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BHESHAJA CHATUSHKA: THE FOUNDATIONAL FRAMEWORK OF DRUG RESEARCH AND DEVELOPMENT IN *CHARAKA SAMHITA*

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ABSTRACT

Background and introduction: As a primary text of the Brihattrayi, the Charaka Samhita stands as a definitive classical guide in Ayurveda. It logically structures the eight sthanas, with Bheshaja Chatushka in Sutra Sthana occupies a foundational position in establishing the principles of drug science. It establishes the foundation for understanding drug origin, classification, formulation, and rational application aimed at restoring dhatu-samya. **Materials and methods:** A classical textual analysis of Dirghanjivitiya, Apamarga Tanduliya, Aragvadhiya and Shadvirechanashatashritiya was conducted to examine organizational structure of drug knowledge, including classification systems, formulation methods, and systematic grouping of preparations. **Results:** Together, these chapters present a structured and comprehensive model for drug identification, grouping, preparation, and application. **Discussion:** Bheshaja Chatushka provides a systematic framework for drug identification, grouping, formulations and rational therapeutic application serving as a foundational model for Ayurvedic drug research and development.

KEYWORDS: Charaka Samhita, Bheshaja Chatushka, Ayurvedic drug research, Mahakashaya.

1. INTRODUCTION

Among the classical *Ayurvedic* texts, as one of the principal treatises of the *Brihattrayi*, *Charaka Samhita* occupies an important place among them. It provides a systematic exposition of medical knowledge encompassing physiology,

anatomy, pathology, diagnosis, therapeutics, and pharmaceutical sciences. The *Sutra Sthana* of *Charaka Samhita* serves as the introductory and conceptual foundation of the text. It consists of thirty chapters organized into *Chatushkas*, each comprising four chapters that dealing with related subjects. This arrangement allows a logical presentation of *Ayurvedic* principles and facilitates structured understanding of complex concepts.[1]

Among these *Chatushkas*, the first *Bheshaja Chatushka* holds a central position in the development of *Ayurvedic* pharmacology. Ayurveda defines medicine broadly to include substances that help re-establish the balance of *Doshas*, *Dhatus*, and *Malas*, thereby promoting health and longevity.[2]

***Bheshaja Chatushka* includes four chapters**

1) *Dirghanjivitiya Adhyaya*
2) *Apamarga Tanduliya Adhyaya*
3) *Aragvadhiya Adhyaya*
4) *Shadvirechanashatashritiya Adhyaya*

These chapters collectively present a structured framework describing the origin, classification, preparation and rational application of medicinal substances. This organized way of presenting drug information shows an early, scientific approach to finding and developing medicines.[1,2]

In contemporary biomedical science, drug development involves several stages such as identification of therapeutic agents, classification, formulation development and clinical application. Interestingly, similar conceptual steps can be observed in the *Bheshaja Chatushka*.[1,2]

Despite its importance, the *Bheshaja Chatushka* has not been extensively explored from the perspective of drug research methodology. Understanding its conceptual structure can provide valuable insights into classical *Ayurvedic* pharmacology and may contribute to contemporary approaches to herbal drug development.

Therefore, the present study aims to analyze the conceptual framework of *Bheshaja Chatushka* and evaluate its role as the foundational model for drug research and development in Ayurveda.

2. AIM

- To elucidate the *Bheshaja Chatushka* as a systematic and rational framework for *Ayurvedic* drug research and development.

3. OBJECTIVES

- To analyze the conceptual structure of *Bheshaja Chatushka*.
- To understand its role in *Ayurvedic* pharmacology.
- To explore its relevance to drug research and development.

4. MATERIALS AND METHODS

Study Design

The present study is a qualitative textual analysis based on classical *Ayurvedic* literature.

Source of Data

The primary source for the study was *Charaka Samhita* (*Sutra Sthana*) with authoritative commentaries, particularly *Chakrapani's Ayurveda Dipika.* Standard English translations and *Ayurvedic* reference texts were also consulted.

The secondary source was peer- reviewed literature on *Ayurvedic* pharmacology.

Study Material

The four chapters comprising *Bheshaja Chatushka* were selected for analysis:

1. *Dirghanjivitiya Adhyaya (Sutra Sthana* Chapter 1*)*
2. *Apamarga Tanduliya Adhyaya (Sutra Sthana* Chapter 2*)*
3. *Aragvadhiya Adhyaya (Sutra Sthana* Chapter 3*)*
4. *Shadvirechanashatashritiya Adhyaya (Sutra Sthana* Chapter 4)

Method of Analysis

The textual content of these chapters was systematically examined to identify key pharmacological concepts related to:

- Origin and nature of medicinal substances
- Drug classification systems
- Methods of pharmaceutical preparation
- Rational therapeutic application
- Systematic grouping of medicinal plants

The extracted concepts were analyzed and interpreted in the context of classical *Ayurvedic* principles and compared with general stages of modern drug research methodology.

5. RESULT

The analysis of *Bheshaja Chatushka* reveals a systematic progression of pharmacological knowledge. Each chapter contributes a specific component to the overall framework of *Ayurvedic* drug science.

5.1 *Dirghanjivitiya Adhyaya*

The *Dirghanjivitiya Adhyaya* is the pivotal first chapter of the *Sutra Sthana* in the *Charaka Samhita*, establishes the foundational philosophy, epistemology and pharmacological framework for the entire text.

The *Dirghanjivitiya Adhyaya* represents the dawn of drug discovery in Ayurveda. It sets the stage for all subsequent pharmacological exploration. Crucially, this chapter establishes Ayurveda not merely as a theoretical philosophy, but as a rigorous observational science. Its primary focus is on systematically identifying and categorizing substances that actively promote longevity and combat disease, which is aim of Ayurveda.

Expanding upon this foundation, the chapter introduces the *Trisutra* framework, which distinctly outlines the scope and parameters of all medical research. By dividing medical science into *Hetu*, *Linga* and *Aushadha*. It provides a highly structured methodology. For researchers, this three-pillar system acts as the foundational blueprint for designing any clinical trial or therapeutic intervention, ensuring that the cause, presentation, and treatment of a disease are studied as an interconnected triad.[3]

To rationalize this framework, the text utilizes the *Shad Padartha* to predict and understand drug behavior. It relies heavily on the principles of *Samanya, Vishesha, Guna, Dravya, Karma and Samvaya*.[4] By deeply understanding how the *Guna* of a substance interact with human biology, a researcher applies *Yukti* - logical planning and experimental design. This application of *Yukti* allows the practitioner to match a drug's specific properties to a patient's exact physiological imbalance, effectively predicting therapeutic efficacy even before the drug is administered.[5]

Serving as the crucial "discovery phase" of the *Bheshaja Chatushka*, the chapter meticulously classifies the materia medica into three primary sources based on origin:

1) *Jangama*
2) *Audbhida*
3) *Parthiva*[6]

This classification establishes a standardized, highly organized database of therapeutic agents.

Based on *prabhava* classifies into 3 types:

1) *Doshaprashamana*
2) *Dhatupradushana*
3) *Swasthahita*[7]

Based on *prayojyanga*

- *Mulini*
- *Falini*[8]

Other

- 4 *Snehas*
- 5 *Lavana*
- 8 *Mutra*
- 8 *Kshira*
- 6 *Shodhana vriksha* ,etc.[8]

The epistemological foundations laid out in this chapter hold immense relevance for modern drug development. By embracing "reverse pharmacology," researchers can move from the well-documented, traditional clinical experiences found in this text back into the modern laboratory. This structured approach bypasses the time-consuming need for blind screening, proving that ancient Ayurvedic epistemology can directly inform and accelerate the modern, targeted drug development pipeline.[9-10]

5.2 *Apamarga Tanduliya Adhyaya*

The *Apamarga Tanduliya Adhyaya*, the second chapter of the *Bheshaja Chatushka*, transitions from the theoretical discovery of raw materials to applied pharmacology and targeted drug delivery. This chapter systematically outlines specific plant-based drugs utilized for *Panchakarma*. For modern researchers, this provides a highly organized blueprint of route-specific drug administration—such as oral, intestinal, and transmucosal pathways—offering a list of botanical compounds with known pharmacokinetic behaviors and specific organ-system targets.[11-13]

Building on these delivery pathways, the chapter delves into early pharmaceutical formulation through the detailing of 28 specific *Yavagus*. By infusing active pharmacological ingredients into easily digestible, nutritional bases, ancient physicians effectively solved complex R&D challenges related to drug bioavailability, gastric irritation and patient compliance. This extensive cataloging of liquid and semi-solid dietary preparations highlights the critical role of excipients and vehicles in drug formulation, essentially laying the groundwork for modern nutraceuticals and functional foods designed for specific therapeutic outcomes.[11-13]

5.3 *Aragvadhiya Adhyaya*

The *Aragvadhiya Adhyaya* represents a significant historical milestone in the research and development of topical and transdermal drug delivery systems (TDDS).[14] By detailing 32 specific formulations used primarily as *Lepas*, *Pradehas* and *Avachurnana* ancient physicians established early methodologies for cutaneous absorption and localized drug delivery.[15] This approach strategically bypassed the gastrointestinal tract and first-pass hepatic metabolism, offering modern researchers developing transdermal patches or topical creams a historical, pre-vetted framework for targeting localized tissue inflammation, joint pain and systemic conditions directly through the skin barrier.[14]

The chapter serves as a highly specialized, pre-screened database for dermatological drug discovery. For modern pharmaceutical scientists searching for novel antimicrobial, antifungal, anti-inflammatory, and wound-healing compounds, these targeted formulations provide a direct, time-tested source for isolating active botanical leads that have proven clinically effective over centuries of observation.

The text highlights profound early innovation in excipient science and permeation enhancement. The ancient selection of specific aqueous or lipid solvents demonstrates a sophisticated, practical understanding of how to alter a drug's bioavailability and optimize its absorption rate across the skin membrane.

5.4 *Shadvirechanashatashritiya Adhyaya*

The *Shadvirechanashatashritiya Adhyaya* starts by listing 600 specific medicine mixtures.[16] Instead of just using one plant at a time, ancient doctors carefully combined base plants with different liquids and secondary herbs. For modern drug research, this acts like a massive, ready-to-use recipe book. Scientists can use this list to study how different herbs work together to boost or control a medicine's effects, rather than starting from scratch with single, isolated chemicals.

A major part of this chapter introduces five basic ways to extract medicine from plants:[17]

- *Swarasa*
- *Kalka*
- *Shruta*
- *Shita*
- *Phanta*

The text clearly explains that these methods go from the strongest to the weakest, and a doctor must pick the right one based on the patient's strength and the disease.[17] For modern pharmacy, this is the ancient science of drug extraction. It shows a deep understanding that some active plant chemicals need heat and water to be pulled out, while other delicate chemicals will be completely destroyed by boiling and require a cold soak instead.

Finally, the most famous part of this chapter is how it organizes 500 medicinal plants into 50 distinct groups of ten.[18]

Rather than grouping plants by how they look or where they grow, the text groups them exactly by what they do in the body—such as relieving pain, promoting healing, or boosting energy. This is a highly advanced, practical way to classify drugs. For modern researchers, these 50 groups provide highly specific, target-based lists. If a scientist wants to develop a new painkiller, they do not have to guess; they already have a pre-sorted list of ten ancient plants to start testing immediately.

6. DISCUSSION

The four chapters of the *Bheshaja Chatushka* form a clear, step-by-step instruction manual for developing new drugs.

Chapter 1 tells how to find and identify raw medicinal materials in nature. Next, Chapter 2 describes how to mix these medicines into food and drinks so the patient's body can absorb them safely. Chapter 3 shows how to bypass the stomach entirely by making pastes and powders that absorb through the skin. Finally, Chapter 4 organizes all these plants into practical groups based on exactly what they do in the body and explains the best ways to extract the medicine out of the plant.

In the context of modern R&D, this ancient framework offers a powerful paradigm shift through the lens of reverse pharmacology. Modern drug discovery often relies on high-throughput, blind screening of millions of synthetic compounds—a process that is notoriously time-consuming, expensive, and prone to late-stage failure. In contrast, the *Bheshaja Chatushka* provides a curated, clinically pre-vetted database of botanical and herbo-mineral compounds.

Instead, they can directly investigate complex, polyherbal formulations that already possess centuries of documented safety, pharmacokinetic behavior, and clinical efficacy.[9,10,19,20]

Table 1: Comparative framework: *Bheshaja Chatushka* vs. Modern drug development

Chapter	*Ayurvedic* focus and concepts	Modern equivalant	Contribution to drug design
Dirghanjivitiya Adhyaya	Discovery phase : Identifying raw materials , defining *Trisutra*	Target identification and preclinical screening.[13,19]	Provides the pre – screened database of raw materials for systemic therapies.
Apamarga Tanduliya Adhyaya	Internal formulation : Developing specific delivery pathways, creating *Yavagus* for digestion and compliance	Pharmacokinetics and enteral delivery.[21]	Establishing safe, patient – specific dosing
Aragvadhiya Adhyaya	External application : Formulating *Lepas*	Transdermal drug delivery systems (TDDS).[14]	Offering targeted, localized therapy specifically for dermatological and joint conditions
Shadvirechanashat ashritiya Adhyaya	Extraction and classification : 5 extraction methods, classifying 500 herbs into 50 groups based on action	Pharmaceutical engineering and Pharmacodynamics.[22]	Creates a sophisticated combinatorial drug library and groups compounds by their physiological effects

7. CONCLUSION

Bheshaja Chatushka of *Charaka Samhita* represents a foundational framework for *Ayurvedic* drug science. The four chapters collectively provide a systematic exposition of medicinal substances, including their origin, classification, formulation, and therapeutic application.

It demonstrates a deeply rational, scientific methodology for identifying, formulating, and delivering therapeutics. It proves that ancient physicians were actively solving complex pharmaceutical challenges—such as drug bioavailability, vehicle optimization, and targeted delivery—thousands of years before the advent of modern laboratories.

Therefore, *Bheshaja Chatushka* may be considered a classical model for *Ayurvedic* drug research, offering valuable insights for contemporary pharmacological studies and the development of herbal medicines.

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