

A Classical Ayurvedic Interpretation of the Time Required for Sneha to Reach Different Dhātu Levels: An Analytical Study of Mātrā and Its Clinical Relevance to Kati Basti

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Abstract: ***Background:** Classical Ayurvedic descriptions assign progressively increasing Mātrā values to the action of Sneha at successive tissue levels. This study interprets these temporal values using a defined classical conversion framework and examines their possible relevance to Kati Basti. **Aim:** To calculate modern time equivalents for the classical Mātrā sequence associated with different Dhātu levels. **Materials and Methods:** Relevant descriptions from the Suśruta Saṁhitā, Dalhaṇa's commentary, and Aṣṭāṅga Saṅgraha were examined. Mātrā was converted into seconds through the stated relationships among Muhūrta, Kāla, Kāṣṭhā, and Akṣi-nimeṣa. **Results:** The calculated duration increased progressively from approximately 1 minute 36 seconds at Romānta to approximately 4 minutes 48 seconds at Majjā when rounded for practical presentation. **Conclusion:** The adopted classical conversion framework places the 900-Mātrā endpoint close to five minutes. This provides a useful conceptual temporal correlation for discussing local Sneha procedures such as Kati Basti, but it should not be interpreted as experimental evidence of sequential anatomical penetration of externally applied oil.*

Keywords: Abhyaṅga, Sneha, Mātrā, Kāla, Dhātu, Dalhaṇa, Suśruta Saṁhitā, Asthi, Majjā, Kati Basti, Ayurveda

1. Introduction

Ayurveda describes health as a state of equilibrium among Doṣa, Dhātu and Mala along with the proper functioning of Agni and other physiological components. Therapeutic and preventive measures are therefore directed not only toward disease management but also toward maintaining the structural and functional integrity of the body.

Among the external Sneha procedures, **Abhyaṅga** has an important place. It involves the application of oil or other suitable unctuous substances over the body, traditionally accompanied by appropriate massage. Classical texts attribute multiple beneficial effects to Abhyaṅga, particularly with respect to Vāta, strength, skin health, sleep and general nourishment.

The concept of Sneha reaching different levels of the body is particularly interesting from the perspective of Ayurvedic physiology. Dalhaṇa's commentary on the Suśruta Saṁhitā describes a sequential time requirement expressed in Mātrā, with increasing values assigned to progressively deeper structures:

Romānta → **Tvak** → **Rakta** → **Māṃsa** → **Meda** → **Asthi** → **Majjā**

The corresponding values are given as:

300 → **400** → **500** → **600** → **700** → **800** → **900 Mātrā**

Although the original description is expressed in a classical unit of time, it can be conceptually converted into modern

seconds using the relationships among Akṣi-nimeṣa, Kāṣṭhā, Kāla and Muhūrta.

2. Classical Basis

2.1 Abhyaṅga and Sneha

Abhyaṅga is described in Ayurvedic literature as an important Sneha-based procedure. The application of oil is associated with Snigdghata, softness and nourishment and is particularly useful in counteracting the qualities associated with Vāta¹.

The classical understanding is not restricted to superficial lubrication. Sneha is described in terms of its capacity to influence the body at deeper functional levels. This understanding provides the background for the description of the time required for Sneha to reach different Dhātu levels.

2.2 Dalhaṇa's Description

In the explanatory tradition of Dalhaṇa, the time required for Sneha to reach successive structures is described in Mātrā as follows:

Structure: **Romānta** → **Tvak** → **Rakta** → **Māṃsa** → **Meda** → **Asthi** → **Majjā**

Mātrā: **300** → **400** → **500** → **600** → **700** → **800** → **900**²

The sequence represents an incremental increase of **100 Mātrā** from one level to the next.

3. Classical Concept of Kāla

To interpret the above values quantitatively, the classical divisions of time need to be considered.

Suśruta describes the temporal sequence beginning with a very small interval associated with the time required to pronounce a short syllable³. The relationship between Akṣi-nimeṣa and Kāṣṭhā is then described, followed by progressively larger units culminating in Muhūrta and Ahorātra.

For the present calculation, the following relationships are adopted:

30 muhurta = 1 Ahoratri = 24 hours.

1 muhurta = $1/30 \times 24$ hours

= $24 \times 60 / 30$ minutes

1 muhurta = 48 minutes.

and, according to the particular conversion scheme used:

1 muhurta = 20 kala + $1/10$ of 1kala

= 20×30 kastha + $1/10 \times 30$ kastha

= 600 + 3 kastha

1 muhurta = 603 kastha.

Therefore:

603 kastha = 48 minutes

1 kastha = $48/603$ minutes

= $48 \times 60 / 603$ seconds

= $2880/603$ seconds

= 4.77 seconds.

Also, 15 akshinimesh = 1 kastha = 4.77 seconds

1 akshinimesh = $4.77/15$ seconds

= 0.318 seconds.

4. Methodology

This is a **textual and mathematical conceptual study** based on the classical Ayurvedic descriptions supplied for analysis.

Source material

The analysis considers:

- 1) **Suśruta Saṃhitā** – descriptions of Abhyāṅga/Sneha.
- 2) **Suśruta Saṃhitā** – description of Kāla-vibhāga.
- 3) **Dalhāṇa's commentary** – description of the time associated with Sneha reaching successive tissue/Dhātu levels.
- 4) **Aṣṭāṅga Saṅgraha** – the cited relationship of Mātrā with Akṣi-nimeṣa.

Method of calculation

The calculation was performed in four stages:

Stage 1: Muhūrta → minutes

Stage 2: Muhūrta → Kāṣṭhā

Stage 3: Kāṣṭhā → Akṣi-nimeṣa

Stage 4: Mātrā → seconds

The final equation used was: Mātrā multiplied by 0.318 seconds.

5. Calculation

5.1 Calculation of one Muhūrta

Given:

30 Muhūrta = 24 hours

Therefore:

1 Muhūrta = $24/30$ hours

1 Muhūrta = 0.8 hours

1 Muhūrta = 48 minutes

5.2 Calculation of Kāṣṭhā

According to the conversion framework adopted:

1 Muhūrta = 20 Kāla + $1/10$ Kāla

Since: 1 Kāla = 30 Kāṣṭhā

Therefore:

1 Muhūrta = $(20 \times 30) + 1/10 \times 30$ Kāṣṭhā = $(600 + 3)$ Kāṣṭhā

Thus:

1 Muhūrta = 600 + 3 Kāṣṭhā

1 Muhūrta = 603 Kāṣṭhā

5.3 Calculation of one Kāṣṭhā

Since:

603 Kāṣṭhā = 48 minutes

Then:

1 Kāṣṭhā = $48/603$ minutes

Converting minutes to seconds:

1 Kāṣṭhā = $48 \times 60 / 603$ seconds

1 Kāṣṭhā corresponds to approximately 4.776 seconds.

5.4 Calculation of one Akṣi-nimeṣa

Given:

15 Akṣi-nimeṣa = 1 Kāṣṭhā

Also,

1 Kāṣṭhā = approx. 4.776 seconds

Therefore:

1 Akṣi-nimeṣa = $4.776/15$ seconds

1 Akṣi-nimeṣa corresponds to approximately 0.3184 seconds.

According to the Aṣṭāṅga Saṅgraha relationship cited in this analysis:

1 Mātrā = 1 Akṣi-nimeṣa⁴

Therefore: 1 Mātrā = approx. 0.3184 seconds

For practical calculation: 1 Mātrā corresponds to approximately 0.318 seconds

6. Calculation of Time Required for Different Dhātu Levels

The formula used was: $T = M \text{ times } 0.318$

where: **T = time in seconds**

M = number of Mātrā

6.1 Romānta

300 times 0.318 = 95.4 seconds ≈ **1 minute 36 seconds**

6.2 Tvak

400 times 0.318 = 127.2 seconds ≈ **2 minutes 8 seconds**

6.3 Rakta

500 times 0.318=159 seconds $\approx$ **2 minutes 40 seconds**

6.4 Māmsa

600 times 0.318=190.8 seconds $\approx$ **3 minutes 12 seconds**

6.5 Meda

700 times 0.318=222.6 seconds $\approx$ **3 minutes 44 seconds**

6.6 Asthi

800 times 0.318=254.4 seconds $\approx$ **4 minutes 16 seconds**

6.7 Majjā

900 times 0.318=286.2 seconds $\approx$ **4 minutes 48 seconds**

7. Results

S. No.	Structure / Dhātu	Classical time (Mātrā)	Calculated time (sec)	Approximate time
1	Romānta	300	95.4	1 min 36 sec
2	Tvak	400	127.2	2 min 8 sec
3	Rakta	500	159	2 min 40 sec
4	Māmsa	600	190.8	3 min 12 sec
5	Meda	700	222.6	3 min 44 sec
6	Asthi	800	254.4	4 min 16 sec
7	Majjā	900	286.2	4 min 48 sec

Overall observation

The difference between each successive level is 100 Mātrā and 100 Mātrā corresponds to approximately 31.8 seconds.

Thus, approximately **32 seconds** is added for every successive level.

The sequence can therefore be represented as:

300 → 400 → 500 → 600 → 700 → 800 → 900

1:36 → 2:08 → 2:40 → 3:12 → 3:44 → 4:16 → 4:48

8. Discussion

The classical sequence demonstrates a clear relationship between increasing depth and increasing time expressed in Mātrā. Romānta is assigned 300 Mātrā, whereas Majjā is assigned 900 Mātrā. Thus, the deepest level in the sequence is assigned three times the Mātrā of the first level.

From an Ayurvedic perspective, this may be understood in relation to the progressive conceptual levels of the body. The sequence moves from the external/superficial level toward deeper Dhātu:

Romānta → Tvak → Rakta → Māmsa → Meda → Asthi → Majjā

This is significant because it demonstrates that the classical description is not merely qualitative; it also provides a quantitative temporal framework.

The use of Mātrā provides a means of expressing very short intervals of time. By relating Mātrā to Akṣi-nimeṣa and then

to larger units of Kāla, the classical description can be mathematically interpreted in terms of seconds.

However, this conversion requires an important methodological qualification. **The value of 0.318 seconds per Mātrā is not itself a modern experimentally measured constant.** It is derived mathematically from the particular classical conversion scheme adopted for the analysis.

Therefore, the result should be interpreted as:

“The modern time equivalent calculated from the classical Mātrā system.”

It should not be interpreted as:

“The experimentally proven time required for oil to penetrate a specific anatomical tissue.”

This distinction is essential for maintaining scientific accuracy.

9. Ayurvedic Interpretation of Dhātu Levels

The seven levels described in the sequence can be interpreted within the Ayurvedic framework as follows:

Romānta

Romānta refers to the hair-root/follicular region and represents the initial level of contact of Sneha with the external body.

Tvak

Tvak represents the skin and constitutes the principal external interface between the applied Sneha and the body.

Rakta

Rakta is the third level in the sequence. Although it may be correlated conceptually with blood for explanatory purposes, Rakta Dhātu has a broader significance within Ayurvedic physiology and should not be regarded as identical in every respect to modern whole blood.

Māmsa

Māmsa represents the muscle/tissue level in the Ayurvedic framework. The 600-Mātrā duration places it approximately 3 minutes 12 seconds into the sequence.

Meda

Meda is traditionally associated with adipose/fat tissue but also possesses a broader Ayurvedic physiological significance.

Asthi

Asthi represents the osseous/bony level. It is assigned 800 Mātrā, corresponding to approximately 4 minutes 16 seconds in the present calculation.

Majjā

Majjā represents the deepest level in the sequence, assigned 900 Mātrā. The calculated duration is approximately 4 minutes 48 seconds. It is important that these correlations be described as **conceptual correlations rather than exact anatomical equivalences.**

10. Clinical Correlation with Kati Basti

Kati Basti is a local Sneha-based procedure in which warm medicated oil is retained over the lumbar region using a suitable containment structure.

The classical Mātrā sequence provides an interesting temporal framework for understanding the duration of Sneha contact.

The calculated times relevant to deeper levels are:

- Māmsa – approximately **3 min 12 sec**
- Meda – approximately **3 min 44 sec**
- Asthi – approximately **4 min 16 sec**
- Majjā – approximately **4 min 48 sec**

Thus, 900 Mātrā corresponds to approximately 4.8 minutes or approximately 5 minutes.

From a classical Ayurvedic perspective, therefore, **approximately five minutes may be considered a meaningful temporal endpoint when discussing the duration associated with the deepest level described in this particular Mātrā sequence.**

This may provide a conceptual rationale for discussing adequate duration of Sneha contact during Kati Basti.

However, it would be scientifically inappropriate to conclude solely from this calculation that oil physically reaches the vertebral bone or bone marrow in five minutes.

Rather, the appropriate interpretation is:

A five-minute duration of Sneha retention corresponds approximately to the classical time calculated for 900 Mātrā, the value associated with Majjā in the described sequence.

This wording preserves the classical concept while avoiding an unsupported modern anatomical claim.

11. Possible Physiological Correlation

From a modern physiological perspective, topical application of oil should not be interpreted as implying that the entire bulk of the applied oil progressively travels through the skin, blood, muscle, adipose tissue, bone and bone marrow. Percutaneous absorption is a complex process influenced by the physicochemical properties of the applied substance, formulation/vehicle, molecular size and lipophilicity, exposure duration, skin hydration and integrity, temperature, anatomical site and mechanical manipulation such as rubbing or massage.⁵⁻⁸ The stratum corneum constitutes the principal barrier to passive transcutaneous transport, and only substances possessing suitable physicochemical characteristics can readily penetrate this barrier.⁶⁻⁷ Furthermore, the modern anatomical compartments of skin, blood, skeletal muscle, adipose tissue, bone and bone marrow do not correspond perfectly with the Ayurvedic concepts of Tvak, Rakta, Māmsa, Meda, Asthi and Majjā.

Therefore, the classical sequence should primarily be retained as an **Ayurvedic conceptual model of progressive tissue-level influence.**

12. Significance of the Five-Minute Correlation

The calculated endpoint of approximately 4 minutes 48 seconds is notable because it approximates five minutes.

The progression can be represented as:

Level	Mātrā	Approximate time
Romānta	300	1.6 min
Tvak	400	2.1 min
Rakta	500	2.7 min
Māmsa	600	3.2 min
Meda	700	3.7 min
Asthi	800	4.3 min
Majjā	900	4.8 min

This provides a simple teaching and research hypothesis:

900 Mātrā ≈ 5 minutes

The relationship may be useful when developing protocols for studying the duration-dependent effects of Kati Basti or other local Sneha procedures.

Importantly, however, **five minutes should not automatically be considered the complete therapeutic duration of Kati Basti.** Clinical procedures may use considerably longer durations depending on the therapeutic indication, physician's protocol, temperature, quantity of oil and patient-specific factors.

The present calculation concerns only the **classical time associated with the 900-Mātrā endpoint**, not the total duration required for a complete therapeutic procedure.

13. Limitations

13.1 Textual variation

Classical Ayurvedic texts and commentaries may differ in the presentation and interpretation of temporal units. Therefore, the exact conversion of Mātrā into seconds should be tied to the specific textual tradition and edition used.

13.2 Edition-related variation

The exact verse numbers and pagination of Dalhana's commentary vary between editions. The original Sanskrit passage should therefore be verified against the edition used for the final manuscript.

13.3 Conceptual nature of the calculation

The conversion is mathematical and textual. It is not based on experimental measurement of oil movement through human tissues.

13.4 Dhātu–tissue equivalence

Ayurvedic Dhātu and modern anatomical tissues are not necessarily identical entities. The English equivalents used in this article are intended primarily for explanatory correlation.

13.5 Variation in Mātrā

Mātrā may be interpreted contextually in classical literature. The calculation of 0.318 seconds represents the particular conversion framework used in this study and should not automatically be considered an absolute universal value.

13.6 Kati Basti duration

The calculated 4 minutes 48 seconds should not be interpreted as the recommended complete duration of Kati Basti. It represents the calculated equivalent of 900 Mātrā only.

14. Conclusion

The classical sequence attributed to Dalhaṇa assigns progressively increasing Mātrā values from Romānta to Majjā. Under the specific temporal conversion framework used in this study, these values can be expressed as short modern time intervals, with the 900-Mātrā endpoint approaching five minutes when presented as a practical approximation. This relationship may provide a useful conceptual framework for discussing the duration of Sneha contact in procedures such as Kati Basti. The calculated values remain textual and mathematical interpretations of classical Ayurvedic concepts and should not be regarded as experimental evidence that externally applied Sneha physically reaches corresponding modern anatomical tissues within these intervals. Further experimental research may examine whether duration-dependent physiological effects show any meaningful relationship with this classical temporal framework.

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