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Impact of *Bhavana Samskara* on Physico-Chemical; Phytochemical Parameters with Special Reference to Particle Size Analysis of Murvadi Agada: A Classical Formulation

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Abstract

Reduction of dosage is the prime concern in Ayurveda, because of which many samskara's have been adopted in order to increase the potency as well as shelf life and reduction of dose. *Samskara* means to bring a transformation; or to bring a new quality which was not existed earlier. Thus these methods are being adopted to remove the unwanted qualities of the drug and to insert a stipulated quality into it and can be understood as the procedure adopted in which a Drug/Formulation is triturated with a liquid media *(Swarasa; Kwatha; Kanji; Ksheera; Mutra* etc) till it gets dried. *Murvadi Agada* is herbal formulation which is indicated in the acute GI manifestations needs to be potentiated in order to increase its *veerya.* So the present study intended to evaluate the changes which are occurring in phytochemicals of *Murvadi agada* before and after *Bhavana* with its own *kashaya* and also to evaluate the changes occurring in the particle size during *Bhavana* while triturating continuously. In present study there was marked reduction in the particle size.

Keywords: Bhavana samskar; Murvadi agada; Particle size.

Introduction

Pharmaceutics of Ancient Traditional science is a well developed and established science, which is called as *Bhaishajya kalpana* conglomerating many principles of Ayurveda while formulating a medicine without violating the fundamentals. Among such concepts, *Samskaras* (The procedures intended to change the nature of a drug) is one of the most highly adopted techniques which were practiced during that time.

The word *Samskara* means – To bring a transformation; or to bring a new quality which was not existing earlier.[1] Thus these methods are being adopted to remove the unwanted qualities of the drug and to insert a stipulated quality into it. *Kshalana* (washing in Running water), *Mardana* (triturating in khalwa yantra); *Agni samskara* (processing with fire); *Toya samskara* (processing with water); *Aatapa samskara* (exposure to sun); *Bhavana* (triturating with liquid to potentiate the drug) are few examples for *samskaras.*[2] *Bhavana* can be understood as the procedure adopted in which a Drug/Formulation is triturated with a liquid media *(Swarasa; Kwatha; Kanji; Ksheera; Mutra* etc.) till it gets dried. This procedure is implied mainly to potentiate the medicine (i.e. to increase its medicinal value).[3,4] Formulations which are prepared by this are explained as quicker, augmented and persistent in action even with minimal dose.[5]

Murvaadi Agada is an unique formulation which is indicated in *Garavisha (Garavishopahata pavaka)* and is helpful in all types of *Agni vikaras*, which are due to *visha.[6]* Thus to potentiate such medicine *Bhavana samskara* can be adopted by adding the *kashaya* of the same and triturated till it becomes dry. As the intention of this procedure is to impart the qualities of drava (liquid media which will be added) *into dravya* (formulation which is

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to be potentiated).

The present work intended to evaluate the changes in phytochemicals of *Murvadi agada* before and after *Bhavana* with its own *kashaya* and also to evaluate the changes occurring in the particle size during *bhavana* while triturating continuously.

Materials and Methods

Collection and Preparation of Sample

The drugs of Murvadi agada were collected from available sources and were authenticated from central research facility.

Ingredients of Murvadi Agada[6]

Murva *(Marsdenia tenacissima.Roxb;* Root), Amruta (*Tinospora cordifolia willd*; Stem), Kana (*Piper longum.linn;* fruit), Chavya (*Piper Chaba*, fruit.), Chitraka (*Plumbago zeylanica*, root), Patola(*Trichosanthes diocia.Willd*, panchanga), Musta (*Cyperus rotundus,* Rhizome), Vidanga (*Embelia ribes,* Fruit), Vacha (*Acorus calamus,* Rhizome), Tagara (*Valleriana walliichi*, Rhizome).

Method of Preparation

The drugs powdered in Pulvarizer and sieved through 120 mesh to get a sukshma churna Then in a clean dry vessel all the churna's were added equally (50 gm each) and stirred well to get a Homogenous mixture. Half portion was preserved in a sterile plastic air tight container (Sample MA1) and remaining half was taken for giving Bhavana with kashaya of its own (Murvadi kashaya) sufficiently to soak and was triturated in a clean khalwa yantra till it gets dried. The formulation was triturated for 35 h in all, later dried in shade, powdered and preserved in a sterile container (Sample MA2).

Bhavana Procedure/Method

In a clean *khalwa yantra* 500g of *Murvaadi agada churna* was added. To this *Churna, Murvadi kashaya* (1p drug; 16p water) was added till earlier got immersed completely. Then this was triturated well till that becomes hard thick paste which is difficult to triturate. Later the time taken was noted and closed properly. Next day *kashaya* was freshly prepared and again the procedure was repeated.

A. Quantity of Kashaya Added during Bhavana

Bhavana was conducted for total 6 days with an average of 5-6 hrs per day. On day 1st, 700 ml of kashaya was added to Murvadi Agada churna(500g) and 450 ml, 300 ml, 260 ml, 210 ml, was added on 2nd, 3rd, 4th, 5th day respectively. On 6th day no kashaya was added and trituration was done for 6 hrs, 7 hrs, 7 hrs, 6 hrs, 6 hrs, 3 hrs on 1st day, 2nd, 3rd, 4th day, 5th, 6th day respectively. Initial weight of the formulation was 500 g and 7.36% final weight gain was observed during the bahvana.

B. Organoleptic Characters

Abhavita churna was having Light brown colour, with amorphous consistency and slightly tikta pradhana rasa with a slight/ faint aroma. After Bhavana samskara , Muvradi Agada 2 sample was Dark brown in colour, with a significant odour of the typical drugs and Increased taste of Tikta and also of Kashaya rasa.

C. Phytochemical Evaluation

Organoleptic characters, loss on drying, ash value, water soluble extract, alcohol soluble extract and pH in 5% aqueous suspension were assessed. Qualitative assessment of functional groups was also carried out.[7,8]

D. Particle Size Evaluation

Particle size was evaluated using a compound microscope and counting method was adopted for the measurement. Particle size was evaluated on every 10 hours; it was estimated to see the effect of continuous

Table I: Data Showing Assessment of Functional Groups in both the Sample

Organic Constituents of Murvadi Agada							
Sl.no	**Phyto chemicals**	**Ma1**	**Ma2**	**Sl.no**	**Phyto chemicals**	**Ma1**	**Ma2**
01	Carbohydrates	+ ve	+ ve	**07**	Non reducing Polysaccharide (starch)	**-ve**	**-ve**
02	Proteins	**-ve**	**-ve**	**08**	Glycosides	+ ve	+ ve
03	Reducing sugars	**0.5%**	**1.5%**	**09**	Alkaloids	+ ve	+ ve
04	Mono saccharides	**-ve**	**-ve**	**10**	Saponins	**+ve**	**+ve**
05	Pentose sugars	**-ve**	**-ve**	**11**	Flavanoids	**+ve**	**+ve**
06	Fats and oils	**+ve**	**+ve**	**12**	Steroids	**+ve**	**+ve**
Inorganic Constituents of Murvadi Agada							
Sl.no	**Inorganic Element**	**Ma1**	**Ma2**	**Sl.no**	**Inorganic Element**	**Ma1**	**Ma2**
01	Calcium (Ca)	+ve	+ve	06	Sulphates	+ve	+ve
02	Magnesium (Mg)	+ve	+ve	07	Phosphates	+ve	+ve
03	Sodium (Na)	+ve	+ve	08	Chlorides	+ve	+ve
04	Potassium (K)	- ve	-ve	09	Carbonates	-ve	-ve
05	Iron (Fe)	+ve	+ve	10	Nitrates	-ve	-ve

Table II: Physicochemical Properties of Murvadi Agada Sample 1 (MA1) and Sample 2 (MA2)

Sl. No.	Parameters	MA1	MA2
1	pH at 5% aqueous solution.	4.3	5.2
2	Loss on Drying at 110^0C (% w/w)	10.72 % w/w	13.31 % w/w
3	Total Ash (% w/w)	13.49 % w/w	14.82 % w/w
4	Acid Insoluble Ash (% w/w)	7.2 % w/w	8.9 % w/w
5	Water Soluble Ash (% w/w)	2.3%w/w	2.8 % w/w
6	Water Soluble Extractive (%w/w)	38.34 % w/w	40.872% w/w
7	Alcohol Soluble Extractive (%w/w)	23.18 % w/w	24.92 % w/w

trituration in a liquid media under pressure, before bhavana the particle size was measuring with a range of 150-310microns. After 10 hrs there was reduction in the particle size which was 130-250 microns, later at 20 hrs, 90-200 microns, at 30hrs 80-160microns and after complete bhavana it was come down to 70-140 micron. At the end half of the particles were reduced to less than 90 microns.

Discussion

Organoleptic Characters showed a significant increase in the *Tikta and kashaya rasa. katu* rasa was hindered day by day. The tingling sensation of the Tongue after keeping pinch of *Murvaadi agada* was increased and persisted for longer duration at the time of completion. Even the colour of the formulation turned from light orange tinged brown (MA1) to dark brown (MA2) after complete drying. All these changes were appreciated due to the addition of *kashaya dravya* during the *Bhavana* procedure which implies that *Bhavana is veerya and Guna vardhaka*.

Preliminary Phyto-chemical Analysis didn't provide strong evidence as the all the components were present in both the samples. Loss on drying in sample MA2 was little on lower side which indicates that this sample is having less moisture. Total Ash value was relatively increased after Bhavana which suggested the increase in the relative amount of inorganic components in the formulation (MA2) which may be due to the addition of the *Murvadi kashaya* (water soluble extract?). Water soluble extractive values were almost similar, which is indicative of similar load of total polar extractive components. Alcoholic extractive value of MA2 is slightly more as compared to MA1 which is indicative of

relative increase in load of total non-polar extractive component of the drug.

Particle Size Estimation

There were significant changes during the *Bhavana*, More than half of the size was reduced by the procedure. Even the Phyto-pharmacognostic changes were very much appreciated under light microscope, which showed breakage of crude fibers, rosette crystals, reduction of the calcium oxalate crystals, and crushing of the almost all particles.

Conclusion

Though it is an initial primitive step taken to assess the efficacy of *Bhavana*, the relative increase in the parameters suggest that there is definite alterations/changes are seen in the formulation after *Bhavana* which are suggestive of *Bala, Veerya Vardhana* i.e. potentiating of the formulation which clearly indicates that the techniques, concepts implied were scientific, time tested and based on the ground principles of Ayurveda.

Thus to justify the new formulations which are potent, fast acting, feasible to prepare and easy to administer, incorporation of developed science & technology; evaluation & analysis of the same according to indispensable principles of Ayurveda becomes the need of the hour and essential for the validation of the Ayurveda to the well developed scientific community.

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