WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.074
Volume 7, Issue 5, 1452-1460. Research Article ISSN 2277– 7105

PRELIMINARY QUALITY CONTROL ANALYSIS OF MEDHYA RASAYANA CHURNA: A POTENTIAL DRUG FOR DAT

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Article Received on
15 January 2018,

Revised on 05 Feb. 2018,
Accepted on 26 Feb. 2018,

DOI: 10.20959/wjpr20185-11443

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ABSTRACT

Dementia of the Alzheimer type (DAT) is a progressive, fatal neurodegenerative condition characterized by deterioration in cognition and memory, progressive impairment in the ability to carry out activities of daily living, and a number of neuropsychiatric symptoms. In traditional practices of medicines, numerous plants have been used to treat cognitive disorders. In Charaka Samhita, in Rasayana adhyaya explained, *Mandukaparni*, *Guduchi*, *Yashtimadhu* and *Shankhapushpi* drugs having *Medhya* property[1] which can be correlated with cognitive enhancement. So combination of this churna i.e. *Medhya Rasayana Churna* was analysed and standardized scientifically through qualitative and quantitative analysis by physico-chemical parameters, Thin Layer chromatography (TLC) and high performance thin layer chromatography (HPTLC). This will help for the use of this formulation as cognitive enhancer.

KEYWORDS: Dementia of Alzheimer's type, *Medhya Rasayana Churna*, Cognitive enhancer.

INTRODUCTION

Alzheimer's disease is a neurodegenerative disorder in which a gradual declining in the memory along with one area of higher intellectual function is involved. The pathogenesis of DAT can be multifactorial in Ayurveda; disturbance in *Tridosha, Triguna*[2]*; Jarajanya smritirhas* with *vataprakopa*[3,4]*; akalaja vyadhi*[5]*; ama* in terms of protein aggregation. So treatment modality ought to act on this pathogenesis. *Medhya Rasayana* are the group of medicines which have numerous benefits especially it improves the memory and intellect by its *prabhava*.*Grahana shakti* (power of acquisition), *Dharana shakti* (power of retention) and *Smriti* (power of recollection) all three are included in *Medha. Medhya property is Prabhava janyakarma* i.e. action applied due to the amalgamation of *Panchamahabhoota* in exclusive way to the specific *dravyas* purely and not by similar *Rasapanchakas.* These drugs act at level of *Rasa* to stimulate the function of *Agni* and improves circulation of the *rasa* by opening and cleansing the *srotas* leads to improvement in *Medhya* function.

AIM AND OBJECTIVES

Pharmacognostical and phytochemical analysis of *Medhya Rasayana churna*indicated for cognitive enhancement.

MATERIAL AND METHODS

- Collection, identification and authentication of raw drugs.
- Pharmacognostical study of drugs.
- Preparation of drug at pharmacy
- Phytochemical analysis of compound drug.

Collection, Identification and Authentication of Raw Drugs

The raw ingredients were procured from Kajarekar Pharmacy, Belgaum, Karnataka. The ingredients and part used are given table No. 1. The raw drugs are identified and authenticated by the Department of Dravyaguna, Parul Institute of Ayurveda, Parul University, Vadodara. The powdered drug was used for powder microscopy.

Table No 1. Ingredients of *Medhya Rasayana Churna.*

Sr. No.	Ingredients	Identification	Part used
1.	*Mandukaparni*	*Centella asitica Linn.*	*Panchang*
2.	*Guduchi*	*Tinospora cardifolia Miers.*	*Kanda*
3.	*Shankhapushpi*	*Convolvulus pleuricaulis Chois.*	*Panchang*
4.	*Yashtimadhu*	*Glycirrhiza glabra Linn.*	*Moola*

Pharmacognostical study

The Pharmacognostical study of the Ingredients of trial drug – *Medhya Rasayana Churna* was carried out in the Pharmacognosy laboratory, Parul Institute of Ayurved, Parul University, Vadodara. The powders of the ingredients of the trial drug was used for macroscopic, microscopic studies were carried out. Standards mentioned in API[6], Quality Standards of Indian Medicinal Plants[7], Database on Medicinal Plants used in Ayurveda[8] are taken as reference for authentication.

- **Pharmacognosy of *Mandukaparni***

Organoleptic characteristics

Greenish - brown in colour, odour nil, taste bitter to slightly sweetish.

Microscopic features of Whole Plant

Epidermal cells, starch grains, bits of epidermis with anisotricytic, isotricytic, tetracytic and anomocytic stomata, Fragments of uniseriate trichome, microsphenoidal crystals, palisade and spongy cells, Collenchyma and parenchyma cells, Rosette crystals of calcium oxalate.

- **Pharmacognosy of *Guduchi***

Organoleptic characteristics

Creamish brown in color, odor nil, taste bitter.

Microscopic features of Stem

Simple & Compound Starch Grains, Prismatic crystals of calcium oxalate, Cork cells in surface view, Pitted vessels, Sclerenchymatous cells, crystal fibres were seen.

- **Pharmacognosy of *Shankhapushpi***

Organoleptic characteristics

Light yellowish-green colour, taste bitter slightly pungent odour.

Microscopic features of whole Plant

Pitted vessels with fibre, Spiral vessels solitary or in groups, starch grains, stomata, tannin, trichome were seen.

- **Pharmacognosy of *Yashtimadhu***

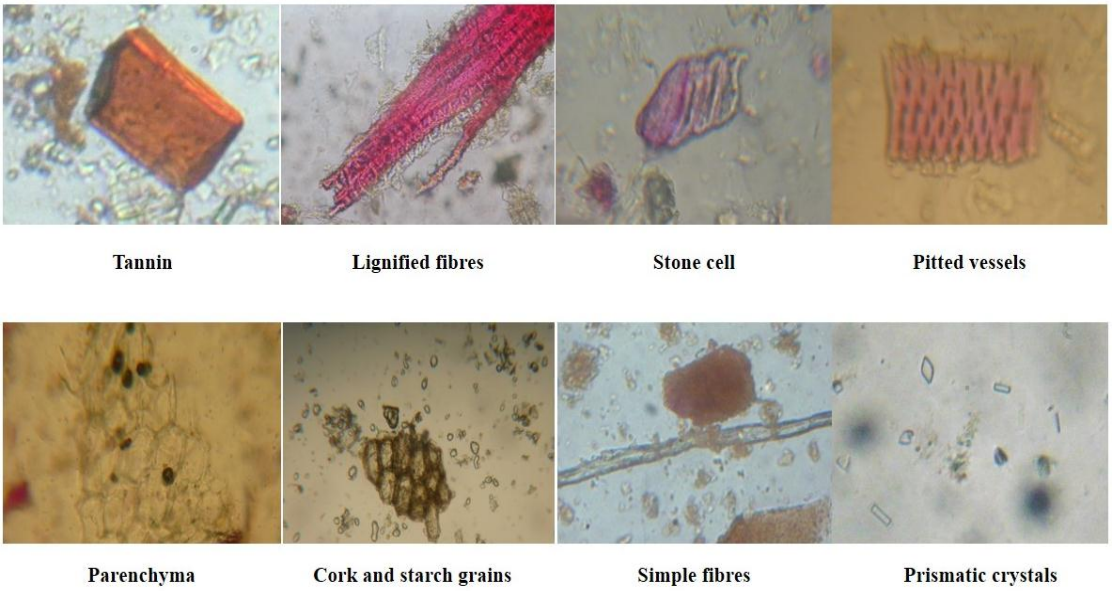
Organoleptic characteristics

Brownish colour, odour faint and characteristic, taste sweetish.

Microscopic features of Root

Outer and inner cork, reddish brown, prisms crystals, lignified fibres, simple, oval or rounded starch grains were seen.

Powder microscopy of Medhya Rasayana Churna



Picture No. 1 Powder microscopy of *Medhya Rasayana Churna.*

Preparation of the Drug at Pharmacy

The ingredients enlisted from 1-4 are cleaned and dried properly. They made into fine powder separately and sieved in mesh no.80. Each one of them (powder) is weighed separately. The ingredients are mixed well in equal quantity in mass mixing machine till a homogenous mixture was obtained.[9]

Phytochemical analysis of compound drug

Phytochemical Analysis of Compound Drug: *Medhya Rasayana Churna* was analysed at Vasu Research Centre, Vadodara.

RESULTS

Table No. 2 Organoleptic Parameters of *Medhya Rasayana Choorna.*

Sr. No.	Parameters	Sample
1.	Appearance	Fine powder
2.	Color	Creamish yellow
3.	Taste	Bitter, Astringent
4.	Odor	Characteristic odour

Phytochemical parameters

Medhya Rasayana Churna was evaluated for various physico-chemical analyses like loss on drying, total ash, Acid insoluble ash, Water soluble extract, Alcohol soluble extract, pH. The results were shown in table No. 3.

Table No: 3 Physico - Chemical Parameters.

Sr. No.	Parameters	Sample
1.	Loss on drying	5.84 % w/w
2.	Water soluble Extract	22.16 % w/w
3.	Alcohol soluble Extract	14.60 % w/w
4.	Total Ash	10.24 % w/w
5.	pH Value (1% of Aqueous solution)	5.41

High-PerformanceThin Layer Chromatography Study

Preparation of test solution (T)

Powder of *Medhya Rasayana Churna* weighing 5 gm are taken in Iodine flask with 20 ml of methanol and vortexed for 10 min. After that given heat for 10 min. Filtered with Whatman filter paper 1 and then concentrated it on water bath upto 2ml. filtered again and used for HPTLC profiling.

Preparation of spray reagent (Anisaldehyde-sulphuric acid reagent)

0.5 ml Anisaldehyde EP is mixed with 10ml Glacial acetic acid AR, followed by 85ml Methanol Ar and 5Ml Sulphuric acid 98% GR.

Table No. 4 Preparation of Chromatographic conditions

Chromatographic Conditions	
Application Mode	CAMAG Linomat 5 - Applicator
Filtering System	Whatman filter paper No.1
Stationary Phase	MERCK - TLC / HPTLC Silica gel 60 F254 on Aluminum sheets
Application (Y axis) Start Position	10 mm
Development (Y axis) End Position	90 mm from plate base
Space Between Band	10 mm
Sample Application Volume	8 µL
Development Mode	CAMAG TLC Twin Trough Chamber
Chamber Saturation Time	30 minutes
Mobile Phase (MP)	Toluene: Ethyl acetate: Formic acid (10:3:1)
Visualization	@254nm, @ 366nm and @ 540 nm (after derivatization)
Spray reagent	Anisaldehyde - Sulphuric acid reagent
Derivatization mode	CAMAG – Dip tank for about 1 minute
Drying Mode, Temp. & Time	TLC Plate Heater Preheated at 100± 50C for 3 minutes

Table No. 5Details of HPTLC profile of all tracks at 254 nm.

No. of spots	Track -1
1	0.17
2	0.45
3	0.56
4	0.62

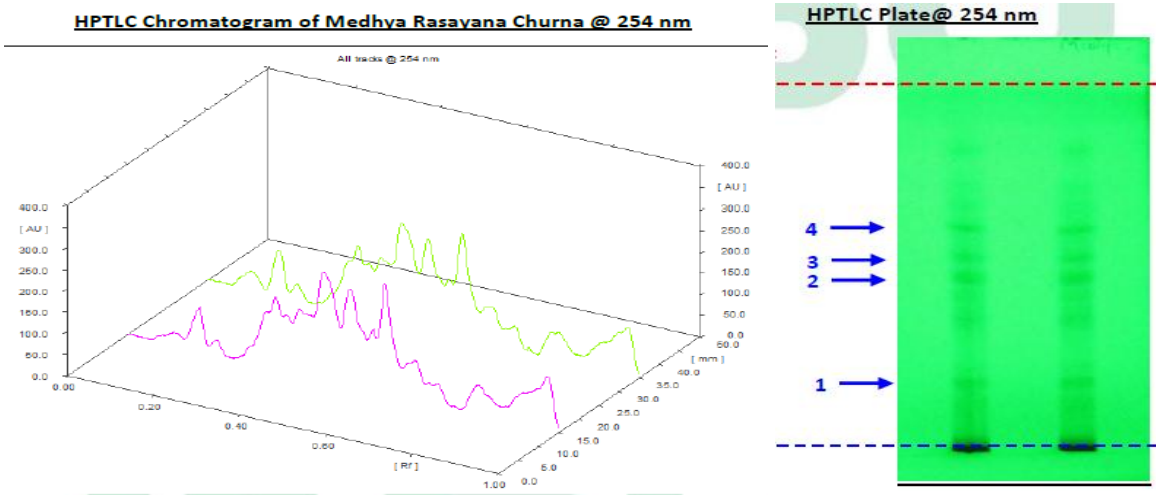


Table No. 6 Details of HPTLC profile of all tracks at 366 nm.

No. of spots	Track -1
1	0.26
2	0.36
3	0.40
4	0.45
5	0.53
6	0.56
7	0.62
8	0.72
9	0.75
10	0.83

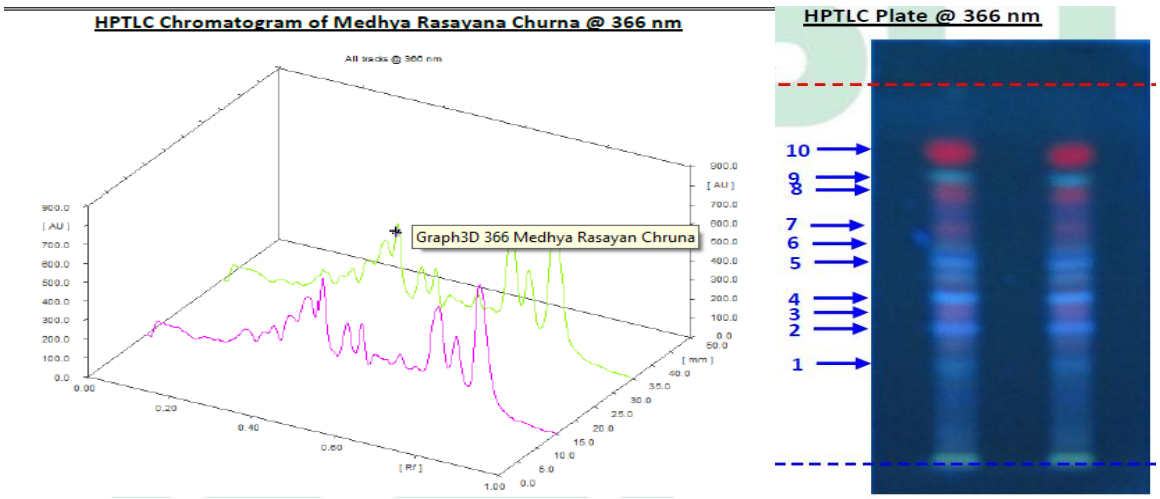
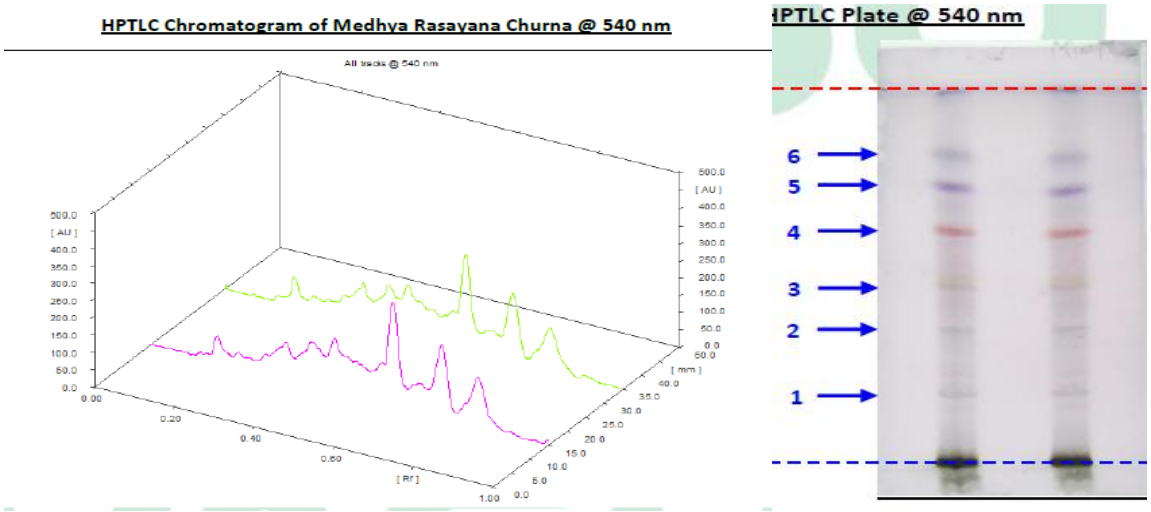


Table No: 7 Details of HPTLC profile of all tracks at 540 nm.

No. of spots	Track -1
1	0.17
2	0.36
3	0.45
4	0.62
5	0.72
6	0.83



DISCUSSION

- Loss on drying: Present sample's loss on drying is 5.84%, which indicates it may have good shelf-life and may not decay on storage. Drying among samples indicates that it is devoid of excess water content and presence of microbial overgrowth or insect infestation.
- Total ash: In present sample total ash value is 10.24%. It is slightly more than normal limits. The value may be altered due to the presence of more fibres and sclereids, not because of the contamination, substitution and adulteration.
- Water soluble extract and Alcohol soluble extract: The high solubility of the sample in water denotes that drug is best suited for extraction with water or water based preparations. In present sample water soluble extract and alcohol soluble extract is 22.16% and 14.60% respectively. Value is low so unable to prepare *Kashaya, Phanta, Arishta* etc. So Lipid media is effective for Medhya Rasayana Churna**.**
- pH: The pH is 5.41% so it is acidic in nature. So these drug can be given along with Ghrita to compensate the acidic nature of drug. The pH value is useful to note the acidity or alkalinity of the aqueous solution of the drug. This helps in understanding the pharmacological basis of drug absorption and metabolism.

- Almost all the drugs are having *Tikta rasa*andmain properties of *Tikta rasa* are *Srotoshodhana, Agnidipana and Medhya*

- ***Mandukaparni, Yashtimadhu & Shankhapushpi***

  The place of *Tarpaka kapha* is *Masthishka and* the place of mind is *Mastishka*. *Sheeta virya* and *Madhura vipaka* nourishes kapha. So these drugs act on *Mana* improving its function like *chintya, vicharya* improves *Dharana karma* (i.e. retention of cognition).

- ***Guduchi***

  Due to *Ushna virya*, *Tikta rasa* and*tridoshagna properties, samshamani* promotes *pitta*, enhances *Grahana* and *Smarana* (i.e. grasping power and memory).

CONCLUSION

The ingredients of *Medhya Rasayana churna* are well known to have *Medhya* property. In this compound preparation part used and form of drug is modified, in order to make it cost effective and easily available. For palatability, absorption *anupana* of drug is used as *Go ghrita* and *Madhu* in unequal quantity. It is an attempt to standardize the formulation of compound. The phytochemical tests are under normal limits so it can be used for further pharmacological evaluation for its efficacy and safety. The chromatographic finger printing was developed which could be useful in identification of chemical constituents of the drug with help of R_f values for the researchers to carry out further research. The probable mode of action of the drug is in line with the properties of the ingredients via, *Medhya*, *Srotoshodhana*, anti-oxidant, stimulant, neuro-protective. Research work with larger samplefor a longer period of time should be carried out to prove its efficacy.

REFERENCES

1. Vd. H. S. Khushvaha, Agniveshkrita Charaka Samhita, Chikitsasthana 1/3/30-31, Chaukhamba Orientalia, Varanasi, 2015.
2. Vd. H. S. Khushvaha, Agniveshkrita Charaka Samhita, Katidhapurashiya Sharira adhyaya, sharirasthana 1/22.23, Chaukhamba Orientalia, Varanasi, 2015.
3. K. K. Shrikantha Murty, Vagbhata, Ashtanga Samgraha, Sutrasthana, Chaukhamba orientalia, Varanasi, 2000.
4. Vd. H. S. khushvaha, Agniveshkrita Charaka Samhita, [1]Vd. H. S. khushvaha, Agniveshkrita Charaka Samhita, Vimanasthana 8/122., Chaukhamba Orientalia, Varanasi, 2015.

5. Vd. Keval Lrishna Thakaral, Sushruta virachita Sushruta samhita, part 1, Vyadhisamuddeshiya adhyaya, Sutrasthana 24/7, Chaukhamba Orientalia, 2014.
6. Anonymous, Ayurvedic Pharmacopoeia of India, Part –I., Ministry of Health and Family Welfare, Govt. of India, Department of ISM &H, 1999; 1-5: 82.
7. Quality Standards of Indian Medicinal Plants, New Delhi, Indian Council of Medical Research, 2003-2011; 1-9.
8. Database on Medicinal Plants used in Ayurveda, Vol. 1-3, New Delhi, CCRAS.
9. Anonymous, Ayurvedic Formulary of India, Ministry of Health and Family Welfare, Govt. of India, Department of ISM & H, 1999; 1.l.