



Analytical Study of *Madhutailika Basti* Formulation Prepared by Classical and Modified Methods

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Abstract

Analytical study ensures regarding purity of drug. The study aims at checking the drug on several parameters by using various instruments & techniques. It provides the objective parameter to fix up the standards for quality of raw drugs, in process as well as finished products. It helps in identification of drug, quantification of components, structure of final product, nature of the drug etc. In the present study *Madhutailika Basti* formulations are prepared by classical and modified methods. So total of 6 samples are prepared and they were subjected for organoleptic examination, physico-chemical analysis and stability study. Results showed that all the samples can be identified as O/W type of Emulsion. Analytical study proved that classical method of preparation of *Madhutailikabasti* with serial order of mixing the ingredients using churner is more stable and would be better absorbed compared to other modified methods.

Keywords

Madhutailika basti, Physico-chemical analysis, Stability study, Classical methods, Modified methods



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INTRODUCTION

Analytical study ensures purity of drug. The study aims at checking the drug on several parameters by using various instruments & techniques. It provides the objective parameter to fix up the standards for quality of raw drugs, in process as well as finished products. It helps in identification of drug, quantification of components, structure of final product, nature of the drug etc.

The prepared drug should be understood well and interpreted with the help of modern technology, in order to make a link with the scientific mass. The findings should be backed by proper scientific validation. The use of genuine ingredients ensures the potency and efficacy of the compound drug and therefore there is a need to evaluate the ingredients by various parameters prior to their usage in formulations. Hence Analytical study has to be actively adopted for screening of the ingredients and the compound drug.

AIMS AND OBJECTIVES

- a) To perform physico-chemical analysis and stability studies of *Madhutailikabasti* formulation prepared by classical and modified methods.
- b) To compare the results of physico-chemical analysis and stability studies of

Madhutailikabasti formulation prepared by classical and modified methods.

MATERIALS & METHODS:

Six samples of *Madhutailikabasti* were prepared by different methods using authentic raw material as follows:

- Sample 1: Mixing the ingredients in serial order using mixer
- Sample 2: Mixing the ingredients all together using mixer
- Sample 3: Mixing the ingredients all together using edge runner mill.
- Sample 4: Mixing the ingredients in serial order using edge runner mill.
- Sample 5: Mixing the ingredients in serial order using churner
- Sample 6: Mixing the ingredients all together using churner

Ingredients¹:

- *Madhu* : *1pala* (50ml)
- *Saindhavalavana* :
1/16thpala(3.125g)
- *Tilataila* : *1pala* (50ml)
- *Shathapushpakalka* :
1/8thpala(6.25g)
- *Erandamulaquatha*: *2pala*
(100ml)



The parameters used for the analysis has been mentioned below:

Table 1 Organoleptic Characteristics of all Samples

Features	1 st sample	2 nd sample	3 rd sample	4 th sample	5 th sample	6 th sample
Colour	Dull brown	Dull brown	Dark brown	Dull brown	Dark brown	Dark brown
Taste	Lavana kashaya	Kashaya lavana	Madhura Lavana Kashaya	Madhura Lavana Kashaya	Madhura Lavana Kashaya	Lavana Madhura Kashaya
Smell	Tailagandha	Tailagandha	Tailagandha	Tailagandha	Tailagandha	Tailagandha
Consistency	Viscous liquid	Moderate viscous liquid	Less viscous liquid	Less viscous liquid	Moderate viscous liquid	Moderate viscous liquid

Table 2 Results of standardization parameters

Samples	Parameter						
	Acid value	Saponification value	Iodine value	Refractive index	Specific gravity	Viscosity	pH
I	3.29	78.30	16.16	1.38717	1.1171	7.0740	6.0
II	3.73	76.22	11.43	1.3886	1.1258	9.7898	5.0
III	2.7855	71.22	13.30	1.3895	1.1245	5.4127	5.0
IV	2.6562	61.5601	44.6132	1.38606	1.1191	11.7834	6.0
V	2.7690	71.8168	22.51	1.38830	1.1406	10.8502	5.0
VI	4.2357	91.5578	23.7473	1.39794	1.1428	6.3360	6.0
Taila	1.0989	21.5980	45.4567	-	0.9422	75.7795	6.0
Kashaya	-	-	-	-	1.0286	1.2083	6.8

Table 3 Sedimentation Rate of all samples

Samples	Beginning of separation after the preparation	Total time taken to sediment
1 st sample	After 40 min	7hr 35 min
2 nd Sample	After 18min	3hr 15min
3 rd Sample	After 03min	2hr 38min
4 th Sample	After 06min	2hr 49min
5 th Sample	After 35min	36hrs
6 th sample	After 15min	8hr 55min

A. Organoleptic Characteristics:

- Colour
- Taste
- Smell
- Consistency

B. Physico-chemical analysis

- Acid value
- Saponification value
- Iodine value
- Refractive Index at 25⁰C



- Specific Gravity
- Viscosity
- p^H

C. Physical stability test

- Dilution Test
- Conductivity Test
- Dye Test

RESULTS

A. Organoleptic Characteristics:

The drug is examined by means of sense organs and the difference in the drugs which are observable at a macroscopic level is appreciated. It is explained in table no. 1.

The colour, smell, taste, consistency features were observed in all the 6 samples.

The differences in features may be due to certain chemical changes taking place in relation to their method of mixing and instrument used. So observations of all samples are different from one another.

B. Physico-chemical Analysis:

Results of physico-chemical analysis are enlisted in table no. 2

C. Physical stability test:

There are two types of emulsions O/W type and W/O type. Since both the types (O/W) and (W/O) of emulsions are similar in appearance it is very difficult to differentiate

them with naked eyes. They cannot be identified with single tests hence they were confirmed with 2 to 3 tests which includes dilution test², conductivity test³ and dye-solubility test⁴.

Sedimentation rate:

Stability is also assessed with rate of sedimentation which is explained in table no. 3.

Results of Physical stability test:

Dilution test, conductivity test and dye test are used for identification of type of emulsion whether it is oil in water type (O/W) or water in oil type (W/O). In oil in water type emulsion the oil is the dispersed phase whereas water is the continuous phase. This type is generally preferred for internal use because the unpleasant taste and odour is masked by emulsification and oil being in finely dispersed state is more quickly assimilated in the body⁵. In water in oil type emulsion the water is the dispersed phase whereas oil is the continuous phase. These types of emulsions are mainly used externally as lotions or creams.

Dilution test:

Dilution test was carried out on all 6 samples, they are identified as O/W type of emulsion.

Conductivity test:



Conductivity test was carried out on *taila* and *kashaya* which were considered as standard. *Kashaya* being water media easily conducts electricity while *taila* did not allow the electricity to pass through it. Later the test was done on 6 samples and all of them conducted electricity. So it was identified as O/W type of emulsion. Related pictures are enumerated under the heading Figure 1.

Dye test:

Dye test was initially done on *taila* and *kashaya* which were considered as standard. On treating Amaranth with *taila* drop and when observed under microscope continuous phase appeared colorless and on adding Sudan III with *taila* it showed continuous phase red. On adding Amaranth to the *kashaya* and observing under microscope showed continuous phase red and it was colourless with Sudan III. Later 6 samples were treated with Amaranth and Sudan III Dye separately and observed under microscope. All the samples gave continuous phase red with Amaranth and droplets appeared colorless, continuous phase colorless with Sudan and droplets showing reddish pink colour. All were categorized as O/W type emulsion. Related pictures are enumerated under the heading Figure 2.

Rate of sedimentation:

A homogeneous mixture and a single entity of a *basti* formulation yields better results. If all the ingredients get separated then the purpose will not be served hence rate of sedimentation is given importance.

Based on onset and rate of separation along with total time taken for separation, samples can be rated from less stable to highly stable sample as follows:

3rd sample-quick onset and rapid separation - less stable/not stable

4th sample-rapid onset and rapid separation - less stable/not stable

2nd sample-mild onset but rapid separation - less stable/not stable

1st sample-slow onset, mild rate of separation - stable

6th sample-mild rate of onset, mild separation - stable

5th sample- very slow onset, very slow separation - highly stable

DISCUSSION

- Organoleptic examination reveals difference in colour, taste, consistency among all samples which indicate some chemical changes in each method while smell of all samples being the same.

- Acid value⁶ is increased in sample 6th, followed by 2nd, 1st, 3rd, 5th and 4th sample. It indicates short shelf life in 6th sample followed by other samples. Hence,

early chances of rancidity in 6th sample followed by 2nd sample, 1st sample, 3rd sample, 5th sample, 4th sample with delayed chances of rancidity.

Figure 1 Conductivity test carried on all samples

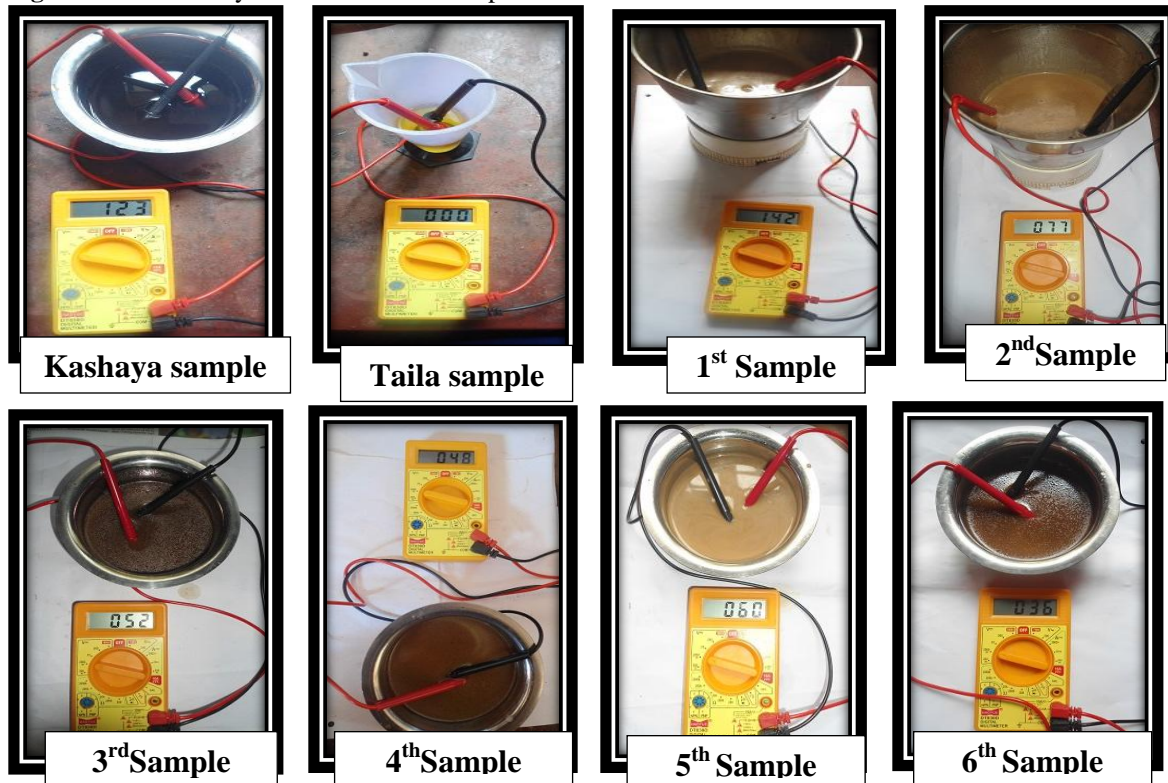
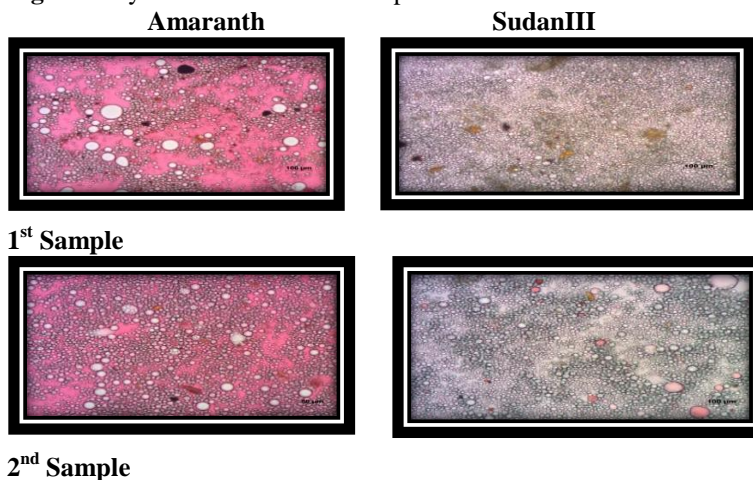
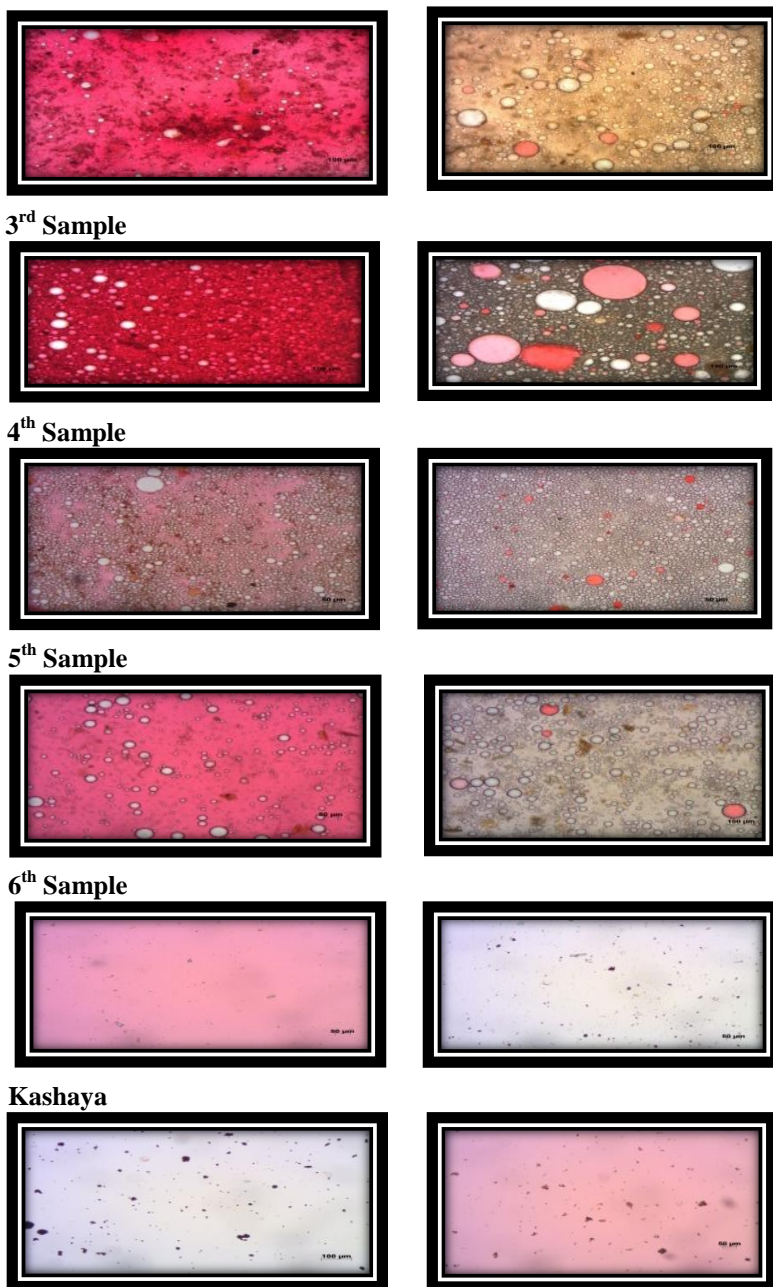


Figure 2 Dye test carried on all samples





- Highest rate of absorption to lowest rate is seen among samples in following order: sample 6th followed by 1st sample, 2nd sample, 5th sample, 3rd sample, and last 4th sample which is indicated by saponification value⁷.

- Level of unsaturation⁸ is indicated by iodine value which is more in 4th sample followed by 6th sample, 5th sample, 1st sample, 3rd sample, least value in 2nd sample
- 4th sample is said be more viscous, followed by 5th sample, 2nd sample, 1st



sample, 6th sample and 3rd sample in decreasing order respectively based on viscosity value⁹.

- All the samples are identified as O/W type of Emulsion.
- Based on rate of sedimentation it can be understood that classical method of Madhutailikabasti formulation is having more stability than modified methods.
- Better action will be seen with the formulation which is prepared using churner than mixer or edge runner mill.

CONCLUSION

With the analytical study it can be concluded that classical method of preparation of *Madhutailikabasti* with serial order of mixing the ingredients using churner is more stable and would be better absorbed compared to other modified methods.



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