

MEDICINAL PLANTS FOR ACNE VULGARIS: A REVIEW

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Abstract

In addition to hormonal, anti-androgen, or antiseborrheic treatments, benzoil peroxide, retinoids, isotretinoids, keratolytic soaps, alpha hydroxy acids, azelaic acid, and salicylic acid are some of the many diverse therapy options for acne vulgaris. None of these strategies, meanwhile, are without flaws, and it's not quite apparent how they fit into therapy. This article examines the various causes and treatments for acne vulgaris as well as recent research on the effects of acne-treating herbs. These plants are a reliable source for developing new pharmaceuticals.

Keywords: Medicinal Plants, Herbal Medicines, Infectious Disease, Skin Diseases

Introduction

Context

A typical viral illness is acne vulgaris. Seborrhea, tiny papules the size of a pinhead, comedones (blackheads and whiteheads), nodules, and sporadic scarring (pimples) are all signs of it. Inflammation is common in severe acne. Hair follicles and sebaceous glands change as a result of acne, altering the skin. To stimulate these alterations, androgen is required (1). Regardless of gender, increased androgen levels in the body cause acne vulgaris throughout adolescence. Acne on the face, upper chest, and back is brought on by high oil gland counts.

85% of children get acne, which may last until adulthood. Teenagers see the doctor two million times annually, compared to those over 35 who visit 0.2 million. In the US, the expense of treating acne is around \$1 billion. These individuals spent \$100

million on over-the-counter acne medications (1). Less psychological, social, and emotional impairment is caused by asthma, diabetes, rheumatoid arthritis, and epilepsy than by acne. Acne vulgaris scars may negatively impact self-esteem permanently. These patients are less employed and more sad (3). Around the world, 650 million people are afflicted with acne, the fifth most prevalent ailment. Most individuals think that acne vulgaris either gets better or worse with age. Nobody is aware of when it will decline or vanish, however.

Depending on the severity of the acne, several therapies are used. Topical and oral medications are used to treat severe acne with dispersed pustules and papules. The regimen is once again changed depending on effectiveness, adherence, and side effects after six to eight weeks (2). Alpha hydroxy acids, azelaic acid, salicylic acid, retinoids, isotretinoids, keratolytic soaps, hormonal, anti-androgen, and antiseborrheic drugs are some treatments for acne vulgaris (2). There are risks associated with radiofrequency, light, laser, microdermabrasion, chemical peels, and direct steroid injections into inflammatory cysts. The therapeutic effects of these techniques need additional research (2, 5). Patients with viral skin diseases and acne often use natural medications (6).

Evidence Acquisition

The history of medicinal herbs is extensive

(7), and their adverse effects are few (8, 9). Many difficult-to-treat illnesses, such as cancer (14), cardiovascular diseases (15, 16), diabetes (17, 18), hypertension (19, 20, 21), and atherosclerosis (21, 22), are prevented (10, 11) and treated (12, 13) by them. In addition to viral illnesses and colds. Herbal medicines may help lessen toxicities from heavy metals or other substances and pharmacological adverse effects (23, 24). Rats are shielded from lead by artichoke leaf extract (25). Drugs for acne vulgaris may be created using medicinal plants without any negative side effects. The causes, remedies, and most recent studies on medicinal plants are included in this page on acne vulgaris.

Causes of Acne Vulgaris

Infectious Contribution

Acne vulgaris is brought on by *Propionibacterium acnes* and *Staphylococcus aureus*. Their potential role in creating acne is unknown. There are many sub-strains of both healthy skin and recurrent acne. Therefore, these strains could have contributed to this condition or acquired it from a pathogen. Increased drug resistance is seen (1). These strains may modify acne pore sloughing, inflammation, and oil production. Acne and the parasitic mite *Demodex* are related. Acne has not been made better by removing mites.

Dietary Contribution

No proof exists that eating causes acne. A high-glycemic diet makes acne vulgaris worse. Salinity, milk, and chocolate all heighten the severity of acne vulgaris. The effects of chocolates are unknown because of their high sugar and milk content. Acne and fat are said to be related.

Genetic Contribution

In certain individuals, acne may run in the family. Studies on acne in twins and first-

degree relatives support this theory. There are genes similar CYP1A1.

Hormonal Changes

Acne vulgaris may be impacted by puberty and menstruation. Androgen levels grow throughout puberty and pregnancy, stimulating the follicular glands to generate more sebum. Anabolic steroids have comparable effects. Testosterone, dehydroepiandrosterone, dihydrotestosterone, and insulin-like growth factor 1 have been linked to acne vulgaris. Female adults with acne vulgaris may also have hirsutism, polycystic ovarian syndrome, or Cushing syndrome.

Psychological Contribution

According to some study, stress may cause acne to develop and flare up. Acne vulgaris may not be brought on by stress.

Medical Treatments

You may treat acne systemically, topically, or both. Patients respond to therapy in various ways. The greatest outcomes come from treatment designed by a clinician. Numerous techniques are often used to treat acne. Only retinoids are given to comedone patients. They diminish inflammatory lesions and comedones by 40%–70%. Good response rates are seen with hormone treatment, oral antibiotics, topical antimicrobials, and isotretinoin. Retinoids and topical antibiotics are advised for mild to severe inflammatory papulopustulosquamous acne. Initially, oral antibiotics are used to treat moderate to severe inflammatory acne. For severe nodular acne, recurring relapses, treatment failures, or psychological anguish, oral isotretinoin is advised. Isotretinoin is the best treatment for preventing bacterial resistance. Being a potent teratogen, isotretinoin should be used with caution by expectant mothers. Acne may be cured by medicinal herbs.

Medicinal Plants with Anti-Acne Activity

Due to their greater patient tolerance, extensive history of usage, minimal risk of adverse effects, and reduced price, herbal medications are growing in popularity (8). They also treated a number of fatal illnesses. With or without medications, these plants heal illnesses. They might potentially be used to stop or mitigate the negative effects of synthetic medications. Botanicals are used in treatments for acne vulgaris. Acne and other infectious disorders may be treated using medicinal herbs that are anti-inflammatory and antibacterial.

They have aestivalum, these plants. After washing or a steam bath, use plant creams or aqueous infusions containing tannins and astringents. Epidermal extraction of the tannin-rich *Hamamelis virginiana* is used to treat acne due to its topical safety. Other plants that contain tannins include *Agrimonia eupatoria*, *Syzygium cuminum*, *Ledum latifolium*, *Alchemilla mollis*, *Lavandula angustifolia*, *Verbascum thapsus*, *Krameria triandra*, *Hypericum perforatum*, and *Rumex crispus*. Additionally used topically or as depuratives include *Taraxacum officinale*, *Viola tricolor*, *Elymus repens*, and *Bellis perennis*. Horsetail depurative (*Equisetum* species) is needed topically for the anthranoids in fresh *ferox* leaves.

Before periods, acne is treated with *vitex agnus-castus*. The entire fruit extract decreased premenstrual prolactin by increasing progesterone and lowering estrogen. For acne, the German Commission E advises taking 40 mg of *Vitex agnus-castus* extract daily. Women who are pregnant or nursing shouldn't ingest this plant. There have been reports of skin rashes and digestive problems. The

antibacterial properties of many plants have been investigated to ascertain their acne-fighting capabilities in addition to herbal acne therapies. *P. acnes*, an anaerobic bacterium that causes acne, boosts cytokine and ROS production. *P. acnes* is inhibited in vitro by licorice (*Glycyrrhiza glabra*) without causing bacterial resistance.

Strongly present in *Usnea barbata*, usnic acid has shown notable anti-bacterial and anti-yeast action against plant extracts. It significantly slows *P. acnes* development. Bacteria were inhibited below 1 g/mL. Numerous antioxidant and antibacterial qualities of *U. barbata* imply that it may treat acne. In a four-week clinical experiment, *Ocimum gratissimum* essence was put up against a placebo and 10% benzoyl peroxide at four different concentrations (0.5-%) on four different bases. In comparison to a 5% concentration, a hydrophilic base (alcohol or cetomacrogol) containing 2% *O. gratissimum* essence removed cutaneous lesions more quickly and without side effects. Studies have shown that *O. gratissimum* essence applied topically outperformed 1% clindamycin and a placebo. This study demonstrated that *O. gratissimum* and topical yellow aloe vera effectively cured acne.

In a clinical study with 60 participants who had mild to moderate acne, a 50% Aloe vera gel and tretinoin cream combination was well tolerated and more effective than tretinoin plus a vehicle. Due to its antibacterial qualities, the German Commission E has authorized the topical use of *Solanum dulcamara* and edible *Saccharomyces cerevisiae* for the treatment of acne. For acne, *lemna minor* is used topically in China.

In a three-month research, acne was treated with gugulipid, a standardized oleoresin extract from the Indian medicinal plant *Commiphora mukul*. The effectiveness of gugulipid on oily skin is fascinating. The trials described above have problematic methodology. Because there were only 10 volunteers in each group and no placebo, the investigations lacked sufficient power.

After six weeks, green tea (*Camellia sinensis*) lotion was shown to be more effective than pretreatment in 20 patients with moderate to severe acne. Green tea's antiseptic and anti-inflammatory tannins and flavonoids may be useful in the battle against acne. *Mahonia* or *Berberis aquifolium* root is used to treat persistent skin rashes (pustules) in Western medicine. In vitro, the primary active components of *Mahonia* extracts, *Jatrorrhizine* and *Berberine*, inhibit *Staphylococcus coagulase*, *Candida* species, and *P. acne*. Animal sebum fat levels were reduced by 63% by berberine (100 mol/mL).

In 3T3-L1 fatty cells, berberine alkaloid inhibits the formation of fat and has anti-inflammatory effects. Transcription factors and fat-producing enzymes are downregulated. The effects of berberine and berberine-containing plants are enigmatic. By reducing histamine release, tea tree oil (TTO) lessens skin irritability and antimicrobial activity. In a three-month single-blind research experiment, 124 people with acne saw less acne after using 5% tea tree oil and 5% benzoyl peroxide. However, some users of tea tree oil had skin problems. In a 45-day double-blind, randomized study with 60 participants, topical tea tree oil gel at 5% concentration showed promise for mild to moderate *vulgaris* acne despite the absence

of a placebo group. In comparison to a placebo, tea tree oil gel reduced acne lesions by 3.55 and the severity score by 5.75.

Polyhydroxy acid is produced by *S. boulardii* for gluconolactone. In a 150 patient double-blind experiment, inflammatory acne lesions were eliminated with a topical 14% gluconolactone solution. With fewer side effects, this medicine was more effective than the placebo and 5% benzoyl peroxide. More details regarding botanicals that cure acne *vulgaris* are provided below.

Achyranthes aspera

This medicinal plant is used to treat acne *vulgaris*, boils, scabies, and other skin conditions. The non-polar fraction of this plant's leaves has the strongest inhibitory efficacy (96.9%; 60% viability), whereas the saponin, alkaloid, and non-alkaloid fractions all block Epstein-Barr virus early antigen activation in Raji cells. The complete methanolic extract demonstrated a 76% anti-carcinogenic efficiency in the in vivo two-stage mouse skin carcinogenesis test. Leaf extract and non-alkaloid fractions enhanced anticancer activity that combats carcinogenesis. The plant is a rodent-abortive and a contraceptive due to its estrogenic activity.

Allium cepa

After utilizing onion extract gel, seborrheic keratosis patients had better scar appearance. Four, six, and ten weeks after using this extract gel, it has been shown that the redness, softness, and texture of the scar at the site of the excision all improve. In a separate study, it was shown that *A. cepa* and *A. sativum* had antibacterial and antifungal effects against *Malassezia furfur*, *Candida albicans*, and a number of other *Candida* species, as well as several strains of

dermatophytes and *Acne vulgaris* microorganisms. The data suggest that *A. cepa* and *A. sativum* may be effective in treating bacterial and fungal-related diseases. **Azadirachta indica**

Acne was controlled with a herbal anti-acne combination that included ethanol extracts of green tea, *andrographis paniculata*, *azadirachta indica*, and *G. glabra*. *Staphylococcus epidermis* and *Propionibacterium* were eradicated by the anti-acne treatment. Aqueous extract from *Azadirachta indica* leaf may guard against mouse skin cancer. Proliferating cell nuclear antigen levels are greater in skin cancers than in controls. In skin cancers, lipid peroxidation was high.

Cannabis sativus

Psoriasis, eczema, seborrheic dermatitis, rosacea, and lichen planus may all be treated with *cannabis sativus* seed oil. The leaf powder from this plant may treat sores and wounds. Extract from *Cannabis sativus* soothes itchy skin. Seed oil protects the skin against bacterial, fungal, and viral illnesses.

Echinacea angustifolia and Echinacea purpurea

P. acnes, the germ that causes *acne vulgaris*, is killed by *echinacea purpurea* extract. *P. acnes* increased pro-inflammatory cytokines such IL-6 and IL-8 in cell culture models. On typical leaves, *E. purpurea* completely reversed this effect. *E. purpurea* provided *acne* sufferers with protection by lowering bacterially-induced itch and preventing organism growth. Psoriasis, burns, ulcers, herpes, and hemorrhoids are among conditions that *echinacea* helps.

Rosmarinus officinalis

Worldwide, *rosmarinus officinalis* is grown as a houseplant. It is used in

beverages, flavoring, and cosmetics. Rosmarinic acid is produced by *Rosmarinus officinalis*. Photo-aging and photo-cancers are brought on by UV exposure. Due to its antioxidant action, *R. officinalis* aqueous extract protects against UV-induced photodamage. Oxidative stress is caused by infections. Therefore, antioxidant substances could help this approach without also acting as an antibiotic. *Rosmarinus officinalis* oil also combats the *P. acnes* bacteria, which causes *acne*. In a research, *R. officinalis* essential oil significantly changed the size and morphology of *P. acnes*.

Melaleuca alternifolia

Melaleuca alternifolia, sometimes known as the tea tree. It spreads to the nearby regions and north coast of New South Wales. In marshy plains and around streams, it often outcompetes other species. Tea tree oil kills methicillin-resistant *S. aureus*, Gram-positive and Gram-negative bacteria, and yeasts like *C. albicans* in vitro. The action is brought about by monoterpenes rupturing the plasma membrane barrier. Tea tree oil, which is antibacterial and anti-inflammatory, stimulates monocytes. Tea tree oil used topically treats *acne* without any harm. Osteomyelitis and persistent wounds gain.

Conclusions

In vitro, a number of plants suppress viruses, fungus, and bacteria. Many plants have anti-inflammatory and anti-fat properties. But several academic research show how well and risk-free these herbs work to cure *acne* and other skin problems. Chemical therapies thus seem to provide the strongest defense against skin infections and *acne*. The effectiveness of

synthetic medications for acne and other skin conditions has not yet been established. Plants used in this investigation produced encouraging findings. They may be used as a supplement to other therapies or in the treatment of mild to severe ailments. When taking topical or oral medications, take contact sensitization into consideration. Natural acne therapies may be made from a variety of plants, such as mountain grape roots, tea tree oil, *Saccharomyces*, and even *Ocimum basilicum*. Clinical studies with controls are especially necessary for *G. glabra*, *U. barbata*, *L. minor*, green tea, mountain grape root (*M. aquifolium*), *S. bulderi gluconolactone*, and *gugulipid*. Research on the therapeutic efficacy and safety of *H. perforatum*, *C. sativum*, *B. serrata*, *U. barbata*, *R. officinalis*, and green tea is crucial for treating bacterial skin infections. How these plants run is a significant additional issue. Plant phenolic compounds have antibacterial properties. The majority of the plants in this review have these substances. The degree of these medications' anti-acne effectiveness is unknown, however. Keep in mind that phenolic chemicals are found in many plants. Any plant that contains phenolic compounds should thus have anti-acne qualities, making it worthwhile to investigate if these substances are the only ones to blame.

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