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### Nutritive Estimation of (*Tribulus terrestris*) Gokshura Ksheerpaka: A health supplement for pregnant women

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#### Abstract

**Objective:** *Tribulus terrestris* (Gokshura) belonging to family Zygophyllaceae is a well-known herb having many pharmacological properties; it has been used to treat liver disorders, headaches, dizziness, and general tonic and it also used for therapeutic purpose as health supplement. *Tribulus Terrestris* has clinically proven effect in enhancing energy, vitality helps in building muscle and strength. It is very rich in proteins and calcium. The main aim of the present study was to assess the nutritive value of Gokshura Ksheerpaka.

**Methods:** In the present study Nutritive Estimation of Gokshura powder and Gokshura Ksheerpaka was carried out at CFST BHU Varanasi; by using AOAC (1980-89) Official Methods of Analysis of the Association of Official Agricultural Chemists.

**Results:** The result of the study shows that Gokshura Ksheerpaka has higher nutritional Profile than Gokshura powder alone.

**Conclusion:** The study shows that the Gokshura Ksheerpaka has great potential of high nutritional importance for pregnant women because of its preparation with milk.

**Keywords:** Milk, Gokshura Ksheerpaka, nutritive, herbal drug

#### Introduction

Ayurveda, which originated in ancient India over 5000 years ago, is probably the world's oldest system of natural medicine. This herbal based system of natural medicine. This herbal based system of medicine is now well reorganized not only in India but also in western world With the growing need for the safer drugs, attention has been drawn to their quality, efficacy and standards of the Ayurvedic formulations. Ayurveda is an integrated system of specific theories and techniques employing: diet herbs, exercise, meditation yoga etc. The goal of Ayurveda is to achieve optimal health on all levels: physical, psychological and spiritual. Ayurveda places an enormous emphasis on the importance of caring for the mother before, during and after pregnancy. Acharya Charka, says when the child is in the womb, then each activity of its mother affects in its development <sup>[1]</sup>.

Nutrition and Health is determining every aspect of our life and specially Pregnancy is the time of main focus on the diet and health supplements taken by a pregnant women. In Ayurveda there are so many Herbs and pasta and special Dietary regimen are well described by our Acharaya <sup>[2]</sup>. Ayurvedic Herbs and Dietary Regimen are full spoon of nutraceuticals which are very essential during pregnancy for wellbeing of mother as well as her baby. The term nutraceuticals is a hybrid or contraction of nutrition and pharmaceutical. Reportedly, it was coined in 1989 by DeFelice and the Foundation for Innovation in Medicine. Restated and clarified in a press release in 1994, its definition was "any substance that may be considered a food or part of a food and provides medical or health benefits, including the prevention and treatment of disease. Such products may range from isolated nutrients, dietary, supplements and diets to genetically engineered 'designer' foods, herbal products, and processed foods such as cereals, soups, and beverages <sup>[3, 10]</sup>. There are so many kind of Ayurvedic health supplements herbs which are describe for pregnancy are very rich in various type of nutraceuticals properties. Due to increasing requirements during pregnancy the importance of diet is also increased. So that role of nutraceuticals is very important for pregnant women. In the present study main focus on nutritive value on Gokshura Ksheerpaka

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**Gokshura:** Tribulus is cooling, sweet and strengthening. It is common throughout India and found to be growing as weed along roadside and waste places. It is trailing and spreading herb, density covered with minute hair. Leaves compound, in opposite pairs, leaflets 3-6 pair, up to 8 w cm long. Flowers are usually silky, white or yellow, solitary, arises from the axils of leaves. This Plant is almost important ingredient of Ayurvedic preparation. The drug is diuretic, tonic aphrodisiac. The decoction of leaves is useful as a gargle for mouth trouble, painful gum and to reduce inflammation. The leaves increase the menstrual flow, cure gonorrhoea. Fruits are also used to treat coughs, scabies and anemia. The roots are said to be stomachic appetizer, diuretic and carminative. *Tribulus Terrestris* has clinically proven effect in enhancing energy, vitality helps in building muscle and strength.

Botanical Name : *Tribulus terrestris* Lin.  
Family : Zygophyllaceae  
English Name : Land Caltrop

### Distribution

Throughout India, up to 5,400m. As a weed along roadsides and waste places

### Morphology

Gokshura is an annual or perennial herb with many spreading slender branches, the immature portions covered in a fine silky hair.

**Leaves:** The leaves are stipulate, oppositely arranged, usually unequal, abruptly pinnate, with 4-7 eight simple leaflets that are almost sessile to the leaf stem.

**Flowers:** Solitary, axillary or leaf- opposed, yellow or white. The solitary yellow flowers have five petals, and are borne in the leaf axils

**Fruits:** The fruits are globose, hairy, 5-angled, spinous with two long and two short spines on each cocci, each cocci containing several seeds [4].

### Ayurvedic Properties [8, 4]

Rasa : Madhura (sweet)  
Guna : Guru (heavy), Snigdha (oily)  
Virya : Shita (cold)  
Vipaka : Madhura (sweet)

### Pharmacology

Tribestan is a completely natural non-hormonal herbal (phytochemical) biostimulator derived from the plant *Tribulus terrestris* L., Bulgaricum, which contains predominantly saponins of furostanol type, with prevailing quantity of protodioscin (not less than 45% in Tribestan). It is a natural herbal alternative to synthetic anabolic hormones without any clinically proven toxic effects. Tribestan administration leads to increased muscle mass in active sports by activating the enzyme associated with energy metabolism. At the same time it has also been reported to have the ability to stimulate some functions associated with the increase of the body's natural endogenous testosterone and luteinizing hormone (LH) levels. With the increase of the body's natural endogenous testosterone level, it can help alleviating some symptoms associated with male menopause *Tribulus terrestris* has been used in ayurveda and other folk medicine for multiple therapeutic actions, including as an aphrodisiac, analgesic, diuretic, astringent, abortifacient, diuretic, anti-urolithiasis and general tonic. [5, 6, 9].

### Gokshura Ksheerpaka

Ksheerpaka is the one of the unique preparations of Ayurvedic pharmaceuticals. It is one of the best health promoter effective and nutritive preparations for the pregnant women. (Shiddhinandan Mishra)

Here milk is used as a media for the formulation. Because milk is a emulsion form having capability to dissolve mainly water soluble, protein soluble and fat soluble ingredients to some extent, from the herb used for Ksheerpaka preparation. Besides to this milk is also having antacid activity due to its alkalinity. Because of more dietetic value of milk it is used as a dietetic regimen and as well as medicine. Because of its palpability, it can be used easily for treatment purposes. The preparation media (milk) is good for heart. They are advisable even to a person having low digestive capacity. The effect of the drug is prolonged because of the fat (colloidal substance) present in the milk [7].

### Conceptual Study

#### Kwatha Kalpana

According to Charak: Preparation boiled on fire is known as srita Kasaya. According Sushruta Samhita chikitsa sthana preparation of decoction take the bark, leaf, root, fruit, etc.

Part of the drug or whole drug in a prescribed quantity and dried in sunrays may be cut in to peace or burnished and added with eight times or sixteen times. Water and boiled in a wide mouth pot, should be reduced to ¼<sup>th</sup> part by boiling. This is known as Kashaya Kalpana. According to Sharangdhar: One phala drug and 16 times water boil it in earthen wear and reduce it to 1/8 part by applying mild heat and use so prepared decoction in luke warm state.

#### Ksheerapaka Kalpana

Ksheerapaka Kalpana a liquid dosage form plays an important role in Ayurvedic therapeutics, due to its nutritive and curative values. It is found both in Brihatrayi and Laghutrayi, but specially the method of preparation and ratio of the ingredient are elaborately described in Laghutrayi. The dosage form is mainly prescribed for the management of diseases caused due to Agnimandya like Jwara, Raktapitta and Gulma etc. There are more than fifty formulations described in the classics of ksheer paka which are prepared from different herbs. Milk is the main ingredient and used as a media for the formulation. A lot of variety of milk is utilized in classics but amongst them cow's and goat's milk are the most common. Milk is a colloidal suspension of casein micelles, globular proteins and lipoprotein particles. During the pharmaceutical procedures, the stability of casein micelle and solubility depends upon some of the physico-chemical factors like temperature, pH, salt content, hydrophobic interaction etc, and are ultimately responsible for their therapeutic efficacy of the products.

The detail description of Ksheerapaka is available since Samhita period and is also a commonly prescribed dosage form nowadays. In Charaka Samhita although various references are found described but there is variation in the ratio and form of the components utilized, which are described as ksheera or payah. Acharya Sushruta has termed the formulation as "Aushadha siddha dugdha and kseer" while in Ashtanga hridaya, as "Sanskrita Paya and ksheera". Acharya Vagbhata also suggested to prescribe it in Ushna (warm), Sheeta (self-cooling condition / cooling stage after heating) or Dharoshna (fresh milk) to the patients as per need. As per Ashtanga sangraha, kwatha of the medicinal drug is utilized in place of the water. The commentator Hemadri has also described the three varieties i.e. Apakva, pakva and atipakva

ksheera. After deep scanning of the classical texts, it seems that Acharyas might vary in their opinions in context of ratio of drug, milk and water utilized. In later period after tenth century Acharya Chakrapani Sharangdhar and Bhavprakash have described the same ratio of ingredients and method of preparation while Acharya Yadavji has its different view in describing ratio of ingredients [14, 15].

**Importance of Ksheerapaka**

- To Reduce Tikshnata of the drug
- To Improve efficacy
- To Improve Palatability
- To Improve Digestibility

**Materials and Methods**

**Collection, identification and authentication of plant part**

**Collection & Authentication of the drugs:** Authentication of the drugs from Darvya Guna Department, Faculty of Ayurveda, IMS, BHU, Varanasi.

In the present study the dry fruits of Gokshura were collected from Gola Dinanath market, Varanasi, and powered separately from Pharmacy, Faculty of Ayurveda IMS BHU in Pulverizer and then weighed again. (Table 1)

**Packaging and labeling of drugs**

In the packaging and labeling of the drug, Amalaki powder and Gokshura powder were fill in 100gm plastic containers and label it sticker with important information i.e. name of the supplements, date of manufacturing etc.

In the present study Gokshura powder given to the subjects and describe them, How to take it with milk preparation respectively. (Anupana of health supplements)

**Preparation of Gokshura Ksheerapaka**

Different methodology and ratio of ingredients are found, inspecting Ayurvedic classics, out of which some common methods of preparation of the Ksheerapaka are summarized here: One part of drug is boiled in eight parts of milk with addition to thirty two parts of water. The boiling is continued till the added water gets evaporated and the original quantity

of milk is left. (1:8:32) The dry drug is mixed after making it into coarse powder form and the green drugs. Ksheerapaka has to be prepared on Mandagni (low temperature) so that sensitive active principle may not get spoiled with high temperature. Usually for the preparation of this formulation, the drugs which are having Amla and Lavana rasa should not take because it leads to spoiling in the milk [11, 12].

**Results**

Assessment of Nutritive Value and pH of Gokshura powder & Gokshura Ksheerapaka in the following table 2 & 3:

**Discussion**

Ksheerapaka is one of the best health promoter, effective and its contents maximum nutritive values for especially for the pregnant women. It is true that child birth is an extremely important event for women in their life and proper nutrients as well as good environment is the key factor for optimum growth and development of foetus during antenatal period. Ksheer-paka as ksheer means milk and paka means to boil in Sanskrit language. The advice of Gokshura with ghee during sixth month is a unique protocol which can help in preventing PIH and related conditions like pre-eclamptic toxemia and their complications. This drug is a diuretic and considered as the best choice in the disorder of urogenital system. Due to increasing requirements during pregnancy the importance of diet is also increased. And milk is considered as complete food with full of nutraceuticals, So that role of Gokshura ksheerapaka is very important for a pregnant women. Ayurveda places an enormous emphasis on the importance of caring for the mother before, during and after pregnancy. In this context advice of Gokshura with ghee and milk during pregnancy; by keeping this view an attempted has been made to prepare Gokshura Ksheerapaka. In the present study Gokshura Powder and Gokshura Ksheerapaka were analyzed and it was found that Gokshura Ksheerapaka has high nutritive value than Gokshura Powder.

**Photographs of Pharmaceutical study**



**Table 1: Powdering of drugs**

| Name of the drugs | Total weight | Total yield | Loss   |
|-------------------|--------------|-------------|--------|
| Gokshura fruit    | 15kg         | 14.10kg     | 0.90gm |

**Table 2:** Estimation of Nutritive value of Gokshura Powder & Gokshura Ksheerpaka

| S. No. | Nutritional Components        | Results         |                     | Methods of Analysis |
|--------|-------------------------------|-----------------|---------------------|---------------------|
|        |                               | Gokshura Powder | Gokshura-Ksheerpaka |                     |
| 1      | Carbohydrates (g/100g)        | 15.9            | 17.6                | AOAC 1980           |
| 2      | Protein (g/100g)              | 1.3             | 4.3                 | Kjeldahl Method     |
| 3      | Fat (g/100g)                  | 0.52            | 3.3                 | Soxhlet Method      |
| 4      | Total Energy(Kcal)            | 73.48           | 117.3               | AOAC 1980           |
| 5      | Vitamin C (mg/100g)           | 14.2            | 13.3                | DI Titration        |
| 6      | Total Flavonoids( $\mu$ g/ml) | 19.92           | 27.12               | AOAC 1980           |
| 7      | Calcium(ca)(mg/100g)          | 59              | 187                 | Titration Method    |

**Table 3:** Average pH of *Gokshura Ksheerpaka* along with its ingredients

| Test | Gokshura | Ksheer | Gokshura Ksheerpaka |
|------|----------|--------|---------------------|
| pH   | 5.2      | 6.5    | 5.7                 |

### Conclusion

Milk is widely used from ancient era as food and base of medicament. Expecting mother should be given milk, honey and ghee in all the three trimester. Milk is an ideal source of calcium since it contains both lactose, butter fat and moderate amount of protein and has got the anabolic property, So it gives strength to a woman, beside this it acts as laxative and alone is sufficient to cope with the constipative tendency of mother to be. Qualities of milk have been potentially used as a medicine by combining it with different herbs as in the case of ksheer paka. Modern and ancient, sciences both are focusing on food to enrich mother and foetus with healthy balanced diet. A detailed analysis at the various medicated milk formulations should be done on a molecular level with regards to its absorption, assimilation duration and its bio availability. Role of every ksheerpaka should be studied in reference of its role in the various rogas mentioned.

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