Vamana, Virechana, Niruha Basti and Anuvasana Basti followed by Uttarabasthi\textsuperscript{64} which can be adopted for all types of \textit{šukra} Dosha including \textit{šukra} Kshaya.

The \textit{šukra} Dosha can be treated with proper diet of Madhura and Tikta Rasa, proper Vyavaya and Vyayama, timely elimination of Dosha in proper quantity\textsuperscript{65}.

Coming to the Vishesha Chikitsa of Ksheena \textit{šukra}, after Panchakarma procedures (Snehana, Vamana, Virechana and Basti) the Shamanoushadhi are to be administered. Basti is considered as the main line of treatment in Ksheena \textit{šukra} (Ksheena \textit{šukrasya chativa snehabastir balapradah)\textsuperscript{66}}.

The principle treatment in any Dhatu Kshaya is to administer the Dravya, which are having the same qualities of that Dhatu Eg. Mamsa in Mamsakshaya, \textit{šukra in šukrakshaya}\textsuperscript{67}. In \textit{šukra} Kshaya, Nakra Retah is admissible\textsuperscript{68}. In Sushruta Samhita Vajikara Dravyas are particularly recommended for \textit{šukra} Kshaya in Ksheena Baleeya chapter some of them are Vajikara Utharika, Amalaka Yoga, MashaYoga, Swayamguptadi Yoga\textsuperscript{69}.

Dravya having the properties of Madhura, Sheeta, Sniqgda, Picchila such as Kshira, Ghrita, Mushali etc. are very good \textit{šukra} Dravya. Charaka has mentioned \textit{šukrajana} Gana, 10 Dravya namely Mashaparni, Meda, Shatavari, Kulinda etc\textsuperscript{70}.

\textbf{Uttara Basti:} Administration of medicine through urethra of males has been emphasized in the disorders of \textit{šukra}. Various \textit{šukra} Shodhana as well as \textit{šukra} Pravartaka drugs bring about the desired therapeutic effect and helps in palliating the Apana Vata.

\section*{CHAPTER 6}
\section*{DRUG REVIEW}

\textbf{GHrita}

\begin{tabular}{lll}
\textbf{Vernacular name} & \textbf{Assamese} & \textbf{Bengali} & \textbf{Hindi} & \textbf{English} \\
\hline
\textbf{Assamese} & Ghee & Ghee & Ghee & Ghrita \\
\textbf{Bengali} & Ghee, Ghrit & Ghee & Ghee & Clarified butter \\
\end{tabular}
Synonyms

<table>
<thead>
<tr>
<th>Sanskrit synonyms</th>
<th>DHN</th>
<th>BPN</th>
<th>RJN</th>
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<tr>
<td>1. Aajya</td>
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<tr>
<td>2. Havi</td>
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<tr>
<td>3. Sarpi</td>
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<tr>
<td>4. Pavitra</td>
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<tr>
<td>5. Navanitaj</td>
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<tr>
<td>6. Amrit</td>
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<td>+</td>
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<td>7. Abhidhaar</td>
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<td>+</td>
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<td>8. Jivaniya</td>
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<tr>
<td>9. Ghrit</td>
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<td>10. Homya</td>
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<td>-</td>
<td>+</td>
</tr>
<tr>
<td>11. Aayushya</td>
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<td>-</td>
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<tr>
<td>12. Taijasa</td>
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</table>

Fig. 6.1 Go-Ghrit (Cow’s Ghee)

Description

Clarified milk fat or butter fat is known as ghrita (ghee). It is obtained from the class mammalian of the animal kingdom (jangama) especially cow, she-buffalo, goat, sheep, she camel and mare. Out of these except the last two, the rest are the main sources of milk and milk products in the areas of their habitat. Though the ghee of these animals possess many common features, Ayurveda discriminates their particular features also and recommends the Go-ghrita (cow’s-ghee) as best and the ghrita of choice for both, food and medicinal purposes. So that in the Ayurvedic classics and tradition, if not specified, the epithet ghrita always applied to Go-ghrita (cow’s-ghee).

Ghee is prepared by heating butter or cream to just over 100°C to remove water content by evaporation. The residue is filtered out as pure ghee. The colour of ghee is yellow to white depending upon the carotene content. During preparation of ghee, protein casein is removed. Animal studies have shown that casein elevates cholesterol. Ghee resists spoilage by micro organisms or chemical action. It contains more oxygen than other oils.

The melting point of ghee is 33 to 37°C which is less than the normal human temperature of the body. Its digestibility coefficient or rate of absorption is 96%, which is highest of all oils and fats.
Ghee is best among all snehanas used internally. Digestion, absorption and delivery to a target organ system are crucial in obtaining the maximum benefit from any formulation. This is facilitated by ghee. Since active ingredients are mixed with ghee, they are easily digested and absorbed. Lipophilic action of ghee facilitates transportation to a target organ and final delivery, inside the cell, because cell membrane also contains lipid. This lipophilic nature of ghee facilitates entry of the formulation into the cell and its delivery to the mitochondria, microsome and nuclear membrane. It has been found by sophisticated research that when herbs are mixed with ghee their activity and utility is potentiated many times.

Ghrita is again subdivided into various types depending on the conditioning and time of storage.

1. **Ksheeraghrita**: Ghrita prepared by heating cream which is extracted directly from milk is called ksheeraghrita.
2. **Haiyangaveen**: Cream extracted directly from milk is called haiyangaveen.
3. **Sadyoghrita**: Ghrita which is immediately obtained by heating butter is called sadyoghrita.
4. **Ghrita**: The same sadyoghrita, when solidifies, is called ghrita.
5. **Ajya**: Ghrita, when melted by mild heating, is called ajya.
6. **Ghritamanda**: The upper layer of ghrita which remains in a melted state for year is called ghritamanda.
7. **Puran-Ghrita**: 1 to 10 years old ghrita is called puran-ghrita.
8. **Kumbha-Ghrita**: 11 to 100 years old ghrita is called kumbha-ghrita or Kumbha-sarpi.
9. **Maha-Ghrita**: More than 100 years old ghrita is called maha-ghrita or maha-sarpi.

**Test for Identification of Ghrita**

Ghee may be adulterated by the addition of insoluble, non volatile fatty acids. This can be tested by finding out the Polanski number. It is defined as the number of milliliters of 0.1n KOH required to neutralize the insoluble fatty acids, not volatile with steam distillation obtained from 5 g of fat. The Polanski number is usually negligible or very low in pure ghee.
**Properties of Go-ghrita**

**Ras**: Madhur [C.S. - Madhur];

**Guna**: Guru, Snigdha [BPN- Guru]

**Virya**: Sheeta [DHN, BPN, S.S. & C.S- Sheeta]

**Vipak**: Madhur [DHN, RJN, S.S. & C.S-Madhur, BPN-Swadu]

**Karma (Action)**

<table>
<thead>
<tr>
<th>Book, s name</th>
<th>Karma</th>
<th>Dosha Karma</th>
<th>Dhatu Karma</th>
<th>Rogaharatwa</th>
</tr>
</thead>
</table>
| **DHN**      | * Smriti vardhak  
* Agnidipak  
* Balavardhak  
* Ayushya  
* Chakshushya  
* Santanjanak  
* Kantidayak  
* Bisahaha | *Vata-pitta upaham | * Sukrajanak | * Kshatakshin  
* Parisarpa  
* Sastraghat  
* Dagdha |
| **BPN**      | * Medhya  
* Agnikrit  
* Balya  
* Ayushya  
* Chakshuchya  
* Vrshyam  
* Tejvarthak  
* Rakshogna  
* Vayasthapan | *Vata-pitta-kapha upaham | * Ojahvridhikar | * Visarpa  
* Unmad  
* Shool  
* Jwar  
* Anah  
* Kshaya  
* Udavarta |
| **RJN**      | * Smriti dayak  
* Medhaprada  
* Agnibardhak  
* Balakaram  
* Vrshyam  
* Kantidayak  
* Dhidayak  
* Pustikrit  
* Hridya  
* Sramaupasaman | * Vata-sleshmahara  
* Pitta upaham | * Sukra vivardham  
* Ojah vivardham  
* Medavi vardham  
* Unmad  
* Jwar  
* Sosha |
| **C.S.**     | * Smriti vivarhdham  
* Buddhivivarhdham  
* Agnivivarhdham  
* Bisopaham | *Vata-pitta upaham  
*Kapha vivardhanam | * Sukra vivardham  
* Ojah vivardham  
* Medavi vardham  
* Unmad  
* Jwar  
* Sosha |
| **S.S.**     | * Samriti vardhak  
* Vata-pitta upaham | * Vata-pitta upaham  
* Ojah vardhak  
* Unmad | | |
## Pharmacology

### Composition of Cow’s Milk Ghee\textsuperscript{146}

<table>
<thead>
<tr>
<th>Constituents</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Triglycerides</td>
<td>97-98%</td>
</tr>
<tr>
<td>Diglycerides</td>
<td>0.25-0.4%</td>
</tr>
<tr>
<td>Monoglycerides</td>
<td>0.016-0.038%</td>
</tr>
<tr>
<td>Ketoacid Glyceride</td>
<td>0.015-0.018%</td>
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<tr>
<td>Glycerylesters</td>
<td>0.011-0.015%</td>
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</table>

### Composition of Cow’s Milk Ghee Glycerides\textsuperscript{146}

<table>
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<th>Fatty Acids</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Butyric acid</td>
<td>4.5-6%</td>
</tr>
<tr>
<td>Caproic acid</td>
<td>1-1.36%</td>
</tr>
<tr>
<td>Caprylic acid</td>
<td>0.9-1%</td>
</tr>
<tr>
<td>Capric acid</td>
<td>1.5-1.8%</td>
</tr>
<tr>
<td>Lauric acid</td>
<td>6-7%</td>
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</table>

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### Composition of Ghee residue obtained from Indian cow

<p>| | | |</p>
<table>
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</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>14.4%</td>
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</tr>
<tr>
<td>Fat</td>
<td>32.4%</td>
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</tr>
<tr>
<td>Protein</td>
<td>36.0%</td>
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<tr>
<td>Lactose</td>
<td>12.0%</td>
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<tr>
<td>Ash</td>
<td>5.2%</td>
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Ghee contains vitamin A, D, E and K. Vitamin A and E are anti-oxidant and are helpful in preventing oxidative injury to the body. No other edible fat or oil contains vitamin-A except fish oil. It is estimated that 80% to 90% of degenerative disease are related to excessive production of free radicals of re-active oxygen species. When free radicals are in excess, they try to latch on to whatever is available in their surrounding area, and this is how the lipids in the blood and cell membranes are oxidized. The oxidized lipids or the lipid peroxides are injurious to the system and they are triggering the process of atherosclerosis. The reactive oxygen species also cause damage to the DNA in the cells. Excessive free radicals have been associated with inflammatory diseases like lupus, diabetes mellitus, ageing, atherosclerosis, cancer, skin pigmentation, wrinkling and skin tumors in sun-exposed areas. The effectiveness of many ghee contains compounds is due to potent anti-oxidant properties of removing of scavenging free radicals. Vitamin-A keeps epithelial tissue of the body intact, keeps the outer lining of the eyeball moist and prevents blindness. Ghee also contains 4 – 5% linoleic acid, an essential fatty acid, which promotes growth of human body.

The property of drugs are potentiated by ghee which creates good medium for absorption, transport and delivery of the Ayurvedic formulation to the proper area of the body. Apart from being preservative aspect, ghee when treated or impregnated with other drugs without losing its own characters.
According to Russian Scientist Sirovish, cow's ghee has immense power to protect human body from the ill effect of radioactive waves.¹⁴⁶

10gms of cow’s ghee used in fire sacrifice produces one ton of oxygen. When cow’s ghee is burned with rice it produces Etholine oxide, propylene oxide and formaldehyde. Etholine oxide and formaldehyde give immunity against bacteria which are used in operation theatre. Propylene oxide induces rain. Therefore, sacrifice done cow ghee purifies atmosphere and induces rain.¹²⁸

In Ancient India, wells were made, full of ghee, that were saved for times of war, especially for those who suffered wounds when a surgeon cuts open a body; he only does so knowing that the body will be able to heal itself. The surgeon cannot do this. Ghee is known for the quality of Ropana (healing) and its effectiveness in facilitating recovery from wounds is legendary.¹⁴⁶

The other uses of ghee are –

1. It is used for abhyanga (body massage). Apply ghee all over the body, rubbing into head, chest, limbs, joints and orifices. This will bypass the digestive system and allow the qualities of ghee to penetrate directly into the deeper tissues. Western science has discovered that massaging the skin creates endorphins or peptides, which enhance the body’s immune system. Peptides are thought to be the vehicle that the mind and body use to communicate with each other, a literal chemistry of emotion. According to the Charak Samhita, regular abhyanga slows the ageing process.

2. Ghee is used in Purvakarma (early panchakarma), where a small amount of Ghee is taken first thing in the morning by the practitioner to oleate the internal organs and ‘dissolve’ the ama or toxic wastes in the tissues, allowing them to be carried to the digestive tract for elimination.

3. One or two teaspoons first thing in the morning followed immediately with hot water will promptly produce a bowel movement. It will also warm the body quickly. Two spoonfuls of Ghee in warm (non-homogenized) milk before bedtime is soothing to the nerves and lubricate the intestines and facilitates bowel movement in the morning.
4. Ghee is excellent for cooking and sauteing or stir-frying. Ghee has one of the highest flash points of all oils and is very difficult to burn. In India, it is said that food is incomplete without the use of Ghee.

5. Ghee is excellent for a gargle-gandush, to improve the health of the teeth and gums.

6. Ghee can be used as bath oil. Take two tablespoons of ghee and mix with several drops of an essential oil of own choice.

7. Ghee is excellent for scrapes and both chemical and heat or fire burns. Ghee can be used in the eyes for tiredness or fatigue.

8. Ghee is an exquisite facial moisturizer.

9. In India it is said that if a few drops of ghee are placed in the nostrils then nosebleed can be checked. If this is done twice in a day, then headache can be relieved.

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**SATAVARI**

**Botanical Name:** Asparagus racemosus Willd

**Family:** Liliaceae

**Gana:** Balya, Vayasthapan, Madhurskandha, Vamak, Sukrajanan

(C.S:Su:4/10,12,18; C.S:Vi:8/135,139)

Vidarigandhadi, Varunadi, Kantak panchamoola, Vata-
samshaman, Pitta samshaman (S.S:Su:38/4,8,74; 39/7,8)

**Vernacular Name**

<table>
<thead>
<tr>
<th>Vernacular</th>
<th>Assamese</th>
<th>Hindi</th>
<th>Bengali</th>
<th>English</th>
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<tbody>
<tr>
<td>Assamese</td>
<td>Shatamul</td>
<td>Sataavar, Satamuli</td>
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<tr>
<td>Bengali</td>
<td>Satamuli</td>
<td></td>
<td></td>
<td>WildAsparagus</td>
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![Fig. 6.2 Satavari (Asparagus racemosus Willd)](image)

**Synonyms**

<table>
<thead>
<tr>
<th>Sanskrit synonyms</th>
<th>DHN</th>
<th>MPN</th>
<th>BPN</th>
<th>RJN</th>
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*Fig. 6.2 Satavari (Asparagus racemosus Willd)*
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**Morphology**

A Clinical Study on *Vrishya Satavari Ghrit* in the management of Oligospermia  Page 77
**Description:** A tuberous climber with straight or hooked spines. The entire plant has a feathery appearance. The tubers are white, radish shaped and found in clusters. The tubers are bitter in taste, and have central wiry pith. The stem is woody, dark green. The branches are modified into leafy structure called cladodes. The entire plant has feathery appearance. The flowers are fragrant, small and white and arranged in cluster. The fruits are fleshy, red berries, which looks like small cherries. The berries have three to six seeds.

**Habitat:** Climber is found commonly growing in the dry thorny and deciduous forests.

**Distribution**

**India:** Throughout tropical and sub-tropical regions. It is seen in Andamans also. In Himalayan region it occurs up to an altitude of 1500m. In the Himalayan region it is found in Jammu and Kashmir of North West Himalayas to Sikkim of Eastward Himalayas. It is cultivated as an ornamental also.

**Global:** Paleotropics in distribution occurs in Tropical Africa through South Asia to China, South Malesia and North Australia.

**Varieties**

There is another large variety of this creeper called mahasatavari or sahasramooli or sahasraveerya (Asparagus armentosa). The roots of this variety are longer and more spread out. Another thornless variety is found in the Himalayas at the height of 8-9 thousand meters and is known as Asparagus filicims (threads like).

**Properties**

**Ras:** Madhur, tikta [Tikta, svadu-DHN, BPN; svadu-MPN; madhura, tikta-RJN]

**Guna:** Guru, snigdha [Guru, snigdha-MPN, BPN]

**Veerya:** Sheeta [Hima-DHN, RJN; sita-MPN, BPN]

**Vipak:** Madhura

**Karma (Action)**

<table>
<thead>
<tr>
<th>Book,s name</th>
<th>Karma</th>
<th>Dosha-Karma</th>
<th>Dhatu-karma</th>
<th>Roga haratwa</th>
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<tr>
<td>DHN&quot;**&quot;</td>
<td>* Rasayana</td>
<td>* Vata-pitta hara</td>
<td>* Asrajit</td>
<td>* Kshaya</td>
</tr>
<tr>
<td></td>
<td>* Vrisya</td>
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<tr>
<td>MPN&quot;**&quot;</td>
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<td>* Vata-pitta hara</td>
<td>* Asrajit</td>
<td>* Stanyakara</td>
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<td></td>
<td>* Vrisya</td>
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<td>* Sopha</td>
<td></td>
</tr>
</tbody>
</table>

A Clinical Study on *Vrishya Satavari Ghrit* in the management of Oligospermia  Page 78
| BPN<sup>87</sup> | * Rasayana  
* Pustikara  
* Balya  
* Medhya  
* Agnikara  
* Netrya | * Vata-pitta hara | * Asrajit  
* Stanyakara  
* Sukrakara  
* Atisaara  
* Gulma  
* Sotha |
|---|---|---|---|
| RJN<sup>90</sup> | * Rasayana  
* Vrisya | * Pitta-kapha-vata hara | |
| C.S. | * Vata-pitta hara  
(C.S.: Su: 27/107) | | |
| S.S. | * Vrisya  
(S.S.:Su:46/302) | * Vata-pitta hara  
(S.S.: Su: 46/302) | * Timir rog  
* Karsha roga  
* Rakt-pitta  
* Sotha  
* Prameha  
* Sukradosha  
(S.S.: U:17/48;  
S.S.: Su: 15/40) |
| A.S. | * Vrisya  
* Chaksuchya  
(A.S.: Su: 14/11;  
16/15; 71/127) | * Shool  
* Gulma  
* Adhray vat  
* Vidradhi  
(A.S.:Su: 18/20) |
| A.H.<sup>96</sup> | * Vrishya  
* Chaksuchya  

**Parts Used:** Tuber

**Pharmacology**

**Chemical constituents:** Shatabarin I to IV; Diosgenin; Saponins, Glycosides, Flavones,<sup>125</sup> Carbohydrates (53%) inclusive of mucilage, poly fructosans, free sugar and insoluble poly saccharides as well as proteins (3%).<sup>136</sup> Tuber- In fresh tuber, water soluble ingredient is 52.5%, fibre 33.3% and water 9%. Water soluble ingredient contains sugar 7% and some mucilaginous principle.<sup>137</sup> Glycoside–AR–4(C<sub>46</sub>H<sub>74</sub>O<sub>16</sub>), Benzaldehyde–dihydrox, Daucosterol,<sup>126</sup> B-sitosterol,<sup>136</sup> Rutin.<sup>126</sup> Flower- Volatile oil, rutin, hyperoside and quercetin.<sup>126</sup> Fruit- Quercetin, rutin and hyperoside along with cyaniding
glycosides. A polycyclic alkaloid, asparagines-A is reported from plant of Thailand. Leaf: Sarsapogenin.

Abortifacient: Saponin A₄ in 20-500µg/ml blocked oxytocin induced contraction of rat, Guinea pig and rabbit uteri in vitro and in situ and also blocked uterine motility. Root– Alcoholic extract has antioxytocic activity.

Anti viral: Root – Alcoholic extract was antiviral Vs Ranikhet disease virus.

Analgesic: Hot water extract of dried root in the dose of 1g/Kg in mice by gastric intubation which has shown the effect as analgesic.


Respiratory: Root – Glycoside fraction at high dose of 15mg/kg in cat showed depression in respiration. Alcoholic extract showed partial effect on bronchial musculature in Guineapigs and had no action on histamine induced bronchospasm.

Immunomodulation: Root is immunostimulant in mice at 100mg/kg. Compounds showed immunomodulating activity Vs Mycos suppression induced by cyclophosphamidine in mice when given oral for 15 days. It prevented leucopenia and acted as immunostimulant.

Anti-ulcer: Dried root – hot water extract at 1.5g/L effective in rates by gastric intubation.

Anti-tumor: Aerial parts– 50% alcoholic extract anti cancerous in human epidermal carcinoma of the nasopharynx in tissue culture. Root – Chloroform: MeOH extract at 0.25% in rat diet active Vs Chemical induced tumors; hot water extract – anti leukopenic in mice at 100mg/kg intragastric.


Anti-hypercholesterol: Plant – 50% alcoholic extract – Hypolipemic in rats at 50mg/kg intragastrically.

Diuretic: Alcoholic extract showed mild diuretic effect in rats.
CNS: Dried root – Hot water extract – autonomic effects in mouse at 200mg/kg by gastric intubation, spontaneous activity decrease in mice at 500mg/kg.\textsuperscript{126}

Hypoglycemic: Alcoholic extract showed mild hypoglycemic effect in rabbits given oral or i/v.\textsuperscript{129}

Cardiovascular: Alcoholic extract (water soluble fraction) at 10-20mg increased force and rate of contraction in frog heart and at 40mg caused cardiac arrest.\textsuperscript{128,129} Glycosidal fraction at 0.5mg produced bradycardia, reduced force of contraction and at 1-5 mg transient cardiac arrest; 15mg/kg in cat was hypotensive, increased bleeding time.\textsuperscript{128} Aerial part – 50% alcoholic extract – cardiotonic on Guinea pig heart by perfusion.\textsuperscript{126} Extract showed dilatory and congestive effect on mesenteric capillaries of mice.\textsuperscript{129} Root – Extract increased bleeding time in rabbits.\textsuperscript{129}

Estrogenic: Root – alcoholic extract increased weight of mammary glands in postpartum and estrogen primed rats and uterine weight in estrogen primed rats. It increased weight of mammary lobulo alveolar tissue and milk yield due to released cortico steroids or increase in prolactin. Leaf – Estrogenic in rats by gastric intubation. Saponin fraction showed antioxytocic and anti ADH activity.\textsuperscript{135}

Hypotensive: Root extract is hypotensive.\textsuperscript{133} Alcoholic extract at 15mg/kg caused sharp fall of B.P. blocked by atropine and partially by anti histamine indicating cholinergic like effects.

Gastrointestinal: Alcoholic extract showed encouraging result in intestinal amoebiasis in rats.\textsuperscript{129}

Smooth Muscle Relaxant: Aerial part – 50% alcoholic extract – antispasmodic on Guinea pig ileum; saponin fraction has uterine relaxation on Guinea pig, rat and rabbit at 0.1mg/ml and intra arterial relaxation in rats at 2mg/animal. Shatarvarin at 20 to 500\(\mu\)g/ml produced specific blockade of oxytocin induced contraction of rat, Guinea-pig and rabbit uteri in vitro and in situ. It blocks uterine spontaneous motility.\textsuperscript{134}

Spasmolytic: Aerial part – 50% alcoholic extract – Antispasmodic on Guinea-pig ileum.\textsuperscript{126}
Toxicity: Aerial parts produced carcinoma of pharynx in animals. In clinical doses no adverse effects are seen. Bark is reported as toxic.

Formulation

Charak Samhita: Anu toil, Aamalak ghrit, Bringhani gutika, Satavari ghrit (Vrishya), Amrit ghrit etc.

Susrut Samhita: Tripaladi ghrit, Patoladi ghrit, Balaghrit, Mahatiktak ghrit, Bala toil, Satavari ghrit etc.

Astanga Samgraha: Rasna ghrit, Satavari ghrit, Sukumar ghrit, Mahatiktak ghrit, Amritadya toil, Phala ghrit etc.

Astanga Hridaya: Sukumar toil, Bala toil, Satavaryadi ghrit etc.

Sarangadhar Samhita: Maharasnadi kwath, Varunadi kwath, Satavaryadi churna, Kamdev ghrit, Narayan toil, Baladi toil, Satavari toil, Madankamdev ras.
Milk is obtained from the class mammalia of the animal kingdom (jangama) especially cow, she-buffalo, goat, sheep, she-cammel and mare. Out of these the first four are the main sources of milk in the areas of their habitat. Milk is included in the jeevaneeya varga which is of eight types as described by Charakacharya.

The eight types of milk are those obtained from sheep, goat, cow, buffalo, camel, elephant, horse and human. Even though the properties and actions of all these are generally same, yet, each one has its own specific properties. Ayurveda recommends the Go-dugdha (cow’s milk) as best and the milk of choice for both, food and medicinal purposes. So that in the Ayurvedic classics and tradition if not specific, the epithet milk always applies to cow’s milk. Indra, the lord of heaven, has said cow’s milk as nectar. So, one gift of cow makes a gift of nectar only.

If milk is consumed without heating it is heavy and causes excessive viscosity in the body. But if it is heated at lower temperature for a longer
period then its properties are altered and do not cause viscosity. But again, if it is heated strongly, it becomes heavy to digest. Fresh milk is extremely good for health. In fact, proper care about the cleanliness has to be taken.

No substance is absolutely useful or absolutely harmful. This point of view is supported by the universally accepted principle that ‘No two individuals are identical’. The beneficial or harmful effects of all dravyas differ from person to person. Milk may not suit a particular person but if it is necessary for him, then not only milk but any other dravya can be given after proper conditioning.

In the west as well as in the far eastern countries, only cold milk is used. Pregnant women are rightly advised large quantity of milk for their nutrition as well as well-being of the foetus.

Milk is pasteurized either at 63°C for 30 minutes, or at 72°C for 15 secs or at 150°C for half a second. These treatments destroy both harmless and pathogenic bacteria, but not baterial spores which can again multiply after some storage and the deadly toxin ‘aflatoxin M₁’. During the milk pasteurization, several vitamins are hardly affected. These are – Vitamin A, Vitamin D, Vitamin B₆, riboflavin and niacin. Losses of thiamin, Vitamin B₁₂ and ascorbic acid during pasteurization are about 10% each.

Properties

Ras: Madhur [Svadu-RJN, C.S., A.S., A.H.; Madhur-BPN, S.S., DHN]
Vipak: Madhur [Madhur-BPN, S.S., DHN; Svadu-A.S, A.H.]

Karma (Action)

<table>
<thead>
<tr>
<th>Book,s name</th>
<th>Karma</th>
<th>Dosha-Karma</th>
<th>Dhatu-karma</th>
<th>Rogaharatwa</th>
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A Clinical Study on Vrishya Satavari Ghrit in the management of Oligospermia  Page 84
<table>
<thead>
<tr>
<th>DHN^105</th>
<th>* Jivaniyam</th>
<th>* Balyam</th>
<th>* Medhyam</th>
<th>* Pungsatwakarak</th>
<th>* Ayushya</th>
<th>* Rasayanam</th>
<th>* Vata-pittagha</th>
<th>* Rakta-pitta</th>
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<tr>
<td>RJN^106</td>
<td>* Medha bardhak</td>
<td>* Pathyam</td>
<td>* Ruchikar</td>
<td>* Kanti bardhak</td>
<td>* Praga pusti</td>
<td>* Buddhi bardhak</td>
<td>* Angapusti</td>
<td>* Pitta-vataghnam</td>
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<td>A.S.^102</td>
<td>* Jibaniyam</td>
<td>* Vata-pitta</td>
<td>* Rasa, Rakta etc.</td>
<td>* Jirnajwar</td>
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Composition of Cow’s \(^{138,139}\) (comparative study) \(^{140}\)

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<tr>
<th>Composition</th>
<th>Quantity</th>
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<tr>
<td>Water</td>
<td>87.5%</td>
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<tr>
<td>Fat</td>
<td>4.1%</td>
</tr>
<tr>
<td>Protein</td>
<td>3.2%</td>
</tr>
<tr>
<td>Lactose</td>
<td>4.4%</td>
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<tr>
<td>Vitamins (in 100g)</td>
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</tr>
<tr>
<td>Retinol</td>
<td>60µg</td>
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<tr>
<td>Thiamin</td>
<td>50µg</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>190µg</td>
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<tr>
<td>Niacin</td>
<td>100µg</td>
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<td>Minerals (in 100g)</td>
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</tr>
<tr>
<td>Total</td>
<td>800mg</td>
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<tr>
<td>Calcium</td>
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<td>Phosphors</td>
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Nutritive value of different milk

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<th>Cow</th>
<th>Goat</th>
<th>Human</th>
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<tr>
<td>Fat(g)</td>
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<td>4.1</td>
<td>4.5</td>
<td>3.4</td>
</tr>
<tr>
<td>Protein(g)</td>
<td>4.3</td>
<td>3.2</td>
<td>3.3</td>
<td>1.1</td>
</tr>
<tr>
<td>Lactose(g)</td>
<td>5.1</td>
<td>4.4</td>
<td>4.6</td>
<td>7.4</td>
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<tr>
<td>Calcium(mg)</td>
<td>210</td>
<td>120</td>
<td>170</td>
<td>28</td>
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<tr>
<td>Iron(mg)</td>
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<td>0.2</td>
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</tr>
<tr>
<td>VitaminC(mg)</td>
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<td>2</td>
<td>1</td>
<td>3</td>
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<tr>
<td>Minerals(g)</td>
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<td>0.8</td>
<td>0.8</td>
<td>0.1</td>
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<tr>
<td>Water(g)</td>
<td>81</td>
<td>87</td>
<td>86.8</td>
<td>88</td>
</tr>
<tr>
<td>Energy(K.cal)</td>
<td>117</td>
<td>67</td>
<td>72</td>
<td>65</td>
</tr>
</tbody>
</table>

Uses

Milk is extremely important in chronic fever but not in acute fever. It is useful in burning sensation, especially in inflammatory condition and act as a purgative in constipation. Similarly it is useful in reproductive system and in seminal disorder. It’s act as a diuretic on the urinary system. From the point of view of doshas, it is vata-pitta samak.

It can be used as nasya (nasal administration), for topical application, for avagah, as an emetic, for asthapanvasti, as a purgative and for various procedures like snehan etc.

People who experience excessive chest congestion with expectoration during night time should be given hot milk with turmeric or jaggery before bed.
time. This stops production of kapha in the body. These conditionings of milk are very useful.

In the west as well as in the far eastern countries, only cold milk is used. Pregnant women are rightly advised large quantity of milk for their nutrition as well as well-being of the foetus.

Even though milk is similar to all the dhatus of the body, it produces sukra immediately. As a result, it increases oja. If milk is taken internally in the morning, it acts as vrishya and agnivardhak. If milk is taken in the afternoon produces kapha, increases strength and relieves dysuria. If milk is taken at night cures many ailments on the basis of different age group. As for example, i) in childhood, milk increases agni, ii) in youth, milk increases strength, iii) in old age, milk increases veerya.

Cow’s milk should be consumed in the morning whereas buffalo’s milk in the evening. Even though milk is extremely beneficial, it is not compatible with salt, food items made from flour, blackgram, moong, rhizomes etc.

Parpati kalpa can be given to a patient, depending on the disease, prakriti and condition of patient and than milk can be taken in any amount to produce the effect of rasayana. In ascities a diet consisting of only milk is advised for six months. In jwara, when the doshas are pakva and are aggravated, virechan (purgation) is indicated. But other dravyas cannot be given in fever. In such a situation, milk should be used as a purgative.

In diarrhoea, when there is ama along with abdominal spasm, milk boiled with mustard is indicated.
SHARKARA

Vernacular Name

Assamese : Cheni                           Hindi : Shakkar, Chini
Bengali : Chini                        English: Sugar

Synonyms: Sharkara, Minandi, Sweta, Matsyandi, Abhicchatra,
           Sikata, Sita, Gudodbhava.

Fig. 6.4 Sharkara (Sugar)

Description
Sugar is sucrose, a carbohydrate that occurs naturally in every fruit and
vegetable in the plant kingdom. It is major product of photosynthesis, the
process by which plants convert solar energy and atmospheric carbon dioxide
into stored food energy and oxygen. Sugar occurs in greatest quantities in
sugar cane and sugar beets. But there is no difference between the sugar
produced from sugar cane or sugar beets. Sugar cane is a giant grass that
thrives in a warm, moist climate, storing sugar in stalk. The sugar beet grows
best in temperate climate and stores as sugar in its yellow to white root. Sugar
from either source is produced by nature in the same fashion as all green
plants produce sugar- as a means of storing the sun’s energy.

White sugar is a pure carbohydrate (at least 99%) and contains trace
amounts of Na, K and Fe. Brown sugar contains higher amount of these
minerals, as well as Ca, P and 2.1% moisture. Like all carbohydrate, sugar
contains about 4 calories of food energy per gram. A teaspoon of granulated or brown sugar contains 15 calories, a typical restaurant packet about 110 calories per quarter-cup.

Ayurvedic Samhitas have mentioned various types of sugar cane viz. Poundrak, Bhiruk, Vangshak etc. which produces different types of gura, matsyandika, khanda and sharkara. Charaka has mentioned three types of sharkara on the basis of source.\(^{123}\)

1. **Gura sharkara**: Sugar produced from sugar cane juice is known as gura sharkara. It is good aphrodisiac.
2. **Yasa sharkara**: Sugar prepared by boiling the decoction of duralabha (*Fagonia cretica* Linn).
3. **Madhu sharkara**: Sugar deposited in the vessel containing honey is known as madhu sharkara.

**Properties**\(^{122,123,124}\)

- **Ras**: Madhur
- **Guna**: Sneigdha
- **Veerya**: Sheeta

**Action**\(^{122,123,124}\)

Sharkara is vrishya, vata samak and shrama hara. It acts on the disease of Rakta-pitta, Trishna, Chardi, Kshata-kshina, daaha, murcha, krimi etc. Besides its pleasant sweetness, sugar performs a host of less-obvious and important functions in cooking, baking, candy-making and the like.

1. **Flavour Enhancement**
2. **Soluble in water**
3. **Boiling Point Rise, Freezing Point Depression.**
4. **Hydrolysis (inversion)**
5. **Caramelization (thermal decomposition)**
6. **Browning (Maillard reactions)**
7. **Yeast Fermentation**
8. **Bodying/Bulking Agent**
9. **Texture Modification**
10. **Preservative**
11. **Dispersant**
12. **Whipping Aid**
13. **Humectant**
14. **Microwave Properties.**
Pippali

Botanical name: Piper longum Linn.
Family: Piperaceae

Vernacular Name

- Assamese: Pipeli
- Hindi: Pipal, Pipar
- Bengali: Pipul
- English: Long pepper

Gana: Kasahara\textsuperscript{44}, Hikkanigrahan\textsuperscript{45}, Shirovirechan\textsuperscript{46}, Vamak\textsuperscript{48}, Deepaneeya\textsuperscript{49}, Shoolaprasaman\textsuperscript{50}, Sheetaprasaman\textsuperscript{50}, Katuskandha\textsuperscript{51}, Asthapanopag\textsuperscript{52}(C.S.:Su:4/9,11,13,14,16,17; C.S.:Vi:8/135,142,151)
Pippalyadi, Shirovirechan (S).

![Fig. 6.5 Pippali (Piper longum Linn)](image)

Synonyms

<table>
<thead>
<tr>
<th>Sanskrit synonyms</th>
<th>DHN\textsuperscript{109}</th>
<th>MPN</th>
<th>BPN\textsuperscript{108}</th>
<th>RJN\textsuperscript{106}</th>
<th>C.S.</th>
<th>S.S.</th>
<th>A.S</th>
<th>A.H</th>
<th>Sa.S.</th>
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<tbody>
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<td>+</td>
<td>+</td>
<td>+</td>
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<td>2. Magadhi</td>
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<td>3. Krikara</td>
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<td>4. Capalaa</td>
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<td>5. Tiksnatandulaa</td>
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<td>6. Upakulyaa</td>
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<td>7. Kanaa</td>
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<td>8. Syamaa</td>
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<td>9. Kolaa</td>
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<td>10. Soundi</td>
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</tbody>
</table>
Morphology

**Description:** A perennial, climbing herb with slender branches. The roots are found clasping at nodes. The male and female plants are separate. The branches are erect, slender and sometime climbing. The leaves are simple, alternate, oval-heart shaped with round lobes at the base, and smooth. There are seven prominent ribs from the base of the leaves. The flowers are arranged in dense spikes. The male spikes are longer and slender. The female spikes are stout. The flowers are greenish-yellow and inconspicuous (small). The fruits are borne on female plant called berries. The single seeded berries are yellowish-orange when ripe. The fruit is pungent in taste.

**Habitat:** The herb is commonly seen in dry deciduous to semi evergreen forest, planted in home garden.

**Distribution**

**India:** Native to North East India occurs in the lower hills of Central to Eastern Himalayas as well as Western Ghats of Kerala and Tamil Nadu.

**Global:** Globally the species occurs in Indo-Malesian region and Sri Lanka.

**Varieties**

There are 4 varieties of piper longum.

1. **Pippali** – This is found in Indian places like Magadh, Videha etc.
2. **Gajapippali** – It is an ambiguous drug. Many people call Chavaka’s fruit as gajapippali. (चवाका: फले प्राचै कथिता गजपिप्पली)
3. **Saimhalee** – This variety is imported from Sri Lanka, Singapore and other foreign countries. (Jahaaji pippali is the synonym for it.)
4. **Vanpippali** – Grows in the jungles. It grows in abundance in Bengal. But it is small, slender, thin and less tikshna.

The pippali from Paanveli is available under the name of Paan pippali.

**Properties**

**Rasa** : Katu [Katu, Svadu-DHN; Katu-MPN, BPN; Katu, Tikta-RJN]

**Guna** : Laghu, Snigdha, Tikshna [Snigdha-DHN; Snigdha, Laghu-BPN]

**Veerya** : Anushna sheeta (not hot and not cool) [Hima-DHN; Ushna-ATI, MPN, RJN; Anushna-BPN]

**Vipak** : Madhur [Svadu-MPN, BPN]

When the fruits of pippali are wet and raw they are guru, sweet and sheeta veerya.

**Karma (Action)**

<table>
<thead>
<tr>
<th>Book, s name</th>
<th>Karma</th>
<th>Dosha-Karma</th>
<th>Dhatu-Karma</th>
<th>Rogaharatwa</th>
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</thead>
<tbody>
<tr>
<td><strong>DHN</strong>&lt;sup&gt;107&lt;/sup&gt;</td>
<td>* Ama hara  * Rasayani</td>
<td>* Tridosha hara</td>
<td>* Jwara  * Udara  * Jantu</td>
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<tr>
<td><strong>MPN</strong></td>
<td>* Dipani  * Vrisya  * Rasayani  * Recani</td>
<td>* Kapha-vata hara  * Pittala</td>
<td>* Vrisya</td>
<td>* Svasa  * Kasa  * Jwara  * Kustha  * Prameha  * Gulma  * Arsa  * Pliha  * Amavata</td>
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<td><strong>BPN</strong>&lt;sup&gt;106&lt;/sup&gt;</td>
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<td>* Vatakapha hara</td>
<td>* Vrisya</td>
<td>* Svasa  * Kasa  * Udara  * Kustha  * Prameha  * Gulma  * Pliha</td>
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<tr>
<td><strong>RJN</strong>&lt;sup&gt;106&lt;/sup&gt;</td>
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<td>* Vataslesma hara</td>
<td>* Vrisya</td>
<td>* Jwara  * Svasa  * Kasa  * Kshaya</td>
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<td>* Vrisya</td>
<td>* Kapha-vata hara</td>
<td>* Vrisya</td>
<td></td>
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</tbody>
</table>

**Parts Used:** Fruits.

**Pharmacology**
**Chemical constituents:** Piperine, Piplartine.\(^{133}\) **Roots**- Piperolactam A, B and piperadine,\(^{142}\) Aristolactam A–II.\(^{126}\) **Fruit**- Eicosadienamide, Eicosatrienamide, Guineensine, Longamide Octadecadiene, Piperlongine, Piperlongumine, Pellitorine, Piper Piperidine alkaloid-1, Pipercide, Piperundecalidine (alkaloid).\(^{126}\) **Essential oil**- Carveol, Cymene, Terpinolena, Thujene, Zingiberene.\(^{126}\) **Root**- Cepharadione A, B, Piperadione, Piperlongine, Piperlongumine (alkaloid).\(^{126}\) **Steam**- Piperaltrine.\(^{126}\) **Seed**- Sylvatine (alkaloid)\(^{126}\)

**Abortifacient:** Root – Gastric intubation in rats at 100mg/kg is active abortifacient.\(^{126}\)

**Anti bacterial:** Alcoholic extract has weak activity Vs E. coli.\(^{126}\) **Fruit** – Alcoholic extract of fruit is active Vs M. pyogens and E. coli.\(^{144}\) **Leaf** – water extract of leaf is also active Vs M. Pyogens and E. coli.\(^{144}\) **Essential oil** – Essential oil was active Vs B. cereus, B. subtilis, M. tuberculosis, Staph. albus, Staph. aureus, Sar. lutea, B. shigella dysentriae, E. coli, Sh. boydi, Sal. typhi, V. cholerae, Sh. nigher and Sal. paratyphi.\(^{145}\)

**Analgesic:** Analgesic in mice Vs Tail clip and writhing syndrome.\(^{127}\) **Unrippeded fruit** – Alcoholic extract at 125 mg/kg i/p in mice active as analgesic.\(^{126}\) Piperine had no antagonising action against morphine induced analgesia in rats and can be used as analeptic.\(^{145}\)

**Anti-pyretic:** Piperine – Antipyretic in typhoid vaccinated rabbits\(^{127}\) and also showed mild antipyretic activity.\(^{145}\) Antimalarial – Piperine given at 5-10mg/kg. oral for 5 days exhibited 50-60% antimalarial activity in mice infected with PL. berghei.\(^{129}\)

**Toxicity:** Standard doses are tolerated. Powder boiled in milk and water given oral to ratsin a dose of 1g/kg had no mortality. Acute toxicity with piperine, piperlongumine and piperlonguminine in mice given oral showed LD 5056.2; 110.1; 115.3 respectively.\(^{132}\) Piperine – LD 50 in mice was 750-800mg/kg oral.\(^{129}\) Piperlongumine and piperine were well tolerated by Guinea-pigs upto 2000 and 850mg/kg respectively. Ether extract was toxic at a dose of 1200 mg/kg in Guinea-pigs.\(^{145}\)
**Anthelmintic:** Essential oil – at 0.002% active Vs A. lumbricoides.\(^{108}\) Oil – showed significant paralytic action on nerve muscle preparation of A. lumbricoides.\(^{132,145}\)

**Respiratory:** Milk extract – Effective against antigen induced bronchospasm,\(^{142}\) crude extracts containing alkaloids suppress cough reflex.\(^{143}\) Anti allergic activity – Fruit effectively reduced passive cutaneous anaphylaxis in rats and protected Guinea-pigs against antigen induced bronchospasm 30% protection of mast cells was seen in vitro.\(^{132}\) Piperine increased respiratory rate and antagonized morphine and pentobarbitone induced respiratory depression in dogs. It might be useful in narcotic and sedative poisoning in humans. Plant extracts (Pet. ether extract) in small doses stimulated respiration in cardio-respiratory centre and antagonised morphine or pentobarbitone induced depression. Piperine had a more prolonged action against respiratory depression induced by pentobarbitone and morphine. The clinical use of piperine in treating respiratory depression due to narcotic poisoning may be useful.\(^{129,145}\) Crude alcoholic and water extract and piplartine (alkaloid) suppressed the ciliary movements of frog oesophagus (the alkaloid is more active) suggesting that the effect in relieving cough could be due to suppression of cough reflex.

**Immuno-modulation:** Immunomodulatory effect – Pippali rasayana showed 98% recovery in mice infected with Giardia lamblia and significant activation of macrophages and host resistance enhancement was seen.\(^{131}\)

**Anti-hepatotoxic:** Fruit-gastric intubation in rat at 100mg/kg has liver regeneration effects.\(^{126}\) Fruit showed hepatoprotective action Vs CCl\(_4\) induced liver damage in rats.\(^{132}\) Piperine was active Vs terebutylhydroperoxide and CCl\(_4\) toxicity and reduced lipid peroxidation, enzymatic leakage of GPT and AP both in vitro and in vivo. It was less active than sylimarin.

**Anti-fertility:** Plant, oral in rabbit antiestrogenic and benzene extract oral in female rat; Pet. ether extract oral at 100mg/kg has weak embryotoxic effect; hot water extract by gastric intubation in female rat active.\(^{126}\) Alcoholic extract at acute dose of 0.5, 1 and 3 g/kg and chronic dose of 100mg/kg/day increased reproductive organ weights, sperm motility and sperm count.\(^{131}\) Root powder was 100% effective as antifertile agent in rats given 100mg/kg
on day 6-9 of pregnancy. Benzene extract combined with methanol extract of E. ribes inhibited pregnancy in 80% of animals. Pet. ether extract P. longum was effective as post coital antifertility agent in rats and waxy alkaloid fraction was effective as anti-implantation or early abortifacent agent. A combination of P. longum, E. ribes and borax (ROC 101) impaired the fertility of female rats and mice and produced sterility in male mice. The effect was reversible in females. It inhibited spermatogenesis at 50-100mg/kg. This drug disrupts estrous cycle in female rats at 10% of the diet for 2 weeks and in Guneapigs at 0.5g in the diet for 6 days and enhanced alkaline phosphatase activity in uteri.145

**Anti-microbacterial:** Pelltorine type of isobutylamide CH-isobutyledeca–trans-4-dienamide exhibited significant activity against M. tuberculosis H37 Rv strain in vitro and was acomparable to 20% of the potency of streptomycin. Nisobutyl-deca-trans-2-trans-4-dienamide showed antitubercular activity both in vitro and in vivo at 1/5 potency of streptomycin.145

**Anti-inflammatory:** Piperine active Vs carrageenin induced oedema in rats.127 At 100 and 240mg/kg given oral to rats showed significant activity Vs carrageenin induced rat hind paw oedema.129 Decoction was also highly effective against carrageenin induced rat paw oedema.

**Anti-diarrhoeal:** Alcoholic extract and CHCl₃ extracts were antiamoebic in vitro at 1000 and 500mcg/ml.131

**Anti-tumor:** Water extract intragastric in mice at 50mg active Vs CA-Ehrlich–Ascites; water extract in ration at 80mg/g diet inhibited carcinogenesis.126

**Anti-convulsant:** Alcoholic extract at 2.2g/kg by gastric intubation and at 3.2g/kg I/P in mice and at 263.4mg/kg I/P in rats active; dried stalk powder intragastric at 10g/kg in mice and at 3g/kg in rat active.126

**Anti-fungal:** Essential oil showed antifungal activity against Aspergillus, Trichoderma viridi, Curvularia lunata, P. javanicum and P. striatum.145

**Anti-hypercholestrol:** Plant intragastric in rat at 50mg/kg acts as hypolipemic; dried seed fermented in rat ration at 5ml/day hypocholesterolemic. 

*Seed oil* – Non saponifiable portion intragastric in mice active.126

**CNS:** Piperine – CNS depressant, potentiated hexobarbital induced narcosis; antagonistic effect Vs electro shock and chemo shock seizures as well as
muscular incordination in mice, repeated dosage at 100mg/kg, i/p for 7 days reduced barbiturate induced hypnosis, marked increase in hexabarbital hydroxylase activity.\textsuperscript{127} Piperine potentiated pentobarbitone sleeping time in mice and had no effect on rota rod test in rats at 25-50mg/kg given oral.\textsuperscript{129} \textit{Plant} – Extracts and Piperine showed significant CNS stimulant, antileptic and antinarcotics effect. It was more potent than Nikethamide as an analeptic. The main site of action was medulla.\textsuperscript{129,145} Pet. ether extract in large doses produced convulsions in mice and the action was blocked by phenobarbitone and trimethadione.

**Hypoglycemic:** Whole plant 50% alcoholic extract given oral to rat at 250mg/kg was active.\textsuperscript{126,145}

**Cardiovascular:** Dehydroperoniline had coronary vaso dilating activity.\textsuperscript{131,133} Ethyl acetate extract has shown vasodilator activity on coronary artery in rabbit.\textsuperscript{126} \textit{Leaf} – water extract at 10-20mg/kg in dogs increased the blood pressure moderately. \textit{Plant} – Ether extract showed transient and complete cessation of frog heart beats which was not blocked by atropine. Piperine showed stimulant action on frog heart and also hypertensive effect that could be blocked by regitine. Ether extract and Piperlongumine caused a dose related transient fall in B.P.\textsuperscript{145}

**Estrogenic:** Alcoholic extracts oral in rat at 50mg/kg active.\textsuperscript{126}

**Hypotensive:** Piperine showed hypotensive effect in dogs.\textsuperscript{145}

**Smooth Muscle Relaxant:** Exhibits uterine relaxant effect in rat. (Type of Ext is not known).\textsuperscript{126}

**Gastro-intestinal:** \textit{Dried fruit} – Gastric intubation in rat at 250mg/kg enhances absorption; 50% alcoholic extract oral in rat active as contraceptive/interceptive agent.\textsuperscript{126} Piperine showed non specific blockade of ACH, histamine and 5-HT induced spasm on isolated Guineapig and rat intestine.\textsuperscript{145} Pippali was antiamoebic Vs Exptt. Caecal amoebiasis ibn rats.\textsuperscript{131} Alcoholic extract and piperine cured 90 and 40% of amoebiasis in rats. Rats treated with a mixture containing pippali recovered faster from duodenal ulcers with increased glucuronidase activity of Bruners glands. It is not an antacid but improved secretary status of Bruners glands involved in protection against duodenal ulcers.
Spasmolytic: 50% alcoholic extract of the whole plant was antispasmodic on Guineapig ileum Vs spasms induced by spasmogens.\textsuperscript{126,145} Methanol extracts spasmogenic on rat ileum.\textsuperscript{126} Piperlongumine and the whole plant extract showed marked antispasmodic action on isolated tissues and piperine showed spasmodic action on rabbit ileum.\textsuperscript{145}

KSHOUDRA

Vernacular Name
Assamese: Moujol  Bengali: Madhu  Hindi: Madhu, Shahad
English : Honey  Latin : Mel

Fig. 6.6 Kshoudra (Honey)

Synonyms

<table>
<thead>
<tr>
<th>Sanskrit Synonyms</th>
<th>DHN\textsuperscript{112}</th>
<th>BPN\textsuperscript{120}</th>
<th>RJN\textsuperscript{111}</th>
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<tbody>
<tr>
<td>1. Madhu</td>
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<td>2. Kshoudra</td>
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<td>3. Makshik</td>
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<td>4. Kusumasav</td>
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<td>5. Pushpasav</td>
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<td>6. Pavitra</td>
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<td>7. Pitya</td>
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<td>8. Pushparasahva</td>
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The etymology of the word ‘madhu’ is “मन्यते एतम् इति मधु” Madhu or honey is included among those dravyas which can be consumed regularly. In India, it has been considered only as medicine.

Many plants have nectar in their flowers. Honey bees are always attracted towards this nectar. They suck this nectar and store it in their bee hive. After a few days, they stop collecting nectar. Pure honey can be obtained from this bee hive by centrifugation. Such honey will not contain eggs of the bees and other unwanted constituents of the hive. Wax is obtained in this method of extracting honey.

Freshly collected honey by honey bees is apakva or ama and should not be used. If honey collected by honey bees in a closed bee hive is pakva and is called madhyam (better type of honey). The one year old honey is also pakva and is considered the best.

Susruta has described eight types of honey, where as Charaka has enumerated four namely makshik, bhramar, kshaudra and pautik. By the time Susruta Samhita was written, four new types came to be known viz. chatra, aardhya, daal and auddalak.

1. **Makshik**: Honey collected by big, brickred, wild bees is called makshik. This honey is lighter than kshaudra honey and is considered to be the best. Useful in disease like asthma.

2. **Bharamar**: Honey which is collected by a blue-black garden bee is called bharamar. It is viscous, sweet and heavy.

3. **Kshaudra**: Honey collected by small honey bees is called kshaudra. This honey is sheeta, light and lekhana.
4. **Pautik**: Honey collected by yellowish bees which sit on sweets is called pautik. It is ununctuous, ushna, toxic and therefore, it causes vatarakta, raktapitta, intoxication and causes burning.

5. **Chatra**: The shape of the bee-hive is like an umbrella. This honey bee lives in cold regions and it likes the nectar of mahuva tree. This honey has sweet vipak, is heavy, cold and is useful in raktapitta, leucoderma, diabetes and worms.

6. **Aardhya**: This type of honey is collected by bees which are reddish yellow in colour and are found in the wild. It relieves kapha and pitta.

7. **Daal**: This honey bee is very small in size and it builds its bee hive in the leaves of trees. The word ‘daal’ means leaves. Honey collected on leaves is called daal. It is astringent, ushna veerya, sour, increases pitta, ununctuous, pungent vipaki and is useful in vomiting and diabetes.

8. **Auddalak**: Honey collected by small, brick red insects in a hive. It is astringent, increases strength, bitter to taste, but pungent vipaki, does not vitiated vata, increases appetite and improves voice and is useful in dermatosis and toxins.

**Properties**

**Ras:** Madhur, Kashay [Madhur, Kashay- C.S., A.S, A.H.; Madhur ras, Kashay
anuras-S.S., DHN; Swadu, Kashay anuras- BPN]

**Guna:** Ruksha, Laghu, Picchilya [Guru, Ruksha- C.S., A.S.; Ruksha, Laghu,
Picchilya- S.S.; Ruksha- A.H., DHN; Laghu, Ruksha, Bishada- BPN]

**Virya:** Sheeta [Sheeta- C.S., S.S, A.S., DHN, BPN]

**Action**

Honey increases the agni, improves complexion and voice, increases softness of the skin, cardiac tonic, aphrodisiac, facilities reunion of bones in fractures, removes vitiated doshas, improves wound healing, promotes mental health, cleanses all the srotas, act as an astringent improves vision, produces
a sense of well-beings pervades the minute srotas of the body, increases appetite and facilities formation of asavas and aristas.

**Action on doshas:** Pacifies all the three doshas, acts on kapha through its lightness and pacifies vata-pitta by its viscosity sweet and astringent properties (Acc. to Vagbhatta, honey increases vata).

**Action on diseases:** Diabetes, hiccups, asthma, cough, diarrhoea, vomiting, excessive thirst, helminthiasis, toxin, dermatosis, jaundice, haemorrhoids, pruritus, abdominal distention, disease of the throat, uneasiness, intoxication, burning sensation, constipation.

**Chemical composition**

Glucose 84.9%, formic acid; sucrose 2.69%, alkaloids 0.12%, water 10.03%, nitrogen 1.29%.

**Characteristics of best quality Honey**

1. Sinks in water.
2. Flies do not sit on it.
3. A dog does not lick good honey.
4. If honey is poured on a vertically held cloth, then it does not wet the cloth but instead flows along its surface.
5. Burns like oil.
6. If applied in the eyes, causes irritation.

**Testing of honey by the five senses**

1. **Appearance:** Honey should have a yellowish tint similar to that of cow’s ghrit. As the honey becomes older, its colour changes. It changes with seasons also. The appearance of honey does not aid much in testing its purity.

2. **Rasa:** The taste of honey depends on the taste of the nectar collected from various flowers. Honey is sweet to taste and has an astringent aftertaste. We can obtain honey which is collected from the flowers of the same tree. Honey may initially contain various rasas apart from sweet taste and astringent aftertaste but they are not refined. They remain unmanifested, only sweet and astringent taste being manifest.

3. **Odour:** On burning, honey should not give out a bad odour. (Sugar gives such bad odour). Honey has its own characteristic strong odour. Dogs, which have a strong sense of smell, stay away from honey. Honey is useful in masking the odour of castor oil and cod liver oil.
4. **Consistency**: Viscous honey becomes thin on heating. If a drop of honey is held between two fingers and pressed then pure honey will become thinner whereas honey contaminated with sugar or jaggary becomes more viscous.

5. **Sound on heating**: The proportion of water in honey is 10.03%, but it is totally a part of honey. Therefore, when unadulterated honey is put in a flame, it does not produce any crackling sound. A wick of cotton dipped in honey, like the one dipped in oil or ghee, burns without producing any sound.

## CHAPTER 7

**SURVEY STUDY ON TRADITIONALLY USE FERTILE MEDICINE BY LOCAL HEALER**

**Introduction:**

The World Health Organization in 2001 estimated that eighty percent of the world population use medicinal plant in the treatment of diseases\(^1\).......It was also estimated that up to 90% of the population in developing countries rely on the use of medicinal plants to help meet their primary health care needs.\(^2\) The use of plant extracts as fertility enhancer and in the infertility treatment in animals is now in the increase because of the shifting of attention from synthetic drugs to natural plant products\(^3\). Herbs have been used since the beginning of time to aid in many different ailments. Of these ailments, fertility has been enhanced and even corrected by the use of certain herbs\(^4\).

Infertility is a worldwide medical and social problem, affecting perhaps one in six couple; the majority of whom seek medical treatment\(^5\). Infertility in itself may not threaten physical health but can have serious impact on the mental and social well being of infertility couple. It is estimated that there are 60-80 million infertile couples worldwide and above 10-15% of married couples are affected\(^6\). Similarly, rising human population throughout India...