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Review Article

EVIDENCE BASED STUDY OF *SURASADI GANA* ON RESPIRATORY DISORDERS: A REVIEW

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ABSTRACT

Introduction: Collection of medicinal herbs having similar effect are collectively known as *Gana* (group) in *Samhita* and *Vargas* (category) in *Nighantu*. *Surasadi Gana* is included in 37 of such groups mentioned in *Sushruta Samhita*, with 21 Herbs completing the group. This article is made in a view to review the importance and utility of few herbs included in *Surasadi Gana* indicated for the management of respiratory disorders.

Material and Methods: The literature regarding the drugs mentioned in the group, collected from different Ayurveda classics. Research papers are compiled from published sources and discussed in light of therapeutic effects.

Observation and Result: Maximum of the herbs in this group are having properties as *Katu rasa* (pungent) and *Ushna veerya* (hot potency). Such herbs are predominantly advised in *Kapha* (phlegm humour) dominant diseases, viz. *Kasa* (cough), *Shwasa* (asthma), *Pratishyaya* (common cold), *Kushtha* (skin disorders), *Krimi* (worm infestation) and *Vrana* (wound).

Conclusion: The herbs, despite having several Ayurvedic indications, the respiratory tract is the focus of the specific activity.

INTRODUCTION

In ancient treatises of Ayurveda, single medicinal treatment was a primary method of disease management but various ancient texts have also emphasized on treatment using combination of drugs having similar properties. The grouped herbs, having similar mode of action are called as either *Vargas* or *Ganas*. This classification or grouping was based on their pharmacological characteristics as well as nutritional use. Etymologically, the *Vargas* and *Ganas* provide the same meaning. In *Sushruta Samhita,* 37 groups of herbs are mentioned in *Sutra Sthana*. In each group the herbs were picked which were having similarity in pharmacological properties. [1] Although *Sushruta Samhita* listed many indications for each group, but called the group based on its first herb constituent, which is regarded as the most important in the listed. For example, *Vidarikandadi*, *Varunadi*, *Salasaradi* etc.

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Surasadi Gana is 8th group in the serial out of 37 mentioned in *Sushruta Samhita*. This group consist of 21 plants as *Surasa (Ocimum sanctum* Linn*.), Shweta Surasa (Ocimum sanctum* Linn*.), Phaninjaka (Origanum majorana), Arjaka (Orthosiphon stamineus), Bhustruna (Hyptis suaveolens), Sugandhaka (Leucas cephaloates), Sumukha (Brassica juncea), Kalamala (Ocimum basilicum), Kasamarda (Cassia occidentalis), Kshavaka (Centipeda minima), Kharapushpa* (*Origanum majorana*), *Vidanga (Embelia ribes), Kataphala (Myrica esculenta), Surasi (Vitex negundo), Nirgundi (Vitex negundo), Kulahala* (*Sphaeranthus indicus*), *Undurukarnika (Ipomea reniformis), Phanji* (*Clerodendrum serratum*), *Prachibala (Vitex penduncularis), Kakamachi (Solanum nigrum)* and *Vishamushtika (Melia azedarach).*[2] Out of total 21 herbs, around 8 to 9 herbs are usually known as *Tulasi* or Holy basil *(Ocimum sanctum* Linn*.)* varieties or are different species of the Labiatae family that are having common similarity in pharmacological properties. In this article a modest attempt is made to convey the value and significance of a few chosen herbs.

MATERIAL AND METHOD

The sources for the literature are the *Samhita*, modern reference works, and articles submitted for evaluation of *Surasadi Gana* herbs. Based on their

medicinal effects, published research studies on specific herbs have been gathered from online sources and reviewed.

OBSERVATION AND RESULT

1. *Surasa* and 2. *Shweta Surasa*

Surasa is the synonym for Holy basil *(Ocimum sanctum Linn.). Surasadwaya* (two types) consist of *Krushna Pushpa* (black flower) and *Shweta Pushpa* (white flower). The term *Tulasi* is nowhere to be found in *Bruhatrayi* literature. *Madanpal Nighantu* coined the term *Tulasi* for the first time and given a synonym *Surasa* for it which it is regarded later in *Bhavprakash Nighantu*. [3]

Holy basil *(Ocimum sanctum)* of Lamiaceae (Labiatae) family, is an erect, properly branched, softly hairy, having peculiar odour and an annual herb. It is found abundantly in India and is a universal in almost all kitchen gardens, as holy Basil. It is richly empowered with properties like antibacterial, antifungal, antiviral, antipyretic, anti-inflammatory, antioxidant etc. [4]

3. *Phanijjhaka*

Phanijjhaka (*Origanum majorana*) is also known as *Marubaka* or *Phanija*. It is an aromatic plant that is having properties like anti-oxidant, anti-fungal, anti-protozoan etc. [5]

4. *Arjaka*

Arjaka (Orthosiphon stamineus) is synonym for *Barbari*, that is explained locally as *Vanatulasi*. It is subdivided into two types based upon appearance i.e - *Krushna* (black) and *Shweta* (white) and the white type is explained to be *Arjaka*. [6] It is explained to have properties like antimicrobial, antioxidant, anti-inflammatory, antiviral etc. [7]

5. *Bhustruna*

Bhustruna means any herb that cover the surrounding area by virtue of its aroma. It is thought to be *Rohish* grass and may be *Hyptis suaveolens*. In exhibit the property like anti-cancerous, anti-bacterial, anti-fungal, anti-viral, anti-inflammatory etc. [8]

6. *Sugandhaka*

Sugandhaka is explained in commentaries to be regarded as *Dronapushpi*. It is a fragrant, annual, pubescent herb similar to Holy basil *(Ocimum sanctum Linn.)* and belongs to Labiatae family. So *Sugandhaka* can be termed as *Dronapushpi* i.e., *Leucas cephaloates*. It has antipyretic, expectorant, antioxidant, analgesic and anti-inflammatory activity. [9]

7. *Sumukha*

It is synonym to *Rajika* (*Brassica juncea)* and is explained under Cruciferae family. It is an upright, perennial, annual herb that is cultivated throughout India. The major used part of it is its seed, that are having properties like anthelmintic, antidysentery, diaphoretic. It is mainly used in fever and cold and is having fair results in bladder inflammation or haemorrhage. [10]

8. *Kalamala / Kalamalika*

Kalamala identified as *Krushna Arjaka*. Its botanical name is *Ocimum basilicum* and belongs to Laminaceae family. It is known to have properties like antioxidant, anti-inflammatory and have effects in condition like cough, fever, bacterial infections etc. [11]

9. *Kasmarda*

The herb *Kasmarda* is known as *Cassia occidentalis* and belongs to Caesalpiniaceae family. This herb found all over India especially on road side as weed. It has been shown to have anti-inflammatory, anti-allergic, antibacterial properties. [12]

10. *Kshavaka*

It is known to produces sneezing so is regarded as *Nak-Chikkani*. *Centipeda minima* is an annual procumbent shrub belongs to Asteraceae family. It is having properties like anti-bacterial, anti-viral, anti-inflammatory. [13]

11. *Kharapushpa*

It is one of the synonyms for the herb *Barbari*, and identified it as *Van-Barbari* (*Origanum majorana*).

12. *Vidanga*

Vidanga (Embelia ribes) is an abundant shrub defined in Myrsinaceae family. It is having a synonym termed as *Jantunashana* (that kills the worms) is similar kind of a synonym and included in *Sursadi Gana* and provide *Krimisudana* (expulsion of worms) property to the group. [14] Various Ayurvedic preparation contains *Vidanga (Embelia ribes)* as an important constituent. Few of them are *Vidangarishta, Avipattikar Churna, Lohaasava* etc and these are regarded as integral medicine in the process of disease management. It works by virtue of its properties like analgesic, anti-inflammatory, antioxidant, antibacterial, anti-inflammatory etc. [15]

13. *Kataphala*

Kayaphala or *Kataphala* is *Myrica esculenta* belonging to Myrsinaceae family. It is an ever-green tree of medium height and mainly confined to Himalayan region. It is frequently used to treat a variety of conditions, including anaemia, fever, diarrhoea, ulcers, chronic bronchitis, chronic cough, asthma, and coughing. [16]

14. *Surasi*

It is explained in commentaries as to be a white variety of *Nirgundi* (*Vitex negundo*) belonging to Verbenaceae family. In mammals, the phenolics, especially polyphenols, have a wide range of beneficial effects, including antiviral, antibacterial, immune-stimulating, antiallergic, anti-inflammatory. Prostaglandins, well-known mediators of

inflammation, are shown to be inhibited by flavonoids, a significant class of polyphenols. [17]

15. *Nirgundi*

It is a type of *Nirgundi* (*Vitex negundo*) having blue variety of flower is regarded as *Nirgundi*. Botanical name, properties and medicinal properties are similar to *Surasi.*

16. *Kulahala*

It explained in commentaries as *Mundika* (*Sphaeranthus indicus*) belonging to Asteraceae family. Leprosy, fever, cough, and skin disorders are among the vitiated conditions that can be treated with this medication. According to reports, this plant has immunomodulatory, antioxidant, anti-inflammatory, bronchodilators, anti-hyperglycaemic, and hepatoprotective properties. [18]

17. *Undurukarnika*

Undurukarnika is explained as *Ipomea reniformis* belonging to Convolvulaceae family. It has been asserted to be beneficial for fever caused by liver enlargement, cough, headache, neuralgia, rheumatism, diuretic, inflammation, nose problems, and renal illnesses. The root has diuretic and laxative properties and is administered to eye and gum diseases, while the juice serves as a purgative and the powder from the leaves is smoked during epileptic episodes. [19]

18. *Phanji*

It is also termed as *Bharangi* (*Clerodendrum serratum*) and it belongs to Verbenaceae family. It is used in the management of several terminal illnesses, including typhoid, jaundice, and hypertension. Constituents like D-mannitol, hispidulin, cleroflavone, apigenin, scutellarin, serratagenic acid, are few of the main substances discovered in the plant. The roots of it are having properties like anti-oxidant, anti-bacterial, and anti-fungal. [20]

19. *Pranchibala*

It is identified as *Kakajangha* in various commentaries. It may be *Vitex penduncularis*. [21] Properties such as antipyretic, antioxidant, antibacterial, antifungal, and anti-inflammatory are major advantage of *Prachibala (Vitex penduncularis).* According to numerous research findings, *Vitex peduncularis* contains primary phytochemical components such as flavonoids, terpenoids, triterpenoids, and iridoids. [22]

20. *Kakamachi*

Kakamachi (Solanum nigrum), is a white flowering, tall, annual herb that can be found all over India. and belongs to Solanaceae family. It is included in *Tikta Skandha Gana* (group of pungent taste drug) in *Charaka Samhita*. Rheumatisms, cough, asthma, bronchitis, wounds, ulcers, flatulence, and dyspepsia might all benefit from it. The central nervous system and spinal cord reflexes are slowed down by its plant decoction, which also affects heart function and blood pressure management. For skin conditions, gouty joints, and rheumatoid arthritis, leaves are used as poultices. In cases of cough, erysipelas, rat bite, bronchitis, pulmonary TB, fever, diarrhoea, ophthalmopathy, and hydrophobia, a decoction of berries and flowers is helpful. Giddiness, inflammations, and skin conditions can all be treated with its seeds. Hepatitis, ear, eye, nose, and root bark infections can all be treated with its bark. The berries and leaves are particularly significant as a treatment for stomach ulcers. It is known to be compiled with properties such as anti-microbial, antioxidant and hepatoprotective activity. [23]

21. *Vishamushtika*

It can either be *Mahanimba* (*Melia azedarach)*, which belongs to Meliaceae family or *Kuchala (Strychnos nuxvomica)* belonging to Loganiaceae family. *Mahanimba* (*Melia azedarach)* is used to treat piles, and traditional healers employ its fruits for the purpose. Flowers are tied on the affected area to treat headache and uterine pain during the postpartum period. The root, leaf, blossom, and seed are beneficial for respiratory tract, skin, and reproductive problems as well as for worm infestation and splenic hypertrophy. Volatile organic plant-derived substances with antibacterial activity can be found in *M. azedarach* extract. It possesses numerous physiological attributes, such as antibacterial, insecticidal, and anti-inflammatory activities. [24]

Table 1: Explains the properties of drugs in *Surasadi Gana*

Sr. No.	Name		Latin Name	*Rasa*	*Vipaka*	*Veerya*	*Karma*	Pharmacological actions
1.	*Surasa*	*Tulasi*	*Ocimum sanctum Linn.*	*Katu* (pungent, *Tikta* (bitter)	*Katu* (pungen)	*Ushna* (Hot potency)	*Kasa* (anti-tussive) *Shwasa* (anti-asthmatic) *Krumi hara* (anti-helminthic)	Anti-histaminic and mast cell stabilizer, [25] antipyretic, [26] anti-inflammatory, [27] antioxidant, [28] antifungal, [29] antibacterial. [30]
2.	*Phanijjhaka*	*Marubaka*	*Origanum majorana*	Pungent,	Pungent	Hot potency	*Kapha* (expectorant),	Anti-viral, [31]

			Linn	bitter			anti-helminthic.	anti-oxidant. [32]
3.	*Arjaka (Shweta)*	*Parnasashweta vana tulasi*	*Orthosiphonstamineus*	Pungent	Pungent	Cold potency	*Kanduh* (anti-pruritic), anti-helminthic	Antimicrobial, [33] antioxidant, [34] anti-inflammatory. [35]
4.	*Bhustruna*		*Hyptis suaveolens*	Bitter	Pungent			Anti-bacterial, [36] anti-fungal, [37] anti-inflammatory. [38]
5.	*Sugandhaka*	*Dronapushpi*	*Leucas cephalotes*	Pungent, *Lavana* (salty)	Sweet	Hot potency	*Tamaka shwasa* (bronchial asthma), anti-helminthic	Anti-inflammatory activity, [39] antipyretic, [40] antioxidant, [41] analgesic. [42]
6.	*Sumukha*	*Rajika*	*Brassica juncea*	Pungent, bitter	Pungent	Hot potency	Expectorant, anti-pruritic, anti-helminthic	Antioxidant, [43] anti-bacterial, [44] anti-viral, [45] anti-inflammatory activity. [46]
7.	*Kalamala*	*Krushnamallika/ Barbarika*	*Ocimum basilicum*	Pungent	Pungent	Cold potency	Anti-pruritic, anti-helminthic *Visha hara* (anti-toxic)	Antioxidant, [47] anti-inflammatory, [48] anti-bacterial. [49]
8.	*Kutheraka*	*Krushna vana tulasi*	*Orthosiphon pallidus*	Pungent	Pungent	*Sheeta* (cold potency)	Expectorant, anti-helminthic, anti-toxic	Anti-inflammatory, [50] anti-viral, [51] antibacterial, [52] anti-pyretic, [53] anti-oxidant. [54]
9.	*Kasamarda*	*Kasamarda*	*Cassia occidentalis*	*Madhura* (sweet)	Pungent	Hot potency	Expectorant, anti-toxic	Anti-inflammatory, [55] anti-oxidant, [56] antibacterial. [57]
10.	*Kshavaka*	*Chhinkini*	*Centipeda minima*	Pungent	Pungent	Hot potency	Expectorant, *Kushtha* (skin disorders), anti-helminthic	Anti-bacterial, [58] anti-viral, [59] anti-inflammatory. [60]
11.	*Kharapushpa*	*Marubaka*	*Origanum majorana*	Pungent, bitter	Pungent	Hot potency	Expectorant, skin disorders, anti-helminthic	Anti-inflammatory, [61] antioxidant, [62] antibacterial. [63]
12.	*Vidanga*	*Vidanga*	*Embelia ribes*	Pungent	Pungent	Hot potency	Expectorant, skin disorders, anti-helminthic	Analgesic, [64] anti-inflammatory, [65] antioxidant, [66] antibacterial. [67]
13.	*Kataphala*	*Kayaphala*	*Myrica esculenta*	*Kashaya* (astringent), bitter	Pungent	Hot potency	Bronchial asthma, anti-tussive	Antibacterial, [68] anti-inflammatory, [69] anti-oxidant. [70]
14.	*Surasi*		*Vitex negundo*	Bitter	Pungent	Hot potency	Expectorant, skin disorders, anti-helminthic	Antibacterial, [71] immune-stimulating, [72] antiallergic, [73] anti-inflammatory. [74]

DISCUSSION

Out of the 21 plants, 8 to 9 are classified as variants of *Tulasi (Ocimum sanctum* L.) or resemble several taxa of the family Labiateae. Different parts of holy basil *(Ocimum sanctum* L.) contain different concentrations of components. 0.7 percent of the volatile oil in leaves is composed of around 71 percent eugenol and 20 percent methyl eugenol, carvaxrol and sesquiterpene hydrocarbons are found in oil. From the leaves, ursolic acid has been isolated. Oleanolic acid, ursolic acid, rosmarinic acid, eugenol, carvacrol, linalool, and caryophyllen can therefore be considered the primary ingredients. [75] The results of numerous investigations show that holy basil *(Ocimum sanctum* L.) extract has antihistaminic and anti-anaphylactic properties, which are primarily attributed to its ability to stabilise mast cells, to decrease IgE, and to prevent the production of inflammatory mediators. As a result, the internal administration of holy basil *(Ocimum sanctum* L.) leaves demonstrated the sound justification for the aforementioned therapeutic activities. [76] Holy basil *(Ocimum sanctum* L.) extracts in ethanol, methanol, and other organic solvents exhibit extensive zones of inhibition against various bacteria. [77]

Phanijjhaka (Origanum majorana) essential oil, dichloromethane, ethyl acetate, aqueous fractions, and crude extract all significantly reduced bacterial and fungal growth as well as the production of microbial metabolites.

Dronapushpi (Leucas cephalotes) organic leaf extract significantly inhibited the growth of various bacteria. Comparing *Dronapushpi (Leucas cephalotes)* to other plant extracts, it showed a smaller zone of inhibition in all harmful bacteria tested. [78]

Kshavaka (Centipede minima) is the drug that help in expelling out vitiated *Doshas* (bodily humours) from head and diseases of head caused by vitiated *Kapha dosha* (phlegm humour). With the exception of *Surasi* (*Vitex negundo*)*, Nirgundi* (*Vitex negundo*)*, Prachibala (Vitex penduncularis)*, and *Vidanga (Embelia ribes)*, which are shrubs, most medications in use today are herbs. As it is stated in Dysuria, *Kulahala* (*Sphaeranthus indicus*) is a helpful medication for the treatment of urinary tract infections.

Summary of key findings- Respiratory infections are the most common clinical condition found in both children and adults. Overuse of antibiotics have led to drug resistance and emergence of superbugs. Therefore, there is a need of development of any alternative management. Present review provides scientific evidences regarding the efficacy of drugs of *Surasadi Gana* in the management of respiratory infections. The findings suggest that drugs of *Surasadi Gana* can be used as alternative treatment for respiratory infections.

Strengths and limitations of the study. The drugs are potent and effective in the management or respiratory infections, but there is a need to study clinically in patients with all drugs of *Surasadi Gana* in combination.

Interpretation and implication in context of totality of evidence (is there a systematic review to refer to, could one be reasonably done here and now?)- There is no systematic review to refer to. Systematic review of this drug (*Surasadi Gana*) cannot be done as of now because more studies are required with this particular drug which is not available.

What this study adds to the available evidence, effects on patient care and health policy, possible mechanisms- Present study provides evidences that *Surasadi Gana* is a potent alternative treatment for the respiratory infections which can minimise the use of antibiotics.

Future research directions (for this particular research collaboration, underlying mechanism, clinical research)- Clinical research can be conducted to validate the efficacy of *Surasadi Gana*.

CONCLUSION

All the herbs mentioned in the *Surasadi Gana* are explained to be effective in the management of disorders of respiratory system by virtue of their properties like anti-inflammatory, anti-bacterial, anti-fungal, immunomodulator, anti-tussive etc. All the properties are quite useful in the management of respiratory system ailments. By virtue of anti-inflammatory properties, the airway inflammation in the diseases like asthma, allergic rhinitis could get reversed resulting in symptomatic relief. Anti-bacterial and anti-fungal properties leads to decrease in the episodes of recurrent infections. The effect of these herbs in the form of immunomodulation results in improvement of immunity that results in improve quality of life amid free from recurrent infections. So, it can be concluded that *Surasadi Gana* is a collection of herbs that are very useful in the management of Respiratory ailments and improves the quality of life in the recipient.

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