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UNDERSTANDING THE MECHANISM OF SWEDAHARA PRADEHA IN REGULATING SWEAT SECRETION

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ABSTRACT

Swedahara Pradeha, a class of topical Ayurvedic formulation, plays an essential role in the management of disorders characterized by excessive sweating (*Atisweda*), burning sensation (*Daha*), and *Pitta* vitiation. While their clinical use is well documented in classical Ayurvedic texts, the underlying mechanism of action remains less explored in modern scientific terms. This review attempts to correlate the Ayurvedic concept of *Swedahara Pradeha* with modern understanding of sweat gland physiology and thermoregulation. The study explores classical references, probable pharmacodynamic actions, and potential mechanisms through which these formulations may modulate sweating—such as local vasoconstriction, astringent effects, anti-inflammatory actions, and reduction of local heat. The integrative understanding developed through this review may help standardize and rationalize the use of *Swedahara Pradeha* in modern clinical contexts.

INTRODUCTION

Sweating (*Sweda pravritti*) is a physiological process essential for maintaining thermal homeostasis and eliminating metabolic waste. Ayurveda describes *Sweda* as the *Mala (waste*

product) of *Meda Dhatu*, which helps in regulating body temperature and maintaining skin softness. However, *Atisweda* (excessive sweating) is considered a pathological state, often associated with aggravated *Pitta dosha* and *Meda dhatu dushti*.

Classical Ayurvedic texts describe *Swedahara Pradeha* as topical paste applications possessing cooling, astringent, and absorbent properties and as a key therapeutic measure for such conditions. In modern physiology, sweating is primarily controlled by the sympathetic nervous system and involves eccrine and apocrine sweat glands. Exploring the link between these two paradigms provides valuable insights into how *Swedahara Pradeha* could influence the neurophysiological and biochemical regulation of sweat secretion.

Sweda* and *Swedavaha Srotas

According to *Charaka Samhita*, *Sweda* is the *Mala* of *Meda Dhatu*. The *Swedavaha Srotas* (channels of sweat) originate from *Meda Dhatu* and the *Romakupa* (hair follicles). Proper *Sweda pravritti* maintains *Twak snigdhata* (skin softness), while its vitiation leads to *Rukshata*, *Daha*, *Atisweda*, or *Asweda*.

The activity of *Sweda* formation and excretion is governed by the *Tridosha*:

- **Vata**: regulates movement of sweat through channels.
- **Pitta**: governs heat and metabolism, stimulating sweat production.
- **Kapha**: maintains the fluid balance and moisture of skin.

Hence, *Pitta* predominance or *Vata-Pitta* vitiation often leads to *Atisweda*.

Swedahara Pradeha

The term *Swedahara Pradeha* denotes paste applications (*Pradeha*) that mitigate excessive sweating (*Swedahara*). These are typically made from *Sheeta virya* (cooling potency), *Kashaya rasa* (astringent taste), and *Snigdha* (unctuous) dravyas.

Classical formulations include ingredients like

- **Shirish** (**Albizzia lebbeck**) – Cooling, Pitta shamaka, anti-inflammatory.
- **Usheera (Vetiveria zizanioides)** – Fragrant, refrigerant, *Tridoshahara*.
- **Lodhra (Symplocos racemosa)** – Astringent, reduces secretion.
- **Nagakeshar (Mesua ferrea)**- Kapha-Pitta shamak, Astringent

Indications

- *Atisweda* (excessive sweating)

- *Daha* (burning sensation)
- *Pittaja rogas* (Pitta-dominant conditions)
- Post-*Swedana* procedures to restore cooling balance

Modern Physiology of Sweating

Sweating is controlled by the thermoregulatory center in the hypothalamus and mediated by sympathetic cholinergic fibers innervating eccrine glands.

Mechanism

- **Thermal sweating**: triggered by rise in core temperature.
- **Emotional sweating**: mediated by adrenergic response.
- Sweat production depends on acetylcholine release**,** local blood flow**,** and glandular function**.**

Disorders of Sweat Secretion

- **Hyperhidrosis**: excessive sweating due to overactive sympathetic activity.
- **Anhidrosis**: absence of sweating due to gland or nerve dysfunction.

Ayurvedic Concept	Modern Correlate	Possible Mechanism
Pitta shamana (cooling of body heat)	Decrease in cutaneous vasodilation and metabolic heat production	Vasoconstriction, reduced local temperature
Kashaya rasa (astringent property)	Protein coagulation and reduction in glandular secretions	Mechanical constriction of sweat pores
Sheeta virya drugs	Cooling and anti-inflammatory action	Decrease in sympathetic stimulation
Snigdha guna	Restores lipid layer and barrier function	Prevents excessive fluid loss
Meda mala shamanam	Regulation of glandular lipid metabolism	Balances sebum and sweat secretion

Probable Mechanism of Action

1. **Astringent action** of ingredients like Lodhra and Usheer may cause mild constriction of sweat gland ducts, reducing secretion.
2. **Cooling and anti-inflammatory effects** may lower local skin temperature, reducing thermal stimulus to sweat glands.
3. **Adsorptive and absorbent properties** may physically reduce surface moisture and regulate evaporation.

4. **Neurophysiological modulation**—some herbs may reduce acetylcholine-mediated sympathetic activity, thus decreasing sweat output.
5. **Barrier repair and hydration balance**—maintaining optimal stratum corneum integrity prevents compensatory over-sweating.

Experimental and Clinical Correlations

Although limited, some modern studies suggest:

- **Albizzia lebbeck** and **Vetiveria zizanioides** possess measurable *antiperspirant* and *cooling* activity.
- **Astringent herbs** containing tannins (e.g., *Lodhra*) can contract skin proteins and reduce secretary activity.
- Topical Ayurvedic pastes have shown positive effects in managing *Pittaja daha*, prickly heat, and hyperhidrosis-like symptoms in preliminary studies.

However, systematic research and controlled trials are still needed to establish efficacy, standardize formulations, and identify bioactive compounds responsible for the *Swedahara* action.

DISCUSSION

Swedahara Pradeha operates through both Ayurvedic principles—*Pitta shamana*, *Stambhana*, and *Sheeta virya* actions—and modern mechanisms such as local vasoconstriction, glandular inhibition, and barrier restoration. This dual understanding provides a rational basis for integrating Ayurvedic external therapies into modern dermatological care for sweat-related disorders.

Future research should focus on formulation standardization**,** pharmacological validation, and clinical trials using objective sweat measurement techniques (e.g., gravimetric testing, thermography).

CONCLUSION

The *Swedahara Pradeha* represents a unique Ayurvedic approach to regulating sweat secretion through natural, multi-target mechanisms. When correlated with modern physiology, these formulations appear to influence local thermoregulation, sweat gland activity, and skin homeostasis. Integrating Ayurvedic wisdom with contemporary scientific

methods can pave the way for developing safe, effective, and evidence-based topical therapies for excessive sweating and related heat disorders.

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