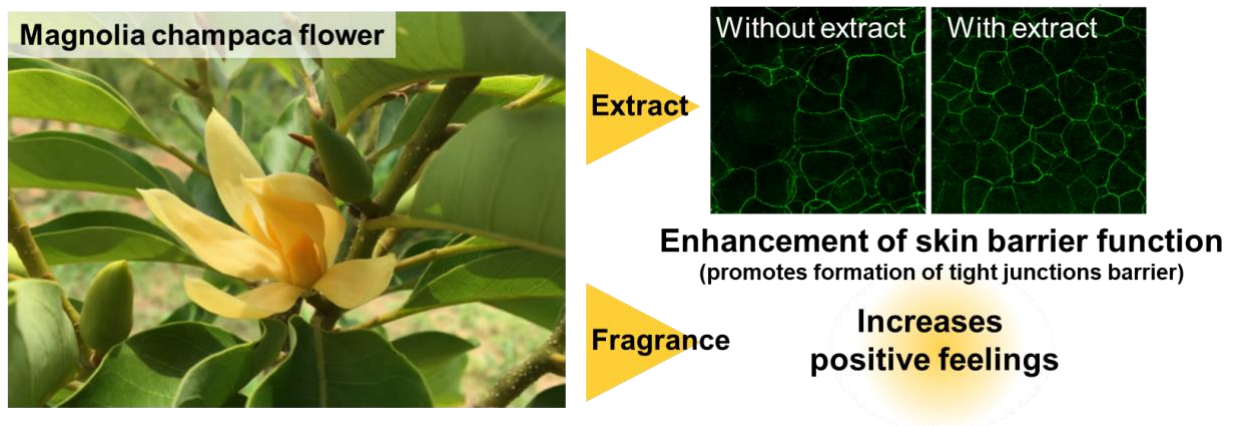


Fig. 1: Effects of the extract and fragrance of *Magnolia champaca* flowers developed

Background

KOSÉ has continued to apply the value of plant-derived ingredients to cosmetics by researching their efficacy on the skin. In this context, it has formed a partnership with the Botanical Garden, which has rare plants and more than a million plant specimens, since 2018, and started collaborative research with the Botanical Garden for the application of plant resources in the field of cosmetics. One of the many plants that the research has focused on is the *Magnolia champaca*. Although its flowers were known to have an elegant fragrance, it was difficult to obtain fresh flowers because it grows into a tree over 100ft. tall and the flowers’ components and pharmacological effects were poorly understood.

By establishing a system to cultivate and manage *Magnolia champaca* in shrub form at the Botanical Garden, it has become possible to harvest fresh flowers and conduct extensive research on the components. Through this research, it was discovered that the *Magnolia champaca* flower extract that was developed has the effect of promoting formation of a tight junctions barrier, an intercellular structure that is important as a skin barrier function. The chemistry of the fragrance was also analyzed

and its psychological effects evaluated, and it was found that the fragrance of the flowers has the effect of increasing positive feelings, indicating that *Magnolia champaca* has enormous potential for both the skin and the mind.

Discovery of effect of *Magnolia champaca* flower extract on promoting formation of epidermal tight junctions barrier

Tight junctions are skin barrier structures that stop the gaps between cells within the skin (Fig. 2). They protect the skin from drying out by preventing moisture evaporation from within the skin and foreign substances from the external environment, such as pollen and bacteria, from entering the skin. They are important structures for maintaining healthy skin, and also known to be affected by aging, daily UV rays exposure, and stress.

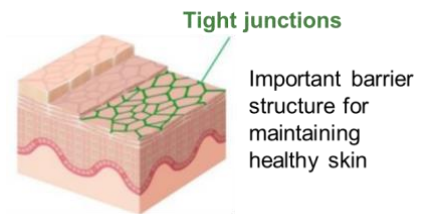


Fig. 2: Schematic diagram of tight junctions barrier

When the newly developed *Magnolia champaca* extract was added to a human epidermis model, electrical resistance, an indicator of skin barrier performance, increased. In addition, fluorescence images showed that the formation of tight junctions was insufficient in some areas where the extract was not applied while the formation was enhanced overall in areas where it was applied (Fig. 3). This indicates that the *Magnolia champaca* flower extract promotes the formation of a tight junctions barrier and enhances the skin barrier function.

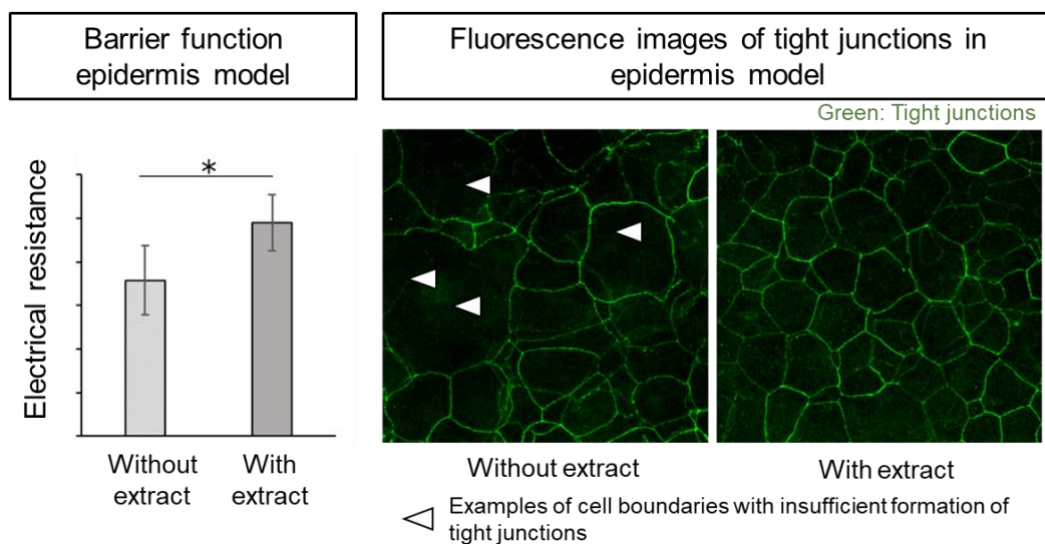


Fig. 3: Effect of *Magnolia champaca* flower extract on skin barrier function

Discovery that the fragrance of *Magnolia champaca* flowers at the start of blooming has an effect of increasing positive feelings

A detailed study was also conducted evaluating the fragrance of *Magnolia champaca* flowers, which are known for their elegant fragrance at each stage of flowering. The flowering was classified into four stages and fragrance components were extracted. Chemical analysis of the components and evaluation of the fragrance characteristics were then conducted, and it was confirmed that the fragrance components are different at each stage of the flowering (Fig. 4). It was found that the

fragrance is well-balanced, with the fresh green floral notes characteristic of *Magnolia champaca* being most apparent at the start of the blooming stage.

Stage of flowering	Characteristic fragrance components	Fragrance characteristics
Budding	Dihydro-β-ionone	Sweet green tea-like fragrance
Start of blooming	Linalool Methyl benzoate	Fresh green floral notes fragrance
Full bloom	Phenethyl alcohol Methyl anthranilate	Intense floral notes fragrance
End of blooming	Indole	Ripe and slightly spoiled floral notes fragrance

Fig. 4: Characteristic fragrance components and fragrance characteristics at each stage of flowering of *Magnolia champaca* flowers

Next, fragrances were used that reproduced the scent of each stage of flowering to evaluate the effects on the psychological state of 38 experimental participants. When the participants responded to the General Emotions Scale, which measured overall emotions (positive, negative, etc.) before and after inhaling the fragrances, a significant increase was observed in participants' positive emotions scores (lively, pleasant, fulfilled, etc.) when they inhaled the fragrance at the start of blooming (Fig. 5).

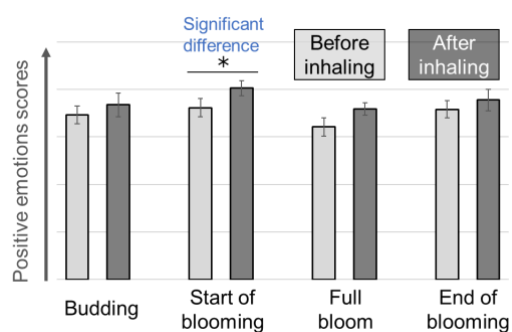


Fig. 5: Changes in positive emotions scores from *Magnolia champaca* flower fragrances

Future outlook

This study reveals that *Magnolia champaca* flower extract promotes the formation of the epidermal tight junctions function, which is an important skin barrier function, and that the fragrance of the flowers has the psychological effect of increasing positive feelings. Furthermore, it was also found that the *Magnolia champaca* extract acts on dermal cells to increase the expression of receptors for oxytocin, one of the happiness hormones, making *Magnolia champaca* a useful material that supports healthy living from the perspective of both the skin and the mind.

KOSÉ will continue to be a pioneer in research and development; and promote studies based on the concept of wellbeing that enables people to be healthy in both mind and body. The Company will leverage this current research to develop products that address customers needs taking a holistic approach.