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"PRATINIDHI DRAVYA: A CRITICAL REVIEW OF THE CLASSICAL RATIONALE FOR DRUG SUBSTITUTION AND THE PHYTOCHEMICAL AND PHARMACOLOGICAL EVIDENCE FOR EQUIVALENCE"

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ABSTRACT
Ayurvedic texts recognise that drugs may be unavailable and prescribe approved substitutes, pratinidhi or abhava pratinidhi dravya, to be used in their place. The practice has become more important as many classical drugs, particularly Himalayan and orchid species, have become rare or threatened. This review examines the classical rationale for substitution, summarises studies that have tested the equivalence of classical substitute pairs, and proposes standards for evaluating substitutes. Classical substitution rests on shared Dravyaguna properties and actions rather than on botanical relationship. The best-studied example is Musta (*Cyperus rotundus*), a common weed, as a substitute for Ativisha (*Aconitum heterophyllum*), a rare Himalayan plant. The two are botanically unrelated, yet similar in classical properties, phytochemical profile and antidiarrhoeal activity. An analysis of 223 substitutes for 122 drugs in Rhazes' Unani compendium *Kitab al-Abdal* found that about 76% were consistent with Ayurvedic and Unani property-based principles. Compilations of substitutes from Ayurvedic texts list many more pairs, but most have not been tested. The Ashtavarga group, several of whose members are orchids that are rare or of uncertain identity, is routinely replaced with other drugs in commercial formulations, often without comparative evidence. We argue that substitution should be judged by equivalence for a defined indication. That requires pre-specified criteria based on classical properties, chemical markers and relevant pharmacological or clinical endpoints, using authenticated and characterised material. Evaluated in this way, pratinidhi dravya offer a principled route to conserving threatened species without compromising therapy.

KEYWORDS: Pratinidhi dravya, abhava pratinidhi, drug substitution, Ativisha, Musta, Ashtavarga, conservation, equivalence, Dravyaguna

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INTRODUCTION

Ayurvedic texts did not assume that every prescribed drug would always be available. Later works, notably the Bhavaprakasha and Yogaratnakara, list approved substitutes to be used in the absence of the original drug, called abhava pratinidhi dravya.[1,2] The practice reflects a pragmatic tradition: if a drug cannot be obtained, another with similar properties and action may take its place.

Substitution has become more pressing. Many classical drugs come from Himalayan or forest species that are now rare, threatened or protected, and some, such as members of the Ashtavarga group, are of uncertain identity.[3] At the same time, substitution in trade often happens without any classical sanction and is better described as adulteration.[4] Distinguishing legitimate pratinidhi from unacceptable substitution requires both an understanding of the classical rationale and evidence of equivalence. This review addresses both.

METHODS

This is a critical narrative review. We examined classical sources on substitution and searched PubMed, Indian journals and publisher websites for compilations of classical substitute pairs and for studies that compared an original drug with its classical substitute.

THE CLASSICAL RATIONALE

The underlying logic of pratinidhi is that a substitute should share the relevant Dravyaguna properties – rasa, guna, virya and vipaka – and the intended action of the original.[1,5] Botanical relatedness is not required. Substitutes are often from different families, and in some cases a common plant replaces a rare one. This approach treats drugs as interchangeable when they are functionally similar for a given purpose. It implies that a substitute need not be equivalent in every respect, only in the respects that matter for the formulation and indication.

Comparable principles exist in Unani medicine. An analysis of the substitutes listed in *Kitab al-Abdal*, a compendium attributed to Rhazes, examined 223 substitutes for 122 original drugs and found that about 76% were consistent with property-based principles shared by Ayurveda and Unani, even though most were not listed as substitutes in Ayurvedic texts.[6] Compilations of substitutes from selected Ayurvedic texts list many further pairs.[7]

EVIDENCE FOR EQUIVALENCE

Table 1 summarises examples.

Table 1. Classical substitute pairs and the evidence available.

Original → substitute	Evidence	Comment
Ativisha (*Aconitum heterophyllum*) → Musta (*Cyperus rotundus*)	Similar Dravyaguna properties, phytochemical profiles and antidiarrhoeal activity[8]	Botanically unrelated; rare Himalayan plant replaced by common weed
Ashtavarga orchids and others → other drugs in commercial formulations	Orchid members identified in some formulations;[3] comparative evidence for substitutes scarce	Identity of several members uncertain
Unani substitutes (Rhazes)	About 76% consistent with property-based principles[6]	Analysis of rationale, not experimental equivalence
Multiple sources under one name (e.g., Pashanabheda)	Different sources differ in strength of the same action[9]	Illustrates that functional similarity is a matter of degree

The most complete test of a classical substitution is the study of Musta as a substitute for Ativisha. The two plants are unrelated botanically, and Ativisha is a rare Himalayan species. The study combined classical textual analysis with phytochemical profiling and pharmacological testing and found that the two were similar in Dravyaguna properties, phytochemical profile and antidiarrhoeal activity.[8] The authors concluded that Ayurveda emphasises pharmacological properties over botanical classification in choosing substitutes.[8] This study offers a model for evaluating other pairs.

Comparative studies of different plants sold under one name, though not strictly pratinidhi, show that functionally similar drugs can differ in the strength of a shared action. In a comparison of sources of Pashanabheda, all three tested plants were diuretic, but one was markedly stronger.[9] A substitute may therefore be equivalent in kind but not in degree, which matters for dosing.

DEFINING EQUIVALENCE

Classical texts justify substitution by shared properties, and studies of taste suggest that such properties carry real information about action.[10] Shared properties do not guarantee equivalence for every indication, however. We propose that the equivalence of a pratinidhi be judged against pre-specified criteria for a defined indication (Table 2).

Table 2. Proposed criteria for evaluating a pratinidhi dravya.

Criterion	Assessment
Classical concordance	Shared rasa, guna, virya, vipaka and the relevant karma, documented from classical sources[1,5]
Identity and quality	Both original and substitute authenticated and chemically characterised[4,11]
Chemical similarity	Overlap of relevant constituent classes or markers, or a justified explanation for differences[8]
Functional equivalence	Comparable effect in a model relevant to the indication, with an equivalence margin defined in advance
Dose correspondence	Doses that produce comparable effects, if potency differs[9]
Safety	No additional toxicity relative to the original
Sustainability	Substitute is not itself threatened or overharvested

PRATINIDHI AND CONSERVATION

Pratinidhi offers a classical basis for reducing pressure on threatened medicinal plants. If common or cultivable plants can be validated as substitutes for rare ones, as Musta for Ativisha,[8] pharmacopoeias can recommend the substitute for routine use while protecting the original. Unvalidated substitution, by contrast, risks reducing efficacy and erodes trust in Ayurvedic products. The Ashtavarga group, which includes orchids of uncertain identity and limited availability,[3] is a priority for structured evaluation of substitutes.

LIMITATIONS

Few pratinidhi pairs have been tested experimentally, and this review relies heavily on a single well-designed study. Compilations of substitutes and analyses of Unani sources address rationale rather than equivalence.

CONCLUSION

The classical doctrine of pratinidhi dravya permits substitution based on shared properties and action rather than botanical relationship, and the Musta–Ativisha study shows that such substitutions can be supported by chemical and pharmacological evidence. Most classical substitute pairs, however, remain untested. Evaluating them against explicit equivalence criteria with authenticated material would allow pharmacopoeias to adopt validated substitutes, protect threatened species, and distinguish legitimate pratinidhi from adulteration.

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