ISSN 0976 – 3333

I haAvailable Online at www.ijpba.info

International Journal of Pharmaceutical & Biological Archives 2012; 3(6):1410-1414

ORIGINAL RESEARCH ARTICLE

Pharmacognostical and Phyto-Chemical Standardization of *Tila kwatha*: A Polyherbal Formulation

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Received 22 Sep 2012; Revised 30 Nov 2012; Accepted 03 Dec 2012

ABSTRACT

Tila Kwatha is indicated for the management of Nastapushpata (Secondary amenorrhoea/Oligomenorrhoea), Raktagulma (Amenorrhoea) and other menstrual disorders with scanty menstruation. The present work was carried out to standardize the finished product *Tila Kwatha* to confirm its identity, quality and purity. There has been an increase in demand for the Phyto-pharmaceutical products of *Ayurveda* so a new pharmaceutical preparation in the form of *Tila Kwatha* was tried to standardize which is economical in terms of time and machinery usage. Pharmacognostical and phyto-chemical observations revealed the specific characters of all active constituents used in the preparation. The presence of aloerone grains, oil globules, starch with prismatic crystals, cork cells, annular vessels and prismatic crystal of calcium oxalate were the characteristic features observed in the microscopy of drug combination. Phyto-chemical analysis showed that Solid Content 11.24% w/w, Water soluble extract 36.38 % w/w, Specific Gravity 1.010. On the basis of observations and experimental results, the study may be used as standard protocol in the further quality control researches. Further studies may be carried out on *Tila Kwatha.*

Keywords: *Tila Kwatha*, PCOS, Pharmacognosy, Phyto-chemistry.

INTRODUCTION

Traditional Medicines [1] are in great demand in the developed as well as developing countries for primary healthcare because of their wide biological activities, higher safety margins and lesser costs [2]. It has been reported that there has been an alarming increase in number of diseases and disorders caused by synthetic drugs prompting a switch over to traditional herbal medicine [3]. The WHO assembly in number of resolutions has emphasized the need to ensure quality control of medicinal plant products by using modern techniques and applying suitable standards [4]. Selection of scientific and systematic approach for the biological evaluation of herbal formulations based on their use in the traditional systems of medicine forms the basis for an ideal approach in the development of new drugs from plants [5]. But the most important challenges faced by these formulations arise because of their lack of complete standardization. Detailed research on the chemistry and pharmacology of products of plant origin are much essential and this may eventually lead to the discovery of medicine that can be used in the treatment of several diseases. *Tila Kwatha* is a poly herbal formulation [6]. The poly herbal formulations described in Ayurveda have been the basis of treatment of various human diseases. Vata–Kaphaja Artava Dushti compared to Polycystic Ovarian Syndrome(PCOS) [7] is characterized by Oligomenorrhoea, Chronic Anovulation and Multiple cystic lesions in either or both the ovaries as evidenced by ultrasonography, with or without Obesity, Hirsutism, Acne, Acanthosis Nigricans, ultimately leading to Infertility in adult female population. *Tila Kwatha* is indicated for the management of Nastapushpata (Secondary amenorrhoea/Oligomenorrhoea), Raktagulma (Amenorrhoea) and other menstrual disorders with scanty menstruation. In the light of above background, the present study aimed to standardize the finished product of *Tila Kwatha*

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using pharmacognostical and phytochemical parameters. The authenticity, quality and purity of herbal drugs are established by references given in pharmacopoeia [8].

MATERIALS AND METHODS

Collection, Identification and authentication of raw drugs

The raw drugs for the study were procured form the Pharmacy of Gujarat Ayurved University, Jamnagar. The ingredients were identified and authenticated in the Pharmacognosy Laboratory, Institute for Post Graduate Teaching & Research in Ayurveda, Gujarat Ayurved University, Jamnagar. The ingredients and parts used and proportion are listed in (**Table 1**).

The drugs enlisted from 1 to 5 (Table **1**) were washed, dried and made into fine powder and then sieved in mesh no. 85 separately. The ingredients 2 to 5 are mixed well in quantity as per formulation in mass mixing machine till a homogenous mixture was obtained. The *tila* was boiled with four times water and reduced to half to obtain the infusion and powders of 2 to 5 are mixed with it at the end point of reduction and filtered through a muslin cloth [9].And later it was added with additive drug of *guda* (*Saccharum officinarum* Linn.*)* to activate the drug action. After cooling the prepared material for 15 minutes, it is filtered and stored in plastic containers.

Pharmacognostical evaluation

The ingredients which are used in the *Tila kwatha* preparation was powdered properly, mixed and studied under the Carl zeiss binocular microscope with stain (Phloroglucine and concentrated HCl) and without stain to study the characters of the product. The microphotographs were taken attached with the microscope [10].

Phyto-chemical assay of drug

Tila Kwatha was analyzed by using qualitative and quantitative parameters at Pharmaceutical Chemistry Laboratory, Institute for Post Graduate Teaching & Research in Ayurveda, Gujarat Ayurved University, Jamnagar. All Physico-chemical parameters such as solid content, water soluble extract, methanol soluble extract, pH, Specific gravity were determined (**Table 3**).

High performance thin layer chromatography (HPTLC) [11]

Methanol extract of *Tila Kwatha* was used for High performance thin layer chromatography (HPTLC) study. Methanol extract of *Tila Kwatha* was spotted on pre-coated silica gel GL60254 aluminum plate as 10mm bands by means of a Camag Linomate V sample applicator fitted with a 100 µL Hamilton syringe. Toluene: Ethyl acetate: Acetic acid (7:2:1) was used for *Tila Kwatha* as a mobile phase. The development time was 30 minutes. After development, Densitometry 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 (V1.2.1. Camag).12, 13 Then the plate was sprayed with Vanillin sulphuric acid followed by heating and then visualized in day light (**Table 4** and **Fig 2**).

CONCLUSION

Pharmacognostical and phyto-chemical evaluation of *Tila Kwatha* illustrated the specific characters of all ingredients which were used in the preparation. The weak acidic pH of the preparation is the cause for inducing *Agneyatwa*, helping in induction and regularization menstruation and ovulation. More than 30 % w/w of water soluble active ingredients contents in the preparation accounts for the selection of combination in liquid form in the classics. For the first time, this pharmaceutical preparation *Tila Kwatha* which was economical in terms of time and machinery usage was tried for the evaluation. On the basis of observations and experimental results, this study may be used as reference standard in the further quality control researches. Further studies may be carried out on *Tila Kwatha* based on identification and separation of active ingredients with the help of various Biomarkers.

Table 1: Ingredients, Part used and Proportion used in the *Tila Kwatha*

S.No	Name	Bot. Name	Part	Proportion
1	Tila	*Sesamum indicum* Linn.	Seeds	50 gms
2	Pippali	*Piper longum* Linn.	Dry Fruit	3 gms
3	Maricha	*Piper nigrum* Linn.	Dry Fruit	3 gms
4	Sunthi	*Zingiber officinale* Roxb.	Rhizome	3 gms
5	Bharngi	*Clerodendrum serratum* Linn	Bark	3 gms
6	Guda	*Saccharum officinarum* Linn	Swarasa	5-6 gms

Table 2: Organoleptic properties of *Tila Kwatha*

Rupa (Colour)	Greenish Black
Rasa (Taste)	Sweetish, Astringent
Gandha (Odour)	Characteristic
Sparsha (Consistency on Touch)	Liquid

Table 3: Physico-chemical parameters of *Tila Kwatha*

S. No	Test	Sample (*Tila Kwatha*)
1	Solid Content	11.24% w/w
2	Water soluble extract	36.38 % w/w
3	Methanol soluble extract	4.80 % w/w
4	pH	5.5
5	Specific Gravity	1.010

Table 4: HPTLC of *Tila Kwatha* (Methanol Extract)

S. No	Visualizing condition	No of spots	Rf value
1	**254nm**	**8**	0.02, 0.15, 0.38, 0.48, 0.70, 0.77, 0.86, 0.90
2	**366nm**	**10**	0.02, 0.16, 0.24, 0.38, 0.48, 0.60, 0.68, 0.79, 0.88, 0.90
3	**After spray**	**8**	0.06, 0.37, 0.45, 0.54, 0.62, 0.73, 0.79, 0.86.

Fig 1 :(1-17) Microphotographs and Densitometry of finished products of *Tila Kwatha*

Plate 1: Aloerone Grains of Tila

Plate 2: Oil globule of Tila

Plate 3: Oil content of Pippali

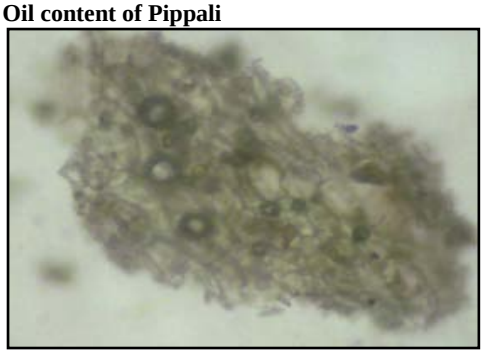


Plate 4: Starch grains of Pippali

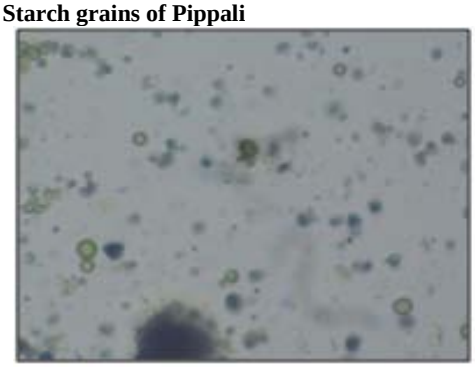


Plate 5: Starch + crystals of Marica

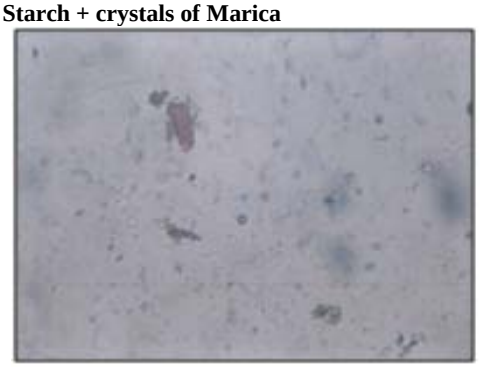


Plate 6: Fibres of Marica

Plate 7: Stone cell of Marica

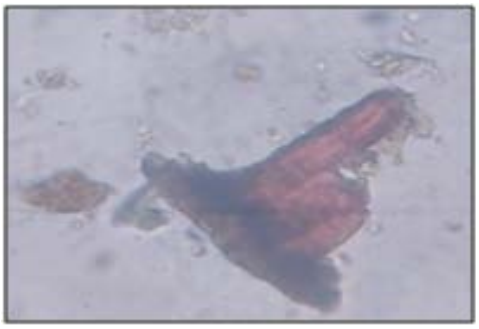


Plate 8: Cork cells of Sunthi

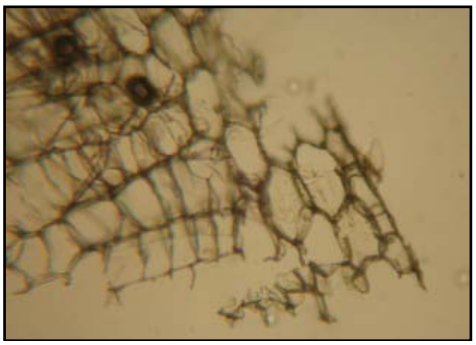


Plate 9: Annular vessels of Sunthi

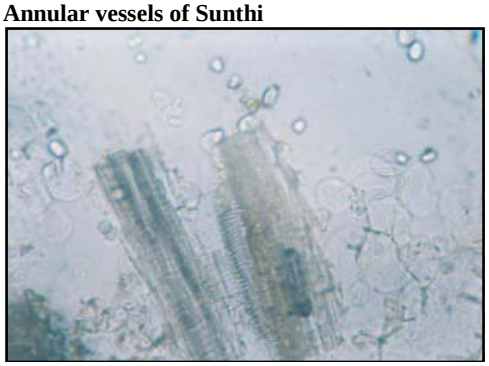


Plate 10: Oleoresin of Sunthi

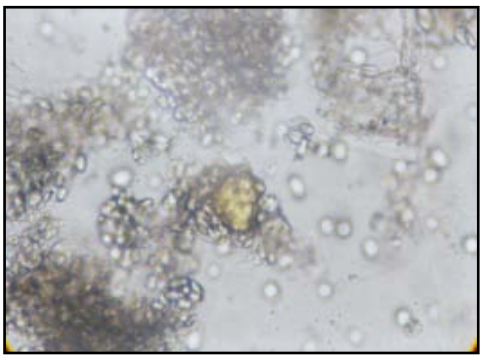


Plate 11: Group of Fibres of Sunthi

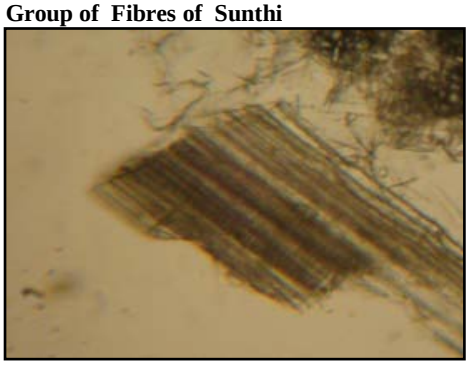


Plate 12: Cork cells of Bharngi

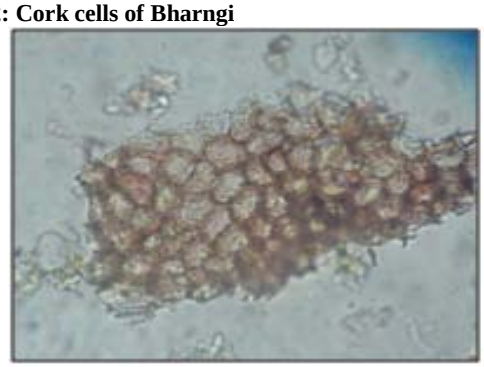


Plate 13: Fibres of Bharngi

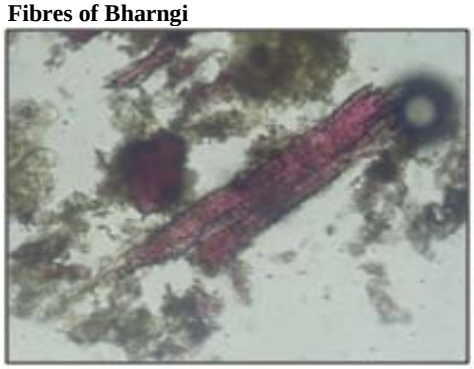


Plate 14: Stone cells of Bharngi

Plate 15: Crystals of Bharngi

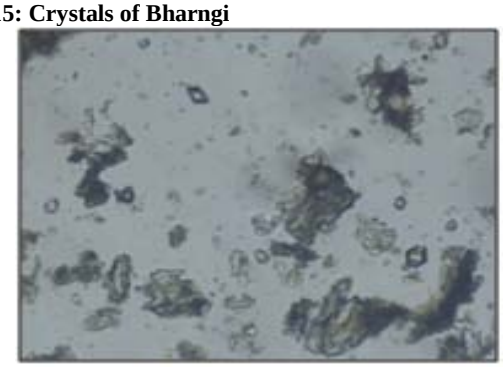


Plate 16: Densitometry at 254nm

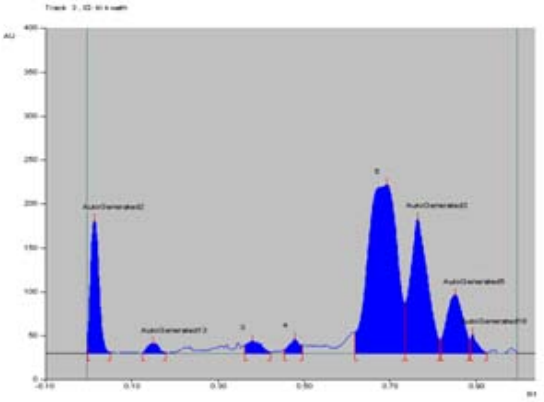


Plate 17: Densitometry at 366nm

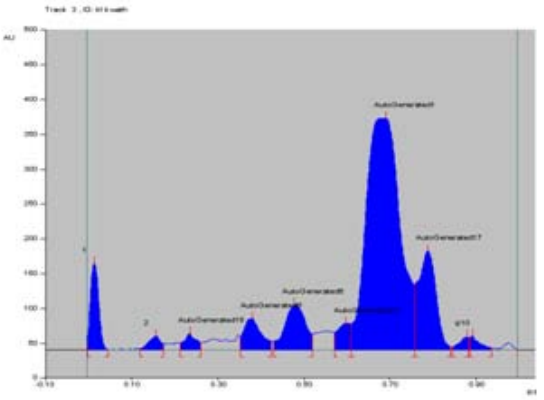
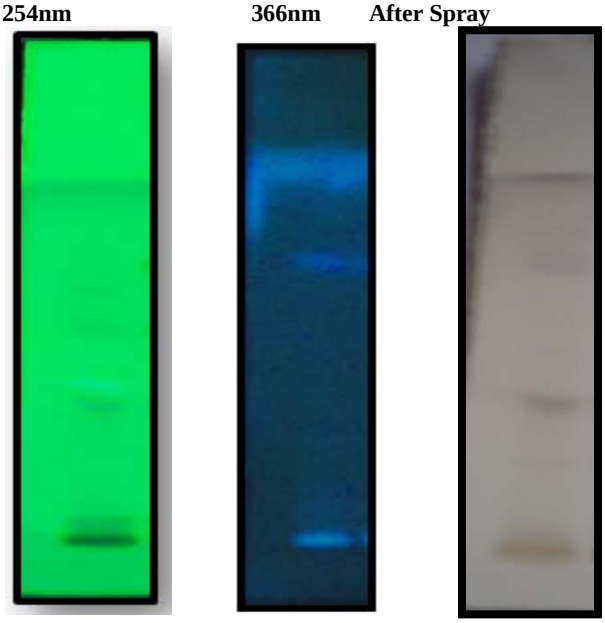


Fig 2: HPTLC of *Tila Kwatha* (Methanol Extract)

254nm **366nm** **After Spray**



ACKNOWLEDGEMENTS

The authors wish to express their sincere thanks to Professor M S Baghel, Director, and Professor Prajapati P K, I/C Director, Pharmacy & Head of Department, Department of Rasashastra and Bhaisajya Kalpana, IPGT & RA, Gujarat Ayurved University, Jamnagar for guidance and support.

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