

Guggulu plant of *Jambudia vidi* at Saurashtra region : A review of the medicinal evidences for it's Remedial properties

Reena P.Dave^{1*}, Rajes S.Patel²

¹Dept. of Botany, Shri M.N.Virani Science College, Rajkot-360005, (INDIA)

²K.K.S.J. Maninagar Science College, A'bad, (INDIA)

E-mail: reenadave23@gmail.com, rsbotany72@yahoo.com

ABSTRACT

This paper deals with medicinal properties and traditional uses of guggulu. we present here a review of medicinal evidences and traditional uses of COMMIPHORA WIGHITTI bhandari (Syn. COMMIPHORA MUKUL HOOK).

Guggulu is an oleogum resin that exudes spontaneously as a result of injury from the bark of COMMIPHORA MUKUL HOOK. In Ayurveda guggulu enters into the preparation of several compound medicines most of which are named with suffix 'guggulu'. It is a complex mixture of steroids, aliphatic esters, carbohydrates, amino acids and variety of inorganic compounds. Traditionally it is used to treat arthritis, obesity and other disorders. Guggulu has been shown to lower cholesterol and triglycerides.

This review (is an effort to compile all the available information reported on its macroscopic features. © 2014 Trade Science Inc. - INDIA

KEYWORDS

Guggulu;
Commiphorawighitti;
Macroscopic features.

INTRODUCTION

Guggulu is an oleogum resin that exudes spontaneously as a result of injury from bark of Commiphorawighitti bhandari (syn: Commiphoramukul hook. Ek stocks or *balasmodendron mukul* hook. Ek stocks). Guggul more popularly known as bdellium is derived from the gummy resinous exudates of a plant closely related to myrrh that is found in arid or semi-arid areas of northern India, Bangladesh and Pakistan. The Sanskrit definition of the term 'guggulu' is 'one that protects against disease'. This attest to the wide respect and therapeutic ayurvedic application for this botanical considered the most important for the removal of "ama", toxic substances which accumulates as a re-

sult of sluggish digestion and circulation associated with a slowing of metabolism²³. Guggul is a resin, the major ingredient in joint care and immune care that has been regarded as a remedy in ayurvedic medicine, known to increase white blood cell count and to possess strong immune modulating properties. Guggul is one of the 'broad spectrum' health products with a wide range of benefits.

STUDY AREA

Jambudia Vidi is located between 22.2969° N and 70.7984° W Longitudes, In Wankaner Taluka of Rajkot District in Saurashtra peninsula. The northern part of Rajkot District adjoining to Surendranagar District is

Review



Plate 1 : Natural habitat – gugulu plant

relatively plain with undulating terrain in some of the area. Area of Wankaner Taluka is good grassland and scrub forest. North-East of Wankaner adjoining to them and Halvad is a relatively compact patch of forest in table land with sparse vegetation of *Acacia*. In *Jambudia Vidi* is spread over 1952.78 Hectoors. Adjoining area 700.34 hectoors like Lunsar / Jivapar / Chitrakhada, Rajgadha are seen.

Jambudia Vidi is dry-deciduous and semi-arid with patches of grasslands, Ideal original grassland with compact patch of 2476 hectare of Rajkot District and 1000 hectare of surendranagar District. It is centrally located in the draught prone zone of Saurashtra Kutch and north Gujarat. Wankanner the nearest taluka town is on national quadrilateral root of porbandar Delhi national highway 8A & on main broad gauge railway track of Rajkot – Ahmedabad.

A compact path of 3176.60 hectare in Wankaner Taluka adjoining to Halwad and Than Taluka at Surendranagar District in the following villages :

Whereas the adjoining area 700.3 of Than and

No.	Village	Total Area
1.	Jambudia	1951.78
2.	Lunsar / Jivapar	404.09
3.	Chitrakhada	59.09
4.	Rajagadh	60.70
	Total	2476.26

Halvad taluka of surendranagar District can be a part of this project.

SCIENTIFIC CLASSIFICATION OF GUGULU PLANT

Kingdom	: Plantae- plants
Subkingdom	: Tracheobionta- Vascular plants
Super division	: Spermatophyta- Seed plants
Division	: Magnoliophyta - Flowering plants
Class	: Magnoliopsida- Dicotyledons
Subclass	: Rosidae
Order	: Sapindales
Family	: Burseraceae-
Genus	: <i>Commiphora</i> Species <i>Commiphorawighitti</i> (Arnott.) Brand

VERNACULAR NAMES OF GUGULU PLANT

Bengali	: Guggulu, Guggul, Guggal, Ranghanturb, Makal, Canarese.
Gujarati	: Gugul, Guggul, Gugal, Bhesaghgala, Gugara, mukul, Ranghanturb, Bhaisoguggul.
Hindi	: Gugala, Guggal, Guggul, Guggulu, Gugava, Gugavik, Kukul, Ranghanturb, Gogil,

	Bhasagugul.
Kannad	: Kanthgal, Kangah, Guggul, Ivadolguggala, Idbol.
Marathi	: Gugul, Guggal, Guggul, Hansaguggul, Kantguggul, Mahaishguggul.
Sindhi	: Gugaru.
Tamil	: Kukkil, Gukkal, Guggal, Gugul, Gukkula, Maishakshim, Mahishaksh-Gugilamu, Cheetu-mahishashi.
Arabic	: Mukulahuda, Mukarlijk, Mushkilerajak, Mogal, Mogla, Mokhit, Aphalatana, Mukal, Ahlatan, Arzagiaglatam.
English	: Gum giggulu, Indian bdellium, Salativee, Bdellium, Guggulu, Borassaus, Flabelliformis.
Persian	: Baijahundan, Boejahudan.
Pharsi	: Boejahudan, Buejadan, Boe, Jhoodan, Vorojahu.
Sinhali	: Rata dummula, Guggulu, tatayy, Jauya.
Unani	: Afaletana, Mikal.

BOTANICALS

Commiphorawighitti is a small tree indigenous to India, growing wild in the semi-arid to arid states of

Rajasthan, Gujarat and Karnataka. It is much branched, dioecious upto 6m tall with brown coloured, spine scented knotty, crooked and spirally ascending branches ending in sharp spines. Bark shiny, ash to yellowish white coming off in rough flakes exposing the greenish underbark, which also peels off in thin papery rolls. Leaves small, sessile, rhomboid-(ob) ovate, 1-3 leaflets, highly aromatic, leathery, shiny green on top and grayish below with irregularly toothed edges. Flowers small, unisexual, sessile, brownish red, occurring singly or in groups of 2-3, 8-10 lobed disc and oblong ovoid ovary; stamen 8-10. Fruits an ovoid green berry like drupe, reddish, 6-8mm in diameter. Seed generally contain an underdeveloped embryo. The generic name is derived from greek "kommis" and "phora" meaning gum bearer. This is a threatened and vulnerable species due to its over exploitation.

FLORISTICS

In a field examination in India, a predominantly large number of isolated and groups of female individuals were recorded. It was also revealed that female plants set seed irrespective of the presence or absence of pollen. Hand-pollination experiment and embryology studies



Plate 2 : Commiphoramucula – hook @ Jambudia vidi

Review



Plate 3 : Microscopic features – gugulu plant

have confirmed the occurrence of non-pseudogamous apomixes, nuclear polyembryony and autonomous endosperm formation for the first time in this plant. Which is presently threatened by overexploitation. In its natural ranges in India, the tree drops its leaves during the rainy season. This is followed by flowering (October-December) and fruit set (October-January). The young leaves appear towards the end of the dry season.

ECOLOGY

The tree is found in rocky and open hilly areas of rough terrain and sandy tracts in warm and semiarid to arid areas. It is also found in anogeisuspendula and ravien throne forest types associated with anogeisus spp, acacia spp, dichrostachyscinerea, rhusmysorensis, grewiaspp, euohorbiassp and secirunega sp.

TREE MANAGEMENT

Weeding and irrigation is necessary for 2-3 years after planting for commercial cultivation or spacing of 4m-4m is recommended resulting to 250 plants per acres. It is a slow growing plant and takes 8-10 years to come to a height 3-3.5m. Pruning or removal of branches in early stages helps to achieve better growth, increase in girth of growing branch and thereby better

gum yield.

IRRIGATION AND INTERCULTURE

Light irrigation during the summer season is required for good growth of plants. One weeding and one hoeing is needed in early growth of the crop. But the soil is stirred up around the plants (bushes) two times per year.

HARVESTING

The plants should be allowed for at least 5-6 years before commencing incision thick branches for extracting oleogum resin. The oleogum resin is tapped during winter, from November-February, by making a 7-10cm long incision in the main stem near the base. The cut part is completely covered with resin in about a months time. The exuded gum secreted is collected every week upto one month after which further exudation of gum stops.

Yield : Fro 10 years all plants about 700-900g of gum resin may be obtained. This is return may give an yield of about 700-900 kg of gum per hectare.

MACROSCOPIC FEATURES

Translucent, vernacular or stalactic, tears of varying sizes, reddish yellow or brown in colour, more often



Plate 4 : Gugulu plant – occurs rocky & hilly area : ruff terrain area

occurring in resinous lumps which turn darker in colour on long storage. Fracture-brittle, exposing a rough or waxy surface having a moist unctuous appearance; balsamic odour, acrid, bitter and aromatic taste. A Thorny shrub with nime like leaves. When injured, It yield an aromatic gum resin.

TRADITIONAL USES OF GUGULU PLANT

In Ayurvedic, Indian traditional system of medicine, herba are usually used in combinations. Yogarajguggulu is traditionally for detoxifying, treating obesity, joint pain arthritic condition, muscle aches, rheumatism, and gout. Punavadi guggulu is for detoxifying the kidneys, eliminating fluid, helping heart condition and inflammations. Triphalaguggulu is for joint pain arthritic condition, rheumatism and weight loss. Gum guggulu is used as incense, to make lacquers, varnishes and ointment, as a fixative in perfumes and in medicine. Gum guggulu is used to treat dysmenorrhea, dyspepsia, endometritis, hypercholesterolemia, hypertension, impotence, bronchitis, caries, catarrh, gingivitis, hay fever, hysteria, inflammation, laryngitis, lochia, mania, pharyngitis, phthisis, pyorrhea, rheumatism, sores, sore throat, stimulant, tonsillitis, tumors, wounds, bone fractures, gout, scrofula, sciatica, facial paralysis, diplegia, leprosy, leucoderma, pectoral disorders, otorrhea epilepsy, fever, strangury, hemorrhoids, dysmenorrhea, amenorrhea,

ulcers, anemia, coronary, thrombosis, stomatopathy, pharyngopathy, spermatorrhea, urinary calculus, diabetes, trichosis, to enhance phagocytosis, to increase leukocytes, to induce abortion, and as a tonic for the uterus. Traditional uses of *C. mukul* include as an anti-inflammatory, antispasmodic, carminative, emmenagogue, hypoglycemic, alterative, antiseptic, astringent, sedative, stomachic, diaphoretic, diuretic, expectorant, antispasmodic, antisupplicative, aperients, a thyroid stimulant, anthelmintic, depurative, vulnerary, antiseptic, demulcent, aphrodisiac, liver tonic, detergent, anti spasmotic, hematinic, lithonotriptic.

MODERN USES (MEDICINAL) OF GUGULU

Modern therapeutic uses of guggul includes nervous diseases, hemiplegia, leprosy, marasmus, muscle spasms, neuralgia, ophthalmia, pyelitis, phorrhea, scrofula, skin diseases, spongy gums, ulcerative pharyngitis, hypertension, ischaemia, hemorrhoids and urinary tract disorders. More recently, *C. mukul* was found to be relatively safe and effective supplement for osteoarthritis of the knee. Research studies showed that guggul is effective against aspects of cardiovascular disease. Guggul reduced the stickiness of platelets. The crude gum guggul and each of the fractions containing the E and Z-guggulsterones have hypocholesteremic activity: the ethyl acetate extract, the neutral compound from

Review



Plate 5 : Flouristic study of gugulu plant @ Jambudia vidi

the extract, the ketonic compound in neutral fractions, and that containing the purified E- and Z-guggulsterones.

Guggul is also been used for the treatment of Anti fertility activity. Anti oxidant effect, Platelet effects, Anti inflammatory, Thyroid effect, Anti arthritic activity: a) treatment of heart diseases, b) In ineffective hepatitis.

The side effects are associated with the crude gum guggul. These includes skin rashes, irregular menstruation, diarrhea, headache, mild nausea, eructation, hic-cough and with very high doses, liver toxicity.

CHEMICAL CONSTITUENTS OF GUGULU PLANT

A detailed Chemical constituents of guggulu revealed that it is a complex mixture of steroids, diterpenoids, aliphatic esters, carbohydrates, amino acids and variety of inorganic compounds. Besides known sesamin and cholesterol, Z- AND E-guggulsterons, 16-??-hydroxyprogesterone and three new sterols viz. guggulsterols I, II, & III. Besides a new alcohol viz. mukulol, four steroids too have been isolated from guggulu.

CONCLUSION

Although the result from this review are quite promising for the use of guggulu as a multi-purpose medicinal agent, several limitations currently exist in current literature. while guggulu has been used successfully in

Ayurvedic medicine for centuries, more clinical trials should be conducted to support its therapeutic use. Remarkably it's naturally occurs in *Jambudia vidi* – at Saurashtra region.

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