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Comprehensive review of *Tankana*

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ABSTRACT

Rasa Shastra and *Bhaishajya Kalpana* is branch of the ancient Indian medical science based on herbs and herbo-mineral preparation. *Tankana* has been described under *Uparasa Tankana*, which is one among the *Kshara Trayas* has been used since very long time in Ayurveda. It has a wide range of therapeutic applications, including diseases like *Varna* (ulcers), *Shvasa* (asthma), *Kasa* (cough), *Hrudya* (beneficial to heart disease), *Streepushpajanana* (menstrual disorders) etc. It is used in the form of compound formulations like *Parpati*, *Kupipakwa*, *Khalvee Rasayana*, *Churna*, *Vati*, *Lepa* etc. In this paper *Tankana Shodhana* procedure, different synonyms, dose, *Anupana*, indications and different formulations containing *Tankana Bhasma* has been discussed.

Key words: *Tankana*, *Shodhana*, *Ksharatraya*, *Borax*.

INTRODUCTION

In *Rasashastra* drugs are classified into various groups such as *Maharasa*, *Uparasa*, *Sadharan Rasa*, *Dhatu Varga*, *Upadhatu Varga*, *Lavana Varga*, *Kshar Varga*. *Tankana* has been described under *Uparasa*.^[1] *Rasagranthas* have included *Tankana* under the group of *Ksharvarga*, *Ksharapanchaka*, *Dravaka Gana*, *Mitrapanchak* etc. In the procedure of *Apunarbhava*, test for *Bhasma*, *Parada Vedasmskara*, *Vidahi Mukhakara Dravyas*, *Tankana* are also used to cleanse gold and silver.^[2]

There are various references in *Charaka Samhita*, *Ashtanga Hrudaya*, *Sushruta Samhita*, *Gadanigraha*, *Kalyankaraka*. It is best antidote for *Vatsanabha* and also found in most of the formulations of *Vatsanabha*.

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Synonyms:^[3]

Tankana, *Tankanakshara*, *Rasakshara*, *Rasadhika*, *Lohadravi*, *Rasaghana*, *Subhaga*, *Rangadh*, *Malatiteerasambhutam*, *Ksharashreshtha*.

Vernacular names

English : Borax

Hindi : Suhaga

Kannada : *Tankana*

Latin : Sodium Pyro borate

Vargas/ Ganas:^[4-17]

- *Kshara Dravya*^[4]
- *Satapushpadi Varga*^[5]
- *Dhatu Varga*
- *Pippalyadi Varga*
- *Uparasa*^[1]
- *Shodhana Traya*^[6-8]
- *Kshara Traya*^[9-11]
- *Ksharashtaka*^[12]
- *Dravaka Gana*^[13-15]
- *Mitra Panchaka*^[16-17]

Types:^[18-19]**Base on appearance**

1. *Gudadha*
2. *Spatikabha*
3. *Neelakantabha*

Base on colour

1. *Pidakya* : dirty white
2. *Sandanaka* : pure white

Occurrence

It is available on the bank of the bank of Malati river DN, also available in Kashmir, Tibet. A kind of mud containing *Tankana* is found in the beds of dried lakes in upper part of India and Tibet. This mud is called as *Tankal*. It is to be dissolved with water filtered in usual way and dried up by heat leaving crystals of borax deposited in the bottom.

It is also occurs in borax lake and Searlis lake of California and in the mud of marshes around their border.

Ashuddha Tankana Doshas

Tankana if consumes without purification it causes *Vanti* (vomiting), *Bhranti* (giddiness).^[20-21]

Shodhana

There are various methods of *Tankana Shodhana* mentioned in *Rasa Granthas*.

According to Ayurveda Prakash, Rasa tarangini, Rasa Jananidhi^[20,22,23]

Raw *Tankana* first make into powder form then take hot iron pot and stirred till it becomes light and puffed.

According to Brihat Rasa Raj Sunder^[24]

Raw *Tankana* is taken and is given *Bhavana* of *Jambira Rasa* for one day, after that *Tankana* is dried under sun heat.

According to Rasenra Sar Sangraha^[25]

Tankana is kept in *Kanji* for a day, dried after removing. Later *Bhavana* is given in *Rudra Yantra* with

cow and human urine each for one day. Then, *Bhavana* is given with *Jambira Rasa* at night, after which kept in the shell of coconut and mixed with *Maricha Churna* and washed with cold water. This *Tankana* can be administered in all types of diseases.

Guna Karmas:

- **Rasa** - *Katu*
- **Guna** - *Tikshna, Laghu, Sara, Rookshna*
- **Virya** - *Ushna*
- **Vipaka** - *Amla*
- **Karma** - *Kapha, Vatahara, Pittakrut*
- **Rogagnata** - *Samastamaya, Kasa, Shwasa, Agnimandya, Visha, Adhmana, Vrana, Ashmari, Atisara, Sthavara Visha*.^[26,27]

Matra : 1-2 Ratti. (125 - 250 mg approximately).^[28]

Anupana : *Madhu, Ghrita*^[28]

Amayika Prayoga of Tankana Bhasma^[22]

- *Kapha Vilayanartha* - *Tankana, Kayaphal, Trikatu, Vasakshara, Javakshara*.
- *Uadara Roga* - *Tankana, Trikatu, Jamalgota*.
- *Ashuddha Parada Sevit Vikara* - Gargling with *Tankana Mishrit Jala*.
- *Dantaveshtana Shotha, Shool* - *Tankana, Bola Choorna*
- *Swaravarodha* - *Tankana* to chew
- *Udaradhamana* - *Tankana, Trikatu, Madhu*.

Other Uses:^[29]

- It is used in the treatment of cough, bronchitis.
- It is also used in treating food poisoning.
- It improves digestion power, relieves bloating.
- It induces menstruation in women suffering with amenorrhea or oligomenorrhea (Scanty menstrual flow).
- It is useful in dandruff, *Tankan* is applied on hair and kept for 5 to 10 min and then washed out.

- It is useful in ulceration of mouth and cracks and fissures of tongue.
- Dose varying from 10-30 grains are given in prolonged labour.
- Useful in other uterine infection.
- Useful in chronic tonsillitis.
- The gargling with *Tankan Bhasma* dissolved water gives significant result in relieving the tonsillitis.

Yogas of Tankana Bhasma:^[30]

<i>Shankha Drava</i>	<i>Nimbu Drava</i>
<i>Tankanadi Choorna</i>	<i>Amrutarnava Rasa</i>
<i>Tankanadyanjana</i>	<i>Ardhanarishwar Rasa</i>
<i>Tankanai Vati</i>	<i>Aanandabhairava Rasa</i>
<i>Dadruhar Lepa</i>	<i>Udakamanjiri Rasa</i>
<i>Amrutmanjiri Rasa</i>	<i>Kanakasundara Rasa</i>
<i>Gaganasundara Rasa</i>	<i>Chintamani Rasa</i>
<i>Jwaranagamayur Rasa</i>	<i>Trailokya Chintamani Rasa</i>
<i>Navajwarebhankush Rasa</i>	<i>Nasyabhairava Rasa</i>
<i>Panchavaktra Rasa</i>	<i>Pratapapana Rasa</i>
<i>Pratapamartanda Rasa</i>	<i>Prataplankeshwara Rasa</i>
<i>Mrutyunjaya Rasa</i>	<i>Sannipatabhairava Rasa</i>
<i>Sarvangasundar Rasa</i>	<i>Siddhapraneshwar Rasa</i>

Modern View^[31]

Borax, also known as sodium borate, sodium tetraborate or disodium tetraborate, is an important boron compound, a mineral and a salt of boric acid. Powdered borax is white, consisting of soft colorless crystals that dissolve in water. A number of closely related minerals or chemical compounds that differ in their crystal water content are referred to as borax, but the word is usually used to refer to the

decahydrate. Commercially sold borax is partially dehydrated.

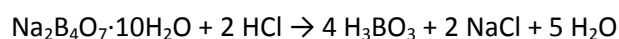
Chemistry

The term borax is often used for a number of closely related minerals or chemical compounds that differ in their crystal water content;

- Anhydrous sodium tetraborate, $\text{Na}_2\text{B}_4\text{O}_7$
- Sodium tetraborate pentahydrate, $\text{Na}_2\text{B}_4\text{O}_7 \cdot 5\text{H}_2\text{O}$
- Sodium tetraborate decahydrate, $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$

Borax is generally described as $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$. However, it is better formulated as $\text{Na}_2[\text{B}_4\text{O}_5(\text{OH})_4] \cdot 8\text{H}_2\text{O}$, since borax contains the $[\text{B}_4\text{O}_5(\text{OH})_4]^{2-}$ ion. In this structure, there are two four-coordinate boron atoms (two BO_4 tetrahedra) and two three-coordinate boron atoms (two BO_3 triangles).

Borax is also easily converted to boric acid and other borates, which have many applications. Its reaction with hydrochloric acid to form boric acid is,



The "decahydrate" is sufficiently stable to find use as a primary standard for acid base titrimetry. When borax is added to a flame, it produces a yellow green color.^[11] Borax is not used for this purpose in fireworks due to the overwhelming yellow color of sodium. Boric acid is used to color methanol flames a transparent green.

Natural Sources

Borax occurs naturally in evaporate deposits produced by the repeated evaporation of seasonal lakes. The most commercially important deposits are found in Turkey, Boron, California and Searles Lake, California. Also, borax has been found at many other locations in the South western United States, the Atacama desert in Chile, newly discovered deposits in Bolivia, and in Tibet and Romania. Borax can also be produced synthetically from other boron compounds.

Naturally occurring borax (known by the trade name Rasorite-46 in the United States and many other countries) is refined by a process of recrystallization.

Medicinal Uses:^[32]

It is believed that it improves the natural ability of the human body to absorb calcium and magnesium. Borax, commonly used as a natural cleaning agent, is an increasingly popular natural remedy for a whole host of health issues. Fruits like apples, oranges, red grapes, pears, plums, kiwis, sultanas, dates, as well as certain vegetables, avocado, soybeans, and nuts are rich sources of boron. Other notable sources of Boron are chickpeas, hazelnuts, currants, peanut butter, red kidney beans, tomato, lentils, olive, onion, potato, wine and beer.

1. **Prevents Arthritis:** Research suggests that those with arthritis have lower boron concentrations in their bones along with synovial fluid, and femur heads. Thus use of Boron can stem this. Boron ensures that calcium levels are maximized and used effectively, thus preventing arthritis.
2. **Heals swollen Throat, Mouth and Tongue Sores:** Borax is a remedy to be used as a topical treatment for certain health problems like sores on the tongue or mouth, as well as swelling of the throat. The remedy includes application of a paste made by combining borax with Cinnabaris, Borneolum, and Natrii Sulfas Exsiccates.
3. **Relief from Painful Swollen Red Eye:** Borax is paired with Calamina, Borneolum and Natrii Sulfas Exsiccates to create eye drops. These are used to soothe the eye when it is red and swollen. Boron protects the eye from a host of parasitic attacks and other nasty fungal infections.
4. **Solves Menstrual Problems:** Studies have evaluated its use along with other herbs to help treat Poly Cystic Ovarian Syndrome or PCOS and found it to be effective. Boron can also cure the symptoms such as hot flashes and night sweats that are typically associated with menopause, clotted menstruation, painful menstruation and it ensures that the mineral level remains at appropriate levels since post-menopausal women often suffer from hormonal imbalances that can skew many of the body's most important systems.
5. **Cures Urinary Infections:** Its antimicrobial benefits can therefore be tapped to cure urinary infections. Chinese herbal medicine has a similar application in treating urinary dysfunction that involves stone formation in the urine and is often painful.
6. **Enhances Testosterone Levels:** Boron is able to enhance the testosterone level in males; this quality is increasingly taken advantage of by male bodybuilders and athletes.
7. **Enhancement of female libido:** Borax stabilizes calcium and magnesium in the blood. It stimulates hormone production. Toxic states of hyper fluoride accumulation, internal fungal growth and dangerous microbe production are normalized by borax consumption. Finally, borax has been attributed to female libido enhancement.
8. **Cures Womb Inflammation:** Women suffering from womb inflammation are recommended to soak in lukewarm bathwater with borax twice a day. If women displayed profuse, egg-white-like discharge or leucorrhoea, they were told to douche with borax and lukewarm water solution three to four times per day. Other symptoms that can be alleviated by borax and water exposure include painful sexual intercourse, blood-streaked vaginal discharge, abdominal distension and false signs of pregnancy.
9. **Helps in cancer Therapy:** Boron neutron capture agents are used for cancer therapy and in the development of strong enzyme inhibitors. Its compounds are also used as antibody mimics that can easily identify biologically important saccharides.

Side Effects and Allergies of Borax

Internal use of Borax is generally not suggested. Due to its highly alkaline nature, it might cause skin irritation. There are also reports of adverse reproductive and developmental impact on the foetus. Its use in the long term is not recommended as there is a possibility of causing renal dysfunction as the borax accumulates in the body. It can also cause

fatigue or vomiting due to toxicity. Some research suggests it could also cause genetic damage and be toxic to lymphocytes, the building block of the body's immune system.

DISCUSSION

Tankana is also named as *Tankanakhara* or *Tankanakshara* due to its *Ushna*, *Tikshana*, *Sara Guna* and *Katu Rasa*. It is used as *Kshara*. Borax is alkaline in nature. There are various methods of *Shodhana* mentioned in *Rasa Granthas*. Intention of *Shodhana* procedure is to make *Tankana* light and puffy one so that moisture content should evaporate. Most of the *Granthakaras* has described the method with the help of *Agani Sanskara* in simple hot pan. Other one has described the use of Sun light for drying purpose. But *Rasa Sara Sangraha* has mentioned the use of *Bhavana Samskara* by using cow urine and human urine followed by *Jambira Swarasa*. *Tankana* shows characteristic of *Kshara*, and hence used in *Shwasa*, *Kasa*, *Mukhapaka*, *Danta Roga*. It acts as *Kaphavidravaka* in above diseases. It is also used in Cancer recently. *Tankana* make the action faster if *Madhu* and *Ghruta* use as *Anupana* along with *Tankana*.

CONCLUSION

For *Shodhana* of *Tankana*, use of external heat method is more easy and economically cheaper. But if we want *Tankana* to be used for specific disease like *Agnimandya*, *Ajirna*, *Atisara*, we have to concentrate on *Rasa Sara Sangraha* method. The use of *Tankana* on menstrual disorder and prolong labour is more significant. Further scope is there in above mentioned area.

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