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STANDARDIZATION OF SALAVANA UPANAHA CHURNA: A HERBAL COMPOUND DRUG USED FOR UPANAHA IN SPASTIC CEREBRAL PALSY

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Keywords:

Ayurveda, Salavana upanaha churna, Herbal compound drug, Upanaha, Spastic cerebral palsy, Standardization, HPTLC

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ABSTRACT: Background: Salavana upanaha churna is a herbal compound drug consisting of Godhuma churna (*Triticum aestivum* L.), Rasna churna (*Pluchea lanceolata* (DC.) Oliv. & Hiern), Devadaru churna (*Cedrus deodara* (Roxb.) G.Don), Erandamoola churna (*Ricinus communis* L.), Vidanga churna (*Embelia ribes* Burm.f.), Vacha churna (*Acorus calamus* L.) and Saindhava lavana (rock salt) as main ingredients. Salavana upanaha churna is used extensively in management of spastic cerebral palsy in children. **Aim:** To standardize Salavana upanaha churna. **Materials and Methods:** Physico-chemical studies like organoleptic characters, Powder microscopy, Loss on drying and HPTLC were carried out as per the WHO guidelines, Ayurvedic Pharmacopoeia and Indian Pharmacopoeia. **Conclusion:** Standardization tests done on Salavana upanaha churna helped in authenticating and ensuring the quality of the same.

INTRODUCTION: The quality assessment of herbal formulations is having huge importance as they are having a vital role in health care systems [1, 2]. About 85-90% of the world's population consumes traditional herbal medicines according to an estimate of World Health Organization [3, 4]. The issues regarding effectiveness and quality have raised up with the increased demand of herbal medicines [1, 5]. There is increased general awareness about the necessity for developing standards for Ayurvedic medicines by Drug Control Authorities which will ensure quality to the public [6, 7]. The standardization of is a significant step for the establishment of a consistent chemical profile biological activity of herbal drugs.

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At present, most pharmaceutical companies are using substitute drugs owing to minimal availability of authentic [8]. This will go on to compromise the quality of the drug. Hence it is necessary to authenticate raw drugs as well as prepared formulations in order to ensure quality of the same. Salavana upanaha churna is is a herbal compound drug consisting of Godhuma churna (*Triticum aestivum* L.), [9] Rasna churna (*Alpinia galangal* (L.) Willd.), [10] Devadaru churna (*Cedrus deodara* (Roxb.) G.Don), [11] Erandamoola churna (*Ricinus communis* L.),[12] Vidanga churna (*Embelia ribes* Burm.f.), [13] Vacha churna (*Acorus calamus* L.) [14, 15] and Saindhava lavana (rock salt) [16, 17] as main constituents.

Salavana upanaha churna is used extensively in management of spastic cerebral palsy in children but till present day, standardization of the formulation is not been carried out yet. Hence, the present study emphasizes the standardization of Salavana upanaha churna.

MATERIALS AND METHODS: Physico-chemical studies like organoleptic characters, powder microscopy, loss on drying and HPTLC were carried out as per the WHO guidelines, Ayurvedic Pharmacopoeia and Indian Pharmacopoeia.

Plant Material: The constituents of Salavana upanaha churna were collected from the local market of Hassan district, Karnataka state, India in the month of March 2017. The collected drug was identified and authenticated at the teaching pharmacy of Department of Dravyaguna (Ayurveda Pharmacology), SDM College of Ayurveda and Hospital, Hassan, Karnataka state, India.

Methodology: The studies were done at SDM Centre for Research in Ayurveda and Allied Sciences, Kuthpady, Udupi, Karnataka, India as per standard procedure.

Organoleptic Characters: Organoleptic characters of the test sample were documented by means of examination using sensory organs.

Powder Microscopy: A pinch of powder was warmed with drops of chloral hydrate on a microscopic slide and mounted in glycerine. Slides observed under microscope and diagnostic characters were observed and photographed using Zeiss AXIO trinocular microscope attached with Zeiss Axio Cam camera under bright field light. Magnifications of the figures are indicated by the scale-bars.

Loss on Drying at 105 ºC: 10 g of sample was placed in tared evaporating dish. It was dried at 105ºC for 5 h 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.

HPTLC: 1 g of Salavana upanaha choorna powder was extracted with 10 ml of alcohol, kept for cold percolation for 24h followed by filteration. 4, 8 and 12µl of the above extract were applied on a pre-coated silica gel F254 on aluminium plates to a band width of 7 mm using Linomat 5 TLC applicator. The plate was developed in toluene: ethyl acetate (7.0: 1.0). The developed plates were visualized under short UV, long UV and then derivatised with vanillin sulphuric acid, observed under white light and scanned under UV 254 nm, 366 nm. R_f, colour of the spots and densitometric scan were recorded.

RESULTS AND DISCUSSION: The loss on drying of Salavana upanaha churna is detailed in **Table 1**. The rganoleptic characters of Salavana upanaha churna is detailed in **Table 2**.

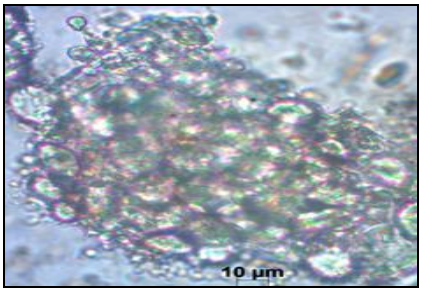


FIG. 1A: GROUP STARCH GRAINS

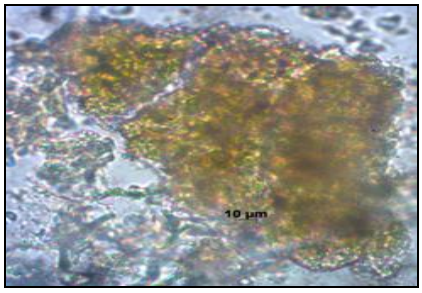


FIG. 1B: PARENCHYMA WITH CONTENT

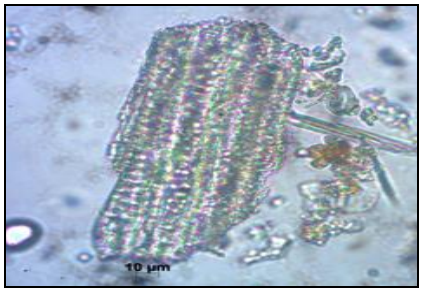


FIG. 1C: VESSELS WITH RETICULATE THICKENING

FIG. 1D: GROUP OF FIBRES

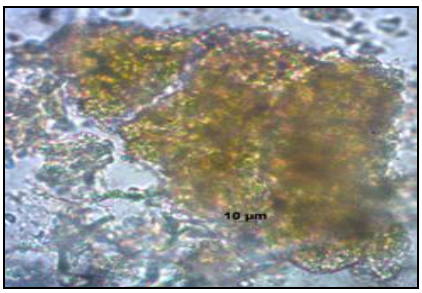


FIG. 1E: PARENCHYMA WITH CELL CONTENT

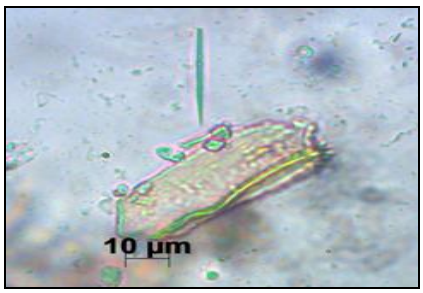


FIG. 1F: PARENCHYMA WITH CELL CONTENT

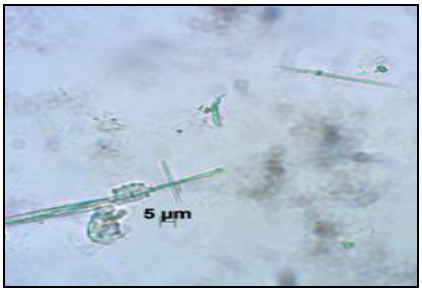


FIG. 1G: NEEDLES OF CALCIUM OXALATE

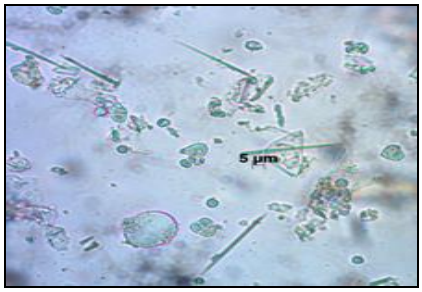


FIG. 1H: STARCH GRAINS AND NEEDLES

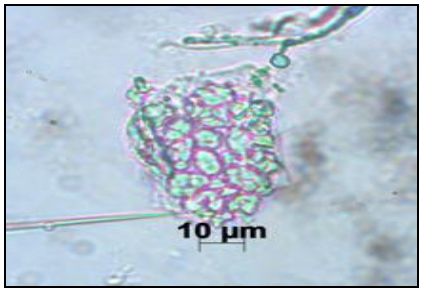


FIG. 1I: BUNCH OF STARCH GRAINS

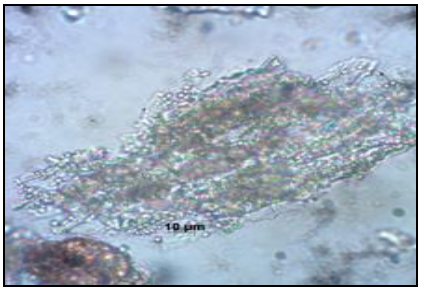


FIG. 1J: PARENCHYMA WITH CELL CONTENT

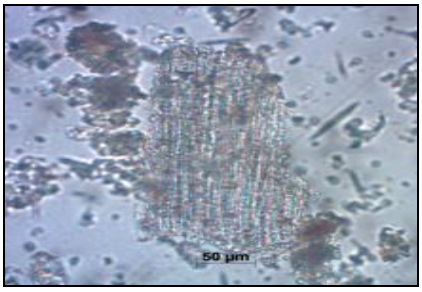


FIG. 1K: BUNDLE OF FIBRES

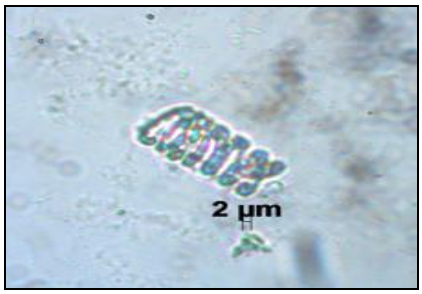


FIG. 1L: SPIRAL VESSELS

The powder microscopy of salavana upanaha churna is shown in **Fig. 1**. The HPTLC photo documentation of ethanolic extract of Salavana upanaha churna is shown in **Fig. 2**.

TABLE 1: RESULTS OF LOSS ON DRYING OF SALAVANA UPANAHA CHURNA

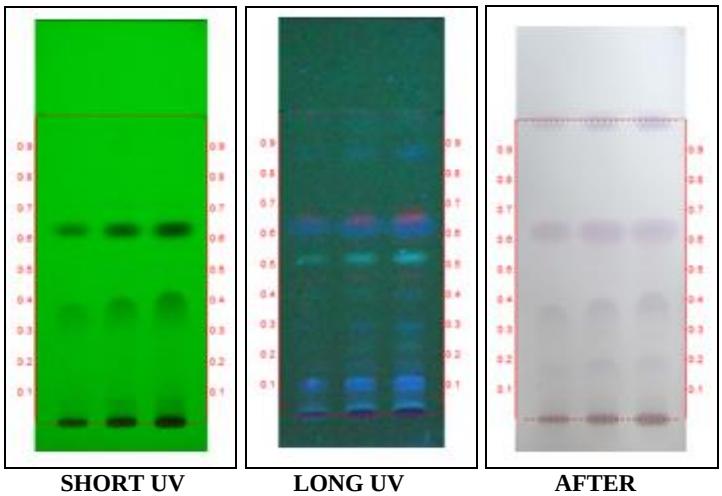
Parameter	Results n = 3 % w/w
Loss on drying	3.50

TABLE 2: ORGANOLEPTIC CHARACTERS OF SALAVANA UPANAHA CHURNA

Parameter	Results n = 3 % w/w
Colour	Off white
Odour	Characteristic
Taste	Salty

The R_f values of sample of Salavana upanaha churna is detailed in **Table 3**.

The densitometric scan of Salavana upanaha churna is shown in **Fig. 3**. The physicochemical standards would serve as preliminary test for the standardization of the formulation. Tests such as organoleptic characters, powder microscopy, Loss on drying and HPTLC, results of TLC photo documentation, the unique R_f values, densitometric scan and densitogram obtained at different wavelengths can be used as fingerprint to identify the herbal drug of Salavana upanaha churna.



SHORT UV **LONG UV** **AFTER DERIVATISATION**

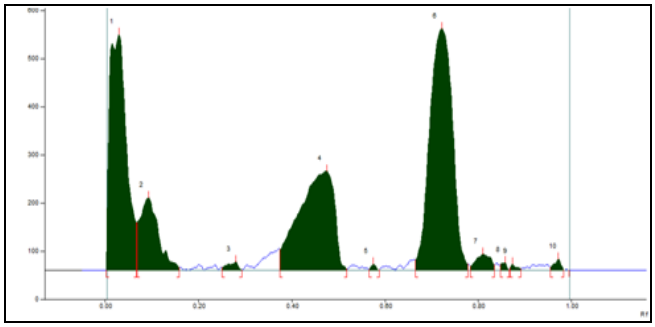
FIG. 2: HPTLC PHOTO DOCUMENTATION OF ETHANOLIC EXTRACT OF SALAVANA UPANAHA CHURNA

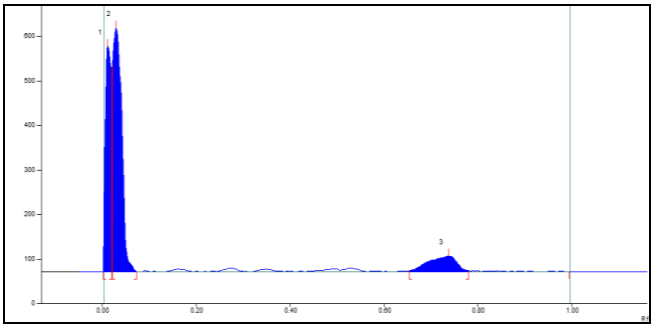
Track 1- Salavana upanaha churna – 4µl; Track 2- Salavana upanaha churna – 8µl; Track 3- Salavana upanaha churna – 12µl
Solvent system – Toluene: Ethayl acetate (7.0: 1.0)

TABLE 3: R_f VALUES OF SAMPLE OF SALAVANA UPANAHA CHURNA

Short UV	Long UV	After derivatisation
0.07 (L. green)	-	-
-	0.10 (F. blue)	-
-	0.12 (F. blue)	-
-	0.17 (F. blue)	0.18 (D. purple)
-	0.23 (F. blue)	-
-	0.30 (F. blue)	-
0.38 (D. green)	-	0.37 (D. purple)
-	0.41 (F. blue)	-
-	0.47 (F. blue)	-
-	0.52 (F. green)	-
-	0.62 (F. blue)	-
0.64 (D. green)	0.64 (F. pink)	0.64 (D. pink)
-	0.87 (F. blue)	-

*F –fluorescent; D – dark; L – light





Track 3, ID: Salavana upnaha churna

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	0.0 AU	0.03 Rf	489.5 AU	33.52 %	0.07 Rf	98.6 AU	12681.4 AU	26.82 %
2	0.07 Rf	99.0 AU	0.09 Rf	150.0 AU	10.27 %	0.16 Rf	5.4 AU	4307.5 AU	9.11 %
3	0.25 Rf	5.3 AU	0.28 Rf	17.4 AU	1.19 %	0.29 Rf	0.4 AU	271.7 AU	0.57 %
4	0.38 Rf	43.3 AU	0.48 Rf	206.0 AU	14.11 %	0.52 Rf	2.7 AU	11106.4 AU	23.49 %
5	0.57 Rf	1.5 AU	0.58 Rf	12.3 AU	0.84 %	0.59 Rf	1.0 AU	93.2 AU	0.20 %
6	0.67 Rf	21.7 AU	0.72 Rf	501.0 AU	34.30 %	0.78 Rf	12.6 AU	17598.3 AU	37.22 %
7	0.78 Rf	8.3 AU	0.81 Rf	33.2 AU	2.27 %	0.84 Rf	10.9 AU	756.7 AU	1.60 %
8	0.85 Rf	11.1 AU	0.86 Rf	15.2 AU	1.04 %	0.87 Rf	2.1 AU	128.3 AU	0.27 %
9	0.87 Rf	5.4 AU	0.87 Rf	12.7 AU	0.87 %	0.89 Rf	2.9 AU	106.7 AU	0.23 %
10	0.95 Rf	6.4 AU	0.97 Rf	23.1 AU	1.58 %	0.98 Rf	0.6 AU	237.5 AU	0.50 %

Track 3, ID: Salavana upnaha churna

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	0.0 AU	0.01 Rf	507.2 AU	46.43 %	0.02 Rf	55.4 AU	4582.5 AU	33.10 %
2	0.02 Rf	463.8 AU	0.03 Rf	549.5 AU	50.30 %	0.07 Rf	0.3 AU	7697.0 AU	55.59 %
3	0.65 Rf	2.1 AU	0.74 Rf	35.6 AU	3.26 %	0.78 Rf	2.8 AU	1566.7 AU	11.32 %

FIG. 3A: AT 254nm **FIG. 3B: AT 366 nm**

FIG. 3: DENSITOMETRIC SCAN OF SALAVANA UPANAHA CHURNA

CONCLUSION: The development of analytical techniques can serve as a specific tool in herbal drug research, thereby, maintaining the quality of these plant products. The present study on standardization of Salavana Upanaha churna is a first evolution on the physicochemical analysis and standardization of the formulation so far. Salavana Upanaha churna ghrita is an important compound drug with various biological properties. Hence, efforts have been made to provide scientific data on standardization of Salavana Upanaha churna.

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CONFLICT OF INTEREST: Nil

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