

Comparative Analytical Evaluation of Physicochemical Characteristics of *Madhutailik Basti* Prepared by Hasta and Blender Methods

Manjusha Sunil More^{1*}, Nehal Jayesh More², Vaishnavi Rajesh Kherde³, Rucha Vijay Datar⁴, Neha Prakash Hedao⁵, Vatsal Ashvinkumar Surati⁶

- ¹. Professor and HOD, Department of Panchakarma, Shree Saptashruni Ayurveda Mahavidyalaya Nashik, Maharashtra, India-422003. Email ID- manjushasunilmore@gmail.com
- ². Assistant Professor, Department of Panchakarma, Shree Saptashruni Ayurveda Mahavidyalaya Nashik, Maharashtra, India-422003. Email ID- bhoinehal@gmail.com
- ³. PG scholar, Department of Panchakarma, Shree Saptashruni Ayurveda Mahavidyalaya Nashik, Maharashtra, India-422003. Email ID-g263293@gmail.com
- ⁴. PG scholar, Department of Panchakarma, Shree Saptashruni Ayurveda Mahavidyalaya Nashik, Maharashtra, India-422003. Email ID- ruchadatar443@gmail.com
- ⁵. PG scholar, Department of Panchakarma, Shree Saptashruni Ayurveda Mahavidyalaya Nashik, Maharashtra, India-422003. Email ID-nehahedao1999@gmail.com
- ⁶. PG scholar, Department of Panchakarma, Shree Saptashruni Ayurveda Mahavidyalaya Nashik, Maharashtra, India-422003. Email ID-vatsalsurati02@gmail.com

Corresponding Author*:

Dr. Manjusha Sunil More

Professor and HOD, Department of Panchakarma

Shree Saptashruni Ayurveda Mahavidyalaya Nashik, Maharashtra, India- 422003

Address- More Niwas, Behind KKW Engineering College, Jai Ambe Nagar, Panchavati, Nashik, Maharashtra, India - 422003

Email ID- manjushasunilmore@gmail.com

ABSTRACT

Background

Basti is an important therapeutic procedure of Ayurveda in which appropriate preparation of Basti Dravya is essential for obtaining a properly homogenized formulation. Classical Ayurvedic texts describe a specific sequence for combining Madhu, Saindhava, Sneha, Kalka and Kwatha. Differences in the order and technique of mixing may influence the physical characteristics and stability of the final preparation.

Objective

To compare the physicochemical characteristics of Madhutailik Basti prepared by Hasta and Blender methods using sequential and all-together mixing procedures.

Materials and Methods

An analytical comparative formulation study was conducted in the Research Laboratory of Shree Saptashruni Ayurved Mahavidyalaya, Nashik. Madhutailik Basti was prepared by four methods: Hasta-sequential, Hasta-all together, Blender-sequential and Blender-all together. Each preparation contained Erandamoola Kwatha 300 mL, Madhu 150 mL, Tila Taila 150 mL, Saindhava 15 g and Shatapushpa-Madanphala Kalka 50 g. The preparations were evaluated for pH, viscosity, colour, temperature, specific gravity, refractive index, mixing duration, separation time, dilution behaviour and microscopic characteristics.

Results

The pH values were 5.30, 5.11, 4.90 and 4.52 in Hasta-sequential, Hasta-all together, Blender-sequential and Blender-all together preparations, respectively. Viscosity ranged from 8.23 to 9.38 cP. Specific gravity ranged from 1.0067 to 1.036, while refractive index ranged from 1.4250 to 1.4979. Mixing duration was 80, 60, 15 and 8 minutes, respectively. Separation began after 50 minutes and ended at 3 hours in Hasta-sequential preparation, whereas the corresponding periods were 10–20 minutes, 5–15 minutes and 2–7 minutes in the other three methods. Surface bubbles were observed in the Blender preparations but not in the Hasta preparations.

Conclusion

The four preparation methods showed broadly comparable recorded values for several physicochemical parameters, whereas marked differences were observed in mixing duration, separation behaviour, dilution characteristics and microscopic appearance. Under the conditions of this study, Hasta-sequential preparation demonstrated the longest separation time and absence of visible surface bubbles, indicating greater physical stability than the other tested methods.

Keywords: Madhutailik Basti; Niruha Basti; Basti Samyojana; Hasta; Blender; physicochemical characteristics; emulsion stability; Panchakarma

How to cite this article: Manjusha Sunil More, Nehal Jayesh More, Vaishnavi Rajesh Kherde, Rucha Vijay Datar, Neha Prakash Hedao, Vatsal Ashvinkumar Surati. Comparative Analytical Evaluation of Physicochemical Characteristics of

Madhutamlik Basti Prepared by Hasta and Blender Methods. Int J Drug Deliv Technol. 2026;16(88s):157-162. DOI: 10.25258/ijddt.16.88s.16.

INTRODUCTION

Basti Karma is one of the major therapeutic procedures described in Ayurveda, and detailed descriptions of its preparation and administration are available in Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, Kashyapa Samhita and Sharangadhara Samhita. The preparation of Niruha Basti involves the combination of multiple components, including Madhu, Saindhava, Sneha, Kalka and Kwatha, and classical texts describe an ordered procedure for their incorporation.[1-4]

The sequence of mixing has particular importance because the individual ingredients possess different physical characteristics. Madhu and Sneha represent different phases, while Saindhava and Kalka require adequate incorporation into the liquid components. Classical descriptions therefore emphasize appropriate mixing and homogenization before administration. [2,3] The desired Basti Dravya should not be excessively fluid or excessively thick, and proper preparation is associated with appropriate consistency and integration of its components. [3,4]

Madhutamlik Basti is a formulation containing Madhu and Tila Taila along with Saindhava, Kalka and a decoction component. The preparation described in the present study consists of Erandamoola Kwatha, Madhu, Tila Taila, Saindhava and Shatapushpa-Madanphala Kalka. The source formulation specifies equal quantities of Madhu and Tila Taila, together with the other ingredients.

The preparation of Basti has traditionally been performed manually. However, contemporary practice may employ mechanical devices such as blenders for rapid mixing. A previous study on Madhutamlika Basti specifically examined preparation and standardization with reference to emulsion stability, demonstrating the relevance of formulation technique to the physical behaviour of Basti preparations.[6] Studies concerning Bhavana Samskara and particle-size distribution in Niruha Basti have also indicated that processing can influence physical characteristics of the finished formulation.[7]

Despite the availability of mechanical mixing, the comparative effect of manual and mechanical preparation using different mixing sequences requires assessment. The present study therefore compared Madhutamlik Basti prepared by four approaches: Hasta-sequential, Hasta-all together, Blender-sequential and Blender-all together.

Equipment:

Table No. 02: Equipment for study

Blender	Microscopes, slides, test tubes
Vessels	Viscometer

AIM AND OBJECTIVES

Aim

To compare the physicochemical characteristics of Madhutamlik Basti prepared by Hasta and Blender methods.

Objectives

1. To prepare Madhutamlik Basti by four different mixing methods.
2. To compare the physicochemical characteristics of the preparations.
3. To assess the effect of sequential and all-together mixing.
4. To compare the mixing duration and separation behaviour of the four preparations.
5. To assess the dilution characteristics and microscopic appearance of the preparations.
6. To identify the preparation method demonstrating greater physical stability under the conditions of the study.

MATERIALS AND METHODS

Study Design

The study was an analytical comparative formulation study involving four preparations of Madhutamlik Basti. The analytical work was conducted in the Research Laboratory of Shree Saptashrungi Ayurved Mahavidyalaya, Nashik. The formulation was prepared in the Postgraduate Hospital, Panchakarma section of the institution.

Formulation Composition

The same quantities of ingredients were used for each preparation.

Table 1. Composition of Madhutamlik Basti

Ingredient	Quantity
Erandamoola Kwatha	300 mL
Madhu	150 mL
Tila Taila	150 mL
Saindhava	15 g
Shatapushpa and Madanphala Kalka	50 g

Madhu and Saindhava were procured from the local market in Nashik, while Murchita Tila Taila, Shatapushpa and Madanphala Churna and Erandamooladi Kwatha were obtained from the institutional pharmacy.

Induction/ Stove	Refractometer
Measuring cylinder	pH meter
Filter	Thermometer

Microscopes	Sp. Gravity measuring
-------------	-----------------------

Methods

The study was conducted in two phases:

Phase 1: Preparation of Madhutailik Niruha Basti

Madhutailik Niruha Basti was prepared by four different methods to compare classical and contemporary approaches: Hasta (manual) sequential mixing, Hasta (manual) mixing of all ingredients together, Blender sequential mixing, and Blender mixing of all ingredients together. The sequential methods followed the prescribed order of ingredient incorporation, whereas the all-together methods involved simultaneous mixing of all ingredients.

Phase 2: Assessment of Bhavana Samskara

The second phase evaluated the role of Bhavana Samskara (trituration) in Madhutailik Basti and bonding of the formulation during the preparation process.

Preparation Methods

Four preparations were prepared using two modes of mixing and two orders of incorporation.

Sample A: Hasta-Sequential

Saindhava was first mixed with Madhu using the palm. Tila Taila was subsequently added and mixed thoroughly. Kalka was then incorporated, followed by Erandamooladi Kwatha. Mixing was continued until a homogeneous preparation was obtained.

Sample B: Hasta-All Together

Madhu, Saindhava, Tila Taila, Kalka and Kwatha were taken together and mixed manually using the palm. Mixing was continued until the ingredients appeared adequately incorporated, Saindhava was dissolved, Kalka did not show obvious sedimentation and separate Taila and Kwatha layers were not visible.

Sample C: Blender-Sequential

Madhu and Saindhava were first mixed, followed by Murchita Tila Taila. Kalka was then incorporated and finally Erandamooladi Kwatha was added. The complete mixture was homogenized using a blender.

Sample D: Blender-All Together

All ingredients were taken together and mixed using a blender until the components appeared adequately incorporated.

Table 3. Preparation Methods

Sample	Method	Mixing sequence
A	Hasta	Sequential
B	Hasta	All together
C	Blender	Sequential
D	Blender	All together

Analytical Assessment

Freshly prepared samples were examined for organoleptic, physicochemical and microscopic characteristics. The parameters included:

1. pH
2. Viscosity
3. Colour
4. Temperature
5. Specific gravity
6. Refractive index
7. Duration of mixing
8. Separation time
9. Dilution test
10. Microscopic characteristics

The equipment used included a blender, microscope, viscometer, refractometer, pH meter, thermometer and specific-gravity measuring apparatus.

pH

pH was assessed for all four preparations after mixing. The recorded values were compared descriptively.

Viscosity

Viscosity was assessed using a viscometer and expressed in cP as recorded in the source data. Viscosity is relevant to the flow characteristics of Basti Dravya, and classical descriptions emphasize that the preparation should neither flow excessively nor remain excessively fixed. [3,8]

Colour

The colour of each freshly prepared formulation was recorded by visual observation.

Temperature

The temperature of each preparation was recorded after mixing using a thermometer.

Specific Gravity

Specific gravity was determined using the available specific-gravity measuring apparatus. Specific gravity provides an indication of the density of a preparation and can be influenced by the distribution of its constituents.

Refractive Index

Refractive index was measured using a refractometer. The recorded values were compared among the four preparation methods.

Mixing Duration

The total time required to obtain the final preparation was recorded for each method.

Separation Time

The onset of visible separation and the recorded completion of separation were documented for each preparation. Separation time was considered an indicator of the physical stability of the formulation.

Dilution Test

The dilution behaviour of each sample was assessed using water. The observations were recorded as soluble or insoluble in water.

Microscopic Examination

Fresh preparations were examined microscopically. The study documented comparative microscopic characteristics, including the presence or absence of visible surface bubbles.

Statistical Analysis

The observations were compared descriptively among the four preparation methods.

RESULTS

pH

The pH of the four preparations ranged from 4.52 to 5.30. The highest value was recorded in the Hasta-sequential preparation and the lowest in the Blender-all-together preparation.

Table 4. pH of Madhutailik Basti

Sample	Method	pH
A	Hasta-sequential	5.30
B	Hasta-all together	5.11
C	Blender-sequential	4.90
D	Blender-all together	4.52

The sequential preparations showed higher recorded pH values than the corresponding all-together preparations.

Viscosity

Viscosity ranged from 8.23 to 9.38 cP.

Table 5. Viscosity of Madhutailik Basti

Sample	Method	Viscosity
A	Hasta-sequential	8.23 cP
B	Hasta-all together	9.09 cP
C	Blender-sequential	9.25 cP
D	Blender-all together	9.38 cP

The lowest recorded viscosity was observed with Hasta-sequential preparation, while the highest was recorded with Blender-all together.

Colour

Table 6. Colour of Madhutailik Basti

Sample	Method	Colour
A	Hasta-sequential	Light cream
B	Hasta-all together	Brown
C	Blender-sequential	Cream
D	Blender-all together	Dull brown

The sequential preparations showed lighter recorded colours than the all-together preparations.

Temperature

Table 7. Temperature of Madhutailik Basti

Sample	Method	Temperature
A	Hasta-sequential	28°C
B	Hasta-all together	27.5°C
C	Blender-sequential	30°C
D	Blender-all together	30°C

The two Blender preparations showed the highest recorded temperature at 30°C.

Specific Gravity

Table 8. Specific Gravity of Madhutailik Basti

Sample	Method	Specific gravity (g/m ³)
A	Hasta-sequential	1.036
B	Hasta-all together	1.0348
C	Blender-sequential	1.0186
D	Blender-all together	1.0067

The highest recorded value was observed in Hasta-sequential and the lowest in Blender-all together.

Refractive Index

Table 9. Refractive Index of Madhutailik Basti

Sample	Method	Refractive index
A	Hasta-sequential	1.4353 m/s
B	Hasta-all together	1.4979 m/s
C	Blender-sequential	1.4250 m/s
D	Blender-all together	1.4252 m/s

The highest recorded refractive index was observed in the Hasta-all-together preparation.

Duration of Mixing

Table 10. Duration of Mixing

Sample	Method	Duration
A	Hasta-sequential	1 h 20 min
B	Hasta-all together	1 h
C	Blender-sequential	15 min
D	Blender-all together	8 min

The Blender-all-together method required the shortest preparation time, whereas Hasta-sequential required the longest.

Separation Time

Table 11. Separation Time of Madhutailik Basti

Sample	Method	Start of separation	End of separation
A	Hasta-sequential	50 min	3 h
B	Hasta-all together	10 min	20 min
C	Blender-sequential	5 min	15 min
D	Blender-all together	2 min	7 min

Hasta-sequential demonstrated substantially longer resistance to visible separation than the other three methods.

Dilution Test

Table 12. Dilution Behaviour

Sample	Method	Observation
A	Hasta-sequential	Soluble in water
B	Hasta-all together	Insoluble in water
C	Blender-sequential	Soluble in water
D	Blender-all together	Insoluble in water

The sequential preparations were recorded as soluble in water, whereas the all-together preparations were recorded as insoluble.

Microscopic Observation

Microscopic examination demonstrated visible surface bubbles in the Blender-sequential and Blender-all-together preparations. No surface bubbles were observed in the two Hasta preparations. The Hasta preparations also showed a more homogeneous appearance.

DISCUSSION

The preparation of Niruha Basti is described in classical Ayurvedic literature as a systematic process involving the appropriate combination and sequential incorporation of Madhu, Saindhava, Sneha, Kalka, and Kwatha. Proper mixing and appropriate incorporation of the ingredients are considered important for achieving a suitably prepared Basti formulation.[1–5] The present study evaluated whether variation in the mode and sequence of mixing influences the physicochemical characteristics of Madhutailik Basti.

The formulation composition was kept constant across the four preparations, while the method of

preparation was varied as Hasta-sequential, Hasta-all together, Blender-sequential, and Blender-all together. This permitted comparison of manual and mechanical mixing as well as sequential and simultaneous incorporation of the ingredients.

pH

The recorded pH values ranged from 4.52 to 5.30. Hasta-sequential showed the highest recorded pH, whereas Blender-all together showed the lowest. The all-together preparations were comparatively more acidic than the sequential preparations.

These findings indicate that the preparation method was associated with variation in the recorded acidity of the final formulation. However, the study measured pH only and did not investigate the chemical mechanisms responsible for these differences. Therefore, the observed variation should be interpreted as a physicochemical difference between the preparation methods rather than as evidence of a specific therapeutic or absorptive effect.

Viscosity

The viscosity values ranged from 8.23 to 9.38 cP. Hasta-sequential showed the lowest recorded viscosity, whereas Blender-all together showed the highest. Classical descriptions emphasize that properly prepared Basti should possess an appropriate consistency and should neither flow excessively like water nor remain excessively fixed.[2,5]

The viscosity measurements therefore provide an objective description of the consistency of the four preparations. Despite the substantial difference in preparation time, the overall variation in viscosity was comparatively limited. This suggests that mechanical mixing substantially improved preparation efficiency without producing a proportionately large change in the measured viscosity.

The presence of Kalka may contribute to the consistency of the formulation; however, the present study did not separately determine the contribution of individual ingredients to viscosity. Any specific association between an individual component and the measured viscosity should therefore be considered interpretative rather than experimentally established.

Colour

The preparations showed variation from light cream to brown and dull brown. The sequential preparations were comparatively lighter than the all-together preparations. This difference may be related to the extent of mixing, rubbing, and distribution of the formulation components.

The original observations suggested that prolonged rubbing during sequential preparation may contribute to more uniform distribution of the constituents.[6] However, because colour was assessed visually rather than by instrumental colour measurement, the finding should be regarded as an

organoleptic observation. Colour alone cannot establish differences in particle size or emulsion characteristics.

Temperature

The recorded temperature was 28°C for Hasta-sequential, 27.5°C for Hasta-all together, and 30°C for both Blender preparations. The relatively higher temperature recorded after Blender preparation may be related to the mechanical action involved in blending.

Temperature can influence the physical behaviour and viscosity of liquid formulations. Classical considerations also emphasize appropriate temperature during Basti administration.[4] However, the present study only recorded the temperature of the prepared formulations and did not experimentally evaluate its relationship with viscosity, absorption, pharmacokinetics, or therapeutic response. Therefore, no direct inference regarding enhanced absorption can be made from the temperature findings.

Specific Gravity

The recorded specific gravity values were 1.0360, 1.0348, 1.0186, and 1.0067 for Hasta-sequential, Hasta-all together, Blender-sequential, and Blender-all together, respectively.

The Hasta preparations showed higher recorded specific gravity than the Blender preparations. Specific gravity provides a physicochemical indication of the relative density of a formulation and may reflect differences in the physical distribution of its constituents. However, compositional analysis was not performed in the present study; therefore, the specific component responsible for the observed differences cannot be identified.

The source discussion relates specific gravity to the physical characteristics of Basti and the presence of dispersed or dissolved components.[6] In the absence of compositional analysis, this relationship should be regarded as a possible interpretation rather than a demonstrated mechanism.

Refractive Index

The refractive index ranged from 1.4250 to 1.4979, with the highest value recorded for Hasta-all together. The variation in refractive index did not follow the same pattern as viscosity or specific gravity.

This finding indicates that the physicochemical parameters did not change uniformly according to a single preparation method. Differences in refractive index may reflect variation in the physical composition or distribution of dissolved and dispersed constituents; however, the present study did not perform compositional analysis to establish the underlying cause.

Mixing Duration

The most pronounced operational difference among the four methods was the duration of mixing. Hasta-sequential required 80 minutes, Hasta-all together

60 minutes, Blender-sequential 15 minutes, and Blender-all together 8 minutes.

Thus, mechanical mixing markedly reduced the time required for preparation. From a practical perspective, this represents an important advantage of the Blender method. Nevertheless, preparation speed alone cannot be considered an indicator of formulation quality. Classical Basti preparation emphasizes appropriate incorporation, mixing, and achievement of the desired formulation characteristics rather than rapid completion.[1–5]

The present findings illustrate this distinction clearly. Blender-all together required the shortest preparation time but subsequently showed the earliest separation, whereas Hasta-sequential required the longest preparation time but demonstrated the longest observed separation time.

Separation Time and Physical Stability

Separation behaviour showed the clearest difference among the four preparation methods. Hasta-sequential began to separate after 50 minutes and reached the recorded endpoint after 3 hours. In comparison, Hasta-all together separated within 20 minutes, Blender-sequential within 15 minutes, and Blender-all together within 7 minutes.

The longer separation time observed with Hasta-sequential indicates greater resistance to visible separation under the conditions of the experiment. This observation is consistent with the importance given to proper mixing, homogeneity, and stability in classical Basti preparation.[5,7]

The findings also suggest that the sequence of incorporation may have an important influence on the physical behaviour of the formulation. Hasta-sequential, which involved stepwise incorporation of the ingredients, showed the longest observed stability among the four preparations. In contrast, simultaneous incorporation, particularly with mechanical mixing, was associated with earlier separation.

However, separation time should be interpreted as an indicator of observed physical stability, rather than as direct evidence of superior therapeutic efficacy. The present study did not assess droplet-size distribution, zeta potential, interfacial characteristics, or other advanced parameters of emulsion stability.

Dilution Behaviour

The dilution test demonstrated a difference according to the order of mixing. Hasta-sequential and Blender-sequential preparations were recorded as soluble in water, whereas Hasta-all together and Blender-all together preparations were recorded as insoluble.

The same pattern across both manual and mechanical preparation suggests that the sequence of ingredient incorporation may have contributed to this observation more strongly than the type of equipment used. The dilution test, however, was qualitative and therefore provides an observation of

physical behaviour rather than a quantitative measure of solubility or dispersion.

Microscopic Characteristics and Particle-Size Interpretation

Microscopic examination revealed visible surface bubbles in both Blender preparations, whereas no surface bubbles were observed in the Hasta preparations. The presence of bubbles may be associated with the mechanical action of the Blender during preparation.

The absence of visible surface bubbles in the Hasta preparations may be consistent with comparatively better physical homogeneity under the conditions of the experiment. The original discussion also relates the absence of visible bubbles and the longer separation time in the Hasta preparations to a tighter and more stable emulsion pattern.[6]

Particle size requires particular caution in interpretation. The source discussion proposes that prolonged rubbing and sequential mixing may reduce particle size and promote more uniform distribution, while all-together mixing may result in comparatively larger particles.[6] However, the present study did not report quantitative particle-size measurements, particle-size distribution, mean particle diameter, or statistical analysis of particle size. Therefore, particle-size differences cannot be presented as a measured quantitative outcome of this study.

Similarly, although smaller particle or droplet size is theoretically associated with physical stability in dispersed systems, the present findings do not establish a direct causal relationship between particle size and the observed separation time. Such a relationship would require dedicated particle-size and emulsion-characterization studies.

Overall Interpretation

Taken together, the findings indicate that both the mode of mixing and the sequence of ingredient incorporation influenced the physicochemical behaviour of Madhutilik Basti, although the magnitude and direction of variation differed among individual parameters.

The Blender methods provided a substantial reduction in preparation time, with completion within 15 minutes for Blender-sequential and 8 minutes for Blender-all together, compared with 80 minutes for Hasta-sequential and 60 minutes for Hasta-all together. This demonstrates a clear operational advantage of mechanical mixing.

However, the fastest preparation did not demonstrate the greatest physical stability. Blender-all together showed the earliest separation, whereas Hasta-sequential demonstrated the longest observed resistance to separation. The sequential preparations were also recorded as soluble in water, while the all-together preparations were recorded as insoluble. Furthermore, visible surface bubbles were observed in the Blender preparations but not in the Hasta preparations.

These findings collectively suggest that preparation efficiency and formulation stability are not necessarily equivalent outcomes. Mechanical mixing can substantially shorten the preparation time, whereas sequential manual incorporation may provide greater resistance to visible separation under the experimental conditions used in this study.

The findings are also consistent with the classical emphasis on systematic incorporation and appropriate mixing of Basti ingredients.[1–5] Nevertheless, the present study should not be interpreted as demonstrating therapeutic superiority of one preparation method, because clinical efficacy, absorption, pharmacokinetics, and patient outcomes were not evaluated.

The present findings have practical relevance for the preparation and standardization of Madhutilik Basti. The Blender method substantially reduced preparation time and may therefore offer an operational advantage where rapid preparation is required. However, the longer separation time observed with Hasta-sequential suggests that the sequence and manner of incorporation remain important considerations when physical stability is prioritized.

Accordingly, mechanical preparation should not be considered equivalent to classical sequential preparation solely on the basis of reduced preparation time. Standardization of the preparation process should consider both operational efficiency and the physicochemical characteristics of the finished formulation.

Overall, the present study demonstrates that variation in the method and sequence of mixing can influence selected physicochemical characteristics of Madhutilik Basti. The Blender methods substantially reduced preparation time, whereas Hasta-sequential preparation demonstrated the longest observed separation time and comparatively greater physical stability.

The findings support the importance of systematic ingredient incorporation in the preparation of Madhutilik Basti. However, the study does not provide quantitative evidence regarding particle-size reduction or enhanced absorption. Such interpretations require confirmation through dedicated analytical and pharmacological investigations.

LIMITATIONS

1. The available observations represent the recorded values for the four preparation methods.
2. Microscopic examination was qualitative and did not provide numerical particle-size measurements.
3. The study evaluated physicochemical and microscopic characteristics only.
4. No assessment of pharmacokinetics, absorption, clinical efficacy or therapeutic outcome was performed.

5. The study does not establish that the observed physical differences translate into differences in clinical effectiveness.

CONCLUSION

Madhutailik Basti prepared by Hasta-sequential, Hasta-all-together, Blender-sequential and Blender-all-together methods showed broadly comparable recorded values for several physicochemical parameters, including pH and viscosity. However, substantial differences were observed in mixing duration, separation time, dilution behaviour and microscopic appearance. The Blender methods substantially reduced the time required for preparation. In contrast, the Hasta-sequential method showed the longest recorded separation time and no visible surface bubbles. Among the four methods evaluated, Hasta-sequential preparation demonstrated the greatest observed physical stability under the conditions of the present analytical study. The findings indicate that both the sequence of ingredient incorporation and the method of mixing influence the physical characteristics of Madhutailik Basti.

ACKNOWLEDGEMENTS

The authors acknowledge the Department of Panchakarma and the Research Laboratory of Shree Saptashrungi Ayurved Mahavidyalaya, Nashik, for providing the facilities required for preparation and analytical evaluation of Madhutailik Basti.

FUNDING

No external funding is reported in the source study.

CONFLICT OF INTEREST

The source study does not report any conflict of interest.

ETHICAL STATEMENT

The present work was a laboratory-based analytical formulation study and did not involve human participants or clinical intervention. No human or animal experimentation is reported in the source study.

DATA AVAILABILITY

The data presented in this manuscript are derived from the analytical observations recorded in the original study.

REFERENCES

1. Vaidya Yadavaji Trikamji Acharya, editor. Charaka Samhita of Agnivesha with Ayurveda Dipika Commentary of Chakrapanidatta. New Delhi: Chaukhambha Surbharati Prakashan; 2011. Siddhi Sthana 10/7. p.724.
2. Sushruta Samhita. Vaidya Jadavaji Trikamji Acharya, editor. Sushruta Samhita with Nibandha Sangraha Commentary. Varanasi: Chaukhambha Orientalia; 2011. Chikitsa Sthana 35/3-4. p.525.
3. Harishastri Paradakara, editor. Ashtanga Hridaya with Sarvangasundara and Ayurvedarasayana Commentaries. Varanasi: Chaukhambha Surbharti Prakashan; 2010. Sutra Sthana 19/45. p.279.
4. Sushruta Samhita. Shastri A, Hindi commentary. Vol 1. Varanasi: Choukhamba Surbharati Prakashana; 2014. Chikitsa Sthana 38/33. p.211.
5. Vijayan L, Prasanth D, Sharma AR. A conceptual analysis on the preparation and administration of Niruha Basti. Ayurpharm Int J Ayur Alli Sci. 2015;4(12):226-235.
6. Savrikar SS, Lagad CE. Study of preparation and standardization of Madhutailika Basti with special reference to emulsion stability. AYU. 2010;31(1):1-6.
7. Prasad BS. Effect of Bhavana Samskara on particle size distribution in various stages of preparation of Niruha Basti with special reference to Madhutailika Basti. Int J Ayurvedic Med. 2014;5(4):307-314.
8. Athira MP. Evaluation of specific physico chemical characters of Balaguduchyadi Niruha Vasti Dravya prepared in various methods. Amrita Vishwa Vidyapeetham. p.17.
9. Kavita BS, Yadahalli SL, Desai AS. Conceptual analysis and practical approach on the preparation of Niruha Basti (Basti Sammilana Vidhi). IJAR. 2019;9(3):72-74.
10. Bende et al. A critical review on pharmacodynamics of Basti Chikitsa and its action on enteric nervous system. IJAM. 2015;6(4):301-304.
11. Mukharjee et al. Efficacy of Vaitaran Basti with respective to Ayurveda. JDDT. 2018;8(6-5):246-250.
12. Patil VC. Principle and Practices of Panchkarma. 4th ed. Delhi: Chaukhamba Publication; 2014. p.453.
13. Khandpur RS. Handbook of Analytical Instruments. 2nd ed. Kapurthala, Punjab: Pushpa Gujarat Science City; p.511.
14. The Ayurvedic Pharmacopoeia of India. Part II. Vol 3. New Delhi: Controller of Publications; 2010. p.193.
15. Charaka Samhita of Agnivesha. Yadavji T, editor. Siddhi Sthana. 3rd ed. Varanasi: Choukhamba Surbharati Prakashana; 2017. Ch.1, Ver.7. p.678.