

COMPARATIVE HPTLC PROFILE OF CULTIVATED, WILD AND MARKETED SAMPLE OF GAMBHARI MOOLA (*GMELINA ARBOREA*, LINN.ROOT)

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ABSTRACT

Dashmoola is the main ingredient in most of the formulations of the *Ayurveda*, *Gambhari*, *Gmelinaarborea*, *Linn.* is a medicinal plant explained in *Ayurvedic* literature and in modern science. The plant is known for curing various disorders because of the presence of alkaloids, carbohydrates, flavonoids, glycosides, tannins, phenols, resins, saponins, sterols, tannins and terpenes. Useful parts (*Prayogya-anga*) of *Gambhari* (*Gmelina arborea*, *Linn*) are *Kanda*, *Patra*, *Pushpa*, *Phala*, *Beeja*, *Twaka* and *Moola*. According to *Ayurvedic* classics uses of *Gambhari* are- *Pachana*, *Dipana*, *Medhya*, *Shukrala*, *Raktapittahara*, *Vrushya*, *Rasayana*, *Keshya*, *Hrudya*, *Dahaprashamana* etc. Cultivation of medicinal plants is the appropriate solution towards the scarcity of endangered species. Cultivation may be carried out by direct sowing the seeds or by transplanting vegetative propagation. According to modern researches *Gambhari* possess properties like- Diuretic, anti-inflammatory, tonic, aphrodisiac, hepato-protective, astringent, and antimicrobial, as well as in the treatment of anemia, leprosy, ulcers, vaginal discharge, alopecia, tumors etc.

Keywords: *Dashmoola*, *Prayogyaanga*, *Dahaprashamana*, Cultivation.

INTRODUCTION

In present era, Pharmacopoeias of many countries of the world included a large number of medicinal preparations of plant origin. It is necessary to examine the plants as a potential source in development of many new formulae. There is a rise in demand for medicine, as millions of people are suffering from various types of diseases worldwide. Cultivation of medicinal plants is another better alternative to fulfill the demand. There are several pharmaceutical formulations available commercially for the treat-

ments of disorders but they are costly, not effective and show numerous toxic effects.

In India, various indigenous plants are used to cure disease, as nature has provided a perfect storehouse of remedies to cure all elements of humanity. It found throughout India, from north-west Himalaya to Chittagong and throughout Deccan peninsula. Today about 300 species of medicinal and aromatic plants are used worldwide in the pharmaceutical, food, cosmetics and fragrance industries. *Ayurveda*

is an ancient system of medicine that uses approximately 1587 species of plants. Cultivation is another option to overcome the need of endangered species, which enhances the effectiveness in *Chikitsa*. By means of cultivation there are more opportunities to the farmers to cultivate and supply the *Dravyas* which are the need of today's era. Traditional cultivation techniques are pollution free and having low cost. Increasing mob towards *Ayurveda* leads more

productivity in *Ayurvedic* formulations; for this there is best alternative is the "cultivation". The basics of thin-layered chromatography (TLC) and high performance thin-layered chromatography (HPTLC) have been reviewed previously, but a comprehensive compilation of its application is lacking. This article covers all the aspects related to HPTLC and would be prove fruitful for research and development in academia and industry.

Table 1: Taxonomical classification of *Gambhari (Gmelina arborea, Linn.)*

Kingdom	Plantae
Sub kingdom	Viridiplantae
Infra kingdom	Streotophyta
Super division	Embryophyta
Division	Tracheophyta
Sub division	Spermatophytina
Class	Magnoliopsida
Super order	Asteranae
Order	Lamiales
Family	Lamiaceae
Genus	<i>Gmelina L.</i>
Species	<i>Gmelina arborea, Roxb.</i>

MATERIALS & METHODS-

Sample/ Part used- *Moola* (root) of *Gambhari* were used in the form of cultivated, wild and marketed.

Collection of sample-

- 1) Cultivated Sample- *Gambhari (Gmelina arborea, Linn.)* was cultivated under self supervision along with the guidelines given by WHO for cultivation of medicinal plants. Strict GACP (Good Agricultural and Collection practices) norms were followed during the complete process. Sample is self cultivated at *Khairi Farm, Nagpur*.
- 2) Market sample- *Gambhari moola (Gmelina arborea, Linn. root)* was collected from well known registered *Ayurvedic* drug vendor.
- 3) Wild sample- *Gambhari moola (Gmelina arborea, Linn. root)* was collected from Forest area around 50km periphery. Complete intact roots were collected without doing any harm to the roots.

Authentication:

All the samples of *Gambhari moola (Gmelina arborea, Linn. root)* were authenticated from taxonomist Department of Botany of well known research institute. The authenticity of these samples were confirmed by comparing their characters with standard herbarium sample available at the Botany department with the help of subject experts.

Place of work-

1. At central research lab and department of *Dravyaguna* at *Shri Ayurved Mahavidyalaya, Nagpur*.
2. Cultivation plot- *Khairi pharm, Nagpur*.
3. *Unijuiles life sciences limited, Kalmeshwar, Nagpur*.

HPTLC is recent technique for evaluation of chemical constituents in that specimen. Accurate and effective techniques are useful to increase standardization of herbal medicines.

High Performance Thin Layer Chromatography:

- High performance thin layer chromatography (HPTLC) is an invaluable 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 wavelengths of light thereby providing a more complete profile of the plant than is typically observed with more specific types of analyses.

STEPS INVOLVED IN HPTLC:

- 1) Selection of chromatographic layer
- 2) Sample and standard preparation
- 3) Layer pre-washing
- 4) Layer pre-conditioning
- 5) Application of sample and standard
- 6) Chromatographic development
- 7) Detection of spots
- 8) Scanning and documentation

CHROMATOGRAPHIC CONDITION:

- Stationary phase - HPTLC precoated, silica gel 60, F 254 (Merck)
- Thickness - 0.2 mm
- Mobile phase - Chloroform: Methanol 8:2
- Mode of application - Band
- Sample Applicator - Linomat 5 (Semiautomatic Applicator)
- Band width - 68 mm
- Solvent front pos. - 90 mm
- Solvent volume - 20 ml
- Drying device - Camag TLC Plate Heater III, time period 5 min.
- Slit dimension - 6.0 x 0.10 mm
- Scanning speed - 10 mm/s
- Data resolution - 100 μ m/step
- Scanning wavelength - 300 nm

- Visualization Aid - Through UV-Cabinet under 254 nm & 366 nm and under day light also.
- Post Chromatographic - Methanolic Vanillin Sulphuric Acid Derivatization
- Measurement mode - UV absorbance/reflectance
- Separation technique - Ascending
- Scanning mode - Single level
- Sample applied - 2 μ l, 4 μ l

DISCUSSION

Gambhari moola (*Gmelina arborea*, Linn. root) is a very commonly and popularly used drug in many formulations from the time of *Vedas* to till date. As per classical literature available in *Ayurveda*, it is evident that drug *Gambhari* is having much significant and importance being extensively used for its various benefits and it has been screened for many pharmacological activities. Overlooking at the frequency of references of *Gambhari* in various *Samhita*, it is seen that it is mostly indicated as *Bhedana*, *Vatahara*, *Sara*, *Shodhana*, *Grahi*, *Deepana*, *Medhya*, *Balyadravya*. The use of *Gambhari* root in many formulations and treatment of the diseases while in some of the formulations, *Kanda*, *Phala*, *Beeja*, *Pushpa* and *Patra* of *Gambhari* is used.

High performance thin layer chromatography study was done under short UV 254nm and long UV 366nm. It has been concluded that no. of peaks are maximum in 12th month cultivated sample, as compared to that of Wild and Market sample. Both the Cultivated sample and Wild sample shows maximum number of peaks as compared to that of Market sample. Hence it is concluded that these two samples have better quality than marketed one. Therefore to maintain the quality of the product, it is very much essential to use standardized crude drug.

CONCLUSION

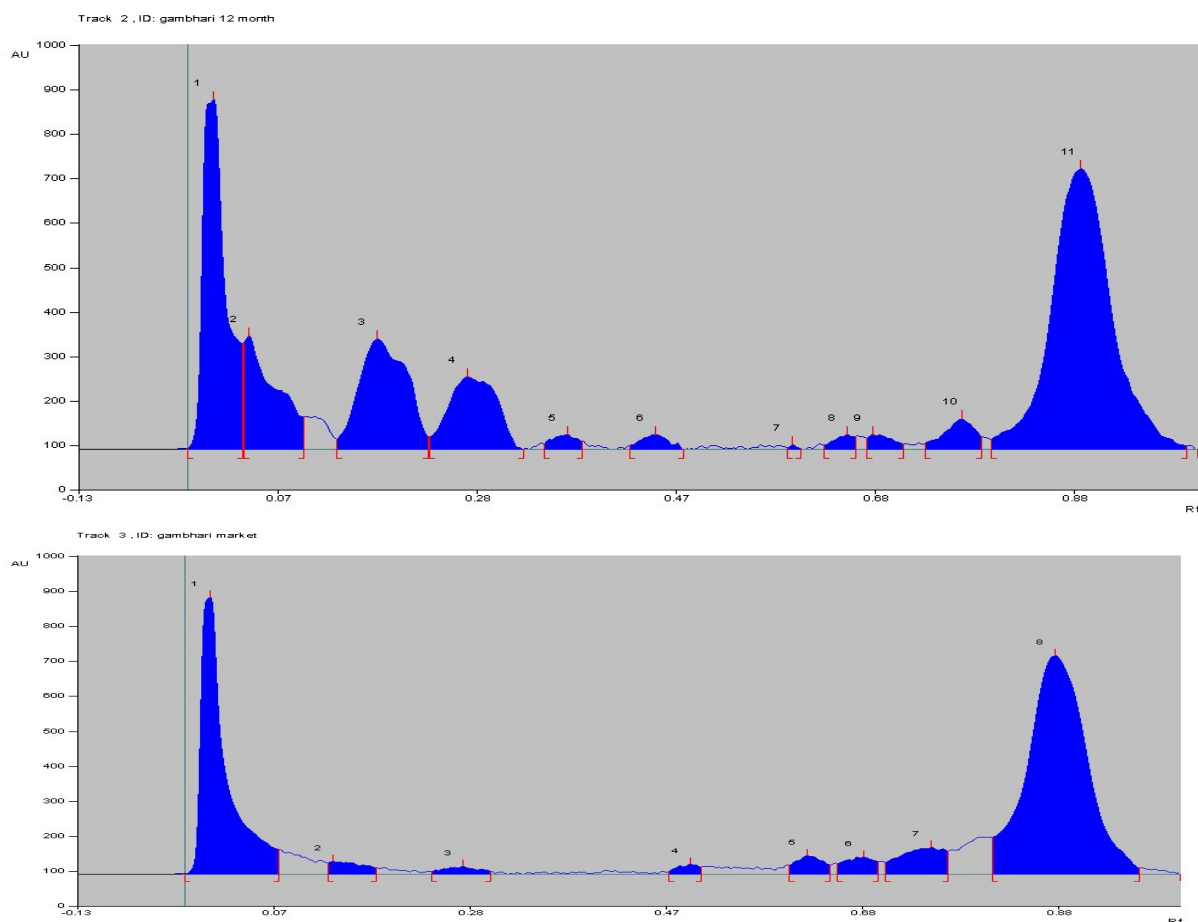
- The HPTLC study revealed some common Rf values and spots and on there is considerable similarity found in wild (W) and 12 months cultivated (C) samples.

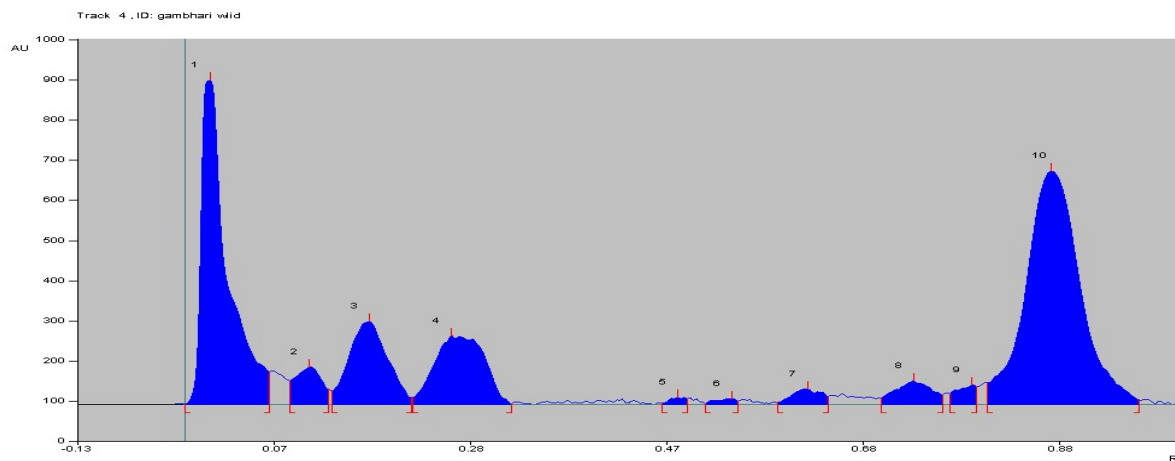
- The HPTLC study revealed some common Rf values and spots and on there is considerable similarity found in wild (W) and cultivated (C) samples.
- Cultivated sample shows considerable similarities with that of wild sample.
- From above study we conclude that, in *Ayurvedic* formulations we should use cultivated sample.

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Densiograms of *Gambhari* samples-





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Conflict Of Interest: None Declared

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