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Pharmaceutico-Analytical Evaluation of *Brihatyadi Kwatha*- A Polyherbal Formulation

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ABSTRACT

Kwatha Kalpana is one of the basic *Kalpanas* explained in *Ayurveda*. Although they have less shelf life they are useful in treating many disorders. *Brihatyadi Kwatha* is one such formulation explained in the context of *Mutrakrichra*. It comprises of five drugs- *Brihati, Kantakari, Prishniparni, Shaalaparni, Gokshura*. Here *Kwatha* was prepared using general method of preparation according to the reference of *Sharangadhara Samhita* and then was subjected for quality control parameters.The present study revealed the analytical parameters like total solids, refractive index, specific gravity, viscosity and the pH of the *Kashaya*. The peaks observed in HPTLC serve as its fingerprint. This helps in standardising the formulation for maintaining its quality and efficacy.

KEYWORDS

Brihatyadi Kwatha, Mutrakrichra, Pharmaceutico-analytical study

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INTRODUCTION

Urinary tract infection is one of the common urological problems seen worldwide. The symptoms seen are pain and burning sensation with the urge to urinate frequently.[1] In the Ayurvedic classical texts the same has been explained in the name of *Mutrakrichra*. Many dosage forms have been explained throughout the classics to mitigate this condition. *Brihatyadi Kwatha* is one such formulation as per *Astanga Hridaya*[2]which is indicated in all *Mutravikaras.* It is prepared using drugs of *laghupanchamuala gana*. This was taken up for pharmaceutical and analytical evaluation as a part of its standardisation to ensure its quality and efficacy.

OBJECTIVES

- To prepare *Brihatyadi Kwatha* according to Ayurvedic texts- *Astanga Hridaya*[2] and *Sharangadhara Samhita*[4]
- To subject it to analytical and chromatographic evaluation.

MATERIALS AND METHODS

Raw drugs required for preparation were collected from S.D.M. Ayurvedic Pharmacy, Udupi. Preparation of samples of *Brihatyadi Kwatha* was carried out in Practical Laboratory of Department of P.G. Studies in Rasashastra and Bhaishajya Kalpana, S.D.M. College of Ayurveda, Udupi. The ingredients taken for the preparation are *Brihati, Kantakari, Prishniparni, Shaalaparni, Gokshura* whose quantity have been enumerated in Table 1.

Table 1 Ingredients taken

Drug name	Botanical name	Parts used	Ratio	Quantity
Brihati	*Solanum indicum* Linn.	Root	1 part	20g
Kantakari	*Solanum xanthocarpum*Schrad&Wendl	Whole plant	1 part	20g
Prishniparni	*Urariapicta* Desv.	Whole plant	1 part	20g
Shaalaparni	*Desmodium gangeticum* D.C.	Whole plant	1 part	20g
Gokshura	*Tribulus terrestris* Linn.	Fruit	8 parts	160g
Jala	-	-	16 parts of drugs	3840 ml

Pharmaceutical study of *Brihatyadi Kwatha* involved 2 steps:

- Preparation of *Kwatha Churna*
- Preparation of *Kwatha*

1. Preparation of *Kwatha Churna*: All the drugs were coarsely powdered in a pulverizer separately.

2. Preparation of *Kwatha*: It was prepared by boiling 1 part of coarsely powdered drugs with 16 parts of potable water as mentioned in the Table 1. Boiling was continued till it reduced to its 1/8th part. Then it was observed for organoleptic characters and subjected for

physicochemical analysis and chromatography.[3]

OBSERVATION AND RESULTS

PHARMACEUTICAL STUDY:

Table 2 Parameters observed during *Kwatha* preparation

Parameter	Observation
Quantity of *KwathaChurna*	240 g
Quantity of water	3840 ml
Temperature	80-90˚c
Time taken for reduction	2 hrs
Kashaya obtained	480 ml

ANALYTICAL STUDY

Table 3: Organoleptic characters

Parameter	Observation
Colour	Brownish
Taste	*Tikta*
Smell	Characteristic
Consistency	Liquid

Table 4 Results of standardization parameters of *Brihatyadi Kwatha*

Parameter	Results n = 3 %w/w
pH	6.06
Refractive index	1.33456 ± 0.0
Specific gravity	0.9822 ± 0.0
Viscosity	1.1566 ± 0.0
Total solids	3.81 ± 0.01

Results of HPTLC:

Table 5 R_f values of sample of *Brihatyadi Kwatha*

Short UV	Long UV	Post derivatisation
0.06 (L. green)	-	-
-	0.09 (F. blue)	-
-	0.17 (F. blue)	-
0.25 (L. green)	-	-
-	0.34 (F. blue)	-
-	-	0.54 (L. purple)
-	0.59 (F. blue)	-
-	0.70 (F. blue)	-
-	0.76 (F. blue)	-
-	0.90 (F. green)	0.90 (D. purple)
-	-	-
-	-	-

DISCUSSION

Pharmaceutical study

- **Preparation of *Kwatha Churna*:** According to Acharya Yadavji Trikamji the *Churna* for *Kwatha* preparation must be *yavakuta* in nature or according to *Astanga Sangraha* they must be cut into small pieces. If the drugs are finely powdered they will settle down during the boiling process which will hamper the complete release of its constituents and also there are more chances of escaping of particles through cloth while filtering. For better extraction of active principles, here drugs were taken in coarse powder form.
- **Source of heat and vessel taken:** Stainless steel vessel was taken for the preparation of *Kwatha* and the source of fire given was through gas stove.
- **Quantity of water added and reduction:** Although many references are available regarding the quantity of water to be taken depending on the nature of drugs and quantity of drugs, here for the preparation of *Brihatyadi Kwatha*, water taken was 16 parts to that of drugs as explained by *Acharya Sharangadhara* in the general method of preparation of

Kwatha. It was reduced to 1/8th part as told in the same reference.

- **Observations during preparation:**(Table 2 and 3)As the boiling progressed the colour of *Kwatha* gradually changed to brown and the smell of ingredients was appreciated. Mild fire was maintained and temperature of *Kwatha* was observed to be between 80-90°C. The vessel was not covered with a lid to facilitate proper evaporation and to prevent trapping of heat. Stirring was done occasionally to prevent sticking of the drugs to the vessel and for their even distribution in the vessel. The reduction took 2 hours to complete. After the required reduction, the *Kwatha* was filtered using a cotton cloth so that the liquid was clear, devoid of any particles of *KwathaChurna*. The *Kashaya* obtained was measured and stored in airtight container for further use.

Analytical study: (Table 4)The pH of the sample was 6.06 suggesting its higher absorption in stomach due to its weak acidic nature. Refractive index was 1.33456 which indicates the density of the sample. The specific gravity determines the solute content in the sample. Here it was 0.9822. Total solids was 3.81 indicating its active constituents. Viscosity was 1.1566 suggesting the concentration of sample.HPTLC (Table 5) revealed 2 spots at 254 nm, 7 spots at 364 nm and 2 spots post derivatisation indicating the presence of different constituents. The peaks observed in HPTLC helps in establishing its fingerprint for the authentication of this formulation.

CONCLUSION

The qualitative and quantitative analysis is essential in any new formulation. The data evolved from the present study will help in setting up the quality control of the formulation and also help in further experimental and clinical studies.

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