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## Review Article on *Tankana* (Borax): Pharmacognostic, Pharmacological, and Ayurvedic Perspectives

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### ABSTRACT:

*Tankana* (Borax), an important mineral drug in Ayurveda, is classified under *Upavisha* (semi-poisonous substances) and widely used after appropriate *Shodhana* (purification). With its diverse therapeutic actions—especially *Lekhana* (scraping), *Kaphahara* (reducing Kapha), and *Krimighna* (antimicrobial)—*Tankana* holds significant importance in Ayurvedic pharmaceuticals. This review explores its identity, traditional uses, purification methods, formulations, and modern pharmacological relevance. Borax is prepared by heating it in a crucible until it turns into a fine, white ash that can be used in a variety of therapeutic applications. A subfield of traditional Indian medicine that relies on the preparation of herbs and minerals is known as Rasa Shastra and Bhaishajya Kalpana. It can be used to treat a variety of ailments, such as ulcers (Varna), asthma (Shvasa), coughing (Kasa), heart illness (Hrudya), menstruation abnormalities (Streepushpajanana), and more. Parpati, Kupipakwa, Khalvee Rasayana, Churna, Vati, Lepa, and other compound formulations are among the forms in which it is utilized. Various synonyms, dosage, Anupana, indications, and formulations incorporating *Tankana Bhasma* have all been covered in this study on the *Tankana Shodhana* method.

### Introduction

*Tankana*, known in modern chemistry as sodium borate ( $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ ), is a crystalline, alkaline salt with applications in traditional Ayurvedic medicine as well as modern pharmacology. It is primarily sourced from evaporated lakes and is also synthetically manufactured today. In Ayurveda, it is used externally and internally after proper purification.

#### 1.Types:

Considering appearance

1. Gudadha
2. The Spatikabha
3. Neelakantabha

based on color

1. Pidakya: soiled white
2. Sandanaka: white as pure

#### 2.occurrence

It is accessible in Kashmir, Tibet, as well as on the banks of the Malati River DN. The beds of dried lakes in Tibet and the upper region of India contain a type of mud called *Tankana*. *Tankal* is the name given to this mud. Borax crystals are to be left in the bottom after it has been dissolved in water that has been filtered normally and dried with heat.

Additionally, it can be found in the mud of the marshes that border California's Bora Lake and Searlis Lake.

Doshas of Ashuddha *Tankana* If consumed unpurified, *Tankana* results in *Bhranti* (giddiness) and *Vanti* (vomiting).

#### 3.Synonyms and Vernacular Names

- Sanskrit: *Tankana*, *Shuktijhara*, *Tutthaka*
- Hindi: *Suhaga*
- English: *Borax*
- Latin: *Sodium borate*
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#### 4.Rasa Panchaka (Pharmacodynamics in Ayurveda)

Parameter	Description
Rasa	Lavana (salty)
Guna	Laghu (light), Ruksha (dry)
Veerya	Ushna (hot)
Vipaka	Katu (pungent)
Doshaghna	Kapha-Vata hara

#### METHODS:

##### Shodhana (Purification Process)

Raw Tankana is considered *Ashuddha* (impure) and is subjected to *Shodhana* before therapeutic use. The classical method involves heating (Swedana or Nirvapa) until effervescence stops, indicating removal of water of crystallization and impurities. This purified form is called *Shuddha Tankana*.

In Rasa Granthas, several TankanaShodhana techniques are listed.

Ayurveda claims that Prakash, Rasa tarangini, and Rasa jalanidhi.

Raw tankana is first ground into a powder, then added to a hot iron kettle and stirred until it turns puffy and light.

As said by Brihat Rasa Raj Sunder,

After being administered Bhavana of Jambira Rasa for a day, raw Tankana is then laid out to dry under.

Rasenra Sar Sangraha claims that

Tankana is stored in Kanji for a day and then removed and dried. Later, for a day, Bhavana is administered in Rudra Yantra with both human and cow urine. Then, at night, Bhavana is consumed with Jambira Rasa. It is then stored in a coconut shell, combined with Martha Churna, and rinsed with cold water. Tankana can be used to treat any kind of illness.

#### Therapeutic Uses in Ayurveda

Tankana is used in both external and internal therapies:

##### Internal Use:

- Cough and asthma (*Shwasa-Kasa*)
- Amenorrhea and dysmenorrhea (*Artavakshaya*)
- Worm infestation (*KrimiRoga*)
- Obesity (*Shoulya*)

##### External Use:

- Oral ulcers and dental care
- Skin diseases (*Kustha*)
- Wound healing (*Vrana Ropana*)
- As a part of Dhoopana (fumigation) for disinfection

#### Formulations Containing Tankana

- *Tankana Loha*
- *Tankana Vati*
- *PushyanugaChurna* (in some classical texts)
- *Kaphaketu Rasa*
- Drava Shankha
- Amrutarnava Rasa
- Tankanadyanjana
- Tankanadi Choorna
- Rasa Ardhanarishwar
- Anandabhairava Rasa
- Tankanadi Vati
- Lepa Dadruhar

- Amrutmanjiri Rasa
- Kanakasundara Rasa
- Udakamanjiri Rasa
- Chintamani Rasa
- Gaganasundara Rasa
- Trailokya Chintamani Rasa
- Jwaranagamayur Rasa
- Rasa Panchavakra
- Rasa Pratapamartanda
- Rasa Pratapankeshwara
- Rasa Mrutyunjaya
- Rasa Sannipatabhairava
- Sarvangasundar Rasa
- Rasa Siddhapraneshwar
- Used in combination with *Trikatu*, *Honey*, *Ghee*, etc.

### Borax Allergies and Side Effects

In general, it is not advised to use borax internally. It may irritate skin because of its extremely alkaline nature. Negative effects on the fetus's development and reproduction have also been reported. Long-term usage of it is not advised since the accumulation of borax in the body may result in kidney impairment. Because of its toxicity, it may also result in exhaustion or vomiting. According to some research, it may also be harmful to lymphocytes, which are the body's immune system's building blocks, and cause genetic damage.

### Modern Pharmacology and Research

The chemical 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, and  $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$  are among the closely similar minerals or chemical compounds that are frequently referred to as borax.

In general, borax is defined as  $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ .

Boric acid and other borate, which have numerous uses, can be readily produced from borax. In order to create boric acid, it reacts with hydrochloric acid as follows:  $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O} + 2 \text{HCl} \rightarrow 4 \text{H}_3\text{BO}_3 + 2 \text{NaCl} + 5 \text{H}_2\text{O}$

The "decahydrate" is stable enough to be used as the main standard in acid-basitrimetry. A flame that has been exposed to borax becomes yellow-green.[11] In fireworks, borax is not utilized for this function because of sodium's overpowering yellow hue. The translucent green color of methanol flames is achieved by adding boric acid.

#### Sources in Nature

Borax is found naturally in evaporate deposits that are created when seasonal lakes repeatedly evaporate. Turkey, Boron, and Searles Lake, California, are home to the most commercially significant deposits.

Borax has also been discovered in numerous other places, including the Atacama desert in Chile, the South Western United States, Bolivia, Tibet, and Romania.

### Pharmacological Actions:

- Antimicrobial and antifungal: Effective against oral and vaginal pathogens.
- Anti-inflammatory: Especially in topical applications.
- Uterotonic: Aids in stimulating menstrual flow.
- Expectorant: Helps liquefy and expel mucus.
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### Toxicity and Safety:

Borax is categorized under *Upavisha*—its long-term or high-dose ingestion can lead to toxicity, especially affecting the kidneys and liver. Hence, strict adherence to dosage and purification is essential. The LD50 (lethal dose) in animal studies varies between species but is relatively low, warranting caution.

### Contraindications and Cautions

- Contraindicated in pregnancy (due to its uterine stimulant action)
- Should be avoided in renal-compromised patients
- Not to be used in infants or young children without supervision

## Conclusion

Tankana is a versatile mineral drug with wide applications in both traditional and modern medicine. Its role in respiratory, gynecological, and dermatological conditions makes it a valuable asset in the Ayurvedic pharmacopeia. However, due care must be taken in its processing and administration due to its inherent toxicity in raw form. There is significant scope for further pharmacological and clinical research to validate and expand its therapeutic applications.

## Discussion

Because of its Ushna, Tikshana, Sara Guna, and Katu Rasa, Tankana is also known as Tankanakhara or Tankanakshara. It's called Kshara. The nature of borax is alkaline. Rasa Granthas discuss a variety of Shodhana techniques. The goal of the Shodhana technique is to make the tankana puffy and light so that the moisture content will evaporate. The majority of Granthakaras have explained the process using a basic heated pan and Agni Sanskara. The utilization of sunlight for drying purposes has been explained by another. However, the usage of human and cow urine for Bhavana Samskara, followed by Jambira Swarasa, has been reported by Rasa Sara Sangraha.

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