Published online in http://ijam.co.in ISSN No: 0976-5921

International Journal of Ayurvedic Medicine, Vol 12 (3), 657-661

Pharmaceutico-analytical study of *Praval Bhasma* (Coral calax) with two different herbs

Research Article

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Abstract

Introduction: In the present study, *Praval* is used as a raw material to form *Praval Bhasma. Praval* (Coral) is the calcareous skeleton of the minute marine organism called *Anthezoa polypus* and belongs to *phylum coelenterate.* It is a natural source of rich calcium widely used in *Deepan, Pachan, Amlapitta Raktapitta, Yakshma, Kasa, Netra Roga* and *Hridaya Roga* (1)and Calcium deficiency diseases etc. it is administered in the form of *Bhasma* and *Pishti*. Method: *Shodhan of Praval* is done in *Sarjika kshara*. The Pravala bhasma is prepared by two different method by triturating it with *Kumari Swaras* and *Guduchi Kashay* and incineration in Muffle furnace. physico-chemical tests like Total Ash, Acid Insoluble Ash, Loss on Drying, and Qualitative analysis of praval bhasma by NPST (Namburi Phased Spot Test) are done. Result & conclusion: *Praval bhasma* prepared by two different medicines shows potency, efficacy for further clinical use.

Key Words: *Shodhana, Marana, Kumari, Guduchi, Muffle furnace. Anthezoa polyps.*

Introduction

Praval bhasma is used in ayurveda for the treatment of Osteoporosis, *Praval* is the calcareous skeleton of minute marine organisms called Anthozoa polypus and belongs to phylum coelenterate. The Skeleton is in the form of minute irregular deposits, called spicules which contain mainly calcium carbonate. In human bone, amorphous calcium carbonate (ACC) is formed as a Precursor of the crystalline carbonated apatite/hydroyapatite (HA).The Calcium carbonate (CC)Skeleton of marine corals has been reported to be biodegradable and osteoconductive. The transformation of the calcium carbonate surface (Degeneration and new crystal formation) is perquisite for osteoblastic apposition and differentiation of osteo progenitor cells into osteogenic cells which ultimate lead to bone formation .For *bhasma* preparation two different *dravya* are used 1.*Kumari(Aloe Vera Tourn. Ex Linn*) *Swaras*, 2.*Guduchi(Tinospora cordifolia (Willd.) Hook. f. and Thoms*) Decoction for trituration.

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- *Kumari Swaras* which contain mainly Calcium oxalate Lf,Calcium Lf 190-4600,Carbonate Lf Carbohydrates,Lf 89.6%.Several mechanism are known which potentiate the immune system[2].
- *Guduchi i*s immune modulator has highest immune stimulatory activity.

To ensure the quality and to establish the standard parameters for study, the physicochemical characterization of *Praval Bhasma* was performed. Qualitative analysis of *praval bhasma* by NPST(Namburi Phased Spot Test) was done.

No any previous work done on this research experiment.

Experimental research study design was used in this research.

Need of Study

Puranam cha punarnavam-The use of ancient medicines for newer invention is present days need. For this purpose we prepared and standardized *Praval Bhasma* by two different methods

Aim & Objectives

- Pharmaceutical study of *Shodhana* of *Praval* with *Sajjikshar jala*.
- Pharamceutical study of *marana* of Pravala with *Guduchi* and *Kumari*.

- Analytical study of *Praval bhasma* with ayurvedic and modern parameters.
- Analytical study with reference to NPST analytical test of both the samples.

Materials and Methods

Raw materials-

1. *Pravala*- was procured from a local market of Mumbai, India (Figure1).
2. *Sarjikakshara*- which is also called *Sajjikhar* (sodium bicarbonate) was purchased from Local market of Pune .
3. *Kumari* Swaras-Collect from garden of Dr D Y Patil College of Ayurved & Research Center ,Pimpri,Pune-18.
4. *Guduchi* Stem-was purchased from local market of Pune.

Prepapration of *Praval Bhsama*

***Shodhana*(Cleaning)(2)**

Praval was purified according to *sodhana* process described in *Rasa Tarangini.* During *Sodhana* process *Pravala* was kept in a musaline cloth and *pottali* was prepared. This *pottali* was hung in pot, containing *Sarjika Kshar + Jala* mixture with the help of bamboo rod and heat was given continuously for *1 prahar*(3 hours). Later the *pottali* was removed from the pot. After removing *Praval* was washed, dried of *shudha Praval.*(Fig 1)

Figure 1: *Praval Shodhana*

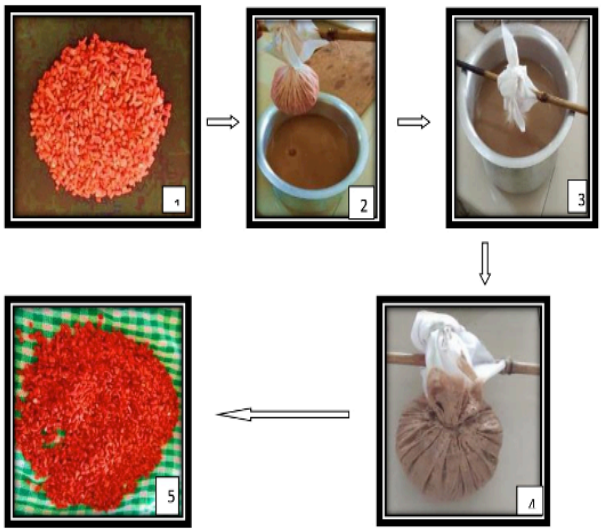

Figure1 Praval Shodhana: 1)Raw Praval,2)Sajjikshar+Jala+Praval Pottali,3)Praval Pottali Kept in Sajjikshar+Jala mixture,4)Praval Pottali after heating 3hrs in Sajjikshar+Jala mixture,5)Shudha Praval

***Maranam* (Incineration)**

After *sodhana* process the *shudha Praval* was subjected to *marana*

(incineration) process. *Shudha Praval* was devided into two parts then *Bhavana of Kumari Swaras* was given to ½ quantity of *shudha praval* powder to make a weak (semi-solid paste) and the circular *chakrikas* of 2-3cm in diameter were prepared. (Fig 2)

Fig 2: *Praval Bhasma* by *Kumari Swarasa*

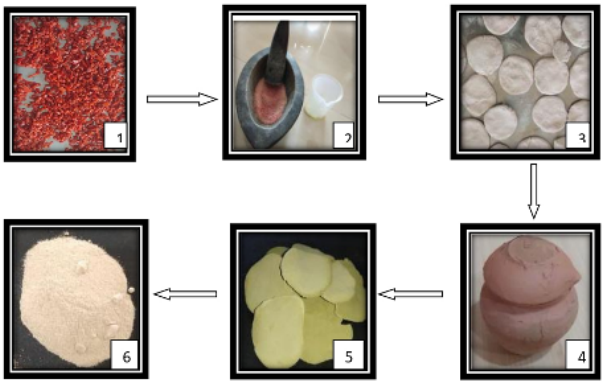

Figure 2 Praval bhasma by kumari swaras-1)Shudha Praval,2)shudha Praval+Kumari Swaras,3)Chakrika of Praval,4)Earthen Vessel containg Praval Chakrika,5)Praval chakrika after puta,6)Praval Bhasma.

For remaining *Shudha Praval* powder *bhavana* of *guduchi* decoction was given to make a weak and the circular *chakrika* were prepared. The *chakrikas* (round and flat pellets) were dried in shade and kept in an earthen vessels(3). (Fig 3)

The joint of both earthen vessels was sealed with the help of *mat-kapad* [ribbon of muslin cotton cloth smeared with *multani mitti*(fuller's earth)] and dried . Finally the sealed vessel was subjected to Muffle furnace. The temperature adjusted to the maximum of 800˚C during the process. Total time taken in ignition and *swangshita* was 10 hrs and 30min.Total process is called one *puta*. The Earthen vessel was removed from muffle furnace *Chakrikas* were again triturated with *Kumari swaras.* Again the flat thin *Chakrikas* (pellets) were prepared, dried in shade and kept in earthen vessel; finally subjected to muffle furnace. The process was repeated thrice. This process was used for preparation of *praval bhasma*. Same procedure was repeated for preparation of *praval bhasma* by *guduchi* decoction.

Fig 3: *Praval bhasma* prepared with *Guduchi kwath*(decoction)

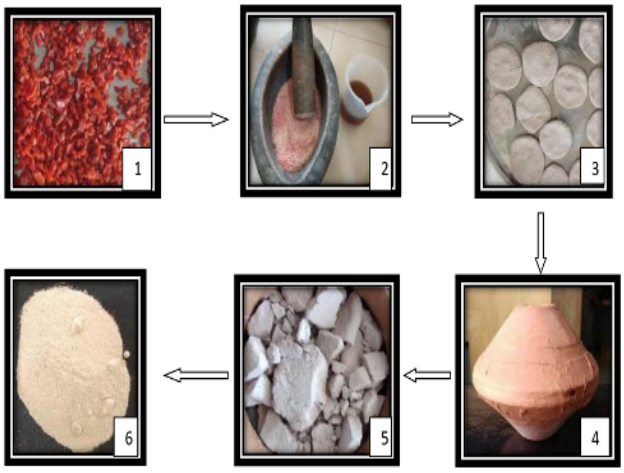

Figure 3Praval bhasma prepared from Guduchi decoction-1)Shudha Praval,2)shudha Praval+Guduchi Decoction,3)Chakrika of Praval,4)Earthen Vessel containg Praval Chakrika,5)Praval chakrika after puta,6)Praval Bhasma.

Physiochemical property analysis

Physiochemical properties were analyzed using API (formulation) at analytical lab of Dr D.Y.Patil College of Ayurved& Research Center, Pimpri, Pune-18.

Organoleptic characters of *Praval bhasam*

The final *bhasma* was analyzed for quality control as described in Ayurvedic text .

Eg: Rekhapurnatvam

Varitaramtav.

Observations

After *Shodhan*(Purification) *Shudha Praval* was divided in two groups for preparation of *Praval Bhasma* by two different methods. Physicochemical tests are done and values obtained.

Raw *praval* of 250gm was subjected for *shodhana*. After *shodhana*10gm loss seen. (Table1)

Table 1-Pharmaceutical Preparation of *Praval Shodhan*

S.No	Quantity of *Praval* for *Shodhan* (Purification)	Obtained
1	Before	250gm
2	After	240gm
3	Loss	10gm

In Pharmaceutical preparation of *praval bhasma by kumari swaras,* in three batches loss in weight seen.(Table 2)

Table 2: Pharmaceutical preparation of *praval bhasma by kumari swaras.*

Sr No.	Procedure		Quantity Taken	Quantity Obtained
	Initial weight of powdered *Praval*		120gm	
1	*Marana* 1st Puta	Before	120gm	
		After *Bhavana*	120gm	130gm
		After *Puta*	130gm	105gm
2	*Marana* 2nd Puta	Before	105gm	
		After *Bhavana*	105gm	125gm
		After *Puta*	125gm	100gm
3	*Marana* 3rd Puta	Before	100gm	
		After *Bhavana*	100gm	124gm
		After *Puta*	124gm	96.155gm

In *bhasma* process with *guduchi swaras* also shows loss in weight. (Table 3)

Table 3: Pharmaceutical preparation of *praval bhasma by guduchi decoction*

Sr No.	Procedure		Quantity Taken	Quantity Obtained
	Initial weight of powdered *Praval*		120gm	
1	*Marana* 1st Puta	Before	120gm	120gm
		After *Bhavana*	120gm	135gm
		After *Puta*	135gm	114gm
2	*Marana* 2nd Puta	Before	114gm	
		After *Bhavana*	114gm	138gm
		After *Puta*	138gm	110gm
3	*Marana* 3rd Puta	Before	110gm	
		After *Bhavana*	110gm	136gm
		After Puta	136gm	100gm

Organoleptic characters of both *bhasma* are same except in color. *Kumari swaras bhasma* is white whereas other is creamish white.(Table 4)

Table 4: Organoleptic Character and *Ayurvedic Pariksha* for *Praval Bhasma*

Sr No	Parameter	***Praval bhasma* prepared from *Kumari***	***Praval bhasma* prepared from *Guduchi decoction***
1	Color	White	Creamish white
2	Odour	Odourless	Odourless
3	Taste	Chalklike	Chalklike
4	Touch	Smooth	Smooth
5	Appearance	Amorphous powder	Amorphous powder
6	*Rekhapurnatva*	Present	Present
7	*Varitaratva*	Present	Present

Physicochemical Analysis of both bhasma in terms of The Total Ash Value,Acid Insoluble Ash, Water soluble Ash,Loss on drying at 110° C shows slight difference(4 &5). (Table 5)

Table 5: Physico-Chemical Properties of *PravalBhasma*

Sr No.	Parameter	***PravalBhasma* by *Kumari Swaras***	***PravalBhasma* by *Guduchi* Decoction**
1	Total Ash	92.85% w/w	88.5% w/w
2	Acid Insoluble Ash	0.144%w/w	0.29%w/w
3	Water Soluble Ash	0.5 %w/w	0.46 %w/w
4	Loss on Drying at 110°C	0.49 %w/w	0.42 %w/w
5	Qualitative analysis Calcium	Present	Present
6	Qualitative analysis Calcium	Present	Present

Observation during NPST of *Praval bhasma* by both methods shows bright red spot of different diameter.(6)(Table 6), (Fig 4)

Fig 4: NPST of *Praval bhasma* by both methods shows bright red spot of different diameter

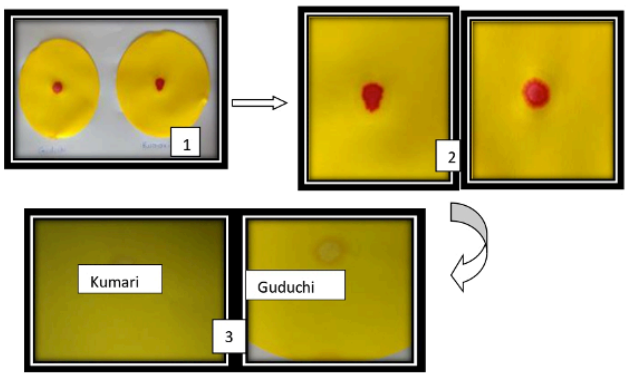

Table 6: Observation during NPST of *Praval bhasma*

Criteria		***Praval Bhasma* prepared from *Kumari* Juice (Swarasa)**	***Praval Bhasma* prepared from *Guduchi* decoction**
Changes on Heating in micro test tube to the bottom of test tube becomes red hot	Liberation of fumes	Nil	Small quantity
	Charring	Nil	Nil
	Odour	Nil	Nil
Changes On Wetting	Exothermic reaction	Not found	Not found
	Endothermic reaction	Not found	Not found
	Colour of the solution	Colourless	Colourless
	Absorption	Fast	Fast
	Settling time	Rapidly	Rapidly
Fading away time	Rapid	Rapid	
Color Pattern Initially	Formation of dark pink spot	Formation of dark pink spot	
Color Pattern of 1st phase (After 5 minutes)	Formation of pink spot wet periphery.	Formation of pink spot wet periphery.	
Color Pattern of 2nd phase (After 20 minutes)	Fading away –Light pink spot	Fading away –Light pink spot	
Color Pattern of 3rd phase (After 6 hours)	Central circle fade away rapidly	Central circle fade away rapidly	

Qualitative Analysis

NPST test is a chemical test done as per NPST Book[6]. Result obtained in fig 4 and Table 6, to detect the Calcium and Carbonate content which is important for growth of stem cells in bone formation.

Discussion

Praval (Coral)is obtained from sea water naturally. In raw form it contains many impurities.to use in formulation there impurities has to be removed .In Ayurveda *Praval* is used as *Bhasma* or *Pisti* form. Before preparation of *bhasma* it is necessary to purify the raw *Praval, shodhan* is the process advised in texts for purification. Shodhana is done by various methods like trituration(*Bhavana*), Frying (*Bharjana*), *swedana* (Steaming)etc. Regarding *Praval, steaming (Swedana)* of different drugs used in this context.

To remove the impurities, use of *Kshariya* or alkaline *Sajjiksharjal* is recommended in the texts. After purification *Praval* looses its shine it becomes dull, fragile and soft enhancing the absorption.

For bhasmikarana, different drugs are used as per their properties. *Shuddha pravala is triturated with various drugs*. Then made into flat cakes, to be dried in sunlight and subjected to appropriate fire. *Aloe vera* triturated *chakrika (*Flat cakes) became more shiny and strong than *guduchi chakrika. Aloe vera (Kumari)* is *sheet, balya*, and *rasayan* (immuno-modulator) *Aloe vera* also has anti-inflammatory activity ,ulcer healing property and immune modulatory activity.(7) Due to these qualities it may help in growth of stem cells. It also contains Calcium oxalate Lf , Calcium Lf 190-4600,Carbonate Lf,Carbohydrates Lf 89.6%Calcium.These might increase the Calcification action of drug .Synonym of *Guduchi* is *Amruta* which donates immortality .*Guduchi* is also *balya* and *rasayan* has highest immune stimulatory activity alcolides Magnoflorin -increases bioavabality, Tembetarine, Deterpinoides- Borapetol, Tinosporide, Cordifoloside A-C,Courdioside, Miscellaneous-Cordiofolide A and B. Minor elements namely Cl, K, Ca, Ti, Cr, Mn, Fe, Co, Ni, Cu, Zn, Br, and Sr in *Tinospora cordifolia*. The very high concentrations of Cl, K, and Ca in all the leaf samples, appreciable levels of Mn and high Zn content in T. cordifolia.(8) So that *Guduchi* is being used in this experiment.

By Trituration with *Guduchi* an organo-mineral complex is formed which enhance bio assimilative effect of *Praval*. By process of *mardana* looses molecular cohesiveness and *Praval* become fragile and soft ultimately improving absorption property.

Conclusion

- *Bhasma* fulfilled the NSPT Standards and both compared with each other.
- Pharmaceutical study of *Shodhana* of *Praval* with *Sajjikshar jala* done and it shows loss of shine and change in fragility.
- Pharamceutical study of marana of *Pravala* with *Guduchi* and *Kumari*.It shows almost same ayurvedic properties like smell, color etc.
- Analytical study of *Praval bhasma* with ayurvedic and modern parameters. All ayurvedic parameters fulfilled. Modern parameters shows difference in their ash value and solubility.

- Analytical study with reference to NPST of both the samples done and shows dark red spot on sheet.

Further scope of the study is, osteogenic ayurvedic drugs can be used in all type of bone disorders like fractures, osteo-malacia, osteoporosis etc.

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