

Pharmacognostical Evaluation of “Naga guining” Rhizome

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ABSTRACT

“Naga guining” is the common name of *Thalictrum foliolosum* DC. It belongs to family Ranunculaceae. It is a herb with rhizomatous rootstock. In Manipur the rhizome is used in the treatment of fever by the Naga tribes of India. The rhizome is also used in curing piles, dyspepsia, jaundice, diarrhea etc. The present investigation deals with the quantitative and qualitative microscopic evaluation of the rhizome and establishment of its quality parameters, including physicochemical and preliminary phytochemical evaluation. Chief characters of transverse section include periderm, pericyclic bast fibre and elongated cortical cells. Physicochemical parameters were also established. Preliminary Phytochemical screening revealed the presence of phytoconstituents such as alkaloids, terpenoids, saponins, anthraquinone glycoside and cardiac glycoside. This study can be a reliable tool for determining the status of the plant organ as a crude medicine. It will also serve as an important parameter for Pharmacological investigations and also ensuring quality formulations in future.

Keywords: Pharmacognosy, Naga guining, *Thalictrum foliolosum*, Ranunculaceae

INTRODUCTION

Naga tribes of Manipur are gifted with traditional knowledge of herbal practices. These tribes are isolated from the main civilization as they dwell in hilly terrain. Therefore they are totally depended on nature for their survival. The medicine man (Khanong) treats the illness of the people by using the herbal plants. The rhizome of “Naga guining” is used by the Khanong to treat the fever. It is botanically known as *Thalictrum foliolosum* DC.(Family -Ranunculaceae)^{2, 18, 19}. It is an erect perennial rhizomatous herb. The decoction of the rhizome is also used in treating ailments like piles, dyspepsia, hemic rhizome samples were collected from the forest of Manipur with prior permission from the Divisional Forest Officer, Research Institute and Training Division, Imphal.

convulsion, jaundice, flatulence, toothache, nail troubles and as diuretic¹³. In Afghanistan the rhizome is used as an anjan or applied for ophthalmia¹⁰. To put forth the pharmacopoeial standards the present investigation is carried out. The study includes macroscopic and microscopical evaluation, histochemical analysis, determination of physicochemical constants and preliminary phytochemical screening of *Thalictrum foliolosum* rhizome.

MATERIAL AND METHODS

Collection and authentication of plant material: Aut The sample was authenticated for its botanical identity from the standard herbaria at Botanical Survey of India (BSI) Shillong. A voucher specimen has been deposited



Figure 1: Habit of *Thalictrum foliolosum*



Figure 2: *Thalictrum foliolosum* rhizome

in Botany Research Laboratory of K.V. Pendharkar College, Thane, Maharashtra, India (KV 212). Pharmacognostic studies: The macroscopy and microscopy of *Thalictrum foliolosum* rhizome was studied^{11, 16, 20}. Photomicrography of transverse sections of fresh rhizome was taken. Rhizomes were dried under shade and made into powder. The powder study were

carried out using camera lucida and stage micrometer^{7, 8, 9, 12}. Histochemical studies were also done by using various reagents¹⁵(Table 1). Physico-chemical evaluation: Physico-chemical values such as the percentage of ash values (total ash, water soluble and acid insoluble ash) and extractive values (water, alcohol and chloroform soluble extractives) were

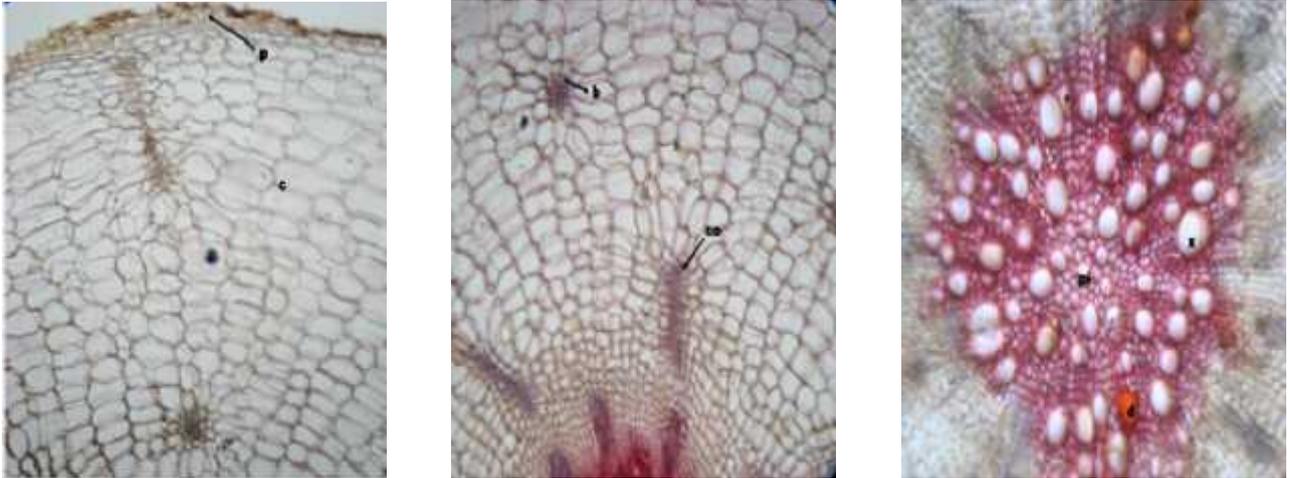


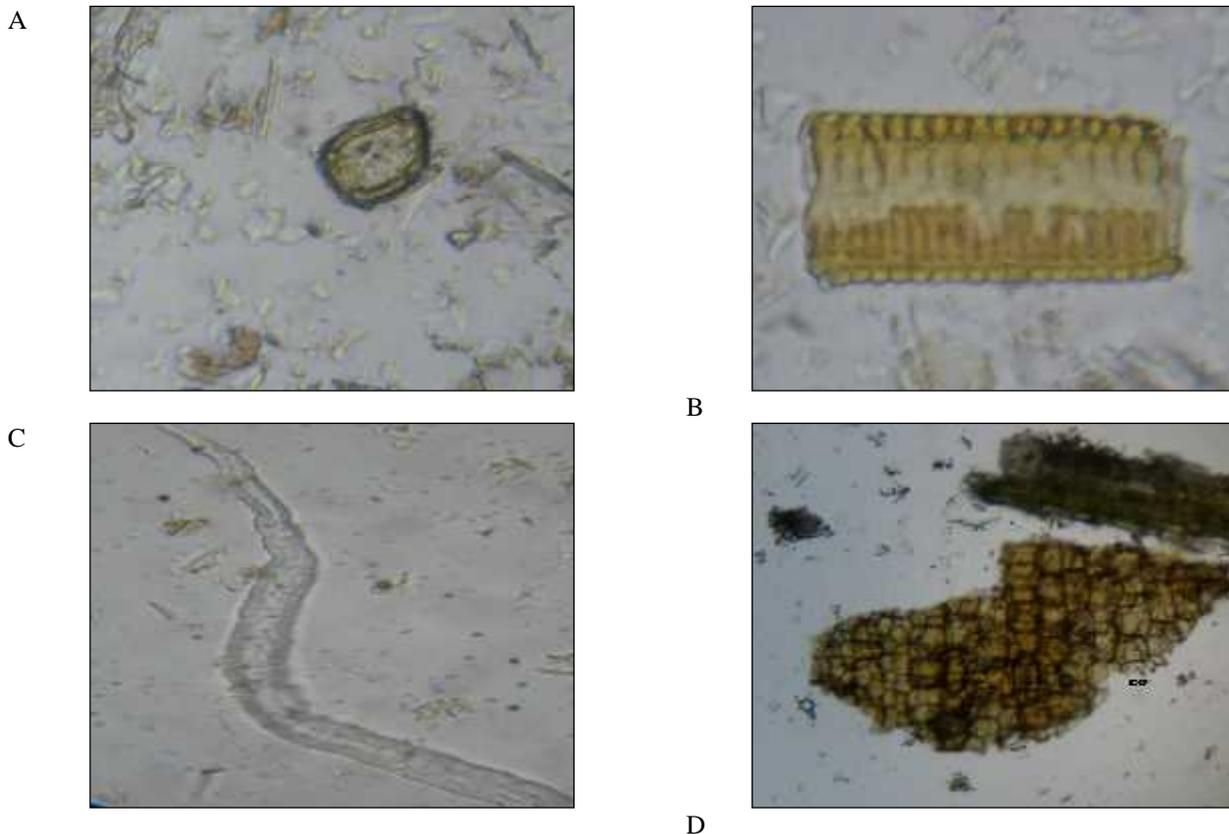
Figure 3: T.S. of *Thalictrum foliolosum* rhizome

A, T.S. of rhizome passing through periderm & cortical region (X 450);

B, T.S. of rhizome passing through cortical region(X 450)

C, T.S. of rhizome passing through vascular region

(p, periderm; c, cortical parenchyma; b, bast fibre; co, elongated cortical cells; x, xylem; d, duct ; pi, parenchymatous pith)



E

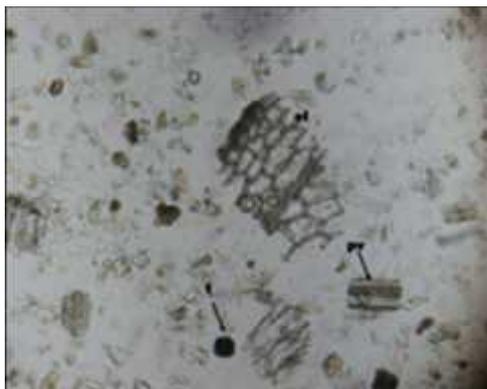


Figure 4: Powder study of *Thalictrum foliolosum* rhizome (X 450)

A, Cork cell; B, scalariform vessels; C, Fiber; D, Cortical parenchyma cells; E,- el, elongated parenchyma cells, t, tannin filled cell, pv, pitted vessels

Table 1 : Histochemical study

Plant constituent Test	Observations
Test for starch	+
Test for Lipids	+
Test for Proteins	+
Test for Tannins	+
Test for Alkaloids	+
Test for Saponins	+
Test for Glucosides	+
Test for Mucilage	+
Test for Calcium oxalate crystals	-
Test for cellulose	+
Test for pectin	+

+ Present, - Absent

Table 2 : Physicochemical evaluation

Ash values	Total ash	Not more than 4.15%
	Acid insoluble ash	Not more than 0.7%
	Water soluble ash	Not more than 1.6%
Extractive values	Ethanol	Not less than 6.6%
	Water	Not less than 35.7 %
	Chloroform	Not less than 1.8%

established using the powdered drug^{1,17} (Table 2).

Fluorescence study: The fluorescence response of powdered drug exposed to U.V. radiations were studied^{4,14} (Table 3)

Preliminary Phytochemical Screening: The powder was extracted with water, alcohol and chloroform. These extracts were tested for their respective phytoconstituents^{3,5,6,17} (Table 4).

RESULTS

Macroscopy: The rhizome is branched, elongated, cylindrical and contorted in shape. It is 8 cm to 15 cm long, 0.5 – 2.0 cm in diameter. Outer surface is brownish while the inner surface is yellowish; the outer surface is smooth with well marked nodes and internodes. It is fibers in fracture. It has strong aromatic odour and bitter taste (Figures 1, 2).

Microscopy

Transverse section of the rhizome show - Phellem : It is made of 4-6 layers, brown colour, compactly arranged

rectangular cells with wavy margin measuring 19.33 – 25.68 – 30.70µm in length and 30.55 – 42.51 – 52.56 µm in breadth.

Phellogen and phelloderm are indistinct.

Cortex: It is compressed due to secondary growth. Each parenchymatous cells are rounded, irregular measuring 45.30 – 75.11 – 100.56µm in diameter. Few tannin filled cells are present in this region.

Endodermis and pericycle are not distinguished. It shows pericyclic bast fibre measuring 15.4 – 22.3 – 28.8µm in diameter. They are found in three fourth layers just above the phloem regions. Each bast fibre is surrounded by elongated cortical parenchyma cells measuring 20.24 – 28.41 – 35.85 µm in diameter.

Phloem: cortical cell is followed by compressed, few layered phloem measuring 23.56 – 32.33 – 44.24µm in diameter, this cell shows prominent rectangular cell wall. Few duct like cells are filled up with yellow colour substances,

Table 3 - Fluorescence analysis

Test	i	ii	iii	iv	v	vi	vii	viii	ix
Fluorescence	3fY	1fY	3gF	2yF	3fY	2yF	3fY	2fY	3gF
<i>Keys to the letters and numbers used-</i>									
<i>Predominant colours:</i>	<i>Modifying colours:</i>			<i>Quality of colours:</i>					
<i>F- Brown</i>	<i>y- Yellowish</i>			<i>2 Light</i>					
<i>Y- Yellow</i>	<i>f- Brownish</i>			<i>3 Dark</i>					
	<i>g- greenish</i>			<i>1 Very light</i>					

Table 4: Preliminary Phytochemical screening

Test for phytoconstituents	W	C	E
Test for Starch	+	+	+
Test for reducing Sugars	+	+	+
Test for Terpenoids	+	+	+
Test for Proteins	+	+	+
Test for Amino acid	+	+	+
Test for Mucilage	+	+	+
Test for Alkaloids	+	+	+
Test for Anthraquinone glycoside	+	+	+
Test for Cardiac glycosides	+	+	+
Test for Cyanogenetic glycosides	-	-	-
Test for Saponin	+	-	-
Test for Tannins	+	+	+
Test for Steroids	+	+	+
Test for Flavonoids	-	-	-

Key: W- water extracts, C- Chloroform extract, E- Ethanol extract, + Present, - Absent

Pith: it is parenchymatous, very much reduced measuring 10.4 – 11.2 – 11.8µm in diameter. (Figures 3. A, B, C)

Powder study: Powder is yellowish in colour and coarse in texture. It has a characteristic odour and bitter taste. Diagnostic microscopic features of the powder include cork cell, cortical parenchyma cells, elongated cortical cells, pericyclic bast fibre, tannin filled cells, fibres, scalariform and pitted vessels and cells with yellow content (Figures 4. A, B, C, D, E).

DISCUSSION

For commercialization and acceptance in the international market, standardization of crude drug including macro and microscopical characters along with pharmacopoeial standards are necessary. In the present work *Thalictrum foliolosum* DC. rhizome was studied for its pharmacognostic details. The macro and microscopical studies along with its powder study will enable the consumer and also the manufacturers to confirm authenticity of the drug. The Phytochemical screening, physiochemical constants and fluorescence analysis do supplement to achieve the genuine drug. Further detailed phytochemical study will be carried out. The antipyretic activity on male albino rats using the said drug is in progress.

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