

# Review on the Effectiveness of a selected Herbal Formula in the Management of *Yuvana Pidaka* (Acne Vulgaris): A Comprehensive Analysis

Samaranayaka Liyanage Gayani Sewwandi\*, Rajendran Vladimir Vidhyajini, Singappuli Arachchige Madushi Randika Rupasinghe

Temporary demonstrator, Department of Cikitsa, Faculty of Indigenous Medicine, Gampaha Wickramarachchi University of Indigenous Medicine, Yakkala, Sri Lanka

\*Corresponding Author

DOI: <https://doi.org/10.51244/IJRSI.2023.101016>

Received: 05 October 2023; Accepted: 10 October 2023; Published: 08 November 2023

## ABSTRACT

The telltale signs of acne vulgaris, a chronic inflammatory disorder of the pilosebaceous apparatus, include comedones, inflammatory papules, pustules, cysts, and scars. Acne vulgaris and *Yuvana Pidaka* are likely connected, in accordance with *Ayurvedic* theory. It also goes by the name *Mukha Dushika*. In order to manage *Yuvana Pidaka*, formula that includes *Vaca* (*Acorus calamus*), *Lodhra* (*Symplocos racemosa*) and mustard oil is selected. This review's objective was to investigate the effectiveness of this herbal formula in the management of acne vulgaris. Information regarding acne vulgaris was gleaned from *Ayurvedic* scriptures, contemporary texts, and earlier research studies. Subsequently, a comprehensive survey of the literature was conducted for these three herbs in the selected paste, which was then scrutinized for their *Pancha Padārtha* (five elements of the herb) and pharmacological qualities related to the management of *Yuvana Pidaka*. *Ayurvedic Pancha Padārtha* analysis has revealed that the selected herbal formula is efficacious in managing *Yuvana Pidaka*. While the majority of studies have demonstrated the anti-inflammatory, analgesics, antioxidants, anti-microbials, and proliferatives and performs similar specialized activities to *Shotha Hara* (reduce swelling), *Shula Hara* (reduce pain), and *Kushtaghna* (reduce skin disorders) effects of the herbal formula. Based on the literature review and *Pancha Padārtha* analysis, the selected herbal formula proves to be valuable in the management of acne vulgaris.

**Key words:** Acne vulgaris, *Acorus calamus*, Mustard oil, *Pancha Padārtha*, *Symplocos racemosa*, *Yuvana Pidaka*

## INTRODUCTION

The most common time for the onset of acne vulgaris, which affects the sebaceous glands and hair follicles, is adolescence. Both sexes are equally impacted. But compared to men, women are more likely to experience it earlier. The peak ages of acne vulgaris severity in both boys and females are 16–17 and 17–19 years old, respectively. Acne vulgaris affects more than 95% of adolescent boys and 85% of adolescent girls. Comedones (black and white heads), inflammatory papules, pustules, cysts, and scars are some of the symptoms of the illness [1].

Due to the chronic nature of this ailment, contemporary medications only temporarily improve symptoms while also causing a variety of negative effects. Relapses also happen when medications are stopped. These reasons make it necessary to create a therapeutic approach that manages acne vulgaris with the fewest possible negative effects.

Acne vulgaris is referred to in *Ayurveda* as *Youvana* or *Yuvana Pidaka*. *Youvana*, *Yuvana*, and *Pidaka* both refer to a skin eruption. *Yuvana pidaka*'s primary contributing variables may be broken down into four categories: *Kalaja* (age/time), *Aharaaja* (food), *Viharaaja* (activities), and *Manasika* (psychological). Even though *Yuvana Pidaka*'s premonitory symptoms are not addressed in any *Ayurvedic* texts, all authors have mentioned this condition's symptoms [2]. According to the *Susruta Samhita*, when *Kapha*, *Vata*, and

*Shonitha (Rakta)* become more aggravated, *Pidaka* (eruptions) that resemble the thorns of the *Shalmali* tree appear on the faces of young people. The term for this is *Mukhadushika* (also known as *Yuvana Pidaka*) [3]. *Ashtanga Hrdaya Samhita* states that *Pitika* (eruptions) created by them (*Vata-Kapha*) is *Mukhadushika*. They resemble the thorns of the *Shalmali* tree, are painful, heavy, and contain fat inside [4]. The appearance of the face of teenagers induced by an increase in *Kapha*, *Vata*, and *Rakta* together is known as *Yuvana Pidaka*, which makes the face unattractive, according to *Madhava Nidana* papules resembling the sprouts on the bark of the *Shalmali* tree (*Bombax malabaricum*) [5]. As a result, acne vulgaris needs to be appropriately controlled. Selected recipe for acne vulgaris is *Vacha (Acorus calamus)*, *Lodhra (Symplocos racemosa)* grind with mustard oil paste.

## AIMS & OBJECTIVES

The study was created to determine the effectiveness of the selected formula in the management of acne vulgaris, based on the pharmacological properties and actions of the ingredients.

## RESEARCH METHODOLOGY

This research utilized a comprehensive methodology to assess the efficacy of the chosen *Ayurvedic* herbal formula for the management of *Yuvana Pidaka* (Acne Vulgaris). This methodology comprised two primary components. Firstly, a systematic literature review was conducted to collect data from both traditional *Ayurvedic* texts and contemporary medical literature.

### A. Comprehensive Literature Review

In-depth examination of authentic *Ayurvedic* classics, including *Susruta Samhitā*, *Ashtanga Hrdaya Samhita*, *Madhava Nidana*, and the *Ayurveda Pharmacopoeia*, to establish the historical context and traditional understanding of *Yuvana Pidaka*. An extensive review of contemporary medical literature and a comprehensive literature search was carried out from March 2023 to September 2023, including encompassing textbooks, research articles, and official medical websites, to gain insights into current perspectives on acne vulgaris.

### B. Investigation of Herbal Components

Detailed study of the specific herbal components, *Vaca (Acorus calamus)*, *Lodhra (Symplocos racemosa)* and mustard oil constituting the *Ayurvedic* herbal formula. A thorough examination of the pharmacological properties of these herbs, with a particular emphasis on their proven anti-inflammatory and analgesic effects and other potential therapeutic qualities based on laboratory tests.

### C. Limitations

We acknowledge certain limitations in our methodology, The availability and interpretation of data from traditional *Ayurvedic* sources may vary, potentially affecting the comprehensiveness of our historical analysis. In the review of contemporary medical literature, we recognize the possibility of publication bias, where studies with positive results may be more likely to be published, potentially influencing our findings. Interpretations of *Ayurvedic* texts can vary among scholars and practitioners, which may introduce subjectivity into our analysis.

## REVIEW OF FORMULA

Herbal Formula chosen has three ingredients: *Vaca*, *Lodhra* and *Sarsapa* (Table 1).

Table I Review of Selected Herbs

Ingredients	<i>Acorus calamus</i>	<i>Symplocos racemosa</i>	<i>Sinapis alba</i> (Mustard oil)
Family	Araceae	Symplocaceae/ Stryaceae	Cruciferae
Sanskrit name	<i>Vacha</i>	<i>Lodhra</i>	<i>Sarshapa</i>
Part used	Rhizome	Barks of stem	Seeds and leaves

### **Acorus calamus (Vacha)**

An aromatic marshy herb with a strong creeping and branching rootstock; leaves simple, distichous, ensiform, 90–180 cm long, 1.6–3.7 cm broad, bright green, acute thickened in the middle, margin wavy, sheaths equitant, nerves parallel; spathe formed from the 15 ensiform, elongate, acuminate summit of the leaflike stem, 15–75 cm long; spadix sessile. A resin, gum, starch, tannin, bitter glucosides called acorin and calamine, an essential oil called calamol, and bitter glucosides called acorin and calamine are all found in the rhizome. According to reports, the essential oil contains asarone, heptolic, palmitic, and asarone esters as well as pinene, camphene, asaraldehyde, eugenol, calamine, calamerol, and calameon. *Acorus calamus* has *Katu, Tikta Rasa, Laghu, Teekshna Guna, Ushna Virya, Katu Vipaka, Kapha Vata Shamaka Dosha Karma* and *Medhya* (intelligence) *Prabhava*

The following are examples of related terms: *Pacana* (digestion), *Deepana* (increase digestive power), *Jeevani* (increase life span), *Vak Prada* (speech), *Unmada* (insanity), *Apasmara* (epilepsy), *Jantu* (micro-organisms), *Shoola* (pain), *Vibandha* (constipation), *Adhmana* (flatulence), *Kanthya* (luster), *Rakshoghna* (protective), *Bhutaghna* (reduce infections), etc. *Acorus calamus* also has qualities that are insecticidal, immunomodulatory, cardioprotective, anti-inflammatory, anti-depressive, memory-enhancing, anti-proliferative, anti-diabetic, anti-bacterial, analgesic, anti-oxidant, muscular actions, and anti-spasmodic. Additionally, it has qualities that are neuro-protective, anti-cholinergic, anti-cancer, nephron-protective, anti-fungal, and anti-toxic. Additionally, it helps with neurotransmission [6]. Now, in order to support the traditional use, we thoroughly investigated the in vivo wound-healing effects of aqueous extracts from fresh *Acorus calamus* roots and rhizomes as well as their in vitro anti-inflammatory activities. In RAW 264.7 cells, the lipopolysaccharide-induced production of inflammatory mediators could be effectively suppressed by the extracts. These findings notably demonstrated the anti-inflammatory and wound-healing properties of aqueous extracts in an animal model of excise wound healing [7], [8], [9]. The latency period for seizures in mice was dramatically lengthened by the methanolic extract of *Acorus calamus* roots. These findings point to the roots of *Acorus calamus* having analgesic and anticonvulsant properties [10], [11], [12]. According to certain studies, *Acorus calamus* possesses antibacterial properties, the ability to scavenge free radicals, and other beneficial effects on chronic constriction injury. Additionally, vagina is quite beneficial in treating skin conditions [13]. *Acorus calamus* rhizomes' antibacterial activity was assessed in vitro. Various petroleum ether extract concentrations (ranging from 50 to 2000 g) were evaluated, and the antimicrobial activity was noted starting at 500 g, and the zone of inhibition grew larger with concentration. Beyond the greatest concentration tested (2000 g), the inhibition zone did not widen, and the maximum activity was seen [14], [15], [16].

### **Symplocos racemosa (Lodhra)**

A small tree or a large shrub with branchlets that are glabrous; leaves that are simple, alternate, oblong and occasionally almost orbicular, cuneate at both ends, obscurely crenate, obtuse, coriaceous; nerves that are far away and not obvious; petioles that are 8mm long; flowers that are bisexual and regular, white, in racemes that are 5 to 10 cm long; bracts that are ovate, hair The fruit is a subcylindric smooth ellipsoid

drupe that is nearly 1.2 cm long, 6 cm wide, and has 1-3 seeds with a woody seed coat. The ovary is inferior, 3-locular, and contains 2-4 anatropous ovules on an axile placenta. The style is filiform, and the stigma is small. Loturine 0.24%, Colloturine 0.02%, Loturidine 0.06% and alkaloids. *Symplocos racemosa* has *Kashaya Rasa, Laghu, Ruksha* (dry) *Guna, Sheetha Virya, Katu Vipaka, Kapha- Pitta Shamaka Doshakarma*.

It also has *Shotha Hara, Kushtaghna, Rakta Shodhaka* (purify blood), *Jwaraghna* (reduce fever), *Stambhana* (stops), and narcotic properties. Additionally, according to certain studies, the phytochemicals in the bark of *Symplocos racemosa* have anti-microbial, anti-proliferative, and anti-androgenic properties [17]. This plant is used to treat a variety of skin conditions since it is said to have cleaning and calming effects. According to Sharma, Joshi, and Goyal (2015), salireposides extracted from its extract have been shown to have efficacy against bacteria that cause acne [18]. *Symplocos Racemosa* Roxb's alcohol and petroleum ether extracts were subjected to preliminary phytochemical analysis, and the results show that the alcohol extract contains carbohydrates, glycosides, saponins, terpenoids, and alkaloids, while the ether extract shows the presence of steroid, phytosterol, and glycoside. It was determined through an antibacterial assessment of petroleum ether and ethanolic extract that ethanolic extract has effective antibacterial properties [19], [20], [21].

Further testing of the *Symplocos racemosa* fractions was also done using the conventional medications. For each method used to assess the anti-inflammatory properties of *Symplocos racemosa* bark extract, writhing, formalin, and carrageenan-induced paw edema in mice and rats were used. At dosages of 300 and 500 mg/kg, the results showed a strong anti-inflammatory impact [22], [23].

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### **Sinapis alba (Mustard oil / Sharshapa Thaila)**

Since the beginning of time, humanity has employed mustard for culinary, religious, and cultural purposes. The *Ayurvedic* classical text extensively evaluates and documents the medicinal benefits of mustard, which has a significant role in Indian tradition. In Ayurveda, mustard, or *Sharshapa*, has been utilized as a food and a medication. *Sarshapa Thaila* has *Katu, Tikta Rasa, Teekshna, Snigdha Guna, Ushna Virya, Katu Vipaka, Kapha Vata Nashaka* and *Pitta Vardhaka Doshakarma*

*Sarsapa* is endowed with various qualities, including *Lekhana* (scraping), *Kushtaghna, Shvayathu Vilayana, Visphota Janana* (emerge pustules), *Varnya* (complexion), *Deepana, Vidahi* (burning sensation), *Krimighna* (reduce worms), and *Mutra Janana* (urine production). 1961's *Ayurvedic Pharmacopoeia*. Additionally, it has qualities similar to *Hridaya* (good for heart), *Rakta Pitta Vardhaka* (increase blood and humors), and *Agni Vardhaka* (increase digestive fire). It has an insulinotropic effect, according to several studies. Additionally, it exhibits pro-apoptotic, antioxidant, anti-oxidative, anti-microbial, and antibacterial effects. Additionally, it might help with chemoprevention [26].

*Sarsapa* is utilized to eliminate toxins from the body internally. It is a component of preparations that cause emesis, enema, etc. According to Ram, Pushpan, and Roshini (2008), these methods are suggested in cases of vomiting, insanity, flatulence, pallor, jaundice, and rhinitis. Additionally, this is used to cure *Kandu* (itching), *Kushta, Koshta Krimi*, and *Grahabadha* (psychic disorders) [27].

The findings showed that both the White *Sinapis Semen* (EWSS) and Yellow *Sinapis Semen* (EYSS) extracts are effective anti-inflammatory agents against both acute and chronic inflammatory processes, with

EWSS having a stronger anti-inflammatory impact than EYSS. The two herbs may, at least in part, exert their anti-inflammatory effects by inhibiting the mRNA expression of a group of inflammatory mediators that includes TNF-, IL-6, and IL-1 [28].

Since the major component of the essential oils from *Sinapis alba* L is allylthiocyanate, which has an inhibitory impact on a wide range of bacteria, the antibacterial activity of these oils is well documented. This research was done to determine how three different bacterial strains responded to *Sinapis alba* L. extracts' antibacterial properties [29], [30], [31]. Furthermore, the seed's anticancer, antiviral, and analgesic properties are employed in traditional medicine [32] [33].

## RESULTS AND DISCUSSION

Acne Vulgaris is popularly known as pimples that is a skin condition the most teenagers involving predominantly on the face. It is a disease which destroys the beauty and cause disfigurement of the face.

*Yuvana Piḍaka* was described under the heading of *Kṣudra Roga* by *Acharya Susruta* for the first time, although this disease is not described in *Caraka Samhita*. This shows that disease was prevalent even during *Samhita Kala* and at that time too, people were conscious about their looks. Ayurveda texts have described the *Vata*, *Kapha* and *Rakta* as the chief culprit *Dosha* responsible for the disease. *Piḍaka* is the chief complaint found in these patients and it is a *Rakta Dusti Lakshana* (features). As this disease condition is having a chronic nature, modern medicines only subsides the disease for short time period along with various side effects. And relapse also occur on withdrawing the medicines. But Ayurveda can provide better cure for this disease and treat the root cause of the disease.

Internal medicine is necessary to bring balanced status of affected *Dosa Dusya* (body humors and tissues). Local application is useful in skin disorders as it directly act on lesion. In *Yuvana Pidaka* treatment, using of drugs in the form of *Lepa* (paste) are described as a *Samana* (pacify) therapy. Ayurveda classical texts have mentioned numerous external medications for *Yuvana Pidaka*. The selected formula is quoted from traditional formula. It consists of *Vaca* (*Acorus calamus*), *Lodhra* (*Symplocos racemosa*) and mustard oil. Collected data of this study reveals that most of the ingredients of this selected formula have somewhat similar properties. The ingredients of the formula predominantly possess *Katu*, *Tikta Rasa* and followed by *Kashaya Rasa*. As well as it possesses *Laghu*, *Snigdha*, *Tikshna* and *Ruksha Guna*. The majority of ingredients having *Katu Vipaka*. The formula possesses both *Ushna Virya* and *Shita Virya* equally. All the ingredients collectively possess *Kapha Shamaka* and *Vata Shamaka* actions. As well as it possesses *Pitta Shamaka* action also. *Katu-Tikta Rasa*, *Laghu-Thikshna Guna*, *Katu Vipaka* and *Ushna Virya* subside aggravated *Kapha Dosha*. As well as by *Thikshna-Snigdha Guna*, *Ushna Virya*, aggravated *Vata Dosha* gets pacified. Furthermore *Tikta Rasa*, *Snigdha Guna*, *Shita Virya* subside aggravated *Pitta Dosha*. *Pitta Dosha* and *Rakta Dhatu* analogues to each other.

Hence by these *Pitta Shamaka* properties, vitiated *Rakta Dhatu* also get pacified. In addition, these ingredients possess various specific pharmacological actions other than *Pancha Padartha*. According to modern view, some researches reveal that plants can be efficient in the treatment of acne vulgaris because of four mechanisms including antibacterial, anti-inflammatory, antioxidant and anti-androgen activities. And anti-proliferative, antimicrobial, analgesic activities are beneficial in the management of acne vulgaris. Flavonoids possess anti-oxidant, anti-inflammatory, anti-cancer and analgesic actions, whereas glycosides possess anti-oxidant and anti-bacterial activities.

Moreover, glucosinolates possess anti-proliferative, proapoptotic, anti-oxidant and anti-microbial activities. And also starch and tannin possess 38 anti-microbial activities while alkaloids possessing anti-inflammatory, analgesic and antitumor activities. Essential oils often possess antimicrobial properties. These

evidences of this study reveal the effectiveness of the selected formula in the management of acne vulgaris. The pharmacological properties and actions of the ingredients of the selected formula, compile in this work can be served as a valuable source of information. It will be immensely profitable in further researches on management of acne vulgaris.

## CONCLUSION

Analysis of *Ayurvedic* pharmacological actions of the ingredients reveals that majority of ingredients possess *Kapha Vata Shamaka* activities. In addition, the ingredients possess *Shotha Hara, Shula Hara, Kushtaghna, Lekhana, Rakta Shodhana, Vruna Ropana* and *Varnya Karma* (actions). As well as analysis of modern pharmacological actions of the ingredients possess predominantly anti-inflammatory, anti-microbial, anti-proliferative, anti-oxidant and analgesic actions. Based on these evidences, the effectiveness of the selected formula in the management of acne vulgaris, can be literally proved.

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