



Review Article

AN OVERVIEW OF *TRIPHALA GUGGULU* AND ITS INGREDIENTS

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ABSTRACT

Triphala Guggulu, a polyherbal Ayurvedic formulation, is among the most significant and frequently used *Guggulu Kalpana*. Numerous references for preparing this formulation have been mentioned in various classical texts. It has been discussed under 'Vranashotha' and 'Vidradhi' rogadhikar in *Chakradutt* and *Yogratnakar* respectively. '*Triphala Guggulu*' presented in this article is mentioned in the *Sharangdhara Samhita* under '*Vati Kalpana*'. As the name itself suggests, this preparation contains *Triphala* and *Guggulu* as the main ingredient along with *Pippali*. It contains *Guggulu* in greater proportion than the other ingredients, much like any other *Guggulu Kalpas*. *Triphala Guggulu* is frequently used in the treatment of *Shotha*, *Arsha*, *Bhagandara*, *Gulma*, *Vrana*, and other ailments. It can also be used as a hypolipidemic drug on its own or in conjunction with other formulations. Several studies and experiments have also demonstrated its efficacy in atherosclerosis, coronary and arterial plaque, and elevated cholesterol levels in the blood. Thus, this article takes the approach of reviewing the experimental research work done on *Triphala Guggulu* as well as covers the pharmacological action of its ingredients.

INTRODUCTION

Given the current global trend toward the use of plant-derived natural treatments, there is an urgent need for accurate and current information on the effectiveness, safety, quality, characteristics and uses of medicinal plant products.^[1] The public's interest in complementary and alternative medicine is primarily sparked by rising side effects in synthetic pharmaceuticals, a lack of curative treatments for various chronic diseases, the high cost of new drugs, microbial resistance, and emerging diseases, among other causes.^[2]

In Ayurvedic texts, a number of formulations have been discussed for the management of *Shotha*, *Arsha*, *Gulma*, and *Bhagandar*. One such extensively used formulation recorded in the *Sharangdhara Samhita* is *Triphala Guggulu*.

Formulations with the same name had already been mentioned in other writings like *Chakradutt* and *Ras Ratnakar*. *Ras Ratnakar* recommended *Triphala guggulu* in *Vata Vyadhi*, whereas *Chakradutt* noted it in *Vranashotha*.^[3]

The name "*Gunjo vyadhe gurdati rakshati*" for *Guggulu* translates to "relief from many ailments."^[4] The antiseptic, antibacterial, astringent, antispasmodic, and drug-carrying qualities of *Guggulu* are well documented.^[5] It has been scientifically confirmed to have anti-inflammatory and hypolipidemic effects.^[6,7] In classical sources, *Guggulu* is never recommended as a stand-alone medication in pure form. Thus, always taken in conjunction with other herbal drugs as in formulations such as *Triphala Guggulu*, *Abha Guggulu*, *Kaishore Guggulu*, *Trayodashanga Guggulu*, *Yograjya Guggulu*, or *Kanchanara Guggulu*. In various *Guggulu kalpana* like *Trayodashang Guggulu* and *Kanchanar Guggulu* the quantity of *Guggulu* is 50%, however, in some *Guggulu* formulations such as *Gokshuradi Guggulu*, *Vatari Guggulu* contains *Guggulu* less than 50%.^[8]

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The powdered extracts of three fruits, *Amalaki* (*Embllica officinalis*), *Haritaki* (*Terminalia chebula*), and *Vibhitaki* (*Terminalia bellirica*) are combined to constitute *Triphala* powder. To extend shelf life, *Gutikas* (tablets) are made from *Churnas* (powders).^[9] It is used in the management of atherosclerosis, coronary and arterial plaque, and high blood cholesterol levels.^[10] *Guggulu*, which is the oleo gum resin of the plant *Commiphora wightii*, acts as a binder when a tablet containing it and other components is applied.^[11] Ayurveda describes various *Guggulu kalpas*, including *Triphala*, *Punarnava*, and *Shatavari guggulu kalpas*, as well as polyherbal preparations made by *Sompaka vidhi*, *Suryapaka vidhi*, and *Analpaka vidhis*.^[12] In various *Guggulu kalpas*, the amount of *Guggulu* is 50% and the other ingredients are 50%.^[13] Reference of *Guggulu Kalpana* is mainly found in

Sharangdhar Samhita, he has described it under *Vati Kalpana*.^[14] There are a large number of commercial polyherbal anti-inflammatory formulations which are using *Guggulu* as the chief ingredient. One such formulation is *Triphala Guggulu*.^[15]

For references to *Triphala Guggulu*, several classical books were looked through. It is a commonly used, standard formulation for treating numerous disorders. *Aamalki*, *Haritaki*, *Vibhitaki*, *Pippali* and *Guggulu* are the primary components. It has been mentioned in numerous books and linked to a number of ailments. The same ingredients are also listed in *Yogratnakar's "Triphala Guggulu"* formulation for *Vidradhi*, *Naadi Vrana*, *Bhagandar*, and *Gandmala*.^[16] *Gadanigraha* also recommends *Triphala Guggulu* and *Triphala Ghrita* for these therapeutic conditions. ^[17]

Table 1: Description of *Triphala Guggulu* in Various Classical Texts

Name of formulation	Classical Texts	Other same reference	Contents	Dose	Rogadhikar	Anupana
<i>Triphala Guggulu</i>	Sharangdhar Samhita ^[18]	AFI	<i>Triphala Churna</i> – 3 Pal <i>Pippali</i> – 1 Pal <i>Guggulu</i> – 5 Pal	3 Masha	<i>Bhagandar</i> , <i>Gulma</i> , <i>Shotha</i> , <i>Arsha</i>	<i>Triphala Kwath</i> / <i>Gomutra</i> / <i>Ushna Jal</i>
	Chakradutt ^[19]	Bhaishajya Ratnavali	<i>Triphala Churna</i> – 250gm <i>Guggulu</i> – 250gm <i>Triphala (Yavkut)</i> - 250gm	500mg	<i>Vranashotha</i>	<i>Triphala Kwatha</i>
	Bharat Bhaishajya Ratnakar ^[20]	Ras-ratnakar	<i>Triphala</i> , <i>Trikatu</i> , <i>Mustak</i> , <i>Vayavidang</i> , <i>Pushkarmool</i> , <i>Vacha</i> , <i>Chitrak</i> , <i>Mulethi</i> <i>Churna</i> – 1 Pal each <i>Lohachurna</i> – 8 Pal <i>Guggulu</i> – 8 Pal <i>Madhu</i> – 12 Pal	1 Masha	<i>Vata vyadhi</i>	<i>Ushna Jal</i>
	Bharat Bhaishajya Ratnakar	Bhav-prakash	<i>Harad</i> , <i>Vibhitak</i> , <i>Amla</i> , <i>Atees</i> , <i>Daruhaldi</i> , <i>Devdaru</i> , <i>Mustak</i> , <i>Falsa</i> , <i>Asantwak</i> , <i>Khadirsaar</i> , <i>Haldi</i> , <i>Giloy</i> , <i>Amaltas</i> , <i>Chirayita</i> , <i>Neem</i> <i>twak</i> , <i>Kutki</i> <i>Indrayav</i> , <i>Patol patra</i> , <i>Bakuchi</i> <i>churna</i> , <i>Shilajit</i> , <i>Guggulu</i>	3 Masha	<i>Vararakta</i> , <i>Kushtha</i> , <i>Vrana</i>	<i>Triphala Kwatha</i>

Drug Review: *Triphala Guggulu* is a preparation made with the ingredients listed below, with *Guggulu* as the primary ingredient.

Table 2 : Ayurvedic Pharmacological Properties [21]

Ingredients	Botanical Name	Part used	Ayurvedic Properties	Quantity
Haritaki	<i>Terminalia chebula</i> Retz.	Fruit	Rasa - Panchras (except Lavana) and prominent Kashaya (astringent) Guna - Laghu (light), Ruksha (dry) Virya - Ushna (hot) Vipaka - Madhur (sweet) Dosha Karma - Tridosahar esp. Vatahar, thus, pacify Kapha dosha due to its Ushna Virya (hot potency) and Ruksha (dry) Guna, Pitta dosha due to its Madhur (sweet) Vipaka and Vata dosha due to its Madhur Vipaka.	1 part
Vibhitaki	<i>Terminalia bellirica</i> Roxb.	Fruit Rind	Rasa - Kashaya (astringent) Guna - Ruksha (dry) and Laghu (light) Virya - Ushna (hot) Vipaka - Madhur (sweet) Dosha Karma - Tridosahar esp. Kaphahar, thus pacify Kapha dosha due to its Kashaya (astringent) Rasa, Ruksha (dry) and Laghu (Light) Guna, Pitta dosha due to its Kashaya (astringent) Rasa and Madhur (sweet) Vipaka and Vata dosha due to its Ushna (hot) Virya.	1 part
Amalaki	<i>Emblica officinalis</i> Gaertn.	Fruit	Rasa - Panchras (except Lavana) and prominent Amla (sour) Guna - Laghu (light), Ruksha (dry) and Sheet (cold) Virya - Sheet (cold) Vipaka - Madhur (sweet) Dosha Karma - Tridosahar esp. Pitta-Shamak thus pacify Kapha dosha due to its Laghu (light) and Ruksha (dry) Guna and Kashaya (astringent) Ras, Pitta dosha due to its Madhur (sweet) Ras, Sheet (cold) Virya and Madhur Vipaka and Vata dosha due to its prominent Amla (sour) Rasa.	1 part
Pippali	<i>Piper longum</i> Linn.	Fruit	Rasa - Katu (bitter) Guna - Laghu (light), Snigdha (smooth), and Tikshana (sharp) Virya - Anushansheeta (temperament neither hot nor cold) Vipaka - Madhura (sweet) Dosha Karma - Kapha-Vatahar, thus pacifies Kapha Dosh due to Katu (pungent) Rasa (taste) and Vata Dosh due to Madhura Rasa (sweet taste). The root of <i>Piper longum</i> Linn is an appetizer, digestant, and carminative.	1 part
Guggulu	<i>Commiphora wightii</i> (Arnott) Bhandari	Gum Resin	Rasa - Katu (bitter), Tikta (pungent) Guna - Laghu (light), Ruksha (dry), Tikshana (sharp), Vishad (vivid), Sukshma (micro), Sar Guna. Sugandhi (Fragrant) in old Guggulu and Snigdha (smooth), Picchila (lucrous) Guna in new Guggulu. Virya - Ushna (hot) Vipaka - Katu (pungent) Dosha Karma -Tridosahar esp. Kapha-Vatahar thus	5 parts

		pacify <i>Vata dosha</i> due to its <i>Ushna</i> (hot) <i>Virya</i> and also <i>Kapha dosha</i> due to its <i>Tikshna</i> (sharp) <i>Ras</i> and <i>Ushna</i> (hot) <i>Virya</i> . It is the prominent drug in alleviating <i>Vata dosha</i> . Due to its <i>Ruksha</i> (dry) and <i>Vishad</i> (vivid) <i>Guna</i> , alleviates fats.	
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Method of Preparation^[22]

1. Wash, dry and powder the ingredients no. 1-4 of the formulation separately and pass it through sieve no. 85, weigh them separately in required quantities and mix.
2. After *Shodhana* of *Guggulu*, crush weighed quantity of *Shudha Guggulu* and add fine powder of other ingredients to it and pound well.
3. Add *Ghrta* to this mixture in a required quantity which facilitates pounding. Continue the pounding till a semi-solid uniformly mixed mass is obtained.
4. Take small quantity of this mass and round it by circular motion of palm covered with a glove smeared with ghee.
5. In this way, *Vatis* are prepared which are spherical in shape, black in colour with agreeable odour and bitter taste.

Dose – 2-3gm daily in divided doses.

Anupana – Warm water

Table 3: Physico-chemical Parameters of *Triphala Guggulu*^[22]

Parameters	Value
Loss on drying	Not more than 13%
Total Ash	Not more than 12%
Acid-insoluble Ash	Not more than 7%
Alcohol-soluble Extractive	Not less than 13.5%
Water-soluble Extractive	Not less than 30%
pH (1% aqueous solution)	4.35 – 4.70

MATERIAL AND METHODS

***Terminalia chebula* Retz.**– It belongs to the family Combretaceae. *Haritaki* consists of the pericarps of mature fruits of *Terminalia chebula* Retz. It is a moderate sized or large tree, chiefly in deciduous forests and areas of light rainfall. Also, occasionally found in slightly moist forests; flowers appear from April-August and fruits ripen from October-January.^[23] It is a tree 15-24m high distributed throughout the greater parts of India from Ravi eastwards to West Bengal and Assam, ascending to an altitude of 1500m in Himalayas.^[24] Synonyms – *Haritaki* (provides good complexion), *Abhaya* (relieves fear against all diseases), *Pathya* (beneficial for all channels), *Kayastha* (definitely provides relief), *Putana* (purifies the body through purgation), *Haimvati* (this tree grows in Himalayas), *Avyatha* (its usage provide relief from all diseases), *Chetaki* (will do the *Stroto shuddhi*), *Shiva* (brings good fortunes), *Shreyasi* (renowned for its good qualities).^[25] It is *Deepan*, *Medhya*, *Rasayana*, *Chakshushya*, *Brinhan*, *Anuloman*^[26] *Aayushya*, *Pachan*^[27] in *Karma*. Indicated in *Shwas*, *Kasa*, *Prameha*, *Arsha*, *Kushtha*, *Shotha*, *Krimi*, *Swarbheda*, *Grahani*, *Vibandha*, *Visham jwara*, *Gulma*, *Aadhman*, *Vamana*, *Hridrog*, *Kaamla*, *Shool*, *Aanaha*, *Pliha-Yakrut*, *Ashmari*, *Mutrakricha*, *Mutraaghat*^[26] *Vivarnata*, *Jeerna jwara*,

Shirorog, *Netra rog*, *Atisaar*, *Pandu*, *Visha*, *Udara roga*, *Vrana*.^[27]

Chemical Composition: Fruits of *Haritaki* has chebulinic acid, chebulagic acid, anthraquinone glycoside, tetrachebulin, and vitamin C, according to phytochemical analysis. Its fruit kernels contain several acids, including arachidic, oleic, palmitic, and stearic. It also contains 18 amino acids, corilagin, 2-hydroxyursolic acid, maslinic acid, and 24.3–32.5% tannin.^[28]

***Terminalia bellirica* Roxb.**– It belongs to the family Combretaceae. *Vibhitaki* consists of pericarp of dried ripe fruits of *Terminalia bellirica* Roxb., a large deciduous tree, commonly found in plain and forests upto 900m elevation; fruits ripen towards November.^[23] It is upto 40m high found in deciduous forests throughout the greater parts of India, in areas of upper Gangetic Plain, Chota Nagpur, Bihar, Odisha and most of the parts of South India.^[24] Synonyms- *Bibhitaka* (eliminates the fear of all diseases), *Aksha* (spreads or grows very easily), *Akshaphala* (fruit weighs equal to one *Aksha* i.e., 10gm), *Karshapala* (its fruit weighs about one *Karsha* i.e., 10gm), *Kalidruma* (considered as tree of kaliyug), *Bhutvasa* (Many invisible organisms reside on this tree)^[25]. In classical texts it is

Vedanasthapana, Shothaghna, Madkari, Kandughna, Dahashamaka^[26], *Chakshushya, Keshya*^[27] in *Karma*. Indicated in *Kasa, Swarbhanga, Jwara, Udar roga, Plihavidhi, Arsha, Atisaar, Kushtha, Balya*.^[26]

Chemical Composition: Belliricanin, ellagic acid, chebulagic acid, ethyl ester, gallic acid, and tannins are the primary chemical components of *Vibhitaki*. It also contains sugars including glucose, galactose, fructose, mannitol, and rhamnose, oxalic acid and proteins.^[28]

***Emblica officinalis* Gaertn-** It belongs to Euphorbiaceae family. *Amalaki*, pericarp of dried mature fruits, is mostly collected in the winter season after they have ripened and in Kashmir in the summer. *Amalaki*, pericarp of dried mature fruits of *Emblica officinalis* Gaertn., are mostly collected in winter season after ripening and during summer in Kashmir.^[23] It is a small or medium sized, deciduous tree distributed throughout tropical and subtropical India, chiefly in dry deciduous forests ascending to 1400m on Himalayas, Chota Nagpur, Bihar, Odisha, West Bengal, Deccan and in Western Ghats.^[24] Synonyms – *Amalaki* (totally filled with properties of *Rasayana*), *Vayasya* (acts as rejuvenant), *Dhatri* (mainly consumed by people who desire *Rasayan* properties), *Amritphala* (if consumed, untimely death doesn't occur), *Tishyaphala* (fruit is good for health).^[25] It is *Mridu virechak, Mutral, Graahi, Deepan, Raktstraavrodhak*^[23] *Medoroga nashak, Shukrajanak, Bhagn sandhan* in *Karma*.^[27] Indicated in *Raktpitta, Prameha, Vrishya, Rasayana, Shwasa, Kasa, Kshaya, Paandu, Agnimandya, Kamala, Hikka, Vaman, Atisaar, Atyartav, Pratishtyaya*.^[26]

Chemical Composition: Tannins, polyphenolic compounds, terchebin, alkaloids, corialgin, ellagic acid, lupeol, phyllantidine, and phyllantine are the primary ingredients of *Aamalki* leaves and fruits. Fruits are also high in vitamin C, carotene, d-glucose, d-fructose, nicotinic acid, riboflavine, phyllembin, and phyllembic acid. Its roots contain ellagic acid and lupeol.^[28]

***Piper longum* Linn.-** It belongs to the family Piperaceae. *Pippali* consists of the dried, immature, catkin-like fruits with bracts of *Piper longum* Linn., a slender, aromatic climber with perennial woody roots.^[29] It occurs in hotter parts of India from Central Himalayas to Assam, Khasi and Mikir hills, lower hills of Bengal, also cultivated in North East and evergreen forests of Western Ghats from Konkan to Travancore.^[24] Synonyms– *Pippali* (its usage restores and maintains good health), *Magadhi* (abundantly available in *Magadha Desha*), *Vaidehi* (grown in *Videha Desha*), *Upkulya* (grows near or along the side of water streams), *Ushna* (due to *Katu* i.e., pungent *Ras*), *Tikshana* (seeds are spicy), *Kana* (fruit is composed of many small particles), *Krishna* (fruit is black in colour),

Kola (fruit appears as a solidified rod consisting of small round particles), *Tikshnatandula* (seeds are very pungent).^[25] It is *Agnidheepaka, Vrishya, Rasayana, Rechaka, Sugandhi, Deepana, Pachan*^[26] *Ruchikaraka, Saaraka, Shukrajanaka, Hridya*^[24] in *Karma*. Indicated in *Aanaha, Agnimandya, Udarshool, Kasa, Shwasa, Jeerna jwar, Aamvata, Gridhrasi, Katishool, Vatarakta, Swarbhanga, Arsha, Yakshma*^[23], *Gulma, Pleeha, Udara roga*.^[27]

Chemical Composition: The fruits and stems of *Pippali* contain piperine and sesamin, alkaloids of major importance^[28]. The fruit of *Piper longum* Linn includes a variety of alkaloids, including piperidine, asarinine, piperderidine and longamide.^[30] Fatty acids from crushed seeds of *Piper longum* Linn have been found to contain palmitic, stearic, linoleic, oleic, highly saturated acids, and arachidic acid. Essential oil of *Pippali* contains a high concentration of sesquiterpene hydrocarbons and caryophyllene.^[31]

***Commiphora wightii* (Arnott) Bhandari** – It belongs to the family Burseraceae. *Guggulu* consists of exudate of *Commiphora wightii* (Arn.) *Bhandari*. It is a small perennial tree or shrub up to 1.2-1.8m high, occurring in rocky tracts of Rajasthan, Gujarat; exudate is collected during winter season by making incisions in the bark or in summer, falling from the bark itself. Drug occurs in vernicular or stalactitic pieces of pale yellow or brown coloured mass makes milky emulsion in hot water and readily burns; when fresh viscid and golden coloured, aromatic in odour and tastes bitter and astringent.^[23] Synonyms - *Guggulu* (*Gunjo vyadhe gurdati rakshati*," meaning to give relief from different diseases), *Devadhupa* (used for fumigation during puja), *Kaushika* (produced in the ridges or cuts on the stem), *Pura* (drug of choice in many diseases), *Mahishaksha* (colour is same as of buffalo's eye), *Palankasha* (*Palam Mansam kashti hinasti*– due to *Lekhana* property, reduces unwanted fatty tissues), *Kumbholukhala* (resin is secreted from *Kumbhakara* and *Ulukalakar kosha*)^[25].

It is *Rasayan, Vrishya, Snehan, Stransan, Vatanuloman, Deepan, Vatahar, Vranashodhan, Vranaropana, Shothaghna, Raktvardhak, Aartavjanan, Lekhana, Balya*.^[26] *Bhagnsandhan, Shukrajanak, Dhatuwardhak*^[27] in *Karma*. Indicated in *Vataroga, Gridhrasi, Ardita, Sopha, Udara, Charma roga, Atisaar, Pavahika, Granthi, Vidradhi, Kushtha, Phiranga, Pandu, Arsha, Prameha*^[26]

Chemical Composition: The gum resin from *Guggulu*, which contains large amounts of the guggulsterols I, II, and III, Z and E-guggulsterones, myrcene, Polymyrcene, lignans, and caryophyllene, is utilised in a variety of medicines. It is also abundant in amino

acids like valine, lysine, proline, threonine, tryptophan, aspartic acid, histidine, and glutamic acid.^[32]

Guggulu Shodhana– Administration of raw *Guggulu* may lead to skin rashes, irregular menstruation, diarrhoea, headache, mild nausea, and, with very high doses, liver toxicity^[33]. To overcome these unwanted effects, various purification processes (*Shodhana vidhi*) using different fluids (*Dravyas*) are described. These procedures not only nullify the adverse effects but also enhance the therapeutic activity. During purification, foreign matter from raw *Guggulu* is removed manually and broken into small pieces. The broken mass is wrapped in a piece of cloth (*Pottali*) and hanged into an inert container i.e., *Dola yantra* containing one of the recommended media. Different liquid medias required for purification of *Guggulu* are: *Gomutra* (cow urine), *Triphala Kashaya* (decoction of *Triphala*), *Vasapatra Kashaya* (decoction of *Adhatoda vasica* leaves), *Vasapatra Swarasa* (aqueous extract of

Adhatoda vasica leaves), *Dugdha* (milk), and water.^[34] The fluid is boiled with the immersed *Guggulu* till all the soluble matter of *Guggulu* is dissolved in the purifying vehicle. After discarding the insoluble part, boiling is continued further till *Guggulu* solution forms a soft mass. Then it is poured out over a smooth wooden board smeared with either cow ghee or castor oil and dried in the sun. This dried mass is called purified *Guggulu* (*Shudha guggulu*). It is possible that few properties (chemical and biological) of *Shodhana* materials get added to *Guggulu* and also some of the toxic or harmful constituents of raw *Guggulu* get neutralized, detoxified, or removed during the purification process. A large number of commercial polyherbal anti-inflammatory formulations use *Guggulu* as the chief ingredient.^[35]

Different methods for purification of *Guggulu* described by different Ayurvedic texts are compiled in the table below:

Table 4: Description of *Guggulu Shodhan* as described in Classical Texts

Procedure	References	Methods
Dissolve in liquid and filtering	<ul style="list-style-type: none"> • Rasendra Sar Sangraha-1/402 ^[36] • Harita Samhita, Kalpasthana 5/9, ^[37] • Gad Nigraha, Rasayana, <i>Guggulu kalpa</i> /253, ^[38] • Brihata Ras Raj Sundar, Madhyam khanda/ Shilajita prakarana, ^[39] 	After heating liquid media, <i>Guggulu</i> is dissolved in it, strained and after filtering, dried it in hot sun. After that mixed it with <i>Grita</i> and make mass.
<i>Swedana</i> (boiling in liquid)	<ul style="list-style-type: none"> • Ras tarangini, 24/579-580,^[40] 	<i>Guggulu</i> tied in a cloth, made in <i>Pottali</i> form and immersed in <i>Godugdha</i> and boiled until the maximum part of <i>Guggulu</i> come in liquid media. After cooling of liquid media, separate the sediment part on bottom of vessel and dried it.
Swedana and frying in <i>Ghrta</i>	<ul style="list-style-type: none"> • Anand Kanda, 15th ullasa, 307 ^[41] 	<i>Guggulu</i> is cut in small pieces, fried in <i>Goghrita</i> and kept in <i>Dolayantra</i> in the prescribed liquid; <i>Guggulu</i> is taken out and dried.
Dipping in <i>Ghrta</i>	<ul style="list-style-type: none"> • Deepika teeka on Sharngdhara samhita, Madhyama khanda 7/70-81 ^[42] 	<i>Guggulu</i> dipped in <i>Ghrta</i> for 7 nights.

Table 5: Experimental Pharmacological Action of ingredients of *Triphala Guggulu*

Drug	Experimental Pharmacological Action
<i>Haritaki</i>	Anti-microbial activity ^[43] Hepatoprotective, anti-inflammatory ^[44] Immunomodulatory ^[45] Anti-oxidant ^[46] Anti-bacterial activity against <i>Salmonella typhi</i> , <i>Helicobacter pylori</i> ^[47] Anti-amoebic ^[48]

Vibhitaki	Anti-oxidant [49] Anti-spasmodic, anti-microbial [50] Hepatoprotective Action [51] Anti-ulcer activity [52] Anti-bacterial activity [53] Anti-fungal, anti-viral, anti-malarial [54] Immunomodulator [55] Astringent, anti-inflammatory, eye disorder [56]
Aamalki	Adaptogenic [57] Hepatoprotective [58] Hypocholestrolemic [59] Anti-oxidant [60] Anti-ulcerogenic [61] Anti-pyretic, analgesic, anti-viral, anti-inflammatory activity [62] Hypolipidemic activity [63] Immunomodulatory, anti-stress, anti-microbial activity [64]
Pippali	Bioavailability enhancer, hepatoprotective agents [65] Anti-depressant activity [66] Analgesic activity [67] Immunomodulatory [68] Stomachic, thermogenic, hypo-cholesterolaemic [69] Anti-bacterial [70] Anti-allergic activity [71] Anti-inflammatory activity [72] Anti-dysenteric [73]
Guggulu	Anti-Inflammatory and anti-arthritic activity [74-77] Anti-atherosclerotic [78-81] Anti-cancer/cytotoxic [82] 82 Anti-hyperglycemic [83-84] Hepatoprotective, neuroprotective [85] Anti-microbial [86-89] Skin diseases [90] Cytotoxic activity [91-93] Cardioprotective [94] Anti-oxidant activity [95-97] Thyroid stimulatory activity [98] Effect on platelet aggregation and fibrinolytic activity [99-100] Hypolipidemic activity [101-107]

Research Studies on *Triphala Guggulu*

Role of *Punarnava Mandur* and *Triphala Guggulu* in Obesity [108]

Anil Mangal et al., (2020) concluded that *Triphala Guggulu* combined with *Punarnava Mandur* can be used to treat obesity in both sexes. *Triphala guggulu* 1gm (2 tablets of 500mg) and *Punarnava Mandur* 500mg (1 tablet of 500mg) thrice daily with lukewarm water were used in a 12-week trial on 58 obese subjects aged 12-60 years of both sexes. The

study found that this combination reduces the symptoms of *Medo Rog* (obesity) while having no side effects. *Triphala Guggulu* contains *Triphala*, which promotes proper digestion and lowers cholesterol, *Pippali*, works against *Kapha*, reduces fat and *Guggulu*, which contains *Tikta*, *Katu Ras*, *Laghu*, *Ruksha Guna*, and *Ushna virya*, is the best drug of choice for obesity.

Role of *Ksara Vasti* and *Triphala Guggulu* in *Raktarsha* ^[109]

In 129 cases of haemorrhoids, a clinical study on the role of *Ksara Vasti* and *Triphala Guggulu* in *Raktarsha* was conducted. The trial combined the local use of *Apamarga Kshar Basti*, 2gm in 10ml of normal water, in the form of *Matra Basti* once a week with the oral use of *Triphala Guggulu*, 500mg twice a day, for 6 weeks. In which 55 patients out of 129 showed significant relief. Rejuvenating properties of oral *Triphala*, combined with the anti-inflammatory and anti-infective action of *Guggulu*, were discovered to be significant in treating haemorrhoids. *Triphala* not only improves digestion but also heals tissue and acts as a mild laxative.

Comparative Hylauronidase enzyme activity of Ayurvedic formulation *Triphala Guggulu* ^[110]

The research was looked at both in-house and commercial formulations. The % inhibition of hyaluronidase enzyme for *Triphala guggulu* formulation was discovered to be 83.90% for TG and 83.86%, 83.87%, and 83.89% for TG-1, TG-2, and TG-3, respectively. TG inhibited the most hyaluronidase enzymes, while TG-3 inhibited the least. In all formulations, hyaluronidase enzyme inhibition was found to be close to 83%. The findings suggest that *Triphala guggulu* may be useful in treating diseases such as joint pain, inflammation, and rheumatoid arthritis. When expensive injections of hyaluronic acid are administered to patients suffering from chronic arthritis, it may become an alternative.

Anti-diabetic Potential of *Triphala Guggulu* ^[111]

In an experiment, oral administration of *Triphala Guggulu* Tablet (TGT) and *Triphala Guggulu Churna* (TGC) showed a significant reduction in blood sugar in each normal control group and in hyperglycaemic alloxan-induced rats. Both formulations significantly restored all parameters to almost normal in alloxan-induced diabetic rats, proving it to be a promising drug in management of diabetes.

External application of *Hinsradya Taila* and *Triphala Guggulu* on non-healing infected wounds ^[112]

In the management of non-healing infected wound, *Hinsradya Taila* was applied externally and *Triphala Guggulu* 500mg was given orally twice a day. Also, the wound was reviewed on every 3rd day. Oral intervention of *Triphala Guggulu* helps early wound healing and also reduces *Paka*, *Kleda*, *Shotha* along with remarkable reduction of pain in the wound.

Effect of *Triphala Guggulu* in Diabetic Retinopathy ^[113]

For the study on Diabetic Macular Oedema, 25 patients (50 eyes) were randomized into two groups comprising of 26 eyes in group I and 24 eyes in Group II. *Triphala Guggulu* was given in Group I i.e., Trial Group and starch capsules for Control Group II. After 2 months, improvement in visual acuity was seen by 1 or more level in 23.07% eyes in Group I and 8.33% eyes in Group II. Thus, it shows that the trial drug which is *Triphala Guggulu* has shown positive effect on visual acuity improvement.

Efficacy of *Triphala Guggulu* and *Gandhak Rasayan* in post operative pain Management wsr to inguinal hernia repair ^[114]

In a single blind study, 30 patients underwent elective surgery of inguinal hernia. Patients were grouped in 2 groups i.e., control and trial. In control group, Tab. Diclofenac Sodium 50mg BD and Gentamycin 80mg IV BD was given. In Trial group, *Gandhak Rasayan* 250mg and *Triphala Guggulu* 45mg, each 1 Tab TID was given. Combination of these drugs help in achieving expected analgesic effect with early wound healing. Thus, paving its way as an alternate for prophylactic and analgesics.

DISCUSSION

Several studies on the constituent herbs of *Triphala Guggulu* formulation demonstrate their therapeutic efficacy in inflammation, piles, oxidative stress, and hypolipidemia. *Triphala Guggulu* consists of *Amalaki*, *Haritaki*, *Vibhitaki*, *Pippali*, and *Guggulu*. Therapeutic effects are explained using the terms *Rasa*, *Guna*, *Virya*, *Vipaka*, and *Karma*. Majority of the *Triphala Guggulu* constituents contain *Tikta*, *Kashaya*, *Madhura Rasa*, *Ushna Virya*, *Katu Vipaka*, *Laghu*, *Ruksha*, *Ushna*, *Tikshna Gunas*, *Tridosahara*, and *Shothahara karma*. It relieves *Kapha dosha* due to *Tikta*, *Kashaya Rasa*, *Laghu*, and *Ruksha Guna*. It reduces *Vata* and *Kapha dosha* due to *Ushna Virya*. *Pitta dosha* is relieved by the drug's *Tikta*, *Kashaya*, and *Madhura Rasa*. It activates *Agni* due to its *Ushna Virya* and *Laghu*, *Ruksha Guna*, and reduces *Srotorodha* due to its *Ushna*, *Tikshna*, *Laghu Guna*, and *Ushna Virya*.

Guggulu is *Kapha Vatahara* (relieves *Kapha* and *Vata*), *Kledahara* (removes soddening), and can aid in the treatment of *Shopha* (oedema), *Arsha* (piles), and *Arbuda* (tumours). Because of its *Jantughna* (anti-microbial) property, used to treat infections. Bitter and pungent *Rasa* in *Guggulu* has antagonistic effects to the *Kapha Dosha*, which is the primary cause of *Shotha*. *Guggulu*'s hot potency relieves vitiated *Vata* and prevents *Kleda* from lingering at the site of pathogenesis and causing *Srotorodha* (obstruction) and aids in wound healing. It also counteracts the

chilly and dryness features of *Vata* (vitiated air). The scraping nature and bitter taste eliminates *Kleda dosha* from the micro channels of body. As a result, it balances *Kapha* and *Vata* and slows the process of pathogenesis. *Guggulu* is also used to treat wounds, lymphadenitis, boils, cysts, and other ailments, indicating that it possesses anti-bacterial, anti-inflammatory, and wound healing effects.

Haritaki is *Tridosahara* in *Karma*, particularly *Vatahar*, and pacifies *Kapha dosha* through *Ushna Virya* (hot potency) and *Ruksha* (dry) *Guna*, *Pitta dosha* through *Madhur* (sweet) *Vipaka*, and *Vata dosha* through *Madhur* (sweet) *Vipaka*. In nature, it is *Dipana* (improves metabolism), *Pachana* (digestive), and *Anulomana* (regulates physiological movement). Anti-microbial, anti-inflammatory and anti-oxidant properties of *Haritaki* are thus proven to be beneficial in inflammatory conditions as well as in wound healing management. *Vibhitaki* shows a powerful purgative action throughout the body and is largely used to treat *Kapha*- related disorders. It is also a great body rejuvenator. Its *Virya* is *Ushna* (hot), and its *Vipaka* is *Madhur* (sweet). It is a laxative and an astringent, and it is used to cure diarrhoea in modest dosages (laxative properties are apparent in higher doses). Despite the fact that it is energetically 'hot,' it does not aggravate *Pitta*. *Amla pradhan Panch Rasa*, *Madhur Vipaka*, and *Sheeta Veerya* are all found in *Amlaki*. It acts as *Deepan* (increases appetite), *Pachana* (increases digestion), *Amlatanashak* (antacid), *Yakrituttejak* (hepatoprotective), and *Anulomana* (to treat constipation). *Triphala* as a whole formulation contains beneficial phytochemicals such as tannin, alkaloid-quinone, flavonoids, phenol-gallic acid, ascorbic acid, hydrolysable tannin-chebulinic acid, epicatechin, ellagic acid, saponins, sterols, diterpenes, and terpenoids. *Triphala* is antimicrobial, antibacterial, antioxidant, and immunomodulatory. It is also a wonderful *Rasayan*. *Pippali* is *Kapha-Vatahar* in *Doshkarma*, hence it soothes *Kapha dosha* due to *Katu* (pungent) and *Vata dosha* due to *Madhura Rasa* (sweet taste). The root of *Piper longum* Linn is also used as a digestant, and carminative. It has *Deepan*, *Pachana*, *Rochana*, *Vatanuloman*, *Krimighna*, *Mridurechaka*, and *Shool Anahar* characteristics. It also has anti-inflammatory, analgesic and anti-microbial properties. As a result, shown to be effective in the treatment of inflammation, wound healing and piles.

Triphala Guggulu, contains more *Guggulu* than the other ingredients listed. *Triphala* aids digestion, alleviates constipation, and detoxifies the body. *Guggulu* relieves inflammation and pain. It is used to cure a variety of diseases, including slow metabolism, obesity, piles, fistulas, inflammation, and gout. It mostly comprises *Rechana* (osmotic laxative),

Deepaniya (promotes digestion and metabolism capacity), and *Vata shamaka* (*Vatadosha* pacifying) properties. Because *Vata* is regarded to be the fundamental cause of many disorders, it is also effective in *Vatajanya* problems by relaxing the aggravated *Vata dosha*. *Triphala Guggulu's* constituents have all proven remarkable anti-inflammatory, antioxidant, and immunomodulatory activity, making it a powerful treatment of choice in inflammatory and infectious illnesses. The anti-microbial and anti-infective properties of *Triphala Guggulu* aid in the healing and pain reduction of haemorrhoids. The hypolipidemic activity of *Guggulu* makes it useful in the treatment of obesity.

CONCLUSION

The constituents of *Triphala Guggulu* contain anti-inflammatory, anti-microbial, and analgesic qualities, according to all of the research done on the formulation as well as its individual ingredients. Because of these properties, this formulation is an excellent anti-inflammatory, analgesic, and antibacterial drug. More research is required to investigate the occluded areas, as well as the actual therapeutic applications of these components and the formulation itself.

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