



PHAMACOGNOSTICAL AND PHARMACUETICAL EVALUATION OF TAGARADI EXTRACT CAPSULE

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ABSTRACT

Background: Insomnia is one of the most common sleep disorders in which people have trouble falling asleep, maintaining asleep or both and nowadays in sedentary and stressful life it is becoming more and more prevalent. *Tagaradi* extract capsule is a newly formulated *Ayurvedic* polyherbal formulation which is made from the extract of 8 herbs which are found effective in promoting the sleep in Insomnia patients. It consists of *Tagara* (*Valeriana wallichii*), *Jatamansi* (*Nardostachys jatamansi*), *Ashwagandha* (*Withania somnifera*), *Parsika yavani* (*Hyoscyamus niger*), *Shankhapushpi* (*Convolvulus pluricaulis*), *Brahmi* (*Bacopa Monnieri*), *Sarpagandha* (*Rouwolfia serpentina*) and *Pippalimoola* (*Piper longum*). It is a new formulation so, till date no published data is available on its analytical profile. **Aim:** To develop the pharmacognostical and phyto-chemical profile of *Tagaradi* extract capsule. **Material and Methods:** Extracts of 8 ingredients were mixed and filled in the capsules and analytical findings were systematically recorded in the laboratories. The sample was subjected to organoleptic analysis, physicochemical analysis and HPTLC examination by optimizing the solvent systems. **Results and Conclusions:** Pharmacognostical profile of *Tagaradi* extract capsule was established. Loss on drying, Ash value, Water soluble extract and Methanol soluble extract of *Tagaradi* capsule were found within prescribed limits. HPTLC fingerprinting profile of *Tagaradi* capsule revealed 5 spots at 254 nm and 4 spots at 366 nm.

KEYWORDS: *Tagaradi* extract capsule, pharmacognosy, pharmaceutical analysis, HPTLC, Insomnia.

INTRODUCTION

Herbal drugs formulation, contain numerous compounds in complex forms in which no single active constituent is responsible for the overall efficacy. Therefore, proper identification of raw materials at the basic level with the help of microscopic and morphological characteristics is essential to maintain the quality of multi-ingredient formulations. Along with developing pharmacognostic standards, adequate analytical methods are essential to ensure the quality and standardize the prepared medicine.

In Ayurveda almost all *Acharyas* have given the due importance to normal sleep at night which is very much important to maintain the homeostasis of the body and healthy lifespan. *Acharya Sushruta* has given the term *Bhutadhatri* to normal sleep. According to *Acharya Charaka Atinidra* and *Anidra* both are pathological conditions. Especially reduced sleep has been termed as *Anidra*, which is considered as one of the *Vata Nanatmaja Vikara*.^[1]

According to modern medical science Insomnia is a common sleep disorder in which people have trouble falling asleep, staying asleep or both. As a result, they may get too little sleep or have poor-quality sleep. They may not feel refreshed when they wake up. Long-standing insomnia can lead to daytime consequences such as fatigue or sleepiness, difficulty with thinking, and mood impairments, which can interfere with performance at school and work as well as it is being a cause of obesity, anxiety, depression, irritability, concentration problems, memory problems, poor immune system function and reduced reaction time. Insomnia has also been associated with a higher risk of developing chronic diseases.^[2]

According to the statistics 20% - 40% adults, encounter insomnia problems during a year time.^[3] Especially 15 to 55 years old are more affected. Further, Insomnia is 1.4 times more common in women than in men and affects 1 in 3 people.^[4]

The modern medical science is still not having a definite treatment for insomnia. Among insomnias, 28% receive psychotropic drug, 14% receive benzodiazepines and 19% receive antidepressants. Allopathic hypnotic drugs are useful for short term treatment in Insomnia which is due to actual stage.^[5] Long term use of certain classes of sedatives such as benzodiazepines and newer non-benzodiazepine drugs causes physical dependence, which manifests in withdrawal symptoms if the drug is not carefully tapered down. Further, the benzodiazepine and non-benzodiazepine drugs also have a number of side effects such as day time fatigue, motor vehicle crashes, cognitive impairments and falls and fractures. Elderly people are more sensitive to these side effects.^[6] In insomnia main causative factor is stress, and psychic treatment like pleasant smell, sound, touch; sense of satisfaction; adaptation of *Brahmacharya* (celibacy); are advised to control stress and to relax the mind. Dietary regimen alleviates the vitiated *Dosha* and herbal formulations which directly act on disease pathology. Proper combination of these three parts of treatment ultimately cures insomnia.

In today's fast life, patients prefer readymade, cost effective, easily palatable drugs with less side effects for their health problems. Hence, it is need of the hour to formulate such herbal formulation which can be a solution for insomnia and can be prescribed for long term with minimal adverse effects. Taking these points into consideration *Tagaradi* Capsule comprising of *Tagara*, *Jatamansi*, *Ashwagandha*, *Parasikayavani*, *Sankhpushpi*, *Brahmi*, *Sarpagandha* and *Pippalimoola* extracts in equal proportion has been formulated. All the ingredients have either *Nidrajanana* or *Madaka* or *Medya* actions which are the properties useful to treat Insomnia.

MATERIAL AND METHODS

Procurement of the drug

Extracts of the ingredients of *Tagaradi* capsule have been purchased separately from the Konark Herbals and Healthcare, Daman, India. Extracts were stored in separate airtight containers. Capsule content mixture was prepared by mixing the extracts of 8 ingredients in equal proportion in mass mixing machine till the homogenous mixture was obtained. The raw powder samples of the ingredients were also procured for the analysis from the same place. The ingredients and the part used are given in Table no.1.

Pharmacognostical Evaluation

As per API^[7] raw drugs were identified and authenticated by the Pharmacognosy Laboratory, IPGT & RA, GAU, Jamnagar. The identification was carried out based on the organoleptic features and powder microscopy of the individual drugs. Later, pharmacognostical evaluation of mixture of the all the ingredients of *Tagaradi* capsule was carried out. It was studied under the Carl Zeiss Trinocular microscope attached with camera, with stain and without stain. The microphotographs were also taken under the microscope.

Physicochemical evaluation

Raw mixture of all the ingredients was analysed using various standard physicochemical parameters such as Loss on drying^[8], Ash value, pH^[9], water soluble extract^[10], methanol soluble extract^[11] uniformity of the capsules, etc as per API at the pharmaceutical chemistry laboratory, IPGT&RA, Jamnagar.

HPTLC STUDY

High performance thin layer chromatography (HPTLC) is a sophisticated and automated form of TLC. H.P.T.L.C is quality assessment tool for the evaluation of botanical materials. It allows for the analysis of a broad number of compounds both efficiently and cost effectively. Additionally, numerous samples can be run in a single analysis thereby dramatically reducing analytical time. With HPTLC, the same analysis can be viewed using different wave-lengths of light thereby providing a more complete profile of the plant than is typically observed with more specific types of analyses.

The details of HPTLC done on alcoholic extract of *Tagaradi* capsule content are as follow:

Mobile phase

Toluene: Ethyl acetate: Acetic acid (7:2:1) v/v.

Chromatographic conditions

Application mode: CamagLinomat V
Development Chamber: Camag Twin trough Chamber.
Plates: Precoated Silica Gel GF254 Plates.
Chamber Saturation: 30 min.
Development Time: 30 min.
Scanner: Camag Scanner III.
Detection: Deuterium lamp, Tungsten Lamp
Data System: Win cats software.

Methanolic extract of finished product was spotted on pre-coated silica gel GF 60254 aluminium plate by means of Camag Linomat V sample applicator fitted with a 100 µL Hamilton syringe. Toluene: Ethyl acetate: Acetic acid (7:2:1) was used as the mobile phase. After development, densitometric scan was performed with a Camag TLC scanner III in reflectance absorbance mode at UV detection as 254 nm and 366 nm under the control of Win CATS Software (V 1.2.1. Camag).^[12]

OBSERVATION AND RESULTS

Pharmacognostical Evaluation

Organoleptic characters

Organoleptic parameters like Taste, Colour, odour and touch were scientifically studied and results are as per depicted in Table no. 2.

Microscopic characters

Diagnostic characters observed under the microscope were lignified elements, sleroids and brown content of *Tagara*; silica deposition and fragment of annular vessel of *Jatamansi*; pitted vessels and simple and compound starch grains of *Ashwagandha*; epicarp cells with oil

globule of *Parsika Yavani*; fragment of stroma of *Brahmi*; parenchyma cells, fragment of trichom and shifted fibres of *Shankhapushpi*; lignified pitted vessel and simple and compound starch grains of *Pippalimoola*; lignified fibres and parenchyma cells of *Sarpagandha*. Details of which are depicted in plate no. 1 & 2.

Preliminary Physico-chemical Parameters

Preliminary Physico Chemical Parameters, i.e. loss on drying, ash value, pH, water soluble extract, methanol soluble extract and uniformity of the capsules were properly studied and the results are depicted in the Table no. 3.

HPTLC RESULTS

HPTLC Results of *Tagaradi* capsule content showed 5 spots at 254nm and 4 spots at 366nm. Detailed results are depicted in the table no. 4. The graphs and 3D spectra charts of HPTLC study are displayed in plate no.3.

DISCUSSION

Pharmacognostical evaluation showed that the *Tagaradi* capsule content contains all the ingredients which were observed in the microscopical characters, it shows the purity and quality of the product. Phytochemical analysis showed that material gains moisture during storage,

which eventually may affect the quality of product. Here, average value of Loss on drying (LOD) was found within normal limits (7.40% w/w), which indicates prompt care taken during packaging and storage of product. The obtained values of these tests were found within normal limits in *Tagaradi* capsule content, which indicate good quality of product. The pH value of the compound was found to be 6.5 and the total ash value was 3.28%. The water soluble extract was found to be 15.84% and methanol soluble extract was found 3.28%. HPTLC results showed that the 5 spots at 254 nm and 4 spots at 366 nm.

CONCLUSION

Pharmacognostical and phyto-chemical evaluation of *Tagaradi* capsule content illustrated the specific characters of ingredients which were used in the preparation. Physico-chemical profile is an essential parameter for quality assurance; in present work the obtained results were found within prescribed limits. For the first time, pharmaceutical and analytical profile of *Tagaradi* capsule content was established. On the basis of observations and experimental results, this study may be used as reference standard in the further quality control researches.

Table 1: Ingredients of *Tagaradi* capsule.

Drug Name	Botanical Name	Ratio of Extract	Part Used
<i>Tagara</i>	<i>Valeriana Wallichii</i> DC.	1 part	<i>Moola</i>
<i>Jatamansi</i>	<i>Nardostachys jatamansi</i>	1 part	<i>Kanda</i>
<i>Ashwagandha</i>	<i>Withania somnifera</i> Linn.	1 part	<i>Moola</i>
<i>Parsika yavani</i>	<i>Hyoscyamus niger</i> Linn.	1 part	<i>Beeja</i>
<i>Shankhapushpi</i>	<i>Convolvulus pluricaulis</i> Chois.	1 part	<i>Panchanga</i>
<i>Brahmi</i>	<i>Bacopa Monnieri</i> Linn.	1 part	<i>Panchanga</i>
<i>Sarpagandha</i>	<i>Rouwolfia serpentina</i> Benth ex. Kurz.	1 part	<i>Moola</i>
<i>Pippalimoola</i>	<i>Piper longum</i> Linn.	1 part	<i>Moola</i>

Table No. 2: Organoleptic Characteristics of *Tagaradi* capsule content.

Sr. No.	Characteristics	Results
1	Colour	Muddy grey
2	Odour	Strong
3	Taste	Astringent bitter
4	Touch	Fine coarse

Table No. 3: Preliminary Physico-chemical Parameters of *Tagaradi* capsule content.

Sr. No.	Parameters	Value
1	Loss on Drying	7.40 % w/w
2	Ash Value	3.28 % w/w
3	Water Soluble Extract	15.84 % w/w
4	Methanol Soluble Extract	3.28 % w/w
5	pH	6.5
6	Uniformity of capsules	
	Highest weight	687 mg
	Lowest weight	502 mg
	Average weight	597 mg

Table No. 4: HPTLC Results of *Tagaradi* capsule

Sample	Detection Condition	No. of spots	Rf value
<i>Tagaradi</i> capsule content	254 nm	5	0.1, 0.12, 0.32, 0.35, 0.71
	366 nm	4	0.1, 0.31, 0.36, 0.92

Plate: 1



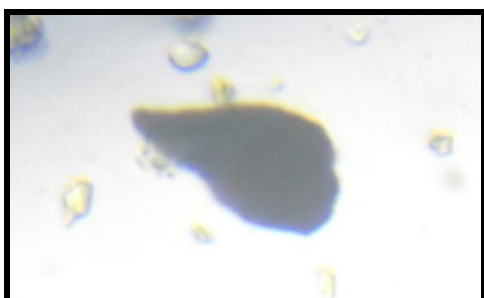
Lignified element of *Tagara*



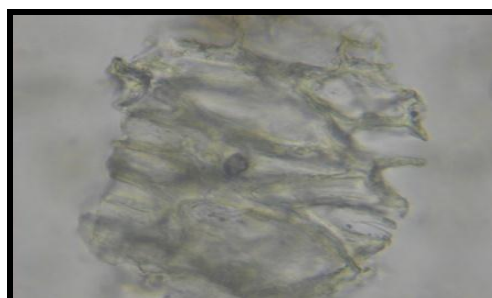
Scleroids of *Tagara*



Starch grains of *Ashwagandha*



Brown content of *Tagara*



Cork cell of *Ashwagandha*



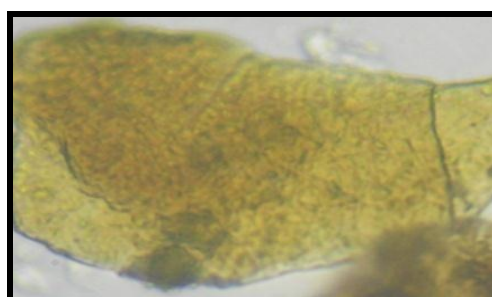
Annular vessel of *Jatamansi*



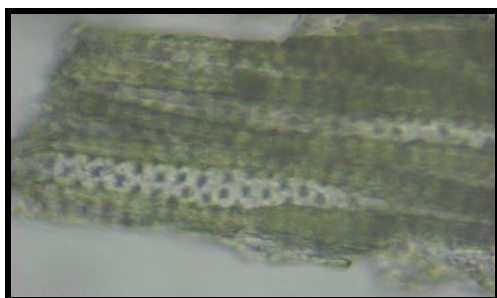
Twin crystal of *Ashwagandha*



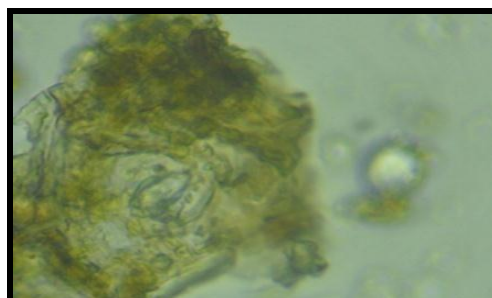
Silica deposition of *Jatamansi*



Epicarp cell of *Parsika yavani*



Pitted vessels of *Ashwagandha*



Stroma of *Brahmi*

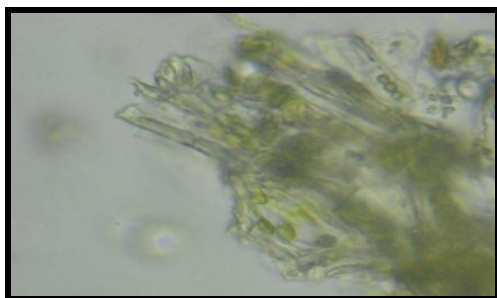


Trichom fragment of *Shankhapushpi*



Lignified stone cells of *PM*

Plate: 2



Parenchyma cells of *SP*



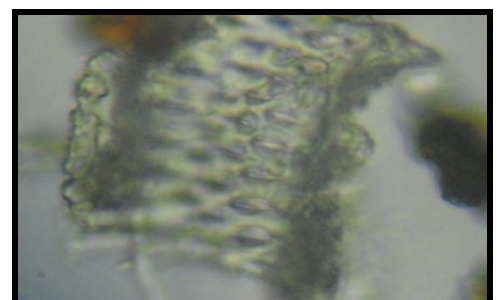
Scleroids of *Pippalimoola*



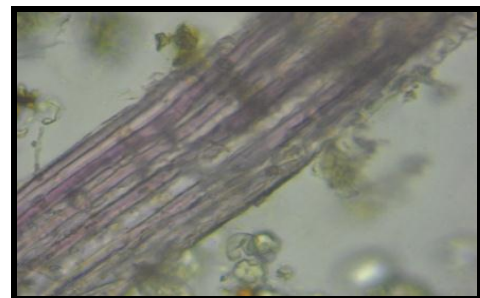
Shifted fibres of *SP*



Starch grains of *Pippalimoola*



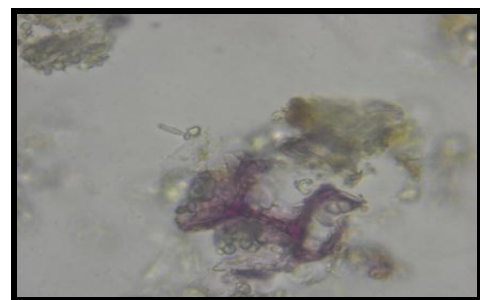
Pitted vessel of *Pippalimoola*



Lignified fibres of *SG*



Lignified pitted vessels of *PM*



Lignified Parenchyma cells of *SG*

Plate 3

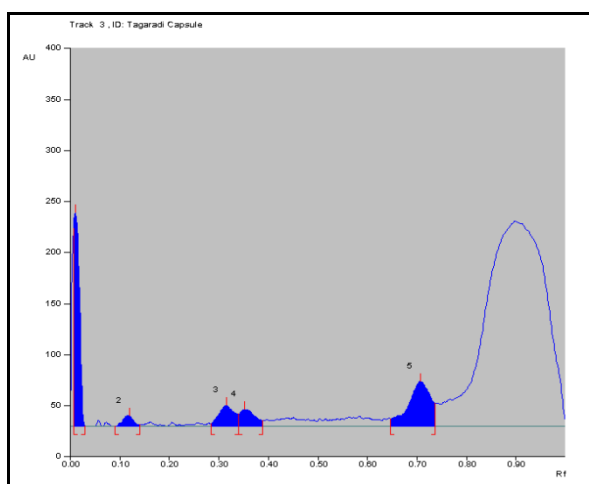


Fig. 1

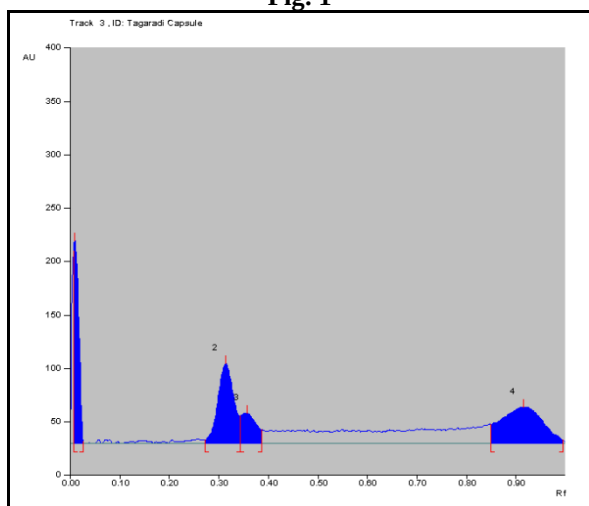
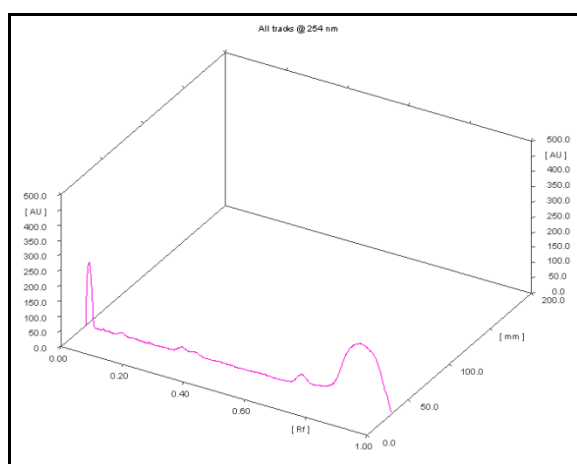
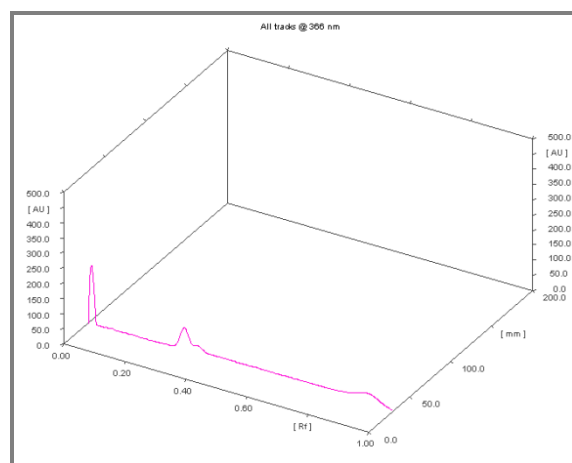


Fig. 2

3. Dimensional Spectra



Spectra at 254 nm



Spectra at 366 nm

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