



CODEN [USA]: IAJPBB

ISSN : 2349-7750

INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

SJIF Impact Factor: 7.187

<https://doi.org/10.5281/zenodo.17487409><https://www.iajps.com/volumes/volume12-october-2025/146-issue-10-october-25/>Available online at: <http://www.iajps.com>

Review Article

AN OVERVIEW ON THE ANTIACNE ACTIVITY OF MEDICINAL PLANTS

Sakshi M.Kadam¹, Prof.Venkatesh S.Nagare², Dr.Swati P.Deshmukh³

Student , Shraddha Institute of Pharmacy Kondala Zamre, Washim 444505

Assistant Professor , Department of Industrial Pharmacy , Shraddha Institute of Pharmacy
Kondala Zamre, Washim 444505Principal , Shraddha Institute of Pharmacy , Department of pharmacology Kondala Zamre,
Washim 444505

Abstract:

Essentiality of natural product Natural products derived from plant, animal and mineral sources have the capacity to treat different human diseases. Around 80% of the general population uses natural products for the treatment of different diseases whereas allopathic drugs may cause many side effects. Acne causing bacteria becomes resistant to the drugs if they are used for a long period. Due to low toxicity and side effects, herbal medicine is becoming popular when compared to allopathic. The natural system of The natural system of medicine focus on the entire body and treat the root cause of acne, whereas allopathic medicine focus on treating the symptoms like inflammation, redness etc. associated with blemishes. In the treatment of acne, herbal drugs are considered due to their negligible adverse effects. Herbal therapies gain the attention of cosmeticians, researchers, academicians, dermatologists and industrialists for acne treatment in upcoming years. Acne treatment with herbs is given by either externally or internally or with both. The most preferable choice of treatment is topical application of herbs because of the ease of application whereas when they are taken internally they may cause bitter or unpleasant taste. Herbs are used in many cosmetic formulations and anti-acne compositions as they are safe with good efficacy. This review mainly focuses on the herbals extracts, powders and essential oils for topical treatment in case of Acne vulgaris. The purpose of this study is to set the trend for better medicinal use of herbs for acne treatment and to discover the active constituent responsible for anti acne activity.

Keywords:- acne vulgaris, antibacterial activity, antioxidant, skin disease, medicinal plants.

Corresponding author:

Sakshi Mahadev Kadam,

Student, Shraddha Institute of Pharmacy,

Kondala Zamre Washim 444505

QR CODE



Please cite this article in press Sakshi Mahadev Kadam et al., An Overview On The Antiacne Activity Of Medicinal Plants, Indo Am. J. P. Sci, 2025; 12(10).

INTRODUCTION:

Affecting approximately two-thirds of people over an entire lifetime, acne vulgaris is a common inflammatory condition on the skin. This condition manifests as an ailment affecting the skin due to clogged hair follicles filled with shed skin cells. Despite having a lower mortality linked to this dermatological condition, its significance as a substantial public health issue stems from its profound impact on mental well-being. Affecting individuals of either gender during adolescence, acne occurs in people regardless of sex. The keratin production occurs as a result of both the cell linings in the hair follicle's canals stimulating it through testosterone and an increase in the size of sebaceous glands leading to greater secretion of sebum. Cysts form when excess oil is secreted by glands, leading to blockages in pores. Clogged channels result in an increase of bacterial growth, causing breakouts. These microorganisms produce these enzymes that lead to the breakdown of sebum, triggering an inflammatory response. Several critical elements contribute to the development of acne spots: heightened oil secretion by glands, shedding of skin cells known as keratins, microbial proliferation, and immune response. *Propionibacterium acnes* (often referred to as *P. acnes*), which is commonly found on human skin, plays a significant role by being identified as primarily responsible for the onset of acne vulgaris. This gram-positive, non-oxygen-requiring microbe synthesizes propionate as an energy output product. Consequently, drugs designed for treating acne vulgaris must possess an efficacy in inhibiting *Propionibacterium acnes*. For decades, antibiotics have been employed in treating acne cases; nonetheless, there is evidence suggesting an increase in antibiotic-resistant strain prevalence. Thus, there is an obstacle in finding natural sources of novel compounds to address this issue. Acne vulgaris is a not unusual cutaneous inflammatory ailment of the pilosebaceous unit, which runs a persistent route. The situation commonly manifests with papules, pustules, or nodules frequently on the face, although it is able to additionally have an effect on the upper fingers, trunk, and back. The pathogenesis of acne vulgaris entails the interplay of a couple of factors that in the end result in the formation of its primary lesion, that's known as "comedo" (see photo. zits Vulgaris). despite the fact that zits vulgaris is normally located among youth, it is not limited to this age organization and can have an effect on individuals of numerous a while. The severity of this circumstance can range, ranging from a mild presentation with only a few comedones to more intense paperwork characterized through disfiguring inflammatory manifestations, which can result in hyperpigmentation, scarring, and negative psychological consequences.

Acne

Acne is a preferred time period used for eruptive ailment of the pores and skin. it's miles from time to time used as a synonym for pimples vulgaris. it is a not unusual human pores and skin sickness, characterized via areas of pores and skin with seborrhea (scaly purple skin), comedowns (blackheads and whiteheads), papules (pinheads), pustules (acne), nodules (large papules) and probable scarring. acne affects on the whole skin with the densest populace of sebaceous follicles; those regions encompass the face, the upper part of the chest, and the again. severe pimples is inflammatory, however acne also can manifest in non inflammatory forms. The lesions are caused by adjustments in pilosebaceous devices, skin systems along with a hair follicle and its related sebaceous gland, adjustments that require androgen stimulation. pimples happens most usually ay through formative years, and frequently continues into maturity. In youth, acne is typically as a result of an growth in male sex hormones, which human beings of each genders accrue all through puberty. For most people, acne diminishes through the years and has a tendency to disappear — or no less than decrease — after one reaches one's early 1920s. there is, but, no manner to predict how lengthy it'll take to disappear absolutely, and some people will bring this situation well into their Thirties, 1940s, and beyond⁵. some of the large nodules have been previously referred to as "cysts" and the term nodulocystic has been used to explain intense cases of inflammatory acne.

Etiology of Acne

- Acne develops due to hypersensitivity of the sebaceous glands to ordinary ranges of circulating androgens. This manner is further exacerbated by the presence of *Cutibacterium acnes* (*C. acnes*), a bacterial species, and subsequent irritation.
- Proposed contributory elements for acne consist of:
- Use of medicinal drugs such as lithium, steroids, and anticonvulsants.
- Exposure to excess sunlight.
- Use of occlusive wear, consisting of shoulder pads, headbands, backpacks, and underwire brassieres.
- Oil-based cosmetics and facial rubdown.
- Endocrine disorders, which includes polycystic ovarian syndrome, or even being pregnant. A premenstrual flare-up in zits appears to comply with edema of the pilosebaceous duct. This takes place in 70% of lady sufferers.
- Genetic elements drastically have an

impact on the percentage of branched fatty acids observed in sebum, with heritability estimates ranging from 50% to 90%

- Repetitive mechanical trauma on account of scrubbing affected pores and skin with soaps and detergents.

Pathophysiology of Acne

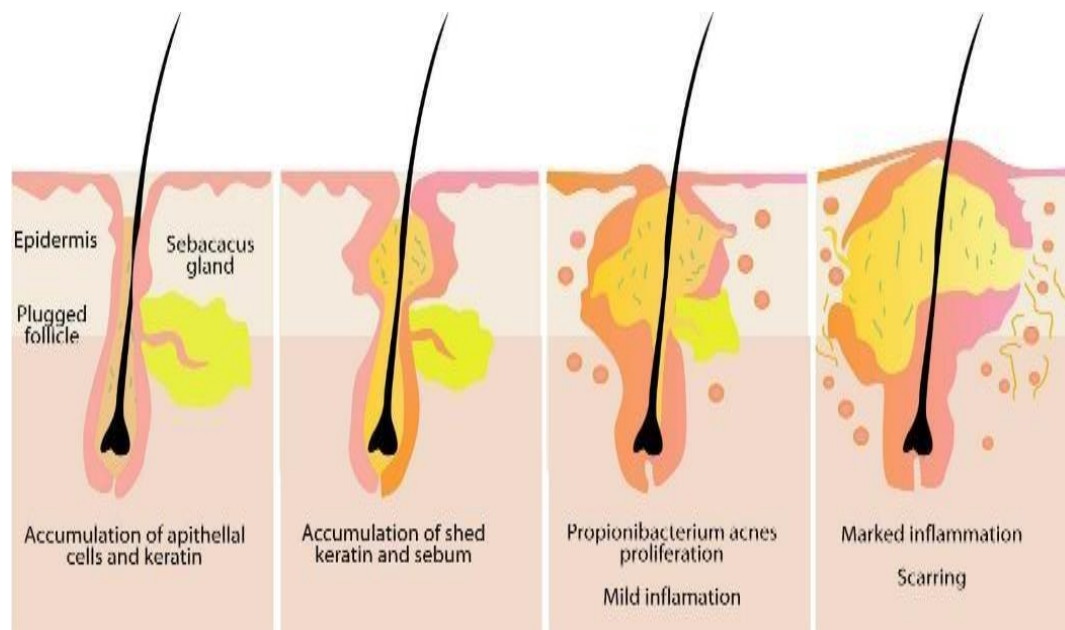


Fig no 06(Pathogenesis of Acne)

A. Increase in Sebum manufacturing: An growth in sebum production inside the hair follicles is one of the most giant reasons of pimples formation. consistent with Gallick et al. androgen hormones, especially testosterone and Insulin boom hormone (IGH-1), growth sebum synthesis and secretion. there is a clean correlation among accelerated sebum manufacturing and the severity and frequency of pimples lesions; as a end result, it is a sizable detail that ought to be considered in patients affected by pimples vulgaris.

B. Hyper keratinization abnormalities of the pilosebaceous follicles: Commonly, the healthy follicles often shed single-cellular keratinocytes into the lumen, which can be then in the long run eliminated. however, in pimples sufferers, keratinocytes hyper proliferate and aren't shed into the lumen, which leads to the buildup of abnormal desquamated corneocytes within the pilosebaceous follicles coupled with lipids and monofilaments.

C. Hyper proliferation of propionibacterium acnes (P. acnes): Propionibacterium, which performs a vast element within the pathophysiology of inflammatory pimples, is a further zits-inflicting agent. Cutibacterium acnes, formerly referred to as propionibacterium acnes, is an anaerobic, lipophilic, gram-effective pathogen that prefers to

Several causal factors are believed to pay a key part within the traditional etiology of acne vulgaris. As discussed formerly, chronic pimples pores and skin illnesses are as a result of accelerated sebum excretion prices, endocrinology factors consisting of androgens, aberrant keratinization of the follicular infundibulum, bacterial contamination proliferation, and consequent inflammation.

colonies in sebaceous follicles due to the fact they produce massive quantities of sebum and offer fantastic anaerobic habitat for bacterial growth. P. acnes secretes a lipase enzyme that metabolizes the triglycerides of sebum into glycerol and fatty acids, that could lead to the formation of comedowns and irritation at the skin.

D. Inflammation Acne: On continuation to the above P. acne manner, whilst the immune device detects P. acnes, the inflammatory process begins. P. acnes has a robust inflammatory effect, which may additionally produce chemo static dealers like lymphocytes, neutrophils, and macrophages. similarly, these conditions purpose follicular harm, rupture, and the release of germs, fatty acids, and lipids into the dermis layer. these mechanistic procedures will produce inflammatory lesions along with ulcers (pustules, nodules, cysts and papules). Non- inflammatory lesions are smaller and less pus-filled than inflammatory lesions. similarly, it changed into determined that neutrophils produce reactive oxygen species (ROS), which damage the follicular epithelium and make a contribution to acne inflammation. This reasons the follicular substances to be expelled into the dermis, resulting in a diffusion of inflammatory zits lesions.

E. DNA Methylation: Underneath environmental strain, epigenetic modification, which represents the intersection of genetics and the environment, can adjust the expression of genes. DNA methylation, one of the well-studied varieties of epigenetic modification, is gaining increasing interest in the subject of dermatology for its characteristic inside the mechanisms of inflammatory, autoimmune, and cancerous skin illnesses. DNA methylation has been proven to play a function inside the pathogenesis and development of inflammatory pores and skin sicknesses which include hidradenitis suppurativa, atopic dermatitis, psoriasis, and different inflammatory pores and skin disorders. Epigenetics plays a large position in the improvement of acne vulgaris and can offer insights into its molecular mechanisms and capability therapeutic processes.

Medicinal plants related to anti acne activity Essentiality of natural product

Natural products derived from plant, animal and mineral sources have the capacity to treat different human illnesses. round eighty% of the trendy population uses natural products for the treatment of different sicknesses while allopathic pills may purpose many facet effects. zits

inflicting bacteria will become immune to the medication if they are used for a long duration. Due to low toxicity and side effects, natural medicinal drug is turning into famous whilst as compared to allopathic. The natural system of The natural gadget of medication awareness on the whole frame and treat the root purpose of pimples, whereas allopathic medicinal drug focus on treating the signs like inflammation, redness and so on. associated with blemishes. In the remedy of acne, natural tablets are considered due to their negligible detrimental outcomes. herbal treatment options benefit the interest of cosmeticians, researchers, academicians, dermatologists and industrialists for zits treatment in upcoming years. zits treatment with herbs is given by using either externally or internally or with each. The maximum optimum preference of remedy is topical software of herbs because of the ease of utility while whilst they are taken internally they may also motive sour or unsightly taste. Herbs are used in many beauty formulations and anti-pimples compositions as they are safe with correct efficacy. This assessment specially focuses on the herbals extracts, powders and vital oils for topical remedy in case of acne vulgaris. The motive of this look at is to set the fashion for higher medicinal use of herbs for zits treatment and to find out the active constituent answerable for anti acne hobby.

Sr. No	Common Name	Biological source	Family	Chemical constituents	Parts to be use
1.	Neem	Azadirachta Indica	Meliaceae	Azadirachtin, Nimbin	Flowers
2.	Turmeric	Curcuma longa Linn	Zingiberaceae	Curcuminoids, volatile oil	Dried rhizome
3.	Liquorice	Glycyrrhiza glabra Linn	Leguminosae	Flavonoids, 5-10% glycyrrhizin	Dried roots
4.	Tulsi	Ocimum sanctum L., Ocimum basilicum L.	Labiatae	Volatile oil, eugenol, caryophyllene, camphor	Leaves

Table.no 1(some medicinal plants)

CONCLUSION:

In contrast to earlier times, modern pharmaceutical preparations place a large emphasis on herbs and plants with unique medicinal properties. People are becoming more knowledgeable and interested in medicinal plants, their cultivation, uses, and advantages over synthetic versions. In India, more than 70% of people utilise herbal cosmetics for personal care. According to the study mentioned above, numerous plants can treat and cure a wide range of skin problems and disorders. various natural ingredients, natural colours, and natural

perfumes derived from diverse plant components, such as flowers, leaves, seeds, etc. are also used in the formulation of various herbal cosmetics. When compared to synthetic cosmetics, this composition counteracts the economic downturn and makes it more affordable.

REFERENCES:

1. Lambrechts IA, de Canha MN, Lall N. Exploiting medicinal plants as possible treatments for acne vulgaris. In Medicinal plants for holistic health and well-being 2018

- Jan 1 (pp. 117-143). Academic Press.
2. Dey P, Karuna D, Bhakta T. Medicinal plants used as anti-acne agents by tribal and non-tribal people of Tripura, India. *American Journal of Phytomedicine and Clinical Therapeutics*. 2014;2(5):556-70
 3. Eady EA, Layton AM, Sprakel J, Arents BW, Fedorowicz Z, Van Zuuren EJ. AGREE II assessments of recent acne treatment guidelines: how well do they reveal trustworthiness as defined by the US Institute of Medicine criteria?. *British Journal of Dermatology*. 2017 Dec 1;177(6):1716-25.
 4. Adityan B, Kumari R, Thappa DM. Scoring systems in acne vulgaris. *Indian Journal of Dermatology, Venereology and Leprology*. 2009 May 1;75:323.
 5. White GM. Recent findings in the epidemiologic evidence, classification, and subtypes of acne vulgaris. *Journal of the American academy of dermatology*. 1998 Aug 1;39(2):S34-7.
 6. Motosko CC, Zakhem GA, Pomeranz MK, Hazen A. Acne: a side-effect of masculinizing hormonal therapy in transgender patients. *British Journal of Dermatology*. 2019 Jan 1;180(1):26-30.
 7. Gollnick H, Cunliffe W, Berson D, Dreno B, Finlay A, Leyden JJ, Shalita AR, Thiboutot D. Management of acne: a report from a Global Alliance to Improve Outcomes in Acne. *Journal of the American academy of dermatology*. 2003 Jul 1;49(1):S1-37.
 8. Fox L, Csongradi C, Aucamp M, Du Plessis J, Gerber M. Treatment modalities for acne. *Molecules*. 2016 Aug 13;21(8):1063.
 9. K. Moreno-Vázquez, L. Calderón, A. Bonifaz Seborrheic dermatitis. An update *Dermatol. Rev. Mex.* (2021)
 10. Shamloul G, Khachemoune A. An updated review of the sebaceous gland and its role in health and diseases Part 1: Embryology, evolution, structure, and function of sebaceous glands. *Dermatologic Therapy*. 2021 Jan;34(1):e14695.
 11. Knutsen-Larson S, Dawson AL, Dunnick CA, Dellavalle RP. Acne vulgaris: pathogenesis, treatment, and needs assessment. *Dermatologic clinics*. 2012 Jan 1;30(1):99-106.
 12. Tan JK, LF SG, Alexis AF, Harper JC. Current Concepts in Acne Pathogenesis: Pathways to Inflammation. In *Seminars in cutaneous medicine and surgery* 2018 Jun 1 (Vol. 37, No. 3S, pp. S60-S62).
 13. Byrd AL, Belkaid Y, Segre JA. The human skin microbiome. *Nature Reviews Microbiology*. 2018 Mar;16(3):143-55.
 14. Mayslich C, Grange PA, Dupin N. *Cutibacterium acnes* as an opportunistic pathogen: an update of its virulence-associated factors. *Microorganisms*. 2021 Feb 2;9(2):303.
 15. Jhawar V, Gulia M, Maddiboyina B, Dutt R, Gupta S. Fate and applications of superporous hydrogel systems: a review. *Current Nanomedicine (Formerly: Recent Patents on Nanomedicine)*. 2020 Dec 1;10(4):326-41.
 16. Chauhan PN, Sharma A, Rasheed H, Mathur H, Sharma P. Treatment opportunities and technological progress prospective for acne vulgaris. *Current drug delivery*. 2023 Oct 1;20(8):1037-48
 17. Baek J, Lee MG. Oxidative stress and antioxidant strategies in dermatology. *Redox Report*. 2016 Jul 3;21(4):164-9.
 18. Dey P, Karuna D, Bhakta T. Medicinal plants used as anti-acne agents by tribal and non-tribal people of Tripura, India. *American Journal of Phytomedicine and Clinical Therapeutics*. 2014;2(5):556-70.
 19. Nasri H, Bahmani M, Shahinfard N, Nafchi AM, Saberianpour S, Kopaei MR. Medicinal plants for the treatment of acne vulgaris: A review of recent evidences. *Jundishapur journal of microbiology*. 2015 Nov 21;8(11):e25580.
 20. Kapoor S, Lata Saraf S. Topical herbal therapies an alternative and complementary choice. *Research journal of Medicinal plant*. 2011;5(3):650-69.
 21. Venkatachalam D, Thavamani SB, Varghese VK, Vinod KR. Review on herbal cosmetics in skin care. *Indo American Journal of Pharmaceutical Sciences*. 2019 Jan 1;6(1):781-9.
 22. Reddy IV, Neelima P. Neem (*Azadirachta indica*): A review on medicinal *Kalpavriksha*. *International Journal of Economic Plants*. 2022;9(1):59-63.
 23. Hewlings SJ, Kalman DS. Curcumin: A review of its effects on human health. *Foods*. 2017 Oct;6(10):92.
 24. Debjit Bhowmik C, Kumar KS, Chandira M, Jayakar B. Turmeric: a herbal and traditional medicine. *Arch. Appl. Sci. Res*. 2009;1(2):86-108.
 25. Bhadra P, Sethi L. A review paper on the Tulsi plant (*Ocimum sanctum*). *Indian Journal of Natural Sciences*. 2020;10(60):20854-60.
 26. Rao KV. A review on Licorice. *Ancient science of life*. 1993 Jul 1;13(1 & 2):57-88.