

Impact of *Sanskara* on *Guduchi* and *Guduchi Ghanavati*

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Abstract

Tinosporacordifolia (willd) Miers. belongs to the family-Menispermaceae commonly known as *Guduchi*, *Chakralakshanika* or *Amruta* is important drug of Indian medicine. It is perennial climber found throughout tropical India, used in form of *Swarasa*, decoction, *Vati*, *Sattva* etc. The *Guduchi* is useful in fever, diabetes, dyspepsia, skin disease, jaundice, heart disease, urinary problem, helmenthiasis and gout in different form like powder, *ghanavati* etc. Potency and action of single drug are changed in different conditions and states. In the present study *Guduchi* is evaluated pharmacognostically in three forms to study the action of *Sanskara* i.e., fresh, dried powder and *Ghanavati*. Results show that the cellular constituents are normal in fresh condition but after *Sanskara* disturbed walls of cork cells, wide lumened fibres, disturbed walls of collenchymas cells etc. are observed.

Keywords

Guduchi, *Ghanavati*, Pharmacognosy, *Sanskara*.



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INTRODUCTION

Tinosporacordifolia(willd) Miers. (family- Menispermaceae) commonly known as *Guduchi* or *Amruta* is important drug of Indian medicine. It is a perennial climber found throughout tropical India, used in form of *Swarasa*, decoction, *Vati*, *Sattva* etc¹. The drug is useful in fever, diabetes, dyspepsia, skin disease, jaundice, heart disease, urinary problem, helmenthiasis and gout. It has been indicated in treatment of leprosy, eye disease, respiratory disorders, chronic fever (*Vishamjvara*) and also used as *Rasayana*². Meaning of word *Guduchi* in Sanskrit is ‘one which protects the body against diseases’. It is one of the most rejuvenating herb that promotes the longevity so called as *Vayastha*. *Amruta* means it is useful in strengthening the immunity of body so body can stay away from death. *Guduchi*, growing up on *Neem* tree has the best rejuvenating and medicinal property³.

Ayurvedic Pharmacology⁴

Rasa (taste): *Katu, Tikta, Kashaya*

Guna (quality): *laghu*

Virya (action): *Ushna*

Vipaka : *Madhura*

Doshaghnata: *VPKnashak*

Karma: *Rasayani, Sangrahi, Balya, Agnidipani, Pathya*

There is predominance of bitter taste⁵ (*Vayu* and *AkashMahabhoota*), so *Dhatvagni dipana, Pachna, Kledadiupashoshan* are done. Its *madhura Vipaka* nourishes all *Dhatus* well⁶.

Pandu is the disease of *Rasavaha Srotas*⁷ and also described as *Raktavahasrotoviddha lakshana*⁸. Thus it is related with both important *Dhatu Rasa* and *Rakta*. Clinical presentation of *Pandu* can be correlated with anaemia of modern medical science. Anaemia is a state in which the haemoglobin concentration falls below the accepted normal range depending on age and sex⁹. Considering its importance of prevalence; anaemia is enlisted as one of the national programme.

The clinical features of *Pandu* develop from the depletion of *Rasa Dhatu* which in turn becomes ineffective in the production of *Rakta Dhatu*. The decreased level of circulating *Rasa* and *Rakta* which have the prime functions of nourishment and providing support to the vital functions give rise to the symptoms like fatigue, body ache, palpitation, peri-orbital oedema, anorexia,



dyspepsia, fever, dyspnoea and fainting. *Panduta* or Pallor of skin is first observed on the most superficial portion of body but it can also be seen in other parts of body like eyes, palate, tongue, nose, lips, palms, soles, nails, feces and urine¹⁰.

MATERIALS AND METHODS

Collection of Raw drugs

Raw drug was collected from the pharmacy department, I.P.G.T. & R.A., Gujarat Ayurveda University, Jamnagar. The botanical name & part used are given in table 1.

Table 1 Botanical Name & Part Used

<i>Sanskrit</i> name	Botanical name	Part used
<i>Guduchi</i>	<i>Tinisporacordifolia</i> Willd.	Stem

Preparation of *Guduchighanavati*¹¹

Twenty five kg. fresh *Guduchi* stem was taken and crushed. Decoction was prepared by following classical method (Sharangdhara Samhita, madhyamakhand, ch 2) and then filtered 2 to 3 times and further heated until it becomes a concentrated *Ghana* then made tablet each of 250 mg.

Pharmacognostical evaluation

The raw drug was identified and authenticated by the Pharmacognosy laboratory, I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar. The identification was carried out based on morphological features, organoleptic characters and powder microscopy of the drug.

The initial purpose of study was to confirm the authenticity of the drug. First studied the section of fresh *Guduchi* stem and the dried powder, then the powdered tablets of drug was subjected to organoleptic and microscopic evaluation separately. The tablets were dissolved in the distilled water, filtered, air dried and studied under the Carl Zeiss Trinocular microscope attached with camera with and without staining. Microphotographs were also taken under the microscope.¹²⁻¹³

Physicochemical parameters

The drug was analyzed by using qualitative and quantitative parameters at Pharmaceutical Chemistry Laboratory of I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar.

HPTLC

Extracts of drugs were spotted on pre-coated silica gel GF 60254 aluminium plates as 5mm bands, 5mm apart and 1cm 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 the mobile phase. After development, Densitometric scanning was performed with a Camag T.L.C. scanner III in reflectance absorbance mode at 254 nm and 366 nm under control of win CATS software (V 1.2.1 Camag). The slit dimensions were 6 mm x 0.45 mm and the scanning speed was 20 mm s⁻¹.

OBSERVATIONS AND RESULTS

Pharmacognostical Evaluation

Organoleptic characters-

The colour, odour, taste etc. of the powders were recorded and placed in Table 2.

Table 2 Organoleptic Features of Drugs

Features	Fresh <i>Guduchi</i>	Dried powder <i>Guduchi</i>	<i>Guduchighanavati</i>
Color	Light green	Light brown	Brownish
Odour	Characteristic	Characteristic	Characteristic
Taste	Bitter	Bitter	Bitter
Touch	Hard fibrous	Fine	Hard
Sound	-----	Slight crispy	Slight crispy

Microscopic Evaluation:

Transverse section of *Guduchi* Stem:

T.S. of fresh *Guduchi* stem shows that outer cork made up off 5-6 layered tangentially elongated cells with brown contents. Cortex differentiated into outer 4-5 layered collenchymatous hypodermis and inner 7-8 layered parenchymatous cells, loaded by simple starch grains. Cortex followed by 8-10 layered lignified Sclerenchymatous fibres forming arch like structure. Vascular bundle open and collateral, Phloem situated above the xylem, made off phloem fibres and sieve elements. Xylem wedge shaped, made up off xylem parenchyma and its fibres. Xylem bundles are separated by multiseriate medullary rays. This gives spokes of wheel appearance largely filled with starch grains. Central pith made off parenchyma cells, loaded with simple starch grains (Plate 1. 1-8.)

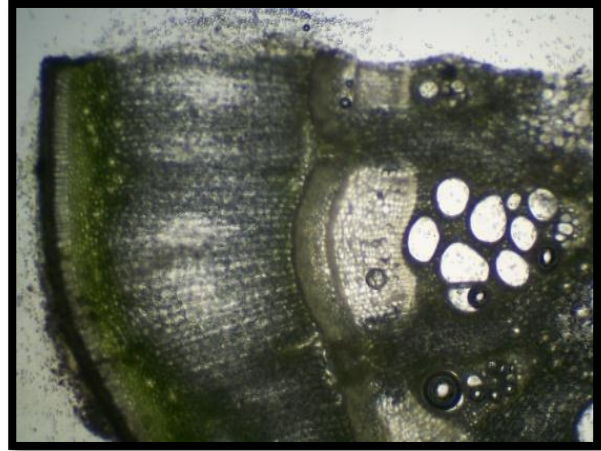
Guduchi stem Dried Powder Microscopy

Diagnostic powder characters of fresh powder showed that Cork cells in surface view, simple starch grains, fragments of collenchymas cells, fibres, bordered pitted vessels are observed normal condition. (Plate 2. 1-7.)

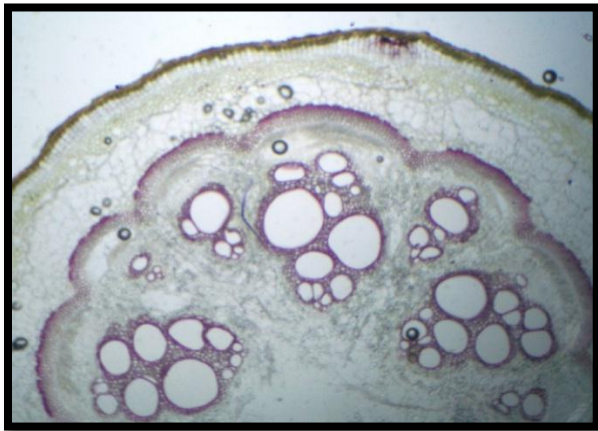
Plate 1: Fresh T.S. of Guduchi Stem



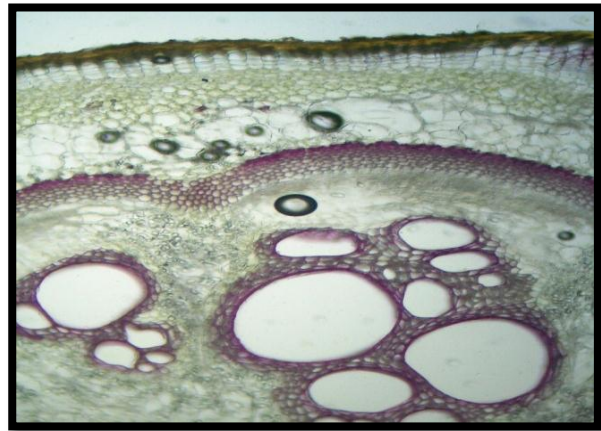
1. Fresh guchi stem



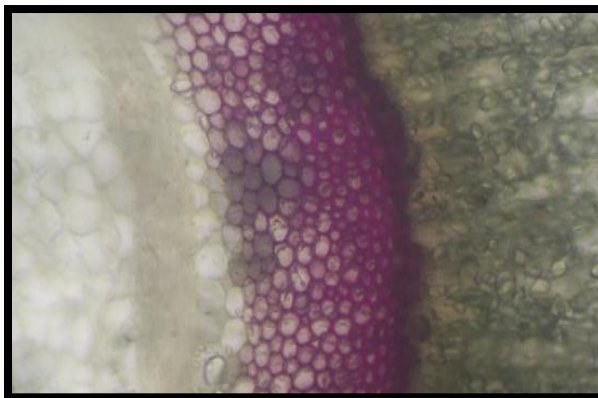
2. Diagrammatic section



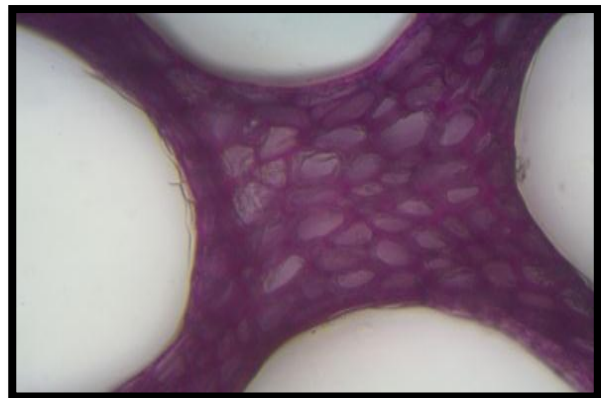
2. Stained section with central pith



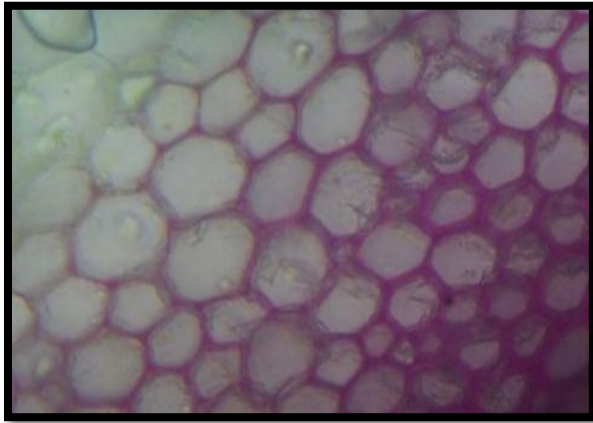
4. Cork, cortex with pericycle fibres



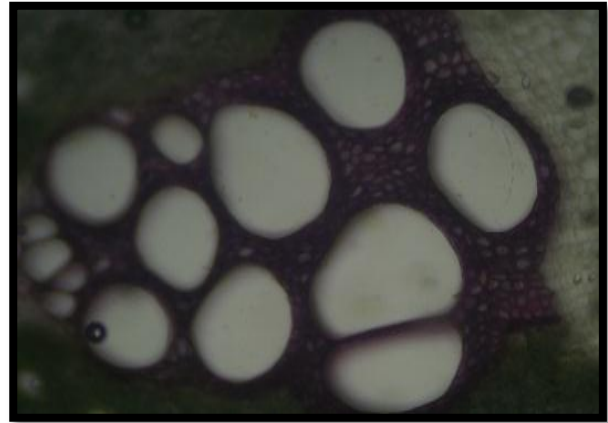
5. Pericycle fibres with phloem



6. Xylem, xylem parenchyma

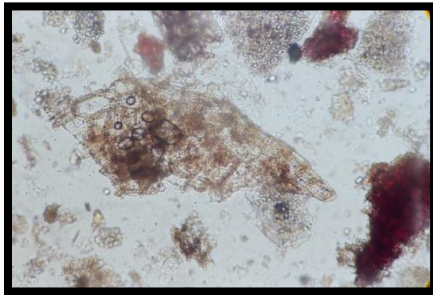


7.Lignified fibres

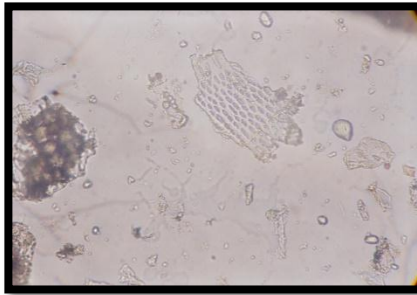


8.Xylem, its fibres and parenchyma

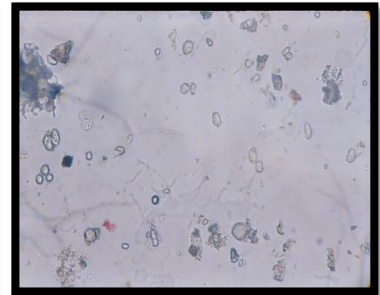
Plate 2: Normal *Guduchi* Powder Microscopy



1.cork in surface view



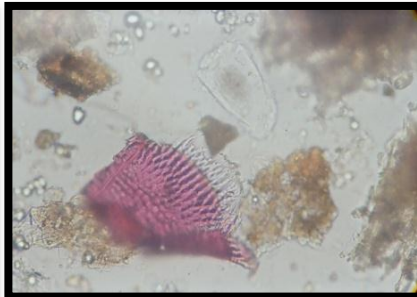
2.Bordered pitted vessels



3.Simple starch grains



4.Normal Collenchyma cells



5.Lignified border pitted vessels



6.Normal Simple fibres



7. Cleared simple starch grains

Guduchi ghanvati microscopy

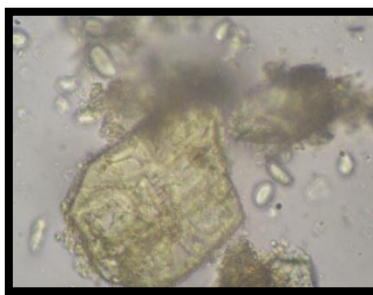
Diagnostic powder characters of fresh powder shows disturbed cork cell in surface view, smoothened walls of simple starch

grains, ruptured walled fragments of collenchymas cells, fibres with smooth surfaces, disturbed walled bordered pitted vessels are observed.(Plate 3. 1-6.)

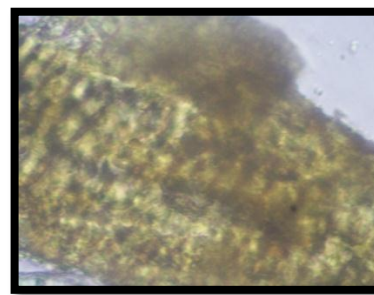
Plate 3: GuduchiGhanavati microscopy



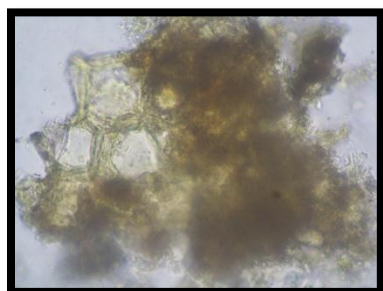
1. Disturbed walled starch grains



2.Deformed collechyma cells



3.Diturbed walled pitted vessels



4.Ruptured cork cells



5.Fibres with lumen



6.Ruptured starch grains

Physico-chemical parameters

Drug was evaluated for various physicochemical parameters like average weight, hardness, loss on drying, water soluble extract, alcohol soluble extract, total ash value, pH value¹⁴⁻²¹. The results are placed at Table 3.

HPTLC

Methanol extracts of drugs were spotted on pre-coated silica gel at 254 nm and 366 nm Results are depicted in the Table 4.

**Table 3** Physico chemical parameters of *Guduchighanvati*

Sr no.	Parameters	Results
1	Average weight	283 mg
2	Tablet Hardness	5.4 kg/cm ²
3	Loss on Drying at 110 c	8.05% w/w
4	Total Ash value	11.3% w/w
5	Water Soluble Extract	35.2% w/w
6	Methanol Soluble Extrac	31.00% w/w
7	pH 5% v/w aqua solution	6.5

Table 4 Results of HPTLC of *Guduchighanvati*

Track	Solvent system	Observation under UV radiation	Observation under visible radiation
		254 nm	366 nm
		No. of spots	No. of spots
<i>Guduchi ghanavati</i>	Toluene (7ml) : Ethyl acetate(2ml): Acetic acid (1ml)	12	8
		Rf value	Rf value
		0.01,0.06,0.11,0.15, 0.19,0.28,0.34,0.45, 0.57,0.70,0.76,0.98	0.15,0.20,0.35, 0.45,0.70,0.76,0.48

DISCUSSION

Guduchi or *Amruta* is important drug of Indian medicine. The drug is useful in fever, diabetes, dyspepsia, skin disease, jaundice, heart disease etc. Thus *Guduchi* is one of the most rejuvenating herbs promotes the longevity and useful in strengthening the immunity of body so body can stay away from death. *Guduchi*, growing up on *Neem* tree has the best rejuvenating and medicinal property because of predominant of bitter test (*Vayu* and *Akash Mahabhoota*)

Dhatvagnidipana, *Pachna*, *Kledadiupashoshn* etc. are done.

The natural fresh *Guduchi* showed that all the cellular constituents properly and scientifically arranged without any deformation destruction, as usual in all stem characters i.e. cork, cortex, pericyclic fibres, phloem, xylem and central pith are clearly marked out.

The fresh *Guduchi* and dried powder showed that the stem are individually

separated all the cellular constituents come into open i.e., Cork in surface view, collechyma cells, starch grains, fibres, vessels and other cellular inclusions. Where in *Guduchighanavati* disturbed cork

in surface view, smoothened surface of collechyma cells, disturbed walls of starch grains, smoothened and with lumened fibres, ruptured xylem vessels and other cellular inclusions.

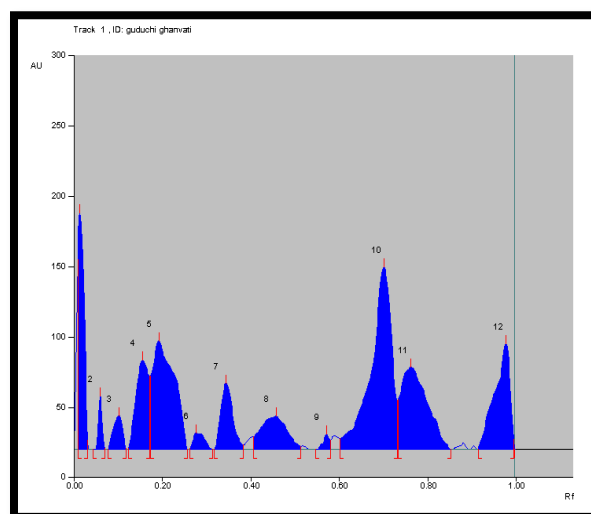
Above observations characters were changed because of the influence of *Sanskara*. *Sanskara* means the different procedures. According to the Ayurvedic thinking *Sanskara* (procedure) changes the attributes of the drug²². Natural or inherent attributes of the drug is due to its *Panchabhautika* configuration. *Sanskara* (procedure) makes change in that



Pachbhautika configuration which results in change in attributes. During preparation of *Ghanavati*, *Guduchi* was subjected to the procedure of making decoction and further boiling till it became semisolid. These procedures are said as *Toya Sannikarsha* (mixing with water) and *Agni Sannikarsha* (preparing with fire) *Sanskara*. The channels of cell wall structure appeared disturbed may be due to *Agni Samyoga* because *Agni*²³ is said to be *Ushna*, *Tikshna* and *Sukshma*. Due to *Sukshma* it enters in minute channels and with *Ushna* and *Tikshna* it changes the shape which reflects as disturbed structure. Cell wall were seemed about to burst due to heavy fluid contain in it may be due to *Toya Sannikarsha*. According to the *Ayurvedic* principle, water produces looseness. Loosened tissue seems to be disturbed structurally. This may be the reason why the structural changes have been observed. This is how the observed changes can be understood with the help of Principle of *Gunantaradhan* (change in attributes).

According to the principle of *Panchavidhkashaykalpana*, Fresh *Swarasa* (juice) is *Guru* (difficult to digest) but *Kwath* (decoction) is *Laghu* (easily

digestable)²⁴. In this particular study, *Ghanvati* is prepared by *Kwatha*, so it may digest well which results in increased bio availability. This is why *Ghanvati* is more potent than fresh *Guduchi*. More over only liquid portion of *Kwatha* remain present as a final preparation of *Ghanvati*. As separation of solid or fibrous materials occurs due to filtration of *Kwatha* during preparation method. This means active substances are present in more quantity in comparison to fresh *Guduchi* plant. This also increase the potency of the final product i.e. *Ghanvati*. Also by *Toya* and *Agni Sannikarsha* bioavailability of end products is increased due to conjunction of *Drava, Ushna, Tikshna, Laghu, Sukshma, Vishad Guna*. So, ultimate desirable action is done on *Pandu*.



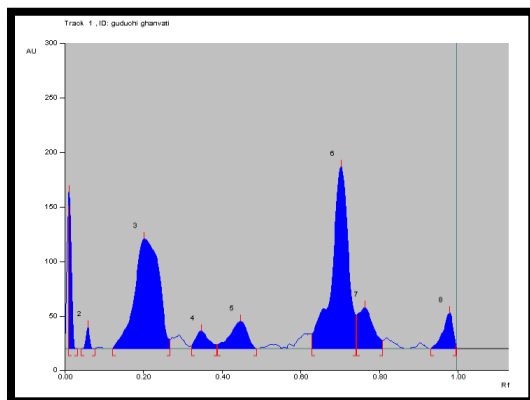
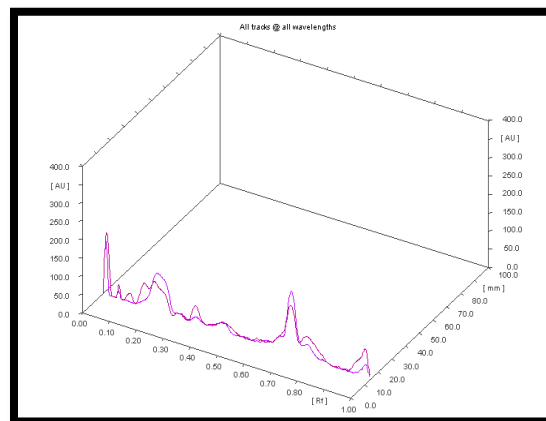
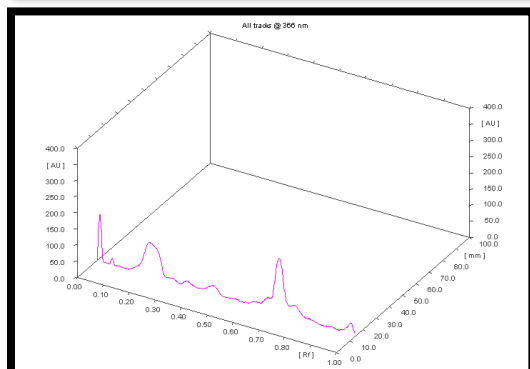
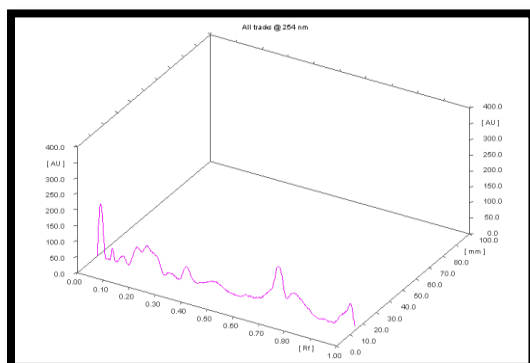


Plate. 4 HPTLC of *Ghanavatiat* 254 and 366nm



HPTLC comparative 3-D graph of *Ghanavatiat* 254 and 366nm



HPTLC 3-D graph of *Ghanavatiat* 254 and 366nm



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