

Anti Acne Property Of Aloe Vera And Ocimum Basilicum L.Extracts:A Review

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ABSTRACT: The aim of this review is to summarize the antimicrobial effect of aloe vera and ocimum basilicum extracts on the acne causing bacteria by conducting various tests. Acne vulgaris is an inflammatory disorder which is common among the adolescent age groups. It affects mostly the teenagers and adolescents. The acne causing bacteria are propionibacterium acnes and staphylococcus aureus. Here, various chemical tests are conducted to prove the presence of chemical constituents essential for the antimicrobial activity. And also antimicrobial test is conducted on propionibacterium acne and staphylococcus aureus by agar well diffusion method using the herbal extracts which showed zone of inhibition. We also suggest that the preparation of formulation on combination with aloe vera and ocimum basilicum extracts may give promising results over acnes.

Key words: Anti- acne, Aloe Vera, ocimum basilicum, herbal extracts, propionibacterium acnes, staphylococcus aureus, anti-microbial activity.

I. INTRODUCTION :

Acne vulgaris is an inflammatory skin problem. It is a common skin condition that affects over 85% of people especially adults. The word 'acne' is derived from Greek language 'akme' meaning facial eruption. Majorly it occurs on face, neck and upper trunk and may remain for long time. Acne may result from hormonal, bacterial and immunological factors. Individual with acne vulgaris may get disturbed mentally which makes them feel inferior. Propionibacterium acnes and Staphylococcus aureus are responsible for causing acne. Nowadays many treatments are available to cure acnes but the most preferred treatment by the people is herbal treatment

as this treatment has less side effects. So here we have reviewed the plants such as Aloe vera and Ocimum basilicum for its antimicrobial activity on the acne causing bacteria like Propionibacterium acnes and Staphylococcus aureus.

TYPES:

*Inflammatory

*Non-Inflammatory

Blackheads: Open bumps on the skin that fill with excess oil and dead skin. They look as if dirt has deposited in the bump, but the dark spots are actually caused by an irregular light reflection off the clogged follicle.

Whiteheads: Bumps that remain closed by oil and dead skin.

Papules: Small red or pink bumps that become inflamed.

Pustules: Pimples containing pus. They look like whiteheads surrounded by red rings. They can cause scarring if picked or scratched.

Fungal acne (pityrosporum folliculitis): This type occurs when an excess of yeast develops in the hair follicles. They can become itchy and inflamed.

Nodules: Solid pimples that are deep in your skin. They are large and painful.

Cysts: Pus-filled pimples. These can cause scars

CAUSES :

- Fluctuating hormone levels around the time of a woman's period.
- Picking at acne sores.
- Clothing and headgear, like hats and sports helmets.
- Air pollution and certain weather conditions, especially high humidity.
- Using oily or greasy personal care products (like heavy lotions, creams or hair pomades and

waxes) or working in an area where you routinely come in contact with grease (such as working at a restaurant where there are greasy food surfaces and frying oil).

- Stress, which increases the hormone cortisol, can also cause acne to flare.
- Some medications.
- Genetics.
- Mainly driven from androgen hormones which become active during the teenage and young adult year.

Collection of plant materials:

Aloe vera and *Ocimum basilicum* are collected from the nearby area and we got authentication from the Tamilnadu Agricultural University located in Coimbatore.

DESCRIPTION:

ALOE VERA:



Fig 1

The name aloe vera derived from the Arabic word "Alloeh" meaning "shining bitter substance" while, "vera" in Latin means "true". The Egyptian called aloe "the plant of immortality". Today, the aloe vera plant has been used for various purposes in dermatology.

Botanical name : *Aloe barbadensis* Miller

Synonyms: *Aloe ferox*, burn plant, Cape aloe

TAXONOMICAL CLASSIFICATION:

Kingdom: Plantae

Subkingdom: Tracheobionta

Division: Magnoliophyta

Class: Liliopsida

Subclass: Liliidae

Order: Asparagales

Family: Aphodellaceae (liliaceae)

Genus: *Aloe*

Species: *A. vera*

GEOGRAPHICAL DISTRIBUTION:

Tropical and Southern Africa, Madagascar, Arabian peninsula, India, Australia, northern South America, etc.

CHEMICAL COMPOSITIONS:

Soluble sugar, glycoprotein, phenolic anthraquinone, flavonoids, flavonols, enzymes, minerals, essential and non essential amino acids, sterols, saponins, salicylic acids, and vitamins.

BENEFITS OF ALOE VERA ON SKIN:

- It's anti-inflammatory properties can reduce pain and swelling and soreness of wounds or injury.
- It supports the production and release of collagens.
- It can speed up wound healing time and limits scarring.
- It is effective in treating fungal and bacterial infections.
- It has an antioxidant effect that can help repair sun damage and slow down the aging process of the skin.
- It protects the skin from the damaging effects of radiation therapy.
- It contains 98% water, which helps moisturize, soothe and hydrate the skin.
- It helps to make the skin more flexible and supple, rather than stiff and leathery.

➤ It has a cooling effect on rashes and

➤ sunburn.

OCIMUM BASILICUM:



Fig 2

Basil belongs to the genus *Ocimum*, derived from the Greek *ozo* which means to smell, in reference to the strong odors of the species within the genus. In French, it's frequently given the name "Herbe Royale", revealing the positive light in which it is viewed. The etymology of basil is unclear, however several potential sources are plausible. It is sometimes referred to as "the King of herbs", and may have derived from the Greek *basileus* or king. Basil may come from the Latin *basilisk*, or dragon; this etymological connection may explain the symbolic connection between basil and scorpions.

Botanical name: *Ocimum basilicum*

Synonyms: Sweet basil

TAXONOMICAL CLASSIFICATION:

Kingdom: Plantae

Phylum: Magnoliophyta

Class: Magnoliopsida

Order: Lamiales

Family: Lamiaceae

Genus: *Ocimum*

Species: *O. basilicum*

GEOGRAPHICAL DISTRIBUTION:

Western Asia, South East Asia, Egypt, Greece, Italy, Europe, England, North America, and India.

CHEMICAL COMPOSITION:

Cinnamate, citronellol, geraniol, linalool, methyl chavicol, myrcene, pinene, ocimene, terpineol,

BENEFITS OF OCIMUM BASILICUM ON SKIN:

- It is used as a plant based moisturizer which helps in treating dry and rough skin.
- The Antimicrobial and anti-inflammatory properties of the herb's oil could positively impact acne.
- The crushed fresh basil leaves used in acne treatment.
- The Essential oil from basil leaves provides protection and acts as a sun-shield.
- The concentrated extract of the leaves and flowers helps in reducing wrinkles.
- The Essential oil from the basil plant may have antifungal properties.

II. MATERIAL AND METHOD:

EXTRACTION OF ALOE VERA:

Aloe vera is extracted by decoction method. Take 50g of aloe vera along with 50ml of water in a beaker and it is heated at 60°C for 30 to 45 minutes. And then filtered and filtrate is used in further experiment.

CHEMICAL TEST FOR ALOE VERA EXTRACT:

TEST FOR ALKALOIDS:

Hager's test;

- Take 1ml of extract add two drops of Hager's reagent (picric acid)
- Prominent yellow precipitate is obtained.

Wagner's test:

- Take 1ml of extract in a test tube and add two drops of Wagner's reagent (potassium iodide solution) along the side of the test tube.
- Reddish brown precipitate is obtained.

TEST FOR PHENOLS:

Lead acetate test:

- Take 1ml of extract and add two ml of 10% lead acetate solution.
- Formation of bulky white precipitate is observed.

Iodine test:

- Take 1ml of extract and add 2 drops of iodine solution.
- Formation of transient red color is observed.



Fig 3

TEST FOR O-GLYCOSIDE:

Modified Borntrager's test:

Take 1ml of extract, add 5ml of Dilute HCL and add 5ml of 5% Solution of ferric chloride. The mixture is boiled for a few minutes and then

subsequently the cooled and filtered part is shaken with benzene; the separated benzene layer and equal volume of Dilute solution of ammonia shows pink color.



Fig 4

EXTRACTION OF OCIMUM BASILICUM:

Ocimum basilicum leaves are extracted using soxhlet apparatus 50g Ocimum basilicum leaves are extracted with water at 60 to 70° C for 5 to 6 hrs and the extract is used for further experiment.

Chemical Test For Ocimum Basilicum Extract:

TEST FOR ALKALOIDS:

Hager's test:

- Take 1ml of extract and add 2 drops of Hager's reagent (picric acid).
- Prominent yellow precipitate is obtained.

TEST FOR CARBOHYDRATES:

Molisch's test:

- Take 1ml of extract and add 2 drops of alcoholic solution alpha naphthol (molisch reagent). Add 1ml of conc sulphuric acid slowly along the sides of the test tubes.
- Violet ring formation at the junction is observed.

TEST FOR STEROIDS:

Salkowski test:

- Take 1ml of extract and add 2ml of chloroform and add 2ml of conc sulphuric acid.
- Appearance of chloroform layer as red and acid layer as greenish yellow fluorescence is observed.

TEST FOR TERPENOIDS:

Liebermann-burchard test:

- Take 1ml of extract and add 2ml of acetic anhydride in a test tube. Add 2ml of chloroform and keep it in a water bath to boiling followed

by cooling. Then add 1ml of conc.sulphuric acid along the sides of the test tube.

- Formation of red color at the junction of the liquids is observed.

TEST FOR PHENOLS:

Lead acetate test:

- Take 1ml of extract and add 2ml of 10% lead acetate solution.
- Formation of bulky white precipitate is observed.

Iodine test:

- Take 1ml of extract and add 2 drops of iodine solution.
- Formation of transient red color is observed.

TEST FOR FLAVONOIDS:

- Take 1ml of extract and add 2ml of ethanol. Add an increasing amount of sodium hydroxide.
- Formation of yellow color which decolorizes after addition of acid is observed.



Fig 5

TEST FOR ANTIMICROBIAL ACTIVITY:

The Aloe vera and Ocimum basilicum extracts are further tested for its antimicrobial activity using microorganisms like Staphylococcus aureus and Propionibacterium acnes by the Agar well diffusion method.

Agar well diffusion method:

It is widely used to evaluate the antimicrobial activity of plants or microbial extracts. Similarly to the procedure used in disk-diffusion method, the agar plate surface is inoculated by

spreading a volume of the microbial inoculum over the entire agar surface. Then, a hole with a diameter of 6 to 8 mm is punched aseptically with a sterile cork borer or a tip, and a volume (20–100 mL) of the antimicrobial agent or extract solution at desired concentration is introduced into the well. Then, agar plates are incubated under suitable conditions depending upon the test microorganism. The antimicrobial agent diffuses in the agar medium and inhibits the growth of the microbial strain tested.

Antimicrobial activity of *Ocimum basilicum* extract



Fig 6

Antimicrobial activity of Aloe vera extract



Fig 7

III. CONCLUSION:

The aqueous extract of the aloe vera and *Ocimum basilicum* extract is checked for the Antimicrobial activity on *Staphylococcus aureus* and *Propionibacterium acne* which is responsible for causing acne. The extract induced good inhibition over other microbes. So we suggest that combination of Aloe vera and *Ocimum basilicum* extract can be used in the formulation that are prepared to treat acnes. As this are the natural herbs available in most of the areas and also cost effective, they can be preferably used in the formulation which also has very less chance of causing side effects.

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