

PRACTICES AND RESULTS OF THE COSMETIC PROCESSING OF MARIGOLD (*CALENDULA OFFICINALIS* L.)

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Abstract

The study focuses on *Calendula officinalis* (marigold), one of the most widely used medicinal plants in Hungary, and its potential applications in homemade ointments and cosmetics. Different preparation methods were tested, including lard-based, coconut oil-based and pharmacy-based formulations (stearin and hydrophilic ointment bases). The products were evaluated through sensory tests and a focus group consisting of 10 participants from different age groups (18–75 years). According to the results, the hydrophilic and stearin-based creams were the most preferred, while the lard-based ointment was rated lowest due to its greasy texture and strong odor. Younger participants valued natural ingredients, pleasant scent and fast absorption, whereas older participants emphasized hydration and skin-regenerating effects.

Keywords: marigold, ointment, sensory evaluation, herbal medicine, cosmetics

Introduction

In Hungary, the collection and cultivation of medicinal plants have not only medical but also cultural significance (Bernáth, 2000; Zámoriné & Bernáth, 2003). Approximately half of the herbal raw materials used originate from cultivation, while the other half still comes from wild collection (Csabai, 2019). The most important wild-collected herbs include chamomile, yarrow, St. John's wort, linden flowers, and hawthorn, while calendula, milk thistle, lavender, and lemon balm are among the most significant cultivated species (Varró, 2011).

Within the *Asteraceae* family, chamomile (*Matricaria chamomilla*), marigold (*Calendula officinalis*), yarrow (*Achillea millefolium*), and purple coneflower (*Echinacea purpurea*) are the most widely cultivated species in Hungary, as they adapt well to the continental climate and have extensive medicinal uses. Important collected members of this family also include species of the genus *Artemisia*. In recent years, more exotic species have expanded the range of phytotherapeutic products, such as *Acmella oleracea*, which appears as an ingredient in anti-wrinkle creams (Csabai et al., 2024).

Calendula officinalis has multiple physiological effects: its anti-inflammatory, antioxidant, immune-strengthening, and skin-regenerating properties are well known. It contains flavonoids (e.g., quercetin, rutin), carotenoids (lutein, zeaxanthin), saponins, and triterpenes, which benefit the skin, circulation, and vision (Bernáth, 2000). Its wound-healing properties were confirmed in hospital applications by Szabó and Bujdosó (1994) (Lelesz & Csajbók, 2016; Molnár, 2024). Triterpenes exert analgesic and anti-inflammatory effects, making them useful for rheumatic complaints (Szarvas, 2020). As a tea, calendula is used for gastric and intestinal ulcers, cystitis, and gallbladder disorders. Externally, it is applied as a ointment for its wound-healing, skin-regenerating, and antiseptic properties, especially in cases of chronic wounds, bedsores, hemorrhoids, and diaper rash. The ointment improves blood circulation in the skin, accelerates tissue regeneration, and has antibacterial effects (Ostrov, 1999; Valló, 2021).

Calendula is extracted both in oil and water: the oil extract is a fundamental raw material of the cosmetics industry, while calendula tea may also alleviate menopausal symptoms (Bördös, 2005; Ájus, 2023). Its phytotherapeutic value is mainly due to cytoprotective compounds: their antioxidant effect helps protect against sunburn and premature skin aging (Molnár, 2020). The properties of the carrier oil used for calendula oil extraction also influence the final product, for

example, certain oils may cause photosensitivity. Its disinfectant and anti-inflammatory effects are also utilized in mouthwashes and toothpastes, while the dried petals are used as soap decoration and natural coloring agents (Boros et al., 1973). The importance of medicinal plants remains significant today, as the pharmaceutical industry continues to use them for a wide range of conditions (Csupor & Lázár, 2021; Csupor, 2023). It is essential to distinguish between herbal medicines and dietary supplements, since their active ingredient content differs (Keskinbaş and Aka Sağlıker, 2024). Natural cosmetics frequently contain beeswax as a base material, which has been known for centuries as the “ointment of crystals” (Dibás, 2004).

Materials and methods

The aim of our study was to prepare homemade marigold creams using different base materials, and to evaluate their sensory properties based on the opinions of participants from various age groups. We sought to work with natural ingredients that are either easily available at home or can be purchased in pharmacies, and the products were assessed according to several criteria.

2.1 Methods of Cream Preparation

The marigold creams were produced with three different fat bases and two pharmaceutical ointment bases. In each case, dried marigold petals were used, which were extracted into the fat bases using traditional methods.

2.1.1 Lard-Based Ointment

The first recipe followed a traditional method using pork lard as a base. In a saucepan, 250 grams of lard were melted at low heat. The temperature was checked with a petal: if it sizzled, the lard was ready. Then, 2–3 handfuls of dried marigold petals were added, and the mixture was heated while stirring continuously for about 5 minutes. After removing it from the heat, the ointment was stirred a little longer, then covered and left to stand for 24 hours. The next day, it was gently reheated and filtered through a piece of cloth before being poured into jars (Figure 1).



Figure 1: (A) Heating homemade pork lard – 24 June 2024. (B) Cooking marigold – 24 June 2024. (C) Homemade marigold cream – 25 June 2024. Source: Own photo

2.1.2 Coconut Butter/Oil Extract

In the second preparation method, coconut butter was used as the fat base. The butter (approximately 200 g) was melted over a water bath, then two handfuls of dried marigold petals were added. The mixture was heated for a few minutes, then removed from the heat and reheated several times over a period of three days. The resulting oil was filtered through a cloth and poured into jars to solidify. No essential oils or other additives were used (Figure 2).

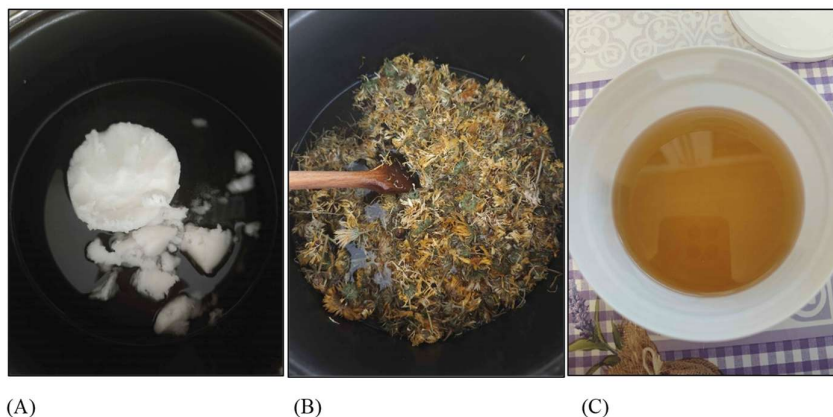


Figure 2: Marigold cream prepared with coconut oil and butter. (A) Heating coconut oil over low heat. (B) Cooking marigold. (C) Finished marigold cream before solidification – 27 October 2024. Source: Own photo

2.1.3 Variants Prepared with Pharmaceutical Base Creams

In the third procedure, paraffin oil was used, which was obtained from the Levendula Pharmacy in Nyíregyháza (Búza Square 7/A). The oil was gently heated in a small saucepan over low heat, after which marigold petals were added and cooked for a few minutes. The mixture was then left covered overnight and filtered the following day.

Afterwards, two different pharmaceutical base creams were used:

- The first was a stearin ointment, which contains stearic acid, a waxy, colorless, solid substance that is insoluble in water. Stearic acid is also produced by the human body, playing a role in blood pressure and blood clotting regulation, while in the cosmetics industry it is commonly used in face creams, body lotions, and soaps (Figure 3).
- The second was a hydrophilic ointment, a fragrance- and colorant-free cream that spreads easily, is suitable for all skin types, and is also known as a massage cream. It is available through pharmaceutical supply (Figure 3).

The filtered paraffin marigold extract was blended into the base creams with the assistance of a pharmacist. The finished ointments were poured into jars and stored in a cool place.



Figure 3: Marigold cream prepared with paraffin oil. (A) Paraffin oil. (B) Cooking over low heat. (C) Finished creams – 29 October 2024. Source: Own photo

2.2 Sensory Evaluation

The sensory properties of the homemade marigold creams were evaluated by a test group of 10 participants. The group consisted mainly of family members from different age groups, ranging from 18 to 75 years. The gender distribution was 9 women and 1 man.

The test was carried out as a blind test.

Each participant received an evaluation sheet and rated the creams on a scale from 1 to 5 according to the following criteria: Colour, Texture, Scent, Skin contact, Absorption, Overall impression (e.g., would you purchase it?).

Results

Evaluation of Creams Prepared by Different Methods by Myself

During the study, four marigold creams with different bases were prepared and tested personally. The creams were placed side by side and examined based on sensory properties. The lard-based cream had a firmer consistency, while the coconut butter cream showed a moderately soft texture. Among the pharmaceutical base creams, the hydrophilic ointment was the softest and easiest to apply, while the stearin ointment provided a slightly greasier feel.

In terms of colour, all four creams showed a similar yellowish-white shade. Significant differences were observed in fragrance: the lard-based cream had a strong fatty smell, which could be disturbing for those with sensitive senses of smell. The coconut butter version had a more pleasant, slightly sweet scent. The paraffin-based stearin and hydrophilic creams emitted a clean, pharmacy-like aroma, which left a positive impression.

The creams also behaved differently when applied to the skin. The lard-based cream absorbed slowly, leaving a greasy layer behind. The coconut butter cream absorbed more quickly but left a shiny layer on the skin. The stearin cream gave a slight sheen, while the hydrophilic cream absorbed completely, leaving a matte finish without residue. Based on our own assessment, the hydrophilic marigold cream proved to be the most pleasant in terms of usability, fragrance, and texture.

Evaluation of the Prepared Creams by Acquaintances

The sensory evaluation was carried out by a group of 10 participants. The first cream, prepared with lard (Cream 1), received the lowest scores. Most participants found it greasy, slow to absorb, and unpleasant in smell. The second cream (Cream 2), prepared with coconut oil and butter, received mixed feedback: it was considered beneficial for those with drier skin, but several participants noted that it was slow to absorb and left an excessively shiny appearance.

The third (stearin-based) (Cream 3) and fourth (hydrophilic) (Cream 4) creams were rated the highest by the participants. Several described them as “similar to store-bought creams.” The stearin ointment made the skin slightly softer and shinier, while the hydrophilic version absorbed more quickly and left a matte finish.

Table 1. Average evaluation results of the creams

Evaluation criteria	Cream 1	Cream 2	Cream 3	Cream 4
Colour of the cream	3	3.1	4.2	4.4
Texture of the cream	2.9	3.1	4.3	4.5
Scent of the cream	2.1	3.1	3.8	4.8
Skin contact	1.9	2.8	3.7	4.6
Absorption	1.6	3.1	3.9	4.7
Would you buy it?	10 %	60 %	90 %	100 %

(1 – did not appeal to me, 5 – very good)

Source: Own data

Feedback from the Younger Age Group

The younger group (18–40 years, 6 participants) primarily emphasized the importance of natural ingredients, pleasant scent, and smooth texture. For them, hydration, skin care, and the relief of possible irritation were key aspects. This age group particularly valued modern fragrance and attractive packaging design, as well as multifunctionality, for example, that the product could be used on the face, hands, or even after shaving. For the male participant, the universal usability of the cream was a clear advantage. The hydrophilic and stearin-based creams were the most favored among this group.

Feedback from the Older Age Group

The older participants (41–75 years, 4 participants) looked for moisturizing, soothing, and regenerating effects in the creams. Due to their drier, more mature skin, it was especially important that the creams alleviated dryness and helped maintain skin elasticity. The stearin-based cream was rated the highest, as its consistency and effects most closely resembled previously used pharmacy products. Although some were bothered by the smell of the lard-based cream, one older family member (grandmother) expressed a positive opinion, saying: “It doesn’t matter what it is, as long as it works”, while she gladly applied it to her hands and nails as a pack.

Discussion

Based on the results, the following conclusions can be drawn:

- The disadvantage of the lard-based cream was its smell and greasy texture, but due to its traditional character, it can still be used.
- The coconut-based version proved beneficial for dry skin, although the excessive shine was considered disturbing by many.
- The stearin-based cream showed excellent moisturizing and skin-softening effects, particularly appreciated by the older age group.
- The hydrophilic cream absorbed quickly, left no residue, and provided a matte finish, making it the most likely choice if available commercially.

In summary, the younger participants preferred modern, pleasantly scented, and fast-absorbing products, while the older participants placed more emphasis on deep hydration and skin-care effects.

Conclusion

In our thesis, we aimed to prepare homemade marigold creams using different base materials and to evaluate them from both sensory and user perspectives. Among the four creams, lard-based, coconut-based, stearin-based, and hydrophilic, it was clearly established that the versions made with pharmaceutical bases received higher scores, both according to our own experiences and the opinions of the test group.

The hydrophilic cream performed outstandingly in all evaluation criteria: it was easy to apply, absorbed quickly, had a pleasant texture, and was favored by most testers. The older participants particularly appreciated the stearin-based cream, as it provided stronger moisturizing and skin-softening effects.

The coconut butter cream proved suitable for individuals with drier skin types, though its shiny, more slowly absorbing layer was considered disturbing by several testers. The lard-based cream, although prepared by traditional methods, was rated lower in sensory terms: its greasy feel and strong smell made it less popular.

Based on the focus group discussions, we found that the younger age group valued natural ingredients, pleasant fragrance, clean packaging, and good absorption. The older participants emphasized hydration, therapeutic effect, and the preservation of skin firmness. According to the feedback, the most marketable product was the hydrophilic cream, with 100% of respondents stating they would purchase it.

In conclusion, the medicinal properties of marigold can be successfully utilized in homemade preparations, but the choice of fat base and extraction method significantly influences the final product quality. In the future, it would be worthwhile to experiment with additional natural ingredients, essential oils, and vitamins in order to develop even more personalized, skin-type specific formulations.

References

- Ájus A.: 2023. A változókori tünetekre alkalmazható gyógynövények termesztési kérdései Kosdon. Doktori értekezés, Magyar Agrár- és Élettudományi Egyetem, Gödöllő. 1–120.
Elérhető: <https://stud.mater.uni-mate.hu/88/1/749946860.pdf>
- Bernáth J.: 2000. Gyógy- és aromanövények. Mezőgazda Kiadó, Budapest.
- Boros Á. – Szabó L. Gy.: 1973. Hazai festőnővényeink. Búvár Magazin, 28 (3), 143–147.
Elérhető: https://real-j.mtak.hu/27147/3/buvar_1973_3.pdf#page=17
- Bördös J.: 2005. Házi természetgyógyász. Kinizsi Nyomda, Debrecen.
- Bodnár B. – Csabai J.: 2019. „Fűben-fában orvosság” – Gyógynövények gyűjtésének lehetősége Putnok környékén. Magyar Mezőgazdaság, 6 (2), 12–13.
- Csabai J. – Kolesnyk A. – Hörsik Zs. T. – Kolesnyk O. – Dobránszki J. – Cziáky Z.: 2024. A comprehensive study to identify novel active components, amino acids, and antibiotic activity of *Acmella oleracea* (L.) R.K. Jansen. South Western Journal of Horticulture, Biology and Environment, 15 (2), 75–96.
- Csupor D.: 2023. Gyógyítás és egészségmegőrzés növényekkel. Accredit Laboratórium, Szeged.
- Csupor D. – Lázár A.: 2021. Gyógynövénytár – 50 gyógynövény tudományos alapokon. Medicina Könyvkiadó, Budapest.
- Dibás G. – Molnár M. – Nagy É. – Várkonyi E. – Zilahi J.: 2004. Nagymama házipraktikái. Reader's Digest Kiadó Kft., Budapest. (Eredeti cím: Grossmutter's Hausmittel neu entdeckt.)
- Keskinbaş H. – Aka Sağlıker, H.: 2024. Ethnobotanic research in some villages of the districts of Osmaniye. Fenntartható tápanyag-gazdálkodási tudományos műhely konferenciája 2024 innovatív megoldások a XXI. század mezőgazdaságában. Nyíregyháza, 34–39.
- Lelesz J. É. – Csajbók J.: 2016. Relationship investigation between the marigold (*Calendula officinalis* L.) essential oil agents and quantitative presences change under different fertilization settings. Natural Resources and Sustainable Development, 8 (1), 93–98.
- Molnár F.: 2024. Az eltérő tápanyagellátás hatása a körömvirág (*Calendula officinalis* L.) élettani és produkciobiológiai jellemzőire. Diplomamunka. II. Rákóczi Ferenc Kárpátaljai Magyar Főiskola, Beregszász. Elérhető: https://dspace.kmf.uz.ua/jspui/bitstream/123456789/4090/4/Molnar_Ferenc_Az_elttero_tapanagellatas_hatasa_a_koromvirag_Calendula_officinalis_L_elettani_es_produkciobiologiai_jell.pdf
- Szarvas N. D.: 2020. Természetgyógyász a családban. Scolar Kiadó, Budapest.
- Ostrov R.: 1999. A szép bőr titkai. Holló és Társai Könyvkiadó, Budapest.
- Szabó E. – Bujdosó J.: 1994. Biotermék a gyógyászatban – körömvirág. Nővér, 7 (3), 20–22.
- Valló Á.: 2021. Orvosi körömvirág. [Online]
Elérhető: <http://www.valloagnes.hu/content/view/page:Koromvirag-Calendula-officinalis-orvosi-/p:123-132-133>
[Letöltve: 2025.08.25.]
- Varró A. B.: 2011. Gyógynövények gyógyhatásai. In: Növényi gyógyszerek – Hazai gyógynövényeink ismertetése, gyűjtésüknek módja és felhasználásuk a mindennapi életben az egészség szolgálatában. Kódexfestő Könyvkereskedés Kft., Debrecen, Kinizsi Nyomda, 1–215.
- Zámboriné N. É. – Bernáth J.: 2003. Gyógy- és aromanövény hungarikumok megőrzése és fejlesztése. Kertgazdaság, 35 (1), 105–110.