Research Article

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PHARMACOGNOSTICAL AND PHYTOCHEMICAL EVALUATION OF NAVAKARSHIK CHURNA: AN AYURVEDIC FORMULATION

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ABSTRACT

Ayurveda practitioners in the present era are totally dependent upon mediators for the drug collection and at the same time, there is a huge demand for the Phyto- pharmaceutical products of Ayurveda. As a result, there is lot of adulteration and substitution in genuine drugs of Ayurveda. So, there develops a need to standardize these Pharmaceutical products. Navakarshik churna is a commonly prescribed ayurvedic medication for the management of hyperuricemia. In the present study, the preparation was subjected to confirm its quality and purity. No work has been done yet regarding evaluation of Navakarshik churna. Organoleptic study of the formulation prepared from crude drugs was done. Coarse powder showed the presence of starch, calcium sulphate, cellulose, mucilage, lignins and cell nuclei. Further Phytochemical study was done using different tests like Molisch test, Benedict test, Fehling test, Hager test, Dragondorf test, Phenolic test, foam test and others which showed the presence of carbohydrate, alkaloids, amino acids, proteins, saponin, phenolic compound, steroids and tannin. Physicochemical results revealed that moisture content was 8.64% v/w, Water soluble extract 26.45% w/w, Alcohol extract 17.67 % w/w and Total ash 4.67 % w/w. Thin layer chromatographic study of the formulation was carried out with appropriate solvent system in which maximum five spots were distinguished at Rf value 0.14, 0.25, 0.28, 0.67, 0.75 which clearly showed the presence of some particular constituents in the sample which are responsible for its hypourecemic activity.

Keywords: Navakarshik churna, Vatarakta, Pharmacognosy, Phytochemistry

INTRODUCTION

Ayurveda is a science that is widely acknowledged to be the world's oldest system of health. Ayurveda is not just a health care system but a complete approach to living. It offers a rich and comprehensive conception of life.[1] India is a mother hub for development of Ayurveda, Unani, Siddha; Homoeopathy and other natural herbs based health science (AYUSH). Ayush Pharmaceutical industry is having great potential and opportunities for development in future.[2] The use of herbs as medicine is the oldest form of healthcare known to humanity and has been used in all cultures throughout history.[3] It becomes the responsibility of the Pharmaceuticals to provide consumers the formulations, which must be pure, potent, safe and effective.

Navakarshik churna is one of the most potential polyherbal preparation mentioned in Chakradutta which is claimed to beneficial in the management of Gouty arthritis.[4] Gout is a metabolic disease most often affecting middle aged to elderly men and post -menopausal women. It is the result of an increased body pool of Urate with Hyperuricemia. It is typically characterized by episodic acute and chronic arthritis, due to deposition of MSU crystals in joints and connective tissue tophi, and the risk of deposition in kidney interstitium or uric acid nephro lithiasis.[5] In spite of the extensive research being conducted throughout the world, the plight of the patients of Vatarakta is still a pitiable one. In view of the sufferings of the patients, both by the inflammatory process and the deformities and the prolonged methods of treatment, there is a need for evolving a definite constructive programme for the diagnosis and prevention of vatarakta.[6] Ayurveda system of medicine has many such wonderful formulations which can be used for curing Vatarakta and Navakarshik churna is one among them. Ingredients of this powder are Haritaki, Vibhitak, Amlaki, Nimba, Manjishtha, Vacha, Katuki, Guduchi and Daruharidra.[4]

MATERIAL AND METHODS

Collection of the drug

Nine different drugs of Navakarshik churna were collected from Prem nagar Pharmacy, Haridwar. The ingredients and the part used are mentioned in Table n1.

Preparation of formulation

The crude drugs collected from Pharmacy were identified and authenticated by the faculty of Dravyaguna dept, Rishikul Campus, Haridwar.[7] These drugs were further preserved by keeping them in separate good quality air tight containers to avoid any kind of degradation. Navakarshik churna was then prepared by taking Haritaki, Vibhitak, Amlaki, Nimba, Manjishtha, Vacha, Katuki, Guduchi and Daruharidra, all nine

drugs are taken in quantity of one karsha each and coarse powder was prepared. The powder was stored in airtight glass jars under hygienic conditions. (Figure 1)

Pharmacognostical Evaluation

This powder was analyzed using organoleptic characters, powder microscopy, and various standard physicochemical parameters such as, Loss on drying[8], PH[9] water soluble extract[10] and methanol soluble extract[11] as per API. Phytochemical study was then carried out in which freshly prepared extracts were tested for the presence of various active phytocompounds like phenols, tannin, flavonoid, protein, reducing sugar, carbohydrates, lipids, saponin, triterpenoid alkaloid, resins, volatile oils, anthraquinone and Quinone.[12] Thin layer chromatographic (TLC) study was done in which 10% 10 ml H_2So_4 was added in 5 ml Alcoholic Extract of drug sample. The filter so obtained was made alkaline by adding strong ammonia solution and then solution was extracted with chloroform. The chloroform extract was made to dry and reconstitute with 2ml methanol. Solvent system was prepared by taking toluene and ethyl acetate in a proportion of 7:3. The spots obtained from both the extracts were examined under Dragendorff's reagent.[13]

OBSERVATION & RESULTS
Organoleptic study

Organoleptic study of sample was carried out and different parameters like Taste, Color, Odor and touch were evaluated and results are mentioned in the table 2. The sample was then subjected to pharmacognostical study in which microscopic evaluation of the powder showed the presence of lignins, starch, cellulose, cell nuclei and mucilage. (Figure 1)

Physico-Chemical Evaluation

Physico-Chemical study of the Navakarshik churna was carried out in which Moisture Content, water soluble extract, alcohol soluble extract and ash values were found within the normal range. (Table 3)

Phytochemical Evaluation (Qualitative test)

Each chemical constituent gives specific test when treated with the specific chemical. Some of the qualitative tests for functional gropus, which play very important role in the expression of biological activity by the plant materials were performed. In phyto-chemical study, alkaloid test (Dragondrof test, Wagner's test, Hager's test), Carbohydrate test (Molisch test, Benedict test, Barfoed's test, Fehling test), Amino acid test (Ninhydrine test), Protein test (Biuret test, Xanthoprotic test, Million test), Glycosides (Borntrager's test), Steroids (Salkowski reaction), Tannins ($FeCl_3$ test, Lead acetate test, Potassium dichromate test) were performed and results are depicted in table 4.

TLC study

On performing TLC, visual observation under Dragendorff's reagent showed few spots at Rf values 0.14, 0.25, 0.28, 0.67, 0.75 (Table 5 and Figure 3).

Table 1: Ingredients and Part used of Navakarshika Churna

S.No.	Sanskrit name	Botanical name	Part used	Quantity
1.	Haritaki	*Terminalia chebula*	Fruit	50 gm
2.	Vibhitak	*Terminalia bellerica*	Fruit	50 gm
3.	Amalaki	*Emblica officinalis*	Fruit	50 gm
4.	Guduchi	*Tinospora cordifolia*	Stem	50 gm
5.	Vacha	*Acorus calamus*	Rhizome	50 gm
6.	Nimba	*Azadirachta indica*	Stem bark	50 gm
7.	Daruharidra	*Berberis aristata*	Stem	50 gm
8.	Manjishtha	*Rubia cordifolia*	Root	50 gm
9.	Kutaki	*Picrorhiza kurroa*	Rhizome	50 gm

Table 2: Organoleptic parameters of Navakarshika Churna

Characters	Results
Taste	Bitter (Tikta), Pungent (Katu)
Colour	Yellowish brown
Odour	Characteristic
Touch	Rough

Table 3: Physiochemical Parameters of Navakarshika Churna

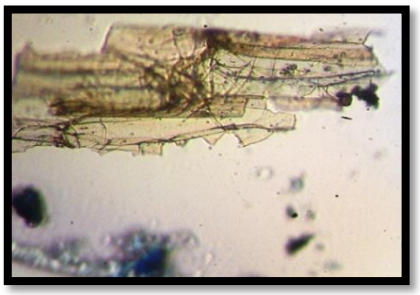
S. No	Parameters	Observation
1	Moisture content	8.64 %v/w
2	Alcohol Extractive Value	17.67%w/w
3	Aqueous Extractive Value	26.45%w/w
4	Petroleum Ether Extractive Value	4.78%w/w
5	Total Ash	4.67%w/w
6	Acid Insoluble Ash	2.13%w/w
7	Water Soluble Ash	2.78%w/w

Table 4: Phytochemical screening of Navakarshika churna

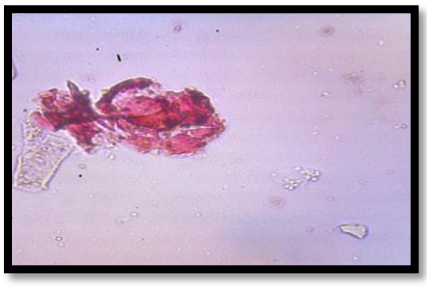
	Name of test	Aqueous extract	Alcohol extract	Petroleum ether extract
Carbohydrate test	Molisch test	+ve	+ve	-ve
	Benedict test	-ve	-ve	-ve
	Barfoed's test	+ve	+ve	-ve
	Fehling test	-ve	-ve	-ve
Alkaloid test	Dragondorf test	+ve	-ve	-ve
	Wagner's test	-ve	-ve	-ve
	Hager's test	+ve	-ve	-ve
Amino acid test	Ninhydrine test	+ve	+ve	-ve
Protein test	Biuret test	+ve	-ve	-ve
	Xanthoprotic test	-ve	-ve	+ve
	Millon's test	+ve	+ve	-ve
Saponin test	Foam test	+ve	-ve	-ve
Glycoside test	Borntrager's test	+ve	-ve	-ve
Phenolic compound test	Phenolic test	+ve	+ve	+ve
Steroid test	Salkowaski reaction	+ve	-ve	+ve
Tannin test	$Fecl_3$ test	+ve	+ve	+ve
	Lead acetate test	+ve	-ve	-ve
	Potassium dichromate test	-ve	+ve	-ve

Figure 1: Prepared Navakarshika churna

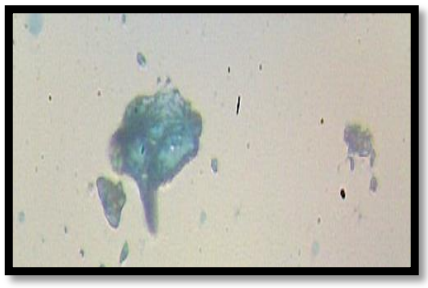
Red colour of Lignins (Stain: Phlorogucinol + HCl)



Violet Colour of Starch and Pale yellow colour of Cellulose (Stain: Iodine Solution)



Red Colour of cell nuclei (Stain: Saffarinin)



Deep Blue Colour of Mucilage (Stain: Methylene Blue)

Figure 2: Powder microscopy of Navakarshika Churna

Figure 3: TLC study of Navakarshika Churna

Table 5: TLC study of Navakarshika churna

Solvent system	Visualisation	No. of Spots	Max. Rf
Toulene : Ethyl acetate (7:3)	Dragendorff's Reagent	5	0.14, 0.25, 0.28, 0.67, 0.75

DISCUSSION

Crude drugs procured from the markets form major part of the Ayurvedic formulations, so the correct identification of these crude drugs is quite necessary to avoid any sort of adulteration. Adulteration of the drugs cause degradation in the quality of the medicine and reduce its therapeutic effect, thus defaming the pathy. There is a need to uplift the quality of medicines and taking them to the adequate standards. For this, proper identification of the plant along with its pharmacognostical and phytochemical evaluation is necessary. The present study was carried out to make pharmacognostical standards for Navakarshik churna, a commonly used medicine for hyperurecemia. Pharmacognostical evaluation of Navakarshik churna revealed the presence of different constituents in its powder microscopic study, from all nine ingredients used in the compound formulation which clearly indicated the genuineness and purity of the prepared medication. Physico-chemical parameters of Navakarshik churna like Loss on drying, Ash value, Extractive value all were found to be within the normal range. Phytochemical tests showed the presence of Carbohydrate, Alkaloids, Amino acids, Proteins, Saponin, Phenolic compound, Steroids and Tannin. TLC study also helped in identifying the genuineness of the sample and gave 5 spots.

CONCLUSION

Pharmacognostical evaluation of Navakarshik churna revealed the characters of different ingredients which were used for the preparation of this formulation and no specific change was observed in the microscopic structure of these crude drugs. Different phytochemical tests were done for this study which helps in revealing different compounds and their presence in different extracts. This can be helpful in analyzing the therapeutic effect of the formulation in different ailments. This study is an attempt to meet the minimum quality standards for this polyherbal formulation and can be used as a reference for further advance studies as some other important parameters are required for the identification and quantification of all chemical constituents of different drugs of this formulation.

REFERENCES

1. Sunil V. Joshi, Ayurveda and Panchkarma, Lotus Press, USA, Print : 1996. p. 3.
2. Rajeev Kurele. Drug standardization of Ayurveda, Unani and Siddha drugs. Int. J. Res. Ayurveda Pharm. 2015;6(2):192-194 http://dx. doi.org/10.7897/2277-4343.06239
3. Barnes J, Anderson LA, Phillipson JD (2007). Herbal medicine. 3rd Edition, Pharmaceutical Press, London. pp 1-23.
4. Babu suresh madham shetty Chakradutta chowkhambha krishnadas academy ed2012 Vata-rakta Chikitsa – Chapter – 23 p.196
5. Jeffrey S, Marathos-Flier E, Kasper, Braunwald, Fauci, Hauser, Longo, Jameson. Harrison's principles of internal medicine. 17th ed. Vol. 2. New York: Mc Graw Hill publications; 2005. p. 2165.
6. V.V.subrahmaniasastry Vatarakta and its treatments ed 2013kottakal arya vaidya sala, p.11-12
7. Anonymous.The Ayurvedic Pharmacopeia of India, First Ed. Part-1, Vol.-5 New Delhi, Ministry of Health & Family welfare. 2004.
8. Anonymous, The Ayurvedic Pharmacopoeia of India, 1st Edition, Ministry of Health and Family Welfare, Govt. of India, Part I, Vol. I 1999, Appendix - 2, Pg. 214 (2.2.9).
9. Anonymous, The Ayurvedic Pharmacopoeia of India, 1st Edition, Ministry of Health and Family Welfare, Govt. of India, Part I, Vol. I 1999 ,Appendix - 3, Pg -230 (3.3).

10. Anonymous, The Ayurvedic Pharmacopoeia of India, 1st Edition, Ministry of Health and Family Welfare, Govt. of India, Part I, Vol. I 1999, Appendix - 2, Pg - 214 (2.2.7).
11. Anonymous, The Ayurvedic Pharmacopoeia of India, 1st Edition, Ministry of Health and Family Welfare, Govt. of India, Part I, Vol. I 1999, Appendix - 2, Pg -214 (2.2.6).
12. Khandelwal KR. Practical pharmacognosy techniques and experiments. New Delhi: Nirali Prakashan; 2002. p. 15-163.
13. Anonymous, The Ayurvedic Pharmacopoeia of India, 1st Edition, Ministry of Health and Family Welfare, Govt. of India, Part I, Vol. I 1999, Appendix - 2, Pg -213-214

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