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RESEARCH ARTICLE

PRELIMINARY PHYSICO-CHEMICAL & PHYTO-COGNOSTICAL EVALUATION OF THE *TINOSPORA CORDIFOLIA* (WILLD) MIERS STEM IN EAST U.P (INDIA) REGION

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ABSTRACT

Herbal plants are having medicinal value gaining more importance in clinical research now days due to their better pharmacological response and less side effects as compared to allopathic drugs. Plant produces primary metabolites for their basic survival and secondary metabolites for their ecological, taxonomical and biochemical differentiation and diversity. *Tinospora cordifolia* (Willd) Miers (Family *Menispermaceae*) common name is "Guduchi" or "Giloy" are broadly used in traditional system of medicine throughout different part of India, Sri Lanka, Bangladesh and Subtropical regions of world. It has great medicinal importance like Anti-oxidant, anti-tumor activity, anti-neoplastic and anti-fertility properties etc. The study of diseases and their treatment are important part of our ancient time worldwide. The knowledge of medicinal plants must have been accumulated in the course of many centuries. Herbal medicine prepare different part of plant are used. It is an important drug of Indian system of medicine. Stem, root and leaves are important to cure the disease. The main aims of this research are Preliminary physico-chemical & phyto-cognostical evaluation of the stem parts. The current study deals with the characterization of morphological features, determination of physical constant such as the Total ash value 4.1%,Loss of weight drying was 9.9%, foaming index>100, swelling index were1.1cm, the percent yield for methanol 9.01%, and aqueous 8.03%.

INTRODUCTION

Now a day's Diseases, treatment and prevention purpose herbal medicine is important part of ancient plant worldwide. Herbal drugs are important resource, especially in developing countries, to treatment of different diseases. India is the largest producer of herbal medicine and it is rightly called the "Botanical Garden of the world". India has number of approved indigenous systems of medicine viz-Ayurveda, Siddha, Unani, Homeopathy is applied for the health care of mankind(1). Herbal plants are effective source of traditional & modern medicines useful for primary health care. This helps to getting increase knowledge of medicinal plants. One fourth of modern medicine is derived from plant base origin. Herbal plants are economical and more acceptable to most of the population in the world. Even in many of the modern medicines, the basic composition is derived from medicinal plants and has become acceptable for easy availability, least side effects, and low prices, eco-friendlily and lasting curative property compared to allopathic medicine (2-3).

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In one of the studies of the World Health Organization, it is estimated that 80 per cent of the population of developing countries relief on traditional plant-based medicines for their health requirements (4-7). There are several factors for the continued popularity of traditional drugs and one is their ready availability as compared to the modern medicines besides the adverse effects of synthetic drugs (8). *Tinospora cordifolia* (Willd) Miers perennial plant under the Family *Menispermaceae*. It is commonly known as Gulancha (English/ Bengali), Giloya (Hindi), Galo (Gujarati), Guduchi (Sanskrit), Shindilakodi (Tamil), Madhupa (Kannada), Thippateega (Telugu), respectively (9). *Tinospora cordifolia* is an important drug of Indian system of Medicine (ISM). It is well known Indian bitter prescribed in fevers, diabetes, dyspepsia, jaundice, urinary problems, skin diseases, chronic diarrhea and dysentery. The plant is distributed throughout the Tropical and Subtropical regions of India. It is indigenous to areas of India, Sri Lanka, China, Myanmar, Thailand, Philippines, Vietnam, Bangladesh and South Africa. It is very rigid warm climate plant but can be grown in almost all climates. It is a climber so it needs support for growth. If it grows with neem, then called as Neem Giloy. *Tinospora cordifolia* (Giloy) propagated through both seeds and vegetative cuttings, tissue culture is done for large scale production (10).

For optimum growth of this herb vine medium black to red soil is best for cultivation but can be successfully grown in all variety of soils. Instead of treating the disease's cause, plant based medicine actually balances the body. Building immunity is the only way to stay safe and healthy and prepared themselves for the ongoing pandemic (11). In the current scenario, good immunity safeguards us from disease progression and prevention from this deadly virus. Giloy herb came into the limelight after the start of the COVID-19 pandemic due to its immunomodulatory and antiviral activity. Commonly, whole plant of *Tinospora cordifolia* is very beneficial in treatment of various diseases. Some plant parts are of prime importance to cure the disease. The stem is bitter, stomachic, diuretic stimulates bile secretion, causes constipation, allays thirst, burning sensation, vomiting, enriches the blood and cures jaundice .The root and stem of *Tinospora cordifolia* are prescribed in combination with other drugs as an anti-dote to snake bite and scorpion sting. Juice or decoction of leaves is administered orally with honey in fever (12).Herbal plants have ability for the formation of secondary metabolites such as steroids, phenolic substances, flavonoids, alkaloids, glycoside etc. These secondary metabolites are used to treatment of many diseases. The secondary metabolites provide a rich biogenic source for novel drug discovery. The metabolites produced by different plants vary from each other. No proper report was found regarding and preliminary physico-phytochemical phyto-cognostical evaluation of *Tinospora cordifolia* (Willd) Miers. till the date. Standardization of herbal drugs are difficult because generally mixture of constituents and the active constituent in most cases is unknown. Now the present study deal the standardize leaves of *Tinospora cordifolia* (Willd) Miers. Keeping this view the aim of the current study deal the a Preliminary physico-phytochemical phyto-cognostical evaluation of the stem parts of *Tinospora cordifolia* (Willd) Miers.

MATERIALS AND METHODS

Tinospora cordifolia (Willd) Miers stem were collected from fields of Itaura, district of Azamgarh, Uttar Pradesh, India in the month of January and authenticated by Prof N.K Dubey, department of botany Banaras Hindu University, Varanasi-221005, Uttar Pradesh, India.

A voucher specimen has been preserved in Department of Pharmaceutical Chemistry, Pharmacy college Azamgarh, Uttar Pradesh, India for future reference (Voucher specimen no. Menisperma. 2023/03). The stem parts were dried under shade and powdered (40 mesh size) and stored in airtight containers.

Macroscopical studies: The stem of the plant were studied for their macroscopic characters such as color, odour, taste, shape and size of the stem. The macroscopic characters were studies as per given procedure in WHO guidelines on quality control methods for medicinal plants materials (19)

Physicochemical and Phyto-cognostical studies: The loss on drying(14-15), ash value (16-7), foaming index(18), swelling index(13,19), phytochemical screening(20-22), microscopy(23-24), extractive value (petroleum ether, chloroform, methanol and water), foreign matter were determined according to the official methods of Ayurvedic Pharmacopoeia of India.(14,25-28), Indian Herbal Pharmacopeia (29) and the WHO guidelines (13).

Extraction method: The powdered plant material was extracted with methanol, aqueous respectively using a maceration process. The extracts were concentrated to dryness in vacuum individually to get Methanol extract (METC), Aqueous extract (AETC) respectively. The yield of methanol, aqueous extracts were 9.01, 8.03% w/w respectively. The extracts are stored in a desiccator.

RESULT AND DISCUSSION

The macroscopical study of the leaves of *Tinospora cordifolia* (Willd) Miers stem was done. The stems were grey brown in color. Large, glabrous, perennial, deciduous, climbing shrub, Up to 2 cm in diameter and have corky bark (Table-1). The values of the physical constant like ash values, foreign matter and loss on drying were determined. Extractive value and color of extract was investigated (Table-2). Preliminary qualitative phytochemical screening showed that presence of alkaloids, glycoside, steroids and saponins (Table-4). Swelling index contain powered drug 1.1cm. The height of the foam in every test tube was less than 1cm, the foaming index were less than 100 (table-5).

Table 1.Macroscopical evaluation of *Tinospora cordifolia* (Willd) Miers Stem

S.NO	Feature	Observation
1.	Color	Grey brownn
2.	Odour	Characteristic
3.	Taste	Bitter
4.	Shape	Large, glabrous, perennial, deciduous, climbing shrub
5.	Size	Up to 2 cm in diameter and have corky bark

Table 2. Physicochemical analysis of *Tinospora cordifolia* (Willd) Miers Stem

S.NO	Solvent	Weight of plant material (gm)	Percentage of yield(%)	Color of extract
3.	Methanol	4	9.01	Dark brown
4.	Aqueous	4	8.03	Brown

Table 3. Physicochemical parameters of *Tinospora cordifolia* (Willd) Miers Stem

S. No	Physicochemical parameters	Observation
1.	Loss of drying	9.9%
2.	Total ash value	4.1%
3.	Foreign matter	Nil
4.	Swelling index	1.1 cm

Table-4: Phytochemical screening of *Tinospora cordifolia* (Willd) Miers Stem

S. No.	Test	Methanol extract	Aqueous extract
1.	Alkaloids	+	+
2.	Glycosides	+	+
3.	Tannins & phenolic comp.	-	-
4.	Saponins	-	+
5.	Flavanoids	-	-
6.	Carbohydrates	-	-
7.	Steroid	+	+
8.	Amino acids	-	-

(+)- present, (-)-absent

Table 5. Foaming index of *Tinospora cordifolia* (Willd) Miers Stem Extract

Treatment	Sample number of the test tube									
	1	2	3	4	5	6	7	8	9	10
Dilutions(drug extract + water)	1:9	2:8	3:7	4:6	5:5	6:4	7:3	8:2	9:1	10:0
Height of foam(cm)	00	00	00	0.1	0.1	0.2	0.2	0.2	0.2	0.3

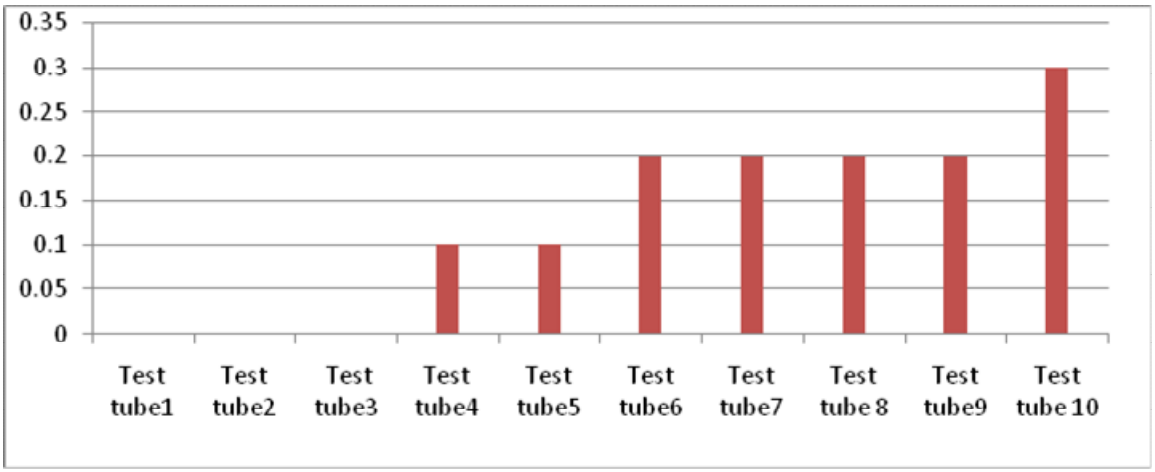

Fig. 1. Height of foam(cm) Microscopy of *Tinospora cordifolia* (Willd) Miers Stem

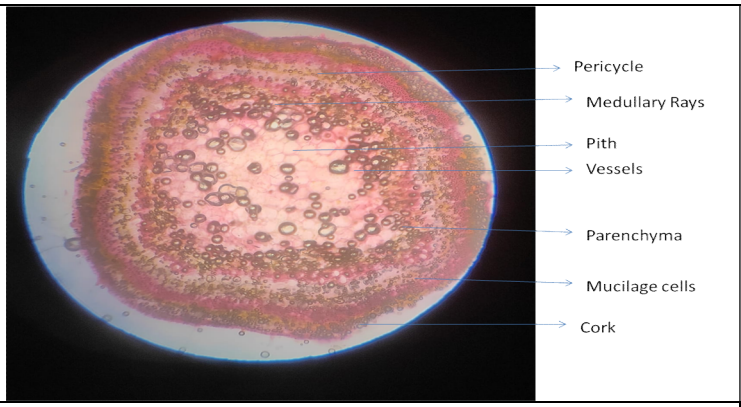

Fig-2: Microscopy of Tinospora cordifolia (Willd) Miers Stem

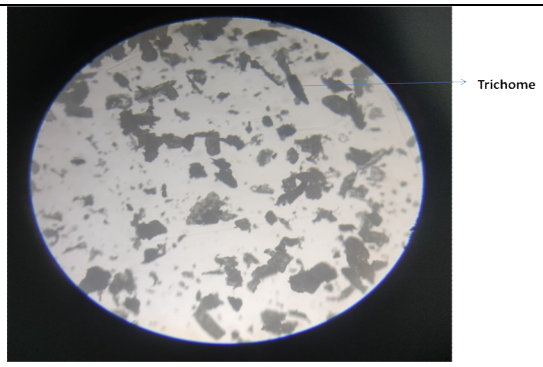

Fig-3:Powder microscopy of *Tinospora cordifolia* (Willd) Miers Stem

The TS of *Tinospora cordifolia* (Willd) Miers stem were showed dorsiventral in symmetry with circular midrib and thin lamina forming wings on either side of the midrib. Also powder microscopy showed trichomes.

CONCLUSION

Preliminary physico-phytochemical study of the *Tinospora cordifolia* (Willd) Miers stem were study concluded to macroscopic, other physical values and parameters will help to identify the species of plant, phytochemical screening will help the presence of compounds, Microscopy is an important tool in the evaluation of crude drugs which is applicable at various levels such as the authentication of the crude drugs, study of powdered drugs, study of T.S.*Tinospora cordifolia* (Willd) Miers stem were is known as wide range of medicinal value, it helps to identification, authentication and standardization. It also require to research on phytochemical and pharmacological aspect. However research going on it would be easier to develop new inovation.

Compliance with ethical standards

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Conflict of Interest: All the authors hereby disclose no conflict of interest.

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