

GOKSHURADI GUGGULU: A MEDICO REVIEW**Dr. Parulkar Geeta D.**

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INTRODUCTION**Gokshura**

The name and synonyms of Gokshura are not found in the vedic literature. Acharya Charaka identified it as the best drug for Mutrakruhra (dysuria) and Vata rogas (C.S.Su.25). It is one of herbs which is “Mutrala” (diuretic) as well as “Shothahara” (anti-inflammatory). The root is used in Dashamula while the fruit is Vrushya (Aphrodisiac).

Controversial Studies – Quoting his great teacher late Amrtalal P. Pattani, Vaidya Bapalal stated that “Trikantaka” should possess three spines/spurs but not six or four as the case with Tribulus or Pedalium. Even considering the term Gokshura the fruit is not like the hoof of a cow. Another herb Martynia diandra (Pedaliaceae) may be the true

Gokshura according to Pattani. Bapalalji is of the opinion that *Acanthospermum hispidum* Dc is the real Gokshura.

Nrtyakundaka or Nrtyakundala mentioned by Vagbhata (A.H.Ci.11/30) is considered as another source for Gokshura according to Pattani. But Thakur Balvant Singhji described it as *Eleusine corocana* which is a different plant.

In Punjab and Sindh *Xanthium strumarium* Linn. (compositae) is used for smallpox. Late Dr. Sakharam Arjun considers it as Gokshura.

A) Gokshura

Gokshura (*Tribulus terrestris*)**Description**

Botanical Name – *Tribulus terrestris*

Family – Zygophyllaceae

Vernacular Names – **Hindi** – Gokharu; **English** – Cow hage

Synonyms – Iksugandhika, Svadanstra, Trikantaka, Svadukantka, Palankasa

Different varieties

We come across utilization of two varieties of Gokshura viz, Bruhat (*Pedalium merex* Linn.) and Laghu (*T. terrestris*) varieties.

Classical Categorization

- **According to Acharya Charaka**- mentioned as Shothahara, Mutravirechaniya, Krumighna.
- **According to Acharya Sushruta**- described under Vidarigandhadi and Viratarvadi as well as Laghu Pancamula gana.
- **According to Acharya Vagabhata**- described under Vidarigandhadi gana.

Botanical Description

(i) **T. terrestris**-A small, prostrate, hirsute or silky hairy herb. **Leaves**- stipulate, opposite, usually unequal, abruptly pinnate; leaflets 4-7 pairs, oblong, mucronate. **Flowers**- solitary, axillary or leaf-opposed, yellow or white. **Fruits**- globose, hairy, 5-angled, spinous with 2 long and 2 short spines on each cocci. **Seeds**- obliquely pendulous. (Flowers and fruits during April- August).

(ii) **P.murex**- A glabrous annual herb. **Leaves**- opposite or alternate, petioled irregularly toothed or almost lobed. **Flowers**- solitary, axillary, with 2 glands at the base. Calyx small 5-partite Corolla yellow. Stamens 4, didynamous, included, Ovary 2- celled. **Fruits**- hard indehiscent, pyramidal-ovoid capsules with 4 patent spines from base.

Major chemical constituents of

1. **Fruits**- Chlorogenin, diosgenin, gitogenin, rutin, rhamnase
2. **Roots**- Campesterol, B- sitosterol and stigmasterol, neotigogenin
3. **Aerial parts**- astragalin, dioscin, diosgenin, hecogenin, ruscogenin, trillin, furostanol glycoside, spirosterol saponin; terrestrosides A-F saponins C and G etc.

Indications- Mutrakrucchra (UTI), Ashmari (Renal Calculi), Prameha (Diabetes), Hrudroga (Heart Disease), Arshas (Piles), Shvasa (Asthma), Kasa (Cough), Klaibya (Impotency).

Therapeutic uses

- (1) **For Vajikarana**- Powder of Gokshura fruit is boiled with milk and consumed.
- (2) **For Management of Amavata**- Decoction of Shunthi and Gokshura (root) will be of definite use.
- (3) **For Kesa Vardhana**- Gokshura and the flowers of Tila are applied externally by making them into paste using honey.

Dosage- Decoction 30 ml twice or thrice a day, Powder 500mg thrice a day.

Important Preparations- Gokshuradi guggulu, Gokshuruka rasayana, Gokshuradi churnam, Gokshuradyavaleha, Gokshuradi kvatha, Dashamularista.

Previous Research works

A. Anti-cancer activity- one of the three new steroidal saponins from the fruits of *T. terrestris* exhibited cytotoxic activity against a human malignant melanoma cell line (Behdir & Khan, 2000).

B. Nephroprotective activity

Nephroprotective activity was evaluated in gentamicin-induced nephrotoxicity (80 mg/kg/day S.C.) in male albino rats, NR-AG-I (Containing *C. nurvala*, *T-Terrestris*, *D. biflorus* & *Shilajit*) and NR- AG-II (*C.nurvala*, *B. diffusa* *S. officinarum* & *B. frondosa*) were tested given for 12 days. Urea clearance and microscopical examinations of kidney were performed after the treatment. Gentamicin caused nephrotoxicity was prevented by both formulations.

Study of renal microscopy showed necrosis, epithelial loss with granular degeneration and fatty changes in gentamicin treated rats and was reversed by both formulations. But, NR-I Proved to be better formulation (due to presence of T-terrestris)-(Samiulla & Harish, 2001).

Simultaneous administration of T-terrestris (200mg/kg/day p.o) and gentamycin to female rats decreased gentamycin- induced renal damage in both structural & functional terms (Nagarkatti et al; 1994).

C. Lithotriptic property

- Aqueous extract of T. terrestris (5g/kg p.o./day) was tested in 6 male rats in whom hyperoxaluria was induced. 24 hr urinary oxalate excretion reversed to normal, from 1.97 ± 0.314 to 0.144 ± 0.004 mg/mg creatinine ($p < 0.001$) within 21 days of administration of drug and remained so until 15 days after withdrawal of extract and sodium glycoate (Sangeetha et al; 1993).
- An ethanolic extract from fruits showed significant dose dependent protection against urolithiosis induced by glass bead implantation in albino rats (Anand et al; 1994)
- The following reports are also available on the clinical effects of Gokshura in urolithiosis Nair P.S. (BHU), 1966; Usha R. (Trivendrum), 1993 & upadhyaya K.N. (BHU), 1995.
- Administration of aqueous extract, and a significant raise in urinary glyoxylate excretion is also observed as compared to sodium glycoate fed animals (Sangeet et al; 1994).

D. Hepatoprotective activity- The hepatoprotective activity of T. terrestris is reported against CCI – induced hepatotoxicity in rats (Lee et al, 1992).

E. Diuretic activity

- The decoction of fruits found to possess a moderate diuretic activity in rats (Gujral et al; 1995).
- An alkaloid from T. terrestris produced slight rise in B.P. and appreciable rise in kidney volume (Chopra, 1956).
- Watery extract of Gokshura possesses similar diuretic activity like urea both in rats and dogs. The diuresis was due to the potassium content of the extract (Karandikar et al; 1960).

F. Aphrodisiac property- A new original preparation Tribestar has been obtained from T. terrestris having a stimulatory effect on sexual functions (Tomova, 1987).

Articles on Gokshura

- Clinical study of Tribulus terrestris Linn. in Oligozoospermia: A double blind study By Thirunavukkarasu M. Sellandi et al, Ayu. 2012, Jul-Sep; 33(3): 356–364. doi: [10.4103/0974-8520.108822]
- Phytopharmacological overview of Tribulus terrestris by Saurabh Chhatre et al, Pharmacogn Rev. 2014, Jan-Jun; 8(15): 45–51. doi: [10.4103/0973-7847.125530].

B) Guggulu**Commiphora mukul Oleoresin****Description**

1. **Botanical Name** – Commiphora mukul (hook. ek. stocks)
2. **Family**- Burseraceae
3. **Vernacular Names- Hindi** –Guggulu; **English**- Indian Bedellium.
4. **Synonyms**- Koushika, Devadhupa, palamkasa, Pura

Classical Categorization

1. **According to Acharya Charaka**- mentioned as Sanjnasthapaniya
2. **According to Acharya Sushruta**- described under Eladi gana
3. **According to Acharya Vagbhata**- described under Eladi gana

Different varieties

1. Bhavamishra mentioned five types of Guggulu Viz, Mahishaksha & Mahanila are used for elephants; Kumuda & Padma are used for horses and Hiranyaksha is used for human beings. If Hiranyaksha variety is not available, Mahishaksha variety may be used.
2. Kaiyadeva mentioned that Guggulu trees habitated in the Jangaladesha. It yields five types of Gum-resin during Grishmarutu as well as in Shaityarutu.

Major Chemical Constituents

Oleoresin- z-guggulsterone, E-guggulsterone, Gum- Guggullignans I & II; Tettrols; Mukulol; Allylcembrol; C-27 Guggulustrols I, II & III; Z-And E- Guggulusterol etc.

Indications- Useful in Sthoulya/Medoroga (Obesity), Amavata (Rheumatoid Arthritis), Vatavyadhi (Disorders associated with vitiation of Vata), Prameha (Disorders associated with Urinary system), Apachi(Cold Abcess), Shotha(Inflammation/Swelling), Arshas(Anorectal Diseases), Kushtha (Skin Disorders) etc.

Therapeutic Uses in the management of following Diseases-

1. **Sthaulya** (Obesity) / **Medoroga** (Lipid Disorders)
2. **Udara** (Ascites)
3. **Kroshtrukashirsha** (Knee joint Disorders)
4. **Amavata** (Rheumatoid Arthritis)

Part used- Oleoresin /Gum.

Dosage- 2-4 gms / day.

Important preparations

- A) Herbal preparations of Guggulu-** Panchatikta Guggulu Ghrita, Simhanada Guggulu, Navaka Guggulu, Amritadi Guggulu, Kanchanar Guggulu, Gokshuradi Guggulu, Aabha Guggulu, Laksha Guggulu, Yogaraj Guggulu etc.
- B) Herbo-Mineral preparations of Guggulu-** Mahayograj Guggulu, Chandraprabha Vati, Arogyavaradhini Vati etc.

Previous Research

1. Anti-inflammatory and Anti-arthritis activity – Oleoresin was found to be highly potent Anti-inflammatory agent as compared to Hydrocortisone and Butazoladin against Brownlee's Formaldehyde-induced Arthritis in Albino rat (Gujaral et al; 1960).

Clinical study on the effect of the of Shuddha Guggulu in Amavata (RA) is reported to be encouraging (Vyas S.N., G.A.U., Jamnagar, 1983); Jhope A.B 1978 & Majumdar, 1979).

Shuddha Guggulu is found to be effective in Katisula (Low back pain) proving the Analgesic & Anti-inflammatory effect (Pandey D.H. 1993 GAU, Jamnagar).

2. Anti-atherosclerotic activity- Effect of Gum-Guggulu was observed on Serum Cholesterol, Fibrinolytic activity and Platelet adhesive index in health individuals, (Groups I) and in patients of CAD (Group II). For a period of 30 days, Serum Fibrinolytic activity improved by 22% and 19% at the end 24hrs, whereas after 30days it was 40% and 30% in Groups I & II respectively. Platelet adhesive index showed 22% and 19% after 30days in Groups I and II respectively. Serum Cholesterol did not decrease significantly (Bordia & Chuttiani, 1979).

Purified steroidal fractions of Guggulu show a marked inhibition of ADP, Adrenaline and Serotonin induced Platelet aggregation. Their Inhibitory effect is comparable to the effect of "Clofibrate". The finding has its therapeutic value in Myocardial Infarction and Thromboembolism.

Effect of Guggulu on Coagulation and Fibrinolytic activity in experimental Atherosclerosis is reviewed (Kaur et al: 1980).

The effect of *C. mukul* on Fibrinolytic activity and Platelet aggregation was studied in 42 IHD patients. It was observed that patients with Myocardial Infarction were found to have a Low Fibrinolytic activity as compared to case of Angina Pectoris, Acute Coronary insufficiency and Asymptomatic coronary disease, but no such difference was observed for Platelet aggregation. Administration of Guggulu improved Fibrinolytic activity in Ischemic Heart Disease (Baldwa et al; 1980).

3. Anti-obesity activity- Crude Guggulu was found to reduce the body weight of hydrogenated groundnut oil treated rabbits (Satyavati et al; 1969 b).

Preliminary Clinical trials on 22 patients of Hypercholesterolaemia associated with Obesity, Ischemic Heart Disease, Hypertension, Diabetes Mellitus etc.(crude) was administered orally (6.12 mg in 3 divided doses for 15 days to one month). A fall in Total Serum Cholesterol and Serum Lipid Phosphorus was found in all the cases treated with Guggulu. The body weight of 10 patients of Obesity also found to be reduced significantly (Satyavati 1966; Dwarakanth & Satyavati 1970).

In another study, 75 patients (both sexes and of different age groups) having varied etiology and clinical manifestation of Obesity and Lipid disorders were treated with Crude Guggulu

and PE extract (16 gm. in four divided doses per day for three months). In average, there is 2 kg. reduction in month in both the groups (Pandey et al; 1989).

4. Hypolipidemic/Hypolesterolaemic activity

- 1) Crude Guggulu was reported to possess highly encouraging Hypolipidaemic activity in rabbits (Satyavati, 1966).
- 2) Fraction A of PE extract effectively lowered Serum Lipids Cholesterol, Phospholipids and Triglycerides in monkey fed with Cholesterol diet (Das at al., 1973).

Articles on Guggulu

1. Safety of Mahayograj Guggulu (A Herbo-Mineral Formulation):An Observational Study ; Tripathi S. , Pandey S D, Sastry J.L.N., Sasibhushan V. ; Int. J. Pharm. Sci. Rev. Res. 38(1), May- June 2016, Article no. 03, Pages-13-17.
2. Guggulu: A precious herb(Review Article); Dr.Geeta Parulkar, World Journal Of Pharmaceutical Research, Aug-Sept 2017, Vol- 6, Issue- 11, 175-179, ISSN -2277-7105.

C) Total Ingredients of Gokshuradi Guggulu.

Ingredients	Latin Name	Parts used	Quantity
Gokshura	Tribulus terrestris	Phala (Fruit)	28pala (Approx.1kg)
Shunthi	Zingiber officinale	Kanda (Rhizome)	1pala (Approx 40g)
Maricha	Piper nigrum	Phala (Fruit)	1pala (Approx 40g)
Pippali	Piper longum	Phala (Fruit)	1pala (Approx 40g)
Haritaki	Terminalia chebula	Phala (Fruit)	1pala (Approx 40g)
Bbibhitaki	Terminalia ballerica	Phala (Fruit)	1pala (Approx 40g)
Amalaki	Embllica officinale	Phala (Fruit)	1pala (Approx 40g)
Mustaka	Cyperus rotundus	Phala (Fruit)	1pala (Approx 40g)

Other ingredients

Content	Quantity
Water	168 pala (Approx 6litres)
Guggulu (Shodhit)	84 pala (Approx 3kg)

Table Properties of Ingredients of Gokshuradi Guggulu

Dravya	Guna	Rasa	Virya	Vipaka	Doshagnata	Karma
Gokshura	Guru, Snigdha	Madhura	Shita	Madhura	Vata-Pittahara	Vrushya, Mutrala, Rasayana
Shunthi	Ruksha, Guru, Ushna	Katu	Ushna	Madhura	Vata-Kaphahara	Dipana, Pachana, Grahi
Maricha	Laghu, Tikshna	Katu	Ushna	Katu	Kapha-Vatahara	Dipana, Pramathi
Pippali	Laghu, Snigdha, Tikshna	Katu	Ushna	Madhura	Vata-Kaphahara	Dipana, Vrushya, Rasayana
Haritaki	Laghu, Ruksha	Kashayapradhana Pancharasa (Lavanavarjita)	Ushna	Madhura	Tridosahara	Anulomana, Lekhana, Rasayana
Bibhitaki	Laghu, Ruksha	Kashaya	Ushna	Madhura	Kapha-Pittahara	Keshya, Chakshushya
Amalaki	Snigdha	Amlapradhana Pancharasa (Lavanavarjita)	Shita	Madhura	Tridosahara	Rasayana
Mustaka	Laghu, Ruksha	Tikta-katu-kashaya	Shita	Katu	Kapha-Pittahara	Pachana, Grahi
Guggulu	Laghu, Ruksha, Vishada Sukshma, Sara (Properties of purana Guggulu). Snigdha, Picchila (Properties of fresh Guggulu)	Tikta-katu	Ushna	Katu	Tridosahara	Rasayana, Vrushya (Properties of fresh Guggulu i.e. New Guggulu), Lekhana (Properties of Purana Guggulu i.e. Old Guggulu)

Dosage – 500mg Three times a day

Articles on Gokshuradi Guggulu

1. Effect of Ayurvedic management in 130 patients of diabetic nephropathy by Kalapi Patel, 1 S. N. Gupta, 2 and Namrata Shah³, Ayu. 2011 Jan-Mar; 32(1): 55–58;doi: [10.4103/0974-8520.85727]
2. Ayurvedic Management of Pediatric Urolithiasis(Mutrashmari) : A case Report by Shubhashree M. N et al, Interanational Journal of Research in Ayurveda Pharma, B(1), Jan- Feb 2017, [DOI- 10.7897/2277-4343.08116]

My Observations

I achieved great results during my experience of last 10years in OPD's and IPD's of M. A. Podar Hospital, Worli, Mumbai-18 in the management of following diseases-

1. **Mutrakruchra** {Urinary disorders (Urinary Tract Infection)}
2. **Mutraghaata** (Prostate Enlargement)

3. **Vata-rakta** (Gouty Arthritis)
4. **Gridhrasi** (Sciatica)
5. **Ashmari** (Renal Calculi)
6. **Sandhigatvata** (Osteoarthritis)

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4. Sharangdhar Samhita (7th Adhyaya, Madhyamkhanda) by Acharya Bramhanand Tripathi, Edition, Chaukhamba Orientalia Publication, 2010.