REVIEW ARTICLE

A Review on Herbal Ointment

Sandip Sonwane

Department of Pharmaceutics, DattaMeghe College of Pharmacy, Salod (H), DattaMeghe Institute of Higher Education and Research (D.U), Wardha, Maharashtra, India

Abstract

Ointments are semisolid dosage forms that frequently exhibit viscoelastic behavior when subjected to shear stress. They contain medicinal ingredients and are frequently applied topically to the body for therapeutic purposes. Many medications that are applied topically to skin or mucous membranes, whether intact or injured, have a semisolid consistency and go by various names, including pastes, ointments, and creams. Usually, it is applied as a protective or emollient layer to the skin. Herbal formulations may contain active ingredients, herbal components, or both. Created herbal mixtures or a combination of numerous prepared herbal combinations containing herbal ingredients. Herbal medications are made using processes such as extraction, distillation, expression, fractionation, purification, concentration, or fermentation of herbal ingredients. In addition to various dosage forms, herbal drugs are commonly used as ointments.

Key words: Conventional medicine, *Convolvulus arvensis*, herbal ointment, the fusion technique

INTRODUCTION

Herbal medicine is the oldest known kind of medicine. It formed the foundation of many ancient civilizations and is currently the most widely used kind of medicine worldwide. Antibacterial, antioxidant, anticancer, hypolipidemic, cardiovascular, neurological, respiratory, immune system, anti-inflammatory, analgesic, and antipyretic were among the many pharmacological qualities the plant exhibited. The genus Convolvulus contains more than 250 species. The bulk of the species in this genus are weeds that may readily climb over more desirable plants to take their place, while others are purposefully planted for their lovely blossoms. Field bindweed is a dicotyledonous perennial vine that can reach a height of 2 m. It is a member of the *Convolvulaceae* family, which includes morning glory, and it spreads through rhizome and seed.[1] *Convolvulus arvensis* is a hazardous perennial plant that grows in all temperate regions of the planet. It is also referred to as field bindweed.[2] This species, which ranks among the top 10 weeds worldwide, has been detected in 32 different crops across about 54 nations.[3] The plant thrives on dry, moist soil that has a pH of either neutral (6.6–7.5) or 7.9–8.5. Although it favors rich, fertile soils, the plant can tolerate extended droughts because of its extensive root system.[4] *Convolvulus arvensis* is commonly known as "field bindweed" in English and "hirankhuri" in Hindi. Possession vine, creeping Jenny, creeping Charlie, and field morning glory are some more well-known names.[5] European bindweed, small-flowered morning glory, corn-bind, and morning glory.[1] Cosmetics made from herbs are easier to handle and keep for longer.[6]

PROPERTIES OF THE IDEAL OINTMENT

1. It needs to be stable both chemically and physically
2. There should be no therapeutic properties in the base of the ointment
3. The finely divided active ingredient must be dispersed uniformly throughout the base of the ointment
4. There must be no roughness, and the ointment must be smooth.

THE BENEFITS OF OINTMENT

1. They offer a way to apply a medication site-specifically to the afflicted area, preventing needless non-target drug exposure and consequent unwanted effects

Address for correspondence:
Sandip Sonwane, DattaMeghe College of Pharmacy, Salod (H), DattaMeghe Institute of Higher Education and Research (D.U), Wardha, Maharashtra, India.
E-mail: sandip.pharmacy@dmiher.edu.in

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2. They steer clear of the drug's first-pass metabolism
3. Convenient for individuals who are unconscious and have trouble taking medication orally
4. Compared to liquid dose forms, they are easier to handle and more chemically stable.[5] They are appropriate dosage forms for medications with a bitter taste.

OINTMENT DISADVANTAGES

1. Less stable physicochemically than solid dose forms
2. An aqueous solution can only be added up to 5% unless acetyl alcohol is added.

It is non-greasy and washable if in o/w form.

1. Broad compatibility
2. Avoid going rancid or encouraging the growth of microorganisms
3. Nonirritating (to the same extent as lanolin, petrolatum, etc.)
4. Stick firmly to the skin
5. Washes off easily.

ASPECTS IMPACTING THE FORMULATION OF HERBS

1. Tampering with drugs
2. Inadequate gathering
3. Poor preparation
4. Poor storage
5. Considerable substitution of plant material replacement with leftover prescription drugs.

VARIOUS KINDS OF HERBAL REMEDIES

1. Herbal and Ayurvedic mixtures (such as Churna, Arishta, Asava, Bhasma, and Aveleha)
2. Traditional: Formulation of herbal pharmaceutical doses (e.g., tablet, capsules, ointment, suspension, and emulsion)
3. Novel herbal formulation (e.g., targeted drug delivery dosage forms phytosomes, nanosomes, nanoemulsion, liposomes) or transdermal/controlled drug delivery.

THE ETYMOLOGY

A word that means "rolling together" or "twining," convolv, is the source of the word convolvulus. "Field" is called arvensis in Latin.[7]

THE MORPHOLOGICAL FEATURES

Leaves

The base of the leaf is cordate, saggitate, and hastate, while the tip is either mucronate or acute. It is 1.5–5 cm long and 1–3 cm wide, with an ovate-oblong to lanceolate shape. The leaf edge is entire and divided into three lobes, with the primary lobe being ovoid, elliptical, narrowly triangular, lanceolate, oblong, or suborbicular, and the lateral ones spreading. Palmate veins begin at the base of the leaf and develop into pinnate veins across the remainder of the leaf. The upper surface of the veins is depressed, while the lower surface is elevated (Figure 1).

Stem

The herbaceous stems are at least 1.5 m long, glabrous to pubescent, and trailing. They twine, too. Due to their twisting, they appear to be 4–5 slanted.

Flower

An inflorescence is an axillary cyme that has one or three blooms. The pedicels are notably longer than the calyx, and the hairy sepals are 2.5–5 mm long. The huge, funnel-shaped corolla is 15–26 mm long, pink or white, with occasional pinkish and whitish midpetaline lines. It also has five lobed margins. The blooms are composed of five connected petals. There are five asymmetrically sized stamens at the base of the corolla. Two stigmas that resemble threads make up the pistil.[3] The hermaphrodite blooms are pollinated by flies and bees.

Fruit

The fruits are usually 6 mm long, dehiscent, capsule-shaped, and have four valves.[8] Four dark brown to black seeds are contained in the glabrous capsules.

Seed

The seeds are wedge-shaped, obovate to broadly obovate in shape, and measure (2.5)3.0–4.5 mm in length, 2.0–3.0(3.5) mm in width, and 2–3 mm in thickness.[9] At their union point, the two ventral sides – which are either flat or slightly concave – combine to form the keel, a blunt ridge. The dorsal side descends downward to a bluntly pointed base after forming a spectacular arch near the peak. The testa has many blue, white tubercles or wavy ridges and is bright to dark gray, dull, and orange–brown in hue. Seeds have rough surfaces and dark brown to black colors. Their shapes vary according to their number of fruits. They are spherical when

only one fruit is formed, and they become thinner as more are produced.[10]

PHYTOCHEMICAL ANALYSIS

δ-aminolevulinic acid, alkaloids,[11] flavonoids, caffeic acid,[8] lipids,[8] saponins,[12] and alkaloids were found in the plant, according to phytochemical studies. The tropane alkaloids tropine, pseudotropine, and tropinine were found in field bindweed, together with the pyrrolidine alkaloids cuscohygrine and hygrine.[13,14] The oil content of *Convolvulus arvensis* seeds ranges from 6.7% to 16.5%. The chemical makeup of oil is as follows: stearic 12.0–19.6%, palmitic 6.6–10.0%, linoleic 27.8–41.3%, oleic 21.6–30.0%, behenic acid 2.8–4.3%, and arachidic 3.3–6.4%. Using TLC and HPLC, the plant's polyphenolic compounds – such as coumarins and phenolic acids – were identified both qualitatively and quantitatively. *Convolvulus arvensis's* aerial parts, roots, and flowers were analyzed for secondary metabolites.[15]

Figure 1: Field view of the aerial parts with characteristic white funnel-shaped flowers of the Convolvulus arvensis

THE PREPARATION METHOD

Preparation of plant extract

A coarse powder composed primarily of the aerial parts but not the flowers were created by crushing and drying the plant material in the shade. The dried powdered material was initially defatted with pet ether (60–80) in a Soxhlet device for 48 h in accordance with successive solvent extraction. The pet ether extract was collected once it had dried. After letting the marc air dry, it was drained for 48 h using alcohol and CHCI, respectively. The solutions were concentrated in a water bath, the extracts were filtered while still hot, and the percentage yield of the extracts was computed (Figure 2). The extracts were stored in different containers that appeared to have labels before being examined in polythene bags.[16]

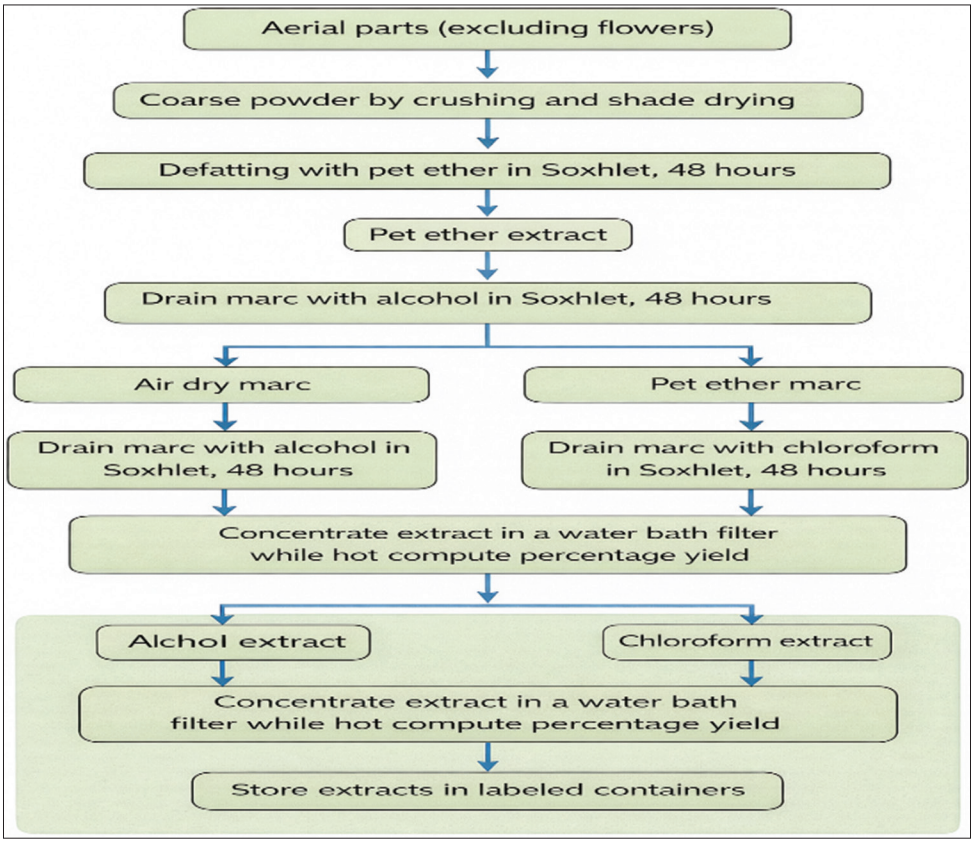

Figure 2: Flowchart of successive solvent extraction of aerial plant parts.

Preparation of ointments by trituration[17]

This technique can be applied during a touch inside the base of the liquid gift. (1) A filter is used to filter finely ground solids (#250, #180, #125). (2) The powder is taken and triturated with a very small amount of the bottom on an associate in nursing ointment slab. A sturdy, wide-bladed steel spatula is employed. To mix the medicine with the bottom, an additional bottom is introduced to the current and triturated. (3) Finally, liquid components are introduced. To avoid spillage, a very small amount of liquid is fully poured into an ointment depression. In the same way, something that is included earlier than many is additional. Splashing is much easier to control with mortar than it is with tile.

Preparation of ointments by fusion method

When an ointment foundation contains a large number of solid ingredients, such as white beeswax, cetyl alcohol, stearyl alcohol, saturated fatty acid, and exhausted paraffin, it is required to soften them.

There are two typical methods for melting

Method 1

The materials with the greatest melting point should dissolve first, then those with the next highest temperature, and so on, since the elements dissolve in decreasing order of temperature. Very slowly, the drug is added to the dissolved ingredients, and the mixture is vigorously stirred until the mass cools and the intended result is achieved.

Benefit: This prevents overheating of equipment that is already at coffee temperature.

Method 2

Every component is taken in a highly fragmented state and breaks down all at once.

Benefit: A lower maximum temperature was reached faster than with Method-I, most likely due to the solvent impact of the lower-temperature components on the other constituents.

CAUTION

1. The melting time can be reduced by grinding waxy ingredients (e.g., beeswax, wool alcohols, hard paraffin, higher fatty alcohols, and emulsifying waxes) and stirring constantly while melting. In addition, the dish can be lowered as far into the water tub as feasible to heat the largest area possible
2. Certain compounds, including wool alcohols and fats, turn discolored when exposed to chemicals; it is best to remove these discolored layers before using
3. After the ingredients have melted, they should be swirled to cool the ointment without causing localized cooling. Using a cold spatula or stirrer, setting the dish on a cold surface (such as a plastic tabletop), or going to a cold object before the ointment cools are a few strategies to prevent this
4. Vigorous stirring causes excessive aeration as the ointment begins to thicken, thus it will not be done. Has firmly established itself
5. Some ointment bases' constituents acquire dirt over time and become evident as they melt because of their oily makeup. This can be separated from the softener by either allowing it to settle and then decanting the supernatant, or by passing it through cloth supported by a heat filter. In each instance, the treated liquid is collected in a different heated basin
6. The product should be remelted with the least amount of heat possible due to the separation of high M.P. elements. If it turns granular when cooled, it should then be combined and chilled once more.

OINTMENT EVALUATION TEST

Mechanical assessment properties, including pH, viscosity, spreadability, and homogeneity, are essential tests to evaluate the effectiveness of medical ointment compositions. The results of all formulations that were near pH 6.8 ± 1 demonstrate better chemical compatibility between ointments and skin. These are some of the important factors. Testing of raw materials, drug substance manufacture, a set drug product manufacturing method, in-process material testing, and end product testing all contribute to the system's assurance of product quality.[17]

Test of absorption rate

It is only necessary to evaluate the ointment's rate of drug absorption into the bloodstream *in vivo*. It is advised to rub the ointment into the afflicted area of skin. To find out how much medication is absorbed, serum and urine samples should be checked often.

Test of non-irritancy

The bases in the ointment may cause skin irritation or an allergic reaction. A patch test is used to assess the preparation's non-irritancy. For this experiment, human participants are selected. Once daily for a predetermined period of time, a

specific quantity of ointment is applied to the volar forearm or back under occlusion. Information is recorded daily.

Test of penetration rate

The rate of penetration of the semi-solid dosage form has a significant impact on the onset and duration of the drug's action. After weighing the quantity, it was applied to the skin for a set period of time. After that, the remaining preparation is collected and weighed. The difference between the preparation's initial and final weights indicates the amount of preparation that has passed through the skin. The preparation's penetration rate can be calculated by dividing this weight by the application area and time. The test should be given 2 or 3 times.

Test of drug release rate

To test the medication's rate of release, a small amount of the ointment can be put on the nourishing agar surface in a petri dish or, alternatively, in a small cup inside the agar surface. If the drug is bactericidal, an agar plate is first seeded with a suitable bacterium, like Staphylococcus aureus. After a suitable incubation period, the zone of inhibition is evaluated and connected to the rate of release.

Test of rheological characteristics

The viscosity of the preparation should allow for easy application to the skin and removal from the container. A cone and plate viscometer is used to measure the viscosity of the preparation.

The homogeneity of content test

The net weight of ten full ointment containers is determined by weighing them. The results must coincide with one another and the indicated quantity.

Test of the effectiveness of the preservative

The pour plate technique is used to ascertain how many microorganisms were initially present in the preparation. Tryptoneazolectin broth is mixed with separate solutions of different preparation samples. All microbial cultures are added to each mixture while maintaining aseptic conditions. Every mixture undergoes cultivation. Each sample's microbe count is determined 7, 14, 21, and 28 days following inoculation.

CONCLUSION

It is clear that weeds are more than just garden weeds that contain phytopharmaceuticals; in fact, some weeds, such as *Convolvulus arvensis*, have important therapeutic qualities. The herb has been used in traditional medicine to treat a number of ailments.

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