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Phytochemical and Pharmacognostic evaluation of stem of *Pergularia daemia* [Forsk]

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ABSTRACT

Pergularia daemia Forsk a foetid –smelling laticiferous twinner found in the plains throughout the hotter parts of the India, ascending to an altitude of 1,000 m. in the Himalayas Widely distributed in the tropical and sub-tropical area from southern and tropical area. In the present research an attempt has been made for the phermacognostical evaluation and comprise of detailed macroscopic, microscopy, powdered characteristic along with physical constant like ash value, extractive value. The stem extract were subjected to preliminary phytochemical testing. The data obtained in the present study will serve as valuable tool for identification, authentification and detection of adulterants, standardization and quality control of the drug. The develop technique will be useful for standardization of formulation containing stem of Pergularia daemia Forsk.

Keywords: *Perguleria daemia [Forsk], extractive value, ash value.*

INTRODUCTION

Plant introduction:

Since ancient time plant are used as a source of novel drug compound, as plant derived medicines have made large contribution to human health and well being [1, 2]. The plant *Pergularia daemia* [Forsk] (Asclepiadaceae) commonly known as "*Veliparuthi*" in Tamil," *Uttaravaruni*" in Sanskrit and "*Utranjutuka*" in Hindi "*Uttarni*" in Marathi.. Traditionally the plant *Pergularia daemia* is used as anti-helmintic, laxative, antipyretic and expectorant, also used to treat infertile diarrhea and malarial intermittent fevers [3-5]. Latex of this plant used for toothache [6]. Stem bark remedy for cold [7] and fever [8]. Aerial parts of this plant the various pharmacological activities like hepatoprotective [9] antifertility [10] anti diabetic [11] analgesic, anti-pyretic and anti-inflammatory. Phytochemically the plant has been investigated for cardenoloids, alkaloids, and saponins [12]. The plant was found to contain various triterpenes and steroidal compounds [13]. Literature revealed that pharmacognostic studies have not been reported for the stem part of this plant. Therefore the aim of present research is to study macro, microscopical and other pharmacognostic characters and physiochemical standards of stem of *Pergularia daemia* Forsk.

MATERIAL AND METHODS

Plant Material:

The fresh sample of *Pergularia daemia* [Forsk] were collected from surrounding area of railway station, Yeola (August 2014), same was identified and authenticate by Taxonomist Prof. S. E. Saindanshiv, H.O.D. Department of Botany of SSGM College of Arts, Commerce and Science, Kopargaon. The fresh collected stem was dried and cut in smaller pieces as per requirement, remainder was powdered.

1. Pharmacognostic studies:

1.1. Macroscopic:

Morphological study were done by using simple microscope to determine the shape, texture, hairs, and colour also the odour and taste of stem will be done [14].

1.2. Microscopic study:

For anatomical studies a very fine, thin section was taken and they were stained by using various staining reagent like Phloroglucinol, HCl, Sudan red III, Iodine, Acetic acid, and photograph were taken by using Motic images.

2. Physiochemical evaluation:

Physiochemical parameter of stem of *Pergularia daemia* Forsk were determined and reported as total ash, water soluble ash, and acid insoluble ash. Alcohol soluble and water soluble extractive value were determine to find out the amount of alcohol and water soluble compounds [15].

3. Preliminary Phytochemical screening of extract:

For preliminary phytochemical testing, extracts were prepared by weighing 250 gm of powdered of stem and were subjecting it to continuous hot extraction with petroleum ether as a solvent and then by methanol as a solvent. The extracts were filtered separately, concentrated and the solvent was removed by rotary evaporator. The extracts were dried in desiccators and residues were weighed. The presence or absence of primary and secondary phytoconstituent were detected by prescribed methods [16, 17]. The extracts were subjected to preliminary phytochemical test for detection of phytoconstituents. 0.5gm of extract was dissolved in 5 ml of water then filter it and test was performed on filtrate [15].

RESULT AND DISCUSSION

1. Macroscopic features of Pergularia daemia stem:

Fig. 1: Diameter of *Pergularia daemia* stem

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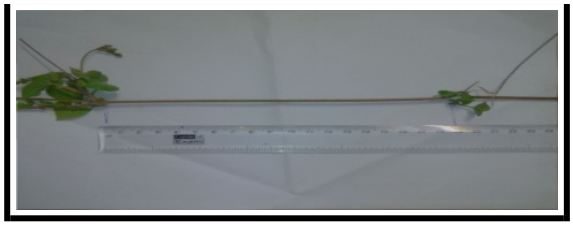

Fig. 2: Internode of *Pergularia daemia* stem

The stem is green to pale green in colour while the young one is slightly pinkish. It has a diameter 1.2-1.9 - 2.6 mm [Fig No. 1]. and internodes measure at 4.7-9.9-14.6 cm. in length. The stem petiole is hairy. Remedy for cold and fever [Fig No. 2] [18].

2. Microscopic character of stem:

Epidermis is an outermost layer consists of thick cuticle. It covers with multi cellular hairs. Cells are compactly arranged and parenchymatous. Cortex forms a few layer below the epidermis. The rest of cortex is parenchymatous. Endodermis layer is of uniserriate cells forms a wavy ring around the vascular tissue. Cells are compactly arranged. Pericycle is in the form of small patches of sclerenchymatous cells. Vascular tissue system shows primary phloem, secondary phloem, cambium, secondary xylem, primary xylem. The patches of secondary phloem occur above the cambium. It comprises vessel and trachieds. The two patches of metaxylem opposite to each are present in the broad extensive region of secondary xylem. Pith is occupied by thin walled parenchyma and also many latex vessels [Fig No. 3].

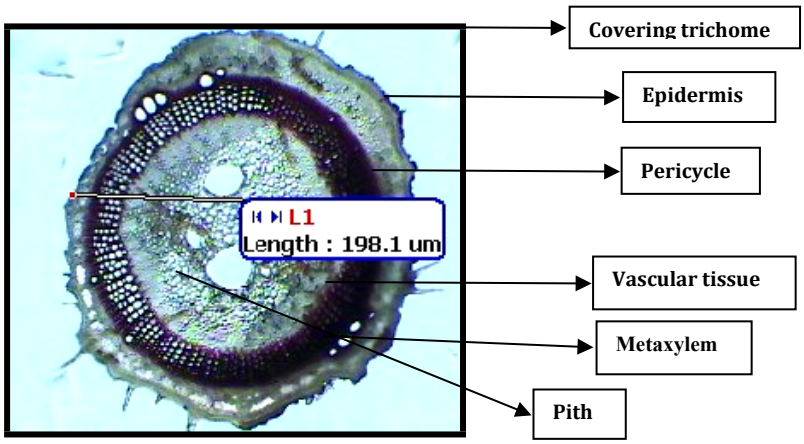

Fig. 3: Transverse section of *Pergularia daemia* stem

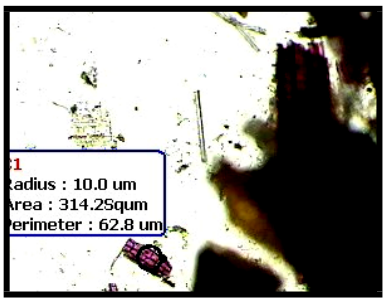

Fig. 4(a): Xylem vessels

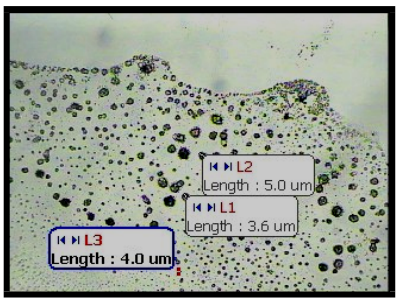

Fig. 4(b): Starch grain

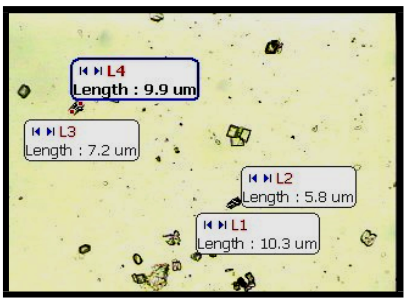

Fig. 4(c): Calcium- oxalate crystals

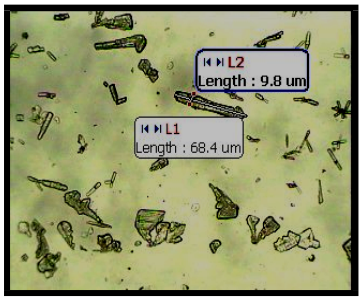

Fig. 4(d): Covering trichome with blunt tips

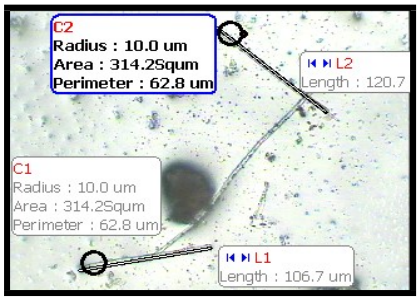

Fig. 4(e): Fibres

Table No. 1: Data showing physiochemical standard value of *Pergularia daemia* Forsk

Physicochemical Parameters of Stem	
Total ash	20.4 %
Acid insoluble ash	1.8 %
Water soluble ash	1.25 %
alcohol soluble extractive value	6.2 %
Petroleum ether soluble Extractive value	1.61%
Methanol soluble extractive value	6.47%
Water soluble extractive Value	12.98 %
Moisture content	20.86 %

3. Physiochemical parameters:

Pergularia daemia stem powder shows the presence of total ash20.4%, acid insoluble ash 1.8%, water soluble ash 1.25%, water soluble extractive 12.98%, alcohol soluble extractive 6.2% and moisture content 20.86% [Table No. 1].

The total ash is particularly important in the evaluation of purity of drugs that is the presence or absence of foreign inorganic matter such as metallic salt or silica. Ethanol soluble extractive value. the physical constant evaluation is an important parameter in detecting adulterants or improper handling or storage of drugs. The moisture content is somewhat high so drug required proper

preservation in rainy season as may be chances of bacterial or fungal growth.

Table No. 2: Data showing qualitative analysis of the phytochemical constituents of *Pergularia daemia* Forsk

Chemical constituents	Petroleum ether extract	Methanol extract
Steroids	+	-
Triterpenoids	+	-
Carbohydrate	-	+
Flavonoids	-	+
Alkaloids	-	+
Glycosides	-	+
Tannins	-	+
Saponins	-	+

4. Preliminary Phytochemical studies:

Preliminary phytochemical analysis of Petroleum ether extract of *Pergularia daemia* [Forsk] stem shows the presence of sterols, tri-terpenoids where as methanol extract of stem of *Pergularia daemia* [Forsk] shows presence of alkaloids, glycosides, tannins, flavonoids and phenolic component. Table no. 2 showed the presence or absence of various phytoconstutuents in different extract. Phytochemical evaluation of plant extract may provide the information regarding various types of phytoconstituents present. Presence or absence of particular type of phytoconstituent in the plant of interest may be helpful, partly in the development of analytical profile and differentiation of contravention plants. Development of analytical profile and differentiation of contravention plants.

CONCLUSION

An Indian medicinal plant are used continuously in many traditional systems throughout the world, their acceptability in modern medicine and in developed country is remarlably low due to lake of standardization. So in present scenario identification and Phytochemical evaluation is important to control the quality of herbal drugs.

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