A REVIEW ON CONTROVERSIAL ASPECT OF GOKSHURA

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ABSTRACT

Gokshura, a drug of herbal origin, is being used extensively by Ayurvedic physicians for the management of various disease conditions like Mutrakrichchhra (dysuria), Prameha (Diabetes), Kasa (Cough), Shwasa (Asthma), Hridroga (Cardiac disorders). It is one of the components of Dashamoola which is popularly used for its anti-inflammatory action. Although official source of Gokshura is authenticated as Tribulus terrestris as per API; it’s some synonyms like Shwadanshtra, Trikantaka etc. do not match the morphological characters of Tribulus terrestris. In this article, an attempt is made to enlist and discuss all the source plants which come under the controversial aspect of Gokshura.

KEYWORDS: Gokshura, Shwadanshtra, Trikantaka, Tribulus terrestris.

INTRODUCTION

India is blessed with largest and richest floral diversity in the world, and there are many species which resemble each other. Moreover, India is a vast country in which multiple languages are in practice according to different regions. So, naturally one plant is known by various names in various parts of the country which creates controversy in authentication of many plants mentioned in classics.

Gokshura is one of the controversial drugs in Ayurveda and one of the components of Dashamoola, a reputed Ayurvedic formulation used in the treatment of various diseases. Gokshura is well known for its diuretic and lithotriptic activity. Trikantaka, Shwadanshtraare the synonyms used in classics which describe the morphological characters of its fruit. But these synonyms create some controversy during consideration of the source plants used under the name of Gokshura. Dr. Bapalal Vaidya has mentioned Pedalium murex as Brihat Gokshura. He has also mentioned Martyniadiandraas Gokshura as its fruit is having 3 spurs (Trikantaka). Xanthium strumariumand Acanthospermum hispidumare also considered during controversial
aspect of Gokshura. In API Part I Volume I, Tribulus terrestris is authenticated as Gokshura. Moreover, there are certain species of Genus –Tribulus like Tribulus rajasthanensis, Tribulus pentandrus, Tribulus lanuginosus and Tribulus subramanyamii which have morphological similarity with Tribulus terrestris (Gokshura). Hence an attempt is made here to enlist the source plants available under the name of Gokshura and discuss their differentiating characters.

**Review and discussion**

Gokshura means hoof of a cow. Fruits are armed with spines which injure the feet of grazing cattle.\(^1\) Trikantaka means fruit with three spines. Shwadanshtra means canine tooth of a dog. When its thorns prick the body causes pain equivalent to that of dog-bite.\(^2\)

Charaka mentions the term Shwadanshtra Krimighna, Anuwasanopagaand Mootравirechaneyeeyagroup of ten drugs in Sutrasathana chapter fourth. Chakrapani does not attempt to explain this term. Again in Chikitsasathana chapter 27, Shwadanshtrais used at seven places. There also he is silent. It is in Shrurta's Vidarigandhadiganaof drugs that Shwadanshtra has been equated to Gokshura by Dalhana, even Arundatta is silent on identifying it. Charaka and Shrurta both use the term Gokshura at several places. In Sutra 4/16 (38), under Shwayathuharahat drugs of Dashamoola Gokshura appears and not Shwadanshtra. It shows Charaka knew these two to be of separate entity.\(^3\)

Although Shwadanshtrais one of the synonyms of Gokshura as per Nighantuslike Dhanwantari nighantu \(^4\), Sodhala nighantu \(^5\), Madanapala nighantu \(^6\), Kaiyadev nighantu \(^7\), Bhavaprakasha nighantu \(^8\), Raj nighantu \(^9\), Shaligrama nighantu \(^10\), Priya nighantu \(^11\) and Saraswati nighantu \(^12\); its Krimighna karma is neither mentioned in any of the above nighantusnor its Madhura Rasa, MadhuraVipakaand SheetaVeeryajustify Krimighna(deworming) activity attributed to Gokshura. So most probably the term used “Shwadanshtra” by Charak may not be the Gokshura which we use in practice because in the same chapter Charaka further mentioned the word “Gokshura” in Shwayathuhara (anti-inflammatory) Mahakashaya. \(^13\) Also the two terms Gokshura and Shwadanshtramight have been possibly used according to part used i.e. Shwadanshtra for fruits and Gokshura for roots.

Gokshura controversial aspect covers the following plant species

1. Tribulus species (Zygophyllaceae)
2. Pedalium murex (Pedaliaceae)
3. Acanthospermum hispidum (Asteraceae)
4. Xanthium strumarium (Asteraceae)
5. Martyniadiandra (Pedaliaceae)
The Gokshura which we all are using in medicines is of two kinds.

1. A spreading plant – *T. terrestris* – a small Gokshura
2. An erect plant – *Pedalium murex* – a big fruited variety

Charaka and Sushruta have not mentioned these two varieties. Only Gokshurak has been mentioned. It is the later addition. Moreover, Vaidyas mostly use the fruits of these two varieties. It is Sharangdharawho has used the whole plant with roots, leaves and flowers.

1. **Tribulus species**

*Tribulus terrestris* is authenticated as Gokshura in API Part 1 Volume 1. But total 5 species of genus Tribulus are found across India, so all those including *T. terrestris* are reviewed here to differentiate them.

**Tribulus Tourn. ex L.**

Herbs, annual to perennial, prostrate to semi-erect, branching, and hairy to glabrescent. Leaves opposite, one of each pair alternately smaller or sometimes abortive, paripinnate, stipulate; leaflets 6-20, opposite, subsessile to sessile. Flowers solitary, axillary, pedicellate, usually yellow. Sepals 5, pubescent, deciduous or persistent, imbricate. Petals 5, obovate to obovate-oblong, membranous. Disk annular, 10-lobed. Stamens 5-10, outer whorl of 5 slightly longer, opposite the petals; filaments filiform; anthers oblong to obovate-oblong, membranous. Ovary globose, covered with bulbous-based stiff hairs, 5-locular; ovules 1-5 in each cell; style simple, cylindrical, 5-ridged; stigma 5-rayed. Schizocarps separating into 4-5, dorsally spiny, winged or tubercled, indehiscent, mericarps; seeds obliquely pendulous; endosperm absent; cotyledons ovoid.

**Key to the species**

1a. Fruits with spiny mericarps
b. Fruits with winged mericarps .................... *T. pentandrus*

2a. Intrastaminal glands not ciliate, style glabrous
b. Intrastaminal glands ciliate; style pubescent ............ *T. subramanyamii*

3a. Each mericarp with 4 spines, basal pair of spines sometimes reduced to tubercles
b. Each mericarp with 2 median and 20-30 dorsal spines, basal pair of spines absent  

* T. rajaasthanensis

4a. Pedicels equal to or longer than subtending leaves; style longer than ovary… *T. lanuginosus*
b. Pedicels shorter than subtending leaves; style shorter than ovary ............ *T. terrestris*
All the above five species are morphologically similar except some differentiating characters in their fruits. They are shown in the following table.

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<thead>
<tr>
<th>Sr. No.</th>
<th>Characters</th>
<th>Tribulus lanuginosus</th>
<th>Tribulus subramanyamii</th>
<th>Tribulus terrestris</th>
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**2. Pedalium murex (Pedaliaceae)**

15-40 cm tall, simple or branched, erect or diffuse, pubescent herbs. Leaves 1-6.5 x 0.7-3.6 cm, fleshy, glabrous, broadly ovate, elliptic-oblong or nearly orbicular. Flowers 1.8-3.7 cm long, axillary, solitary. Drupes 1.3-1.5 cm across, pyramidal-ovoid, 4-gonous. The roots of *Pedalium murex* or the big fruited variety are of bright orange red colour and the plant contains abundance of mucilage so much so that if we dip the plant in water for 5 minutes; it becomes very wet with mucilage and the whole plant has an odour of musk. The fruits of *Pedalium murex* Linn., having four lateral spines are called Bada-gokharu. Dr. Bapalal Vaidya advocated using *Pedalium murex* as Gokshura for aphrodisiac, tonic, rasayana and other vatik disorders.
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The synonym *Trikantaka* is applicable to none of these two kinds as their fruits possess four to six spines on their fruits. Another plant with yellow flowers and three spines on the fruit is *Acanthospermum hispidum* DC. and may have been used as *Gokshura*.\(^{18}\)

3. **Acanthospermum hispidum** (Asteraceae)\(^{19}\)

An annual herb characterized by hairy stem, yellow-green florets, opposite leaves and fruits with hooked spines. Stems are erect; 20-80 cm long, diffusely branched, velvety with long hairs. Leaves are elliptic to ovate, 2-10 cm long, 1-7 cm wide, with glands on lower surface. Leaf margins are toothed to nearly entire; gradually tapering to the base, stalk less. Flower-heads are yellow, 4-5 mm in diameter. Burs are wedge-shaped, strongly compressed, 4-7 mm long, the ribs bearing 1-2 rows of hooked prickles 1-2 mm long, the 2 apical prickles stout, curved or straight, 3-4 mm long.
4. *Xanthium strumarium* (Compositae)\(^{20}\)

Annual, unarmed; stem short, stout, slightly branched, rough with short hairs. Leaves numerous, 2-3 in. long and almost as broad as long, broadly triangular-ovate or suborbicular, acute, often 3-lobed, rough with appressed hairs on both sides, irregularly inciso-serrate, somewhat cordate and shortly cuneate at the base; petioles 1-3 in. long, hairy. Heads in terminal and axillary racemes, the barren heads rather numerous, crowded at the top of the stem, the fertile heads fewer, axillary. Involucre of fertile heads ovoid in fruit, about 5/8 in. long, with 2 erect mucronate beaks, pubescent, thickly clothed with usually hooked prickles, 2-celled, hard and tough. Achenes $\frac{1}{2}$ in. long, oblong-ovoid, compressed, glabrous.
5. *Martyniadiandra* (Pedaliaceae)

A native of Mexico, becoming naturalized and springing up on rubbish-heaps and in waste places. Leaves large, opposite, cordate, sinuately lobed and minutely dentate, often covered with a glutinous dew-like substance. Flowers diandrous, handsome, ill-smelling, rose-colored, in racemes.\(^{21}\) The fruit is a green fleshy capsule, which contains a hard, black woody wrinkled nut, with two anterior hooks. Hooks are just like the scorpion’s tail and that is why is known as *Vinchhudo* – scorpion in Gujarat. This fruit is cleft like a cow’s hoof and has 3 hooks. So in the real sense of the term this is the real *Gokshura* (Cow’s hoof). It is a good diuretic and its fruits are used in medicine. A black coal-tar like oil is obtained and is used in eczema, ringworm etc.\(^{22}\) The drug which is in practice at present as *Gokharuis* neither like hoof of a cow nor its fruits with three spines. But neither plant can be called *Gokshura* and *Trikantaka*. *Martyniadiandra* (Martyniaceae) – the *Vinchhudoor Waghanakhain* Gujarati – seems to be the real *Gokshura* and *Trikantaka* both. *Trikantakawas* the ear ornament. But our

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**Gokshura** i.e. **Trikantaka** is not like this. Martynia (devil’s claw or tiger’s claw) comes nearer this.

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**CONCLUSION**

Controversial drugs should be screened from several angles such as literary, pharmacognostical, pharmacological and clinical apart from collecting relevant data from field study. Although *Tribulus terrestris* is considered as the official source of *Gokshura*; its other regional species should be screened for pharmacognostical, phytochemical, pharmacological and clinical profile in order to evaluate their efficacy. Comparative experimental study on parts used (fruit, root, flower and whole plant) of *Tribulus terrestris* may also be carried out to ascertain the activities like *Krimighna* (Deworming) attributed to *Gokshura* in classics. *Pedalium murex* is the official source for *Brihat Gokshura* still *Acanhospermum hispidum, Xanthium strumarium* and *Martyniadiandra* shall be compared with *Tribulus terrestris* and *Pedalium murex* on the basis of their experimental and clinical profiles.
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