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Research Article

A COMPARATIVE PHARMACEUTICAL STUDY ON *TILADI CHURNA* AND *TILADI* GRANULES

Vani Gayathri P.A[1]*, Manisha Goyal[2], Govind Sahay Shukla[3], Rajaram Agarwal[4], Vijay Pal Tyagi[2]

*[1]PG Scholar, [2]Assistant Professor, [3]Head of the Department, [4]Assosciate Professor, Department of Rasa Shastra and Bhaishajya Kalpana, University Postgraduate Institute of Ayurvedic Studies and Research, Jodhpur, Rajasthan, India.

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ABSTRACT

Bhaishajya Kalpana- the pharmaceutical science of Ayurveda mainly deals with the planning and preparation of medicines. As per Ayurveda, an ideal drug is that one which can process into different forms. Though Ayurveda claims that no material is incapable of being utilized as medicine, none of them can be employed in the form in which they are available because they are not appetizing or easily absorbed by the human system. In this modern era, society prefers medicines which are more palatable, available, less dose and with more shelf life. In this view, as per the need of time, there is a need to modify the classical formulations in order to improve its characters and to make more acceptable.

In this present study, *Tiladi churna,* a pure herbal formulation having minimum ingredients and its granules were prepared in departmental pharmacy. *Churna Kalpana* is considered as an *Upakalpana* of *Kalka Kalpana* which is one among the basic *Panchavidha Kashaya Kalpana* mentioned in classical texts while *Khanda Kalpana* or granules are the preparations added after 20th century which have more palatability and acceptance. Here both *Tiladi Churna* and granules were then compared to determine the efficiency in terms of method, duration of preparation and also in terms of organoleptic and physical parameters.

INTRODUCTION

In Ayurveda, drugs are used in both forms i.e.; crude as well as processed form, and then converted into various medicinal formulations. It is essential that the form of the drugs or the formulations, when ready for ingestion, should be not only effective but also easy to administer and agreeable to the patients. *Bhaishajya Kalpana*– the pharmaceutical science of Ayurveda mainly deals with the planning and preparation of medicines. The pharmaceutical procedures for any drug involve various steps starting from identification and collection of authentic raw material, application of classical as well as standardized processing procedures, and production of quality.

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Ayurveda has given a greater importance to pharmaceutical knowledge. Though Ayurveda claims that no material is incapable of being utilized as medicine, none of them can be employed in the form in which they are available because they are not appetizing or easily absorbed by the human system. Certain adjustments, known in Ayurveda as *Samskara*, are required to make them more appropriate to the body elements and to deliver desired therapeutic results.

In order to achieve a product of the required therapeutic grade, it is necessary to preserve the correctness of the pharmaceutical technique in addition to the genuineness of the raw material. In current era, more importance is given for the palatability, availability, small dose and shelf life of the formulation. As per need of time it is mandatory to modify the classical preparation to make it more acceptable. Hence, the present study is an attempt to develop two different dosage forms: *Churna* and granules from the same *yoga* to compare in terms of various physical and organoleptic parameters.

AIMS AND OBJECTIVES

- Pharmaceutical preparation of *Tiladi Churna* as per the reference of *Gada Nigraha*, *Kaya Chikitsa Khanda, Rajayakshma- Kshataksheena- Soshaadhikara.* [1]
- Development and pharmaceutical preparation of *Tiladi* granules.
- To find out the proper method of granule preparation by manual
- Pharmaceutical study of *Tiladi Churna* was conducted in PG department of *Rasa Shastra* and *Bhaishajya Kalpana*, DSRRAU, Jodhpur.
- Samples of *Tiladi* Granules were also prepared in the PG Department of *Rasa Shastra* and *Bhaishajya Kalpana.*
- Following steps were performed for pharmaceutical preparation. In this study, there are two formulations were prepared.

MATERIALS AND METHODS

Materials

Table 1: Showing ingredients, part used & weight before powdering of T.C &TG

S.N	Ingredients	Part used	Weight of raw drug for TC	Weight of raw drug for TG
1	*Krishna Tila*	Seeds	3 Kg	3 kg
2	*Masha*	Seeds	3 Kg	3 kg
3	*Aswagandha*	Root	3 Kg	3 kg
4.	*Aja ghrit*	Ghee	300 gm	500 ml
5.	Sugar	…….	9 kg	9 Kg

METHODS

(i) Preparation of *Tiladi churna*

The whole pharmaceutical procedure was done by following by both classical and modern standard method of preparation.

All the raw materials of *Tiladi yog* as mentioned in classical text were obtained from local markets and identified by the experts of PG department of *Dravya Guna* and *Rasa Shastra* & *Bhaishajya Kalpana*, DSRRAU, Jodhpur. Each raw drug were washed and dried separately until the physical impurities removed completely.

Each ingredient were weighed (3Kg each) and converted into powder using a mixer grinder. The drugs should be powdered separately since each drug has individual physical and chemical characteristics. As *Tila* consist of volatile oil, it was dry fried sufficiently in an iron vessel for its proper powdering. *Masha* powder was fried in goat's ghee as *Ajaghrit* (300g) is mentioned as an ingredient of *Tiladi yog*. After powdering the ingredients were weighed separately (approx.2.600 kg each). Further, powders filtered separately with a metal plated sieve (sieve no.80) to get a fine powder.

Equally weighed powdered drugs were mixed together by both manually and mechanically by using a mass mixer machine to obtain a uniform mixture. Equal quantity of sugar powder (8 kg) was also added to this as a sweetening agent. The final mixture –*Tiladi Churna* was weighed, packed and labelled. Each packet filled with 150 g *Churna.* The packet filled with 150 gm churna for 1 month and the next 150 gm is planned to be given after follow-up

(ii) Preparation of *Tiladi* granules

Pilot study

- Granules were initially tried to prepare from *Tiladi Churna yog* which prepared already as mentioned above.
- For this 200gm *Tiladi yoga* was added to the sugar syrup prepared by melting the equal quantity of sugar.
- The mixture was stirred again but it was observed as very thick in consistency.
- The reason behind this may be high amount of sugar as it was prepared with sugar syrup and also sugar was already added in *Tiladi Churna yog* during its preparation as an ingredient.

Final Method of Preparation

Here *Tiladi* granules were prepared by following 3 step procedure as given below.

1. Preparation of *Churna*
2. Preparation of *Khanda*
3. Preparation of granules.

Preparation of *Churna* [2]

- All the raw ingredients were collected from local markets of Jodhpur.
- The drugs were cleaned and dried under sunlight properly.
- Each ingredient was converted into coarse powder separately with the help of pulveriser.
- The drugs should be powdered separately since each drug has individual physical and chemical characteristics.

- The powders were stored separately in air tight containers to prevent moisture catching.

Preparation of *Khanda* [3]

- The coarsely powdered ingredients were weighed and equal quantity (2 kg each) was kept aside for *Khanda* preparation.
- 24 liters of water measured using a beaker and kept over fire for boiling.
- When the water gets boiled, the coarse powdered drugs were added one by one.
- The temperature was kept constantly in between 85 -95 ^{0}C throughout the procedure.
- Boiling continued for evaporation of water content up to desired level and it took approx 5 hours to prepare the *Kwatha.*
- Once it got reduced to ¼ th, the *Kwath* was filtered using double folded cloth.
- After proper filtering, the residue kept aside and the filtrate boiled further for adequate consistency.
- Mentioned quantity of sugar and 500 ml of goat's ghee were added and stirred well for uniform mixing.
- The contents were heated at 90-95 ^{0}C until complete dissolution of sugar.
- The procedure of boiling and stirring continued till *Paka Siddha Lakshanas* were observed.
- However, stirring was continued until the *Khanda Lakshanas* appeared i.e. 3-4 consistency.
- After examination of *Siddhi Lakshana*, the preparation was taken out from the stove and kept for cooling.

Preparation of *Tiladi* granules

- Prepared semisolid mass was passed through sieve to obtain granules.
- Granules were dried properly under sunlight.
- Final product was weighed, packed and labelled.

Table 2: Showing ingredients, its weight before and after powdering, loss of weight and percentage of loss of *Tiladi Churna* and granules

S.N	Ingredients	Weight of raw drug		Weight after powdering		Loss after powdering		Percentage of loss	
		TC	TG	TC	TG *Yavakut*	TC	TG	TC	TG
1	*Krishna Tila*	3Kg	3Kg	2.59 Kg	2.4 Kg	0.41Kg	0.6Kg	13.6 %	20%
2	*Masha*	3Kg	3Kg	2.64Kg	2.5 Kg	0.36 Kg	0.5Kg	12%	16.6%
3	*Aswagandh*	3Kg	3Kg	2.8 Kg	2.7 Kg	0.2 Kg	0.3Kg	6.6%	10%
4.	*Aja ghrit*	300g	500ml	.....	.....	.....	.....	.....	.....
5.	Sugar	9 Kg	9 Kg	8.5 Kg	8.5Kg	0.5 Kg	0.4Kg	5.55%	4.8%

Equally weighed powdered drugs were mixed together by both manually and mechanically by using a mass mixer machine to obtain a uniform mixture. Equal quantity of sugar powder was also added to this as a sweetening agent. The final mixture –*Tiladi Churna* was weighed, packed and labelled. Each packet filled with 150 g *Churna*.

RESULT

Table 3: Showing comparative result of *Tiladi Churna* and granules in different criteria

S.N	Criteria	*Tiladi Churna*	*Tiladi* Granules
1	Total duration required for *Tiladi Churna*	3 Days	3 Days
2	Quantity of total herbal powder used	15.8 Kg	18 Kg
3	Final weight obtained	14 Kg	16 Kg
4	Loss of weight	1.8 Kg	2 Kg
5	Percentage of loss	11.3 %	11.1%

OBSERVATIONS

Tiladi Churna

1. Each ingredient shown their own individual colour and the colour of the final product was light brown.
2. Raw *Aswagandha* had an aromatic flavour which persists even after powdering.
3. The colour of goat's ghee was mild yellow in colour with a peculiar odour.
4. *Tila* was dry fried before its powdering as it contains oil constituents.
5. During dry frying, crackling sound was present and later it was got reduced.
6. The absence of crackling sound and the puffiness attained by *Tila* seeds indicates adequate dry frying.

7. The colour of *Masha* powder was changed into mild yellowish brown after *Bharjana* in goats ghee
8. During the procedure of filtering, *Tila* seems to be more difficult to sieve out comparing to other ingredients.
9. Even after manual mixing, the formulation mixture was not mixed up well, hence preferred mechanical mixing using mass mixer machine, which results uniform and proper mixing up.

***Tiladi* Granules**

1. Typical smell was observed during preparation of *Kwath* and its colour was found as black.
2. Difficulty in filtering *Kwath* through double folded cloth was observed due to sticky nature of *Tila* and the residue was also found to be sticky.
3. At the starting, *Ajaghrit* was not readily getting mixed with, but later on it got mixed well as a result of continuous stirring.
4. All the *Sidhilakshanas* for *Paka* were observed.
5. After cooling, the consistency of *Khanda* became a little hard & was difficulty to stir with the ladle easily.
6. When final mass was passing through sieve, it was a little bit difficult to convert into granules due to its semisolid consistency.

Table 4: Organoleptic and physical parameters of final product of *Tiladi Churna* and granules

S.N	Parameters	*Tiladi Churna*	*Tiladi* granules
1	Colour	Pale brown	Greyish brown
2	Taste	Sweet	Sweet
3	Odour	Characteristic	Characteristic
4	Fineness	Very fine	Granular
5	Consistency	Soft, solid	Rough, solid
6	Solubility	Easily soluble	Less soluble
7	Particle size by sieve#20	81.16 g/100g	1.45 g/100g

Fig.no.1 Showing the raw ingredients of *Tiladi Yog*

Fig. No.2 Showing prepared and packaged final products of *Tiladi Churna* and granules

DISCUSSION

In case of *Tiladi Churna* preparation, initially each raw drug was cleaned, dried and weighed. All the drugs were powdered separately by using mixer grinder and pulverizer as the procedure of powdering depends upon various specific factors such as hardness, volatile oil content, fibrous character etc. Powdering of *Tila* was found to be difficult due to the presence of volatile oil, [4] even though it was dry fried

before starting the procedure. *Tila* seeds were turned puffy during the process of dry frying and the process was continued till the crackling sound stops which was present earlier. Even after powdering, *Tila* shows sticky character and leads to maximum loss than other ingredients. Even many varieties of *Masha* and *Tila* are present; here black variety of both drugs were selected as they are considering superior, both pharmacologically and nutraceuticaly.[5] *Aswagandha* twigs were hard enough but turned into very fine powder easily. All the individual drug powders were seen in different colours and textures. In that, *Aswagandha* is seen in light brown colour with fine soft texture, while Tila is seen in black colour with slightly rough in texture, whereas *Masha* is seen as off-white with black colour and with a moderate rough texture. After powdering also, very fine powders were not obtained, so to remove eventually large particles and to get very fine powder, procedure of sieving was done. The powders were sieved through 80 number sieve. During the sieving procedure, *Aswagandha* and *Masha* were get sieved easily comparing to *Tila* due to its sticky nature. The *Masha* powder was further fried with goat's ghee as it was mentioned in formulation. The colour of *Masha* powder turned into little darker after this process. Further, all 3 fine powders were mixed together. Both manual and mechanical mixing was done for proper and uniform mixing. The final product was packed and stored in airtight packets.

Even though sugar is not an ingredient as per classical reference of *Tiladi yoga*, it was added to the formulation to improve its palatability. In classical textbooks the quantity of sugar is mentioned as four times of the total weight of the ingredients,[6] here it was added equal to the total quantity of other drugs to prevent its interference in increasing the parameters like weight in patients.

The *Tiladi* granules were prepared by following the method of *Khanda Kalpana*. Initially, equally weighed coarse powdered ingredients were boiled with four times of water to prepare *Kwath*.[7] The prepared *Kwath* was then filtered through a double folded cloth. The filtrate further boiled till it obtains thicker consistency. Double the quantity of sugar and 500ml goat's ghee were added and mixed well. Even four times of sugar is mentioned in our classics, here I added double the quantity only because research studies proved that intake of higher quantity of sugar may results in hyperglycaemia in patients. [8] Here sugar solution was made and mixed other than adding sugar crystals as such .This may be one of the main reason for higher shelf life of granules. Also there are several ways in which sugar solution inhibits microbial growth. The most common one is simple osmosis. Sugar in aqueous form attempts to reach equilibrium with the sucrose contents of the formulation, results in absorbing available water from the formulation contents, further reduces free water molecules which is necessary for the survival and growth of microbes.[9] The preparation was kept for self cooling after achieving *Khanda Sidhilakshanas*. The *Sidhi lakshanas* or *Paka lakshanas* are as similar to that of *Avaleha Paka Lakshana*, except 1-2 thread consistency of *Avaleha Paka*, *Khanda* achieves 2-3 thread consistency. [10] Thus the *Sidhilakshanas* are [11] – *Tantumatva* – Thready consistency (2-3 thread), *Apsumajjati* – The properly prepared Avaleha will sinks and settle at the bottom of water, *Kharatva/ Sthiratva* – The product will be stable with rough consistency, if it is prepared completely, *Anguli mudra*– The finger prints will appeared when the end product pressed between fingers. *Gandha, Varna & Rasodbhava* – These indicates the genuinity of final product i.e., appreciable colour, odour and taste which mentioned as per original textbooks. The next stage was preparation granules from above prepared semisolid mass. For that, the mass was passed through the sieves. Here also, the issue was present as mentioned in *Churna* filtration, due to the stickiness of *Tila* seeds. The maximum loss of the product was found at this stage of sieving. Once the granules obtained, it was dried properly to avoid contaminations and then the final product was weighed and packaged. As granules prepared by manual method completely, the size and shape was not uniform comparing to those available in markets. The solubility of both formulations was checked before packaging and found that churna was more soluble than granules due to its fine particle size.

CONCLUSION

In the present study, the comparative pharmaceutical part of *Tiladi Churna* and granules were concerned. Differences has been found in the preparation of two forms in terms of time duration, yield and physical parameters such as solubility, consistency etc. In view of these criteria, it is concluded that *Tiladi Churna* possess better efficacy than *Tiladi* granules.

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***Address for correspondence**
Dr. Vani Gayathri P.A
PG Scholar,
Department of Rasa Shastra and Bhaishajya Kalpana,
University Postgraduate Institute of Ayurvedic Studies and Research, Jodhpur.
Email:
vanigayathripa1994@gmail.com