

PANAK KALPANA: A REVIEW ON ITS ROLE IN ANUPANA AND DRUG BIOAVAILABILITY

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ABSTRACT

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Panak Kalpana is a classical Ayurvedic pharmaceutical process involving the preparation of herbal decoctions, juices, and other liquid formulations. Its significance in **enhancing drug bioavailability** and serving as an effective **Anupana** (vehicle or adjuvant) has been acknowledged in Ayurvedic therapeutics. This review provides a comprehensive overview of Panak Kalpana, its classification, preparation techniques, and its role in modulating pharmacokinetics and pharmacodynamics of herbal drugs. The synergy between Anupana and active phytoconstituents can improve absorption, reduce toxicity, and optimize therapeutic outcomes. Understanding the scientific basis behind these traditional practices can aid in modern formulation development and evidence-based Ayurveda.

KEYWORDS: Panak Kalpana, Anupana, Bioavailability, Ayurvedic formulation, Herbal medicine.

1. INTRODUCTION

Ayurveda emphasizes the importance of **drug delivery and adjuvants** to achieve therapeutic efficacy. Among various pharmaceutical approaches, Panak Kalpana, a preparation of herbal juices or decoctions with specific adjuvants, is used to enhance the palatability, stability, and absorption of drugs. Traditionally, *Panak* refers to decoctions or liquids derived from herbal sources, often sweetened or combined with suitable vehicles for oral administration.

Anupana, the substance co-administered with the main drug, plays a critical role in influencing **drug bioavailability, targeting, and efficacy**.

2. Historical Perspective

Classical Ayurvedic texts, including *Charaka Samhita* and *Sushruta Samhita*, describe Panak Kalpana as an important formulation strategy. Various Panak preparations, such as **Draksha Panak, Dadhi Panak, and sugar-based Panak**, were utilized to improve taste, mask undesirable drug properties, and aid digestion. Historically, Panak Kalpana was considered essential for pediatric, geriatric, and chronic disease therapy, where enhanced bioavailability was crucial.

3. Classification of Panak Kalpana

Panak Kalpana can be broadly classified based on **ingredients, preparation, and purpose**:

Classification	Types	Example
Base Liquid	Jala Panak	Water decoction
	Swarasa Panak	Herbal juice-based
	Dadhi Panak	Milk-based
Adjuvant	Madhura Panak	Sugar or jaggery
	Amla Panak	Sour fruits
Therapeutic Use	Digestive tonic	Dadhi Panak with herbs
	Rejuvenator	Draksha Panak

4. MATERIALS AND METHODS (LITERATURE REVIEW APPROACH)

A systematic review approach was adopted to gather relevant literature on Panak Kalpana and its effects on drug bioavailability.

4.1. Data Sources

- Classical Ayurvedic texts: *Charaka Samhita, Sushruta Samhita, Bhavaprakasha*
- Electronic databases: PubMed, Scopus, Google Scholar
- Journals focusing on pharmacology, herbal medicine, and integrative medicine

4.2. Search Strategy

Keywords used included: *Panak Kalpana, Anupana, Ayurvedic bioavailability, herbal decoction, liquid herbal formulations*.

4.3. Inclusion Criteria

- Articles describing preparation, pharmacological evaluation, or clinical studies of Panak Kalpana

- Studies discussing the role of Anupana in bioavailability
- Reviews or experimental studies on liquid herbal formulations

4.4. Data Extraction and Synthesis

- Information on preparation methods, composition, and pharmacological impact was extracted
- Data were summarized to identify patterns linking Panak Kalpana with bioavailability enhancement and clinical efficacy

5. PREPARATION TECHNIQUES

Panak Kalpana preparation involves:

- Selection of **herbal material**
- Extraction using **appropriate medium** (water, milk, juice)
- Addition of **sweeteners, honey, or ghee** for taste and absorption
- Controlled **heating and filtration** to obtain a stable liquid form

Proper preparation ensures **uniformity of active constituents**, improved **stability**, and optimal **bioavailability**.

6. RESULTS (FROM LITERATURE SYNTHESIS)

From the reviewed literature:

1. **Enhanced Solubility:** Panak Kalpana with milk or ghee improved solubility of fat-soluble phytoconstituents.
2. **Improved Absorption:** Herbal decoctions administered with sugar or honey as Anupana showed faster gastrointestinal absorption.
3. **Reduced Toxicity:** Liquid formulations buffered gastric irritation of alkaloid-rich herbs.
4. **Clinical Outcomes:** Studies reported improved efficacy of *Guduchi*, *Ashwagandha*, and *Amalaki* when administered as Panak with suitable Anupana.

Herb	Panak Type	Observed Effect on Bioavailability
Guduchi	Dadhi Panak	Increased plasma concentration of active constituents
Herb	Panak Type	Observed Effect on Bioavailability
Ashwagandha	Jala Panak with sugar	Faster absorption, improved adaptogenic effect
Amalaki	Swarasa Panak	Enhanced antioxidant activity, better tolerance

7. DISCUSSION

Panak Kalpana demonstrates a **clear link between traditional formulation and modern pharmacokinetics**:

- **Synergistic Role of Anupana:** Vehicles like milk, honey, ghee, or sugar not only improve taste but **enhance solubility, absorption, and targeting** of active phytochemicals.
- **Phytochemical Stability:** Liquid preparations protect labile constituents from degradation, ensuring consistent therapeutic outcomes.
- **Clinical Relevance:** Pediatric and geriatric patients benefit from palatable liquid forms, improving compliance and efficacy.
- **Modern Implications:** Insights from Panak Kalpana can guide **herbal syrups, functional beverages, and nutraceuticals**.

The review highlights the **need for standardization, pharmacokinetic studies, and clinical trials** to validate Panak Kalpana in evidence-based medicine. Mechanistic studies exploring gastrointestinal absorption, enzymatic interactions, and tissue targeting would bridge Ayurveda and modern pharmacology.

8. CONCLUSION

Panak Kalpana is a **strategic Ayurvedic formulation** enhancing drug bioavailability and therapeutic efficacy. Its role as an Anupana underscores the synergy between **traditional wisdom and modern pharmacology**. Standardization, pharmacokinetic studies, and clinical validation can further strengthen its relevance in contemporary herbal medicine and personalized therapy.

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