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PHARMACEUTICAL PREPARATION AND ANALYSIS OF KANCHNAR SYRUP

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ABSTRACT

Context- Concepts regarding quality control and standardization of *Ayurvedic* drugs can be traced back from the ancient era. Pharmacological evaluation is a critical component in the development of herbal drug. Based on their observations, ancient *Acharya* have been documenting the principles of drug processing and the ideal qualities of finished drug preparation. The principles developed at that time were based on scientific parameters and even today they are to be viewed and answered in the light of scientific and technological advancements in current scenario. The plant Bauhinia variegata is widely used in India and possesses several health benefits. This article depicts the picture of herbal drug *Kanchnar* along with pharmaceutical preparation and analysis of *Kanchnar* syrup. **Material and Methods**: *Kanchnar* syrup is a herbal formulation containing *Kanchnar twak* and jaggery which was prepared in a GMP certified *Ayurveda* pharmacy and subjected to pharmacopeial procedures for analysis of organoleptic, physicochemical, phytochemical, heavy metals and TLC for standardization. **Observation and Results:** Findings are pH (Direct) 4.66, Specific gravity 1.26, Total solids 74.60%, Total Sugar 61.91, reducing sugar 33.95% w/v, non-reducing sugar 27.96 %w/v. Heavy metals like Lead1.69ppm, Arsenic <0.50 ppm, Cadmium 0.01 ppm, Mercury <0.13 ppm. Identification by TLC- RF-0.447, RF- 0.588. **Conclusion:** Syrup shows all values in the standard range as per API and suggestive of authentic and standard pharmaceutical preparation of *Kanchnar* syrup

KEYWORDS: *Kanchnar* syrup, pharmaceutical preparation and analysis.

INTRODUCTION

Ayurveda has emerged to be a life saviour offering not only curative but also preventive principles for a healthy life. The increasing demand and attractiveness towards *Ayurveda* is due to the fact that *Ayurvedic* medications bear less chances of side effects and toxicity risks, and they are also more cost effective. Also, With the growing awareness of health care and safety aspects, people are turning towards Herbal products. *Ayurveda* provides management in a purely natural way without any side effects as said- "*Ayurvedic* treatments always yield side benefits, not side effects".

The increasing demand of herbal medicines by the population creates a pressure for development of pharmacopeial standards. Concepts regarding quality control and standardization of *Ayurvedic* drugs is a matter of concern. Pharmacological evaluation is an essential component in the development of herbal drug. This includes drug identification, processing, authentication and the ideal qualities of finished drug preparation.

Standardization of drug means confirmation of its identity, quality and purity throughout all phases of its cycle i.e., storage, shelf-life, distribution and use by various parameters.[1] *Ayurveda* is full of treasures in terms of medicinal plants and *Kanchnar* is one of them. *Kanchnar* has a number of therapeutic characteristics and is utilised in a variety of treatments. Each drug has its own distinguishing characteristics that let it stand out from other drugs and among the drugs of the same species. The quality, efficacy, and safety of a medicine has always been a major public health concern. Before delivering a medicine to a human subject or conducting an experiment, the drug should be thoroughly researched and interpreted in light of modern chemistry to determine its suitable scientific background.

The term "analysis" refers to a thorough examination of something to get a better understanding of it. Even minor characteristics of the medicine are revealed through analysis. Analytical studies are necessary to monitor drug quality and to standardize it. Analytical study is required to investigate the physical, chemical properties and active principles of a drug. The results are then compared to standard parameters. The analytical investigation allows us to make more casual assumptions regarding the hypothesised association between risk factors and outcomes. The purpose of the study is to

gather information about the medicine in order to determine its safety and efficacy.

According to *Acharya* Charak *Chikitsa chatushhpada* having the best attributes is an essential requisite for the treatment of disease.[2] Drug is an important component among the medical quartet. The drug should be plenty enough for availability, should be capable enough to cure the diseases, can be made available in diverse forms to make administration easier and rich in all qualities like *Ras panchaka*. The medicines described by the ancient *Acharyas* are the outcome of thorough analysis, observations and discussions of clinical experiments.

In Indian system of medicine different species of Bauhinia are known and used as *Kanchnara*. Watt has described Bauhinia variegata Linn. as *Rakta Kanchnar* and Bauhinia racemosa Linn. as *Shweta Kanchnar*,[3] while in Bhavaprakash Nighantu, besides Bauhinia variegata Linn., Bauhinia purpurea Linn., Bauhinia tomentosa is also mentioned under *Peeta Kanchnar*.[4] Later Professor Priyavrat Sharma in his *Dravyaguna Vijnanam* has described Bauhinia variegata Linn. as *Kanchnar* of *Ayurveda*.[5] Bauhinia variegata Linn. is an important medicinal plant belonging to family Caesalpiniaceae. It is also known by various names like *Kachanara* (Hindi), *Raktakanchan* (Marathi), Mountain ebony or orchid tree (English) and *Kanchana* means "A glowing beautiful lady" in Sanskrit.[6] A phytochemical screening of Bauhinia variegata flowers revealed the presence of terpenoids, flavonoids, tannins, saponins, reducing sugars, steroids and cardiac glycosides.[7]

Kanchnar is *Vranashodhak* (purifies the ulcer), *Vrana ropaka* (heals the ulcer), *Kushthaghana* (anti leprotic), *Shothahar* (anti-inflammatory), *Gandmala Nashak, Lasikagranthi Vriddhi har.*[8] It is a well-known *Ayurvedic* herb having *Grahi, Krimighna, Gandamalanashaka, Medoghana, Kasa hara, Raktapradara nashaka* and *Raktapittashamak* properties.

Palatability of the medicine has always been a matter of concern for children. So, the form of drugs mentioned in *Ayurvedic* literature converted into convenient form using modern technology is essential to accommodate in present era. The drug has been changed from *Kwatha* (Decoction) to syrup form for easier palatability in paediatric age group which also enhances the shelf-life of the drug making it convenient for storage and consumption.

In the present study, *Kanchnar twak Kwatha* is modified to *Kanchnar* syrup without altering the quantity of ingredients and subjected to analytical study through organoleptic, physico-chemical, phytochemical and TLC finger printing methods.

MATERIAL AND METHODS

Collection of fresh raw drug was procured in the month of May from a local raw herbal drug dealer from Haridwar, Uttarakhand. The identification and authentication of raw drugs were done with the sample of raw drug by the faculty of Department of *Darvya guna*, Uttarakhand Ayurved University, Gurukul Campus Haridwar.

Methodology of Preparation of *Kanchnar* Syurup

The medicine was prepared according to *Kwatha kalpana* as mentioned in *Ayurvedic* literature. The processing of recommended drug was started from 8/5/2021. The *Kwatha* of the recommended drug of *Kanchnar* syrup was prepared according to the instructions given in *Sharangdhar Samhita*.

Preparation of *Kwatha* (Decoction)

16 Kg of *Kanchnar twak* was pounded to coarse powder (*Yavkuta*) form and then soaked overnight in eight parts of water (128 litre). On next day, this mixture was heated on medium flame in stainless steel vessel till the quantity of liquid was reduced to one fourth (32litre) of the total and then filtered.

Preparation of Syrup

To this filtered *Kwatha* (32 litre), 40 kg of powdered jaggery was added and stirred till it got dissolved completely, then the whole mixture was heated again on low flame until the solution became thick and attained one thread consistency. Then for better shelf-life class II preservative i.e., KMS (Potassium metabisulfite) was added to the syrup at the rate of 0.3% w/v. Total amount of 54 litre syrup was obtained.

Storage of medicine

After cooling the syrup was packed in 200 ml and 100 ml sterile air tight bottles and labelled. The drug formation procedure was completed on 27/5/2021.

Contents of *Kanchnar* syrup

The syrup includes *Kanchnar twak Kwatha* and jaggery as key ingredients.

Table 1: Composition, used parts and quantity of drugs used in kanchnar syrup.

S. No.	Name	Botanical name	Part used	Ratio
1	Kanchnar	Bauhinia variegata Linn.	Bark (*Twak)*	16 kg
2	Jaggery	Jaggery		40 kg

Benefits of Sharkar (Syrup) Kalpana

It is more palatable, enhances shelf life of drug, has wide therapeutic applicability, patient compliance, reduced dosage and easy administration.

Phytochemical and Analytical Study

SHARBAT(SYRUP) as per Ministry of Ayush, Govt of India- "General Guidelines for Drug Development of Ayurvedic Formulations-page 39; following Test

parameters are given for analysis/drug standardization of syrup dosage form-
1. Description 2. Colour 3. Odour 4. Taste 5. Viscosity 6. PH7. Total solids 8. Reducing sugars/ non-reducing sugars 9. Total sugars 10. Specific gravity at 25 C 11. TLC/HPTLC/HPLC/LC-MS (any one or all) 12. Test for heavy/toxic metals Lead, Cadmium, Mercury, Arsenic (Limits as per ASU Pharmacopoeia) 13. Pesticide residue Organo chlorine pesticides, organophosphorus pesticides, pyrethroids (Limits as per ASU Pharmacopoeia) 14. Microbial contamination Total viable aerobic count Enterobacteriaceae Total fungal count (Limits as per ASU Pharmacopoeia) 15. Test for specific pathogen Escherichia coli, Salmonella spp., Staphyloccocus aureus, Pseudomonas aeruginosa (Limits as per ASU Pharmacopoeia) 16. Aflatoxins (Limits as per ASU Pharmacopoeia) (Bi, B2, Gi, G2) 17. Shelf life.

However, we have done analytical study of prepared research drug by following parameter as per available testing facilities as- Organoleptic characters, physicochemical parameters, phytochemical analysis, test for heavy metals, Thin Layer Chromatography study at Multani Pharmaceuticals Limited (Sample ID-AYF20211220105 Dated: 20/12/2021). The syrup was analysed by employing various analytical parameters. Organoleptic characters like colour, odour, consistency, taste was carried out. Physicochemical study to analyse pH, specific gravity, Total solids was done.

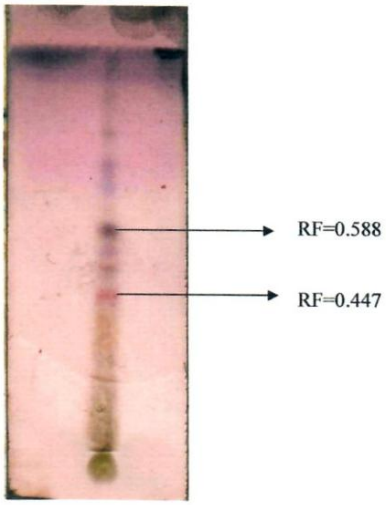
Table 2: Organoleptic characters and Physicochemical characteristics of *Kanchnar* syurp.

S. No.	Parameters	Results
1	Appearance	A dark brown colour liquid
2	Colour	Dark brown
3	Odour	Characteristic
4	Taste	Sweet
5	pH (as such)	4.66
6	Specific gravity at 25 C	1.26
7	Total solids(%w/v)	74.60
8	Reducing sugar(%w/v)	33.95
9	Non reducing sugar(%w/v)	27.96
10	Total sugar(%w/v)	61.91

Table 3: Heavy metals in *Kanchnar* Syrup.

S. No.	Parameters	Results
1	Lead	1.69ppm
2	Arsenic	<0.50 ppm
3	Cadmium	0.01 ppm
4	Mercury	<0.13ppm

Thin Layer Chromatography



RESULTS AND DISCUSSION

The herbal preparation *Kanchnar* syrup was prepared as per guidelines mentioned in Sharangdhar Samhita. Characters of the *Kanchnar* syrup are illustrated in Table 2 and 3. The dark red colour of *Kwatha* turned to dark brown after adding jaggery into the syrup. Physicochemical parameters pH (Direct) of any liquid provides the quantitative indication of the acidity or alkalinity of a solution which was 4.66 i.e., acidic. Specific gravity of *Kanchnar* syrup was 1.26 which is approximately equal to the reference value, indicating that the quality of the manufactured syrup is within normal limits. Total solids were 74.60%w/v. Total solids are the measure of the combined content of inorganic and organic substances present in the syrup. The presence of sugar particles in the syrup causes significant increase of Total solids in syrup. The total solids content was 74.60 percent by weight. Total solids refer to the total amount of inorganic and organic substances present in a syrup. The presence of sugar particles in the syrup generates a considerable rise in the total amount of sugar in the syrup. On Assay analysis Total Sugar was 61.91 %w/v with reducing sugar being 33.95% and 27.96% non-reducing sugar. Heavy metals in the syrup were within range as mentioned in API. The metals were Lead 1.69ppm, Arsenic <0.50 ppm, Cadmium 0.01 ppm, Mercury <0.13 ppm. Identification was done by thin layer chromatography. TLC- RF-0.447, RF- 0.588.

CONCLUSION

Pharmacological evaluation is an essential component in the development of herbal drug. The syrup was subjected to pharmacopeial procedures for analysis of organoleptic, physicochemical, phytochemical, heavy metals and TLC

for standardization. It showed all values in the standard range as per API and suggestive of authentic and standard pharmaceutical preparation.

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