

Formulation and Evaluation of Aloe vera Lotion

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ABSTRACT: Aloe vera is oldest medicinal plant ever known and the most applied medicinal plant worldwide. Several steps used in formulation of lotion such as cutting of tip and base of the leaf, extract mucilage part in mixing jar grinds it well, add vitamin E, pasteurized the mixture, and cool it after that gel was prepared further take the measured quantity of the gel for lotion formulation mixes the measured quantity of ingredient including gel after some time lotion was prepared. The formulation greenish in colour having pH 5.5 easily spreadable and excellent extrudability. The formulation had no adverse effect. It is shown that this preparation is useful in inflammation, wound healing, anti-tumour, anti-aging and soon.

Keywords: Aloe vera lotion, Aloe vera gel, wound healing.

I. INTRODUCTION

Aloe is also frequently used in Ayurvedic and traditional Chinese medicine. The Arabic word "Alloeh" (meaning "aloe") is the source of the name Aloe vera. "Shining bitter substance," but the Latin word "vera" signifies "true" [12]. The history of the aloe vera plant dates back to the Bible. Worldwide, more than 250 different species of aloe are cultivated. Commercial cultivation of Aloe barbadensis Miller and Aloe arborescens is limited to just two species. Many names for this plant exist, including "the wand of heaven," "heaven's blessing," and "the silent healer" [9]. Aloe was formerly thought to belong in the Liliaceae family, but it is now classified in the Aloaceae family. Aloe vera is a health-promoting plant that has the ability to treat illness. Description of Plant: - Habitat-It grows mainly in the dry regions of Africa, Asia, Europe, and America. In India, it is found in Rajasthan, Andhra Pradesh, Gujarat, Maharashtra, and Tamil Nadu [12].

Geographical Source-Aloes are indigenous to South Africa and South America, but are now

cultivated worldwide except in tundra, deserts, and rain forests. It takes approximately four years to reach maturity and has a lifespan of about 12 years [10]. Active Ingredient of Plant- Leaves has three layers. The outer most layers consist of 15 - 20 cells thick protective layers synthesizing carbohydrates and proteins [15]. The active components of aloe include anthraquinones, chromones, polysaccharides, and enzymes. The elements Al, B, Ba, Ca, Fe, Mg, Na, P, Si etc. has also been reported to be present in Aloe vera.

Cultivation: -It is grown successfully in marginal to sub marginal soils having low fertility. The plants have tendency to tolerate high pH with high Na and K salts. The soil should not be disturbed too deep, as the root system of Aloe does not penetrate below 20-30. It is propagated by root suckers or rhizome cuttings. Aloe can be successfully cultivated both under irrigated and rainfall conditions. Provision of irrigation immediately after planting and during summer the plants are sensitive to waterlogged conditions.

Biological & Pharmacological Activity of Aloe Vera: - Aloe vera could prevent adjuvant arthritis 72% and cause a regression of 22 to 26% at a dosage of 150mg/kg per day. We found that it could reduce edema 80%. Keeping the wound moist, increasing epithelial cell reduction in inflammation, it improved skin hydration, Aloe has excellent anti-aging effect skin more elastic and less wrinkled, Anti-Inflammatory effect, Inhibited the growth of fungi Candida albicans, Laxative Effects-Aloe vera latex possesses laxative to relieve constipation it also used as a purgative, The anti-bacterial effects of Aloe vera extract were bactericidal against 7 of the 12 species of organisms studied, Aloe vera, a great immune stimulant, increases the white blood cells or macrophages and T cells, Antioxidant Property, Antitumor Effect-The aloe vera gel in terms of reduced tumor burden.



Aloe vera



Vitamin E Capsule



Almond oil

MATERIAL AND METHOD: Experimental Work

Equipment: - Digital balance, pH meter, measuring cylinder, glass bowl, spoon, Brookfield viscometer.

Required Material

Table-1: Materials of formulation

S.no	Ingredients	Quantity	Category
1	Aloe vera gel	75ml	Moisturizer
2	Almond oil	50ml	Emollient
3	Water	25ml	Liquid vehicle/solvent
4	Vitamin E	One teaspoon	Moisturizer and wound healing
5	Essential oil	18 drops	Nourishment

Preparation before the formulation: - Clean and sanitize your work area and all your packaging materials. It is suggested that you wear gloves, protective clothing and a hair net while preparing this recipe.

Method of formulation

- **Formulation method of gel: -**
Collect raw material (aloe leaves), washed leaf, and removed base and tip of the leaf, leaf is cut into sections (filleting). Extract mucilage part of the leaves into mixing jar and heat it. Grinding/Homogenization of unpasteurized juice. Add Vitamin E and pasteurize. The mixer cools the mixer of aloe leaf. Package the produced gel and store it.

Steps Used in Formulation of Gel

Reception of raw materials- The Aloe vera leaves after harvesting were preferably transported to the processing place. The leaves should be sound, undamaged, mould/rot free and matured (3-4 years) in order to keep all the active ingredients in full concentration.

- Filleting operation- It was shown that the aloe gel, once extracted from the leaf, had greater stability than the gel left in the leaf. In order to avoid the decomposition of the biological activity, the filleting operation must be completed within 36 hrs. of harvesting the leaves.

- Grinding/homogenization- The major steps in this process include crushing or grinding. The aloe gelfillets should be crushed and homogenized using a commercial high speed tissue crusher at room temperature (25°C).
- Addition of vitamin E- The unpasteurized aloe gel juice was fortified with vitamin E to improve the flavour of Aloe vera gel juice and to stabilize the juice. It is used for its antioxidant activity.
- Pasteurization- Treatment (at 85-95°C for 1-2 min) is an effective method to avoid the bad flavour and the loss of biological activity of the Aloe vera gel.
- Flash cooling- After pasteurization, the juice is flash cooled to 5°C or below within 10-15 sec. This is a crucial step to preserve biological activity of the Aloe vera gel.
- Storage- Relative humidity and temperature are two most important environmental parameters that affect product quality.
- Formulation method of lotion: - Measure the quantity of above formulated gel. Weigh all other ingredients used in formulation. Take a large glass or plastic mixing bowl. Add measured out gel of the aloe vera into the mixing bowl. Then add other ingredients of the formulation one by one like almond oil, water, vitamin E & essential oil with measured quantity. Mix all the ingredients of the bowl in a vigorous manner. Aloe vera lotion was prepared.

Formulation

S.no	Ingredients	Standard value(100ml)	Quantity taken(50ml)
1	Aloe vera Gel	75ml	37.5ml
2	Almond oil	50ml	25ml
3	Water	25ml	12.5ml
4	Essential oil	18 drops	9 drops
5	Vitamin oil	1 tablespoon	½ tablespoon



EVALUATION PARAMETER

Spreadability- It is the term expressed to denote the extent of area to which formulation readily spreads on application to skin or affected part. The therapeutic efficacy of a formulation also depends upon its spreading value [16].

It is calculated by using the formula:

$$S = M \cdot L / T$$

Where, M = weight tied to upper slide

L = length of glass slides

T = time taken to separate the slides

- Determination of pH- pH of 1% aqueous solution of the formulation was measured by using a calibrated digital pH meter at constant temperature. pH value of the formulation is 5.5.
- Homogeneity- All developed gels were tested for homogeneity by visual inspection after the gels have been set in the container. They were tested for their appearance and presence of any aggregates.
- Viscosity- The measurement of viscosity of the prepared gel was done with a Brookfield viscometer spindle no.7 and speed 60rpm at 25. C.
- Smoothness- The smoothness of the lotion formulation was tested by rubbing between the fingers and observes whether the gel is smooth, clumped, homogenous or rough.
- Absorbency- Rated at which product is perceived to be absorbed into skin. Evaluated by noting changes in skin surface. Rated slow-moderated-fast.
- Consistency and Greasiness- They both were checked by applying on skin.
- Appearance- All the formulations of aloe vera lotion was light green.
- Washability- The product was applied on hand and was observed under running water.
- Irritancy Test- The cream was applied on left hand dorsal side surface of 1sq.cm and

observed in equal intervals up to 24hrs for irritancy, redness, and edema. The did not produce any irritation or redness on skin.

- For external use only
- Add a dollop (around a 10p coin size) to your hand (more if your skin is particularly dry or on rougher areas such as elbows and knees)
- Rub your palms together to warm up the lotion.
- Use your hands to massage the lotion into your body in small circular motions.

APPLICATIONS

Application of body:

- Helps digestion- Drinking Aloe vera juice it encourages the bowels to move and helps with elimination if a person is constipated. And if you have diarrhoea, it will help slow it down.
- Builds immunity- Aloe vera juice stimulates macrophages, the white blood cells that fight viruses.
- Detoxifies- Aloe vera juice is a great natural aid to detox. Drinking Aloe vera juice provides a fantastically rich cocktail of vitamins, minerals, and trace elements to help our bodies deal with these stresses and strains every day.

These agents stimulate the immune system to fight against cancer.

- Antidiabetic- Aloe vera gel is an effective anti-hyperglycaemic agent against type 2 diabetes. It lowers the blood glucose level without disturbing the normal blood lipid level and liver/kidney function.
- Asthma- Storage of Aloe vera extract in the dark for a period of 3–10 days produces some active compounds proteinoids. These active compounds have shown effectiveness against chronic bronchial asthmatics.
- Cosmetic applications: - Aloe vera gel and powder have many other applications in the cosmetic industry due to their valuable moisturizing and soothing effects in products like shampoos, soaps, cleansers, and moisturizing creams. Soaps prepared with Aloe vera have the advantage that they do not cause irritation and do not leave this kindly.

II. RESULT AND DISCUSSION

Aloe vera plant has potential in pharmaceutical, nutritional and cosmetic industries. The processing of Aloe vera requires critical attention in time, temperature, and sanitation. The herbal gel and body lotion was prepared and subjected to evaluation of various parameters. The

herbal formulation was greenish in colour. The pH was constant throughout the study to about 5.5 which lies in the normal pH range of the skin and the gel did not produce any irritation upon application to the skin. Viscosity is the most important parameter in the evaluation as it governs the many properties of the formulation such as, Spreadability, pourability of the product. The values of Spreadability indicate that the gel is easily spreadable by small amount of shear. The measurement of extrudability becomes an important criterion. All Gel formulations had an excellent extrudability. The stability test was carried out for three months and results revealed that all gels showed better stability. During stability study, there was not much variation in viscosity after testing at different temperature conditions. The preparation was stable under normal storage conditions. These results indicated that the herbal gel had no adverse effects on the topical area. It showed this herbal preparation is useful in inflammation, wound healing, and anti-aging.

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