



Review Article

PROBABLE MODE OF ACTION OF *SYMPLOCOS RACEMOSA* ROXB, *RUBIA CORDIFOLIA* LINN.,
AND *GLYCYRRHIZA GLABRA* LINN. IN ACNE VULGARIS: AN INTEGRATIVE REVIEW

Sumy Basheer^{1*}, Indulekha VC²

¹PG Scholar, ²Associate Professor, Department of Dravyagunavigyana, Government Ayurveda College,
Thiruvananthapuram, Kerala, India.

Article info

Article History:

Received: 03-01-2026

Accepted: 10-02-2026

Published: 15-03-2026

KEYWORDS:

Acne vulgaris,
Mukhadushika,
Herbal drugs.

ABSTRACT

Acne vulgaris is a multifactorial inflammatory disease of pilosebaceous unit, typically presenting with lesions like comedones, papules, pustules and nodules. It can be correlated with *Mukhadushika*, a type of *Kshudra roga* (minor disease) mentioned in Ayurveda classics. Many herbal drugs are mentioned by Ayurveda for the treatment of acne vulgaris as face packs. **Objective:** To explore the probable mode of action of *Symplocos racemosa* Roxb., *Rubia cordifolia* Linn. and *Glycyrrhiza glabra* Linn. in treatment of acne vulgaris through integration of Ayurvedic concepts and contemporary pharmacological evidence. **Methods:** A comprehensive literature review was conducted using classical Ayurvedic texts, Ayurvedic Pharmacopoeia of India and also peer reviewed scientific databases to critically analyse the phytochemical constituents and relevant pharmacological activities related to acne vulgaris in both ayurvedic and modern perspectives. **Results:** *Lodhra* containing alkaloids, tannins etc., exhibits astringent, anti-inflammatory, and antimicrobial activities, helping to reduce sebum secretion and inflammatory lesions. While *Manjishta* contains triterpenoids and anthraquinones which demonstrates anti-inflammatory, antioxidant, antimicrobial actions. Also, *Yashtimadhu* contains triterpenoid saponins like glycyrrhizin, etc, flavonoids such as liquiritin, coumarins such as herniarin, umbelliferone etc and exhibit strong anti-inflammatory activity, antimicrobial and antioxidant activity, antimicrobial and soothing effect. **Conclusion:** By combining these three drugs may provide a multi-targeted and synergistic approach in acne vulgaris treatment by addressing key pathogenic factors, thereby validating their traditional use and supporting their inclusion in Ayurvedic acne formulations.

INTRODUCTION

Acne vulgaris is a multifactorial and chronic, inflammatory skin disease affecting pilosebaceous unit characterized by excess sebum production, epithelial hyperkeratinisation, Cutibacterium acnes colonization in the pilosebaceous unit, and inflammation.^[1] Acne typically present with lesions like comedones, papules, pustules and nodules.

Burden of disease

According to the Global Burden of Disease Study, it is the eighth most prevalent disease, affecting 9.38% of the global population irrespective of age group.^[2]

METHODS

Present work is a comprehensive literature review aimed at analyzing the mode of action of the drugs such as *Lodhra*, *Manjishta* and *Yashtimadhu* in the management of acne vulgaris based on modern and Ayurvedic perspectives.

Relevant data were searched and collected from the classical Ayurvedic texts such as *Charaka Samhitha*, *Susrutha Samhitha* as well as *Astanga Hridaya*. Herbal drug related data were also collected from available *Nighandus*, Ayurveda Pharmacopoeia of India, quality standards of Indian medicine by ICMR etc.

Contemporary scientific literature data such as research related data were sourced from electronic databases such as PubMed, Google Scholar, Scopus as well as other databases.

Access this article online	
Quick Response Code	https://doi.org/10.47070/ijapr.v14i2.3944
	Published by Mahadev Publications (Regd.) publication licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0)

Data were extracted regarding the pharmacological properties, mode of action, and therapeutic relevance of herbal drugs such as *Lodhra*, *Manjishta* and *Yashtimadhu*.

The collected data were critically analysed and correlated with Ayurvedic concepts such as *Dosha*, *Dushya*, *Rasa*, *Guna*, *Veerya*, *Vipaka*, and *Karma*, along with modern dermatological mechanisms. The findings were synthesized descriptively to establish a conceptual framework explaining the mode of action of these drugs in acne vulgaris.

Rationale of herbal interventions

Many treatment options are available for acne vulgaris, including topical therapies, systemic antibiotics, hormonal agents, oral isotretinoin, certain physical modalities and also complementary and alternative medicine

Topical therapies are the considered as mainstay of acne treatment and commonly used topical therapies include topical retinoids, benzoyl peroxide (BP), antibiotics, clascoterone, salicylic acid, and azelaic acid.

Although several therapeutic options are available for the treatment of acne, potential adverse effects, inadequate response to therapy, and the high costs associated with some treatments encourage an increased demand for alternative and complementary therapies, particularly of natural origin.^[3]

Acne Vulgaris: Modern Medical Perspective

Acne vulgaris is considered as a chronic inflammatory disease of the pilosebaceous unit. It is a pleomorphic disorder having the presence of multiple lesion types like comedones, papule, pustule and nodule. Acne is having multifactorial pathogenesis with excess sebum production, epithelial hyperkeratinisation, *Cutibacterium acnes* colonization in the pilosebaceous unit, and inflammation. Face, neck, chest, upper back, and upper arms which are the most common sites of acne lesions.

The hallmark clinical feature of acne vulgaris is the appearance of comedone, either closed (whitehead) or open (blackhead).

Comedones are usually accompanied by inflammatory lesions such as papules, pustules or nodules. However a small number of patients may develop large inflammatory cyst and nodules, that may drain and result in significant and permanent scarring. Current treatment modalities for acne are wide, focus on addressing the various factors contributing to its pathogenesis, including abnormal keratinization, increased sebum production, microbial colonization, and inflammation.

Treatments usually range from topical agents, such as retinoids and benzoyl peroxide, to systemic

therapies, including antibiotics and hormonal agents. The choice of treatment depends upon acne type. Milder forms can often manage with topical agents and more severe forms requiring systemic treatment. Topical treatments or external application remains as a cornerstone of acne management due to their direct action on the skin, minimal systemic side effects, and ease of use.

Although these conventional treatments are being effective in reducing acne lesions, these treatments have several limitations that restrict their long-term usage and patient compliance. These may range from adverse cutaneous effects such as erythema, dryness, scaling etc, antibiotic resistance, recurrence after discontinuation as well as systemic adverse events. These limitations highlight the need for a safer, multitargeted as well as a holistic therapeutic approach, by exploring the ayurvedic herbal interventions in the management of Acne vulgaris.

Mukhadushika: Ayurvedic Conceptual Framework

Mukhadushika is a disease mentioned in ayurveda classical texts which comes under *Ksudra-roga* (minor disease category). NAMASTE PORTAL enlists *Yuvanapidaka* or *Mukhadushika* as pimples (Acne vulgaris) and defines as the disorder characterized by *Salmali-kantaka-akara pidaka* (lesions resembling the prickles of silk cotton tree), *Yoonam-vakre* [occurs in the face of young people] *Sarujam* (associated with pain), *Ghana* (thick and dense lesion), *Medogarbhya*: (presence of fatty pultaceous material inside the lesion) [0-35].^[4] *Dosa* involved in *Mukhadushika* are *Kapha*, *Vatha* and *Raktha*. The Ayurveda treatment of *Mukhadushika* include *Shodana-chikitsa* (purification therapy); which are *Vamana* (emesis), *Nasya* (nasal medication), *Rakthamokshana* (bloodletting). *Samana- chikitsa* (drug therapy) include internal medicines and *Mukha-lepam* (face packs).^[5]

Rationale of selection of herbal drugs

Use of herbal medicine is becoming a promising strategy and most of the trial results showed that herbal medicine significantly reduces both inflammatory and noninflammatory acne lesions and has a relevant effect on acne severity scores.^[5]

Herbal drugs such as *Lodhra* (*Symplocos racemosa* Roxb), *Manjishta* (*Rubia cordifolia* Linn.), *Yashtimadhu* (*Glycyrrhiza glabra* Linn), etc are having *Mukhadushikahara*, *Varnya* and *Kandugna* properties and mentioned in Ayurveda classics like *Ashtanga-Samgraha*, *Charaka Samhita* (*Dasaimani-gana*)^[6] and *Ashtanga- Samgraha*. Botanical identity of each herbal drug with family and part used are summarized in the table 1.

Table 1: Herbal drugs with botanical identity, Family and Parts used

S.No	Herbal Drug	Botanical Identity	Family	Parts Used
1.	<i>Lodhra</i>	<i>Symplocos racemosa</i> Roxb	Symplocaceae	Stem Bark
2.	<i>Manjishta</i>	<i>Rubia cordifolia</i> Linn	Rubiaceae	Root
3.	<i>Yashtimadhu</i>	<i>Glycyrrhiza glabra</i> Linn	Fabaceae	Rhizome and root



A



B



C



D



E



F

A. Lodhra B. Manjishta C. Yashtimadhu D. Stembark of Lodhra
E. Root of Manjishta F. rhizome of Yashtimadhu

Lodhra and *Manjista* having *Kustagna* and *Vranaropana* properties and are common ingredient in many of the *Mukhadushikahara lepanachurna* mentioned in classics.

Yashtimadhu also having *Kandugna* and *Varnya* properties and may be effective in reducing itching and discoloration in Acne.

***Symplocos racemosa* Roxb. (*Lodhra*)**

Symplocos racemosa Roxb commonly grows in plains of eastern and Northern India and in some parts of Kerala and Karnataka

It is a Small evergreen tree with dark greyish bark having pale yellow colour and is finely mottled with pale orange brown colour.

As per Ayurvedic pharmacopoeia of India *Symplocos racemosa* Roxb is the source plant for *Lodhra* (Family-Symplocaceae) and its bark is having *Kashaya rasa* (astringent), *Laghu ruksha guna*, *Seetha virya*, *Katu vipaka* and having properties like *Kaphavatahara*, *Chakshushya*, *Kushtagna*, *Vrana ropana* etc.

The chemical constituents include three principal alkaloids; loturine, loturidane and colloturine. Detailed description of phytoconstituents of *S.racemosa* is mentioned in Table no:2

S.racemosa has proven anti-inflammatory, analgesics, anti-bacterial, anti- helminthic activities through various experimental studies.

Various pharmacological activities of *S.racemosa* related to acne pathogenesis and related research works were summarized in the Table :3

***Rubia cordifolia* Linn. (*Manjishta*)**

Rubia cordifolia Linn. Is a Perennial, herbaceous, climber growing throughout India, most commonly in hilly areas. Its roots are very long, cylindrical with a thin red bark. With Rough, grooved Stem, slightly woody at the base, bark is white.

As per Ayurvedic Pharmacopoeia of India (API), the source plant of *Manjista* is *Rubia cordifolia* Linn. of *Rubiaceae* family.

Manjishta is the root of *Rubia cordifolia* L. (Family-Rubiaceae having properties such as *Kashaya*, *Tiktha*, *Madura rasa*, *Guru guna*, *Ushna virya*, *Katu vipaka*, *Kaphapittahara*, *varnya*, *visagna*, *sothahara* etc. It is indicated in clinical conditions such as *Kushta*, *Rakthathisara*, *Visarpa*, *Vrana* etc.

The chemical constituents include glucosides such as manjisthin and purpurin, alkaloids, glycosides sesquiterpene etc. Detailed description of phytoconstituents of *R. cordifolia* Linn. is mentioned in Table 2. Pharmacological activities of *R.cordifolia* Linn related to acne pathogenesis and related research works were summarized in the Table 3.

***Glycyrrhiza glabra* Linn. (*Yashtimadhu*)**

In Ayurvedic Pharmacopoeia of India, *Yashtimadhu* is identified as *Glycyrrhiza glabra* Linn belonging to the family Fabaceae. *Glycyrrhiza glabra* Linn is a hard, semi-perennial, erect herb or under

shrub growing to a height of up to 1.7m cultivated in Jammu and Kashmir, Punjab and sub-Himalayan tracts having roots which are thick, much branched, with yellow or reddish skin and yellowish inside.

It is having properties such as *Madhura rasa*, *Guru*, *Snigda guna*, *Madhura vipaka*, *Seetha virya*, *varnya*, *kandugna* and *Vatapittahara*. The chemical

constituents include Glycyrrhizin, glycyrrhetic acid, isoliquiritin. Detailed description of phytoconstituents of *Glycyrrhiza glabra* Linn. is mentioned in Table 2. Various pharmacological activities of *Glycyrrhiza glabra* Linn. related to acne pathogenesis and related research works were summarized in the Table: 3

Table 2: Phytoconstituents in Herbal drugs

Herbal Drug	Phyto constituents
<i>Symplocos racemosa</i> Roxb.	Triterpenes: Betulinic acid, oleanolic acid, acetyloleanolic acid. Flavonoids: Quercetin and other flavonoid glycosides. Phenolic Compounds: Symplocoside, ellagic acid. Alkaloids: Loturine, loturidine, colloturine
<i>Rubia cordifolia</i> Linn.	Anthraquinones and Anthraquinonoid Derivatives: Rubiadin, Purpurin, Pseudopurpurin, manjistin, Purpuroxanthin Alizarin, Xanthopurpurin, ruberythric acid, Rubimallin. Naphthoquinones: Mollugin Triterpenoids: Oleanolic acid, Ursolic acid Pentacyclic Triterpenoids: Rubiatriol Rubicoumaric acid, Rubifolic acid
<i>Glycyrrhiza glabra</i> Linn.	Glycyrrhizin, Glycyrrhizic acid, Glycyrrhrtinic acid, Liquiritic acid, Liquirtin, Isoliquiritin, Neoisoliquiritin, Liquiritogenin, Isoliquiritogenin, Glabrine, Glabrene Glabranine, Licuraside, Licochalcones A and B, Hispaglabridin A and B,

Phytoconstituents and pharmacological activity

Each phytoconstituent exhibit different pharmacological activity i.e., terpenoids and some steroids exhibit anti-inflammatory, anti-microbial, anti-oxidant activity. While phenolic compounds protect the skin against oxidative stress and cellular damage, playing a crucial role in Anti-aging and skin protection. Many researches are being conducted to explore the pharmacological activity of these three herbals. Also, pharmacological activities such as Anti-Inflammatory action, anti-oxidant action, anti-microbial activity, immune modulatory activity etc, are necessary to breakdown the pathogenesis of Acne vulgaris.

Table 3: Herbal drugs with their pharmacological activity and related research works

Herbal Drug	Pharmacological action	Research work
<i>Symplocos racemosa</i> Roxb.	Anti-Inflammatory activity	<i>Symplocos racemosa</i> Roxb. extract has proved to exhibit effective anti- inflammatory activity ^[7]
	Anti-microbial activity	<i>Symplocos racemosa</i> extracts showed promising anti-bacterial activities against both <i>Propionibacterium acnes</i> and <i>Staphylococcus epidermidis</i> . ^[8]
<i>Rubia cordifolia</i> Linn.	Antihyperlipidemic and antioxidant activities	The antihyperlipidemic activity observed with Atorvastatin (10mg/kg oral) and the ethanolic extracts of <i>Rubia cordifolia</i> (400mg/kg) showed better activity than aqueous extracts of <i>Rubia cordifolia</i> (200mg/kg). ^[9]
	Anti-bacterial activity and antifungal activity	Methanol extract of <i>Rubia cordifolia</i> root showed anti-bacterial activity against all the three Gram-positive bacteria used in the study showed antifungal activity against <i>Candida albicans</i> . ^[10]
	Anti acne activity	A gel formulation containing 0.1% of anthraquinone rich fraction from the roots of <i>R. cordifolia</i> exhibited potent activity

		against <i>Propionibacterium acnes</i> , <i>S. epidermidis</i> , and <i>M. furfur</i> when compared with standard clindamycin gel with cup plate diffusion method. ^[11]
	Anti-inflammatory activity	The methanolic extract of <i>Rubia cordifolia</i> root was evaluated by carrageenan induced rat paw oedema. They produced significant inhibition of rat paw oedema induced by carrageenan. ^[12]
<i>Glycyrrhiza glabra</i> Linn.	Anti-bacterial activity	<i>Glycyrrhiza glabra</i> containing glycyrrhizin, triterpene glycoside, glabric acid, flavanones, and isoflavones showed remarkable antibacterial activity against <i>P. acnes</i> . ^[13]
	Anti-acne Activity	In a study "Anti-acne effects of Oriental herb extracts: a novel screening method to select anti-acne agents" <i>Glycyrrhiza glabra</i> showed a remarkable antibacterial activity against <i>P. acnes</i> . ^[14]

Also, some specific bioactive phytoconstituent is responsible for the phytochemical activities such as anti-inflammatory, anti-oxidant, anti-microbial activity. These specific Bioactive phytoconstituents with their pharmacological activity and mode of action are summarized in the Table :4

Table 4: Specific Bioactive phytoconstituents with their pharmacological activity and mode of action

Drug	Chemical Constituent	Pharmacological Activity	Mode of Action
<i>Symplocos racemosa</i> Roxb.	Flavonoids, phenolic acids	antibiofilm activity ^[15]	Prevent the biofilm formation
<i>Rubia cordifolia</i>	Naphthohydroquinone	Anti-inflammatory activity	Strong inhibition of arachidonic acid and collagen induced oedema
	Anthraquinones, tannins, and flavonoids.	Antioxidant activity	Neutralize free radicals, thereby reducing oxidative stress in the body.
	Anthraquinones and flavonoids	Anti-inflammatory activity ^[16]	inhibit the lipoxygenase (LOX) and cyclooxygenase. By blocking these enzymes, it reduces the production of inflammatory molecules such as prostaglandins and leukotrienes.
	Anthraquinones such as Rubiadin, Purpurin,	Antimicrobial and keratolytic activity	Purpurin inhibits bacterial cytokinesis (cell division) by targeting the essential FtsZ protein, acts via oxidative stress (ROS generation), acts as anti-biofilm agents.
	Glycyrrhizin	1. Anti-inflammatory activity ^[17]	Exert a strong influence on the Adreno cortex, influencing both minerallo corticoid and glucocorticoid function.
		2. Antioxidant activity	As a free radical scavenger decreases lipid peroxidation and transaminase levels.
		3. Immuno modulatory activity	Potentially inhibits classical complement pathway
	Glycyrrhithinic acid	Anti-inflammatory activity	Inhibiting 15-Hydroxy prostaglandin dehydrogenase and delta-13-prostaglandin reductase effecting the metabolism of inflammatory prostaglandins.
	Coumarins such as Herniarin, umbelliferone, Glycycoumarin, Glycyrol	Anti-inflammatory activity	Inhibition of NO, IL-6, and prostaglandin E2 production in LPS- induced macrophages ^[18]

<i>Glycyrrhiza glabra</i> Linn.	Glabridin, Gabrin, glabrol, glabrene, hispaglabridin A, hispaglabridin B, 40-methylglabridin, and 3-hydroxyglabrol	Antimicrobial activity- (Anti-Bacterial and Anti-viral Activity) ^[17]	inhibiting mitochondrial lipid peroxidation.
	Isoflavones like glabridin, hispaglabridin A and 3'hydroxy-4-O-methylglabridin More recently, dehydrostilbene derivatives like α -dihydro-3,5,4-trihydroxy-4,5-diiodopentenylstilbene have been isolated and reported as free radical scavengers	Antioxidant activity ^[15]	Free radical scavenging

Probable Mode of Action-Ayurveda perspective

Acne vulgaris can be correlated to *Mukhadushika* according to Ayurveda. These pharmacological actions (*Karma*) should be assessed with Ayurvedic properties such as *Rasa*, *Guna virya*, *Vipaka* etc.

Ayurvedic properties of herbals with probable mode of action

Drugs with their *Rasa pancaka* is mentioned in table 5

Table 5: Ayurvedic herbs with *Rasa Pancaka*

No.	Drug	Rasa	Guna	Virya	Vipaka	Dosakarma	Roga karma
1.	<i>Lodhra</i>	<i>Kashaya</i>	<i>Laghu Ruksha</i>	<i>Seetha</i>	<i>Katu</i>	<i>Kapha-pithahara</i>	<i>Sotha</i> <i>Athisara</i> <i>Pradara</i> <i>Netraroga</i> <i>Raktha-prasadana</i>
2.	<i>Manjishta</i>	<i>Madhura Tiktha Kashaya</i>	<i>Laghu Ruksha (API) Guru (All other Nighantus)</i>	<i>Ushna</i>	<i>Katu</i>	<i>Pitha samana (API) Kaphapaha (all)</i>	<i>Varnya</i> <i>Vranaropini</i> <i>Tvakroga</i> <i>Vyanga</i> <i>Sandaneeya</i> <i>Sopha</i> <i>Kushta</i>
3.	<i>Yashti-madhu</i>	<i>Madhura Kinchit tiktha (RN)</i>	<i>Guru Snigdha</i>	<i>Seetha</i>	<i>Madhura</i>	<i>Vatha-Pitha-raktha samana (BPN) Pitha samana (RN)</i>	<i>Rasayana</i> <i>Varnya</i> <i>Sophahara</i> <i>Vrana</i> <i>Visha</i> <i>Twacya</i>

Lodhra with its *Kashaya rasa*, *Laghu rooksa guna* and *Seetha virya* pacifies *Kapha-pitha dosas* due to its *Raktha-prasadana*, *Lodhra* help to alleviate the associated *Raktha dushti*. Due to its *Kashaya rasa*, *Ruksha guna* and *Sita virya* it may help in reducing excess sebum secretion, Minimizing the oiliness induced by *Kapha* and pacify inflammatory *Pitha*. Due to its *Sothahara* action and *Twacya* property, *Lodhra* might targets inflammatory lesions of acne.

Manjishta, is the major *Raktha shodaka* drug (Blood purifier) in Ayurveda. Its *Tiktha Kashaya rasa* along with *Ushna virya* help to eliminate the *Raktha-dushti*, help to remove *Srothorodha* and reduces discolouration (due to its *Varnya* property) and scarring. *Varnya* property might be responsible for enhancing skin complexion and reducing hyperpigmentation. Its anti-inflammatory action helps to eliminate erythema and swelling of inflammatory acne lesions.

Yashtimadhu owing to its *Vata-pitha samaka* karma and its *Madhura rasa*, *Snigdha guna* and *Sita virya* reduces inflammation (Sotha), burning sensation. Due to its *Twachya* (Skin friendly), *Varnya* and *Rasayana* property helps in skin rejuvenation and prevents scarring and pigmentation in skin and reduce recurrence of acne.

Bringing together the three herbs together may help in breaking the *Samprapthi* (pathogenesis) of *Mukha dushika* (Acne vulgaris) by reducing the *Srothorodha*, *Kapha-Pitha Samana* and helps in *Raktha prasada* and skin rejuvenating or *Twacya* action. This multifaceted action not only alleviates lesions of acne but also enhances the complexion of skin and prevents recurrence of Acne in long term usage as external application. Thus, *Lodhra*, *Manjishtha* and *Yashtimadhu* act synergistically on *Dosha*, *Dushya* and *Srotas* levels, making them therapeutically effective in the management of *Mukhadushika*.

Probable mode of action-modern perceptive

Experimental studies have demonstrated that *Symplocos racemosa* Roxb. (*Lodhra*) contains Alkaloids such as Symplocosidine, Loturine, Colloturine which might be responsible for its antimicrobial and anti-inflammatory activity.^[19] While Glycosides & Tannins such as Symplocoside, Ellagic acid, Gallic acid might be responsible for antioxidant and astringent property.^[20] Flavonoids such as Quercetin, kaempferol may inhibit inflammatory mediators (IL-1, TNF- α), thereby reduce redness and swell in Acne.

Rubia cordifolia Linn. (*Manjishta*) contains bioactive anthraquinones such as Rubiadin, Purpurin, etc., which might be responsible for its antimicrobial and keratolytic activity.^[21] Naphthoquinones such as Mollugin may act in anti-inflammatory, antioxidant activity.^[22] Glycosides present in *Rubia cordifolia* Linn. helps in skin healing, and helps in depigmentation. Triterpenoids such as oleanolic acid, ursolic acid might acts as sebostatic (reduce excess sebum) and helps in antibacterial action.^[21] *Glycyrrhiza glabra* Linn. (*Yashtimadhu*) contains triterpenoid saponins like glycyrrhizin, glycyrrhizic acid etc., has strong anti-inflammatory activity.^[23] Flavonoids such as liquiritin, isoliquiritigenin, glabridin might exhibit antimicrobial and antioxidant activity.^[24] Coumarins such as Herniarin, umbelliferone has antimicrobial and soothing effect.^[25]

As oxidative stress contributes to skin disorders like eczema, psoriasis, acne, and aging. The drugs such as *Lodhra* helps to reduce this stress. Antioxidants from natural plants or synthetic sources are vital in cosmetics for protecting skin, delaying aging, and prevents oxidative damage, helps in healing and detoxification, especially in polyherbal formulations.^[26]

Together, these provide a multifaceted therapeutic effect combining antimicrobial, anti-inflammatory, antioxidant, sebum-regulating, and healing activities.

CONCLUSION

Since *Symplocos racemosa* Roxb, *Rubia cordifolia* Linn and *Glycyrrhiza glabra* L were scientifically proven as having antimicrobial activity, antioxidant activity as well as anti-acne potential. Combination of these three Ayurvedic herbal drugs may enhance the anti-acne potency by acting synergistically targeting multiple pathways: reducing bacterial growth, controlling sebum, reducing inflammation, preventing scarring and pigmentation making them highly valuable in holistic acne (*Mukhadushika*) management

Acknowledgement

We are very much thankful to the central council for research in ayurvedic sciences (CCRAS), Ministry of AYUSH, Government of India, For Funding this research work under the Scheme of Training in Ayurveda Research for PG Scholars (PG-STAR-Session 02) for their financial assistance

REFERENCES

1. Hebert A, Thiboutot D, Stein Gold L, et al. Efficacy and Safety of Topical Clascoterone Cream, 1%, for Treatment in Patients with Facial Acne: Two Phase 3 Randomized Clinical Trials. JAMA Dermatol. 2020; 156(6): 621–630. doi:10.1001/ jamadermatol. 2020.0465.
2. Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. The lancet. 2012; 380(9859): 2163–96.
3. Reynolds RV, Yeung H, Cheng CE, Cook-Bolden F, Desai SR, Druby KM, et al. Guidelines of care for the management of acne vulgaris. J Am Acad Dermatol. 2024; 90(5): 1006. e1-1006. e30.
4. Sheshagiri, S. NAMASTE Portal: A standard reference repository for Ayurveda terminologies. J. Indian Syst. Med. 9, 1–2 (2021).
5. Proenca, A. C., Luis, A. & Duarte, A. P. The role of herbal medicine in the treatment of acne vulgaris: a systematic review of clinical trials. Evidence-Based Complement. Altern. Med. 2022, 2011945 (2022).
6. Sharma RK, Dash B. Agniveśa's Caraka Samhita: Next with English Translation & Critical Exposition Based on Cakrapāṇi Datta's Ayurveda Dīpika. Varanasi: Chowkhamba Sanskrit Series Office; 2018.
7. Janani, K., Geetha, R. V. & Rajeshkumar, S. In vitro Evaluation of Anti-Inflammatory Activity of *Symplocos racemosa* Using Protein Denaturation Assay. J. Pharm. Res. Int. 33, 715–720 (2021).
8. Kumar, Shiv & Jayaveera, K.N. & CK, Ashok Kumar & Swamy, BM & P, Sanjay & Kumar, DV. (2007).

- Antibacterial screening of selected Indian medicinal plants against acne inducing bacteria. Pharmacologyonline. 2. 34-47.
9. Kumari P, Sharma SK, Tiwari S, Evaluation of antihyperlipidemic and antioxidant activity of Rubia Cordifolia Linn., Journal of Drug Delivery and Therapeutics. 2019; 9(1): 207-210.
 10. Ismail Y, Wedyan M, Al-Zu'abe M, Abderrahman S. Antimicrobial activity of Rubia cordifolia: methods to determine antimicrobial activity. 2016;
 11. Khan K, Karodi R, Siddiqui A, Thube S, Rub R. Development of anti-acne gel formulation of anthraquinones rich fraction from Rubia cordifolia (Rubiaceae). 2011
 12. Kumar GS, Jayaveera KN, Kumar CK, Sanjay UP, Swamy BM, Kumar DV. Antimicrobial effects of Indian medicinal plants against acne-inducing bacteria. Trop J Pharm Res. 2007; 6(2): 717-23.
 13. Sinha P, Srivastava S, Mishra N, Yadav NP. New perspectives on antiacne plant drugs: contribution to modern therapeutics. BioMed Res Int. 2014; 2014(1): 301304.
 14. Nam C, Kim S, Sim Y, Chang I. Anti-acne effects of Oriental herb extracts: a novel screening method to select anti-acne agents. Skin Pharmacol Physiol. 2003; 16(2): 84-90.
 15. Silva, L. N., Zimmer, K. R., Macedo, A. J., & Trentin, D. S. (2016). Plant Natural Products Targeting Bacterial Virulence Factors. Chemical reviews, 116(16), 9162-9236. <https://doi.org/10.1021/acs.chemrev.6b00184>.
 16. Chavan TR, Ghodgaonkar S, Dhangar H, Chavare D, et al. Pharmacological activity of manjistha (rubia cordifolia). Int J Innov Res Technol. 2024; 11(7): 2928-2931.
 17. Sharma V, Katiyar A, Agrawal RC. Glycyrrhiza glabra: Chemistry and Pharmacological Activity. Sweeteners. 2017 Jul 31: 87-100. doi: 10.1007/978-3-319-27027-2_21. PMID: PMC7124151.
 18. Zang, Yimei. (2020). Pharmacological Activities of Coumarin Compounds in Licorice: A Review. Natural Product Communications. 15. 1934578X2095395. 10.1177/1934578X20953954.
 19. Bhusnar HU, Nagore DH, Nipanikar SU. Phytopharmacological profile of Symplocos racemosa: a review. 2014;
 20. Sc Sunil. In vitro and in vivo antioxidant activity of Symplocos racemosa Roxb. (Authors: Sunil C, et al.) Life Sciences. 2011; 88(23-24): 111-17.).
 21. Chandrasekhar G, Shukla M, Kaul G, K R, Chopra S, Pandey R. Characterization and antimicrobial evaluation of anthraquinones and triterpenes from Rubia cordifolia. J Asian Nat Prod Res. 2023; 25(11): 1110-6.
 22. Humbare RB, Sarkar J, Kulkarni AA, Juwale MG, Deshmukh SH, Amalnerkar D, et al. Phytochemical characterization, antioxidant and anti-proliferative properties of Rubia cordifolia L. extracts prepared with improved extraction conditions. Antioxidants. 2022; 11(5): 1006.
 23. Wahab S, Annadurai S, Abullais SS, Das G, Ahmad W, Ahmad MF, et al. Glycyrrhiza glabra (Licorice): A comprehensive review on its phytochemistry, biological activities, clinical evidence and toxicology. Plants. 2021; 10(12): 2751.
 24. Zhou Y, Ho WS. Combination of liquiritigenin and glabridin exhibits enhanced antibacterial effect against methicillin-resistant Staphylococcus aureus. Molecules. 2019; 24(19): 3567. doi:10.3390/molecules24193567.
 25. Zang Y. Pharmacological activities of coumarin compounds in licorice: A Review. Nat Prod Commun. 2020; 15(9): 1934578X20953954.
 26. Chanchal D, Swarnlata S. Herbal photoprotective formulations and their evaluation. Open Nat Prod J. 2009; 2(1): 71-6.

Cite this article as:

Sumy Basheer, Indulekha VC. Probable Mode of Action of Symplocos Racemosa Roxb., Rubia Cordifolia Linn., and Glycyrrhiza Glabra Linn. in Acne Vulgaris: An Integrative Review. International Journal of Ayurveda and Pharma Research. 2026;14(2):68-75.

<https://doi.org/10.47070/ijapr.v14i2.3944>

Source of support: Nil, Conflict of interest: None Declared

*Address for correspondence

Dr. Sumy Basheer

PG Scholar,

Department of Dravyagunavigyana,

Government Ayurveda College,

Thiruvananthapuram, Kerala.

Email: sumyshamin1@gmail.com

Disclaimer: IJAPR is solely owned by Mahadev Publications - dedicated to publish quality research, while every effort has been taken to verify the accuracy of the content published in our Journal. IJAPR cannot accept any responsibility or liability for the articles content which are published. The views expressed in articles by our contributing authors are not necessarily those of IJAPR editor or editorial board members.