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"PRABHAVA REVISITED: A CRITICAL REVIEW OF MODERN EXPLANATIONS FOR CLASSICAL EXAMPLES OF SPECIFIC ACTION IN DRAVYAGUNA"

Dr. Abhay Gandhi[1]

AFFILIATIONS:
1. Director, Ira Consultancy & Research Organisation, Bhosari, Pune, Maharashtra 411026

CORRESPONDENCE:
Dr. Abhay Gandhi

EMAIL ID:
director@icro.co.in

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ABSTRACT
In Dravyaguna, prabhava is the specific action of a drug that cannot be predicted from its rasa, guna, virya and vipaka. Charaka illustrates it with pairs of drugs that share these properties but differ in action. Danti (*Baliospermum montanum*) is purgative while Chitraka (*Plumbago zeylanica*) is not, although both are pungent in taste and vipaka and hot in virya. Draksha is laxative while Madhuka is not, and ghee stimulates digestion while milk does not. Classical texts regard prabhava as achintya, knowable only by observation and authority, not by reasoning from properties. This review examines whether modern pharmacology can explain classical examples of prabhava and what such explanations mean for Dravyaguna. For the Danti–Chitraka pair, Danti root contains phorbol esters, diterpenoids with irritant and purgative potential, whereas the characteristic constituent of Chitraka is the naphthoquinone plumbagin. Different molecular classes can thus produce different actions despite similar sensory properties. More generally, specific actions often arise from minor constituents acting on defined molecular targets, such as piperine on P-glycoprotein and CYP3A4. Sensory properties do not capture these actions, and the hot herbs of Chinese medicine likewise share an outcome but differ in their molecular targets. We argue that prabhava marks the boundary between what a sensory and functional classification can predict and what requires knowledge of specific constituents and targets. Far from being a mystical residue, it is the point at which Dravyaguna explicitly calls for empirical observation. This makes classical prabhava examples useful starting points for discovering specific molecular mechanisms.

KEYWORDS: Prabhava, specific action, Danti, Chitraka, phorbol esters, plumbagin, Dravyaguna, reverse pharmacology

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INTRODUCTION

Dravyaguna explains the action of a drug mainly through its rasa, guna, virya and vipaka. Charaka recognises, however, that some actions cannot be predicted from these properties. When drugs that are alike in rasa, virya and vipaka nevertheless differ in action, the difference is attributed to prabhava, the specific potency of the substance.[1] Charaka's examples are pairs of drugs: Danti is purgative while Chitraka is not, though both are pungent in taste and vipaka and hot in virya; Draksha (grape) is laxative while Madhuka is not; and ghee stimulates digestion while milk does not, though both are sweet.[1] The commentators describe prabhava as achintya, beyond reasoning, and say it is known only through observation and authoritative teaching.

Prabhava is sometimes presented as a mystical property and sometimes dismissed as an admission that the classification fails. Neither view does justice to it. This review examines whether modern pharmacology can explain classical examples of prabhava and argues that prabhava is best understood as the point at which a property-based classification explicitly hands over to empirical observation of specific constituents and targets.

METHODS

This is a conceptual critical review. We examined the classical definition and examples of prabhava in the Charaka Samhita and searched for phytochemical and pharmacological studies that could explain the differences between the paired drugs, together with general literature on specific molecular actions of plant constituents.

THE DANTI–CHITRAKA EXAMPLE

Danti (*Baliospermum montanum*) and Chitraka (*Plumbago zeylanica*) are the paradigmatic example (Table 1). Both are pungent, hot and katu in vipaka,[1] yet only Danti is a recognised purgative.

Table 1. Classical and phytochemical comparison of Danti and Chitraka.

Feature	Danti (*Baliospermum montanum*)	Chitraka (*Plumbago zeylanica*)
Rasa, virya, vipaka	Katu; ushna; katu[1]	Katu; ushna; katu[1]
Classical specific action	Virechana (purgation) by prabhava[1]	Deepana, pachana; not purgative
Characteristic constituents	Phorbol esters and other diterpenoids[2]	Plumbagin, a naphthoquinone[3]
Relevant activity	Phorbol esters are irritant diterpenoids; one identified ester reduced by about 75% by traditional processing[2]	Antimicrobial, hepatoprotective, anticancer and other activities reported[3]

Danti root contains phorbol esters; a recent study identified an additional ester in the root and showed that a traditional puta-paka processing method reduced it by about 75%.[2] Phorbol esters belong to the same diterpenoid class as the irritant purgative constituents of other euphorbiaceous plants. Their presence offers a plausible chemical basis for Danti's purgative action and for the classical requirement that it be processed before use. Chitraka's characteristic constituent is plumbagin, a naphthoquinone with a different pharmacological profile.[3] Two drugs that taste and feel alike thus contain different classes of active compounds, and the difference in action follows from this.

GENERAL MECHANISMS BEHIND PRABHAVA

The Danti–Chitraka example illustrates a general principle. Sensory and functional properties such as taste and heat reflect the bulk composition of a drug and broad classes of compounds.[4] Specific actions, by contrast, often arise from particular constituents acting on particular molecular targets, sometimes at low concentration. Table 2 gives examples.

The history of Rauwolfia serpentina (Sarpagandha) shows how a specific traditional action can lead to a specific molecule. The plant's effects were studied clinically in India, including a trial in essential hypertension published in 1949,[8] and its alkaloid reserpine became a major antihypertensive drug. The action was specific to the plant and not predictable from its taste, and it was explained only when the active compound and its target were identified. This is the pattern Patwardhan and colleagues describe as reverse pharmacology: starting from documented specific effects in humans and working backwards to constituents and mechanisms.[9]

WHAT PRABHAVA MEANS FOR DRAVYAGUNA

Seen in this light, prabhava is neither mystical nor a failure. Rasa, guna, virya and vipaka form a classification based on sensory qualities and general physiological effects, which can predict the behaviour of most drugs in broad terms.[4] Such a classification cannot predict actions that depend on specific

molecules and targets. Charaka recognised this limit explicitly and assigned such actions to prabhava, to be known by observation.[1] In modern terms, prabhava is the point at which property-based prediction ends and specific pharmacology begins.

This interpretation has two practical consequences. First, classical prabhava examples are excellent starting points for discovery, because they identify drugs whose actions are known to exceed what their general properties predict. Second, prabhava actions are likely to depend on particular constituents and therefore on correct identity, plant part and processing. Danti illustrates this: its classical processing reduces phorbol esters,[2] which may alter both its purgative potency and its toxicity. Studies of prabhava should therefore characterise the material carefully.[10]

Table 2. Mechanisms by which specific actions arise independently of sensory properties.

Mechanism	Explanation	Example
Specific constituent–target interaction	A minor constituent acts on a defined receptor, enzyme or transporter	Piperine inhibits P-glycoprotein and CYP3A4[5]
Different mechanisms behind a shared property	Drugs of the same property act through different targets	Chinese hot herbs share few targets[6]
Microbial transformation	Gut microbes convert a constituent into an active metabolite[7]	Glycoside activation in the colon
Discovered specific action	An action later explained by an isolated compound	*Rauwolfia serpentina* and reserpine in hypertension[8]

RESEARCH AGENDA

- Compile classical prabhava examples from the Brihattrayi and Nighantus into a structured list of paired drugs and specific actions.
- For each pair, compare chemical profiles to identify constituent classes present in the drug with the specific action and absent in its counterpart.[2,3]
- Test the specific action in appropriate models with the classical preparation and with isolated candidate constituents.
- Examine how classical processing changes the candidate constituents and the specific action.[2]
- Characterise all material according to best-practice guidelines.[10]

LIMITATIONS

Phytochemical explanations for most classical prabhava examples have not been tested directly, and the Danti–Chitraka explanation offered here is a plausible hypothesis rather than a demonstrated mechanism. Some classical examples of prabhava, such as the effects of gems, lie outside pharmacology altogether.

CONCLUSION

Prabhava designates actions that cannot be predicted from a drug's sensory and functional properties. Modern pharmacology suggests that such actions typically arise from specific constituents acting on specific targets, as illustrated by the phorbol esters of Danti and the reserpine of Sarpagandha. Understood in this way, prabhava is not a mystical residue but the place where Dravyaguna itself calls for empirical observation, and its classical examples are a valuable guide to discovering specific molecular actions.

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