

A Concise review on extensive analysis of medicinal herbs used to treat acne vulgaris

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Abstract-Acne is an extremely widespread skin ailment, accounting for a significant cutaneous and psychological disease load. It is distinguished through scaly red skin, papules, freckles and whiteheads, nodules, which and pimples. Acne pathophysiology and modern therapies are problematic to comprehend. Acne prevalence differs greatly between individuals, and genetic predisposition plays a significant role in its development. The pus-forming bacterium *Propionibacterium acnes* has been related to acne inflammation. (*P. acnes*). The goal of this research was to evaluate the antimicrobial properties of Indian medicinal plants in opposition to the compounds responsible for acne vulgaris. Pathogenic reasons consist of increased production of sebum, pilosebaceous duct hyper cornification, abnormal bacterial function, and irritation. The procedure requires a year of taking synthetic medications, which can have severe side effects. As a consequence, gentler and safer drugs must be used in treatment. Herbal or herbal-based medications are secure substitutes to pharmaceuticals that use natural extracts. The goal of botanical medicine is to provide people with medicines that are effective, safe, efficient, and inexpensive. The present review summarizes the role of herbs in acne treatment. A variety of databases were searched in order to identify everything varieties of medicinal plants with anti-acne action.

keywords: Bactericidal action, acne, *Propionibacterium acnes*, Medicinal biodiversity

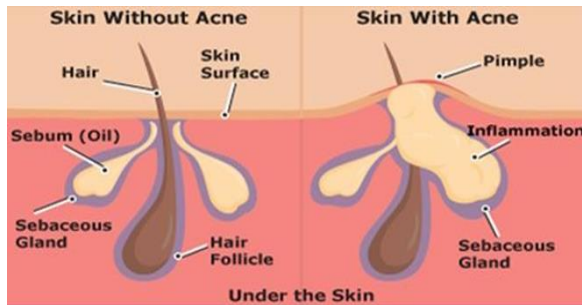
INTRODUCTION

The body's most delicate organ is the skin. Human skin exposure on a daily basis is known to cause a multitude of issues, including acne, pimples, pigmentation, and sunburn markings. These days, acne is the most prevalent skin condition. It is a skin condition that reduces a person's self-esteem in regard to their physical appearance and manifests clinically

between puberty and adolescence⁽²⁾. Acne vulgaris is a multifaceted chronic inflammatory condition that often affects a pilosebaceous unit, which includes the skin's sebaceous gland, hair follicles, and hair¹⁽¹⁾. Non-inflammatory lesions like whiteheads and blackheads and inflammatory lesions like pustules, nodules, podules, and cysts are used to classify acne⁽²⁾.

Numerous clinical conditions, including Seborrhea, scaly red skin, erythematous papules that and inflammation, pustule comedones, lumps, deep pustules, and occasionally pimples, all manifest throughout the acne development phase, are its defining features⁽¹⁾.

The acne vulgaris is a skin illness that affects the sebum (oil) gland. The effect of androgens causes increased sebum production at first. Due to the sebaceous duct's increased keratinization, these glands clog and produce blackheads and whiteheads⁽⁵⁾. The presence of *Propionibacterium acnes* (*P. acnes*) in the sebum results in secondary bacterial infections. The triglycerides in the sebum are converted to lipases, which then convert them into free fatty acids (FFA). *Propionibacterium acnes* (*P. acnes*) is commonly found in the uppermost layers of the skin, where the resultant FFA maintains the skin's pH between 5 and 6, functioning as a barrier towards other bacteria and viruses⁽¹⁾⁽⁴⁾. Fatty acid substances (FFA) become pro-inflammatory when they accumulate in the follicle, close the outer dermis, causing aggravation marked by pimples (such as red papules, pustules) and more profound lumps. (Cysts or nodules)⁽⁶⁾.



Treatments for acne vulgaris that are routinely used include hormonal, systemic, topical in nature, herbal, and some drugs used in combination therapy. Topical drugs used to treat and control acne vulgaris include benzoyl peroxide, as well as retinoid, prescription antibiotics. The systemic agents, also employed, are also known as isotretinoin and antibiotics ⁽⁹⁾. According to the study, antibiotic and retinoids that have been used often in recent years and are still a great alternative for the external and systemic therapy for acne vulgaris. However, these treatments have a multitude of potential side effects, and administering antibiotics usually leads in bacteria establishing a permanent resistance and multiplying within their host ⁽¹¹⁾.

A substantial Amount of new remedies are developed from natural basis, involving plants, as novel drugs (systemic and external) and antibacterial agents to replace or augment existing products. Plant-based extracts have been developed and proposed for usage as naturally occurring antioxidants and/or antimicrobials in foods. It has been demonstrated that methanol, ethanol, as well as essential oil extracts possess antibacterial qualities. Natural methods of treating acne and its deforming consequences have grown in popularity as a result of the studies and research done to identify an alternate source for managing the symptoms of Acne vulgaris. Today, there are both conventional and modern herbal cosmetics that can be utilized to treat skin problems ⁽¹⁸⁾⁽²⁰⁾.

In comparison to modern medications, the side effects of these herbs are minimal, making them a prerequisite component Throughout the course of therapy of acne disease. Academicians, industrialists, cosmeticians, researchers, dermatologists, and scientists are focusing more on herbal remedies for acne treatment in the future year ⁽¹⁴⁾⁽¹²⁾. Herbal medicine may alleviate acne both externally and internally. Customers like topical herb treatments because they are easy to apply and

disguise the unpleasant flavor of herbal compositions. Herbs come from organic sources and have minimal adverse consequences than conventional medications. In recognition of the safety, efficacy, and functionality of botanical remedies, the aforementioned plants are becoming more prevalent as the major concentrating component, which incorporates acne fighting mixtures, in cosmetic solutions ⁽¹³⁾.

Types of acne:

Lesion:

Acne lesions, also referred to as comedones (blackheads and whiteheads), are modifications to the skin caused by a malfunctioning process in the sebum follicle that can range in severity from breakouts to nodules or cysts.. A comedo (plural comedones) is a sebaceous follicle filled with sebum, dead cells from within the sebaceous follicle, microscopic hairs, and occasionally microorganisms ⁽⁶⁾. Pressing or breaking both open and closed type comedones (black heads and whiteheads) can cause tissue harm and lead to infection with bacteria Streptococci, and other types of bacteria. Picking and pressuring the area with inflammation may also raise the chance of hyperpigmentation ⁽⁷⁾.

Pustule:

A pustule may develop as well when the walls enclosing your pores deteriorate. Pustules, as compared with papules, contain pus. These protruding lumps emerging from the outer layer of skin and are often red in hue. Yellow or whiteheads tend to appear on the crown of the head.

Papule:

Whenever there is intense inflammation, the walls enclosing your pores disintegration, resulting in papules. The skin pores in the final product are stiff and blocked but pleasant to the touch. Usually, the skin adjacent to these tiny pores appeared pink.

Cyst:

Cysts can form when a concoction of germs, sebum, and dead skin cells clog pores. The blockages can be discovered farther below the skin's surface and at a deeper level than nodules. When these huge red and white lumps are touched on the affected area, they generate a painful sensation. The most common type of acne is cysts, and these growths are typically caused

by a serious illness. The most prone to leave scars is hence this variety of acne vulgaris.

Nodule:

The nodules that are broad, inflammatory, and painful are produced by the severe form of acne known as nodular acne. A nodule, on the other hand, is a solid, dome-like in form or irregularly shaped lesion, much like a papule. In contrast to a papule, a nodule is differentiated by inflammatory processes, penetrates into the subcutaneous layers of the epidermis, and has the potential for triggering scarring and collagen loss.

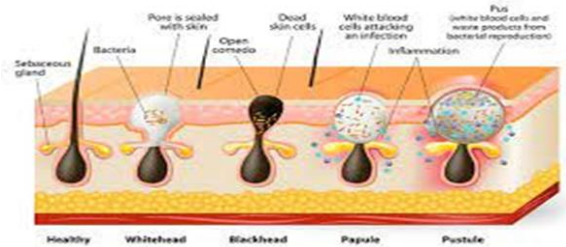
Pathogenesis of acne

The occurrence of acne impacts the pilosebaceous units of the skin and manifests as a variety of lesions at different stages of inflammatory processes, including acne scarring and hyperpigmentation. Lesions associated with acne are most frequently found in the areas of the body known to have a considerable number of glands that produce sebum, such as the front of the face, chest area, upper back, and upper arms

Although the precise mechanisms driving acne are unknown, there are four major pathogenic factors that are connected to it: Excessive sebum production, excessive cornification of the pilosebaceous duct, aberrant bacterial action, and the stimulation of inflammatory Process.

1. Excessive Sebum Production in sebaceous gland
Since it has long been known that acne contributes to sebaceous gland pathophysiology, the diagnosis is now referred to as a sebaceous gland-related problem. Such a classification is, however, rather broad. The pilosebaceous unit, also referred to as the "position" of acne, is a cell-lined pore with a sizable sebaceous gland that secretes oils and vellus, a fine hair that rarely develops outside of the follicle. They are more prevalent on the chest, back, and other areas where acne can appear, including the top of the head, the nostrils, and the cheeks.

The spike in sebum production is one of the most convincing explanations for lesions associated with acne. The severity of acne is connected with the existence of seborrhea, which is primarily influenced by the size and pace of glandular growth, which is controlled by androgens that Acne patients also tend to produce more overall sebum than do people who are in excellent health.



End-organ hyper reaction frequently causes the overproduction in sebum that characterizes individual with acne. It is possible that differential peripheral testosterone to dihydrotestosterone conversion explains the puberty-related enlargement of sebaceous glands. Women with nodulocystic acne frequently have higher plasma testosterone levels. Sebum's primary or associated role in comedogenesis is one potential role it may play in the pathophysiology of acne. Sebum's undisputed function as a substrate for P. acnes development is another one. In addition to monoglycerides, free fatty acids, and diglycerides, P. acnes lipase generates monoglycerides. These substances produce glycerol, the utilisable component for P. acnes metabolism.

2. Pilosebaceous duct undergoes hyper cornification
A accumulation of cells with keratin that stick together in the canal results in a leads to impaction that prevents sebum from passing through. Although the exact cause is unknown, androgenic substances may be having an impact on the process. A shift in sebum lipids, which results in corneocyte hyperproliferation, may also be to blame. The pilosebaceous duct's lack of linoleic acid may be the root of comedone formation.

Linoleic acid penetrates cell membranes of sebaceous glands by plasma, where it is diluted by the high volume of sebum, and ductal corneocytes during are efficiently bathed in an insufficiently low level of the linoleic acid. Sebum, also gets caught beneath the hyperkeratotic plugs, expanding the follicle, as excessively desquamated follicular cells disrupt the follicular lumen.

The conventional follicular morphology has already been damaged at this time. A comedo (plural: comedies) eventually forms as a result of this hyperkeratinization; an open comedone is a blackhead, whereas a closed comedone is a whitehead. These skin lesions have expanded pilosebaceous conduits that are populated by bacteria, naturally saprophytic fungi, cornified follicle epithelium, sebum, and other microbes.

3. Aberrant bacterial invasion of Propionibacterium acnes

Since the commencement of the twentieth century, a role for microorganisms in acne has been promoted. Propionibacterium acnes and Staphylococcus epidermidis are present on the skin's surface in acne-prone areas. Studies on selective inhibitors indicate that P. acnes is the primary organism.

The comedo's maximal circumstances, a congested lipid-rich aperture with inadequate oxygen tension, is where the anaerobic organism P. acnes flourishes. By hydrolyzing sebum triglycerides, this P. acnes overpopulation produces free fatty acids, which may aid in the emergence of microcomedones. A fundamental equilibrium among the groups of pathogenic organisms consuming a follicle may be the key to acne genesis, although it is now unable to tell whether the microflora cause the lesions or exploit the ecological environment in the blemish.

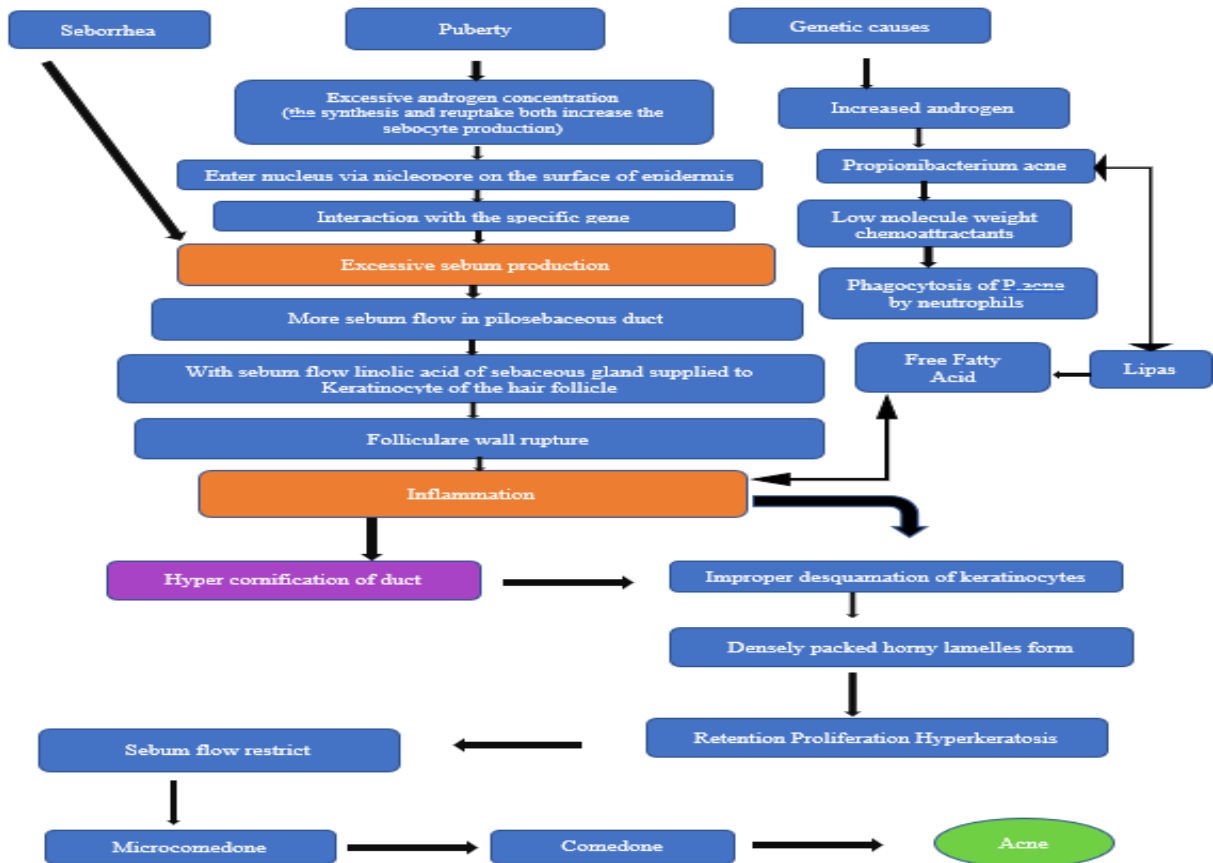
4. Induction of inflammation process

The process of inflammatory response begins whenever the immune system recognises P. acnes.

Because P. acnes is so intensely inflammatory, it may also produce chemostatic agents such lymphocytes, neutrophils, and monocytes. Due to these conditions, follicles may be damaged, break, and discharge germs, fatty acids, and fats infiltrating the dermis beneath them when needed.

Acquired inflammation are going to arise from this procedure. (Pustules, nodules, cysts and papules). In comparison with non-inflammatory lesions, inflammatory lesions are larger and more pus-filled. Meanwhile, the destruction of the follicular epithelium by neutrophil-produced oxygen species that are reactive (ROS), which also contributes to inflammation associated with acne. This culminates in a range of inflammatory events considering that the follicular component is released into the epidermal layer as a result.

With acne lesions, the organization of P. acnes is an excellent stand out with antibiotic control in the proliferation of P. acnes. Together with the decrease in acne lesions, there is an improvement. It's unclear why endogenous bacteria colonies sebaceous gland follicle.



Pathogenesis in formation of acne

Causes of Acne vulgaris:

Dietary Contribution:

When prescription antibiotics are used to inhibit P. acnes development the organizational structure of acne lesions makes an outstanding distinction. There is an enhancement in addition to the decline in acne lesions. Whether endogenous bacteria establish colonies sebaceous gland follicles is unknown.

Infectious Contribution:

Propionibacterium acnes and Staphylococcus aureus have been connected to acne vulgaris. Though their precise contributions to the emergence of pimples are not fully understood. There are thus many different P. acnes sub-strains in both healthy skin and progressive acne. However, it is unclear if these isolates are the cause of this illness or if they have developed into pathogens. Resistance of P. acnes to common drugs is a rising factor. The aforementioned modern strains can change, keep, or adapt to the abnormal oil output, irritation, and insufficient desquamation of acne pores. The pathogenic insect Demodex is assumed to have been the cause of acne vulgaris' development. Yet treating acne vulgaris or getting rid of the mites hasn't worked.

Genetic contribution:

A inherited component may explain certain people's

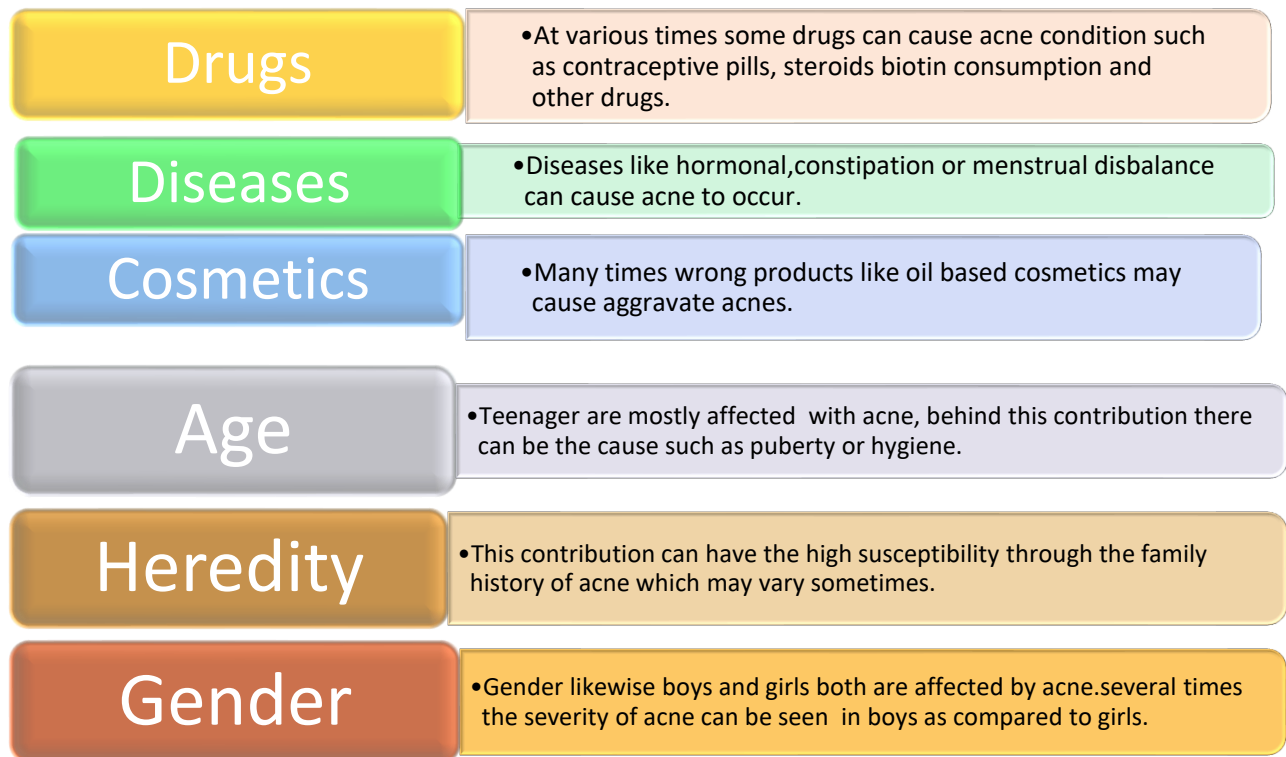
proclivity towards Acne vulgaris. This conclusion has been corroborated by research that estimated the occurrence of acne including first relatives as well as twin studies. Acne has been associated to a number of genetic factors, includes polymorphisms in the IL-1, TNF-, and CYP1A1 genes, among others.

Psychological contribution:

Various scientific and research studies have linked acne severity to an increase throughout stress level, and stress has additionally been mentioned as the primary reason associated to acne flare.

Hormonal changes:

Puberty and menstrual cycles appear to play a role in the growth of Acne vulgaris. Certain sex hormones, especially those that change during puberty and pregnancy, stimulate the follicles glands to generate more sebum. Anabolic steroids' effects are frequently comparable. Hormones associated with the occurrence of acne vulgaris include testosterone, dehydroepiandrosterone, and dihydrotestosterone, and they also contain insulin-like growth factor, which has been linked to acne development. Acne vulgaris in adult women can be caused by an underlying condition such as Cushing 's syndrome, polycystic ovarian syndrome, or seborrheic dermatitis.



Herbs used to treat Acne vulgaris

Medicinal herb	Botanical name	Constituents	Biological purpose
Sawtooth oak	<i>Quercus acutissima. Carr</i>	Tetra galloyl glucose, Penta galloyl glucose, eugenitin, 1-desgalloyl eugenitin, casuarinin, castalagin,	5 α -reductase inhibitor
Enchanting Korean Flower	<i>Pulsatilla koreana (Yabe ex Nakai)</i>	Quercetin quercetin-3-O-glucopyranoside Morin	Antimicrobial, Antioxidant
Nutmeg	<i>Myristica fragrans (Houtt.)</i>	Neolignane, Erythro- Δ 8' -7-acetoxy-3,4,3',5'- tetramethoxy-8-O-4'-	Antimicrobial, Anti-inflammatory
Amla or indian gooseberry	<i>Emblica officinalis L</i>	Gallic acid, methylgallate, corilagin, furosin, and geraniin	Anti-acne In vivo, Anti-inflammatory, Antioxidant
Tumeric	<i>Curcuma longa L.</i>	Curcumin, demethoxycurcumin, bisdemethoxycurcumin	In vivo, Anti-inflammatory, Antioxidant Antimicrobial, Anti-acne
Rosemary	<i>Rosmarinus officinalis</i>	Essential oils	Anti-microbial, Anti-acne, Anti-inflammatory
Shrubby sophora	<i>Syzygium aromaticum L.</i>	Eugenol eugenyl acetate, β -caryophyllene	Anti-inflammatory
Oregon grape	<i>Berberis aquifolium Pursh</i>	Phytosterin, gum and sugars Berberine–yellow alkaloid Berbamine and oxyacanthine–white alkaloids	Anti-inflammatory, skin-lightening, Anti-microbial
Neem	<i>Azadirachta indica Linn</i>	nimbin A and B, nimbin, gedunin, tannin and volatile oil in the barks and leaves Tri-terpenoids and tetra-nortriterpene in seed oil;	Anticancer, Antianthelmintics, Anti-fungal, Anti-acne, Anti-microbial, antiseptic
Blue Eucalyptus	<i>Eucalyptus globules Linn</i>	Essential oils	Antiseptic, Antioxidant
Mulethi	<i>Glycyrrhiza glabra Linn</i>	Licorice roots contain flavanoids, 5-10% glycyrrhizin, licochalcone, glabridin, glibrene	Anti-oxidant, Anti-inflammatory Skin-lightening
Papaya	<i>Carica papaya Linn</i>	The fruit, leaves and seeds contain essential enzymes also peel.	Anti-blemish, Anti-acne, Anti-microbial
Devils Horsewhip	<i>Achyranthes Aspera</i>	Triterpenoids, Oleanolic Acid	Treatment of cough, acne vulgaris
Black Cumin	<i>Nigella sativa</i>	Thymoquinone dithymoquinon	Antihypertensive Antibacterial
Tea Tree	<i>Melaleuca Alternifolia</i>	Terpinen-4-ol 1,8- cineole	Treatment of nail fungus, insect bites and acne
Ashwagandha	<i>Withania Somnifera</i>	Withanolid, Withaferin, Withanolide, Withaferin, Withaferin	Antibacterial, Anti-inflammatory
Tulsi	<i>Oscimum Sanctum</i>	Rosemarinic Acid, Eugenol	Antiaging, Remove Blackheads
Witch Hazel	<i>Hamamelis Virginiana</i>	Eugenol, Safrole, Hexenol.	Relieve swelling, bleeding, itching.
Chamomile	<i>Matricaria Recutita</i>	Bisabdiol, Chamazulene, Apigenin	Treat cough and bronchitis and fever cold
Ceylon cinnamon	<i>Cinnamomum zeylanicum Blume</i>	3-acetyl-11-keto-beta-boswellic acid	Antimicrobial, Anti-inflammatory
Chinese chaste- tree	<i>Vitex negundo L.</i>	β caryophyllene, sabinene, 4-terpineol, γ -terpinene, 1-oceten-3-ol, globulol, caryophyllene oxide,	Anti-acne, In vivo, Antimicrobial, Antiinflammatory, Antioxidant, Anti-androgen
Pomegranate	<i>Punica granatum L.</i>	Flavonoids Alkaloids	Antiacne Anticancer
Lemon	<i>Citrus limon</i>	Limonene, Terpinene	Antioxidant, Source of vitamin
Vitellaria (Shea tree)	<i>Butyrospermum paradoxum</i>	Sesamin, Senamalin, Sesamal.	Antibacterial

Guggul	<i>Commiphara Mukul</i>	Steroids, Diterpenoids, Carbohydrates.	Anti-inflammatory
Tea Plant	<i>Camellia Sinensis</i>	Catechin, Caffeine, Theaflavin	Anti-inflammatory, Antibacterial, Anti-aging
Pine	<i>Pinus roxburghii Sarg</i>	Pycnogenol	Anti-aging
Jajoba	<i>Simmondsia chinensis Schneider</i>	Essential oil	Anti-microbial, Anti-acne
Manjishta	<i>Rubia Cordifolia</i>	Quinones, Iridoids, Triterpenoids.	Antioxidant, Antibacteria
Coriander	<i>Coriandrum, Sativum Linn</i>	Cinalol, Camphor	Flavoring agent, Antioxidant
Camphor	<i>Cinnamomum Camphor</i>	D-Camphor 1,8- cineole	Reduce cold sources, Hemorrhoids
Pepper	<i>Piper longum</i>	Piperin, Piperlongumine	Chronic bronchitis, respiratory infection
Marigold	<i>Calendula officinalis</i>	Eugenol, Safrole, Hexenol.	Anti-inflammatory, Antifungal
Cucumber	<i>Curcubito pepo Linn</i>	oleic, Linoleic palmitic and stearic acid obtained from seeds	Anti-acne, Reduces irritation

Ocimum sanctum Linn:

An aromatic perennial herb native to the Indian subcontinent is tulsi, sometimes known as holy basil. While there are few high-quality studies on tulsi, some research suggests that it may have various skin and hair advantages, including the ability to combat acne. Reduces pigmentation, relieves skin disorders including dermatitis, prevents hair loss or thinning, and avoids dandruff.

Because of its antimicrobial characteristics, tulsi may be good for acne.

Acne develops when the skin's hair follicles become clogged and inflamed with bacteria. Antibacterial compounds such as tulsi may help prevent acne breakouts in those with acne-prone skin. Antioxidants included in *Ocimum sanctum* help to minimize free radical generation and prevent oxidative stress.

This can result in less pigmentation. Antioxidant-rich substances also aid in the fight against environmental stressors including as UV radiation and pollution, which are two of the leading causes of pigmentation.

Eucalyptus globulus Linn:

A member of the *Myrtaceae* family, *Eucalyptus globulus*. A well-known cultivar with great medicinal significance is *Eucalyptus globulus*. A multitude of eucalyptus species are known to provide medical benefits, including a pain reliever, antiviral, antibacterial, anti-inflammatory, antidiabetic, antioxidant, are believed to be antitumor, antihistaminic, cancer prevention, and liver-protective properties.

This herb is said to have analgesic, and antibacterial

abilities. *Eucalyptus globulus*, *E. maculata*, and *E. viminalis* decreased the ability of six gram-positive bacteria, including *Propionibacterium acnes*, *Staphylococcus aureus*, *Enterococcus faecalis*, *Bacillus cereus*, and *Alicyclobacillus acidoterrestris*, to multiply. The antimicrobial qualities of eucalyptus essential oil are no longer effective against several bacteria, including *Propionibacterium acne*.



Phyllanthus emblica Linn:

The aforementioned have a combination of inflammatory, a pain reliever and antibacterial properties. *Phyllanthus emblica*, Indian gooseberry, or amla in Hindi are other names for the fruit of the deciduous tree *Emblica officinalis*, which is also a strong dietary source of vitamin C. It also contains a number of substances, amino acids, and phenolic compounds that can be consumed. In addition to the countries of China, Indonesia, and the Malay Peninsula, amla is a plant that is native to India. It has a long history of usage in Ayurvedic medicine and is recognized for its unique assortment of tannins, in particular Emmicanin A and Emmicanin B, and flavonoids, which have antioxidant action.

Emblica inhibits skin from oxidative stress brought on by transitional metals, free radicals, and non-radicals. Anti-acne, anti-aging, sun protection, and fundamental skin care products all contain emlica. The ability of *P. emblica* to combat microbes was studied in a number of previous investigations. *Staphylococcus aureus* and other gramme-positive and gram-negative bacteria were both resistant to the antibacterial effects of these active isolates. (*Escherichia coli* and *Pseudomonas aeruginosa*). *P. emblica* disintegrated skin debris, causing blocked pores and a worsening of dermatitis.



Curcuma longa Linn:

The *Zingiberaceae* family includes the species *Curcuma longa*. The main biologically functioning component of turmeric is curcumin, which has potent wound-healing, anti-inflammatory in nature and antioxidant capabilities that may be helpful for managing acne. Asian and Ayurvedic medicine have long used turmeric to treat a number of health problems. It has been proposed to be advantageous to everything from inflammation to dyspepsia. Additionally, psoriasis, acne, and diaper rash are all alleviated by it in traditional Asian medicine.



There is no scientific evidence that *curcuma longa* may minimize acne or acne-related hyperpigmentation. No evidence of cutaneous side effects has been provided for turmeric or the ingredient curcumin, which it includes. Previous research has shown that they have anti-inflammatory

in nature anti-HIV, antibacterial and antioxidant, nematocidal, antiparasitic, antispasmodic, and anticarcinogenic qualities.



Cinnamomum zeylanicum Linn:

The annual tree *Cinnamomum zeylanicum*, referred to as "Ceylon cinnamon" or "real cinnamon," is indigenous to Sri Lanka, India, and the neighboring tropical regions of Vietnam and Madagascar. One of the first seasonings to be used in Asian cooking was cinnamon zeylanicum. It has been demonstrated that *C. zeylanicum* extract has significant effects on the progression of disease circumstances. In addition, *C. zeylanicum* differs from other cinnamon types due to its distinctive variations. Nicotine, eugenol, carvacrol, cinnamic acetate, and thymol are the most prevalent phenolic compounds recognized in *C. zeylanicum* oils and are all indispensable.



For dermatological conditions like acne in Persian and Greek medicine, a wide variety of plants have been stated in the texts. Cinnamon is one of the plants that Avicenna recommended for the topical application to facial spots in the Compendium of Medicine. Based on contemporary scientific research, cinnamon species have anti-inflammatory, anti-microbial, and antioxidant qualities. This herbal remedy may therefore deal with different factors relevant to the aetiology of acne. Although archaeological and present evidence for cinnamon's anti-acne properties, no significant clinical research has been performed to date. The primary objective of this preliminary investigation was to investigate the safety and efficacy of a therapeutic cinnamon bark preparation for the

therapeutic management of mild-to-moderate acne lesions.



Azadirachta indica Linn:

The adaptive medicinal plant *Azadirachta indica* is a unique source of several different enhances that have a variety of therapeutic benefits. While *Azadirachta indica* encompasses nimbolinin, nimbidol, nimbin, nimbidin, gedunin, salannin, sodium nimbinate, and quercetin, azadirachtin is the most highly valued and active phytoconstituent. The leaves and bark of *Azadirachta indica* are typically utilized for managing acne vulgaris.

Neem was apparently implemented for years to treat blood- and skin-purifying circumstances. Its therapeutic use for treating skin conditions has a long history due to its antibacterial and anti-inflammatory qualities. Due to its antibacterial properties, it is helpful in treating the majority of epidermal dysfunctions comparable acne, psoriasis, and eczema. The beneficial properties of this plant's extract as an anti-inflammatory in nature anti-arthritis, anti-pyretic, hypoglycemic, anti-gastric prevention from ulcer, anti-fungal, and anticarcinogenic agent has been established by previously conducted research.

Camellia sinensis Linn:

In contrast to green and black teas, which are generated using wilted and oxidised *Camellia sinensis* foliage and buds, green tea is made from fresh *Camellia sinensis* vacuates and buds. Since the first commercialization in China, the production and making of green tea has spread to other East Asian countries. The assortment of *C. sinensis* used, the growing environment, the cultivation methods employed, the growing and processing process, and the time of harvest all have an enormous effect on the various types of green tea that are generated.



Green tea's antioxidant, anti-inflammatory, and antibacterial qualities make it a good acne therapy. Green tea polyphenols can combat infections by destroying bacterial membranes, which aids in acne treatment. When applied to the skin, green tea decreases blackheads and whiteheads while also promoting calm and acne-free skin.

Green tea would include catechins, which are antioxidants. These plant substances, called polyphenols, have anti-inflammatory, antibacterial, and antioxidant effects. Also targeted are free radicals. Epigallocatechin gallate (EGCG), a type of polyphenol that has been shown in studies to help with acne and greasy skin, is particularly abundant in green tea. EGCG is helpful for lowering sebum and oil discharges in the skin because it reduces lipid levels and is anti-androgenic in addition to having anti-inflammatory, antioxidant, and antibacterial qualities. Androgens are hormones the body naturally generates. The sebaceous glands are stimulated to secrete more sebum when androgen levels are high or fluctuate. Hormonal breakouts can be brought on by excess oil, which can clog pores and promote bacterial development. This cycle is broken by EGCG.

Aloe barbadensis Linn:

One of the more than 360 varieties in the family *Liliaceae* is *Aloe barbadensis*, additionally referred to as *Aloe Vera*. Among the components of *Aloe vera* that have the ability to be active are amino acids, lignin, saponins, anthraquinones, and sugars. Several minerals including aluminum, boron, the element barium, magnesium, iron, calcium, sodium, the mineral phosphorus silicon, and the element strontium can be identified in the aloe shrub.

Aloe Vera botanical extracts have been scientifically shown to be advantageous disregarding skin pimples and acne and have been utilized as an organic therapy for preventing the development of various illnesses for generations. It is a made of succulents that is utilized

for curing a variety of skin diseases, which comprises sunburned skin. Aloe Vera is now advantageous when utilized alongside alternative acne pharmaceuticals. Antipyretic, antibiotics, decoagulant, demulcent, diuretic, emollient, parasites excellent, hair growth stimulant, purgative, analgesic, tonic, inflammation reliever, anti-asthmatic, anti-leukopenic, hypoglycemic, insecticides, also animal liver stimulant in nature, local anesthetic, regenerate hunger stimulant, digestion, and anesthesia are just a few of the conditions this miraculous herbal plant encompass. In addition, the an overwhelming majority of people use Aloe vera juice and gel as a better restorative and preventative formulation for handling acne. Propionibacterium acnes, a skin naturally occurring bacteria that causes acne, becomes especially susceptible to the antibiotic actions of aloe vera. In ex vivo research, it has been speculated that aloe gel's multiple constituents may assist in the diminution of this pathogenic microbes population.



Terminalia arjuna Linn:

The Combretaceae family involves plants consisting of Terminalia arjuna, while this genus's plants have historically been administered to treat a wide range of illnesses, which might involve diarrhea, eczema of the skin, cancer, inflammatory conditions, wound repair, cardiovascular stimulant in nature, hemoptysis, lithontriptic, as well as helpful in bilious transmission, diarrhea, as well as acne.

Flavonoids, tannins, triterpenoids, and glycosides were discovered in the bark of Terminalia arjuna. Tannins have cytotoxic, anticancer, astringent, anti-hemorrhagic, anti-oxidant, and anti-bacterial properties.



Berberis Aquifolium Linn:



The family Berberidaceae encompasses the perpetually green shrub Berberis aquifolium, commonly referred to as Oregon hollygrape, Oregon grapeholly, and Oregon grape, a species native to the rugged rocky forests and coniferous forests of the Northwest region, which stretches from British Columbia to northern California. Berberis Aquifolium, which reduces the risk of skin care issues. It's widely used to treat acne, pimples, and popouts. This natural Berberis Aquifolium is suitable for all skin types and offers excellent results in a matter of months. Berberis Aquifolium has several skin-enhancing properties. The best thing about this natural cure is that it can be used for any skin care problem, from acne to scars to pigmentation. Berberis Aquifolium will take care of any uneven skin tone, scars, or other skincare issues you may have. Further information about the benefits of Berberis Aquifolium for radiant skin may be found here.

The Berberis Aquifolium can quickly help clarify acne and pimples. This solution is well renowned for eliminating pimples, acne, and tiny pop-outs in various skin locations. This berberis aquifolium is the best natural remedy if you are looking to get rid of any acne-related difficulties.

Withaniasomnifera Linn:

Acne and acne scar medication can be accomplished effectively and healthily with ashwagandha (Withania somnifera), frequently referred to as Indian ginseng. It boosts the immune system, aids in the battle against infections, and stops oil plugs to developing on the skin. Gram-positive bacteria like Propionibacterium acnes and Staphylococcus epidermidis are the key players in the development of acne vulgaris. 3-b-hydroxy-2, withaferin A, and 3-dihydrowithanolide F are three biologically active steroids found in ashwagandha, and they have promise anti-inflammatory activities. As a result, Ashwagandha treats acne inflammation.



Their importance as a memory booster, anti-parkinsonian, anti-venom, anti-allergic, and anti-tumor medication

have been established by earlier researchers. Immunomodulation, hypolipemic, antimicrobial, and cardiovascular protection are only a few more benefits of *Ashwagandha*.

Withania somnifera which is known for its anti-inflammatory action and antioxidant property. Allopathic treatments are linked to a variety of side effects, including allergies, localised irritation, scaling, photosensitivity reaction, itching, peeling, and redness, but herbal medications are thought to be safer overall.

Hibiscus rosa sinensis Linn:

Among the Hibiscus species is *Hibiscus rose sinensis*. Linn, frequently referred to as rosella, sorrel, Jamaica, red-Ambadi, and Queensland jelly plant, is a beneficial plant in the Malvaceae family. It has been extensively used to cure a variety ailments since the beginning of time. Its possibility for treatment makes it important. It is indigenous to equatorial Africa, India, as well as Brazil, Australia, Hawaii, Florida, the Philippines, Vietnam, and several other nations in Central America and the United States.



H. sabdariffa is one such plant that is grown as a vegetable and garden plant and has a number of traditional applications. It has tremendous therapeutic potential and several beneficial effects. Hibiscus contains acids that act as chemical exfoliators, clearing clogged skin pores. It also has antibacterial properties,

which help in the fight against acne-causing microbes on the skin. As a result, it prevents the formation of pimples.

Gentianalutea Linn:

It is created from up of the desiccated rhizomes and originated of the Gentianaceae plant *Gentianalutea* Linn. Gentiopicrotin and amarogentin, two bitter-tasting secoiridoid glycosides, are the active components of *Gentianalutea*. The gentian root's abstract contains anti-inflammatory qualities. Hence, it produces a cooling sensation when applied to irritated, red skin. The extract also has an antibacterial quality that is good for the skin. It protects the skin surface and the product from harmful bacteria. Hence, it can have therapeutic effects, especially for skin that is prone to acne and skin that is inflamed.



Gentiana blooms appear in a variety of lovely colours, but only the root is utilised medicinally. It's indeed yellow-brown in colour and can be dried to make tablets, drinks, tinctures, and extracts. In traditional medicine, it is frequently mixed with water and used topically or consumed as a drink.

Annova Squamosa Linn:

In botanical terminology, custard apple is referred to as *Annona squamosa*. It is a member of the Annonaceae family. It is a little tree that is indigenous to India and tropical America. It can be found in Australia, Africa, South and Central America, and is now grown in the Philippines, Asia, and West Indies. It has been demonstrated that custard apples reduce sebum (oil) production, clear skin pores, and prevent acne and pimples. It might smooth out and brighten the skin. The custard apple's fruit preserves the skin's tone and improves its appearance. Custard apples are an abundant source of amino acids, which may aid in the synthesis of collagen, a kind of protein that gives skin suppleness.



Figure 2 Showing the Fruits of Custard Apple (*Annona squamosa*)

Custard apple paste treats skin problems naturally and is used to treat ulcers, abscesses, and boils. Vitamin C, found in Custard Apple, aids in wound healing and the production of cartilage, tendons, and ligaments. Regular use of custard apple juice increases the formation of new cells in the skin's layers. It also aids in the healing of wounds and abrasions.

Vigna radiata Linn

Mung bean has anti-acne and anti-aging qualities. Copper, the anti-aging secret of mung bean, easily removes spots, wrinkles, and age creases from the skin. Its continued use may render you appear a decade younger than you were. Women who take care of their hair, nails, and skin tend to be worried about the effects of ageing. If you're striving to look young, you ought to investigate some delicious mung beans for breakfast preparations.

Green gram powder has the capability to organically eliminate the skin and remove cellular debris, rendering the complexion happen lighter and suppler. Green gram powder's high vitamin A and C composition aids to improve skin texture and glow.



Mung beans have been described as sweet and cooling in traditional Chinese medicine literature. Mung beans influence the Heart channel, clearing fever as well as impurities from the epidermis while also cooling the heat in the circulatory system. As a result, mung beans might help in the alleviation of inflammatory skin symptoms such as common skin rashes, cold sores, tongue ulcers, acne, and boils.

According to scientific evidence, mung beans have potent anti-inflammatory and antiviral properties against the virus that causes herpes simplex (HSV-1) that generates cold sores. Mung bean porridge should be thick and devoured at room temperature to benefit skin conditions.

Nigella sativa Linn

Nigella sativa is indigenous to the Mediterranean region. It belongs to the Ranunculaceae family (buttercup family). This plant is utilised as a spice and a medicinal plant all over the world. It is commonly used to treat allergies. Ayurveda (herbs) and Unani are Allergies frequently receive treatment with it. In India's traditional medical methods, Ayurveda (herbs) and Unani are crucial pharmaceuticals. (roots of plants). Foods that are can be flavoured and preserved with the help of seeds. For centuries, people have used black cumin germination to treat a variety of a variety of illnesses and medical issues. It is recognized as one of the most significant types of psychological therapy in Islamic literature. In Indian traditional medical systems (roots of plants). Seeds are utilized to flavour and preserve foods. Black cumin seeds have long been used to cure a wide range of ailments and conditions. In Islamic Studies, it is regarded as one of the highest forms of therapeutic treatment. It's been used for centuries as an aromatic, respiratory stimulant, diuretic, hypoglycemic, anti-microbial, anticancer, and analgesic.



Kalonji is another name for it. Kalonji is a perennial flowering plant that cultivates to an elevation of 20-90cm and has wonderfully separated leaflets with a virtually linear to thread-like arrangement. The fragile blooms are usually composed of 5-10 petals and are coloured pink, yellow, pastel blue, or light purple.

Acne-vulgaris-related skin blemishes have been effectively eradicated with nigella sativa oil moisturiser. An unusual common plant product that has no negative effects. The primary objective of its metabolites, and pinene, demonstrated a detrimental

effect with *Propionibacterium acnes* in a growth chamber. *Propionibacterium acnes* constitutes one of the primary factors in the occurrence of inflammation of the skin.

Aegle Marmelos Linn:

Bael, also recognized by the botanical name *Aegle marmelos*, Family *Rutaceae* is a modest-sized tree with slender branches more over pale brown bark that frequently oozes edible gum. Bael leaves are trifoliate in shape, which implies that each leaf has 4 to 12 pairs of side veins that adjoin at the margin. Bael is a natural detoxifier. The mineral potassium, magnesium, calcium, phosphorus, aluminum, copper, zinc, and iron are minerals that assist in the elimination of impurities. Its feature of bael also makes it beneficial to the skin by preventing acne.



Bael is a fantastic treatment for skin infections because to its anti-bacterial, anti-fungal, and anti-inflammatory qualities. Many forms of fungus that invade the skin are inhibited by bael leaf oil. Moreover, it can help with skin rashes and itching pimples.

CONCLUSION

Long-term research has shown that using aromatic and medicinal plants has few detrimental effects. The plants mentioned above are a reliable source for the production of novel pharmaceuticals. Several plants seem to inhibit the growth of bacteria, diseases, and mould. Some plants have also shown anti-inflammatory and anti-bacterial properties. The herbs and medicinal plants offer an extensive selection of treatment options for the control of acne. Multiple investigations have shown that our ancient cultural assets contain a large number of magical herbs that are a safe and effective substitute for healing acne.

Pharmaceutical organizations are constantly looking for novel approaches to assist troubled youth and other people in removing acne-related deteriorating

inflammation and unsightly areas. This study intends to encourage scientists, cosmeticians, researchers, pharmacy professionals, business owners, and health care providers to employ these herbs more precisely in topical dermato-cosmetic formulations to the advantage of consumers.

However, an insignificant amount of clinical evidence supports the usefulness and safety of these plants when used for therapeutic use in the medical care of facial acne and other skin illnesses or disorders. Acne of this type is a common skin problem that affects thousands of people. Considering all of the ancient plants and herbs have antiviral, antibacterial, and antifungal qualities, they can help with the management of acne. As a result, several herbal treatments are utilized for healing acne.

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