



## PHARMACOGNOSTICAL EVALUATION OF *GLYCYRRHIZA GLABRA* LINN. STEM - A PRELIMINARY STUDY

**Shashikant Prajapati<sup>1</sup>, Harisha CR<sup>2</sup>, Bhupesh Patel<sup>3</sup>**

<sup>1</sup>Ph D Scholar, Dravyaguna Department, IPGT&RA, Gujarat Ayurved University, Jamnagar, Gujarat, India.

<sup>2</sup>Head, Pharmacognosy Laboratory, IPGT & RA, Gujarat Ayurved University, Jamnagar, Gujarat, India.

<sup>3</sup>Assistant professor, Department of Dravyaguna, IPGT & RA, Gujarat Ayurved University, Jamnagar, Gujarat, India..

### ABSTRACT

Ayurveda is simply translated as 'science of life' and more comprehensively as 'the knowledge that teaches us which substances, life style and activities are beneficial or harmful for life.' *Yashtimadhu* or liquorice has been included in the pharmacopeia of many ancient civilizations. The present study was aimed to access the standard pharmacognostical profile of stem of *Glycyrrhiza glabra* Linn. Stem powder of *Glycyrrhiza glabra* Linn was used to access the pharmacognostical evaluation as per standard protocols. Pharmacognostical findings of the drug are prismatic crystals, pericyclic fibers, cortex, medullary rays, starch grain, etc. The preliminary pharmacognostical study needed for proper identification and authentication of stem of *Glycyrrhiza glabra* Linn.

**Keywords:** *Glycyrrhiza glabra*, *Yashtimadhu*, Stem, Pharmacognosy.

### INTRODUCTION

The knowledge about medicinal plants in the early age was documented systematically and organized scientifically in *Ayurvedic Samhitas*, *Nighantus* and other texts. In which we can get so many references of medicinal plants. Among all this *Samhitas* of *Ayurveda Charakasamhita* is a vast treasure of knowledge regarding medicinal plants. *Charakais* the first person who could classify the existing plants, into pharmacological categories and given 50 classes which are known as *Dashemani* [1]. *Acharaya Charaka* has mentioned *Yashtimadhu* in the chief 11 *Dashemanis* which highlights its own importance in *Ayurveda*. In *Ayurveda Yashtimadhu* is one of the important plant which is been referred in various texts with many therapeutically uses.

*Glycyrrhiza glabra* Linn. a perennial herb with a thick rootstock passing below into long, straight, cylindrical, slightly tapering, smooth, flexible, slightly branched roots, about 1.25cm in diameter, red or orange-brown on the surface, pale yellow within, and giving off at the top long horizontal subterranean stolons. Stems several from the crown, 2-4 feet or more high, erect, stiff, solid, strongly striates, shortly pubescent, branched. Leaves alternate, spreading, large, stalked, with very minute deciduous stipules, impair-pinnate, leaflets opposite in 4-7 pairs and a terminal one [2].

Pain of the accidental wound is removed by

applying locally warm *Ghritha* mixed with *Yashtimadhu*. *Payasa* (rice-milk) prepared with *Yashtimadhu* and mixed with *Ghritha* should be taken in hoarseness of voice [3]. Paste of *Yashtimadhu* and *Katuka* should be taken with sugar water in heart disease. Paste of *Madhuka* mixed with *Nimba* leaves acts as wound cleaning. *Madhuka* powder 10gm mixed with *Ghritha* and honey followed by intake of milk makes a man sexually potent. Intake of *Madhuka* powder with milk acts as *Rasayana* particularly intellect-promoting [4].

Stem pieces of *Glycyrrhiza glabra* Linn. are also sold in place of Root of *Glycyrrhiza glabra* Linn.[5]and review of literature shows that pharmacognostical study of stem of *Glycyrrhiza glabra* Linn. is not established. Hence the present study was carried out to authenticate and standardization of the stem powder of *Glycyrrhiza glabra* by pharmacognostical study. All the experiments were done by following the standard procedures mentioned in *Ayurvedic Pharmacopeia of India* [6].

### MATERIAL AND METHODS

#### Collection of the sample

*Glycyrrhiza glabra* Linn. (*Yashtimadhu*) was collected from raw drug market, Jamnagar (Gujarat). Pharmacognostical authentication of drug was done based on the morphological features (Plate 1 a), organoleptic

characters and powder microscopy of *Yashtimadhu*. The API standards were used for authentication.

**Method of Preparation of Sample**

Stem of *Glycyrrhiza glabra* Linn. were washed, shade dried, powdered, sieved through 80 mesh and preserved in an air-tight glass vessel.

**Morphological study**

The cut pieces of stem yellowish to brown branched and woody with longitudinal wrinkled surfaces. Outer bark thick, woody, hard and inner light yellow in colour.

Wood: Light yellow with constant strians.

**Pharmacognostical Evaluation**

Pharmacognostical analysis of *Yashtimadhu* based on organoleptic characters, i.e., colour, odour, taste and texture were recorded. Microscopic studies, i.e., dissolving *Yashtimadh uchurna* (powder) in small quantity of distilled water, filtering through filter paper and the precipitate treated with and without stain to find out the lignified materials along with other cellular constituents. The micro photographs were taken under Carl Zeiss Trinocular microscope attached with camera [6,7,8].

**Powder Microscopy**

Powder microscopy of the dried stem powder was carried out following standard guidelines [9].

**Histo-chemical evaluation**

Stem powder of *Glycyrrhiza glabra* Linn. treated with various reagents to detect the presence and absence of lignified cells, tannin, starch, calcium oxalate crystals etc [10].

**OBSERVATION AND RESULTS**

**T.S of the stem (Plate 2 a-h)**

T.S of the stem is circular in structure, cortex well differentiated along with pericyclic fibers are distributed. Phloem, Xylem and central well defined pith.

T.S. of the stem is outer cork several rows of narrow tangential elongated cells.

**Cortex:** The wide zone of the stem section composed of parenchyma cells without any intercellular spaces. The parenchyma cells filled with starch grains, prismatic and rhomboid crystals of calcium oxalate. Pericyclic fibers arranged circularly all around the cortex.

Vascular bundles radially arranged phloem situated above the xylem composed of fibers and seive elements. Xylem occupies larger part of the stem. Xylem composed of 2-3 cells of components and well differentiated parenchyma and xylem fibers. The radially arranged xylem separated by the medullary rays.

Medullary rays: Medullary rays starting from the centre region extended up to inner cortical region uniseriate to multiseriate, somewhat tangentially elongated cells consists starch grains and prismatic crystals.

**Pith:** Central part of the stem occupied pith composed of parenchyma cells mainly composed of starch grains. Some of the cells filled with dark brown content (Tannin) all over the pith.

**POWDER MICROSCOPY**

**Organoleptic characters**

Yellowish in colour, sweetish in taste, sweet smell and fibrous in touch. (Plate 1 b)

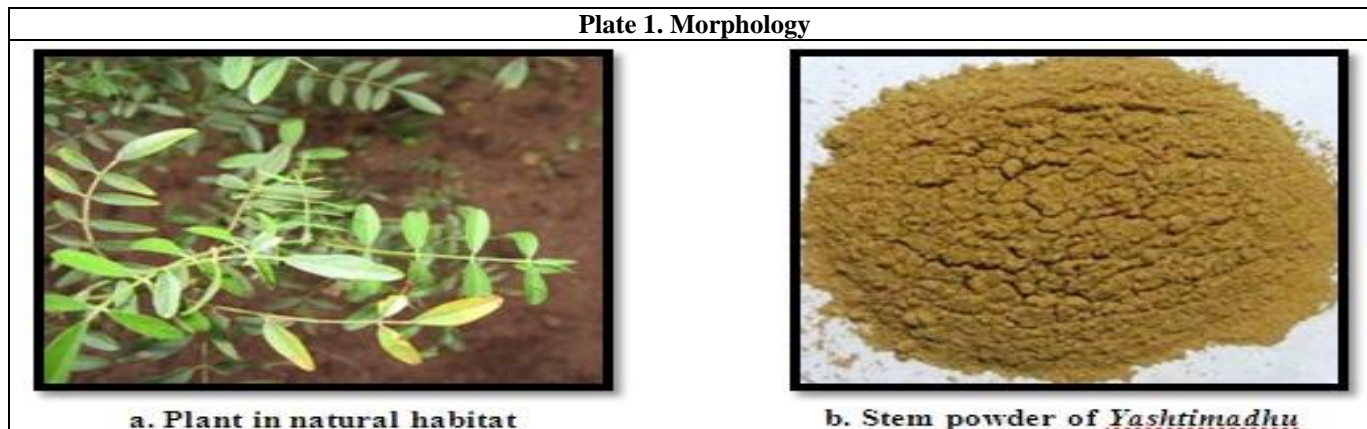
**Microscopic characters**

Diagnostic microscopic characters shows starch grain in groups, crystal fibers, cork in surface view, rhomboidal crystals, lignified fibers, simple starch grain, tanin content and border pitted vessels. (Plate 3 a-h).

**Table 1. Histochemical evaluation of *Glycyrrhiza glabra* Linn. stem**

Sr.No	Reagents	Observation	Characteristics
1.	Phloroglucinol+Conc. Hcl	Red	Lignified cells
2.	Fecl3 solution	Dark blue to black	Tannin cells
3.	Iodine solution	Blue	Starch
4.	Phloroglucinol+Conc. Hcl	Dissolved	Calcium oxalate crystals

**Plate 1. Morphology**



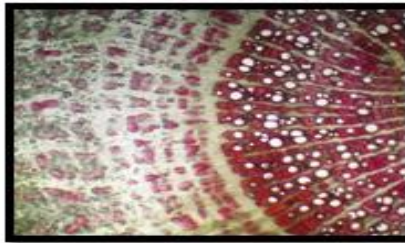
**a. Plant in natural habitat**

**b. Stem powder of *Yashtimadhu***

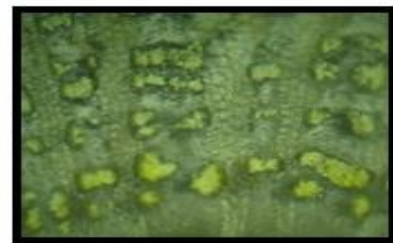
**Plate 2. TS of Stem**



a. Cork, Cortex, Pith



b. Lignified fibers with vascular bundles



c. Cortex with pericyclic fibers



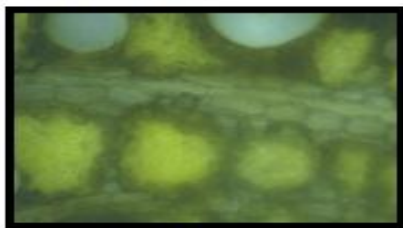
d. Lignified fibers along with starch grain



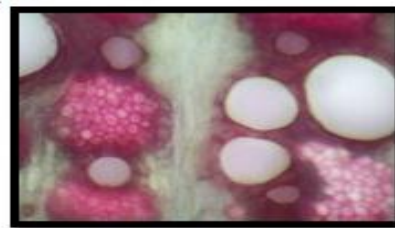
e. Xylem vessels along with medullary rays, pith



f. Xylem with Xylem parenchyma and its vessels



g. Multicriate medullary rays

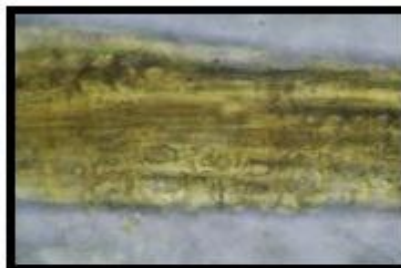


Pericyclic fibers, phloem, xylem

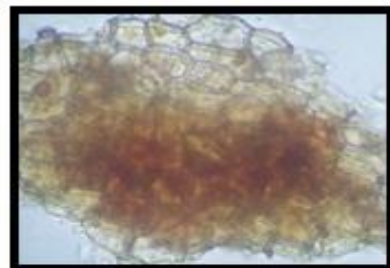
**Plate 3. Powder microscopy**



a. Starch grain in groups



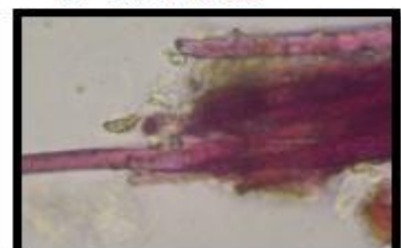
b. Crystal fibers



c. Cork in surface view



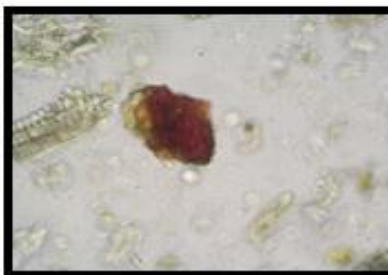
d. Rhomboidal crystals



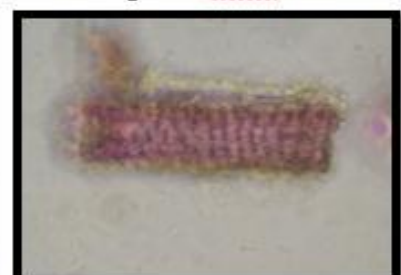
e. Lignified fibers



f. Simple starch grain



g. Tannin content



Border pitted vessels

## CONCLUSION

The observed pharmacognostical study may be useful to establish the botanical standards for identification and standardization of stem of *Glycyrrhiza glabra* Linn. The result of the present study can be considered as the reference values for *Glycyrrhiza glabra* similar research works in future.

## ACKNOWLEDGEMENT

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