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Research Article

STANDARD MANUFACTURING PROCEDURE PROTOCOL FOR TUTTHA BHASMA AN AYURVEDIC ALCHEMY AND ITS UTILITY

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ABSTRACT

Objective: Standard operating protocol for manufacturing of Tuttha bhasma is a precious metal used in Ayurveda Alchemy *Rasa Shastra.*

Methods: The study was facilitated by collecting Tuttha and was procured from Pharmacy IPGT and RA, Gujarat Ayurved University, Jamnagar. With Grahya Lakshanas (qualities as described in the classics), namely, Snigdha (unctuous), Guru (heavy), and Mahaujjala (very bright blue in color) were observed and selected the sample for the study.

Results: From the study, we obtained Tuttha after shodhana is 105 g, 102 g, and 105 g, the average 104% while Marana with Gandhaka media it is 39.2% and in Marana without Gandhaka it is 24.8%.

Conclusion: The study confirms that the manufacturings of Tuttha have contained the purification of Gandhak and its utility and the trituratation with Bijora nimbu and heating pattern of Tuttha bhasama.

Keywords: Protocol, Bhasma, Alchemy, Tituration, Gandhak.

INTRODUCTION

Tuttha is a mineral and chemically copper sulfate that has been indicated in various diseases from skin diseases to eye diseases. Tutth is one of the oldest materials,know to india,the references of which are available in *CarakaSamhita* and *SusrutaSamhita*. Tuttha and Sasyaka were extensively used in Rasa granthas. It origin was Garuda,consumedAmrta after drinking poision and vomittted on Marakatamountain.thisvomtus solidified and turn into Sasyaka and Colored has mayuraskanthaand it is very heavy. Rasajalanidhi describes these synonyms as sasyaka is naturally produced compound while tutthaka is artificially prepared compound, and both can be used in the unavailability of other. Reviews of classical texts of Ayurveda suggest using more in the form of external use than internal use. It mainly mentioned in the context of Rasashastra. According to Alchemical classics such as Yogratnamala (SiddhNagarjuna), Rasarnava (Bhairavnatha yogi), Rasahrdaya-tantra (BhagavatpadaGovinda), GorakshaSamhita (Gorakhanatha), Ras-ratanakar (NityanathaAcarya), Rasa-paddhati (BinduAcarya), Rasamanjari(Salinatha Siddha), Rasacintamani (AnandadevaSuri), Rasamrta (YadavjiAcarya), Ratna-vijnan (RadhakrsnaParasara). it is considered in Maharasa varga while it is Rasavarga dravya according to Rasahrudaya tantra and Goraksha samhita. Classics such as Rasaratnasamucchaya and Rasarajalaxmi have classified in both Maharasavarga and Rasavarga while Rasarajalaxmi classified sasyaka in Maharasa and Tutthaka in Rasavarga [1]. While Rasendra sara sangraha Tuttha Bhasma is said to be Rasayana and good for eyes. It is used in Prameha, Kirmi, Kustha, Sula and Arsa. Tuttha is a mineral, which is used in the form of incinerated (bhasma), purified or added to herbal or herbomineral formulations in different dosage forms of Ayurveda. Ayurveda classical texts indicate to use in skin diseases, ulcer, sinus, worm infection, vitiligo, obesity, diabetes mellitus, pain, asthma, hyperacidity, hemorrhoids, kleda shoshaka, and diseases of eyes. To use Tuttha for the indications, first, it has to pass from processes like shodhana means process of elimination of harmful effect of drug and improvement of its beneficial properties and marana the conversion of drug in to highly potential form so we can cure disease with very less amount of drug with no adverse effect. Rasatarangini has mentioned four types of shodhana of Tuttha with Bhavana (Trituration through liquid media) through nimbu Swarasa (Citrus medica juice), Bhavna of decoction of Raktachandana (Pterocarpus santalinus) and Manjishta (Rubia cordifolia), Swedana in dolayantra in media of gomutra (cow urine) through pottali method, and the bhavna of Amlavarga drug (drug having sour taste) [2-5] Marana of tuttha is again mentioned and categorized by Rasataragini into method with the media of Nimbu Swarasa. Tankana (Hydrated sodium tetraborate) and shuddha Gandhaka (purified sulfur) and only with shuddha gandhaka. Tuttha bhasma with and without gandhaka. Here, we are going to produce standardization of Tuttha shodhana and marana. Copper (II) sulfate, also known as cupric sulfate or copper sulphate, is the inorganic compound with the chemical formula $CuSO_4$ $(H_2O)_x$, where x can range from 0 4 to 5. The pentahydrate (x=5) is the most common form. Blue vitriol and vitriol of copper and Roman vitriol bluestone are also other name of this compound. The pentahydrate ($CuSO_4 \cdot 5H_2O$), the most common salt, is bright blue. It will easily dissolve in water to give the aqua complex $[Cu(H_2O)_6]^{2+}$, octahedral molecular geometry. The structures of the solid pentahydrate have shown polymeric structure, and copper is in octahedral form bound to four water ligands. The Cu (II) $(H_2O)_4$ centers are interconnected by sulfate anions to form chains. Anhydrous copper sulfate is white in color powder [6-8]. It is treated with copper metal with hot concentrated sulfuric and dilute sulfuric acid. Copper sulfate also be produced by slowly leaching low-grade copper ore in air; bacteria may be used to hasten the process. Commercial copper sulfates are about 98% pure and contain traces of water. Anhydrous copper sulfate is 39.81% copper and 60.19% sulfate by mass, and in its blue, anhydrous form, it is 25.47% copper, 38.47% sulfate, 12.82% sulfur, and 36.06% water by mass. Four types of crystal size are provided based on its usage: Large crystals 10–40 mm, small crystals 2–10 mm, snow crystals not <2 mm, and windswept powder is <0.15 mm.

Types of tuttha

Sasyaka or Tuttha can be traced by sahitaperiod. It has been written in "Charka Sahita"and "SusrutaSahita" as "amrtasanga". It is considered among the maharasa group as it is useful in paradajagrana and murcchana.

Tuttha-Two types

Depending on the availability of the minerals:

1. Swabhavika tuttha(natural)
2. Krttrima tuttha (artificial).

Tuttha grahya swarupa:

Which possess deep bluish colour like that of peacock's neck, which is guru (heavy and snigdha with shiny surface; such a sample is consider fit, selected and used for therapeutics purposes [13].

Dosha of ashuddha tuttha

In Ayurved Prakash, they mentioned the toxic effect of ashuddha tuttha. Consumption of ashuddha tuttha can cause nausea, vomiting, and giddiness.

Nirmalikaran of tuttha

This procedure is mentioned only in rasatarangini, and it may be used to clear physical impurities. Nirmalikrut tuttha having slightly bitter taste, it's good for skin, grahi, produced vomiting, kapha nashak, well for eyes and wound. It also purified the wound of firanga and upadansha. It helps in vartma and acts like kshara. According to rasatanangini nirmalikrut tuttha is use in formulations which is for external application only. For internal application, shodhana is necessary.

Shodhana

The procedure in which material gets free from impurities and toxicities and get purified with the help of procedures such as mardana, khalana, andnirvapana is known as shodhana.

Shodhan of tuttha

In rasatarangini, there are a total of four types of shodhana mentioned in which three are of bhavana samskara (mardana) and one is of swedana.

Type of tuthha shodhana with bhavana method according to rasatarangini

Lemon juice for 6 h, Raktachandan, Manjishtha Qwatha for 7 times. Amlavarga Bhavana for 7 times. Here, we have chosen only one type that is Bhavana with lemon juice for 6 h [8-12].

Materials

Khalva yantra, Raw tuttha, and lemon juice (*Citrus acida* Roxb.) were used.

METHODS

Shodhana

1. Tuttha was procured from Pharmacy IPGT and RA, Gujarat Ayurved University, Jamnagar. With grahya lakshanas (qualities as described in the classics), namely, Snigdha (unctuous), Guru (heavy), and Mahaujjala (very bright blue in color) were observed and selected the sample for the study. Tuttha was subjected Shodhana as per classical text mentioned in the text Rasa Tarangini.
2. 200 g of Tuttha was taken in a mortar and pestle and 40 ml of lemon juice (*Citrus acida* Roxb.) was poured to make it sufficiently wet and then with pestle trituration was done with pressure for 6 h, then allowed the paste to dry, and then collected (As shown in Fig. 1).

Preparation of bhasmas

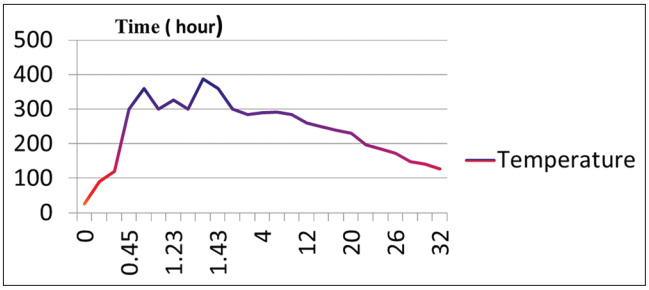
Diagrammatic view of tuttha bhasma

Standard Manufacturing Procedure Protocol For Tuttha Bhasma.

(1) Raw tuttha was taken.(As shown Fig.No1)

(2) Then Triturated with Bijora Nimbu. (As shown in Fig No.7)

(3) Then make Charika of It. (As Shown in Fig No.15).



Graph 1: Temperature pattern graph for tuttha bhasma in electric muffle furnace

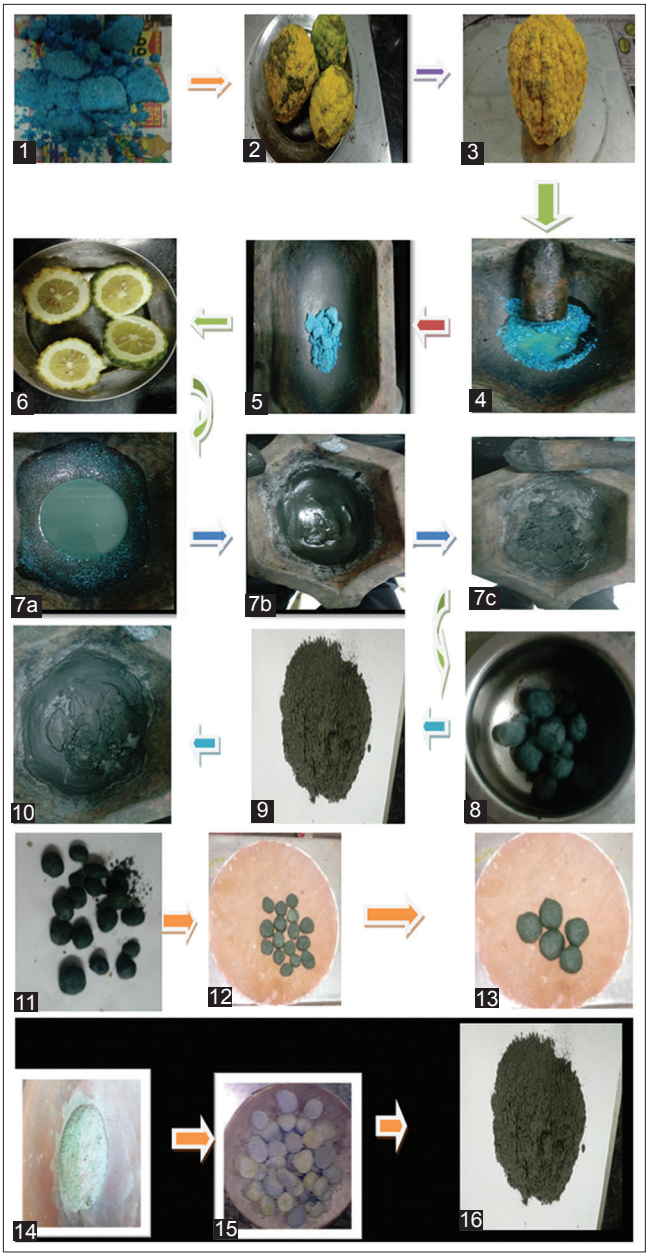


Fig. 1: (1) Raw tuttha. (2 and 3) Solid form of tuttha. (4) Trituration. (5) After trituration, (6) Bijora nimbu. (7a) Tituration with nimbu (bijora), (7b) tituration with nimbu (bijora), (7c) tituration with nimbu (bijora), (8) Modak shape of tuttha, (9) In powder form, (10) Tituration with Nimbu (Bijora), (11-13) In modak form, (14) After heating process, (15) Chakrika of tuttha, (16) Bhasma of tuttha

Table 1: Quantity of tuttha in shodhan

Group No	Tuttha quantity (g)	Wt of Matulunga Nimbu	Qt of swarasa obtained	Matulunga Nimbu Swarasa	Time for trituration	Obtained quantity	% quantity obtained
1	200	250	52ml	40 ml	6 h	211	105
2	200	250	40ml	40 ml	6 h	205	102
3	200	250	45ml	40 ml	6 h	209	105
Average	200	250	46ml	40	6	208	104

Table 2: Tuttha Marana

Gr No	Shodhita tuttha quantity (g)	Shuddha gandhaka quantity (g)	Matulunga Nimbu Swarasa (ml)	Obtained quantity in g	% quantity of final product
1	250	125	80	98	39.2
2	250	-	50	62	24.8

(4) Then after drying of Chakrika .It kept in the muffle Furnace for Bhasmikaran process.
(5) Collect the Bhasma after complete puta and performed the test of bhasma.
(6) Kept in closed container and used it as per physician guidance.

RESULT AND CONCLUSION

From the study, we obtained that tuttha after shodhana is 105, 102, and 105, the average 104%, while marana with gandhaka media, it is 39.2%, and in marana without gandhaka, it is 24.8% (As shown in Tables 1and 2).

DISCUSSION

Copper sulfate dissolves in water which has octahedral molecular structure in geometry, and it is paramagnetic in nature. It is used as an herbicide, fungicide, and pesticide. During the process of Shodhana, copper sulfate triturated with lemon juice and it converts to copper citrate. The bright blue color in crude form converts to a green or bluish green crystalline powder after purification. Shodhita tuttha was found to be more effective compared to crude, as the diameter of the zone of inhibition was higher, even at low concentration of 1 mg. It is bactericide to *Escherichia coli*, *Bacillus subtilis*, *Staphylococcus aureus*, and *Salmonella typhi* and fungicide to *Trichophyton rubrum* and *Candida albicans*. Crude tuttha was alone bactericidal to *S. typhi*.

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