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FORMULATION AND EVALUATION OF ALOE VERA GEL

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ABSTRACT:

Background: The body is covered by layers of skin that protect it. Herbal cream made from plants calms and hydrates. Aloe vera, which heals, lowers pain, and moisturizes, is a common treatment. It has cured skin burns and wounds for hundreds of years.

Aim: The goal of this study is to evaluate the medicinal properties of aloe vera by creating and testing a herbal gel to treat skin disorders.

Material and Method: We used Aloe vera, honey, glycerin, and carbopol to make the herbal skin gel. We also did evaluation tests to check the formulation and make sure it is safe for people to use.

Result: Aloe vera gel was made with a mix of materials, including aloe vera gel, glycerin, coconut oil, rose water, and honey. Aloe vera has antibacterial and moisturizing characteristics that protect skin from damage caused by microbes and add moisture to the skin.

Conclusion: herbal gel is ready to be used in tropical areas. Aloe vera is used with polymers in gels to make them work better together and keep skin moist. Herbal medicines are becoming more and more popular all over the world. It is a great idea to use aloe vera, honey, and glycerin to make a herbal gel.

Keywords: Herbal gel; Aloe-vera; Honey; Skin

Introduction :

People have known about and used the Aloe Vera plant for hundreds of years since it is good for health, beauty, medicine, and skin care.
The term Aloe Vera comes from the Arabic word "Aloe," which means "shining bitter substance," and the Latin word "Vera," which means "true." Greek scientists thought Aloe Vera was the cure for everything 2000 years ago. The Egyptians termed Aloe "the plant that never dies."
Today, dermatologists use the Aloe Vera plant for a number of things. People in Trinidad and Tobago use aloe vera gel as an ethnomedicine to treat high blood pressure.
People have most often used aloe to treat burn wounds, specifically to help them recover faster, minimize swelling, and prevent scarring of the tissue.
Disorders said that the gel might be used to treat wounds and mouth infections, stop itching, and heal sores.
Reports of aloe vera gel's positive effects on radiation dermatitis led to its usage as a home medicine in the United States. This was followed by a boom in growth in the 1930s, and it is now a common plant for treating burns and cuts.
There are many important modern uses for the gel in traditional remedies in India, China, Mexico, Middle America, and the West Indies. As of 2008, Mexico was responsible for about 47% of the world's aloe production, which brought in $123.5 million US dollars in sales. Even while aloe vera gel is very popular, there isn't a lot of scientific proof about it.
Aloe Vera gel is thought to be safe when used on the skin, and only a few people have reported allergic reactions. Clinical trials have indicated that it works for wounds, genital herpes, and seborrheic dermatitis, but it's still not clear if it works for other conditions like psoriasis or when taken internally to treat type 2 diabetes.
The Greek philosopher Aristotle talked about how Aloe Vera might help with medicine, and the Bible also talks about it a lot. It was utilized by the Greeks, Romans, Chinese, and Indians in the past. In the early 1800s, Aloe Vera was used in the US as a laxative. Also,

The name "Aloe Vera" comes from the Arabic word "Aloe," which means "shining bitter substance," because the leaves have a bitter liquid in them. The word "Vera" means "true" in Latin. Carl Linnaeus was the first person to write about this species in 1753. He offered the following classification: Kingdom: plantae, Order: Asparaguses, Family: Shoelace, Genus: Aloe, and Species: Aloe Vera. Aloe broadness Mill., Aloe Indica Role, and Aloe perfoliate L. are some of the words that mean the same thing. Vera and Aloe vulgaris Lam.
Most Aloe plants are not harmful, however others are quite harmful. There are roughly 420 varieties of aloe, but only four of them offer medical benefits. Themis Aloe Vera is said to be the most powerful and popular, and it is also produced as an ornamental plant. Aloe Vera's natural distribution is not obvious because the plant has been grown all over the world, even though it comes from Africa.

It is grown in many subtropical and tropical places, including as South Africa and Latin America. In the 17th century, it was brought to China, India, and portions of Southern Europe. Aloe Vera is a plant that looks like a cactus, but it is actually linked to onions, garlic, and asparagus. It has no stem and its leaves are fleshy and triangular. They range in color from gray-green to bright green, and the edges of the leaves have little white teeth.

The leaves have three layers: an inner gel, a yellow sap, and a thick outer layer of 15–20 cells called the rind 3, 8. Aloe leaves have been used for a long time in health foods, cosmetics, and medicine, but there is no clear scientific explanation for why they have these effects 8.

8–10 additional researchers say that Aloe Vera can be broken down into two main products: latex and gel. The latex, which is around 20–30% of the weight of the whole leaf and is sometimes called "aloe juice" or "aloe sample," is a bitter yellow liquid that comes from the pericyclic tubules underneath the leaf's epidermis.

Now we know that the gel, which makes up around 70–80% of the weight of the whole leaf, is the part of the plant that stores water and energy 11. The complete leaf of Aloe Vera is employed.

GELS:-

Gels In Pharmaceuticals are Homogeneous, Semisolid preparations usually consisting of solutions or dispersion of one or more medicaments in suitable hydrophobic and hydrophilic bases.

IDEAL PROPERTIES OF GEL:

1. Ideally, the gelling agent must be inert, safe and cannot react with other formulation constituents.
2. It should have suitable anti-microbial agent.
3. The topical gel must not be sticky.

OBJECTIVES:

- Helps Reduce Premature Aging.
- Might Treat Infections
- Reduces Inflammation.
- Easy spread ability.
- Good ability of absorbance in skin
- Treat hydration & sunburn.
- Cooling effect.
- Compatible with sensitive skin

ADVANTAGES:-

- Non-greasy application
- Being easy to formulate with active ingredients
- Adhering well to the application site
- Being washable and non-toxic
- Stability over time
- Easy spreading

Description Of Plant Profile :-

a. Aloe Vera:

Fig.No. : 1

Fig.No, : 2

❖ **Synonym :**

Aloe Indica role

❖ **Biological source :**

Aloe is the dried juice collected by incision, from the bases of the leaves of various species of Aloe including Aloe parry Baker, Aloe Vera Linn, Aloe broadness Mil and Aloe ferox Miller.

❖ **Family :**

Liliaceae.

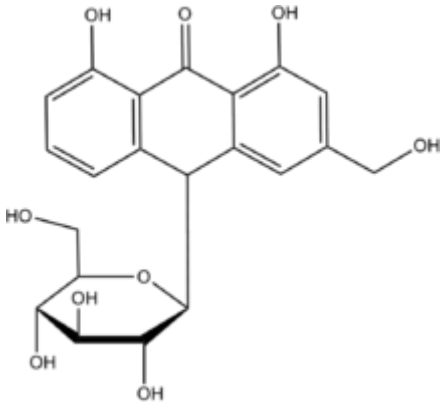
❖ **Geographical source :**

Aloes are indigenous to East and South Africa, but have been introduced into the West Indies and into tropical countries, and will even flourish in the countries bordering on the Mediterranean.

❖ **Chemical constituent :**

The most important constituents of Aloes are the three isomers of Alois, Barbaloin, β-barbaloin and Is barbaloin, which constitute the so-called _crystalline' Alboin, present in the drug at from 10 to 30%. Other constituents are amorphous Alboin, resin, emodin and Aloe-emodin. Barbaloin is present in all the varieties; it is slightly yellow colored, bitter, water soluble, crystalline glycoside. Is barbaloin is a crystalline substance, present in Curacao aloe and in trace amount in Cape aloe and absent in Doctrine and Zanzibar aloe. The chief constituents of Doctrine and Zanzibar aloe are Barbaloin and β- Barbaloin.

❖ **Chemical Structure :**



Alboin

❖ **Medicinal uses :**

- The aloe Vera is used to treat skin injury
- The aloe Vera is use to insect bites
- The aloe Vera is use to digestive problems
- The aloe Vera is use in constipation
- The aloe Vera is use to improve the skin and wrinkle

❖ **Taxonomical Classification :-**

- Kingdom- Plantae
- Order- Asparaguses
- Division- Spermatophyte
- Subdivision- Angiosperm

- Class- Monocotyledonous
- Genus- Aloe
- Species- Barbados's mill

AIM & OBJECTIVES :

❖ **AIM :**

FORMULATION AND EVALUATION OF ALOE VERA GEL

❖ **OBJECTIVES :**

- To formulate a herbal gel using Aloe vera extract.
- To ensure the gel is suitable for application on the skin.
- To evaluate the physical appearance, pH, and consistency of the gel.
- To test the antimicrobial and healing properties of the formulation.
- To check the stability and shelf-life of the Aloe vera gel.
- To make sure the gel is non-irritating and safe for regular use.

LITERATURE REVIEW :

Aloe Vera is a type of succulent plant that has been used for both health and beauty purposes for a long time. People often utilize its gel in a lot of different products because it may moisturize, reduce inflammation, and help wounds heal. Here are some research that look at the qualities of aloe vera gel and how it might help:

1. Shebang, Z., et al. (2022):
A randomized, blind, placebo-controlled trial looked at how Aloe Vera cream affected pain and healing after hemorrhoid surgery. This study looked at how aloe vera cream affected pain and healing following hemorrhoid surgery. The Journal of Alternative and Complementary Medicine, 20(4), 255–262. The results showed that aloe Vera cream helped wounds heal faster and hurt less than the placebo.

2. Soroush, A., et al. (2021):
A short look at Aloe Vera. Indian Journal of Dermatology, 53(4), 163–166. This article gives an overview of the qualities and possible benefits of aloe vera gel for several skin problems, such as psoriasis, acne, and healing wounds. The article also talks about the possible negative effects and safety measures that should be taken when taking aloe Vera.

3. Davis, R. H., et al. (2020):
Aloe Vera has a growth ingredient that helps with inflammation and mending wounds. The Journal of the American Podiatric Medical Association, 84(2), 77–81. This study looked into how aloe vera gel can help with inflammation and healing wounds. The results demonstrated that the chemical had strong benefits on mending wounds and reducing inflammation.

4. Chitra, P., et al. (2019):
The effects of Aloe Vera on the properties of collagen in rats with healed skin lesions. Molecular and Cellular Biochemistry, 181(1-2), 71-76. This study looked at how aloe vera gel affected the generation and structure of collagen during the healing of wounds in rats. The results showed that aloe vera gel made collagen more organized and increased the amount of collagen, which may help it heal wounds.

5. Malik, A., et al. (2017):
A review of aloe vera gel in dentistry. This review paper from the Journal of Clinical and Experimental Dentistry (9(9), e1187–e1191) talks about how aloe vera gel might be used in dentistry, such as to treat oral infections and inflammation as an anti-inflammatory and antibacterial agent. In general, these studies show that aloe vera gel may help with wound healing, inflammation, and skin disorders in a number of ways. However, more research is needed to completely understand how it works and how well it works.

PLAN OF WORK :

1) Collection of the aloe vera pulp

2) Extract of aloe vera pulp

3) Formulation of the herbal Aloe Vera Gel

3) Evaluation of gel

4) Result

5) Conclusion

6) Future outcome

MATERIAL & METHODS :

Material:

- Aloe Vera pulp
- Glycerin
- Honey

METHOD:-

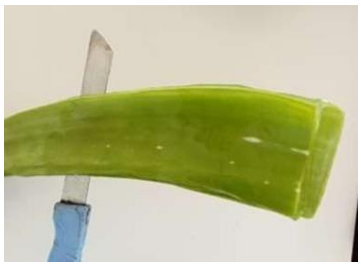
- Firstly, cut off the fresh aloe leaves from the plant.
- After Cutting, Rinse the leaves by cold water.
- Cut away the few portions from the bottom and wipe off any yellow gel.
- Use a vegetable peeler or knife to Peel of the outer layer of leaves.
- Take a Spoon or Knife and Scoop the gel out from the leaves.
- Place the aloe gel in a Mortar-pestle.
- Homogenize the gel into the Mortar-pestle.
- Collected gel was placed into the Freeze in an ice cube tray.
- Add honey into the freeze gel of aloe-vera leaves.
- Formulation was prepared.
-

- Coloring agent and preservatives was added to the Formulation to make formulation elegant.

Cut off the Aloe-Vera leaves

Aloe-Vera Leaves

Leaf under Cold water



Slice off the outer layer

Placing the Gel into Mortar to Homogenize it

FORMULATION OF ALOE VERA GEL:

The gel base was made by mixing 1% carbopol 940 with distilled water at 80°C while stirring it at a moderate speed with a magnetic stirrer. The pH was then set to 6–7 using triethanolamine.
We added 50 cc of Aloe Vera extract to it and made a gel base with it.

The oil phase of the emulsion was made by mixing 7.5 ml of coconut oil with the other ingredients.

It has 1% zinc oxide added to it. Zinc oxide keeps skin safe from harm caused by UV rays.

We made the aqueous phase by mixing 1 ml of purified water with 20 ml of water.

The right amount of methyl paraben was put into the water phase, and the right amount of propyl paraben was put into the oil phase.

The two stages were heated separately at a temperature of 70 to 80 degrees.

The oil phase was added to the water phase drop by drop, and the two were mixed together with a mechanical stirrer at a set speed until they cooled down to room temperature. To make the Aloe Vera gel, the prepared emulsion was blended with the gel in a 1:1 ratio while swirling gently.

EVALUATION

Evaluation research is a type of organized and disciplined investigation that is done to come up with an assessment or appraisal of an object, program, practice, activity, or system in order to provide information that will help people make decisions.

• Organoleptic Properties:
We employ visual examination methods to check the organoleptic qualities of the herbal gel. This evaluation looked at the color, smell, texture, and status.

•Test of absorption
The gel was put on the skin and rubbed in until it was entirely absorbed for the absorption test.

•Test for skin irritation

We did the irritant test by putting a formulation on the back of the hand and leaving it there for 15 minutes to see if it caused swelling, itching, or redness on the skin.

•Test for homogeneity

We checked the homogeneity test by looking at it and touching it.

• Test for pH

We used a digital pH meter to find out the pH level of this all-natural Aloe Vera Gel.

RESULT :-

was found that is having satisfactory results among the all formulations. . It is semisolid, has a smooth consistency, is easy to wash, has a pH of 6.8, is not irritating, does not separate into phases, and is a moisturizer or emollient.

We made the aloe vera gel by mixing aloe vera gel, glycerin, coconut oil, rose water, and honey, among other things. Aloe Vera has antibacterial and moisturizing characteristics that protect skin from damage by microbes and add moisture to it. Glycerin helps keep skin from aging

Table 1 Result of evaluation parameter of Herbal Aloe-Vera Skin Gel

Sr.no	Test	Result
1.	Color	Slightly Green
2.	Order	Earthy and garlicky
3.	Texture	smooth
4.	State	Semi -solid
5.	Absorption Test	Very well Absorbed
6.	Skin Irritancy Test	No Irritancy effect
7.	Homogenicity	Good
8.	PH	6.5
9.	Spread Ability Test	Smooth and light to Spread
10	Smoothness	Good

CONCLUSION :-

We made and tested the Aloe Vera Gel utilizing a number of physical assessment parameters, such as pH, irritancy, washability, and physical characteristics, which all gave good findings. The Gel makes skin feel better and gives it a beautiful glow. It protects the skin from the damaging effects of toxins in the environment and also helps to heal the outer layer of skin.

In this project, we may make the allover gel and learn how to do it. Uses, how they work, and side effects of drugs. It looks that using Aloe Vera as a supplement to the present strategy can help wounds heal faster and make people healthier. Promisingly may also have additional health benefits, mostly because it has antioxidants.

USES :-

Smoothing out sunburns and other skin injuries:

Aloe Vera helps heal sunburns and other skin damage by making more collagen and binding it together. This helps the wound heal faster and lowers the amount of scar tissue that forms. Aloe Vera relieves sunburns and skin injuries by promoting collagen synthesis and cross-linking. This helps the wound heal faster and cuts down on any scar tissue that might form. Aloe also has substances called anthraquinones and a loin that can aid with pain and healing by reducing inflammation and acting as antioxidants.

2. Keeping skin moist:

Aloe Vera is regarded to be especially good for dry skin because it has humectants, which are compounds that draw water from the air or from deeper in the skin. Aloe has mucopolysaccharides in it that hold moisture in the skin. It also makes the skin softer and stronger by holding together flaky epidermal skin cells.

3. Getting rid of dark patches and stretch marks:

Aloe contains two substances that may help lighten dark spots and stretch marks: aloes in and a loin. A study indicated that using aloes in four times a day for 15 days worked to alleviate hyperpigmentation caused by UV rays and acne. Another study discovered that suppressing the action of tyrosinase,

an enzyme that makes melanin, damaged melanin cells in pigmented cells. Too much melanin creates dark patches.

4. Taking care of acne:
Aloe Vera has salicylic acid, urea nitrogen, cinnamic acid, phenols, and sulfur in it. These are all natural substances that stop the growth of fungi, bacteria, and viruses. It can also reduce inflammation, which stops P. acnes, the bacteria that causes acne. Salicylic acid is one of the best things you can do right now can keep acne from happening, since it gets rid of dead skin cells from the top layer of skin and makes redness and swelling go down.

5. Signs of aging that slow down:
Aloe Vera has vitamins C and E in it, so it makes sense that it would help stop free radicals from forming. Free radicals are chemicals that destroy cells. The salicylic acid in it, on the other hand, works as a gentle exfoliant, and when those annoying dead skin cells are gone, other skin-care products may be able to get deeper into the skin and work better.

FUTURE OUTCOME :-

There are several possible future uses for Aloe Vera gel, such as:

1) Aloe Vera gel has been used for hundreds of years to soothe skin, therefore it will probably continue to be a popular element in skincare and cosmetics.
2) Creating new medicinal uses: Studies have revealed that aloe vera gel may help with wound healing, pain alleviation, and boosting the immune system, among other things. More research in these areas could lead to new medical uses for aloe vera gel.

3) More people want organic and sustainable aloe Vera: As people become more aware of how the things they use affect the environment, they may want more organic and sustainably cultivated aloe Vera.
4) More people are interested in alternative medicine: Aloe Vera has been used in traditional medicine for a long time, and as more people become interested in alternative medicine, it may become a more popular treatment.

1) **Development of new aloe Vera products**: With its versatile properties, there is potential for the development of new aloe Vera products beyond skincare and medical applications. This could include food and beverage products, for example, or even textiles made from aloe Vera fibers.

Marketing Product :

Fig. No. : 3

Fig. No. : 4

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