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PHARMACOGNOSTICAL AND PHARMACEUTICAL EVALUATION OF *VAJIGANDHADI YOGA:* AN EFFECTIVE FORMULATION FOR THE MANAGEMENT OF CERVICAL SPONDYLOSIS (*MANYASTAMBHA*)

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ABSTRACT

Cervical Spondylosis is a degenerative condition of the cervical spine & common spinal problem seen nowadays. Approximately 95% of people by age 65 have cervical spondylosis to some degree, it's the most common spine dysfunction in elderly people. Though degeneration of cervical vertebrae is mostly seen in elderly people but due to occupational trauma its prevalence is increasing in early or middle age also. Lots of single and compound drugs have been described in Ayurveda for the management of *Vatavyadhi (Manyastambha). Vajigandhadi Yoga* is having *Rasayana, Balya, Brumhana, and Vatashamaka* property. Till date no published data is available on pharmacognostical and analytical profile of *Vajigandhadi Yoga*, So present study is planned. This paper is made to standardize the formulation through Pharmacognostical and Pharmaceuticals measures. The compound was analysed and standardized scientifically through qualitative and quantitative analysis by physico-chemical parameters and HPTLC and pharmacognostical measures. Pharmacognostical analysis showed characteristics of all the ingredient drugs in the tablet. In Pharmaceuticals analysis, HPTLC was done in appropriate solvent system in which 7 and 3 spots were distinguished at

254 nm and 366 nm respectively. This study may be used as reference standard in the further researches.

KEYWORDS: Cervical Spondylosis (*Manyastambha*), Pharmaceuticals, Pharmacognostical, *Vajigandhadi Yoga*.

INTRODUCTION

Cervical Spondylosis is defined as arthrosis of post intervertebral joint in the cervical vertebrae. This is a degenerative condition of the cervical spine found almost universally in persons over 50 years of age. It occurs early in person pursuing 'white collar job's or those susceptible to neck pain because of keeping the neck constantly in one position while reading, writing etc. The term is often used synonymously with Cervical Osteoarthritis. Approximately 95% of people by age 65 have cervical spondylosis to some degree, it's the most common spine dysfunction in elderly people.[1] Age, Gender and occupation are the risk factors for having Cervical Spondylosis.[2] Nearly 50% of people over the age of 50 and 75% of those over the age of 65 have typical radiographic changes of cervical spondylosis.[3] Although aging is the major risk factor that contributes to the onset of Cervical Spondylosis,[4] repeated occupational trauma may contribute to the development of Cervical Spondylosis.[5] Advancement of busy life, overuse of mobiles, computers, office stress, improper sitting in offices, continuous work in one posture, overexertion and jerky movements during travelling, sports etc – all these factors create undue pressure and stress injury to spine and play an important role in producing disease like Cervical Spondylosis. In this way, this disease is now becoming a significant threat to the working population. There is no exact clinically entity mentioned in *Ayurvedic* classics like Cervical spondylosis, but the degenerative type of condition with clinical manifestation can be considered under the broad umbrella of *Vatavyadhi*. *Manyastambha* enumerated in the eighty *Nanatmaja* disorders of *vata* shows the maximum resemblance with Cervical Spondylosis. The etiological factors responsible for this disease have been mentioned by *Acharya Sushruta* i.e sleep in day time, leaning or sleeping on an uneven place, constantly gazing upward and *Avarana* of *Vayu* by *Kapha* lead to this disease. *Acharya Charaka* has mentioned that if the vitiated *Vata* gets localized in the *Manya*; spread in to the internal channels, it will cause spasticity of the neck. Contents of *Vajigandhadi Yoga* are pacifying *Vata Dosha* and are having *Aampachana, Rejuvenating, Brumhana* property & combination of these drugs was found to be beneficial in cases of *Manyastambha*.

MATERIALS AND METHODS

Plant material

All the raw drug materials were collected from the pharmacy of IPGT & RA, Gujarat Ayurved University, Jamnagar. The ingredients are mentioned in table 1.

Table 1: Ingredients of *Vajigandhadi Yoga* (*Anubhut Yoga*).

Drug	Botanical name	Parts used	Quantity
Ashwagandha	*Withania somnifera* Linn.	Root	2 Parts
Nirgundi	*Vitex negundo* Linn.	Leaf	1 Part
Shallaki	*Boswellia serrata* Roxb.	Gum resin	1 Part
Asthishrunkala	*Cissus Quadrangularis* Linn.	Stem	1 Part
Pippalimoola	*Piper longum* Linn.	Root	1/2 Part
Chopachini	*Smilex chinensis* Linn.	Rhizome	1/2 Part
Godanti	*Gypsum(calcium sulphate)*	Bhasma	1 Part

Pharmacognostical study

All the raw drugs were identified and authenticated by the Pharmacognosy department, IPGT & RA, Gujarat Ayurved University, Jamnagar. The identification were carried out on the basis of organoleptic features, morphological features and powder microscopy of individual drugs. Pharmacognostical evaluation of prepared tablet was also carried out. Tablet dissolved in small quantity of distilled water, filtered through filter paper, filtrate studied under the microscope attached with camera, with and without stain. The microphotographs were also taken under the microscope.[6]

Method of preparation of *Vajigandhadi Yoga*

Vajigandhadi Yoga was prepared after mixing of raw drugs mentioned in table 1. Fine powder of *Ashwagandha* (2 part), *Pippalimoola* and *Chopachini* (1/2 part) & *Shallaki, Asthishrunkala, Nirgundi, Godanti* was taken in equal proportion (1 part). 7 *Bhavna* of *Nirgundi Patra Kwath* was given & After mixing of *choorna* of above mentioned drugs, tab of 500mg was prepared.

PHARMACEUTICAL EVALUATION

Physiocochemical parameter

Vajigandhadi Yoga tablet was analysed by using qualitative and quantitative parameters at Pharmaceutical Laboratory, IPGT & RA, Gujarat Ayurved University, Jamnagar. The common parameters mentioned for compressed tablets in Ayurvedic Pharmacopia of India[7] and CCRAS[8] guidelines are total ash, pH value and water and alcohol soluble extractives.

On this basis these parameters were taken. Presence of more moisture content in a sample can create preservation problem. Hence loss on drying was also selected as one of the parameters.[9]

High Performance Thin Layer Chromatography Study (HPTLC)

Methanol extract of *Vajigandhadi Yoga* tablet were spotted on pre coated silica gel GF 60254 aluminium plate as 5mm bands, 5mm apart and 1 cm from the edge of the plates, by means of a Camag Linomate V sample applicator fitted with a 100 µL Hamilton syringe. Toluene (7 ml), Ethyl acetate (2 ml), Acetic acid (1 ml) was used as mobile phase. After Development, Densitometric scanning was performed with a Camag TLC scanner III in reflectance absorbance mode at 254 nm and 366 nm under control of win CATS software (V 1.2.1 Camag).[10,11] The slit dimensions were 6 mm x 0.45 mm and the scanning speed was 20 mm.

RESULTS AND DISCUSSION

Pharmacognostic study

The initial purpose of the study was to confirm the authenticity of the drugs used in the preparation of *Vajigandhadi Yoga*. For that coarse powder of all the ingredients were subjected to organoleptic and microscopic evaluation separately.

Organoleptic evaluation

Organoleptic features like colour, odour and taste of *Vajigandhadi Yoga* were recorded and are placed at table 2.

Table 2: Organoleptic features of *Vajigandhadi Yoga*.

SI. No.	Characters	Observed
1.	Colour	Dark Greyish Green
2.	Odour	Slightly Aromatic
3.	Taste	Slightly Astringent
4.	Touch	Hard

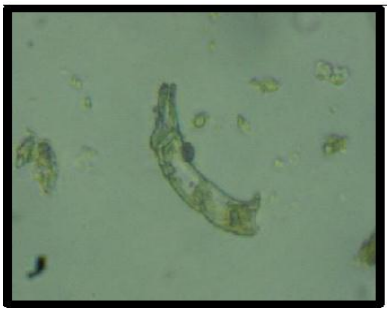
Microscopic evaluation

Microscopic evaluation was conducted by powdering the tablet and dissolving it in the distilled water and studied under microscope for the presence of the characteristics of the ingredient drug and for the probable changes in the features if any. The microphotographs were taken by using Carl Zeiss trinocular microscope. Characteristics of all the ingredient drugs were identified in tablet also. Microscopic characters of *Vajigandhadi Yoga* are starch grains of *Chopachini*, pitted vessels of C*hopachini*, fibres of *Chopachini*, ascicular crystals of

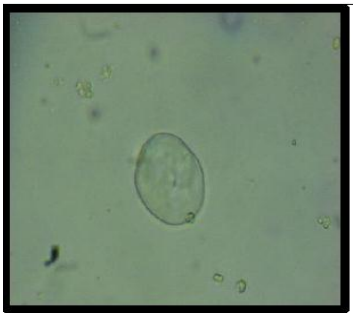
Asthishrunkala, rosette crystals of *Asthishrunkala*, simple fibres of *Asthishrunkala*, annular resins of *Asthishrunkala*, pitted vessels of *Ashwagandha*, starch grains of *Ashwagandha*, fibres of *Ashwagandha*, Fragments of *Nirgundi* trichome, werty trichome of *Nirgundi*, epidermal cells of *Nirgundi* along with stomata, stone cells of *Pippalimoola*, cork cells with brown content of *Pippalimoola*, lignified stone cells of *Pippalimoola*, stone cells with tannin content of *Pippalimoola*, silica deposition of *Godanti*. Plate 1. (Figure 1-18).

Plate -1: Microscopic characters of *Vajigandhadi Yoga* (Final Drug)

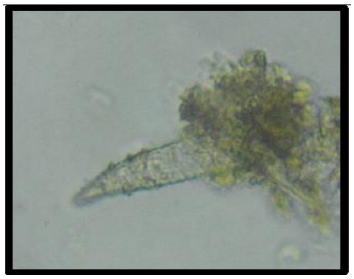
1. Acicular crystal of *Asthishrunkala*



2. Trichomes of *Nirgundi*

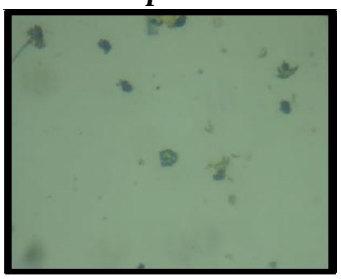


3. Starchgrains of *Chopachini*

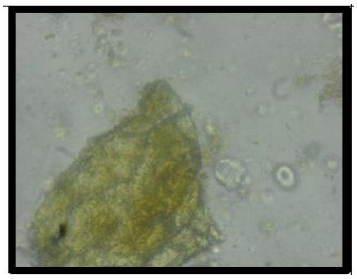


4. Warty trichome of *Nirgundi*

5. Fibres of *Ashwagandha*

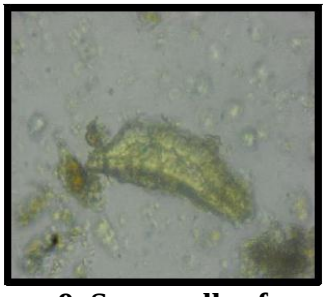


6. Rosette crytals of *Asthishrunkala*

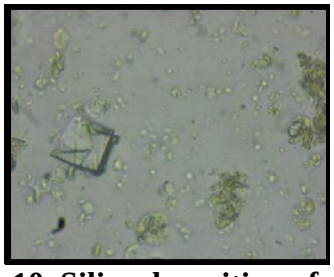


7. Epidermal cells with stomata of *Nirgundi*

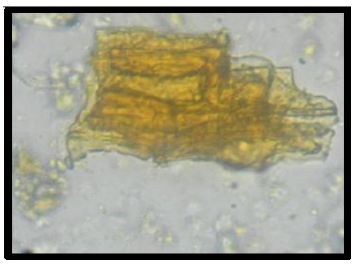
8. Simple fibres of *Asthishrunkala*



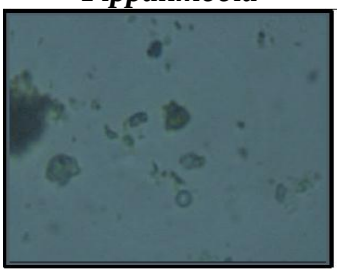
9. Stone cells of *Pippalimoola*



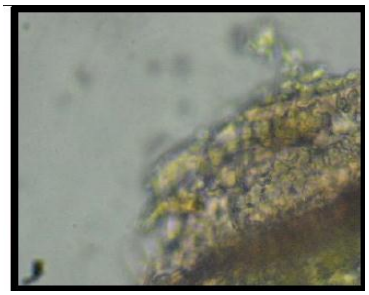
10. Silica deposition of Godanti



11. Cork cells with brown contant of *Pippalimoola*

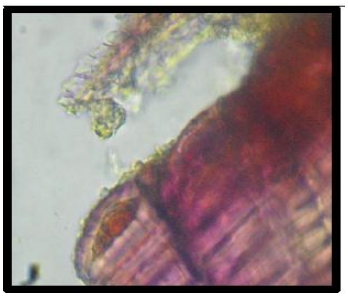


12. Starch grains of *Ashwagandha*

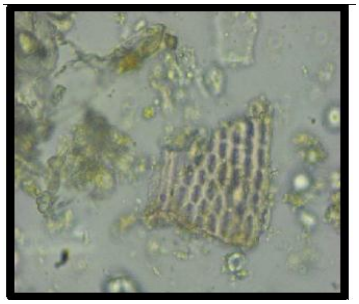


13. Pitted vessels of *Chopachini*

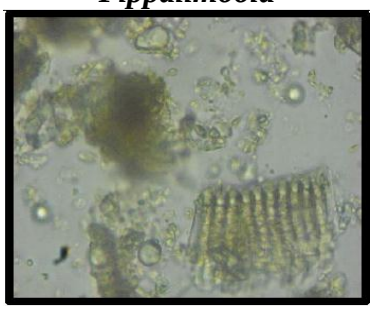
14. Stone cells of *Pippalimoola*



15. Stone cells of *Pippalimoola*



16. Pitted vessels of *Ashwagandha*



17. Annular vessels of *Asthishrunkala*

18. Fibres of *Chopachinni*

Physicochemical parameters

Physicochemical Parameters of the tablet like Uniformity, Disintegration time, Hardness, Loss on Drying were all found to be within the normal range. The water soluble extractive and methanol soluble extractive values were found to be 24.86% w/w and 9.21% w/w respectively. Details are placed at table 3.

Table 3: Physicochemical parameters of *Vajigandhadi Yoga*.

Test		Results
Uniformity of Tablet	Average	502.3 mg
	Highest	565 mg
	Lowest	408 mg
Hardness		1 kg/ cm^2
Loss on Drying		3.960 % w/w
Ash value		9.40 % w/w
Water soluble extract		24.86 % w/w
Methanol soluble extract		9.21 % w/w
pH value (5% aqueous solution)		6.0

High Performance Thin Layer Chromatography Study

Densitometric scanning of the HPTLC pattern showed 7 spots corresponding to hRf values 03, 08, 11, 17, 26, 33, 37 in short wave UV 254 nm and 3 spot corresponding to hRf values 03, 17, 33 obtained in long wave UV 366nm (Table 4, Plate 2 & 3).

Though it may not be able to identify particular chemical constituent from the spots obtained, the pattern may be used as a reference standard for further quality control researches.

Table 4: HPTLC of *Vajigandhadi Yoga*.

254nm		366nm	
Peak	**Rf**	**Peak**	**Rf**
1	0.03	1	0.03
2	0.08	2	0.17
3	0.11	3	0.33
4	0.17		
5	0.26		
6	0.33		
7	0.37		

Plate-2: Densitogram curve of Methanol extract of *Vajigandhadi Yoga* at 254 nm(2A) and 366 nm(2-B).

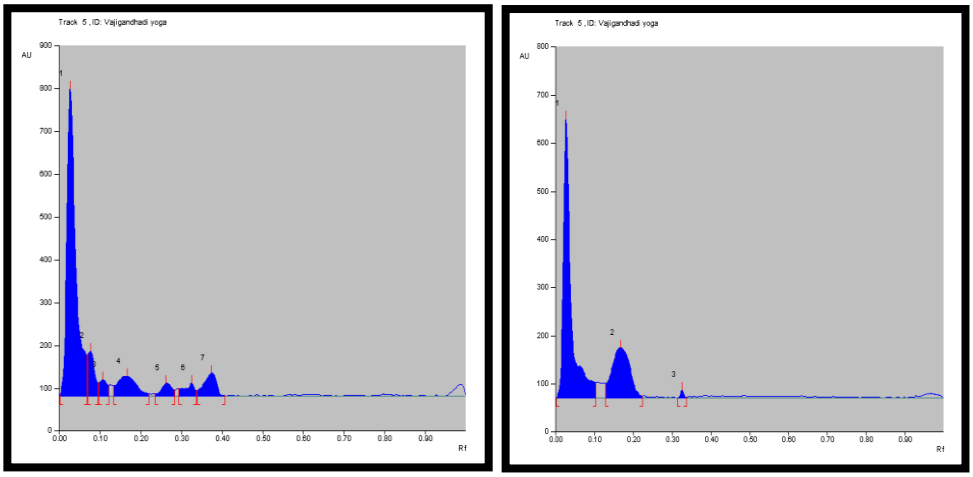


Figure 2-A **Figure 2-B**

Plate- 3: 3 Dimensional graph of Methanol extract of *Vajigandhadi Yoga*.

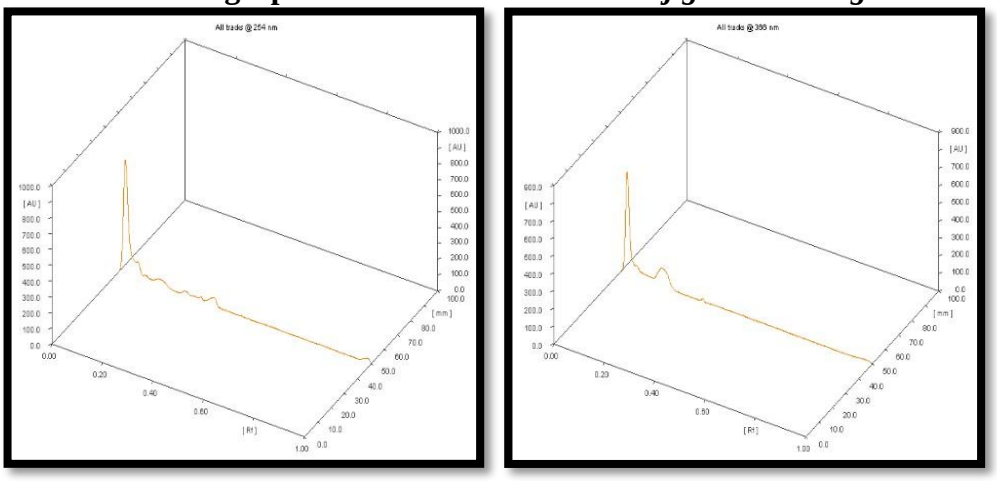


Figure 3-A (at 254 nm) **Figure 3-B (at 366 nm)**

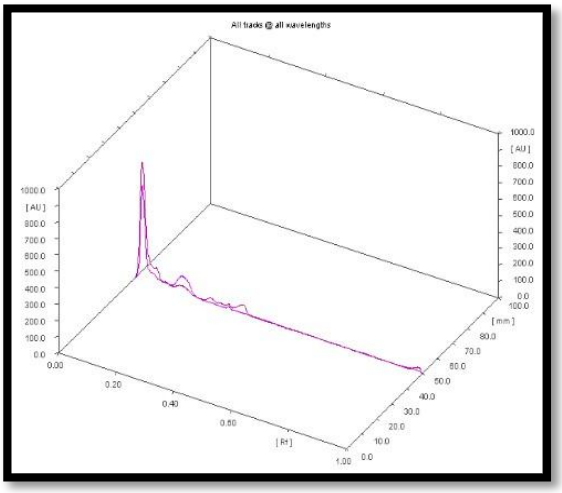


Figure 3-C (MWL).

CONCLUSION

Ayurvedic system of medicine is being relied upon more and more for the various health issues particularly lifestyle diseases. Study on *Vajigandhadi Yoga* is a step towards pharmacognostical, physicochemical standardisation of poly herbal formulation in tablet form. As there is no published information available on pharmacognostical and physico-chemical profiles of this *Vajigandhadi Yoga* tablet preliminary information can be used for reference in future for similar research works.

The ingredients were identified and authenticated pharmacognostically and were used for the preparation. The formulation was subjected to pharmacognostical, physicochemical, HPTLC studies. It is inferred that the formulation meets the minimum qualitative standards as reported in the API at a preliminary level. The inference from this study may be used as reference standard in the further quality control researches. Further clinical evaluation of the compound is in progress.

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