MONOGRAPH OF KALMEGH STEM

ANDROGRAPHIS PANICULATA (NEES)

INTRODUCTION

Botanical Name : *Andrographis paniculata*

Family Name : Acanthaceae

Common Name : Kalmegh, Maha-tita, Bhui –neem

Part Used : Aerial Parts

Fig : Andrographis Plant

HISTORY :

It is commonly known as King of Bitters, Bhu- Neem , as the plant is much smaller in size and shows appearance and bitter taste as that of Neem. It is used in traditional systems of medicine and is an important cold property herb used in fevers and to dispel toxins from the body.

GEOGRAPHICAL SOURCE :

Distributed in tropical Asian countries. Native population of plants are spread through South India and SriLanka. Also available in Java, Indonesia and West Indies.

CULTIVATION AND COLLECTION :

In India , the plant is cultivated as rainy season crop. The propogation is through shattered seeds in nature or through broad casting. Any soil having fair amount of organic matter is suitable for commercial cultivation of this crop. With the onset of monsoon, plant grows luxuriantly and starts flowering. The plants at flowering stage (90–120 days after sowing) are cut at the base leaving 10–15cm stem for plant regeneration. About 50–60 days after first harvest, final harvest is performed

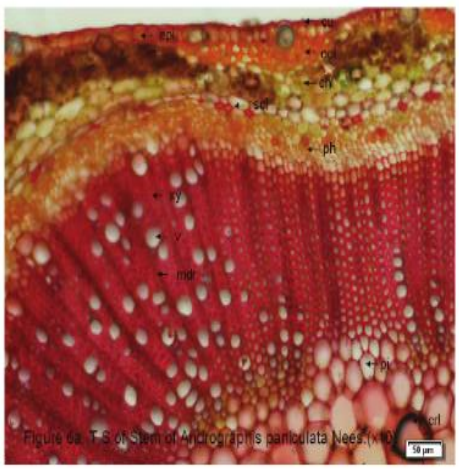
DESCRIPTION :

MACROSCOPY

- Root: Tap root, forming secondary and tertiary branching.
- Stem: Quadrangular, smooth and without hairs.
- Leaf shape: lanceolate. Leaf base & apex: acute at both ends

MICROSCOPY :

- Epidermis: Predominant quadrangular stem consisting of Single layer of cubical cells with straight wall, surrounded by cuticle Many glandular (short stalk of single cell) and unicellular (majority) and few multicellular covering trichomes are present. Cystholiths are also present.
- Hypodermis: 3-4 layer of hypodermis made up of chlorenchymatous cells, followed by 5-6 layers of cortical cells, at all the four angles beneath the epidermis. Cystholiths are present. Calcium oxalate crystals are also present.
- Endodermis: Distinct followed by a single layer of pericycle
- Pericycle: Small and thin walled cells. Some are thick walled and lignified in older stems.
- Secondary phloem: Consists of sieve tubes, companion cells and phloem parenchyma
- Secondary xylem: Consists of lignified trachea, tracheids, fibres and few vessels. Xylem fibres are pitted elongated and moderately thickened.
- Pith: Consists of thin walled, isodiametric cells.



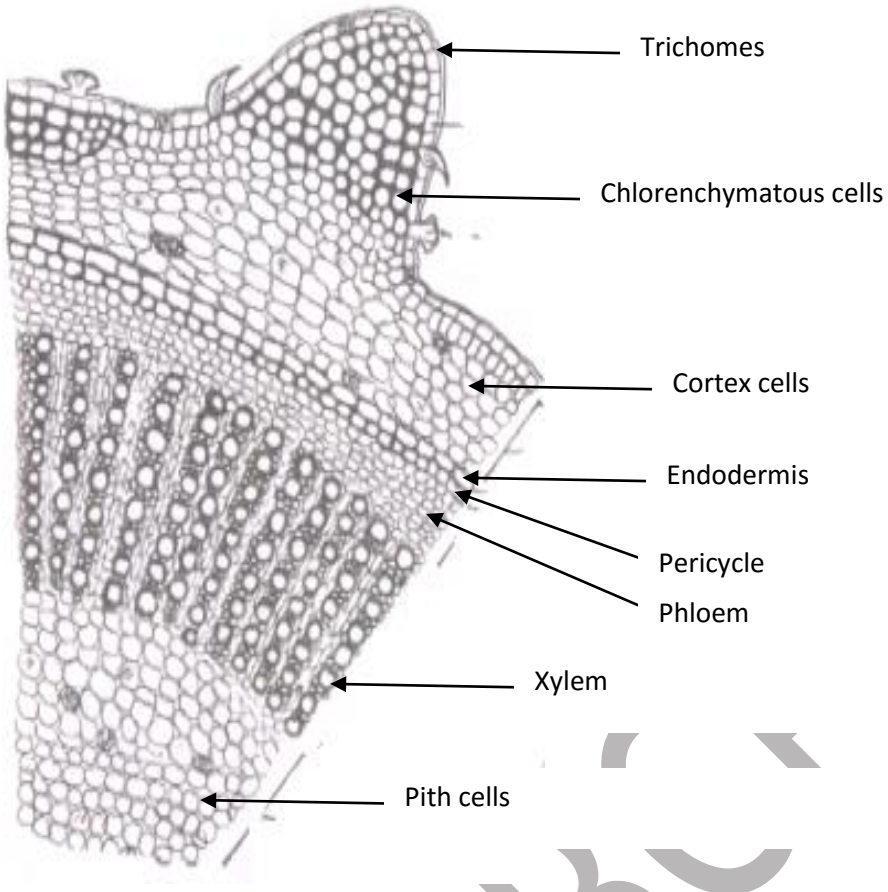


Figure : Transverse section of *Andrographis paniculata*

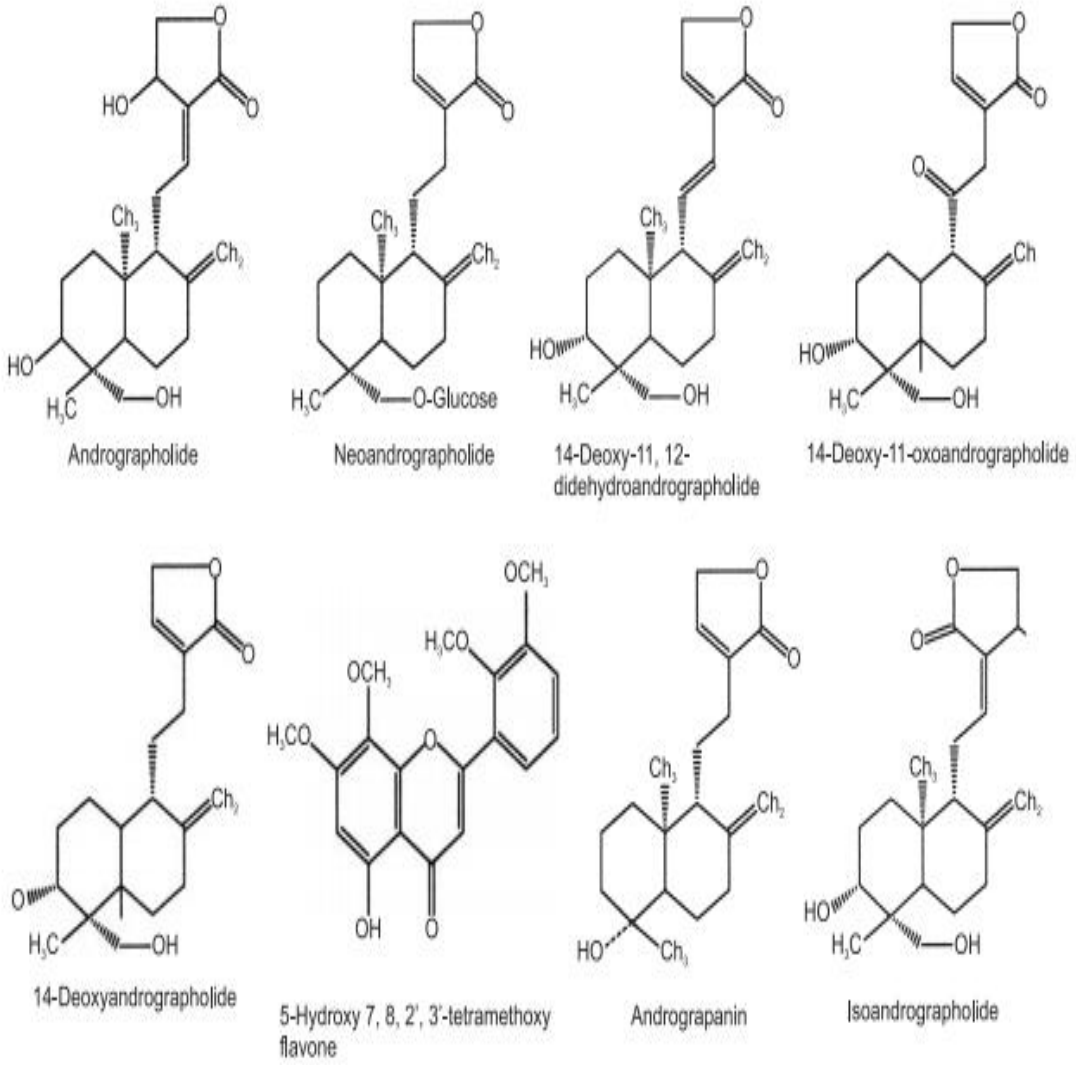
POWDER CHARACTERISTICS

- Fibres : Acicular, pitted xylem fibres
- Vessels : Lignified with pitted wall and Lignified with spiral wall
- Trichomes : Unicellular
- Stomata : Straight walled polygonal epidermal cells with diacytic stomata

Xylem vessels **Trichomes** **Diacytic stomata**

CHEMICAL CONSTITUENTS:

- Diterpene lactone : Andrographolide, 14-deoxy-11-oxoandrographolide, 14-deoxy-11,12- didehydroandrographolide / Andrographolide D, 14-deoxyandrographolide, Neoandrographolide.
- Flavones : Andrograpanin, 5-hydroxy-7,8,2`,3` tetra methoxy flavone
- Xanthones : 1,8-dihydroxy-3,7 dimethoxy xanthone, 4,8- dihydroxy-2,7-dimethoxy xanthone.



CHEMICAL TEST :

Andrographolide on reaction with Dinitrobenzoic acid in alkaline media (KOH) gives yellow to red coluration due to diterpene lactones

THERAPEUTIC USES :

- **Analgesic activity :** Reduces swelling and cuts down exudation from capillaries. Andrographolide inhibits the release of NO and thus has anti-inflammatory activity.
- **Antihyperglycemic :**
  lowering blood glucose level through inhibition of α-glycosidase and α-amylase (b) increasing insulin sensitivity and thus stimulating glucose uptake and oxidation by peripheral tissues
- **Antibacterial:** Against *S. aureus, Streptococcus pyogenes, Micrococcus luteus, Proteus mirabilis,* and *P. aeruginosa.*
- **Antiviral activity :** Significant antiviral activity against HIV, influenza A, and HSV-1
- **Anticancer :** Andrographolide exhibited both direct and indirect effects on cancer cells by inhibiting proliferation of cancer cells, cell-cycle arrests, or cell differentiation, enhancing body's own immune system against cancer cells; and inducting apoptosis and necrosis of cancer cells
- **Hepatoprotective activity :** Helps in reducing cholesterol and triglyceride levels
- **Antihypertensive.**

MARKETED PREPARATION :

- Zycoliv DS, Kalmegh Powder, Liv-First,

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