

## PHARMACOGNOSTICAL, PHYSICOCHEMICAL AND PHYTOCHEMICAL EVALUATION OF SHARAPUNKHA MULA CHURNA

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### ABSTRACT

Phytochemical analysis refers to the extraction, screening and identification of medicinally active substances found in plants. The term phytochemical has generally been used to describe plant compounds that are under research with unestablished effects on health. Some of the bioactive substances that can be derived from plants are flavonoids, alkaloids, carotenoids, tannins and antioxidants. The aim of this research study was to evaluate the screening of phytochemical compounds and to assess the alkaloids present in *Tephrosia purpurea*. For the purpose of study, the extracted fraction of plant root was undertaken by using various solvents of increasing polarity and the extracts thus obtained were subjected for phytochemical analysis. Various pharmacognostical and phytochemical parameters such as microscopy, physicochemical and behavior of powder drug on treatment with different chemical reagents were studied. The result confirmed the presence of physical constants while the preliminary phytochemical analysis established the presence of wide variety of phytochemical like alkaloids, tannins, saponins, steroids etc.

**Keywords:** Phytochemical, Pharmacognostical, physicochemical, *Tephrosia purpurea*.

### INTRODUCTION

The word herb has been derived from the Latin word herba and an old French word herbe. An Herb refers to any part of the plant like fruit, seed, stem, bark, flower, leaf as well as non-woody plant<sup>1</sup>. In *Ayurvedic* system of medicine herbs have been used for medicinal purpose since pre-historic times. Medicinal plants have bioactive compounds which are used for curing various human diseases and also play

an important role in healing. *Sharapunkha* (*Tephrosia purpurea*) is one such significant herb and has a well recognized place in our indigenous system of medicine. This plant is distributed throughout India in forest outskirts and waste lands ascending up to an altitude of 1850ft in the Himalayas, cultivated as a green manure in paddy fields and along with coconut, banana, rubber and tobacco

plantations in south India and elsewhere<sup>2</sup>. The herb is found in abundance as a weed in places like river beds, untended fields, and roadside scrubby jungles. This plant has been referred to as “*Sarwa wranvishapaka*” which means that it has the property of healing all types of wounds. Various parts of this plant are used as remedy for impotency, asthma, rheumatism, ulcer and urinary disorders. The plant has been claimed to cure diseases of kidney, liver, spleen, heart and blood. The dried herb is effective as tonic laxative and diuretic. It is also used in the treatment of chronic bronchitis, bilious febrile attack, boils, pimples and bleeding piles<sup>3</sup>. The plant possesses Anti inflammatory, Analgesic, Antipyretic, Anticancer, Hypoglycemic, Immunomodulatory, Antioxidant action<sup>4</sup>.

According to *Ayurvedic* literature, *Sharapunkha mula* has been said to be the most beneficial part of this plant<sup>5,6,7</sup>. Also research studies on *sharapunkha* have indicated the root has antiulcer, anti carcinogenic, antimicrobial and antioxidant action<sup>8</sup>. So the research study was aimed at Pharmacognostical, Physicochemical and Phytochemical evaluation of *Sharapunkha mula Churna*. The research work involves the root of this selected medicinal plant which was washed, air dried and then powdered. The extract of root samples was used for the phytochemical analysis to find out the secondary phytochemical constituents in the plants. The phytochemical analysis of the plants is very important for the authentication and standardization of medicinal plants and also carries immense significance commercially to the pharmaceutical companies for the production of the new drugs for curing various diseases. The *mula* of this plant has been reported to contain fixed oil, proteins, saponins, carbohydrates and phytosteroids<sup>9</sup>. It is expected that the important phytochemicals recognized by our study in this medicinal plant will be very useful in curing various diseases.

### Aim and Objectives

1. Pharmacognostical analysis of *Sharapunkha mula Churna*.

2. Physicochemical analysis of *Sharapunkha mula Churna*.

3. Preliminary phytochemical analysis of *Sharapunkha mula Churna*

### Material and Methods

The study was designed under following headings

#### 1) Preparation of the sample drug.

1. **Source of data:** Literary aspects were collected from classical Ayurvedic texts, modern texts, journals and updated information was collected from internet search.

2. **Plant material:** *Sharapunkha mula Churna (Tephrosia purpurea.linn.)* was taken as trial drug.

3. **Sample collection:** *Sharapunkha mula* was collected from local area in its natural habitat. Before the collection, plant was properly identified with the help of experts. The whole plant was uprooted

4. **Method of preparation of *Sharapunkha mula Churna*:** The work was carried out at Pharmacy of Shri D.G.M Ayurvedic Medical College, and Research Center, Gadag. The roots were separated from the plants and then washed under running water to remove dirt. The root samples were then air dried for few days. The drug was subjected to powdering using pulverizer and 20 number sieves were used to get coarse powder of *Sharapunkha mula*. Fine powder of *Sharapunkha mula* was prepared by using 120 number sieves.

2. **Pharmacognostical study:** Pharmacognostical study of *Sharapunkha mula* was carried out at Biogenics Test House, Hubli. It included both macroscopic and microscopic studies. The macroscopic characters of *Sharapunkha mula* were observed for color, shape, odor and outer rough texture etc whereas for visualizing the microscopic lignified elements like fibres, vessels and stone cells powder microscopy was done.

### 3. Physicochemical analysis of *Sharapunkha mula Churna*:

Physicochemical analysis of *Sharapunkha mula churna* was carried out at Biogenic, Research and Training Center in Biotechnology, Hubli. Physicochemical parameters such as water soluble ash, water insoluble ash, acid insoluble ash, acid soluble ash, total ash, moisture content, determination of foreign content and Alcohol soluble extractive values were determined. In view of the diversity of physical properties of contents of drugs, water of extractive values were determined as per reported methods<sup>10,11,12</sup> whereas for evaluation of chemical nature different solvents like water, alcohol and hydrochloric acid were used.

#### 4) Phytochemical investigations of *Sharapunkha mula Churna*:

The Phytochemical investigations of *Sharapunkha* were carried out at Biogenic, Research and Training Center in Biotechnology, Hubli. The dried powder

was subjected to preliminary phytochemical screening for qualitative detection of phyto constituents.

The various tests, reagent used and observations recorded are given in table 3. Qualitative examination of inorganic matters was done as per reported methods.

### Results

The research study aimed at the Pharmacognostical, Physicochemical and Phytochemical evaluation of *Sharapunkha mula Churna* was carried out at the pharmacy of Shri D.G.M Ayurvedic Medical College, and Research center, Gadag. This study has confirmed the presence of Phytochemicals which are considered as the active medicinal chemical constituents.

The results of the study are grouped as follows.

1. Results pertaining to Pharmacognostical study  
The organoleptic characters of such as touch, color, taste, odor are discussed in table 1

**Table 1:** Organoleptic characteristic of Root

S. No.	Parameters	Observation
1	Touch	Dry
2	Color	Brownish Yellow
3	Taste	Bitter, tingling
4	Odor	Characteristic Odor

2. Results pertaining to analysis of *Sharapunkha* for physicochemical properties.

**Table 2:** Physico-Chemical Properties of *Sharapunkha mula churna*

S. No	Parameters	Results %
1	Total Ash (% w/w)	8.04
2	Water soluble ash	21.75
3	Acid-insoluble ash (% w/w)	17.75
4	Water-soluble extractive (% w/w)	22.8
5	Alcohol-soluble extractive (% w/w)	18.50
6	Moisture Content	4.68
7	pH (10 % aqueous solution)	6.5
8	Total % of Foreign matter	4.0

**Table 3:** Results of phytochemical analysis:

S.NO	Name of phytochemical	Test	Result
1	Protein	Biuret test	Appearance of violet or pink color.
		Ninhydrin test	Violet or purple color.
		Xanthoproteic test	Appearance of yellow color.
		Sulphur test	Presence of precipitate.
2	Carbohydrate	Molisch test	Presence of violet color ring
		Iodine test	Presence of yellow or brownish red precipitate indicating the presence of reducing sugars
		Benedict test	Presence of no characteristic color formation
3	Tannins	Gelatin test	Presence of white precipitates
4	Anthocyanin	Anthocyanin test	Formation of blue to violet color indicates the presence of anthocyanin
5	Glycoside	Molisch test	Formation of red violet color ring
6	Saponin	Foam test	Presence of having comb like foam
7	Flavonoid	Flavonoids test	Development of scarlet and cherry red color in alcoholic extract
8	Steroid	Salkowski test	Presence of wine red color
9	Alkaloid	Mayer' test	Development of creamy white precipitate.

## DISCUSSION

In this present study underground part of the plant was thoroughly investigated towards authentication and quality assurance of medicinal plants. The research work which included Pharmacognostical, physicochemical and preliminary phytochemical studies was carried out on sharapunkha root powder. From this study, the macroscopic and microscopic evaluation revealed results that are of diagnostic value. The physicochemical analyses revealed values for total ash, water soluble ash, Acid insoluble ash, moisture content, alcohol extract, water extractive and total percentage of foreign matter. Phytoscreening for secondary active metabolites confirmed the presence of phytochemical constituent's i.e. terpenoids, flavonoids, alkaloids, reducing sugars and phlobatannins are present in this plant and the results were summarized in Table 1, 2 and 3.

## CONCLUSION

The herbal medicinal products today are the symbol of safety in contrast to the synthetic drugs that are regarded as unsafe to human being and environment. Although herbs have been priced for their medicinal,

flavoring and aromatic qualities for centuries, the synthetic products of the modern age have surpassed their importance, for a while but today as the blind dependence on synthetics is over and people are returning to the naturals with hope of safety and security Medicinal plants are considered as a rich resource of ingredients which can be used in drug development either pharmacopoeial, non-pharmacopoeial or synthetic drug.. It's time to promote them globally. The plant *Tephrosia purpurea* has an imperative role in our ancient system of medicine. Conclusions were drawn on the basis of detail study of *Sharapunkha*, observations of the phytochemical analysis, results and some aspects of discussion. The root extract confirmed the presence of phytochemical constituents like saponins, terpenoids, flavonoids, alkaloids and steroids. A similar research study involving the hydro alcoholic extract sample of sharapunkha concluded that physicochemical, phyto chemical, and estimation of toxic heavy metal, microbial contaminants is highly essential for raw drugs or plant parts used for preparation of Ayurvedic formulations<sup>9</sup>. The result from the

present study will provide data which will be helpful in authentication of this plant.

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