

PHARMACOGNOSTIC STUDIES ON *Gisekia Pharnaceoides* Linn

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ABSTRACT: *Gisekia Pharnaceoides* Linn is a diffuse subsucculent, glabrous herb. It is aromatic, aperient and act as powerful anthelmintic in cases of taenia. The plant possesses antibacterial, CNS depressant and anthelmintic activity. The present communication deals with the morphology, anatomy, microscopic constants, Physicochemical constants preliminary phytochemical studies and fluorescence analysis of whole plant of *Gisekia Pharnaceoides* Linn.

INTRODUCTION

Gisekia Pharnaceoides Linn. a bitter kitchen herb is commonly known as Manalikeerai in Tamil^{1,2}. It is one of the sources for controversial drug “Elavaluka” used in Ayurvedic System of Medicine³. Bapalal G. Vaidya⁴ refers Vaman Desai's Indian medicinal Plants and quoted *Gisekia Pharnaceoides* as Elavaluka. In Bengali market, it is sold in the Marati name Valuka baji.

It is a diffuse, somewhat succulent herb and belongs to the family Molluginaceae^{2, 5}. Leaves spatulate, subfleshy, subopposite; flowers small many in axillary umbellate cymes; fruits with blackish subreniform seeds.

The plant is anthelmintic and vulnerary. It cures scabies, rhinitis bronchitis, loss of appetite, heart troubles, leprosy, leucoderma and urinary diseases. The plant has been found to act as a powerful anthelmintic in case of taenia^{6, 7, 8}. The plant is also given

for chest disorders, worm infestation and mental disorders².

This plant contain oxalic, succinic, tartaric, citric acids, triacontane, dotriacontane, Myristone and tetracosano⁹. 50% ethanolic extract of the plant showed CNS depressant activity¹⁰. Chloroform extract of this plant exhibited a strong anthelmintic and antimicrobial activities¹¹.

MATERIALS AND METHODS

The plant was collected from Udankudi, Tuticorin district, Tamilnadu. Sections of petiole, leaf, stem and root were obtained using microtome, stained and mounted following the usual plant microtechnique¹². Microscopic constants were determined^{13,14,15}. The dried leaves were powdered and subjected to physico chemical evaluation¹⁶, preliminary phyto chemical tests¹⁷ and fluorescence analysis¹⁸.

OBSERVATION

TRANSVERSE SECTION OF PETIOLE

The transverse section through the petiolar region shows a circular outline with a deep depression on the adaxial face concomitant with the midvein. Outer non-trichomatous single layered epidermis is composed of small rectangular cells and some are enlarged compared with the remainder. The vasculature is represented by a solitary crescentic collateral stand. The ground tissue is composed of thin walled closely arranged parenchyma cells. Some of them contain raphides (Fig 1A).

TRANSVERSE SECTION OF LAMINA

The leaf is typically dorsiventral in structure. Some of the adaxial and adaxial epidermal cells are enlarged and spherical and they appear as bladders. Both the epidermises are perforated by stomata and lack of trichomes.

Mesophyll is differentiated into single layered adaxial palisade and spongy tissue of 1-2 cells depth with elliptic cells. The vascular traces are situated on the line where the palisade mesophyll abuts on the spongy mesophyll. These vascular traces are surrounded by a bundle sheath composed of large parenchyma cells. In between the vascular traces some of the spongy tissues contain large bundle or clustered crystals (Fig 1C).

TRANSVERSE SECTION OF MIDRIB

The midrib is seen as a small convexity adaxially and a depression adaxially in a transverse section. In the parenchymatous ground is situated a single crescentic collateral vascular strand. It is surrounded by a parenchymatous bundle sheath. (Fig B)

EPIDERMIS IN SURFACE VIEW

The adaxial epidermis in surface view as shown by paradermal section is composed of

polygonal in outline with 5-6 sides. The anticlinal walls are nearly straight. (Fig 1D)

The adaxial epidermis is composed of moderately wavy margined cells. Trichomes are totally absent in both the epidermis and are performed by anomocytic (ranunculaceous) stomata. (Fig 1E)

MICROSCOPIC CONSTANTS

STOMATAL NUMBER

For Upper Epidermis = $35-37-39/\text{mm}^2$

For Lower Epidermis = $16-19-22/\text{mm}^2$

STOMATAL INDEX

For Upper Epidermis = $23-25-27/\text{mm}^2$

For Lower Epidermis = $16-21-25/\text{mm}^2$

VEIN ISLET NUMBER = $2-4/\text{mm}^2$

VEINLET TERMINATION NUMBER = $6-8-12/\text{mm}^2$

PALISADE RATIO=4-5

TRANSVERSE SECTION OF STEM

Transverse section of stem is nearly hexagonal in outline with four to six corners, a little drawn out. The epidermis is composed of single-layered small rectangular cells. Underlying the epidermis is a zone of 5-6 cells deep spherical closely arranged cortical parenchyma. Some cells contain raphides. The pericycle is represented by 2-3 rows of discontinuous fibers.

The vasculature occurs in the form of continuous cylinder around the central pith. Phloem region is a narrow strip of 4-6 cells deep. The vessels are circular or oval and occur singly or in radial multiples of 3-4, scattered in the wood. (Fig 1F)

The central zone or pith is composed of large celled pith parenchyma, arranged with

intercellular spaces. Some cells are fully packed with raphides.

TRANSVERSE SECTION OF ROOT

Transverse section of root shows a central woody core, externally lined by a narrow secondary cortex and cork. The outer most layer of the phellem peeling off in superficial flakes because of the superficial origin of successive areas of phellogen. The parenchyma cells of the phelloderm are transversely elongated. Some cells are filled with raphides. The phloem is narrow. The vessels are scattered in the woody core singly or rarely in two's the rays are narrow and uniseriate (Fig1G)

PHYSICO – CHENUCAK CIBSTABTS

Physico-chemical evaluation was carried out according to the standard procedure (Table – I)

PRELIMINARY PHYTOCHEMICAL SCREENING

Petroleum ether, chloroform, acetone, methanol and water extracts were subjected to preliminary phytochemical analysis with different chemical reagents to identify the constituents present in the plant and the results are tabulated in Table – II.

FLUORESCENCE ANALYSIS

Fluorescence analysis of drug powder and extracts was done and recorded in Table – III.

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DISCUSSION

Anatomically this plant showed characteristic features. Trichomes totally absent. Occurrence of large bundles of cluster crystals or raphides in the spongy tissues and parenchyma cells of petiole, stem and root are note worthy features.

The presence of large bundle sheath in the leaf and bladder like epidermis in the leaf and stem are also diagnostic characters. Stomata are of ranunculaceous type and are present in both adaxial and adaxial epidermis. Preliminary phytochemical screening of various extracts reacted positively for steroid, triterpenes, alkaloid flavonoid & glycosides.

Fluorescence studies revealed different shades of green fluorescence under UV light. Along with this, the revealed physico chemical standards & microscopic constants are very much helpful in the identification of the drug.

Biologically, this plant is important because of is antibacterial, CNS depressant and anthelmintic activity.

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Table – I
PHYSICO –CHEMICAL CONSTANTS

S.No	ANALYSIS	VALUES
I ASH VALUES		
1.	Total ash	Not more than 28%
2.	Acid insoluble	Not more than 10.5%
3.	Water soluble	Not more than 4.5%
II EXTRACTIVE VALUES		
1.	Water soluble extractive	Not more than 15.856%
2.	Alcohol soluble extractive	Not more than 9.6%

Table – II
PRELIMINARY PHYTOCHEMICAL SCREENING OF
EXTRACTS OF *Gisekia pharnaceoides* Linn

TEST EXTRACTS	FOR	PET-ETHER	ACETONE	CHOLORO-FROM	METHA-NOL	WATER
Alkaloids		-	-	+	+	+
Glycosides		-	-	-	+	+

Steroids	+	+	+	+	+
Flavonoids	-	-	-	+	+
Fixed oils & Fats	-	-	-	-	-
Saponins	-	-	-	+	+
Furanoid	-	-	-	-	-
Quinone	-	-	-	-	-
Terpenoids	+	+	+	-	-

Table – III
FLUORESCENCE ANALYSIS OF POWDER AND EXTRACTS OF
***Gisekia pharnaceoides* Linn**

POWDER	UNDER DAY LIGHT	UNDER UV LIGHT (254nm)
Powder as such	Greenish brown	Pale green
In IN NaOH (inmethonal)	Pale yellow	Pale green
In IN NaOH (in water)	Pale yellowish brown	Pale green
In IN HCl	Pale brown	Pale green
In 50% HCl	Pale brown	Pale green
In 50% HNO ₃	Pale brown	Pale green
In 50% H ₂ SO ₄	Greenish brown	Dark green
EXTRACTS		
Petroleum ether	Pale greenish brown	Pale green
Acetone	Yellowish	Pale green
Choloroform	Pale yellowish green	Greenish yellow
Mathanol	Pale yellow	Pale green
Water	Pale brown	Pale green

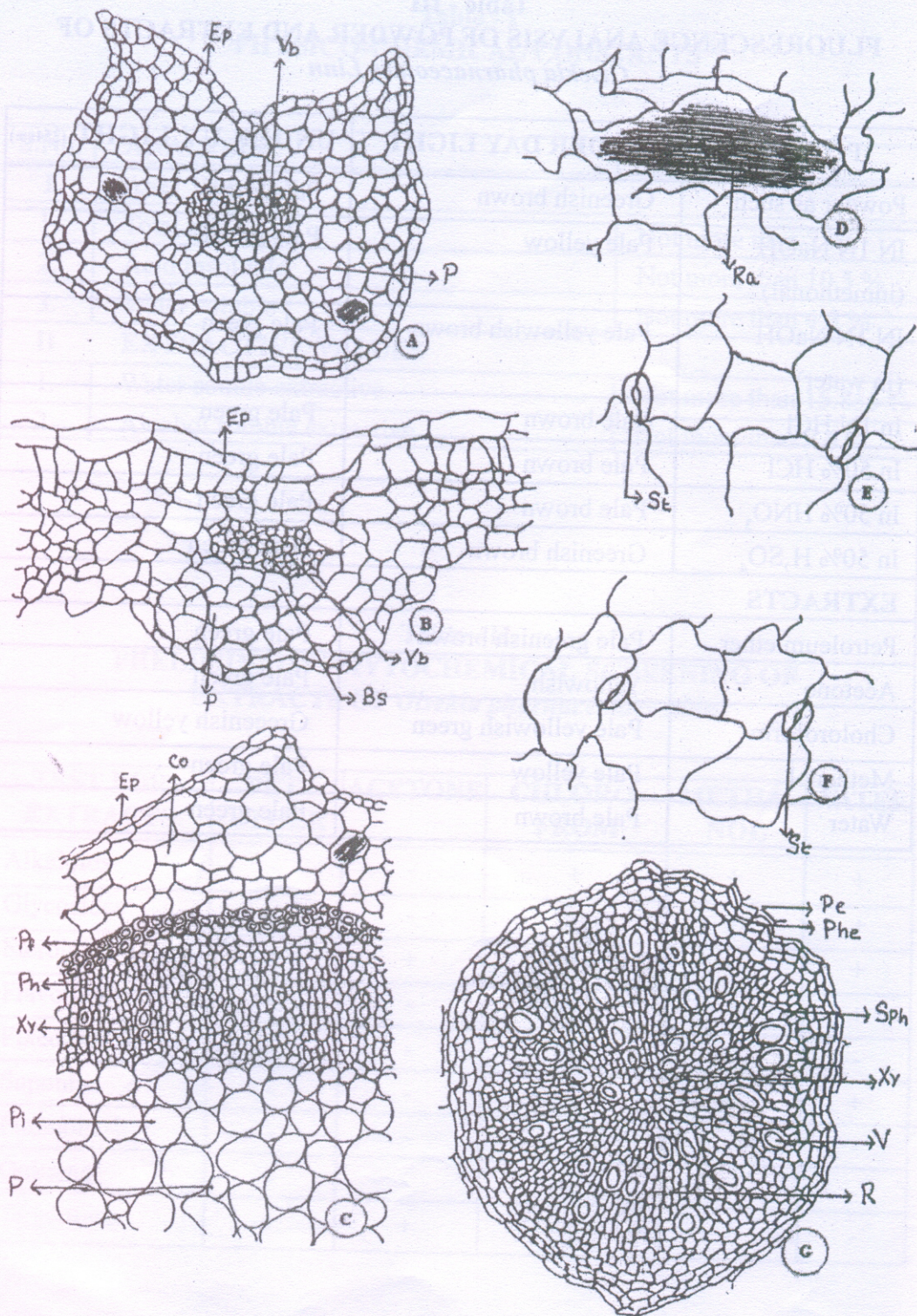


Fig A T.S. of Petiole

Fig B T.S. of Leaf

Fig C T.S. of Stem-A portion enlarged

Fig D Cells showing raphides

Fig E Adaxial Foliar Epidermis

Fig F Abaxial Foliar Epidermis

Fig G T.S. of Root

OBSERVATIONS

Co	-	Cortex
Ep	-	Epidermis
P	-	Parenchyma
Pe	-	Phellem
Pf	-	Pericyclic fiber
Ph	-	Phloem
Phe	-	Pheelloderm
Pi	-	Pith
R	-	Ray
Ra	-	Raphides
Sph	-	Secondary phloem
St	-	Stoma
Sxy	-	Secondary xylem
V	-	Vessel
Vb	-	Vascular bundle
Xy	-	Xylem