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Research Article

A COMPARATIVE STUDY OF PHYSIO-CHEMICAL PARAMETERS FOR KUSHMANDA BEEJA CHURNA AND GRANULES

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ABSTRACT

Kushmanda Beeja is extensively used in traditional Asian medicines, and their potential in bioremediation, and hence are very important genus economically. The objective of this study was to do phytochemical analysis of the Kushmanda Beeja Churna and compared with Kushmanda Beeja Granules

The test drug seeds of *Benincasa hispida* (Thunb.) Cong. was procured from pharmacy and the granules were prepared from procured seed samples and were used to test the various physico-chemical parameters like loss on drying, Ash value, Water soluble extractive, Methanol soluble extractive, Hexane soluble extractive, pH value etc. Increase in loss on drying value indicates increase in moisture holding capacity. Ash value indicates the presence of inorganic constituents in the sample and is mainly due to sugar component added in Kushmanda Beeja granule formulation. The pH value indicates the potential hydrogen ions available in particular substance.

The water soluble and methanol soluble extractive values were found more in Kushmanda Beeja Granule (KBG) than Kushmanda Beeja Churna (KBC) for the reason that of addition of water soluble content (Sugar) in KBG. Ash value was found almost half in KBG; it is due to sugar component added in KBG.

Keywords: Kushmanda, *Benincasa Hispida*, Physico-Chemical Parameters, Loss on Drying, Water Soluble Extractive, Ash Value.

INTRODUCTION

Today Ayurvedic science is spreading its wings all over the world where the drug lore of this system has been the center of global interest. Ayurveda has quoted that; as the Prakriti varies from person to person similarly every drug has got its own physical and chemical characteristics which help to separate it from other closely related drug. The Phytochemical studies of these drugs done by making use of various parameters help in standardizing the drug and authenticate it[9]. So to sustain its valuable contribution in allaying disease in this modern era it is expected an imminent need for a well coordinated research plan touching phytochemical study of drug[1-4]. It is essential to gratify the international standards and quality control of the drug used by convincing the drug regulatory authorities. The present study was carried out to evaluate the phyto-chemical parameters of test drug[5-9].

MATERIALS AND METHODS

The test drug, seeds of *Benincasa hispida* (Thunb.) Cong. was procured from Agra (U.P.) by Pharmacy of IPGT & RA, GAU, Jamnagar and authenticated in the Pharmacognosy Department of IPGT & RA, G.A.U, Jamnagar[10,11].

The granule was prepared from procured seed samples from Agra and was used for phytochemical study.

Preparation of Kushmanda beeja granules:

Kushmanda Beeja Churna (60 mesh size) was prepared. Sugar was taken in equal amount to K. Beeja Churna and four times of water was added to it followed by mild heating and Chasni (60% sugar solution) was prepared. Then the K. Beeja churna was thoroughly mixed with the solution, passed through ten number mesh to prepare the granules and shade dried before subjecting for further studies and later it is subjected for comparative study of Physio-Chemical Parameters for Kushmanda Beeja.

1. Loss on drying (LOD)

The moisture content of a drug should be determined for the percentage of its active chemical constituents because its percentage depends upon air dried basis. So the moisture content of the drug should be minimized in order to prevent decomposition of the crude drugs either due to chemical change or microbial contamination.

Procedure

1 gram of drug sample was taken in a pre weighed dried Petridis. It was dried in an oven at 105ºC untill reaching a constant weight. The Petridis was taken out, self cooled and weighed immediately. The weight loss i.e. loss on drying was calculated and expressed as % w/w.

2. Ash value (AV)

This test was conducted to evaluate the percentage of inorganic salts, naturally occurring in the drug or adhering to it or deliberately added as a form of adulteration.

Procedure

1 gram accurately weighed sample was taken in a pre weighed dried crucible. It was incinerated in a muffle furnace up to 450°C. The crucible was taken out, self cooled and weighed immediately. From the weight of the ash, the ash value was derived with reference to the air dried drug. It was calculated and expressed as % w/w.

3. Water soluble extractive (WSE)

This test was carried out to determine the water soluble extractive and approximate measures of their chemical constituents of the test drug.

Procedure

5 gm. of the sample was weighed accurately. To it 50 ml of distilled water was added and kept covered overnight. It was stirred intermittently in the initial period. Next day, it was filtered. 20 ml of the filtrate was accurately measured with a pipette and transferred to the already weighed evaporating dish. The evaporating dish was placed on a water bath for evaporation of the water. After evaporation of the water it was dried in an oven, allowed cooling and weighed immediately. From the weight of the residue obtained, the percentage of water soluble extractive was calculated and expressed as % w/w.

4. Methanol soluble extractive (MSE)

This test was carried out to determine the methanol soluble extractive of the test drug.

Procedure

The method adopted for this experiment was same as that of water-soluble extract but by using methanol instead of water. Percentage of methanol soluble extract was calculated and expressed as % w/w.

4. Hexane soluble extractive

This test was carried out to determine the hexane soluble extractive of the test drug.

Procedure

The method adopted for this experiment was same as that of water-soluble extract but by using hexane instead of water. Percentage of hexane soluble extract was calculated and expressed as % w/w.

5. pH value

This test is carried out to determine the pH of the test drug with the help of pH meter

Procedure

10g of test drug sample was weighted and taken in a conical flask. Then add 50 ml accurately measured water and stirred well for few minutes; kept this solution for some time and then filtered it through filter paper. Take the filtered solution in a beaker. Standardize the pH meter and electrodes with buffer solution of known pH i.e. 7pH.Rinse the electrodes with distilled water and introduce into the test solution contained in a small beaker. Read the pH value of solution.

RESULTS

The analytical data of common Physico-chemical parameters of the samples are tabulated in Table 1.

Table 1: Analytical data of Kushmanda Beeja Churna and granule sample

Sr. No	Parameters / Samples	Results	
		Kushmanda beeja churna (KBC)	Kushmanda beeja Granules (KBG)
01	Loss on drying	2.2 % W/W	4.2 % W/W
02	Ash value	4.25 % W/W	2.1 % W/W
03	Water soluble extractive	7.20 % W/W	67.3 % W/W
04	Methanol soluble extractive	10.6 % W/W	19.2 % W/W
05	Hexane soluble extractive	28 % W/W	17.9 % W/W
06	pH value	6.33	5.47

KBC = Kushmanda Beeja Churna

KBG = Kushmanda Beeja granule

Table-1 shows the values obtained of the different parameters studied. In which we can see that there is variation in loss of drying of the samples; it varies between 2.2 % w/w to 4.2 % w/w in Sample-KBC and Sample-KBG respectively. There is also variation in Ash value of both the samples that is 4.25 % w/w and 2.1 % w/w in sample KBC and KBG. There is considerable variation in Water soluble extractives (WSE) of both the samples. The WSE of Sample- KBG is comparatively much higher (67.3 % w/w) as compared to that of Sample-KBC (7.20 % w/w).There is also considerable variation in Methanol soluble extractives (MSE); in sample-KBG (19.2 % w/w) it is higher as compared to sample-KBC (10.6 % w/w).The pH value of sample-KBC (6.33) and sample-KBG (5.47) is also having variation.

DISCUSSION

The formulation of granules is prepared from Churna of Kushmanda Beeja. The main component added was sugar that affects the physico-chemical values of finished product.

As could be seen from the Table-1 the loss on drying value of the Churna and granule was 2.2% W/W and 4.2% W/W. Increase in loss on drying value in finished product indicate increase in moisture holding capacity. Ash value indicates the presence of inorganic constituents in the sample and it is found that there are more inorganic constituents in sample-KBC (4.25 % W/W) than sample-KBG (2.1 % W/W), it is due to sugar component added in Kushmanda Beeja granule formulation.

Simultaneously, addition of water soluble component (sugar), increase extractive values in methanol and water but due to insolubility of added component in organic solvent, like hexane, extractive value decreases to 17.9% W/W in KBG in comparison to 28% W/W of KBC.

The pH value indicates the potential hydrogen ions available in particular substance. Both test samples are having slight acidic pH that is in sample-KBC (6.33) and sample-KBG (5.47) which is not having much variation.

CONCLUSION

Phytochemical study deals with material and methods and physio-chemical parameters. The materials and methods content the seed powder of Kushmanda and granules of Kushmanda seeds. Seed powder and granules were evaluated for loss on drying, ash value, water soluble extracts, Methanol soluble extracts, Hexane soluble extract and pH.

The water soluble and methanol soluble extractive values were found more in Kushmanda Beeja Granule (KBG) than Kushmanda Beeja Churna (KBC) for the reason that of addition of water soluble content (Sugar) in KBG. While due to insolubility of added component in organic solvent like hexane, extractive value decreases to 17.9% in comparison to 28% of KBC. KBG had more moisture holding capacity, as loss on drying value was noticed more in KBG than KBC. Ash value was found almost half in KBG; it is due to sugar component added in KBG. Finally it is concluded that the Physico-chemical analysis will surely give an idea of the nature, strength and purity of the plants such that it can result in proper utilization.

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