

PROBABLE STANDARDIZATION FOR QUALITY CONTROL OF SIMHANAD GUGGULU

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ABSTRACT

One important plant based Ayurvedic drug i.e. *Simhanad Guggulu* is being selected from famous Ayurvedic book (i.e. *Bhaishajya Ratnavali*) for its probable standardization on the basis of its Ayurvedic drug review and its modern chemical review in context of *Amavata* (Rheumatoid arthritis). It is a herbo-mineral Ayurvedic drug. It contains six ingredients and out of which five are plant based and one is mineral based ingredient. The *Rasa, Guna, Virya, Vipak* and *Karma* of ingredients of *Simhanada Guggulu* help to minimize the clinical manifestations of *Amavata* (Rheumatoid arthritis). The Physicochemical study on this drug revealed that it contains more inorganic constituents, less moisture and less water soluble constituents. The Phytochemical study revealed that tannin, reducing sugars, saponin glycosides, phenolic compounds and gum are present into the sample of this drug. Seven phytocostitutents are indicated under short ultra violet ray (254 nm) and eight phytocostitutents are indicated under long ultra violet ray (366 nm) into the sample of this drug by thin layer chromatography (TLC) study.

Keywords: *Simhanad Guggulu, Amavata, Rheumatoid arthritis.*

INTRODUCTION

In Ayurvedic view *Ama* (Bio toxin) and vitiated *Vata* (Bio force) are main pathological factors for disease manifestation of *Amavata*¹. The disease *Amavata* is more similar to Rheumatoid arthritis on basis of its clinical features and pathogenesis². A drug is defined as any predicament used for the purpose of diagnosis, prevention, relief or cure of the disease. As per Ayurveda any *dravya* (substance) has the medicinal property but all of them cannot be used everywhere and the use of a particular *dravya* (substance) for a particular purpose demands the *yukti* (logic)³. Many plants

based drugs are described in Ayurvedic books in context of management of different diseases. One important plant based Ayurvedic drug i.e. *Simhanad Guggulu* is being selected from famous Ayurvedic book (i.e. *Bhaishajya Ratnavali*) for its probable standardization on the basis of its Ayurvedic drug review and its modern chemical review in context of *Amavata* (Rheumatoid arthritis). Modern chemical review means review on Physicochemical, Phytochemical and TLC study on *Simhanad Guggulu* in context of *Amavata* (Rheumatoid arthritis). Standardi-

zation of Ayurvedic drug is essential for the purpose of quality control of Ayurvedic medicines and better global acceptance of Ayurvedic medicines. This drug is being selected for probable standardization because it is easy to prepare and its ingredients are easily available and it is also commonly used by Ayurvedic physician in *Amavata* (Rheumatoid arthritis) treatment.

MATERIAL AND METHODS

Simhanad Guggulu is a herbo-mineral Ayurvedic drug. It contains six ingredients and out of which five are plant based and one is mineral based ingredient. Its dose is 1.5 gm orally twice in a day with luke warm water after meal and it is mainly used in the treatment of disease *Amavata* (Rheumatoid arthritis). It is mentioned in *slokas* (Information in Samskrit

language) no. 190 to 195 of 29th chapter of *Bhaishajya Ratnavali* (Ayurvedic book)⁴. Name of the ingredients (Ayurvedic name and Botanical name), used part of the plant ingredients and quantity of used part of the ingredients into the 500 mg medicine are shown in the table-1. Drug preparing, Physico-chemical, Phytochemical and Thin layer chromatography study had been done in the Institute for Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, and Jamnagar. The action of *Ausadha dravya* (drug) has been explained as per Ayurveda on the basis of theory of *Rasa* (Taste), *Vipaka* (Post digestion effect), *Guna* (Quality), *Virya* (Potency), *Karma* (Pharmacological activity) and *Prabhava* (special Property)^{5,6,7}. As per Modern Medicine Physicochemical, Phytochemical, TLC & HPTLC study are essential parameters for quality control of the drug⁸.

Table 1: Ingredients list of *Simhanad Guggulu* (500mg)⁹

Ingredients (Ayurvedic name)	Botanical Name or Scientific Name	Used part	Quantity (part)
<i>Haritaki</i>	<i>Terminalia chebula</i> Retz.	Dried mature Fruit	1
<i>Amalaki</i>	<i>Emblica officinalis</i> Gaertn.	Dried mature Fruit	1
<i>Bibhitaka</i>	<i>Terminalia bellirica</i> Roxb.	Dried mature Fruit	1
<i>Guggulu (Shodhita)</i> (Purified)	<i>Commiphora wightii</i> (Arnott) Bhandari	Gum exudates	1
<i>Gandhak (Shodhita)</i> (Purified)	Sulphar	Mineral	1
<i>Eranda taila</i>	<i>Ricinus communis</i> Linn.	Seed oil	4

RESULTS AND DISCUSSION

The ingredients of the *Simhanad Guggulu* are containing mainly *katu-tikta rasa* (pungent-bitter taste), *ushna-laghu-ruksha-tikshna guna* (hot-levity-dry-sharp qualities), *ushna virya* (high potency), *katu or madhur vipaka* (pungent or sweet taste bio-substance produced after completion of digestion) and so it has mainly *vata-kapha-shamaka* (vata-kapha-reducing) properties and it has mainly *deepan* (enzyme stimulant), *ama-pachan* (biotoxin neutralizer), *shothaghna* (oedema reducing), *vedanasthapaka* (analgesic), *jwaraghna* (anti-pyretic), *rasayana* (rejuvenator),

valya (power enhancer), *mutrakaraka* (diuretic) and *amavatahara* (antirheumatism) e.t.c. *Karmas* (Pharmacological activity) and by these properties it helps to enhance the *Agni* (enzymes), to mitigate the *Ama* (bio-toxin), to reduce the aggravated *Vata dosha* (bioforce) and *Kapha dosha* (biofluid) which are the main root causes of the disease *Amavata* (Rheumatoid arthritis). Due to these properties it breaks down the *samprapti* (pathogenesis) of *Amavata* (Rheumatoid arthritis) and helps to minimize the clinical features of *Amavata* (Rheumatoid arthritis). The Ayurvedic Properties of *Simhanad Guggulu* is given in the table-2.

Tabel 2: Ayurvedic Properties of *Simhanad Guggulu*¹⁰

Ingredients	parts	Rasa	Guna	Virya	Vipaka	Vata	Pita	Kapha
<i>Haritaki</i>	1	M,A,K, T, Ka	L, Ru	<i>Ushna</i>	<i>Madhura</i>	↓↓	↓	↓
<i>Amalaki</i>	1	M,A,K, T, Ka	G,Ru,Sh	<i>Sheeta</i>	<i>Madhura</i>	↓	↓↓	↓
<i>Vibhitaka</i>	1	Ka	L, Ru	<i>Ushna</i>	<i>Madhura</i>	↓	↓	↓↓

<i>Guggulu</i> (<i>Shodhita</i>) (Purified)	1	K, T	L, Ru, Tik, V, Sa, Su	<i>Ushna</i>	<i>Katu</i>	↓		↓
<i>Gandhak</i> (<i>Shodhita</i>) (Purified)	1	M	Sn, Sa	<i>Ushna</i>	<i>Katu</i>	↓		↓
<i>Eranda taila</i>	4	M, K, Ka	G, Sn, Tik, Su	<i>Ushna</i>	<i>Madhura</i>	↓		↓

M=Madhura, A=Amla, La=Lavana, K=Katu, T=Tikta, Ka=Kashaya, G=Guru, L=Laghu, Ru=Ruksha, Sn=Snigdha, Sh=Sheeta, Tik=Tikshna, Sa=Sara, V=Visada, Su=Sukshma.

Physicochemical Study of *Simhanada Guggulu*:

Table 3: Data of Physicochemical parameters (Quantitative test) of *Simhanada Guggulu*¹¹

Parameter	Results
Uniformity of tab/ pill (Weight variation) (Average wt)	502.5 mg
Hardness of tablet/ pill (average)	1.55 kg./cm ²
Disintegration time of pill	more than 1 hour
Determination of Loss on drying at 110 °C	2.30 % W/W.
Ash value (% of total ash)	10.00 % W/W.
Acid insoluble ash value	2.40 % W/W
Water soluble extractive value	28.10 % W/W.
Methanol soluble extractive value	22.20 % W/W.

The data of table-3 of Physicochemical study of *Simhanada Guggulu* pill shows that the moisture holding capacity is less in the sample of *Simhanada Guggulu*. Water soluble extractive value of its sample is less and so, water soluble constituents is less in *Simhanada Guggulu*. *Guggulu* contains sterol sub-

stance and it is alcohol soluble therefore, methanol soluble extractive value is more in the sample of *Simhanada Guggulu*. Inorganic constituents are more in *Simhanada Guggulu*, because it is made by herbo-mineral ingredients; therefore its Ash value is more.

Phytochemical Study of *Simhanada Guggulu*:

Table 4: Analytical data of phytochemical parameters (Qualitative tests) of *Simhanada Guggulu*¹²

Components	Tests	Results
Reducing sugars	Fehling's test	Positive
Proteins	Biuret test	Negative
Tannin	With 5% ferric chloride solution	Positive
Phenolic compounds	With Lead acetated solution	Positive
Flavonoids	Shinoda test	Negative
Cardiac glycosides	Keller-Killiani test	Negative
Saponin glycosides	Foam test	Positive
Steroid	Salkowski reaction	Negative
Gum	Hydrolysis test with dilute HCl	Positive
Mucilage	With ruthenium red	Negative
Non-reducing polysaccharides (Starch)	Iodine-test	Negative
Alkaloids	Mayer's test	Negative

The data of table-4 of Phytochemical study of *Simhanada Guggulu* reveals that tannin, reducing sug-

ars, saponin glycosides, phenolic compounds and gum are present in the sample of *Simhanada Guggulu*. But

flavonoids, proteins, cardiac glycosides, mucilage, steroid, non-reducing polysaccharides (Starch) and alkaloids are not present in the sample of *Simhanada Guggulu*.

TLC Study of *Simhanada Guggulu*:

Results of Thin layer chromatographic study on sample of *Simhanada Guggulu* under short ultra violet ray (254 nm) and under long ultra violet ray (366 nm) are shown in the table-5 and table-6 respectively.

Table 5: Thin layer chromatography data of *Simhanada Guggulu* under short ultra violet ray (254 nm)¹³

No. of Spots	Distance travel by Solvent (cm)	Distance travel by Solute(cm) Short UV (254nm)	R _f -value	hR _f -value	ΔhR _f -value
7	17.2	3.3	0.19	19	
		4.2	0.24	24	5
		5.5	0.32	32	8
		6.8	0.40	40	8
		8.5	0.49	49	9
		10	0.58	58	9
		16.6	0.97	97	39

Thin layer chromatography data of table-5 of *Simhanada Guggulu* shows that the distance traveled by the solvent is 17.2 cm, number of spots under short Ultra violet ray are 7, the distance traveled by the solutes seen under short Ultra violet ray are respectively

3.3cm, 4.2cm, 5.5cm, 6.8cm, 8.5cm, 10cm and 16.6cm. The R_f –values are respectively 0.19, 0.24, 0.32, 0.40, 0.49, 0.58 and 0.97. The hR_f –values are respectively 19, 24, 32, 40, 49, 58 and 97. The ΔhR_f –values are respectively 5, 8, 8, 9, 9 and 39.

Table 6: Thin layer chromatography data of *Simhanada Guggulu* under long ultra violet ray (366 nm)¹⁴

No. of Spots	Distance travel by Solvent (cm)	Distance travel by Solute(cm) long UV (366nm)	R _f -value	hR _f -value	ΔhR _f -value
8	17.2	1.9	0.11	11	
		3.1	0.18	18	7
		4.0	0.23	23	5
		4.7	0.27	27	4
		5.5	0.32	32	5
		6.8	0.40	40	8
		8.8	0.51	51	11
		10.5	0.61	61	10

Thin layer chromatography data of table-6 of *Simhanada Guggulu* reveals that the distance traveled by the solvent is 17.2 cm, number of spots under long Ultra violet ray are 8, the distance traveled by the solutes seen under long Ultra violet ray are respectively 1.9cm, 3.1cm, 4.0cm, 4.7cm, 5.5, 6.8, 8.8, and 10.5cm. The R_f –values are respectively 0.11, 0.18, 0.23, 0.27, 0.32, 0.40, 0.51 and 0.61. The hR_f –values are respectively 11, 18, 23, 27, 32, 40, 51 and 61. The ΔhR_f –values are respectively 7, 5, 4, 5, 8, 11 and 10.

CONCLUSION

The *Rasa*, *Guna*, *Virya*, *Vipak* and *Karma* of ingredients of *Simhanada Guggulu* help to increase the *Agni* (enzymes), to decrease the aggravated *Vata dosha* (bioforce) and *Kapha dosha* (biofluid) and to mitigate the *Ama* (biotoxin), hence, it minimizes the clinical manifestations of *Amavata* (Rheumatoid arthritis). The Physicochemical study on this drug can be concluded that the *Simhanada Guggulu* contains more inorganic constituents, less moisture and less water

soluble constituents. The Phytochemical study on *Simhanada Guggulu* can be concluded that tannin, reducing sugars, saponin glycosides, phenolic compounds and gum are present into the sample of this drug. Thin layer chromatography (TLC) study of *Simhanada Guggulu* can be concluded that seven phytocostitents are indicated under short ultra violet ray (254 nm) and eight phytocostitents are indicated under long ultra violet ray (366 nm) into the sample of this drug. But more research work is necessary on this drug for more information and more authenticity for better standardization and quality control of this drug.

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