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PHYSICO-CHEMICAL ASSESSMENT OF *ASTANGAVALEHA*: A COMPARATIVE ANALYSIS

Research article

[1]Rajib Kishore Jena, [2]Jitendra Kumar Chhatria, [3]Sujit Kumar Dalai, [4]Arun Kumar Das
[1]Ph.D Scholar, Utkal University, Vani vihar, Bhubaneswar, Odisha
[2]Lecturer, PG Dept. of Rasashastra & B.K, Gopabandhu Ayurveda Mahavidyalaya, Puri, Odisha.
[3]Professor, Dept. of Rasashastra & B.K., IIMT Ayurvedic Medical College & Hospital, Meerut, U.P.
[4]Principal, Gopabandhu Ayurveda Mahavidyalaya, Puri, Odisha

ABSTRACT

The present study was evaluated to support the standardization method of *Astangavaleha*. Two samples of *Astangavaleha* were prepared and analyzed. Sample-1 is *Astangavaleha* powder which is coded with 'AP'(*Astangavaleha* Powder) and sample-2 is *Astangavaleha* prepared with *Astangavaleha* powder mixed with honey and *Adraka swaras*(Expressed Juice of *Zingiber officinale* Roscoe) which is coded with 'AA'. Both the prepared samples were under gone physico chemical evaluation for comparative study. The study includes evaluation of physical characteristics, physical constants, physico-chemical screening & quantification of microbial loads to fix the quality standards.

Key Words: *Astangavaleha*, Phisico-chemical, TLC, Microbial Load.

INTRODUCTION: The term '*Avaleha'* (Confection) described in various Ayurvedic texts denotes a dosage form of powder which is to be licked with some sweetening agent or with some *Anupana*[1]*(*Vehicle*)*or*Sahapana*[2](Adjuvant). This is a semi-solid dosage form, having long shelf-life in comparison to primary dosage forms, and can be administered to all age groups such as *Bala* (children), *Yuva* (young) and in *Vriddha* (old age). It has been advocated in *Charaka Samhita* that such preparation results in quicker and amplified action with minimum dosage. *Ashtangavaleha* is a compound formulation being used for *Shwasa* (Bronchial Asthma) [3] *and Kasa Roga*(Cough)[4].

Acceptance of a drug is a prime criteria of G.M.P. aims & objectives. So that, conversion of classical to new dosage forms are more palatable, easily absorbable, having more shelf life and enhanced therapeutic efficacy becomes the demand of present days. Powder form has some demerits like bitter taste, difficulty in administration etc. So in the present study; it had been implemented *Ashtangavaleha* powder into *Avaleha* form which is convenient in handling, dispensing, storage and maximum the palatability. The form of *Ashtangavaleha* is powder that is to be licked by adding honey and *Ardraka Swarasa* in sufficient quantity.

Due to the difference in pharmaceutical procedures, there may be difference among pharmacognostical and preliminary physico-chemical profiles of both samples prepared with different pharmaceutical procedures. So it is the need of an hour to find out these possible differences of the

two dosage forms with same ingredients.

AIM AND OBJECTIVES

In the present study, an attempt has been made to develop the pharmacognostical and preliminary physico-chemical profiles of *Astangavaleha* powder and *Astangavaleha*.

MATERIALS AND METHODS

Collection & preparation of samples

All the raw materials were procured from the local market of Puri, Odisha after identification and authentication of the ingredients in the department of Dravyaguna, GAM, Puri viz. All the eight dried ingredients (Image-1) were powdered with the help of pounding machine, then mixed and preserved in air tight container. *Ashtangavaleha* in powder form is coded as 'AP' and *Avaleha* form coded as 'AA'. (Image-2) The samples were prepared in the mini pharmacy attached to PG department of Rasashastra & Bhaishajya Kalpana, Gopabandhu Ayurveda Mahavidyalaya, Puri, Odisha. The eight ingredients of *Ashtangavaleha* are given in Table-1 along with honey and *adrak swaras*.

Table1.Ingredients of *Ashtangavaleha*

S.N.	Ingredients	Latin name /English name	Part used	Proportion
1	*Katphala*[6]	*Myrica esculenta*Buch-Ham.	Dried stem bark	1part
2	*Pushkaramoola*[7]	*Inula Racemosa* Hook.f.	Dried root	1part
3	*Shringi*[8]	*Pistacia integerrima* Stew. Ex Brandis	Dried gall	1part
4	*Yavani*	*Trachyspermum ammi* Linn.	Dried fruit	1part
5	*Krishna jeeraka*	*Carum carvi* Linn.	Dried fruit	1part
6	*Shunthi*[5]	*Zingiber officinale* Roscoe.	Dried rhizome	1part
7	*Maricha*	*Piper nigrum* Linn.	Dried fruit	1part
8	*Pippali*	*Piper longum* Linn.	Dried fruit	1part
Adjuvant /*Anupana*				
9	*Madhu*	Honey	--	Q.S.
10	*Ardraka Swarasa*	Juice of *Zinger officinale* Roscoe.	Fresh rhizome	Q.S.

Pharmacognostical evaluation

The analytical tests were carried out in ALN Rao Memorial Ayurvedic Medical College and PG Centre, Koppa, Karnataka-577126. Macroscopic characters like colour, odour, taste and touch of both samples of *Ashtangavaleha* were carried out by naked eye observations.

Physico-chemical parameters of AP and AA

Physico-chemical parameters of both samples of *AP and AA* were determined as per Ayurvedic Pharmacopoeia of India. Moisture content, total ash value, acid insoluble ash, alcohol soluble extractive value and water soluble extractive value were determined as per API also.

Preliminary phyto-chemical screening

Preliminary phyto-chemical screening of AP and AA were also detected.

The methanolic extract of both samples of *Ashtangavaleha i.e. AP & AA* were prepared and subjected to detect the presence of various functional groups like alkaloids, tannins, phenols, carbohydrates, glycosides, flavonoids, steroids, saponins by using relevant reagents. The reference

of method was followed from API.

Thin Layer Chromatography

For Thin Layer Chromatography (TLC), methanol extract of sample AA was prepared by 5 g. of drug is added with 100 ml of methanol, & shaken for few times; followed by heat treatment & then allowed for cooling for half an hour & then filtered. The filtrate was evaporated on water bath to approximately 20 ml and used for the next process.

The glass chamber was used for developing the plates. Pre-coated silica gel GF 254 plate was used as stationary phase. Toluene : Ethyl acetate (45 : 5) v/v was used as mobile phase. After 30 minutes of chamber saturation, plate was developed, and then scanned under short UV (254 nm) and long UV (366 nm).

RESULTS AND DISCUSSION

Macroscopic characters of Astangavaleha

The organoleptic characters showed that the colour of AP was grayish-brown and brown colour in AA. Pungent taste was found with tingling sensation in AP while AA has sweet and pungent in taste. The texture of AP was powder while it was semi-solid sticky paste texture in AA. The sweetness in AA is due to addition of honey, which makes it more palatable and masks the bitter taste of powder. Most of the *Avaleha* contains *Madhura dravya(*Sweetening agent*), sneha dravya*(Fatty substance) and *Prakshepa dravya*(Precipitating substance) as base ingredients. Here, the uses of *Madhura dravya* having importance in *avaleha* form because it reduces the *Tikta*(Bitter), *Katu*(Pungent), *Kashaya*(Astringent) taste of drug, ultimately making it more palatable, and also nourishes all *Dhatus*(Fundamental tissue) along with *Oja*(Essence of *Dhatu*).

Table-2. Organoleptic characters of *Ashtangavaleha* Powder and *Astangavaleha*

SN	Character	AP	AA
1	Colour	Greyish- brown	Brown
2	Odour	Characteristics	Characteristics
3	Texture	Powder	Semi-solid sticky paste
4	Taste	Pungent	Sweet, pungent

Macroscopy of Ashtangavaleha powder and Ashtangavaleha

Macroscopic characters of both samples of *Ashtangavaleha* were done by naked eye observations. *Ashtangavaleha* powder was grayish brown, coarse in touch, bitter in taste with pungent odour. *Ashtangavaleha* linctus was chocolate brown in color, semisolid, sweetish and spicy in taste with sweetish odor.

Results of physicochemical parameters of both samples of *Ashtangavaleha* are provided in Table-3. The differences in the physico-chemical profile of AP and AA are significant, as they vary in type of dosage form and preparation method. Most of the physico-chemical parameters of AA are complying with the standards laid down in API parameters.

Table-3.Physicochemical evaluations of *Ashtangavaleha* Powder and *Ashtangavaleha*

Parameters	AP (%)	AA(%)
pH	4.85±0.10	4.78±0.10
Loss on drying	2.78%	9.89%
Total AshValue	8.56%	6.25%

Acid insoluble ash	1.68%	1.05%
Water insoluble ash	4.15%	3.45%
Water soluble ash	95.85%	96.55%
Water soluble extractive	45.25%	55.85%
Alcohol soluble extractive	35.91%	37.54%

Preliminary phytochemical screening of AP and AA

Qualitative analysis for the presence of various functional groups was carried out in methanol soluble extractive of both samples (Table 4).

Table4- Qualitative analysis of AP & AA

Parameters	AP	AA
Carbihydrate	present	present
Protein	present	present
Alkaloids	present	present
Cadiac glycosides	present	present
Flavounoids	present	present
Tannins	present	present
Anthraquinone glycosides	present	present
Triterpenoides	present	present

TLC: Alcoholic extract of *Ashtangavaleha* of both samples under visible light and long UV (366 nm) of AP and AA are given in Table 5 (Figure 3, 4). The findings of TLC under visible light showed presence of 02 spots in both the samples and it showed 14 spots in AP and 16 spots in AA. at long wave (UV@ 366 nm). One common blue spot was observed for both the samples at Rf value 0.08 and it is light orange spot at Rf value 0.60.

Under Visible light

Table -5 Showing Rf value under Visible light

Rf Value	AP	AA
0.08	Blue	Blue
0.60	Light orange	Light orange

Under Long UV light Table -6 Showing Rf value under UV light

Rf Value	AP	AA
0.02	Light fl.green	Light fl.green
0.08	Fl.blue	Fl.blue
0.18	Fl.green	Fl.green
0.23	Fl.green	Fl.green
0.27	Fl.green	Fl.green
0.31	Fl.green	Fl.green
0.35	Fl.green	Fl.green
0.39	Fl.green	Fl.green
0.41	Fl.green	Bright fl.green
0.52	Fl.green	Pale bright fl.green
0.60	Bright fl.orange green	Bright fl green
0.64	-	Fl.blue

0.71	-	Fl.green
0.75	Flgreen	Fl.green
0.85	Fl.green	Bright Fl.green
0.91	Fl.green	Bright Fl.green

Table – 7 Microbial Contamination.The microbial contamination of both the samples of *Astangavaleha*

	AP	**AA**
Total aerobic count	$2.8x10^2$ cfu/g	$1.6x10^2$ cfu/g
Total fungal count	3.1x10 cfu/g	1.8x10 cfu/g

CONCLUSION: Significant differences in the physico-chemical profile of *Ashtangavaleha* powder and *Ashtangavaleha* form were traced out, as the pharmaceutical procedure varies for preparation of both samples and they differ in type of dosage form also. Thus, it is evident from the evaluation that changes are found in pharmacognostical and physico-chemical parameters of both samples, due to adoption of different procedures for preparation, though the ingredients in both the samples were same.GMP guideline advocates study, effectiveness and accessibility is the main objective, when a formulation is undergoing any quality assessment. Thus the organoleptic character fixes the accessibility nature of the formulation. The present study is being useful to supplement the information with regards to its quality assessment identification and to confirm the uniformity of the finished product available at market.

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Corresponding Author: Prof. (Dr.) Rajib Kishore Jena, Professor & Head, PG Department of Rasashastra & Bhaishajya Kalpana, Gopabandhu Ayurveda Mahavidyalaya, Puri, Odisha .
E-Mail: rajibjena89@gmail.com

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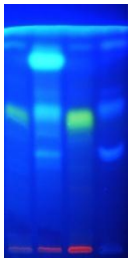
Image-1(Two Samples of Astangavaleha)

ASTANGA AVALEHA POWDER

ASTANGA AVALEHA



TLC PLATE UNDER UV

TLC PLATE IN VISIBLE LIGHT