ISSN 2456-3110
Vol 5 · Issue 6
Nov-Dec 2020

Journal of Ayurveda and Integrated Medical Sciences

www.jaims.in

JAIMS

An International Journal for Researches in Ayurveda and Allied Sciences

Charaka Publications

Indexed

Journal of
Ayurveda and Integrated Medical Sciences
ISSN 2456-3110
ORIGINAL ARTICLE Nov-Dec 2020

Phyto physico-chemical profile of *Ashwagandha* (*Withania somnifera* Dunal)

Dr. Bargale Sushant Sukumar[1], Dr. Tripathy T. B.[2], Dr. Shashirekha H.K.[3]

[1]Ph.D Scholar and Asst. Professor, [2]Guide and HOD, Dept. of Swasthavritta, Sri Dharmasthala Manjunatheshwara college of Ayurveda and Hospital, Hassan, [3]Associate Professor, Department of Samhita Sanskrit, Faculty of Ayurveda, Institute of Medical Science, Banaras Hindu University, Varanasi, Uttar Pradesh, INDIA.

ABSTRACT

Introduction: The present article deals with study of phytochemical analysis of *Withania somnifera* Dunal roots. *Ashwagandha* (*Withania somnifera* Dunal - Solanaceae), The use of *Ashwagandha* (WS) is increasing due to a number of chemical constituents present in are found useful for promotion of health. Important bio-active constituents of *Ashwagandha* root powder are alkaloids, tannins and flavonoid and phenolic compound helps to promote the health benefits. **Objective:** Evolution of Physico- chemical and phyto chemical analysis of *Ashwagandha* (WS) powder. **Materials and methods:** The current investigation deals with extraction and detection or screening of active phytochemical compounds from different extracts of *Withania somnifera* root. Pharmacognostic studies, Physico-chemical studies, Preliminary phytochemical studies and HPTLC was carried out. **Result and conclusion:** The result drown were 2% foreign mater was determined. Loss on drying 1.6%, total ash obtained was 9%, acid insoluble ash was 1% and water soluble extractive was 12% and Alcohol soluble extractive was 13%. The phytochemical investigation revealed the presence of various phytochemical constituents such as alkaloids, flavonoids, carbohydrate, Steroids and Saponin Glycoside. HPTLC chromatograms of methanol extracts obtained from root of *Withania somnifera* revealed that higher quality of with a nolides was present. Hence the root of *Withania somnifera* was considered to mostly prefer for commercial preparation of drugs.

Key words: *Ashwagandha, Withania somnifera, Phyto-chemical.*

INTRODUCTION

Ashwagandha (*Withania somnifera* Dunal - Solanaceae), commonly known as *Asagandh*, Indian ginseng and winter cherry, is an important medical herb in *Ayurveda*, which has 1250 species, widely distributed in the warmer parts of the whole world. *Ashwagandha* (WS) is an ingredient of many formulation prescribed for variety of musculoskeletal conditions. It is used as a general health tonic for elderly personsand lactating women. It is known for antiseptic properties and can be used as narcotic, anti-epileptic, against female sterility.[1,2]

The use of *Ashwagandha* (WS) is increasing due to a number of chemical constituents present in are found useful for promotion of health. Important bio-active constituents of *Ashwagandha* root powder are alkaloids, tannins and flavonoid and phenolic compound helps to promote the health benefits.[3,4]

OBJECTIVE OF THE STUDY

Evolution of Physico- chemical and phytochemical analysis of *Ashwagandha* (WS) powder.

Address for correspondence:
Dr. Bargale Sushant Sukumar
Ph.D Scholar and Asst. Professor, Sri Dharmasthala Manjunatheshwara college of Ayurveda and Hospital, Hassan, Karnataka, INDIA.
E-mail: dr.sushant99@gmail.com

Submission Date: 12/11/2020 Accepted Date: 17/12/2020

Access this article online

Quick Response Code

Website: www.jaims.in

DOI: 10.21760/jaims.5.6.17

ISSN: 2456-3110 ORIGINAL ARTICLE Nov-Dec 2020

Material and Methods

Authentication of drug

Ashwagandha (WS) were collected from teaching Pharmacy Sri Dharmasthala Manjunatheshwara college of *Ayurveda* and Hospital, Hassan as per standard methods.[5]

The identity of the plant was confirmed by Department of Dravyaguna, Sri Dharmasthala Manjunatheshwara College of Ayurveda & Hospital, Hassan. No- SDMCAH-DG/E/2018/02, Date: 14.12.2018 and Biocyte Institute of Research & Development, Sangli, Maharashtra (Reg. No. - 1831300312031566) and SDM center for research in Ayurveda and allied Sciences, Kuthpady, Udupi. The plant was compared with voucher specimen in the institute. For further confirmation, the microscopic characteristics of this plant were studied and compared with available literature.

Foreign matter

The term "Foreign Matter" is used to designate any matter, which does not form a part of the drug as defined in the monograph. 100g of the powdered drug is taken and spread out in a thin layer. Plant material collected should be free from foreign matters like soil, insect parts or animal excreta. They are separated and weighed and the percentage is calculated.

Pharmacognostic studies

Macroscopic study

Macroscopic observation of roots of *Withania somnifera* was done. It comprised of shape, size, surface characteristics, texture, color, consistency, odour, taste, etc.[6]

Microscopic study

Transverse sections of *Withania somnifera* roots were taken by using a microtome. Permanent mount of stem was prepared using saffranin fast green stain by double staining technique.[7]

Preliminary phyto-chemical studies

The roots of *Withania somnifera* Dunal, were coarsely powdered and extracted with methanol and water (6:4) using cold maceration technique. The extract is filtered and concentrated and dried in a Rota evaporator initially and then in vacuum desiccator. Preliminary phytochemical screening of extract was done for the presence of various phyto constituents by using standard procedure.[8]

Preparation of the extract

The *Ashwagandha* powder was successively extracted in soxhlet apparatus with methanol, Acetone, chloroform, Ethyl acetate and hot water. The liquid extracts were collected in tarred conical flask. The solvent was removed by distillation. These extracts were used to study to various qualitative chemical tests and determine the presence of different phyto-chemicals.

Preliminary Phyto-chemical Screening

Phytochemical screening of the *Withania somnifera* was done by the standard procedures prescribed by Kokate and Harborne.[9,10]

Estimation of physicochemical parameters

Various physicochemical parameters were studied in all the root samples using standard procedures.

Physicochemical studies

Physicochemical parameters were determined as per guidelines of WHO. Total ash value, loss on drying, water soluble ash, acid insoluble ash, alcohol soluble extractive value and water soluble extractive value were determined.[11,12,13]

Loss on drying at 105˚C

10g of sample was placed in tarred evaporating dish. It was dried at 105˚C for 5 hours in hot air oven and weighed. The drying was continued until difference between two successive weights was not more than 0.01 after cooling in desiccator. Percentage of moisture was calculated with reference to weight of the sample.[14]

Total Ash

2g of sample was incinerated in a tared platinum crucible at temperature not exceeding 450˚C until

ISSN: 2456-3110 ORIGINAL ARTICLE Nov-Dec 2020

carbon free ash is obtained. Percentage of ash was calculated with reference to weight of the sample.[15]

Acid insoluble Ash

To the crucible containing total ash, add 25ml of dilute HCl and boil. Collect the insoluble matter on ashless filter paper (Whatmann 41) and wash with hot water until the filtrate is neutral. Transfer the filter paper containing the insoluble matter to the original crucible, dry on a hot plate and ignite to constant weight. Allow the residue to cool in suitable desiccator for 30 mins and weigh without delay. Calculate the content of acid insoluble ash with reference to the air dried drug.[16]

Alcohol soluble extractive

Weigh accurately 4g of the sample in a glass stoppered flask. Add 100 ml of distilled Alcohol (approximately 95%). Shake occasionally for 6 hours. Allow to stand for 18 hours. Filter rapidly taking care not to lose any solvent. Pipette out 25ml of the filtrate in a pre-weighed 100 ml beaker. Evaporate to dryness on a water bath. Keep it in an air oven at 105°C for 6 hours, cool in desiccator for 30 minutes and weigh. Calculate the percentage of Alcohol extractable matter of the sample. Repeat the experiment twice, and take the average value.[17]

Water soluble extractive

Weigh accurately 4g of the sample in a glass stoppered flask. Add 100 ml of distilled water, shake occasionally for 6 hours. Allow to stand for 18 hours. Filter rapidly taking care not to lose any solvent. Pipette out 25ml of the filtrate in a pre-weighed 100 ml beaker. Evaporate to dryness on a water bath. Keep it in an air oven at 105°C for 6 hours. Cool in a desiccator and weigh. Repeat the experiment twice. Take the average value.[18]

Preliminary Phytochemical evaluation was done as per the standard methods

Test for Carbohydrates

Extracts were dissolved individually in 5ml distilled water and filtered. The filtrates were used for the detection of carbohydrates.

Test for Carbohydrates	Procedure
Fehling's test	In 1 ml of the extract, one ml of Fehling's A and one ml of Fehling's B solutions were added in a test tube and heated in a water bath for 10 minutes. Formation of red precipitate indicates the presence of a reducing sugar. The filtrate was treated with one ml of Fehling's A and B, and heated in a boiling water bath for 5-10 min. Appearance of reddish orange precipitate shows the presence of carbohydrates.
Fehling's test	In 1 ml of the extract, one ml ofFehling's A and one ml of Fehling's B solutions were added in a test tube and heated in a water bath for 10 minutes. Formation of red precipitate indicates the presence of a reducing sugar. The filtrate was treated with one ml of Fehling's A and B, and heated in a boiling water bath for 5-10 min. Appearance of reddish orange precipitate shows the presence of carbohydrates.
Benedict's test	Few drops of Benedict's reagent wasadded to the test solution and boiled on water bath. Formation of reddish brown precipitate indicates the presence of sugars. Depending on the concentration of the reducing sugar, the amount and colour of the precipitate produced varied. A positive Benedict's test appears green, yellow, orange, or red.
Molisch Test	To 2.0 ml of the extract, 2 drops of Molisch reagent was added and mixed. 2.0 ml of concentrated sulphuric acid was added to this solution. Formation of the red violet ring at the junction of the solution and its disappearance on addition of excess alkali solution indicates the presence of carbohydrates.

Test for Protein

Test for Protein	Procedure
Xanthoprotein test	Mix 3 ml test solution with 1 ml conc. Sulphuric acid. White Precipitate. is formed. Boil it. Precipitate turns yellow. Add Ammonium hydroxide Precipitate. Turns orange. Protein is present.

ISSN: 2456-3110 ORIGINAL ARTICLE Nov-Dec 2020

Precipitation test	The test solution gives white colloidal Precipitate mixed with 5% lead acetate. White colloidal Precipitate.

Test for Tannins

Test for Tannins	Procedure
Ferric chloride test	To 2 ml of the test solution, addfew drops of 5% Ferric chloride solution, deep blue-black colour is formed.
Lead acetate test	To 2 ml of the test solution, add fewdrops Lead acetate solution, white ppt. is formed.

Test for Alkaloids

Extracts were dissolved individually in dilute HCl and filtered.

Test for Alkaloids	Procedure
Mayer's test	To 1.0 ml of the filtrate, 2 ml of thereagent was added. Formation of white or pale precipitate shows the presence of alkaloids.
Wagner's test	To about 1-2 ml of the filtrate, 2ml of Wagner's reagent was added. Reddish brown colored precipitate indicates the presence of alkaloids.
Hager's reagent	The acetic test solution treated withHager's reagent (Saturated picric acid solution) gives yellow precipitate.
Ehrlich's test	The acidic test solution treated withEhrlich's Reagent shows two separate yellow and brown colored layers.
Dragendroff's test	The filtrate was treated with Dragendorff's reagent and the formation of orange precipitate indicates the presence of alkaloids.

Test for Steroids

Test for Steroids	Procedure
Acetic anhydride test	2 ml of acetic anhydride wasadded to 0.5 ml crude extract of plant sample with 2 ml H2S04. The change in colouration from violet to blue or green in samples indicates the presence of steroids.
Liebermann-Burchard Test	The extracts weredissolved in 2 ml of chloroform to which 10 drops of acetic acid and five drops of concentrated sulphuric acid were added and mixed. The change of red colour from blue to green indicates the presence of steroids.

Test for Saponin Glycoside

Test for Saponin Glycoside	Procedure
Foam test	Shake the test solution vigorously with water. Persistent foam is observed.

Test for flavonoids

Test for flavonoids	Procedure
Shinoda test (Magnesium hydrochloride reduction test)	To the test solution (0.5 0- 1 ml), few reagent ofmagnesium ribbon were added and concentration hydrochloric acid was added drop-wise. Pink scarlet, crimson and red of occasionally green to blue colour appears after few minutes, if flavonoid is present in the sample.
Alkaline reagent test	To the test solution (0.5–1ml), few drops of sodium hydroxide solution (10 percent) were added. Formation of an intense yellow colour, which turns colorless on addition of few drops of dilute acid, indicates presence of flavonoids.
Zinc–hydrochloride test	To the extract, a pinch ofzinc dust was added followed by addition of concentrated hydrochloric acid along the sides of the test tubes. Appearance of magenta color indicates the presence of flavonoids.
Lead acetate test	The extract was treated with a fewdrops of lead acetate solution. Formation of yellow precipitate indicates the presence of flavonoids. Orange to crimson colour shows the presence of flavonones.
Ammonia test	5 ml of dilute ammonia solution wereadded to a portion of the crude extract followed by addition of concentrated H2SO4. Formation of a yellow colouration in the extract indicates the presence of flavonoids. The yellow colouration disappears after some

ISSN: 2456-3110 ORIGINAL ARTICLE Nov-Dec 2020

	time.
Ferric chloride test	To the extract, a few drops ofneutral ferric chloride solution was added, a blackish red colour forms, indicating the presence of flavonoids.

Test for Steroids

Test for Steroids	Procedure
Acetic anhydride test	2 ml of acetic anhydride wasadded to 0.5 ml crude extract of plant sample with 2 ml H2S04. The change in colouration from violet to blue or green in samples indicates the presence of steroids.
Liebermann-Burchard Test	The extracts weredissolved in 2 ml of chloroform to which 10 drops of acetic acid and five drops of concentrated sulphuric acid were added and mixed. The change of red colour from blue to green indicates the presence of steroids.

HPTLC

1g of each of sample was extracted with 10 ml of *alcohol*, filtered and filtrate was made upto 10ml. 10µl of the above extract was applied on a pre-coated silica gel F254 on aluminum plates to a band width of 7 mm using Linomat 5 TLC applicator. The plate was developed in Chloroform : Methanol (9:0.8). The developed plates were visualized in short UV, long UV and then derivatised with vanillin sulphuric acid and scanned under UV 254 and 366 nm. R_f, colour of the spots and densitometric scan were recorded.

Result and Discussion

Physicochemical studies

The quantitative determination of some pharmacognostic parameters is useful for setting standards for crude drugs. The physical constant evaluation of the drugs is an important parameter in detecting adulteration or improper handling of drugs. The moisture content of the drug is not too high, thus it could discourage bacterial, fungi or yeast growth. Equally important in the evaluation of crude drugs, is the ash value and acid-insoluble ash value determination. The total ash is particularly important in the evaluation of purity of drugs, i.e. the presence or absence of foreign inorganic matter such as metallic salts and/or silica.

The results of physicochemical parameter analysis of crude powder of *Withania somnifera* root are shown in Table 1. The average values are expressed as percentage of air-dried material.

Table 1: Physicochemical studies result

SN	Test Done	Obtained Value	Standard value % w/w
1.	Foreign Matter	2%	Not more than 2 %
2.	Loss on Drying	1.6%	NMT 8%
3.	Total Ash	9 %	NMT7%
4.	Acid Insoluble Ash	1%	NMT 1%
5.	Alcohol Soluble Extractive	13%	NLT 15 %
6.	Water Soluble Extractive	12%	NLT 15%

Pharmacognostic studies

The pharmacognostic study is the major and reliable criteria for identification of plant drugs. The pharmacognostic parameters are necessary for confirmation of the identity and determination of quality and purity of the crude drug. The detailed and systematic pharmacognostic evaluation would give valuable information for future studies.

Macroscopic studies

Roots straight, unbranched, thickness varying with age. Roots bear fibre like secondary roots, outer surface buff to grey- yellow with longitudinal wrinkles, crown consists of 2-6 remains of stem base, stem bases variously thickened, nodes prominent only on the side from where petiole arises, cylindrical, green with longitudinal wrinkles, fracture, short and uneven, odor, characteristic, taste, bitter and acrid.

Microscopic studies

Cork exfoliated or crushed, when present isodiamatric and nonlignified, Cork cambium of 2-4 diffused rows of cells, Secondary cortex about twenty layers of compact parenchymatous cells, Phloem consists of

ISSN: 2456-3110 ORIGINAL ARTICLE Nov-Dec 2020

sieve tubes, companion cells, phloem parenchyma, Cambium 4-5 rows of tangentially elongated cells, Secondary xylem hard forming a closed vascular ring separated by multiseriate medullary rays, a few xylem parenchyma, Vessels with bordered pits and horizontal perforations. Fibresaseptate with pointed ends. Starch grains abundant, simple, mostly spherical, reniform - oval with central hilum. Microcrystals in parenchyma cells.

Preliminary phytochemical studies

Preliminary phytochemical screening showed the presence of alkaloids, flavonoids, carbohydrate, Steroids and Saponin Glycoside.

Table 2: Test for Carbohydrates

Name of test	Observed changes	Results
Fehling's Test	First yellow, then brink red ppt. is observed.	**Present**
Benedict's Test	Solution appears green, yellow or red depending on the amount of reducing sugar present in test solution.	**Present**
Molisch Test	Formation of the red violet ring at the junction of the solution and its disappearance on addition of excess alkali solution indicates the presence of carbohydrates.	**Present**

The dry weight of plant, typically composed of 50-80% of the polymeric Carbohydrate Cellulose along with related structural material. Carbohydrates are the backbones of Nucleic Acids. These are synthesized in plants by photosynthesis from CO2 and H2O. The fundamental principles of life are catalyzed by the green plant pigment, Chlorophyll and enzyme system and liberate oxygen

Table 3: Test for Proteins

Name of test	Observed changes	Results
Precipitation Test	White colloidal Precipitate	**Absent**
Xanthoprotein Test	Precipitate turns yellow. Add Ammonium hydroxide Precipitate. Turns orange	**Absent**

Proteins are highly complex molecules, which contain the elements of Carbon, Hydrogen, Nitrogen and occasionally Sulphur. They are synthesized by living cells and are essential part of the structure of the cell and its nucleus. The plant proteins are more easily isolated in crystalline form. Proteins are stored in plants in the form of aleuronic grains and are required for animals as the source of nitrogenous food. Proteins are hydrolysed to form simpler substance i.e. Amino acid.

Table 4: Test for Tannins

Name of test	Observed changes	Results
Ferric chloride test	Deep blue- black colour is formed	**Absent**
Lead acetate test	White ppt.	**Absent**

Tannins are derivative of Benzoic acid, which are widely distributed in the Vegetable Kingdom. Tannin precipitates and combines with Proteins and the Protein-Tannin complex is resistant to proteolytic enzymes.

Table 5: Test for Alkaloids

Name of test	Observed changes	Results
Mayer's test	Cream colored precipitate	**Present**
Wagner's test	Reddish brown precipitate	**Present**
Hager's reagent	Yellow precipitate floating	**Present**
Ehrlich's test	Two separate yellow and brown colored layers	**Present**

Alkaloid may be defined as Organic Nitrogenous substances of plant origin exhibiting well defined physiological action. Alkaloids exhibit a variety of physical and chemical properties. The free alkaloids are insoluble in water but their salts are freely soluble. These are mainly three types, True alkaloids- Those having a Heterocyclic ring with Nitrogen atom. Proto alkaloids- They don't have Heterocyclic ring with Nitrogen atom. Pseudo alkaloids- They have

ISSN: 2456-3110 ORIGINAL ARTICLE Nov-Dec 2020

Heterocyclic ring with Nitrogen atom but not derived from Amino acid. Both True and Proto alkaloids are derived from Amino acids.

Fig. 1: Mayer's reagent

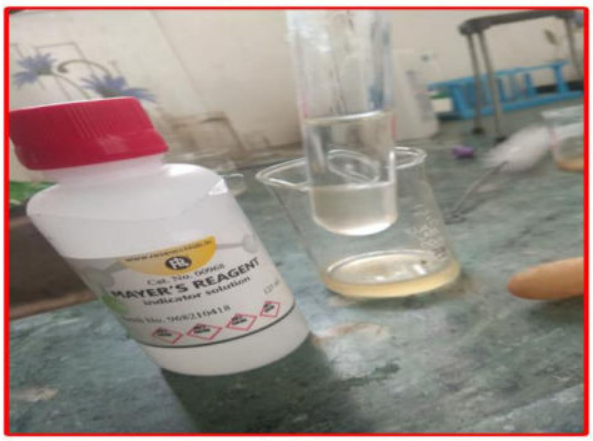


Fig. 2: Wagner's Reagent

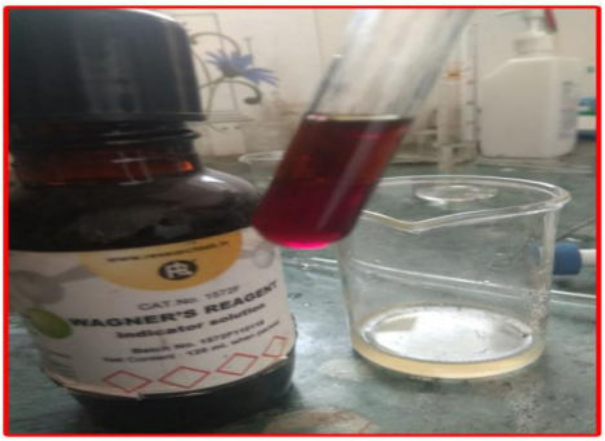


Fig. 3: Hager's Reagent

Fig. 4: Ehrlich's Reagent

Table 6: Test for Saponin Glycoside

Test for Saponin glycoside	Test Result	Remarks
Foam Test	Persistent foam	**Present**

Glycosides are compounds, which upon hydrolysis give rise to one or more Sugars (Glycones) and a compound, which is not a Sugar (Aglycone or Genin). Glycosides are use was added as Cardiac stimulant; Laxative, Bitter Tonics, Hepatoprotective and some other have Expectorant properties.

Table 7: Test for Steroids

Test for Steroids	Test Result	Remarks
Acetic anhydride test	The change Blue or green in samples indicates the presence of steroids	**Present**
Liebermann Burchard Test	The change of red colour from blue to green indicates the presence of steroids.	**Present**

Table 8: Test for flavonoids

Test for flavonoids	Test Result	Remarks
Shinoda test (Magnesium hydrochloride reduction test)	Occasionally green to blue colour appears after few minutes, if flavonoid is present	**Present**
Alkaline reagent test	Formation of an intense yellow colour, which turns colorless on addition of few drops of	**Present**

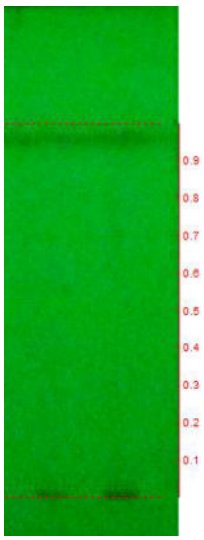
ISSN: 2456-3110 ORIGINAL ARTICLE Nov-Dec 2020

	dilute acid, indicates presence of flavonoids.	
Ferric chloride test	Blackish red colour forms, indicating the presence of flavonoids	**Present**
Lead acetate test	Orange to crimson colour shows the presence of flavonones.	**Present**
Zinc–hydrochloride test	Appearance of magenta color indicates the presence of flavonoids.	**Present**

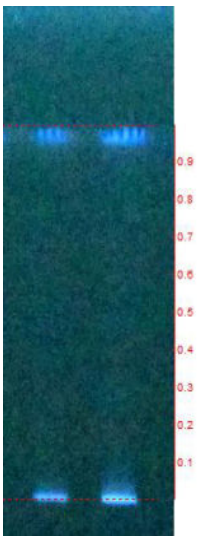
Table 9: Results of standardization parameters for *Ashwagandha.*

Parameter	**Results n = 3 %w/w**	
	A	**B**
Loss on drying at 105˚C	13.915	13.184
Total ash	6.308	6.180
Acid Insoluble Ash	0.394	0.198
Alcohol soluble extractive	3.197	2.400
Water Soluble extractive	17.486	21.367

Fig. 5: TLC photo documentation of Alcoholic extract of *Ashwagandha.*



At 254nm



At 366nm

Post Derivatisation

track 1- A–10 µl, track 2 - B–10 µl, Solvent system: Chloroform: Methanol: Ethyl Acetate (9:0.8)

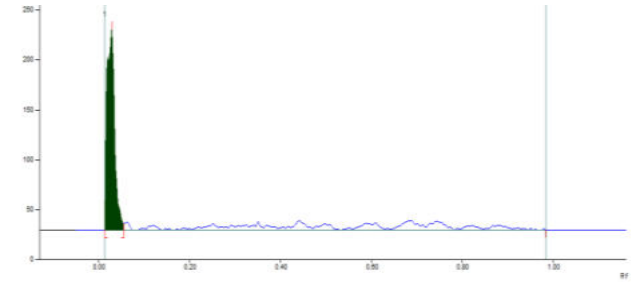
Table 10: R_f values of the all samples

A			**B**		
At 254nm	**At 366nm**	**Post Derivatisation**	**At 254nm**	**At 366nm**	**Post Derivatisation**
-	-	-	-	-	0.03 (L Violet)
-	-	0.10 (L Violet)	-	-	0.10 (L Violet)
-	-	0.21 (Violet)	-	-	0.21(L Violet)
-	-	-	-	-	0.28 (L Violet)
-	-	0.40 (L Violet)	-	-	-
-	-	-	-	-	0.42(L Violet)
-	-	0.48 (L Violet)	-	-	-
-	-	-	-	-	0.53 (L Violet)
-	-	0.65 (Violet)	-	-	0.65 (L Violet)
-	-	0.69 (Violet)	-	-	-
-	-	-	-	-	0.73 (Violet)
-	-	0.82(L Violet)	-	-	-
-	-	-	-	-	0.85 (L Violet)
-	-	0.92(L Violet)	-	-	0.92 (LViolet)
-	0.96(F Violet)	-	-	0.96(F Violet)	-

***L - Light, D - Dark, F - Fluorescence**

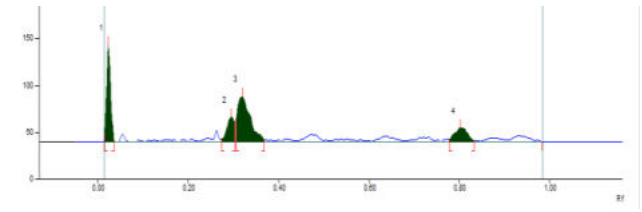
ISSN: 2456-3110 ORIGINAL ARTICLE Nov-Dec 2020

Fig. 6: Densitometric Scan of the sample at 254nm.



Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.01 Rf	0.0 AU	0.03 Rf	201.5 AU	100.00 %	0.06 Rf	6.3 AU	2442.9 AU	100.00 %

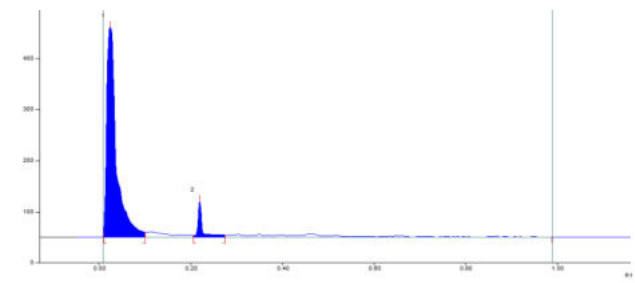
Fig. 6a: *Ashwagandha A*(10 µl)



Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.02 Rf	9.2 AU	0.02 Rf	102.8 AU	53.45 %	0.04 Rf	0.4 AU	634.5 AU	28.23 %
2	0.27 Rf	2.7 AU	0.30 Rf	26.5 AU	13.76 %	0.30 Rf	21.3 AU	322.0 AU	14.33 %
3	0.31 Rf	23.3 AU	0.32 Rf	48.3 AU	25.11 %	0.37 Rf	2.2 AU	984.0 AU	43.78 %
4	0.78 Rf	2.5 AU	0.80 Rf	14.8 AU	7.68 %	0.83 Rf	1.1 AU	306.9 AU	13.66 %

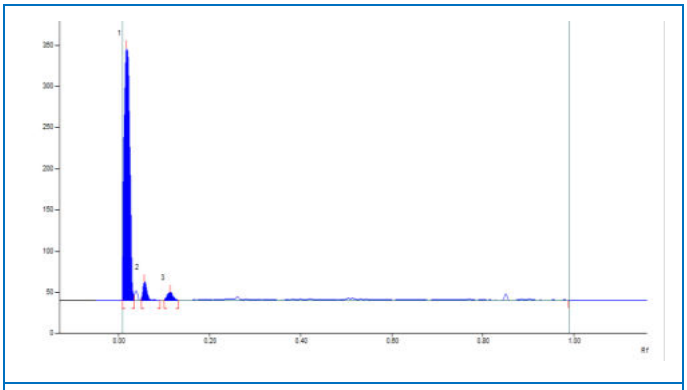
Fig. 6b: *Ashwagandha B*(10 µl)

Figure 7: Densitometric Scan of the sample At 366nm:



Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.01 Rf	7.2 AU	0.03 Rf	410.7 AU	85.30 %	0.10 Rf	9.3 AU	6335.4 AU	92.64 %
2	0.21 Rf	4.0 AU	0.22 Rf	70.8 AU	14.70 %	0.28 Rf	4.0 AU	503.4 AU	7.36 %

Fig. 7a: *Ashwagandha A*(10 µl)



Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.01 Rf	0.0 AU	0.02 Rf	306.2 AU	90.39 %	0.04 Rf	6.2 AU	2729.4 AU	91.97 %
2	0.05 Rf	1.8 AU	0.06 Rf	22.5 AU	6.65 %	0.09 Rf	0.0 AU	147.1 AU	4.96 %
3	0.10 Rf	0.6 AU	0.11 Rf	10.0 AU	2.96 %	0.13 Rf	0.1 AU	91.2 AU	3.07 %

Fig. 7b: *Ashwagandha B*(10 µl)

CONCLUSION

The present study was carried out with an aim of authenticity of the drug along with Physcio-chemical and phytochemical analysis of *Ashwagandha Churna*. The result drown were 2% foreign mater was determined. Loss on drying 1.6%, total ash obtained was 9 %, acid insoluble ash was 1% and water soluble extractive was 12 % and Alcohol soluble extractive was 13 %. The phytochemical investigation revealed the presence of various phytochemical constituents such as alkaloids, flavonoids, carbohydrate, Steroids and Saponin Glycoside. HPLC chromatograms of methanol extracts obtained from root of *Withania Somnifera* are veled that higher quality of with a nolides was present. Hence the root of *Withania somnifera* was considered to mostly prefer for commercial preparation of drugs.

REFERENCES

1. "*Withania somnifera*" Alternative medicine review, find article. 13 Oct 2008.
2. P. Bandhoria, V.K. Gupta, M Amina, N. K. Satti, P. Dutta, K. A. Suri: Journal of chemical crystallography,36,153-159(2006).
3. Shah B, Seth A. Text book of pharmacognosy and phytochemistry. India: Elsevier A Division of Reed Elsevier India Private Limited; 2010.

ISSN: 2456-3110 **ORIGINAL ARTICLE** Nov-Dec 2020

4. Aiyelaagbe, O. O. and Paul M. Osamudiamen (2009) Phytochemical screening for active compounds in Mangifera indica leaves from Ibadan,Oyo State. Plant science Research; 2(1):11-13.
5. Jain, S.K. and R.R. Rao (1977).A Handbook of Field and Herbarium Methods. Today and tomorrow's Printers and Publishers, New Delhi.
6. Johansen DA. Plant Microtechnique, Edition 1: 1940 McGraw Hill Book Co, New York, London, 1940, 182–203.
7. Johansen DA. Plant Microtechnique, Edition 1: 1940 McGraw Hill Book Co, New York, London, 1940, 182–203.
8. Harborne JB. Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis, 1984.2nd Ed.
9. Kokate, C. K. (1994). Practical Pharmacognosy, 4thedn.Vallabh Prakasan, New Delhi, 179-181.
10. Harbone, J.B and B. L. Turner (1984).Plant chemosystematics. Academic press, London.pp: 61-62.
11. Anonymous. The Ayurvedic Pharmacopoeia Of India, New Delhi Department Of Ayush, Ministry Of Health And Family Welfare, Government Of India, 2009,70 – 72.
12. Anonymous. Pharmacopoeia of India. Vol.**2**, Edition 4: 1996 Government of India, Ministry of Health, Controller of publication, New Delhi, 1996, A-53–55.
13. Lohar DR, Ravindra Singh. Quality Control Manual for Ayurvedic, Siddha and Unani Medicine. Ghaziabad: Department of Ayush, Ministry of Health and Family Welfare, Pharmacopoeial Laboratory for Indian Medicine, 2008, 21-24.
14. Joseph L, George M, Agrawal S, Kumar V. Pharmacognostical and Phytochemical studies on Jasminum grandiflorum leaves. Int J Pharm Frontier Res 2011; 1, 80-92.
15. Joseph L, George M, Agrawal S, Kumar V. Pharmacognostical and Phytochemical studies on Jasminum grandiflorum leaves. Int J Pharm Frontier Res 2011; 1, 80-92.
16. Joseph L, George M, Agrawal S, Kumar V. Pharmacognostical and Phytochemical studies on Jasminum grandiflorum leaves. Int J Pharm Frontier Res 2011; 1, 80-92.
17. Joseph L, George M, Agrawal S, Kumar V. Pharmacognostical and Phytochemical studies on Jasminum grandiflorum leaves. Int J Pharm Frontier Res 2011; 1, 80-92.
18. Joseph L, George M, Agrawal S, Kumar V. Pharmacognostical and Phytochemical studies on Jasminum grandiflorum leaves. Int J Pharm Frontier Res 2011; 1, 80-92.

How to cite this article: Dr. Bargale Sushant Sukumar, Dr. Tripathy T. B., Dr. Shashirekha H.K. Phyto physico-chemical profile of Ashwagandha (Withania somnifera Dunal). J Ayurveda Integr Med Sci 2020;6:120-129. http://dx.doi.org/10.21760/jaims.5.6.17

Source of Support: Nil, **Conflict of Interest:** None declared.

****