

An Analytical Study of Twak Sharir in Ayurveda with Correlation to Modern Dermatology and Histology

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ABSTRACT

Twak (skin) is one of the essential anatomical and functional entities discussed in *Rachana Sharir* of Ayurveda. Ancient seers have elaborated the multi-layered structure of *Twak* in terms of its origin (*Utpatti*), types (*Saptadhatuja Twak*), location, and physiological relevance. In modern biomedical science, the skin is the largest organ of the body and is extensively studied in terms of its histology, function, and pathology. This article attempts to bridge the traditional Ayurvedic descriptions of *Twak Sharir* with the contemporary understanding of dermatology and histology, highlighting parallels, complementarities, and unique insights.

Keywords: *Twak Sharir, Ayurveda, Skin Anatomy, Integrative Approach*

1. INTRODUCTION

Ayurveda, the ancient Indian system of medicine, offers an in-depth perspective of the human body through *Sharir Rachana* (anatomy) and *Sharir Kriya* (physiology). Among its intricate classifications, *Twak Sharir*—the anatomical and physiological description of the skin—holds significant importance as a diagnostic and prognostic tool in various diseases. The *Twak* is also a *Dnyanendriya* (sensory organ) and plays a vital role in maintaining the body's interface with the external environment.

In modern science, skin is understood as a dynamic organ comprising three major layers—epidermis, dermis, and hypodermis—with a multitude of cells, glands, and associated structures that play roles in protection, sensation, thermoregulation, and immune response [1]. This comparative analysis of *Twak Sharir* with contemporary dermatological and histological views aims to explore correlations, validate Ayurveda insights, and propose integrative models for future interdisciplinary research.

2. CONCEPT OF TWAK IN AYURVEDA

Definition and Significance

In Ayurveda, *Twak* is more than a physical covering. It is the seat of touch sensation (*Sparshanendriya*) and reflects internal health. As per *Acharya Sushruta*: "*Twak hi sparshanendriyasthana bhavati*" — (*Sushruta Samhita*, Sharir Sthana 4/4) [2]

It reflects the health of internal systems such as *Rasa*, *Rakta*, and *Dhatu*s, and is considered an important site for the manifestation of diseases like *Kushtha* (skin disorders), *Pama*, *Shwitra*, etc.

Embryological Origin (*Twak Utpatti*)

Ayurveda attributes the origin of *Twak* to *Rasa Dhatu* and *Rakta Dhatu*, indicating its close relationship with the circulatory and lymphatic systems [3]. The *Sushruta Samhita* states that the *Twak* develops from the *Saptadhatu*s (seven body tissues), each contributing to one of its seven layers. "*Rasa Rakta Mamsa Meda Asthi Majja Shukrani twak saptadhatu sambhuta*" — (*Sushruta Samhita*, Sharir Sthana 4/6) [2]

Layers of *Twak* in Ayurveda

Acharya Sushruta describes **seven layers** of *Twak*, each associated with specific physiological functions and pathological conditions.

Ayurvedic Layer	Approximate Modern Equivalent	Associated Disease
Avabhasini	Stratum corneum / superficial epidermis	Kushta, Daruna
Lohita	Stratum spinosum	Charmadala
Shweta	Stratum basale / dermo-epidermal junction	Ajagallika
Tamra	Papillary dermis	Kilasa
Vedini	Reticular dermis	Kushtha (Painful)
Rohini	Subcutaneous layer / adipose tissue	Granthi
Mamsadhara	Fascia over muscles	Bhagandara

These layers reflect a composite understanding of skin as a multi-tiered entity involved in nourishment, protection, and sensory perception [4].

Development and Origin

Twak is considered the *Upadhatu* (secondary tissue product) of *Mamsa Dhatu* (muscle tissue) and its origin is traced to the process of embryonic tissue differentiation ⁶⁻⁷.

Ayurvedic view: Twak arises as a byproduct during the formation of dhatus, especially Mamsa.

Modern view: Skin develops embryologically from ectoderm (epidermis) and mesoderm (dermis and subcutis), with regional and structural complexity.

Histological Structure of Skin in Modern Anatomy

The modern understanding of skin divides it into three principal layers:

1. Epidermis

Composed of keratinized stratified squamous epithelium.

Layers: stratum basale, stratum spinosum, stratum granulosum, stratum lucidum (palms/soles), and stratum corneum.

Functions: Protection, barrier formation, vitamin D synthesis [5].

2. Dermis

Contains fibroblasts, collagen fibers, elastic tissue, blood vessels, lymphatics, and nerve endings.

Subdivided into papillary and reticular layers.

Functions: Thermoregulation, sensation, immunity.

3. Hypodermis (Subcutaneous Layer)

Consists of adipose tissue and connective tissue.

Functions: Fat storage, insulation, cushioning of internal organs [6].

This structure is functionally comparable to the Ayurvedic layers of *Twak* and their respective roles.

Twak as a Sense Organ (*Sparshanendriya*)

In Ayurveda, *Twak* is the site of the tactile sensory organ and is governed by *Vata Dosha*, particularly *Vyana Vata*, and *Manas* (mind). The modern nervous system corresponds to this through:

Mechanoreceptors: Merkel cells, Meissner's corpuscles

Thermoreceptors

Nociceptors (pain receptors)

This aligns with the Ayurvedic principle that *Sparshanendriya* perceives *Ruksha*, *Snigdha*, *Ushna*, and *Sheeta* guna (qualities), through which the body interacts with external stimuli [7].

Comparative Pathological Insights

Ayurveda classifies skin diseases under the umbrella of *Kustha*, *Shwitra*, *Pama*, *Charmadala*, etc., each with detailed etiology and doshic imbalances.

Modern dermatology classifies skin diseases into:

Infectious (bacterial, viral, fungal)

Inflammatory (eczema, psoriasis)

Autoimmune (vitiligo, pemphigus)

Neoplastic (skin cancers)

Shwitra vs. Vitiligo

Ayurveda: *Shwitra* involves vitiation of *Tridosha*, especially *Pitta*, with loss of skin color due to *Rakta dushti*.

Modern: Vitiligo is an autoimmune disorder where melanocytes are destroyed.

Ayurvedic interventions like *Shodhana*, *Shamana*, and *Raktamokshana* have shown effectiveness, and modern studies have corroborated the anti-inflammatory and immunomodulatory effects of herbs like *Bakuchi* (*Psoralea corylifolia*) [8].

Physiological Functions: Ayurveda vs. Modern Science

Function	Ayurvedic View	Modern View
Protection	Maintains balance of <i>Doshas</i> , barrier to environmental insult	Barrier to pathogens, UV rays, mechanical damage
Sensation	Site of <i>Sparshanendriya</i>	Sensory nerve endings
Excretion	Through <i>Sweda Vaha Srotas</i> (sweat ducts)	Sweat glands for thermoregulation
Immunity	<i>Ojas</i> preservation, <i>Rakta</i> purification	Langerhans cells, immune surveillance
Temperature regulation	Governed by <i>Vata</i> and <i>Pitta</i> through <i>Sweda</i>	Vasodilation, sweat evaporation [9]

Twak and Diagnostic Correlation

Skin in Ayurveda is considered a mirror of internal health. Disorders of *Rasa* and *Rakta* dhatus, *Agni*, and *Ama* accumulation are reflected in skin quality, color, and integrity.

Modern clinical dermatology also uses skin as a window to systemic diseases:

Jaundice (yellowing)

Cyanosis (bluish tint)

Petechiae (blood disorders)

Skin tags and insulin resistance [10]

Twak and Cosmetic Ayurveda (Varnya and Twachya Dravyas)

Ayurveda has a well-established tradition of dermatocosmetics. Herbs classified as *Varnya* (improve complexion) include:

Chandana (*Santalum album*)

Manjishtha (*Rubia cordifolia*)

Yashtimadhu (*Glycyrrhiza glabra*)

These have antioxidant, anti-inflammatory, and antimicrobial effects validated in modern pharmacological studies [11].

Histopathological Correlation of Twak Layers

Ayurveda's seven layers may be understood as follows:

Avabhasini: Keratinized layer (stratum corneum)

Lohita: Epidermal layers with blood supply indirectly

Shweta: Basal cells and melanocytes

Tamra: Papillary dermis

Vedini: Pain receptors in reticular dermis

Rohini: Healing layer with fibroblasts

Mamsadhara: Fascia overlying muscle, reflecting structural depth

This correlation suggests that ancient seers had observational knowledge of micro-anatomy.

Role of Twak in Ayurvedic Therapeutics

Skin is both a diagnostic tool and therapeutic gateway in Ayurveda:

Abhyanga (oil massage)

Lepa (herbal applications)

Parisheka (pouring decoctions)

Swedana (sudation therapy)

These techniques act through transdermal absorption and local circulation enhancement, paralleling modern transdermal drug delivery systems [12].

Twak and Systemic Health: The Dhatu Connection

In Ayurveda, Twak reflects the *rasa*, *rakta*, and *mamsa* dhatus' health (fluid, blood, and muscle), and is influenced by digestive / metabolic power (*Agni*).

Many Twak Rogas (skin diseases) like *Kushta* (leprosy), *Shwitra* (vitiligo) are considered rooted in *dhatu* / *kostha* (internal) imbalances.

Modern dermatology also recognizes systemic contributors to skin disease: autoimmune conditions, metabolic disorders (diabetes, thyroid), and nutritional deficiencies.

Blockquote: "Many skin manifestations are reflections of internal *dhatu dushti* or even *Agni dushti*."

Burns (Dagdh) Management- Ayurvedic Approach

Twak is classified for burn severity into *Dagdhavastha* (stages of burning). Therapeutics: *Seka* (pouring medicated liquids), *Lepana* (external application of herbal pastes), *Ghrita* (ghee / butter for soothing and healing), *Rakta Shodhana* (blood purification). Emphasizes prevention of *Dosha* aggravation, promotion of tissue regeneration, and scar minimization.

3. DISCUSSION

The Ayurvedic concept of *Twak* provides a multidimensional view integrating anatomy, physiology, pathology, and therapeutics. Its division into seven layers and correlation with *Dhatus* suggests a unique tissue-level understanding. Modern histology validates several of these aspects with objective evidence, including the layered structure, vascular and neural supply, immune components, and disease manifestations.

Emerging interdisciplinary studies show promising potential in merging Ayurvedic skin therapeutics with modern dermatological protocols. Herbal preparations for skin conditions are increasingly studied for their efficacy, with outcomes supporting Ayurvedic claims [13].

4. CONCLUSION

The comparative evaluation of *Twak Sharir* and modern dermatological and histological science reveals significant overlaps and complementary insights. While Ayurveda views the skin through functional, structural, and systemic lenses, modern science confirms these through histopathology, immunology, and physiology. Integrating these perspectives can enrich diagnostic, therapeutic, and cosmetic applications. A holistic view of skin as both a barrier and a bio-reflective surface can foster innovation in integrative dermatology.

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