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Research Article

PRELIMINARY ANALYTICAL STUDY OF GANDARVAHASTHADI KWATHA – AN AYURVEDIC POLYHERBAL FORMULATION

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Abstract

Gandarvahasthadi Kwatha is a purely herbal product used commonly for the management of vataja rogas like grudhrasi (sciatica), Kati graha (back pain) etc. The Gandarvahasthadi Kwatha is an orally administrable pharmaceutical drug combination of 8 ingredients namely Gandarahastha (*Ricinus communis* Linn), Chiruvilwa (*Holoptelea integrifolia* Planch.), Hutaswa (*Plumbago zeylanica* Linn.), Vishwam (*Zingiber officinale* Roxb.), Pathya (*Terminalia chebula* Retz.), Punarnava (*Boerhavia diffusa* Linn.), Yavashaka (*Tragia involucrata* Linn.) and Bhumithalam (*Asparagus adscendens* Roxb.). Lack of standardization of poly-herbal formulations creates difficulty in validating the efficacy and maintaining quality of the product. Hence an attempt has been made to study Gandarvahasthadi Kwatha by analyzing through qualitative and quantitative analysis of Physico-chemical parameters and to develop fingerprints of High-Performance Thin Layer chromatography study (HPTLC). Four peak values at areas at % 8.05, 6.75, 9.32 and 5.89 were found in the HPTLC graph. The data evolved in the present study will help to maintain the quality of the formulation.

Key words: Grudhrasi; Gandarvahasthadi Kwatha; Physico-chemical; Chromatography.

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INTRODUCTION

Drug is any substance or product that is used or intended to be used to modify or explore physiological systems or pathological states for the benefit of the recipient.[1] The word drug is derived from the French word 'drouge', a dry herbal. A drug is defined as any substance used for the purpose of diagnosis, prevention, relief or totally cures of the disease in man or animals. The drug (Dravya) comes second in the order of the four fundamental components of the treatment.[2] Success of the treatment depends upon proper raw drug selection, proper manufacturing method and proper way of dose administration. The drugs of herbal origin come first in the series medicine.

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Herbals have been used successfully in traditional systems of medicine for the management of various disease conditions like sciatica, back pain, arthritis, bronchial asthma, cold, cough, chronic fever, dysentery, convulsions, diabetes, diarrhoea, emetic syndrome, skin diseases, insect bite etc. and in the treatment of gastric, hepatic, cardiovascular & immunological disorders.[3] to [7] Herbal drugs have served the human society from time immemorial in curing various ailments.The important advantages claimed for therapeutic uses of medicinal plants in various ailments are their safety besides being economical, effective and their easy availability.[8][9] Because of these advantages the herbal drugs have been widely used by the traditional medical practitioners in the day to day practice.

Back pain is a common difficulty faced by the society. Back pain is a human condition with 60-80% of the world's population experiencing pain, out of the total number of patients 40% complain of radicular pain which comes under the umbrella of the Grudhrasi and it is the major cause for huge loss of millions of work days annually; Gandarvahasthadi Kwatha is a purely herbal product used commonly for the management of vataja rogas like grudhrasi etc. The Gandarvahasthadi Kwatha is an orally administrable pharmaceutical drug combination of 8 ingredients namely Gandarahastha, Chiruvilwa, Hutaswa, Vishwam, Pathya, Punamava, Yavashaka and Bhumithalam. (Table 1) This is an important compound formulation mentioned in the Ayurvedic classics for vataja diseases, mandagni (loss of appetite), malabandha (constipation), arochaka (anorexia)[10] but till today the field of Ayurveda is lacking back regarding standardization. Stress has been laid down repeatedly towards the standards of raw drug and finished product in classics. According to our ancient seers the drug should be safe, effective and capable of pacifying the disease in minute doses. At the same time, it should not produce any kind of complications.[11] In order to satisfy these ideal qualities, the drug should be standardized before administration. Standardization of the compound formulation is the need of the present era to set standards for maintaining the quality of the products. Even though specific parameters are available in the Ayurvedic classics, it is necessary to evaluate their safety and efficacy through modern parameters. Keeping this in view, the CCRAS committee has set specific criteria for specific dosage forms.

Here an attempt has been made to study Gandarvahasthadi Kwatha analytically and to develop fingerprints of High-Performance Thin Layer chromatography study (HPTLC).

MATERIAL AND METHODS

Collection of raw drugs:

All the individual drugs of the compound formulation Gandarvahasthadi Kwatha were purchased from local market (Kerala) and the raw drugs were authenticated in the Dept. of Dravyaguna, Nangelil Ayurveda College, Kothamangalam, Kerala.

Pharmaceutical study:

Gandarvahasthadi Kwatha was prepared with the ratio mentioned in Table 1 at Department of Rasashastra and Bhaishajya Kalpana, Nangelil Ayurveda College, Kothamangalam, Kerala.

Method of preparation:

After the identification of the drug, drugs were washed and dried properly. Then the drugs were pounded to convert into yavakuta churna (coarsely powder form). One pala (48 gm) of the drugs was mixed with 16 parts of water and boiled in an earthen pot over a mild fire till the liquid portion was reduced to 1/8th of the original quantity.

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Table 1: Ingredients of Gandarvahasthadi Kwatha

Sl. No.	Ingredients	Botanical Name	Parts Used	Ratio
1.	Eranda	*Ricinus communis* Linn.	Roots	1 part
2.	Chirubilwa	*Holoptelea integrifolia* Planch.	Bark	1 part
3.	Chitraka	*Plumbago zeylanica* Linn.	Roots	1 part
4.	Haritaki	*Terminalia chebula* Retz.	Fruit rind	1 part
5.	Shunti	*Zingiber officinale* Roxb.	Rhizome	1 part
6.	Punarnava	*Boerhavia diffusa* Linn.	Whole plant	1 part
7.	Yavashaka	*Tragia involucrata* Linn.	Whole plant	1 part
8.	Bhumithala (Musali)	*Asparagus adscendens* Roxb.	Tuber	1 part

Analytical study:

Analytical study in the present study deals with the physical and chemical evaluation of the formulation. The tests were carried out at SGS India private limited, Ernakulum, Kerala and Drug Standardization unit, Govt. Ayurveda College, Thiruvananthapuram.

Organoleptical parameters, Physico-chemical analysis were carried out by following standard procedure mentioned in Ayurvedic Pharmacopeia of India. Various organoleptical parameters of the formulation, such as colour, odour and taste of the kwatha were recorded. In physical evaluation, Loss on drying at 105° C, Total dissolved solids, Total suspended solids, Ash value, Acid soluble ash, Specific gravity at 27° C, pH were determined. Extracts obtained by exhausting the drugs are indicative of approximate measures of certain chemical compounds they contain.[12]

Heavy metal analysis:

For acid digestion of sample, take 0.5g sample and 5 ml of Hcl + 5 ml of HNO_3 + 1ml of H_2O_2 in a closed vessel device using temperature control microwave heating at 200°C for 15 minutes then after cooling the vessel device, then the solution was filtered and washed by deionized water and make upto 25 ml solution. Instrument was calibrated with reference standard.[13]

HPTLC

High Performance Thin layer chromatography (HPTLC) studies were carried out with solvent system toluene : ethyl acetate (7 : 3).

CAMAG HPTLC system equipped with a sample applicator Linomat V sample applicator was used for application of samples. CAMAG TLC Scanner 3, Reprostar and Wincats 4.02 were used for scanning the plates. CAMAG twin through glass chamber was used for developing the plates.

The sample Gandarvahasthadi kwatha churna (2g) was extracted with 25 ml methanol for 1 hr. under reflux. The methanol extracts were filtered and concentrated to 5 ml and used as test solutions. 5µl of each test solution was spotted The plates were developed in mobile phase of Toluene: Ethyl acetate (7 : 3 v/v) and scanned at 254 nm.

RESULTS

The organoleptic characters of Gandarvahasthadi Kwatha - the colour was brown, odour was a typical smell of decoctions, taste was bitter and consistency was liquid in nature.

Analytical study:

Establishment of standard criteria using best sample as baseline with a range of standard errors i.e. 95% confidence limit was done. (Table 2)

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Heavy metal analysis:

Heavy metal analysis of the drug Gandarvahasthadi kwatha was carried out and the obtained values are within the permissible limit. (Table 3)

HPTLC analysis of Gandarvahasthadi kwatha:

Four peak values at areas at % 8.05, 6.75, 9.32 and 5.89 were found in the HPTLC graph. (Figure 1)

Table 2: Results of Analytical study

Sl. No.	Parameters	Values
1.	Loss on drying at 105° C	97.84%
2.	Total dissolved solids	1.054%
3.	Total suspended solids	1.78%
4.	Ash	0.38%
5.	Acid soluble ash	Not detected (0.01%)
6.	Specific gravity at 27° C	1.0017
7.	pH	5.39

Table 3: Results of Heavy metal analysis

Sl. No.	Lead	Not detected (0.5mg/kg)
1.	Cadmium	Not detected (0.020mg/kg)
2.	Arsenic	Not detected (0.01mg/kg)
3.	Mercury	Not detected (0.01mg/kg)

DISCUSSION

In the present era, standardization of herbal products is essential for several reasons. According to a survey (1993) of World Health Organization (WHO), the practitioners of traditional system of medicine treat about 80% of patients in India, 85% in Burma and 90% in Bangladesh.[14] Herbs are staging a come-back and the herbal renaissance is “the happening” all over the globe. Ironical fact – Ayurvedic System of medicine is still struggling to reach the heights beyond numerous hurdles in its path. One such hurdle is controversy over botanical identity of drugs. The quality assessment of herbal formulations is of paramount importance in order to justify their acceptability in the present era. It becomes essential for anyone involved with manufacturing of drugs to provide the public a standard quality medicine. Few parameters are set by the World Health Organization (WHO) related with standardization. These parameters further are able to trace out any admixing (if done) with genuine drugs. pH shows that the Gandarvahasthadi kwatha is acidic in nature (Table 2). The specific gravity at 27˚C is 1.0017. Ash value is 0.38% this proves that there is no much inorganic salts in the product. The investigation had proved the formulation is free from heavy metals, this ensures that the final product is safe and is prepared under good condition. Acid insoluble ash was not detected (Table 2). This showed the absence of inorganic materials in the compound formulation. Four peak values at areas at % 8.05, 6.75, 9.32 and 5.89 were observed in the HPTLC graph. This Rf values can be considered as HPTLC fingerprinting for the Gandarvahasthadi kwatha. Ancient heritage blended with current updated pharmaceutical technology helps in better appreciation.

CONCLUSION

The data evolved in the present study will be very useful for routine quality control of Gandarvahasthadi kwatha and also to control the batch to batch variation. Further studies should be carried out with huge samples of different batches to standardize the formulation. Pharmacological and clinical studies should be carried out to re-establish the ancient knowledge with modern scientific parameters.

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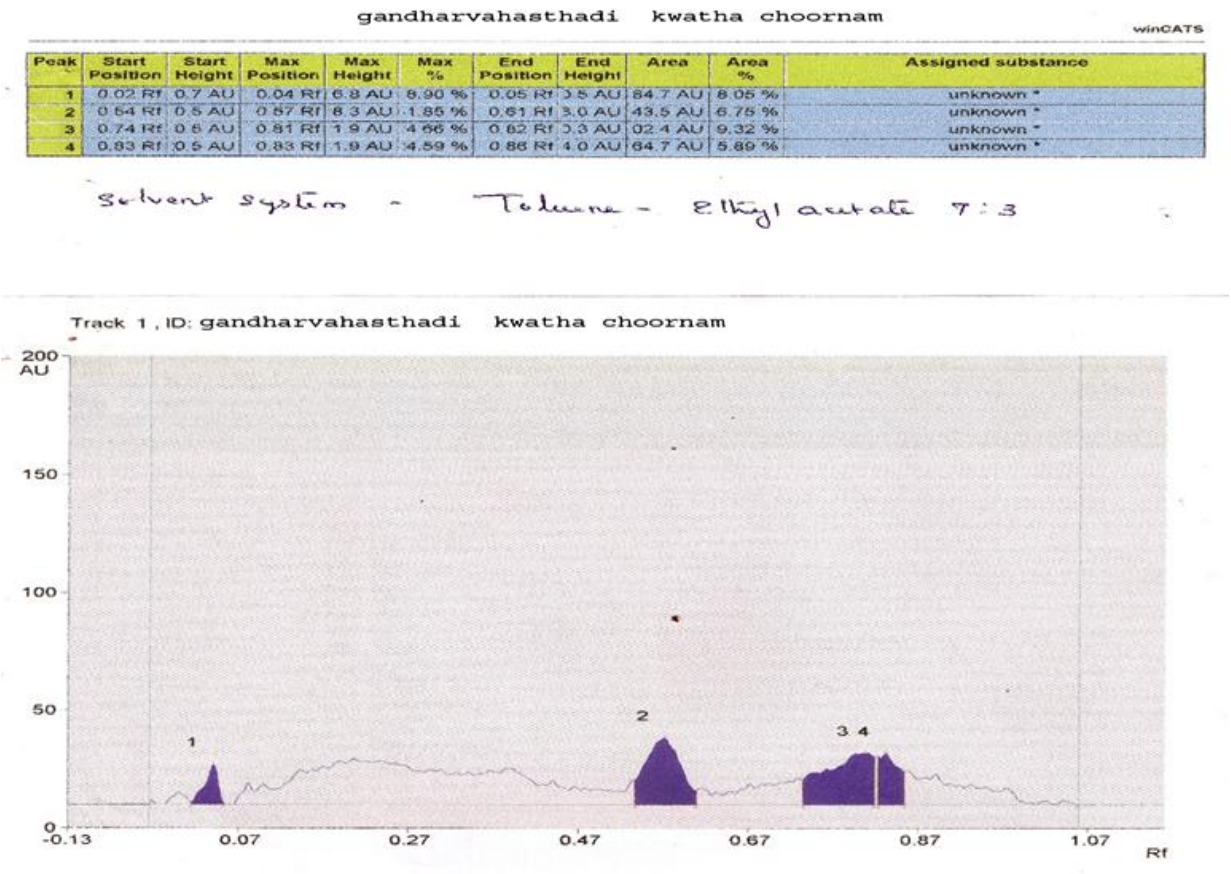
Figure 1: HPTLC analysis of Gandarvahasthadi kwatha



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