



PHARMACOGNOSTICAL EVALUATION OF GOKSHURA (TRIBULUS TERRESTRIS LINN)

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ABSTRACT:

The oldest remedies known to mankind are herbal medicines. Gokshura (Tribulus terrestris) belonging to Zygophyllaceae family, are well known drug used in Ayurveda as diuretics. It is widely distributed around the world, that is adapted to grow in dry climate locations in which few other plants can survive. It is an invasive species in North America. Like many weedy species, this plant has many common names, including bindii, bullhead, burra gokharu, caltrop, cat's head, devil's eyelashes, devil's thorn, devil's weed, goathead, Puncture Vine, Puncturevine, and tackweed. It is classified under mishrak varga as 'Dashmoola' in Ayurveda and in chemotaxonomy as Saponin glycosides. The chemical constituent of the plants includes Sapogenins, Tannins, Glycosides etc. Among these steroidal Saponins is the main active principle which is responsible for the diuretic activity of the plants. Gokshura is a well-known Ayurvedic drug that is used in many preparations. Botanically it is identified as Tribulus terrestris Linn., especially the roots and fruits of the plant. Pharmacognostical study has been carried out to identify the distinguishing features, morphological and microscopic, of Tribulus terrestris Linn. This knowledge should help reduce the problem of substitution of the genuine drug. The objective of the work is to find out the diagnostic tool to identify the Gokshura.

KEYWORDS: Ayurveda, Dashmoola, Glycosides, Gokshura, Saponins, Sapogenins, Tannins, Tribulus terrestris Linn, Zygophyllaceae.

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INTRODUCTION

In the Ayurvedic literature certain drugs have been clubbed together and given group names. *Dasamula* which literally means the ten roots is

one such group. *Acharya Charaka* has explained that are should modify the potency of drugs from lower to higher side & vice-versa, by combination, elimination, timing, processing & method of administration. *Acharya Charaka* , explained *Gokshura* under *Madhuraskandha dravyas*, *Mutravirechana Gana*, *Svayathuhara Gana* & *Anuvasanopaga Gana*¹; Where as , *Acharya Sushruta* included this drug under *Vidarigandhadi Gana* & *Kantaka Panchamula*². It is found in sub-Himalayan forests of India, Burma, and several other countries. A short crooked tree with persistent fruit in the cold season, common in all forests, frequently found in villages and worshipped by the Hindus during Dasara festival.

According to Ayurvedic traditions, *Gokshura* is a wonderful healing plant with a broad range of properties, belonging to *Zygophyllaceae* family, posses *Madhura Rasa*, *Sheeta Virya* and *Madhur Vipaka*; *Guru*, *Snigdha*

Gunas and *Vatapittakapha shamaka* in nature³.It recently becoming very popular in Western herbalism under the common name "Puncture Vine" and the abbreviated latin name *Tribulus*, where it is used for its demonstrated ability to increase Luteal Hormone in men and women, leading to increased testosterone. In Ayurveda, *Gokshura* is known as effective *Rasayana* for rejuvenation of health and muscle strengthening. *Gokshura* improves urinary tract disorders by its positive effect on *Vrikka* (kidney). *Gokshura* is widely accepted in Ayurvedic medicine system for treatment of most of urinary disorders.



(2) Dig. Of *Gokshura* plant



(2) Dig. Of Fruit of *Gokshura* plant

TYPES OF GOKSHURA:

1. *Brihat Gokshur* : *Pedalium murex*
Linn.

2. *Laghu Gokshura* : *Tribulus terrestris* Linn.

MACROSCOPIC CHARACTERS OF *Tribulus terrestris* Linn.-:

It consists of root, 7-18 cm long and 0.3-0.7 cm in diameter, slender, cylindrical, fibrous, frequently branched bearing a number of small rootlets, tough, woody and yellow to light brown in colour, surface becomes rough due to presence of small nodules, fracture fibrous, odour aromatic,

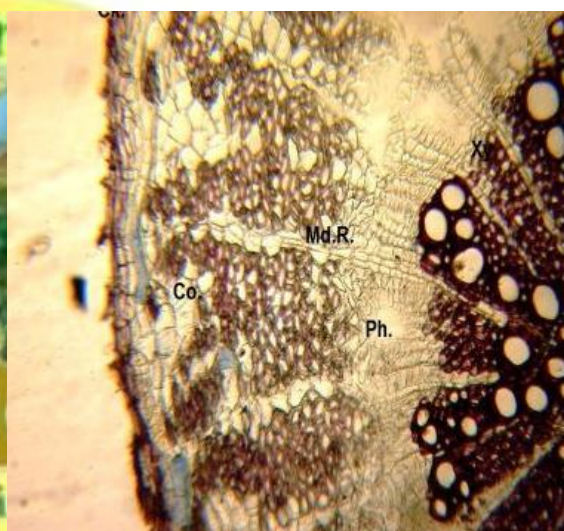
taste, sweetish and astringent. Fruit stalked, light or greenish yellow, five ribbed or angled, more or less spherical in structure and covered with short stiff or pubescent hairs, 1 cm in diameter with five pairs, of prominent short stiff spines, pointed downwards, about 0.5 cm in length, tips of spines almost meet in pairs whole together forming pentagonal framework around fruit, ripe fruit separates into five segment, of each cocci and each appears as single-fruit, each coccus semi-lunar or plano-convex in structure one chambered, armed with a pair of spines, starting from its middle, containing four or more seeds, taste, slightly astringent.⁴

MICROSCOPIC CHARACTERS OF *Tribulus terrestris* Linn.-:

Transverse section of primary roots show a layer of epidermis followed by 4-5 layers of thin-walled parenchymatous cortex, endodermis distinct, pericycle enclosing diarch stele, in mature

root, cork 4-6 layered, cork cambium single layered followed by 6-14 layers of thin-walled parenchymatous cells with varying number of fibres, distributed throughout, some secondary cortex cells show secondary wall formation and reticulate thickening, fibres found in groups resembling those of phloem, secondary phloem divided into two zones, outer zone characterized by presence of numerous phloem fibres with a few sieve tubes slightly collapsed, inner zone frequently parenchymatous, devoid of fibers often showing sieve tubes and companion cells, phloem rays distinct, few cells get converted into fibres in outer region, cambium 3-5 layered, wood composed of vessels, tracheids, parenchyma and fibres and traversed by medullary rays, vessels scattered, arranged in singles or doubles towards inner side, in groups of three to four on outer side having bordered pits, tracheids long, narrow with simple pits, xylem parenchyma rectangular or slightly elongated with simple

pits and reticulate thickening, xylem fibres few, tracheids elongated with simple pits, medullary rays heterogenous, 1-4 cells wide, starch grains and rosette crystals of calcium oxalate present in secondary cortex, phloem and medullary rays cells, few prismatic crystals also present in xylem ray cells.⁴



(3) Dig. Of Microscopic structure of *Tribulus terrestris* Linn.

PHYSICOCHEMICAL PARAMETERS OF *Tribulus terrestris* Linn.:

Physicochemical study includes the parameters such as Ash value, Acid insoluble ash, Extractive values in water and methanol, according to

API part 1, vol.1. This Ayurvedic Medical College, Physicochemical analysis done in Kharghar. central Research Lab. YMT

- **Quantitative examination of inorganic matter of *Tribulus terrestris* Linn.:**

Sr. No.	Parameters	Results	Values acc. to API	Methods
1.	Total Ash %	11.2	Not more than 13%	As per API
2.	Acid Insoluble Ash %	2.0	Not more than 3%	As per API
3.	Water Soluble Extract %	25.05	Not less than 10%	As per API
4.	Alcohol Soluble Extract %	10.2	Not less than 4%	As per API
5.	Moisture Content %	7.2	-	-

- **Qualitative examination of organic matter of *Tribulus terrestris* Linn.:**

Sr. No.	Test	<i>Tribulus terrestris</i> Linn.
1.	Tannin	Present
2.	Saponin	Present
3.	Alkaloid	Present
4.	Glycoside	Present
5.	Carbohydrate	Present
6.	Flavanoid	Present

CONCLUSION

All the above parameters can be used as diagnostic tool to identify and differentiate the *Gokshura* i.e. *T.terrestris*. Microscopy study

reveals that rosette crystals of calcium oxalate present in secondary cortex, phloem and medullary rays

cells, few prismatic crystals also present in xylem ray cells.

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