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PRELIMINARY ANALYTICAL STUDY OF CHANDANA AND SARSHAPA CHURNA

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ABSTRACT

Ayurveda pharmaceutics is a branch that deals with designing of formulations. Various dosage forms are mentioned in treatises of Ayurveda for treatment purpose. Churna is one dosage form that is used both for internal administration as well as external use in the form of lepa (external application), dhupa (fumigation), etc. Different combinations of drugs are utilized in the form of churna. Sarshapa and Chandana are easily available herbs used immensely in Ayurveda pharmaceutics in various formulations. The combination of these is said as krimighna (anti- microbial). The raw herbs were taken, and churna prepared and subjected to phyto constituent and physico- chemical analysis. The Physico- chemical parameters namely Total ash (g/100g), Acid insoluble ash (g/100g), Loss on drying (g/100g), Alcohol Soluble Extractive (g/100g), Water Soluble Extractive (g/100g), pH, Tannin (g/100g) showed 4.01, 0.09, 6.59, 27.49, 12.69, 5.50, 3.37 values respectively. The above analytical study parameters can be taken as preliminary standards for the formulation.

KEYWORDS: Ayurveda, therapeutics, analysis, Chandana, Sarshapa

INTRODUCTION

Ayurveda pharmaceutics deals with formulations intended for both internal and external usage. Various dosage forms are available in the treatises of Ayurveda among which churna Kalpana are quite popular and used as a primary medicament in clinical practice. Combinations of various single drugs are used and one such combination of Sarshapa and Chandana are said as krimighna. Topical applications have been given significance in Ayurveda therapeutics and its emphasis is seen in classical texts of Ayurveda.[1]

MATERIALS & METHODS

Pharmaceutical study

Place of collection of Ingredients

The ingredients were collected from local vendor at Hassan.

Authentication of Ingredients

The ingredients were authenticated from Department of Dravyaguna, Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan, Karnataka. Authentication was done based on macroscopic and microscopic characters, organoleptic features as well as morphological appearance.

Place of study: Dept. of Rasashastra and Bhaishajya Kalpana, Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan, Karnataka. The churna was prepared in a single batch in following method.

Materials Apparatus: Khalva yantra (Mortar-pestle), Patra (Vessel), Darvi (Spoon), Weighing machine, Sieve, Tray

Table 1: Details of ingredients

Sl. No.	Name of the Ingredient	Botanical Name	Part Used	Quantity taken
1	Sarshapa	*Brassica campestris*	Seed	50 g
2	Chanadana	*Santalum album*	Heartwood	50 g

Method of preparation:

Raw Ingredients were taken in equal quantity. Each ingredient was pounded separately, sieved through a cloth and then mixed well into a homogenous mixture.

Precautions: The ingredients were dried well to avoid moisture content. The spilling of drug was avoided while mixing.

Analytical study

Odour:

Wherever a specific odour has been observed, it has been mentioned as characteristic for that substance, but the description as 'odourless' or 'no odour' has generally been avoided in the Description where a substance has no odour. Where an 'odour' is said to be present, it is examined by smelling the drug directly after opening the container. If an odour is discernible, the contents are rapidly transferred to an open vessel and re-examined after 15 minutes. If odour persists to be discernible, the sample complies with the description for 'odour', as a characteristic for that substance.

Flavour: The taste of a drug was examined by taking a small quantity of drug by the tip of a moist glass rod and allowing it to remain on the tongue.

Preliminary phytochemical tests: [2]

Test for Alkaloids

a. Dragendroff's test: To 2-3 ml filtrate, few drops of Dragendroff's reagent were added Orange brown ppt. was formed.

Test for Glycosides:

a. Borntrager's test for Anthraquinone glycoside: To 3 ml of extract, dilute sulphuric acid was added, boiled and filtered. To cold filtrate, equal volume benzene/chloroform was added and shaked well. The organic solvents were separated and ammonia added. Ammoniacal layer turns pink or red.

Test for Saponin

a. Foam test: The drug extract or dry powder was shaken vigorously with water. Persistent stable foam was observed.

Test for flavonoids

a. Shinodatest: To extract, 5ml 95% ethanol/ t-butyl alcohol, few drops conc. HCL and 0.5g magnesium turnings was added. Orange, pink, red to purple colour appeared.
b. b. Sulphuric acid: On addition of sulphuric acid (66% or 80%) flavones and flavonols dissolve into it and give a deep yellow solution. Chalcones and aurones give red or red bluish solutions. Flavones give orange to red colours.

Tests for carbohydrates

a. Benedict's test: Equal volume of Benedict's reagent and test solution was mixed in test tube. It was heated in boiling water bath for 5 min. The solution appeared green, yellow or red depending on amount of reducing sugar present in test solution.

b. Fehling's test: 1 ml Fehling's A and I ml Fehling's B solutions were mixed, boiled for one minute and equal volume of test solution was added. Then it was heated in boiling water bath for 5-10 min. First yellow, then brink red precipitate, was observed.

Test for Tannins and Phenolic compounds

a. Ferric chloride test: To 2 ml of the test solution, few drops of 5% Ferric chloride solution was added, deep blue- black colour was formed.

b. Lead acetate test: To 2 ml of the test solution, few drops of Lead acetate solution was added, white precipitate was formed.

Tests for Protein

a. Biuret test: To 3ml Test solution 4% NaOH and few drops of 1% CuSO, solution was added. Violet or pink colour appeared.

b. Precipitation test: The test solution gave white colloidal precipitate with following reagents: (a) absolute alcohol (b) 5 % Mercuric chloride solution (c) 5 % Copper sulphate solution (d) 5% lead acetate (e) 5% Ammonium sulphate

Test for Steroids:

Salkowski reaction: To 2 ml of test solution, 2 ml Chloroform and 2 ml conc. Sulphuric acid was added, shaked well. Chloroform layer appears red and acid layer shows greenish yellow fluorescence.

Physico- chemical analysis of Sarshapa & Chandana Churna

Total Ash[3]

About 2 to 3 g of the ground drug was accurately weighed and incinerated in a tared platinum or silica dish at a temperature not exceeding 600^0 until free from carbon, cooled in a desiccator for 30 min and weighed without delay. When carbon free ash could not be obtained in this way, the charred mass was exhausted with hot *water,* the residue collected on an ashless filter paper, the residue and filter paper was incinerated, the filtrate was added, evaporated to dryness, and ignited at a temperature not exceeding 600^0. The percentage of ash with reference to the air-dried drug was calculated.

Acid insoluble Ash: [4]

To the crucible containing total ash, 25 ml of dilute hydrochloric acid was added drop wise. The insoluble matter was collected on an ashless filter paper (Whatman 41) and washed with hot water until the filtrate was neutral. The filter paper containing the insoluble matter was transfered to the original crucible, dried on a hot plate and ignited to constant weight. The residue was allowed to cool in a suitable desiccator for 30 min and weighed without delay. The content of acid-insoluble ash with reference to the air-dried drug was calculated.

Loss on Drying: [5]

The evaporating dish was dried for 30 min under the same conditions to be employed in the determination. About 5 to 10 g of powder/drug accurately weighed was placed in a tared evaporating dish. By gentle, sidewise shaking, the test specimen was distributed as evenly as practicable to a depth of about 5 mm. The loaded bottle was placed in the drying chamber. The test specimen was dried at 105^0 for 3 hours and weighed. The drying and weighing was continued at half an hour interval until difference between two successive weighing corresponded to not more than 0.25 per cent.

Alcohol soluble extractive[6]

5 g of the air dried drug was macerated, coarsely powdered, with 100 ml of alcohol of specified strength in a closed flask for 24 hours, shaking frequently during 6 hours and allowing to stand for 18 hours. It was filtered rapidly, taking precautions against loss of solvent, evaporate 25 ml

of the filtrate to dryness in a tared flat bottomed shallow dish and dried at 105^0, to constant weight and weighed. The percentage of alcohol-soluble extractive with reference to the air-dried drug was calculated.

Water soluble extractive: [7]
The same procedure as directed for the determination of Alcohol-soluble extractive, using chloroform water (2.5 ml chloroform in purified water to produce 1000 ml) instead of ethanol was used.

pH: [8]
The pH value of an aqueous liquid may be defined as the common logarithm of the reciprocal of the hydrogen ion concentration expressed in g per litre. For the purpose of pharmacopoeia pH is defined as the value given by a suitable, properly standardized, *p*H meter capable of reproducing pH values to 0.05 pH unit using an indicator electrode sensitive to hydrogen ion activity, the glass electrode and a suitable reference electrode.
To standardize the pH meter, two Buffer solutions were selected whose difference in pH does not exceed 4 units such that the expected pH of the material under test falls between them.
The cell was filled with one of the Buffer solutions for standardization at the temperature at which the test material is to be measured. The temperature control was set at the temperature of the solution, and the calibration control was adjusted to make the observed pH value identical with that of the declared pH. The electrodes and cell with several portions of the second Buffer Solution for Standardization were rinsed, then the cell was filled with it, at the same temperature as the material to be measured. The pH of the second buffer solution was within ±0.07 pH unit of the declared value. The standardization was repeated until both Buffer Solutions for Standardization give observed pH values within 0.05 pH unit of the declared value without further adjustment of the controls. When the system was functioning satisfactorily, the electrodes and cell were rinsed several times with a few portions of the test material, the cell was filled with the test material, and the pH value was read.

OBSERVATION AND RESULTS

Pharmaceutical observations and results

The individual drug were powdered and mixed homogeneously and 94 g of churna was obtained. The final product of churna was light brown colour with good odour.

Table 2: Organoleptic characteristics

Sl. No.	Organoleptic characters	Observation
1	Colour	Light Brown
2	Appearance	Powder
3	Touch	Smooth and unctuous
4	Odour	Aromatic fragrance
5	Flavour	Characteristic Flavor

Table 3: Phyto Chemical Analysis of Shweta Chandana (*Santalum album* Linn.)

Sl. No.	Particulars	Result
1	Alkaloids	Positive
2	Glycosides	Positive
3	Saponins	Positive
4	Flavonoids	Positive
5	Carbohydrates	Positive
6	Tannins	Negative

7	Proteins	Negative
8	Steroids	Negative

Table 4: Phyto Chemical Analysis of Sarshapa (*Brassica campestris* Linn.)

Sl. No.	Particulars	Result
1	Alkaloids	Positive
2	Glycosides	Positive
3	Saponins	Positive
4	Flavonoids	Positive
5	Carbohydrates	Positive
6	Tannins	Positive
7	Proteins	Positive
8	Steroids	Negative

Table 5: Values of Physico- chemical analysis

Sl. No.	Parameters	Value
1	Total ash (g/100g)	4.01%
2	Acid insoluble ash (g/100g)	0.09%
3	Loss on drying (g/100g)	6.59%
4	Alcohol Soluble Extractive (g/100g)	27.49%
5	Water Soluble Extractive (g/100g)	12.69%
6	pH	5.50
7	Tannin (g/100g)	3.37

DISCUSSION

Total ash value is 4.01 the residue remaining after incineration is the ash content of the drug. It indicates the purity and identity of raw drugs. Acid insoluble ash is a part of total ash which is insoluble in dilute HCL. In this churna 0.09 % is soluble in water. Loss on drying determines the moisture content of the sample. However the value varies according to the drug and condition. For the samples the obtained mean value suggested that the drug had minimal moisture and hence further considered for the formulation. Alcohol soluble extractive value is applied for the drugs which contain alcohol soluble constituents such as tannins, resins and alkaloids, thus helps to know active principles. The obtained value is 27.49%. Chandana-Sarshapa churna has tannin content in it. Water soluble extractives indicate water soluble constituents such as tannins, sugars, plant acids and mucilage. Chandana- Sarshapa churna has 12.69% water soluble extractive because of tannin content in it. The pH of the churna is 5.50 which is weakly acidic. pH as a measure of the hydrogen–ion activity is important from the standpoint of stability or physiological suitability. The optimal pH of face and body lies between 4.7 to 5.75. Thus when used externally, the churna will not have irritant effect and can be used for external application.

CONCLUSION

Carbohydrates, Flavonoids, Saponins, Glycosides, Alkaloids are present in both sarshapa and chandana; Tannins, Proteins are present in sarshapa but not in chandana, and Steroids are negative in both chandana and sarshapa. The physico- chemical parameters can be taken as preliminary standards for the churna.

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