

From Formula to Function: a Deep Dive into Preparation and Evaluation of Lotion by using Comfrey

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ABSTRACT

As we know that skin is a vital organ of our body and with daily changing lifestyles which includes hyperpigmentation, inflammation and various other conditions can affect skin. So, in order to treat these problems Herbal lotion plays an important role as they work by forming a protective layer on your skin and helps to prevent excessive water loss from the epidermis which helps in keeping our skin smooth. Lotions generally help in removing sebum and cleanse the skin. This study shows the formulation of Herbal Body lotion by the use of Comfrey herb (*Symphytum officinale*) as an active ingredient for the skin benefits. Various other ingredients like Bees Wax, Aloe Vera gel etc. have been used to formulate this lotion. This perennial shrub is used on the skin to treat wounds and reduce inflammation. Comfrey roots and leaves contain allantoin that helps new skin cell grows, along with other substances that reduce inflammation and keep skin healthy. For extracting the active ingredients from the comfrey (*Symphytum officinale*) herb Steam distillation apparatus was used and essential oil was extracted from the comfrey (*Symphytum officinale*) herb. Further preparation of Lotion was done and after that herbal lotion was evaluated for its physical, chemical and stability studies were tested. The herbal lotion demonstrated acceptable uniformity sensitivity and ease of washing throughout the study period. This study adds to the expanding field of herbal-based skin care by providing information on how to create natural and efficient moisturizing lotion.

Keywords- Hyperpigmentation, *Symphytum officinale*, Allantoin, Extraction, and Herbal body Lotion, Inflammation

I. INTRODUCTION

Pharmaceuticals, nutraceuticals, nutritional supplements, traditional cures, pharmaceutical intermediates, and chemical

components of synthetic drugs are all made from medicinal plants. India is a veritable goldmine of historically accurate and extensively used herbal medical knowledge. Because of advances in crude drug chemical knowledge, various methods such as botanical, chemical, spectroscopic, and biological methods, in addition to physical constants, are now used to estimate the active constituents present in crude drugs.(1)

As a result, researchers are focusing on medicinal plant standardization, qualitative and quantitative analysis of various phytoconstituents found in plants, and quality control during processing and storage for thousands of years, medicinal plants and other natural resources many novel pharmaceuticals have been discovered from natural sources (95 percent from plants). Because of its large collection of medicinal plants, India has earned the title "World's Botanical Garden."

The Eastern Himalayas, Western Ghats, and the Andaman and Nicobar Islands have the highest concentrations of the roughly 45,000 medicinal plant species." Since ancient times, people have been looking for natural remedies to heal their illnesses. As with animals, the use of medicinal plants begins instinctively. As the justification for employing specific medicinal plants to heal specific conditions became clear, the use of medicinal plants gradually shifted away from the empiric framework and toward the use of explicatory facts.

However, there is an ayurvedic system of medicine, it is a traditional medicinal method that started on the Indian subcontinent and is now used as an alternative kind of therapy around the world. Ayurveda is a combination of the Sanskrit words ayus (life) and Veda (related to knowledge or science). Ayurveda has evolved over time and continues to be an effective medical system in South Asia. Over the centuries, Ayurvedic practitioners, known as "Ayurvedacharyas," We have found a variety of medical treatments and

surgical approaches for a variety of ailments and disease. There are various approaches that can help in various aspects for treatment of disease. These approaches can be used to quantify a specific chemical or a group of bioactive substances, such as alkaloids, flavonoids, or polyphenolic components, whenever possible.(2)

The skin is a vital organ that serve as a protective barrier for all living organism (3). The skin is the first that generally gets impacted due to increasing lifestyles and pollution loads, which leads to aging, inflammation, hyperpigmentation, and numerous other conditions. Due to which the skin experience relative stress(4). So, in order to address this problem, a wide range of cosmetic products, specifically foundation makeup that contains significant bioactive components from both natural and synthetic sources, are commercially used(5).

This extensive selection of cosmetics includes items from many brands, with different price points and quality levels. But these brands involve the use of various harmful chemicals which can lead to skin deterioration. In order to prevent this herbal product, play a vital role as they are free from any type of toxic chemical compounds and can be extracted naturally. Since skin is generally a very sensitive part, to protect it from harmful chemicals present in environment or to protect it from getting dry or flaky, herbal lotion here works by forming a protective layer on your skin and helps to prevent excessive water loss from the epidermis which helps in keeping your skin smooth (6).

Advantages of Lotion

- Provides local Therapeutic Effect
- Protection from Free Radical
- It can be applied on Broken skin
- Self-Medication is Possible

Disadvantages of Lotion:

- They are less stable as compared to ointments
- Need to shake container before use in case of emulsion or suspension type of lotion

Herbal Lotion

Herbal lotions provide advantages derived from the medicinal qualities of plants and herbs(7). An herbal lotion is a liquid preparation applied externally on the skin to produce or enhance the beautification. Lotions are used for washing the skin and to remove the oily secretions It helps in

increasing the blood circulation, emollience, extended to astringency, skin freshness, bleaching and other properties (8). Lotions are generally applied gently, finely dividing insoluble materials into colloidal particles soothes inflammatory areas and improve interaction with ill surfaces. The function of skin lotion is to oppose to skin against different environmental condition, weather and gives soothing effect to the skin. Interest in herbal remedies has grown as a result of the current spike in demand for skincare products that are chemical-free and organic. These lotions avoid the negative effects of synthetic chemicals, which are generally present in current cosmetic products, and instead these lotions are generally prepared by the use of plant-based substances, which include essential oils, herbs, and various other herbal ingredients, which helps to support healthy skin. (9)

Herbal lotions or remedies provide necessary nutrients and minerals which boost the body's nutrition. Herbal lotions are thought to be safer for skin because they usually don't contain parabens, artificial perfumes, or preservatives and can chill, calm or protect locally These lotions comprise the power of herbal medicine, which generally plays an important role in hydrating and protecting the skin by making use of herbs in their natural state.(10)

Herbal lotions can be prepared by extracting healthy substances from plants. Which can be done by the process of distillation, maceration, or infusion. These products are generally made by taking considerations for all the skin. Types, including dry, sensitive, and acne-prone skin

Subsequently, the study now has been transformed into the evaluation phase, where the prepared herbal lotions are thoroughly examined for their phytochemical characteristics and dermatological advantages by clarifying the corresponding effects of herbal extracts on skin health. This study intends to not only confirm the effectiveness of herbal lotions but also open the door for their incorporation into the standard skincare regimen. Compared to body butter, body lotion has more water. Manufacturers disperse oil into the water because it is an oil in water emulsion. Body lotions made using this technique are lighter than body butter, making application simpler (11)

Advantages of Herbal Lotion

- Use of Natural Ingredients

- They are easily available and are found in large variety of plants
- They are gentle and safe to use
- They often contain natural humectants and emollients that help retain moisture
- Easy To Manufacture
- Cheap Cost

Ideal Characteristics of Herbal Lotion

- Natural herbs should be used for the preparation of Herbal lotion instead of any type of harsh chemicals
- Should involve the use of components like shea butter or coconut oil for the preparation as these components can deeply hydrate the skin, leaving it feeling hydrated and smooth without being oily.
- Components like Calendula or lavender, which are generally recognized for their mild and restorative benefits, should be included in the lotion to help soothe sensitive, dry, or irritated skin

Review of Literature

- 1) **Cameron et.al. (1996)** Background Before extraction and synthetic chemistry were invented, musculoskeletal complaints were treated with preparations from medicinal plants. They were either administered orally or topically. In contrast to the oral medicinal plant products, topicals act in part as counterirritants or are toxic when given orally. Objectives To update the previous Cochrane review of herbal therapy for osteoarthritis from 2000 by evaluating the evidence on effectiveness for topical medicinal plant products.(12)
- 2) **D Rode (2002)** Comfrey is an herbal medicine with a history of efficacious use in humans. However, owing to the presence in comfrey of pyrrolizidine alkaloids (PAs), which are compounds known to be hepatotoxic, many countries have restricted its availability. This review emphasizes crucial aspects of PA toxicity, and suggests that comfrey might not be as dangerous to humans as current restrictions indicate.(13)
- 3) **R Koll et.al. (2004)** (*Symphytum officinale* L.) is a medicinal plant with anti-inflammatory, analgesic and tissue regenerating properties. In a double-blind, multicentre, randomized, placebo, controlled, group comparison study on patients suffering from unilateral acute ankle sprains (n= 142, mean age 31.8 years, 78.9% male), the percutaneous efficacy of an ointment of comfrey extract (Kytta-Salbe f, four treatments per day for 8 days) was confirmed decisively. Compared to placebo.(14)
- 4) **Kollet al., (2004)** The efficacy of comfrey root extract ointment was evaluated in a randomised, double-blind, placebo-controlled multicentre study involving 142 patients with a unilateral ankle sprain. Compared to placebo, the superiority of the verum treatment was significant.(14)
- 5) **Klingenburg (2004)** For many years, comfrey root extract alone or in combination with methyl nicotinate has been utilized. Pilot research that was not published revealed that the combination had a positive impact on lumbar spine syndrome patients. Additionally, a postmarketing monitoring study assessed the medication's analgesic and antiphlogistic qualities. There are records of 167 patients who applied the preparation externally to treat joint and muscular discomfort as well as contusions and deformities. The main symptoms were obviously lessened.(15)
- 6) **HG Predel et.al. (2005)** In the treatment of minor blunt injuries several topical drugs are known to have anti-inflammatory and analgesic properties. They represent, however, two fundamentally different major pharmacological therapy approaches: the “chemicalsynthetical” and the “phytotherapeutical” approach.(16)
- 7) **Englert et.al. (2005)** Topical treatments with anti-inflammatory and analgesic properties provide an interesting alternative, taking into account the potential adverse effects of oral therapies (e.g. gastrointestinal and renal side effects of NSAIDs and analgesics). Extracts of comfrey in mono preparations and in combination with methyl nicotinate have a long tradition of use as topical treatment.(17)
- 8) **Staiger(2005,2007)** The medicinal use of preparations from the underground parts of the plants (*Symphyti radix*) is well established. Relevant medicinal products are now marketed in more than 10 countries and the present licences include the topical treatment of pain,

- inflammation and swelling of muscles and joints in the case of degenerative arthritis, acute myalgia in the back, sprains, contusions and strains after sports injuries and accidents, also in children aged 3 and over. Corresponding randomized clinical trials and non-interventional studies studied the efficacy of comfrey root extract ointment for treatment of various muscle and joint pain .(18)
- 9) **Barna et al., (2007).** A randomized clinical double-blind study involving 278 patients with new abrasions, including 64 patients under the age of 20, investigated the wound-healing effects of a topically applied preparation containing a concentrate (10% active ingredient) from the aerial parts of medicinal comfrey. As a reference, a low-dose formulation with 1% active component that was otherwise equivalent was employed. **RESULTS:** A considerably and clinically significant faster initial reduction of wound size of 49 ± 19 % versus 29 ± 13 % per day in Favor of verum was observed after 2–3 days of application of the study drug ($p < 5 \times 10^{-21}$). (19)
- 10) **GP Roman et.al., (2008)** In Romanian traditional medicine, *Symphytum officinale* L. (Boraginaceae) species are used to treat a variety of human and animal illnesses. They are also effective against some types of cancer. The goal of this work is to get concentrated extracts of *Symphytum officinale* employing performance membrane procedures. Tangential flow ultrafiltration was used to concentrate the aqueous extracts using a Koch Laboratory Cell CF1 membrane. HeLa cell culture was used to examine the cytostatic activity of the whole plant extracts. We observed that in vitro treatment of HeLa neoplastic cells with these concentrated extracts determined a Mito inhibitory impact with statistical and cytostatical significant amplitude when compared to the bystander value of 100%. The readings for *Symphytum officinale* were around 57.6%. (20)
- 11) **N Mei,L Guoet.al. (2010)** For almost two millennia, people have used comfrey as a herbal remedy and as a vegetable and tea. However, comfrey causes carcinogenicity in experimental animals and hepatotoxicity in people and livestock. Up to 14 pyrrolizidine alkaloids (PA) have been identified in comfrey, including crimidine, intermedine, lasiocarpine, lycopsamine, myoscorpine, symlandine, symphytine, symviridine, 7-acetylintermedine, and 7acetyllycopsamine. These two substances produced comparable mutation spectra and profiles of DNA adducts formed from 6, 7-dihydro-7-hydroxy-1-hydroxymethyl-5H-pyrrolidine (DHP). Additionally, the two drugs' drug metabolism and carcinogenic mechanisms are similar. All things considered, comfrey is mutagenic to the liver, and the PA it contains seems to be the cause of its toxicity and ability to generate tumours.(21)
- 12) **N Meiet.al. (2010)** Comfrey has been consumed by humans as a vegetable and a tea and used as an herbal medicine for more than 2000 years. Comfrey, however, produces hepatotoxicity in livestock and humans and carcinogenicity in experimental animals. Comfrey contains as many as 14 pyrrolizidine alkaloids (PA), including 7-acetylintermedine, 7acetyllycopsamine, echimidine, intermedine, lasiocarpine, lycopsamine, myoscorpine, symlandine, symphytine, and symviridine. The mechanisms underlying comfrey-induced genotoxicity and carcinogenicity are still not fully understood. The available evidence suggests that the active metabolites of PA in comfrey interact with DNA in liver endothelial cells and hepatocytes, resulting in DNA damage, mutation induction, and cancer development.(21)
- 13) **E Neagu et.al. (2010)** Hydro-alcoholic extracts of *Symphytum officinalis* at 8% and 10% (mass concentration) in 50% ethylic and 50% methyl alcohol were produced. Membrane processes (ultrafiltration) were used to further purify and concentrate them. Two membrane types were employed: composite polysulfona PSF membranes (obtained in our laboratory) and Millipore ultrafiltration membranes with a 5.000 Da cut-off. All extract types were evaluated for their total polyphenol content, flavonoid content, and antioxidant capacity using two methods (ABTS and DPPH).(22)
- 14) **DB Smith et.al. (2011)** - The purpose of this study was to determine the effect of 2 concentrations of topical, comfrey-based botanical creams containing a blend of tannic acid and eucalyptus toa eucalyptus reference cream on pain, stiffness, and physical

functioning in those with primary osteoarthritis of the knee. METHODS: Forty-three male and female subjects (45-83 years old) with diagnosed primary osteoarthritis of the knee who met the inclusion criteria were entered into the study.(23)

- 15) **Smithet.al., (2011)**In patients with primary osteoarthritis of the knee, the effects of two concentrations of topical botanical creams based on comfrey and including a combination of tannic acid and eucalyptus were contrasted with a eucalyptus reference cream. Both active topical comfrey formulations outperformed a placebo in terms of reducing pain and stiffness and enhancing physical functioning.(23)
- 16) **Hacioglu et.al. (2011)**With about 34 known species, *Symphytum L.* is a significant genus in the Boraginaceae family. Originating in the Pontic province in the Euro-Siberian region, these perennial plants have spread over South Asia, North and South America, Africa, and Australia.(24)
- 17) **Wien Med Wochenschr (2013)** Comfrey (*Symphytum officinale L.*) has been used as a medicinal herb by mankind. In situations of degenerative arthritis, acute back pain, sprains, contusions, and strains after accidents and sports injuries, as well as in children three years of age and older, it has been clinically shown to reduce muscle and joint discomfort, inflammation, and edema.(25)
- 18) **M Cameronet.al. (2014)** Context Products made from medicinal plants are taken orally to treat osteoarthritis. Although their exact modes of action are still unknown, their interactions with prevalent inflammatory mediators justify their use in the treatment of osteoarthritic symptoms. Goals to evaluate the advantages and disadvantages of oral medicinal plant products in the treatment of osteoarthritis, updating a prior Cochrane study.(26)
- 19) **FU Alkanet.al. (2014)** The current study's objective is to assess the proliferative and antioxidant properties of *Symphytum officinale* aqueous and ethanolic extracts. The antioxidant properties of the extracts were assessed using the Folin-Ciocalteu assay, superoxide radical scavenging, and 2, 2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging. Similarly, superoxide radical scavenging activity of ethanolic extract (IC₅₀ value of 190.76 µg/ml) was found to be higher than aqueous extract (IC₅₀ value of 307.42 µg/ml). The total phenolic contents of ethanolic and aqueous extracts of *S. officinale* were found as 116.93 mg GAE/g and 99.49 mgGAE/g, respectively; showing that the greater number of phenolic compounds leads to more potent radical scavenging effect. Also, the results of cell proliferation assays indicated that both extracts have proliferative activity on 3T3 Swiss albino mouse fibroblast.(27)
- 20) **VL Savić et.al (2015)** The aqueous extract of comfrey root was determined qualitatively, quantitatively, and microbiologically in this investigation. Using the UHPLC-DAD-HESI-MS technique, both qualitative and quantitative studies were conducted. Allantoin, rosmarinic acid, and ellagic acid were identified as the main bioactive constituents, and their measurement was also carried out. High levels of allantoin, ellagic acid, and rosmarinic acid (8.91, 7.4, and 12.8%, respectively) were found in the results, suggesting that comfrey root can be utilized as a source for the separation of these three substances.(28)
- 21) **Trifan et al., (2018).** There is a variety of active substances which is present in comfrey, which includes components likes polysaccharides, triterpenes, phenolic acids, allantoin, tannins and alkaloids.(29)
- 22) **Kucera et al., (2018)** The perennial herbaceous plant comfrey (*Symphytum officinale L.*) is a member of the Boraginaceae family. In addition to having a large yield, a long shelf life, and resistance to illnesses and insect pests, it is heavy in protein and vitamins. Because of its analgesic and anti-inflammatory properties, comfrey has use in medicine. The use of comfrey in trauma therapy is not new.(30)
- 23) **Cao et al.(2022)** The main representative species of the genus is common comfrey, or *S. officinale L.* In the fields of medicine and agriculture, it has attracted a lot of attention, along with *S. uplandicum Nyman* (Russian comfrey). The aerial parts (*Symphyti herba*), leaves (*Symphyti folium*), and roots are frequently used as herbal preparations. The microbial activity and bioactive component identification and quantification of the comfrey root aqueous extract using the UHPLC-DAD-HESI-MS technique.(29)

COMFREY: An Amazing Gift from Nature

A) Botanical Description of Comfrey Herb

1) Synonym - Knit bone, Boneset, Slippery Root

2) Biological Source- *Symphytum officinale* (21)

3) Geographical Source- It is mostly found on moist grasslands and often grow on the months May to July and is mostly found on Asia, Europe and North America regions



Fig 1: Representation of Comfrey Leaf

Table 1: Taxonomy of Comfrey

Classification	Name
Kingdom	Plantae
Class	Magnoliopsidae
Order	Boraginales
Family	Boraginaceae (31)
Genus	<i>Symphytum</i> L
Species	<i>Symphytum Officinale</i> L

A) Description

Symphytum officinale is a perennial shrub that is native to Europe and some parts of Asia. Fond of moist soils, comfrey has a thick, hairy stem, and grows 2 to 5 feet tall. Its flowers are dull purple, blue or whitish, and densely arranged in clusters. Comfrey is used on the skin to treat wounds and reduce inflammation. Comfrey roots and leaves contain allantoin that helps new skin cell grows, along with other substances that reduce inflammation and keep skin healthy. *Symphytum officinale* has a long tradition as an external treatment for inflammatory disorders of joints, wounds, gout, bone fractures, distortions, haematomas and thrombophlebitis. It is also

applied as a decoction for oral and pharyngeal gargle. For internal application, comfrey is claimed to benefit gastritis and gastroduodenal ulcers, though its effects have never been demonstrated in controlled investigations. In addition, herb practitioners recommend comfrey capsules for the treatment of rheumatoid arthritis, bronchitis, various allergies etc.(32)

Uses of Comfrey (33)

- 1) In the treatment of inflammatory disorders of joints, wounds, gout, bone fractures, and thrombophlebitis.
- 2) *Symphytum officinale* is also used as an oral and pharyngeal gargle.
- 3) For treatment of gastritis and gastroduodenal ulcers(29)
- 4) In treatment of rheumatoid arthritis, bronchitis, various allergies and for diarrhoea.
- 5) Provides soothing to the skin

B) Cultivation

Comfrey requires deep soil, while not necessarily good soil for cultivation. It requires this soil depth because it pushes its roots far down to get calcium, phosphate, and trace minerals. It prefers a pH of 6.0 to 7.0, however it is not overly sensitive to the soil's ph. Although it may tolerate a partially shaded spot, it prefers full sun. Although it can readily adapt to a wide range of situations and is highly resistant to dryness thanks to its root structure, it should be planted in moist, fertile soil for maximum yield. Comfrey plants can last for more than 20 years if sufficient weed control and soil fertility are maintained and if each plant are planted three to four feet from each other(19). Comfrey gets nitrogen from the soil and has a high protein content, so, fertilizing and composting are one of the necessary methods to supply this nutrient. Because of its 14:1 carbon to nitrogen ratio (34)

C) Toxicity

In July 2001, the Food and Drug Administration (FDA) issued an advice by indicating that comfrey products be taken off the market due to Hepatic SOS which is also known as venoocclusive disease cases. A 2018 analysis of the pyrrolizidine alkaloids found in comfrey revealed their potential for broad human and animal toxicity as well as their potential for therapeutic development. (35)

D) Chemical Constituents

There are numerous chemical components which are found in comfrey (*Symphytum officinale*) which contribute to its therapeutic qualities. But it's crucial to remember that although

comfrey includes healthy components. The following are some of the main chemical components of comfrey which are represented in the table below:

Table 2: Chemical constituents

Sr.no.	Chemical Compounds	Properties
1	Alkaloids Alkaloids) (Pyrrolizidine	Pyrrolizidine is a complex molecule consisting of a pyrrolizidine nucleus that is a pair of linked pyrrole rings. Each pyrrole consists of a five membered structure which mainly consists of four carbons and one nitrogen forming the ring. Large consumption of comfrey can damage the liver so it should be taken cautiously when used and specially during internal applications. (36)
2	Rosmarinic Acid	It has anti-inflammatory and anti-microbial properties
3	Tannins	Tannins are generally complex phenolic substance which have antioxidant activity and have the ability to bind to proteins, metallic ions and various large molecules. They have astringent properties and helps in reducing inflammation. (37)
4	Mucilage	Mucilage is generally a gelatinous substance of various plants that mainly contains polysaccharides and protein and is similar to gums. So, mucilage majorly works as a healing agent and work by smoothening and protecting the irritated tissues.
5	Flavonoids	Comfrey contain compounds like quercetin and kaempferol as a flavonoid and have antioxidant and anti-inflammatory properties
6	Saponins	They have anti-inflammatory and antimicrobial actions
7	Choline	A nutrient that promotes various biological functions as well as cell structure

E) Comfrey Name in Different Languages

Table 3: Common names of Comfrey herb

Sr.no.	Language	Common Name
1	English	Common Comfrey
2	Hindi	Bachcha Or Guldhoya
3	Kannada	Sambala Gida Or Bekke Gida
4	Telugu	Soraka chettu Or Gaddi chettu
5	Spanish	Consuelda
6	Portuguese	Confrei, Consolida
7	Italian	Consolida maggiore
8	French	Consoude Officinale
9	Turkish	Karakafes
10	German	Echte Beinwell

F) Pharmacological Properties Of Comfrey(39)

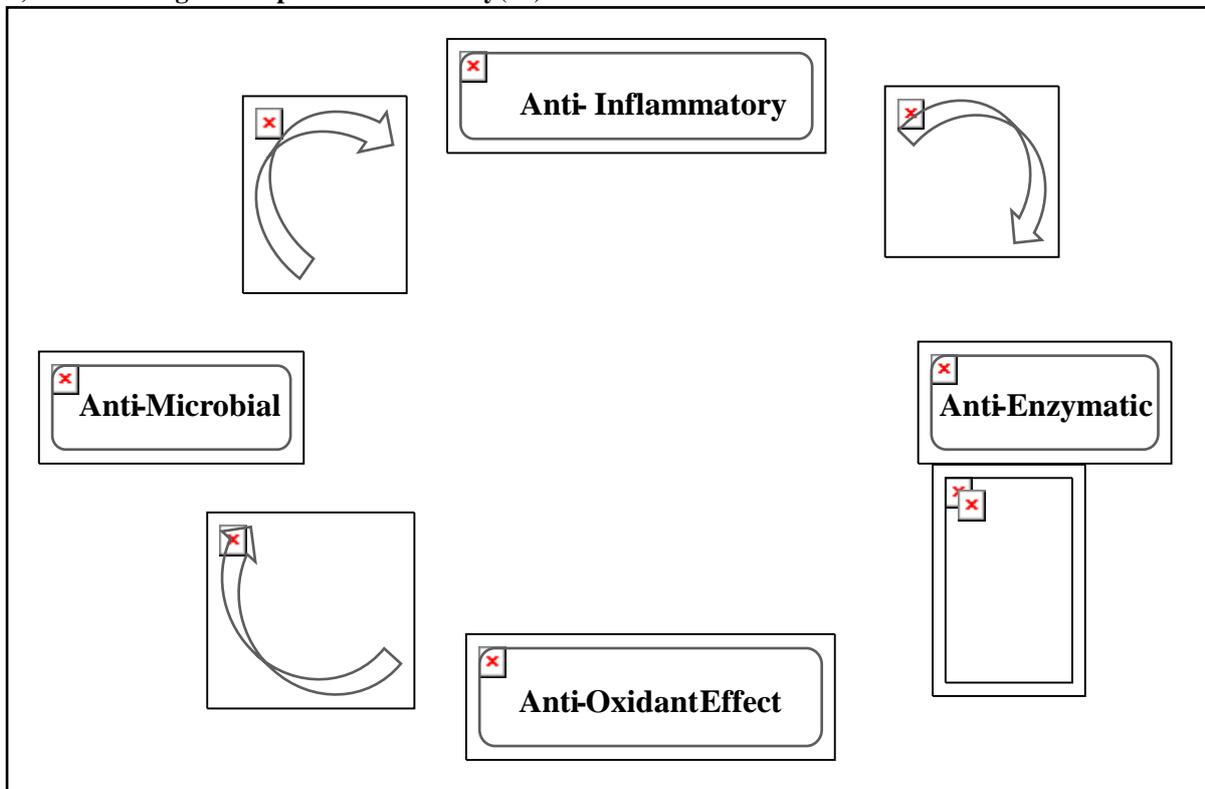


Fig.2: Pharmacological uses of Comfrey Herb

Formulation of Herbal Lotion

1) Material and Methods

A) Collection of Plant -Comfrey (*Symphytum officinale*) was the botanical plant which was selected for the preparation of herbal lotion, and it came from a certified organic supplier. For additional examination, the plant or its components were carefully dried and then was infused with mineral oil for two weeks for further analysis

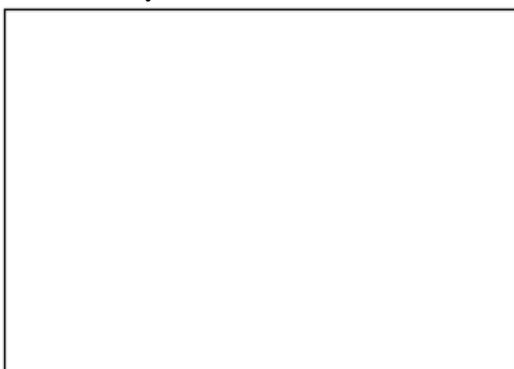


Fig.3: Representation of Dried Comfrey Leaves (self-captured)

- B) Plant Material-**
 - a) Aloe vera was taken from the nearby locality in Nerchowk (Mandi)
 - b) Honey was purchased from the local market of Nerchowk
 - c) Glycerine, Bentonite, Bees-Wax and rose water were taken by the chemistry and pharmaceutical lab of the Abhilashi College of Pharmacy (Nerchowk)
- C) Formulation of Lotion--**To avoid the two separations of two phases the lotion was made by rapidly mixing the aqueous and non-aqueous phases, or the water phase and the oil phase together. The non-aqueous phase was melted, then carefully added to the hot aqueous phase while being constantly stirred with a help of glass rod. The mixture was then placed into a container and then stored.(6)

Table 5: Materials which were used for the Formulation

Sr.no.	Ingredients	Uses
1	Comfrey	Treatment of Wounds, Reduce inflammation
2	Glycerine	Humectant
3	Borax	Emulsifier
4	Lavender Oil	Perfume
5	Beeswax	Natural Emollient, Provides Protective barrier
6	Methyl Paraben	Preservative
7	Bentonite	Detoxify Skin
8	Aloe Vera gel	Provides Hydration and promotes healing
9	Distilled Water	Diluent

D) Ingredients and their phases

Since the ingredients used for the formulation are of both the polar and non-polar nature so they are differentiated below on the following table:

Table 6: Ingredients and their phases

Sr.no.	Components	Ingredients
1)	Aqueous Phase	Aloe Vera
		Glycerine
		Methyl Paraben
		Distilled Water
2)	Oil Phase	Bentonite
		Comfrey
		Lavender Oil
		Borax
		Bees Wax

A) Aloe Vera gel(40)

- a) Helps in wound healing
- b) Helps in Reduce swelling
- c) Helps in moisture retention
- d) Helps in Erythema reduction
- e) It also has Anti-Tumour and Laxative Effects

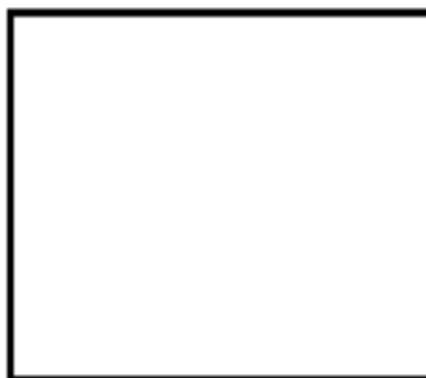


Fig.4: Representation of Fresh Aloe Vera

B) Bentonite(41)

- a) Helps in improving the appearance of the product
- b) Used as a Detoxifying agent
- c) It has Antibacterial effects



Fig.5 Representation of Bentonite
:

C) Bees-Wax (42)

- a) Helps in Treatment of Burn
- b) It works by forming a thin film on the skin surface and protect against many external irritants
- c) It is primarily used as a thickener and when combined with borax it can act as an emulsifier

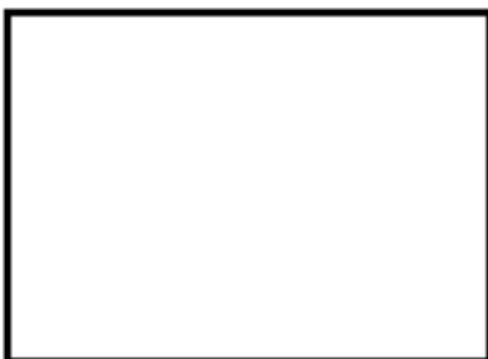


Fig.6: Representation of Bees-Wax (self-captured)

D) Methyl Paraben

- a) Helps in preventing Bacterial Growth
- b) Extend shelf life of the product



Fig.7: Representation of Methyl Paraben (self-captured)

E) Glycerine (43)

- a) Helps in retaining moisture
- b) Solubilizing Property

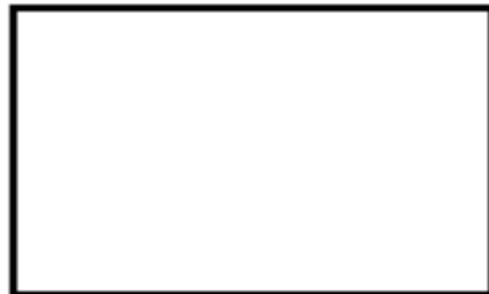


Fig.8: Representation of Glycerine (self-captured)

F) Borax:(44)

- a) Used as an Emulsifier
- b) Used to Reduce Surface Tension
- c) It can be used as a Preservative

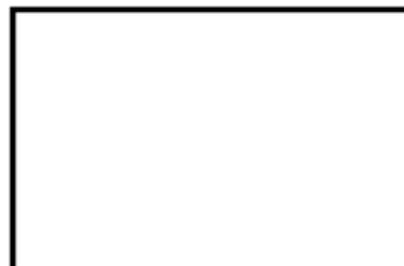


Fig.9 Representation of Borax
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Extraction Process (Comfrey Oil)

Essential oil was extracted from dried plants of *Symphytum officinale* by the use of Clevenger apparatus in accordance with Indian Pharmacopeia



The dried comfrey leaves were putted into round bottom flask for about 3 hours for the reflux process.



All the components of the apparatus were arranged as specified in the Pharmacopeia



After 3 hours of reflux there was presence of oil and water droplets in burette, then the mixture was collected and with the help of separating funnel separation of both the oil and water phase was done



The oil phase of the product was collected and further the procedure was performed



Fig.10: Representation of Distillation Apparatus Consisting Comfrey Herb

A) Composition of Aqueous Phase

Sr.no	Ingredients	Quantity
1	Aloe Vera	2ml
2	Glycerine	1ml
3	Methyl paraben	0.05g
4	Distilled Water	2ml

B) Composition of Oil Phase

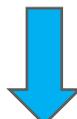
Sr.no	Ingredients	Quantity
1	Comfrey Oil	3ml
2	Borax	0.5g
3	Bentonite	0.5g
4	Bees Wax	0.75g
5	Lavender Oil	0.2ml

Procedure

Fill a bowl with required quantity of Aloe Vera gel



In the same bowl combine other ingredients of aqueous phase such as Glycerine, Rose oil Methyl Paraben and distilled water to create the aqueous phase



Then to prepare the oil phase, transfer the above-mentioned amount of Borax into beaker and put the beaker into heating mantle with continuous stirring after that add all other oil phase into the beaker with continuous stirring



Then mix both the phases together vigorously and herbal lotion was prepared

Evaluation Test of Lotion

A) **Physical Properties-** the Physical properties of the formulated Herbal Lotion were noticed which majorly include parameters like Colour, Odour and Appearance.

Sr.no	Parameters	Observation
1	Colour	White
2	Odour	Sweet
3	Appearance	Semi-Solid and Light Weight

B) **Ph. Determination-**For the determination of Ph, Ph meter was used in which 0.5g of lotion was dispersed into 50ml of distilled water and after some point of time the ph. was evaluated. The Ph generally was found to be in the range of (5-5.5)

C) **Irritancy Test-**The lotion was applied on the left-hand dorsal surface. Irritancy, erythema, oedema was checked for up to 24 hours and reported,

D) **Washability Test-** The ease of removal of lotion was checked by washing the surface

where lotion was applied with the help of water

E) **Spread ability-**For this test the formulated lotion was generally placed between the two slides and then the slides were compressed by putting a definite weight for a specific time.

Result

The formulated herbal lotion, incorporating Symphytum officinale essential oil shows a smooth, light brownish emulsion with a good aromatic odour. It shows good spread ability, washability and a compatible ph.

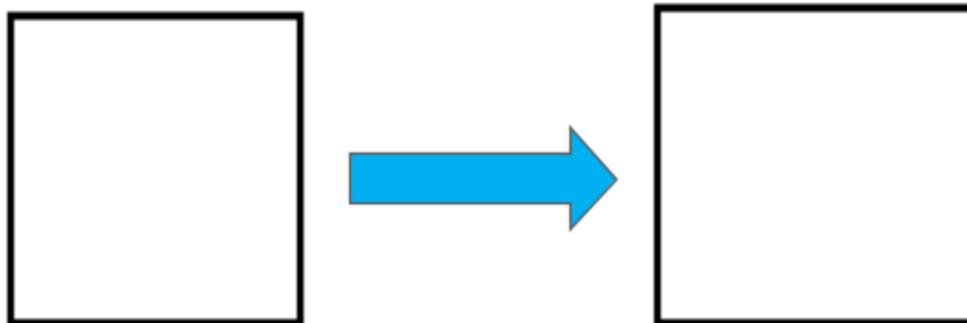


Fig.11: Representation of Prepared Comfrey Lotion

II. CONCLUSION

This study shows successfully formulated Herbal Lotion incorporating the essential oil from the leaves of Symphytum officinale. The evaluation test of the formulated lotion shows good Physical Properties at room temperature including good spread ability, washability and a suitable ph. for the lotion. This research shows the ability or potential of Symphytum officinale oil in a conventional topical dosage form. Further in-depth studies are generally needed to assess the lotion stability, its efficacy over time. The development of this herbal lotion shows the growing interest in traditional medicinal plants for skin

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