International Journal of Applied Ayurved Research ISSN: 2347- 6362

ANALYTICAL STUDY OF *KUKKUTANDA TWAK BHASMA* PREPARED AS PER *BHASMA VIGYANEEYA*

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ABSTRACT

Kukkutanda Twak is a *Jangama* origin (Animal Source) Drug. It is the natural source of trace elements and minerals like Calcium having similarities with human body component. It follows the rule of *Samanya-Vishesh* (Charak) to fulfill the natural requirement of human being in deficient stage.*KukkutandaTwak* was also practiced therapeutically since Samhita *Kala* in the form of *Choorna*. Use of *Kukkutanda Twak Bhasma* and method of preparation of *Kukkutanda Twak Bhasma* was described first in *Siddhabhaishajya Manimala*.There are different *bhawana dravya* described in different Rasa Shastra Texts for *Kukkutanda Twak Marana* process.Here,The Analytical Data presented below are the Sample of *Kukkutanda Twak Bhasma* prepared as per *Bhasma Vigyaneeya* in five *gajaputa* with *Kumari Swarasa Bhawana.*

Keywords: *Kukkutanda Twak, Siddhabhaishajya Manimala, Bhasma Vigyaneeya, Kumari Swarasa, Marana*

INTRODUCTION:

Rasa Shastra is a branch of Science which deals with the metals, minerals, gems and animal originates. This branch is responsible for the preparations of many formulations to overcome many ailments.*Sudha* varga is one among them, which is considered as one of the class of drugs in the field of Rasa Shastra. It consists many drugs like *Sudha, Shankha, Shukti, Kukkutanda Twak, Godanti, Khatika* etc. which contain calcium compounds as a major component.

Kukkutanda Twak (Murgi ke Ande ka Chilka) was also practiced therapeutically since Samhita kala in the form of *choorna*[1]. Use of *Kukkutanda Twak Bhasma* and method of preparation of *Kukkutanda Twak Bhasma* was described first in *Siddhabhaishajya Manimala*[2].

There are different bhawana dravya described in texts as like *Kumari* Swarasa, Nimbu Swarasa and *Changeri* Swarasa for *Kukkutanda Twak Marana.* So that the role of different bhawana dravya in the preparation of Kukkutanda Twak Bhasma can be evaluated in the pharmaceutical and analytical background. Here,*Kukkutanda Twak Bhasma* prepared with the *bhawana* of *Kumari* Swarasa in five gajaputa as per reference of *Bhasma Vigyaneeya* text[3]. The Analytical study of the prepared *Kukkutanda Twak Bhasma* is presented in the tubular form.

AIMS AND OBJECTIVES:

1) To analyze *Kukkutanda Twak Bhasma* prepared as per *BhasmaVigyaneeya* method.

2) To characterize *Kukkutanda Twak Bhasma* by adopting advanced analytical techniques.

MATERIALS AND METHODS:

Samples for analysis:

1) *Kukkutanda Twak Bhasma* prepared as per *Bhasma Vigyaneeya*(B.V)

2) *Kumari Swarasa* (Aloe vera juice)

Raw Materials were collected from NIA Pharmacy, Jaipur. Preparation of *Kukkutanda Twak Bhasma* was carried out in Rasa Shastra Lab, NIA, Jaipur.

Pharmaceutical Study *Kukkutanda Twak* was subjected to *shodhana* as per the reference of *Siddhabhaishajya Manimala* Text. The *Swarasa* of *Kumari Patra* (Aloe

Vera leaves) was extracted from juicer machine.

In 1st *puta*, *Shuddha Kukkutanda Twak choorna* was kept in *sharava* in one layer, then it was covered with another *sharava*. *Gajaputapaka* through EMF at 850 degree celsius for 1hr.

2nd *puta* to 5th *puta Kukkutanda Twak* powder levigated with *Kumari Swarasa* and subjected to *gajaputapaka* and after 5th *puta*, The *Kukkutanda Twak Bhasma* became bright white in colour and pass all *bhasma pariksha* like *rekhapurnata*, *sukshmatwa*, *mridutwa* and *shlakshnatwa*.

Analytical Methods:

Classical Physical Parameters:

Varna (colour),*Sparsha* (touch)

Rasa (taste),*Gandha* (odour)

Classical Parameters:

Rekhapurnatwa

Sukshmatva

Shlakshnatwa

Mridutwa

Nirgandhatwa

Modern Physico-chemical Parameters:

Determination of PH[4]

Determination of Specific gravity[5]

Determination of Moisture Content[6]

Determination of Water Soluble Ash[7]

Determination of Acid insoluble ash[8]

Determination of Water soluble extractive[9]

Determination of Alcohol soluble extractive[10]

Sophisticated Instrumental Techniques:

Inductively coupled plasma with Atomic emission spectroscopy (ICP-AES)[11,12]

SEM-EDAX(Scanning Electron Microscope)

FTIR(Fourier Transform Infrared) [13]

XRD(X-Ray Diffraction) [14]

OBSERVATIONS AND RESULTS:

Table 1: Physical parameters of *Kukkutanda Twak Bhasma*

Sr.No.	Parameter	KT Bhasma
1	*Varna*	Bright White
2	*Sparsha*	Soft Smooth
3	*Rasa*	Tastelessness
4	*Gandha*	Characteristic

Table 2: Classical parameters of *Kukkutanda Twak Bhasma*

Sr.No.	Parameter	KT *Bhasma*
1	*Rekhapurnata*	+
2	*Varitaratva*	-
3	*Sukshmatva,Shlakshnatva*	+
4	*Mridutva*	+
5	*Nirgandhtva*	+

Physico-Chemical Analysis of Liquid Media: *Kumari Swarasa* was used as media for levigation to prepare *Kukkutanda Twak Bhasma.Bhavana Dravya* like *Kumari Swarasa* plays an important role for *Bhasma* preparation. Its quality may affect the quality of *Bhasma*.

Table 3: Physico-chemical analysis of *Kumari Swarasa (BhasmaVigyaneeya, KT Bhasma*

Parameter	value
PH	*5.5*
Specific gravity	*1.08*
Total solid content(%w/w)	*12.030*

Table 4: Physico-Chemical analysis of Lavanodaka before and after *Kukkutanda Twak Shodhana*

Sample	*Lavanodaka*	PH	Specific gravity	Total solid content(%w/w)
KT-*Bhasma*	*Before Shodhana*	*7.4*	*1.15*	*5.6*
	After Shodhana	*8.2*	*1.12*	*6.2*

Physico-Chemical Parameters: Table 5: Physico-Chemical Parameters Of *Kukkutanda Twak Bhasma*

parameter	Value
PH	11.05
Moisture Content	1.30
Acid Insoluble Ash	63.72
Water Soluble Ash	1.23
Water Soluble Extractive	20.09
Alcohol Soluble Extractive	5.71

Table 6: Results of ICP-AES analysis of *KukkutandaTwak Bhasma*

Element	Wave Length	Instrument Detection Limit (ppm), mg/l	KT-Bhasma mg/kg (ppm)
As	AOAC 18th Ed. 975.03	0.01	ND
Pb	AOAC 18th Ed. 975.03	0.01	ND
Hg	AOAC 18th Ed. 975.03	0.01	ND
Cd	AOAC 18th Ed. 975.03	0.01	ND
S	AOAC 18th Ed. 975.03	0.01	ND

Table 7: Result of SEM-EDAX of *Kukkutanda Twak Bhasma*

No	Element	E d x %
1	Ca	21.42
2	O	52.88
3	C	25.18
4	Mg	0,20
5	Si	0.04

Table 8: Result of FTIR analysis of *KukkutandaTwak Bhasma*

S no	Peak Position cm-1	Assignment
1	875.83	C-O
2	1413.95	C=O
3	3643.21	O-H

Table 9: XRD Report of *KukkutandaTwak Bhasma*

Compound Name	Chemical Formula	2 Theta Value	d-spacing
Calcium Carbonate	$CaCO_3$	29.71	3.00
Calcium Oxide	Cao	34.28	2.61

DISCUSSION :*Kukkutanda Twak Bhasma* was passed Organoleptic parameters like *varna,sparsha,rasa,gandha* etc. *Varna* was found bright white. *Bhasma* was found smooth on touch. *Kshariya* by *rasa pariksha* and odourless by *gandha pariksha.*

Kukkutanda Twak Bhasma was passed Classical parameters like *rekhapurnata, sukshmatwa,shlakshnatwa, mridutwa, nirgandhatwa* etc. All these parameters were compatible with chief desirable characters of *bhasma.As Bhasma* predominantly contain "Incinerated calcium compounds " *Varitara* pariksha was negative in *Kukkutanda Twak Bhasma* due to hygroscopic nature.

PH of *Kukkutanda Twak Bhasma* was 11.04, which are basic in nature.It is evident from previous research work that *KukkutandaTwak Bhasma* is in CaCO3 or CaO form.Thus calcium compounds inherent with basic nature. Herein, *KukkutandaTwak Bhasma*, the *bhawana* of Kumari Swarasa, was given, which is also alkaline in nature, which tends to make the final product more basic. Alkalinity of the drug indicates the site of absorption and thus may interfere pharmacokinetic of the

drug. Basic drugs are not absorbed until they reach the alkaline environment of the small intestine. The alkaline environment, in which the major component of the drug exist in a unionized form facilitates their absorption and this PH will help in acid neutralization of stomach.

Kukkutanda Twak Bhasma the percentage of Ca, O, C, Mg and Si was 21.42, 52.88, 25.18, 0.20 and 0.04 respectively.

Kukkutanda Twak Bhasma fairly sharp peaks were obtained at and around 875.83,1413.95,3643.21.These peaks indicates the presence of organic compounds like C-O, C=O and O-H. On the basis of these functional group, the compounds may be estimeed as Carbonate, Hydroxide and Oxide. Thus presence of these organic functional groups indicates their potent action. *Kukkutanda Twak Bhasma*, Theta value was found 29.71 and d- spacing was 3.00(Calcium Carbonate) and 2-Theta values -34.28 and d-spacing 2.61(Calcium Oxide).

CONCLUSION The Colour of the *KukkutandaTwak Bhasma* was bright white.On the basis of XRD studies, The *Kukkutanda Twak Bhasma* are Calcium Carbonate and Calcium Oxide in nature.

In ICP-AES Analysis, No heavy metal detected in the *Kukkutanda Twak Bhasma.*

SEM study showed that Calcium percentage was more in *Kukkutanda Twak Bhasma*, is 21.42percent.ICP-AES and SEM-EDAX Analysis Showed presence of trace elements like Magnesium, Silicon, Sulphur etc.

FTIR Study showed that Functional Group (C-O, C=O,O-H) are present in the *Kukkutanda Twak Bhasma*.

Kukkutanda Twak Bhasma was prepared in five *puta*, Same as per classical reference.

This method of preparation of *Kukkutanda Twak Bhasma* with *the bhawana of Kumari Swarasa as per Bhasma Vigyaneeya* is a Cost effective method.

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Source of support: Nil Conflict of interest: None Declared

Cite this Article as :[Sharma Basant Kumar et al : Analytical Study of Kukkutanda Twak Bhasma Prepared as Per Bhasma Vigyaneeya] www.ijaar.in : IJAAR VOLUME IV ISSUE I MARCH –APRIL 2019 Page No:55-58