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Review Article

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"GRANTHIHARA AND ARBUDAHARA DRAVYA: A CRITICAL REVIEW OF PRECLINICAL ANTICANCER EVIDENCE FOR KANCHANARA, VARUNA AND BHALLATAKA AND THE GAPS THAT BLOCK CLINICAL TRANSLATION"

Dr. Jalpa Gandhi[1]

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

CORRESPONDENCE:
Dr. Jalpa Gandhi
EMAIL ID:
ceo@icro.co.in

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ABSTRACT
Classical Ayurvedic texts describe granthi (localised swellings) and arbuda (larger, deep-seated, slowly growing masses) and prescribe drugs to dissolve them. Among those used most often are Kanchanara (*Bauhinia variegata*), Varuna (*Crataeva nurvala*) and Bhallataka (*Semecarpus anacardium*). Interest in these drugs as sources of anticancer agents has generated a substantial preclinical literature. This review appraises that evidence and identifies the gaps that prevent clinical translation. An ethanol extract of Kanchanara increased survival in mice with Dalton's ascitic lymphoma. A milk extract of Bhallataka nuts, prepared in a classical manner, improved tumour marker enzymes in rats with aflatoxin-induced hepatocellular carcinoma. Lupeol, a triterpene present in Varuna and many other plants, has broad in vitro and xenograft activity, but no human cancer trials. For Kanchanara Guggulu, the only recent randomised work we found is a registered protocol in subclinical hypothyroidism, not in cancer. Across the three drugs, evidence relies on crude extracts, transplantable or chemically induced tumour models, and short treatment periods. It lacks pharmacokinetic data, dose justification, toxicity assessment in tumour-bearing animals, and comparison with standard therapy. Classical granthi and arbuda also include benign conditions, and modern studies seldom specify which tumour types correspond to classical indications. We propose a staged pathway: chemical characterisation of classical preparations, validated cell and animal models matched to defined indications, pharmacokinetic and safety studies, and early-phase trials in carefully selected settings such as benign tumours or adjunctive care.

KEYWORDS: Granthi, arbuda, Kanchanara, *Bauhinia variegata*, Varuna, *Crataeva nurvala*, Bhallataka, *Semecarpus anacardium*, cancer, translational research

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INTRODUCTION

Sushruta describes granthi as a rounded, knotty swelling arising from vitiated dosha, rakta, mamsa and meda, and arbuda as a larger, round, immobile, deep-rooted and slowly growing mass that seldom suppurates.[1] Arbuda is often equated with cancer, but the classical categories are broader: they include benign tumours, cysts, lymph node enlargements and goitre-like swellings, and the texts distinguish arbuda that are curable from those that are not.[1] Treatment combines purification, local measures, surgery, cauterisation and drugs that are described as dissolving or scraping (lekhana) the mass.[1,2]

Kanchanara (*Bauhinia variegata*) is the principal drug in Kanchanara Guggulu, one of the most widely prescribed classical formulations for granthi, galaganda and arbuda.[3] Varuna (*Crataeva nurvala*) is used for swellings and for urinary calculi, and Bhallataka (*Semecarpus anacardium*), a potent upavisha, is used after processing for arbuda among other conditions. These drugs have been studied as potential anticancer agents. This review appraises the preclinical evidence and identifies the gaps that must be closed before clinical claims can be made.

METHODS

This is a critical narrative review. We searched PubMed, Indian journals and publisher websites for in vitro, in vivo and clinical studies of the three drugs and their classical formulations in cancer and tumour models, together with guidance on evaluating natural products for anticancer activity.

PRECLINICAL EVIDENCE

Table 1 summarises representative evidence.

Table 1. Representative preclinical and clinical evidence for granthihara and arbudahara drugs.

Drug or formulation	Model	Main finding	Gap
Kanchanara (ethanol extract)	Dalton's ascitic lymphoma, mice	Increased mean survival; restored haematological values[4]	Transplantable model; non-classical extract
Bhallataka (milk extract of nuts)	Aflatoxin B1-induced hepatocellular carcinoma, rats	Improved tumour marker enzymes[5]	Biochemical markers; toxicity of the drug itself
Varuna (lupeol)	Many cell lines and xenografts	Antiproliferative, pro-apoptotic and chemosensitising effects; no human cancer trials[6]	Lupeol is not specific to Varuna; bioavailability
Kanchanara Guggulu	Subclinical hypothyroidism (protocol)	Randomised trial against levothyroxine registered; results pending[7]	Not a cancer indication

Kanchanara

An ethanol extract of *Bauhinia variegata* increased the mean survival time of mice bearing Dalton's ascitic lymphoma and reversed haematological changes.[4] Several cytotoxicity studies have reported activity of bark extracts and isolated compounds against cancer cell lines. The classical preparation, Kanchanara Guggulu, combines Kanchanara bark with Triphala, Trikatu, Varuna and other drugs in a Guggulu base,[3] and its own anticancer activity has not been studied rigorously. The only recent randomised work we identified tests it in subclinical hypothyroidism against levothyroxine, a protocol whose results are awaited.[7]

Bhallataka

A milk extract of Bhallataka nuts, a preparation that echoes the classical use of milk in its processing, improved tumour marker enzymes in rats with aflatoxin B1-induced hepatocellular carcinoma.[5] The same research programme produced further studies in other models. Bhallataka is an upavisha with vesicant phenolic constituents, and shodhana changes its chemical profile.[8] The anticancer activity and toxicity of processed and raw nuts therefore need to be compared directly, and the therapeutic margin defined.

Varuna

Varuna bark contains lupeol, a pentacyclic triterpene with antiproliferative, pro-apoptotic and chemosensitising effects in many cell and xenograft models; a 2025 review found no human cancer trials and concluded that clinical evidence is insufficient.[6] Lupeol occurs in many plants, so its activity does not establish a specific role for Varuna, and its poor water solubility limits bioavailability.[6]

GAPS THAT BLOCK TRANSLATION

Table 2. Gaps between preclinical evidence and clinical use.

Gap	Explanation
Preparation	Most studies use solvent extracts unlike classical preparations, without chemical characterisation[10]
Potency	Crude-extract cytotoxicity is often weak by accepted screening criteria[11]
Model relevance	Transplantable murine tumours and chemically induced models predict human response poorly
Pharmacokinetics	Plasma and tumour concentrations after oral dosing are rarely measured
Specificity	Common constituents such as lupeol and polyphenols act on many targets; some may interfere with assays[12]
Safety	Toxicity in tumour-bearing animals, especially for Bhallataka, is seldom reported
Comparators	Few studies compare with or combine with standard chemotherapy
Indication	Classical granthi and arbuda include benign masses; modern studies rarely map tumour type to classical indication[1]

A DRAVYAGUNA PERSPECTIVE

The classical texts describe arbuda as difficult to treat and combine drugs with surgery, cautery and purification.[1] They do not claim that a single drug cures all arbuda. Lekhana drugs such as Kanchanara and Guggulu are expected to reduce kapha and meda and to dissolve accumulations, which suggests that their most plausible modern uses may lie in benign or slowly growing lesions, in reducing symptoms, or as adjuncts, rather than as primary treatment for aggressive cancers. Defining these indications precisely would allow realistic trials.

The classical preference for specific vehicles and processing, such as milk for Bhallataka, also deserves attention. The milk extract that showed activity in hepatocellular carcinoma[5] is closer to classical practice than many solvent extracts, and studies that compare classical and modern preparations side by side would test whether classical processing matters.

A STAGED TRANSLATIONAL PATHWAY

- Characterise the classical preparation chemically, including markers and known toxic constituents.[10]
- Test it in validated cell and animal models matched to a defined indication, at doses justified by human use.
- Measure pharmacokinetics and conduct toxicity studies, including in tumour-bearing animals.
- Evaluate interactions with standard chemotherapy, since patients commonly combine them.

LIMITATIONS

This review discusses representative studies and does not include all published cell-line data. Some studies could be summarised only from abstracts. The correspondence between classical categories and modern tumour types is an interpretation rather than a settled fact.

CONCLUSION

Kanchanara, Varuna and Bhallataka show anticancer activity in preclinical models, but the evidence is based mainly on non-classical extracts in models with limited predictive value, and no completed randomised trial in cancer was identified. Closing the gaps in preparation, pharmacokinetics, safety and indication is a prerequisite for any clinical claim. A staged pathway that begins with characterised classical preparations and moves to carefully chosen clinical settings offers the best chance of establishing whether these classical granthihara and arbudahara drugs have a place in modern cancer care.

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