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Research Article

STANDARDIZATION OF KAWACH BEEJ CHURNA

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ABSTRACT

Herbal medicine has been utilized in many diseases in ancient times. Standardization of herbal formulation is essential to assess the quality of drugs. The World Health Organization (WHO) in 1999 has given a detailed protocol for the standardization of herbal drugs comprising of a single content. We have developed a simple scheme for the standardization of Kawach Beej churna. Three marketed preparations and laboratory preparations were used for the study performed. The various parameters include organoleptic characteristics and physicochemical. UV spectroscopy was carried out for quantitative analysis of all the formulations. The set parameters were found to be sufficient to standardize the Kawach Beej churna and can be used as reference standards for the quality control/quality assurance study mostly on plant drugs for primary health care needs.

Keywords: Standardization; Kawach Beej churna; Traditional medicine; physicochemical parameters, Marketed formulation.

INTRODUCTION

Medicinal plants are nature's gift to human beings to make a disease-free healthy life. There has been exponential growth in the field of herbal medicine. There is a great need for the standardization of herbal formulation. Standardization is a system to ensure that every packet of medicine that is being sold has the correct amount and will induce its therapeutic effect. WHO also issued guidelines for quality control methods for medicinal plant material in 1992 with a clear objective to provide general test methods for correct botanical evaluation and identification of medicinal plants. The preparation of Kawach beej churna is based on traditional methods in accordance with the procedures given in classical texts. This may not have the desired quality and batch-to-batch consistency. Hence this formulation required standardization according to guidelines given by WHO. Therefore, an attempt has been made to standardize Kawach beej churna, a Herbal formulation as prescribed in the Herbal formulary, used as antiparkinsonian. The individual plant powders of the formulation were subjected to various pharmacognostical parameters. Four formulations, one lab preparation and three samples from different manufacturers were procured and subjected to various physicochemical analysis, TLC fingerprinting and botanical characterization using authenticate ingredients as controls.

MATERIALS AND METHODS

The seeds of Kawach were procured from local market of Mumbai, India and were authenticated by Mr. M. D. Wadmare Head Department of Botany, Smt. K. W. College, Sangli, India.

Preparation of Kawach Beej churna

The seeds were dried in the shade, powdered, and passed through the sieve no. 44 and defatted with acetone and lastly packed in well closed container to protect them from moisture.

Marketed samples

The marketed samples of various brands i.e. (A), (B), (C) and Lab preparation were standardized based on their organoleptic characters, physical characteristics and physicochemical properties.

Organoleptic Evaluation

Organoleptic evaluation refers to the evaluation of formulation by colour, odour, taste etc. The organoleptic characters of the samples were carried out. [Table 1]

Pharmacognostical studies.

The seed powder was studied for its physicochemical constant which includes ash values, and extractive values.[1] [Table 2]

Determination of moisture content.

Loss on drying is the loss of mass expressed as per cent w/w. About 5g of drug samples of each formulation was accurately weighed in a dried and tared flat weighing bottle and dried at 105°C for 5 hours. The percentage was calculated with reference to the initial weight.[1] [Table 2]

Determination of Physical Characteristics

The powdered drug was taken and was kept for determination of powder characteristics like bulk density, Tap density, Angle of repose, Hausner's ratio etc.[2] [Table 3]

Preliminary Phytochemical Tests

Preliminary phytochemical tests for alcohol extract of the drugs were carried out. It shows the presence of Alkaloids, Glycosides, Terpenoids, Steroids, Tannins, Saponins, and Reducing sugars.[3] [Table 4]

Isolation of Marker Compound-Levodopa

The dried, milled seeds (100 g) were defatted with acetone (300 ml) by shaking for 48 h at room temperature. Defatted material was extracted with water-ethanol (1:1) with 0.1% ascorbic acid by shaking overnight. The residue was removed by filtration and filtrates were pooled and concentrated. The concentrate after crystallization yielded crude L dopa, which on further recrystallization in hot water gave pure crystals.[4]

Identification of isolated marker compound

For identification, isolated samples were subjected to Qualitative tests, IR spectroscopy and UV spectroscopy were determined and compared with a standard sample of Levodopa.

Qualitative Tests for Levodopa

Dissolve 2 mg in 2 ml of water and add 0.2 ml of Ferric chloride solution Green colour develops which changes to bluish violet on the addition of 0.1 g of hexamine.

IR spectroscopy

The IR analysis of standard levodopa was carried out using the pressed pellet technique and the presence of probable functional groups were interpretated. Similarly, the isolated levodopa of all the four samples was analyzed for their IR spectra, and the IR spectra of the isolated levodopa of all the four samples were compared (overlaid) with that of standard levodopa.

Qualitative and Quantitative Estimation of isolated levodopa by spectroscopic analysis[5]

For Estimation, isolated levodopa was subjected to UV spectroscopy and results were compared with standard levodopa (RS). [Table 5]

Table 1: Organoleptic properties of different Kawach churna formulations

Different Formulations	Appearance	Color	Odor	Taste
Formulation A	Powder	Brown	Characteristic	Sweet
Formulation B	Powder	Brown	Characteristic	Sweet
Formulation C	Powder	Whitish brown	Characteristic	Sweet
Formulation D	Powder	Brown	Characteristic	Sweet

*Samples are collected and labeled as MK1, MK2, MK3, Lab formulation named as formulation A, formulation B, formulation C, formulation D respectively.

Table 2: Quality tests for different Kawach churna formulations

Sample	Moisture content (%)	Alcohol soluble (%)	Water soluble (%)	Total ash (%)	Acid insoluble ash (%)	Water soluble ash (%)
Formulation A	3.76±0.0055	15.38±0.100	32.18±0.114	3.9±0.023	0.39±0.0010	0.62±0.0022
Formulation B	4.30±0.0010	15±0.097	31.5±0.129	4.04±0.036	0.53±0.0003	1.68±0.011
Formulation C	5.06±0.050	14.94±0.093	30.68±0.068	4.06±0.043	0.58±0.0007	1.72± 0.011
Formulation D	3.71±0.0011	15.7±0.086	32.62±0.084	3.16±0.019	0.36±0.0005	1.27±0.0049

*****Samples are collected and labeled as MK1, MK2, MK3, Lab formulation named as formulation A, formulation B, formulation C, formulation D respectively.

Table 3: Physical characteristics of different formulations of Kawach churna

Parameters	Formulation A	Formulation B	Formulation C	Formulation D
Tap Density(gm/cm^3)	0.74±0.085	0.70±0.111	0.76±0.1	0.70±0.087
Bulk Density(gm/cm^3)	0.61±0.056	0.61±0.008	0.62±0.055	0.59±0.006
Angle of repose	30.11±0.59	24.70±1.3	20.55±1.12	26.56±1.23
Hausner ratio	1.2±0.04	1.13±0.02	1.21±0.055	1.18±0.03

*****Samples are collected and labeled as MK1, MK2, MK3, Lab formulation named as formulation A, formulation B, formulation C, formulation D respectively.

Table 4: Phytochemical screening of extract of different formulations of Kawach churna

Phytochemical	Formulation A	Formulation B	Formulation C	Formulation D
Alkaloids	+	+	+	+
Glycosides	+	+	+	+
Terpenoids	+	+	+	+
Steroids	+	+	+	+
Tannins	+	+	+	+
Saponins	+	+	+	+
Reducing sugars	+	+	+	+

(+) Present.

Table 5: Content of levodopa present in different formulations of Kawach churna

Sample	Formulation A	Formulation B	Formulation C	Formulation D
% of levodopa present	2.75	2.77	2.65	3.4

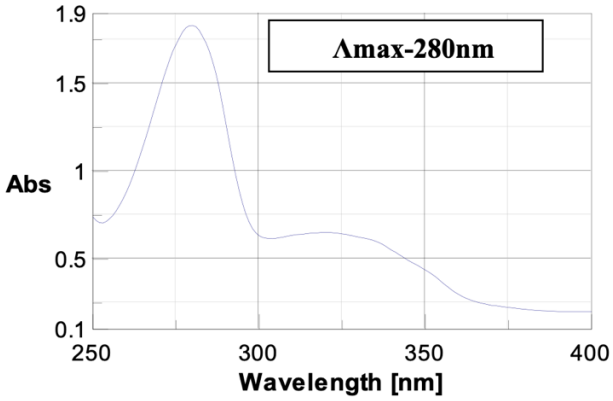

Figure 1: UV spectra of standard Levodopa

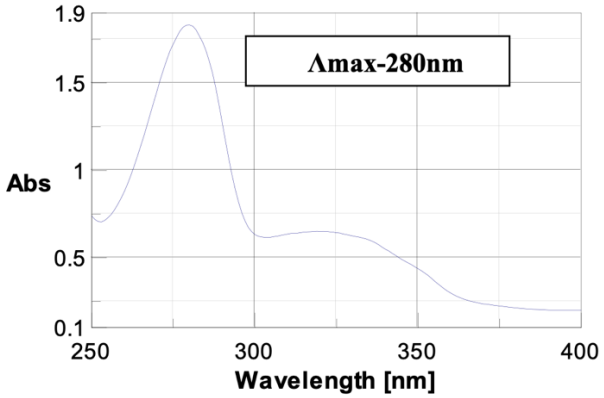

Figure 2: UV Spectra of isolated Levodopa

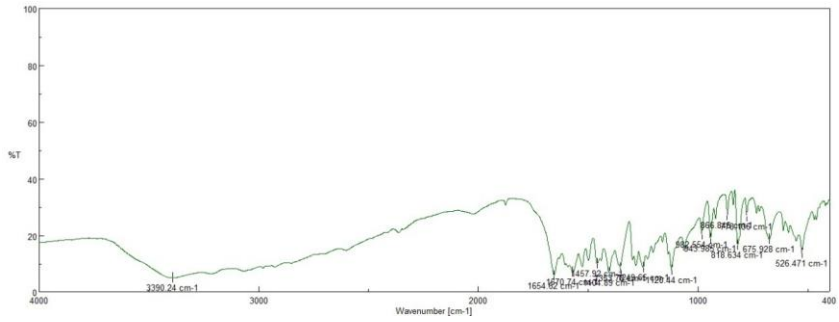

Figure 3: IR Spectra of standard Levodopa

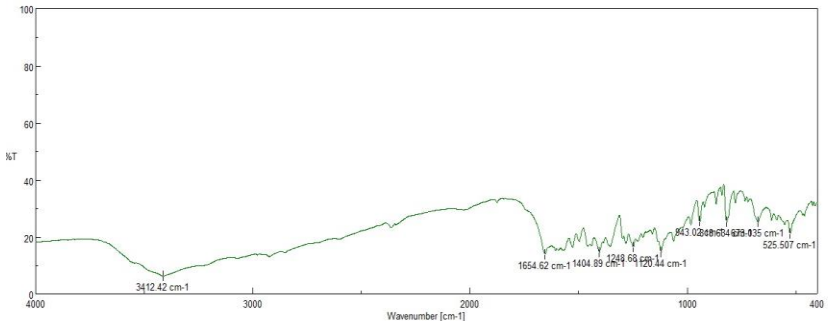

Figure 4: IR Spectra of MK1 formulation

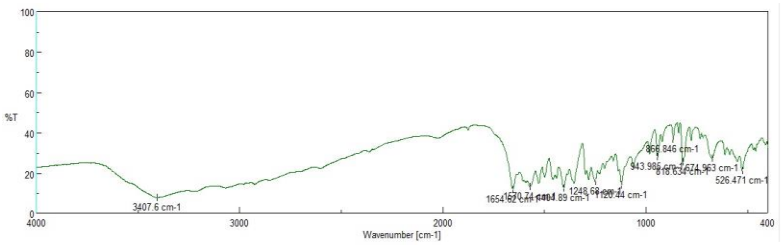

Figure 5: IR Spectra of MK2 formulation

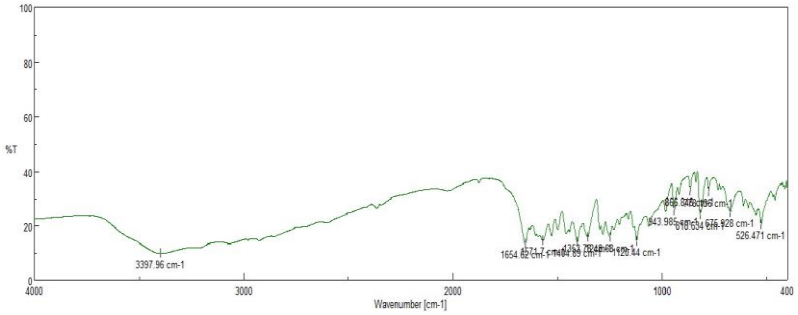

Figure 6: IR Spectra of MK3 formulation

RESULT AND DISCUSSION

Lab formulation was prepared in accordance with the Ayurvedic Formulary of India. As part of the standardization procedure, the finished product Kawach Beej churna was tested for relevant physical and chemical parameters along with samples from three different manufacturers A, B and C for a comparative study. All samples were brown in colour except formulation C which was whitish brown in colour. The powders were smooth, having a characteristic odour, possessing a sweet taste. The organoleptic properties of the marketed formulations and the Lab formulation were reported in table 1. Quality tests for different Kawach churna were performed for moisture content, ash content, water soluble extractive, alcohol soluble extractive, acid insoluble ash and water-soluble ash were found to be within standard ranges. The extractive values, ash values and moisture content of Lab formulation and different marketed formulations are given in table 2. The results are expressed as mean (n=3) ±standard deviation (SD). The total ash value of formulation C was found to be higher than that for A, B and D. Acid insoluble ash value for lab formulation (D) was found to be 0.36±0.0005 and in the case of marketed formulations A, B and C this was found to be 0.39±0.0010, 0.53±0.0003 and 0.58±0.0007 respectively. On the contrary, water-soluble ash percentages of A, B and D were comparable except C which was comparatively high. The extractive values of formulations in water were found to be much higher than alcohol soluble extractive values. The physical characteristics of the lab formulation (D) and three marketed formulations (average value along with standard deviation) are shown in Table 3. The results of the marketed formulations and lab formulation were found to be comparable. The flowability of the formulations was found to be good for all formulations, which was further confirmed by the values of Hausner ratio. The marker compound levodopa was found to be more in lab formulation (3.4%) and less in MK3 formulation (2.65%). The marker compound levodopa was estimated by UV spectroscopy in Kawach churna sample. Ayurvedic medicine Kawach churna has been standardized by intervention of modern scientific quality control measures described in classical texts. Hence, the physicochemical parameter, quantitative analysis and TLC fingerprint profiles together may be used for quality evaluation and the standardization of compound formulations.

CONCLUSION

Herbal formulation Kawach churna has been standardized as per Herbal pharmacopoeia. Pharmacognostic and phytochemical characteristics established for the raw material could be employed as standards for evaluating the identity, purity and potency of crude drugs and formulations. This present study has revealed the depth of the medicinal plant as well as its chemical constituent for therapeutic activity.

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