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Review of Phytochemical and Pharmacological properties of *Thalictrum foliolosum*

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Abstract

Thalictrum foliolosum DC (Ranunculaceae) is a perennial flowering herb traditionally used as a tonic, antiperiodic, diuretic, febrifuge, purgative and stomachic and for the treatment of snakebite, jaundice, and rheumatism.

To provide a critical assessment of the state-of-the-art related to the traditional uses, phytochemistry, and pharmacology of T. foliolosum with the ultimate objective of providing further research strategies to facilitate the exploitation of the therapeutic potential of T. foliolosum for the treatment of human disorders.

T. foliolosum is rich in berberine and other benzylisoquinoline alkaloids. T. foliolosum can be used as an excellent and effective herbal remedy for various human ailments since there are no reports on the toxicity of this herb.

Keywords: Thalictrum foliolosum, 8-Oxyberberine, Alkaloids;Berberine, benzylisoquinoline

Introduction

Thalictrum foliolosum, is an herbal plant having several pharmacological properties including anti- oxidants, anti-cancer, ant-diabetic, hepatoprotective. The root extract of Rubia cordifolia is useful in treating polycystic ovary syndrome by ameliorate the oxidative stress, and enzymes like Glutathione Peroxides, Superoxide Dismutase and rest other parameters increases.

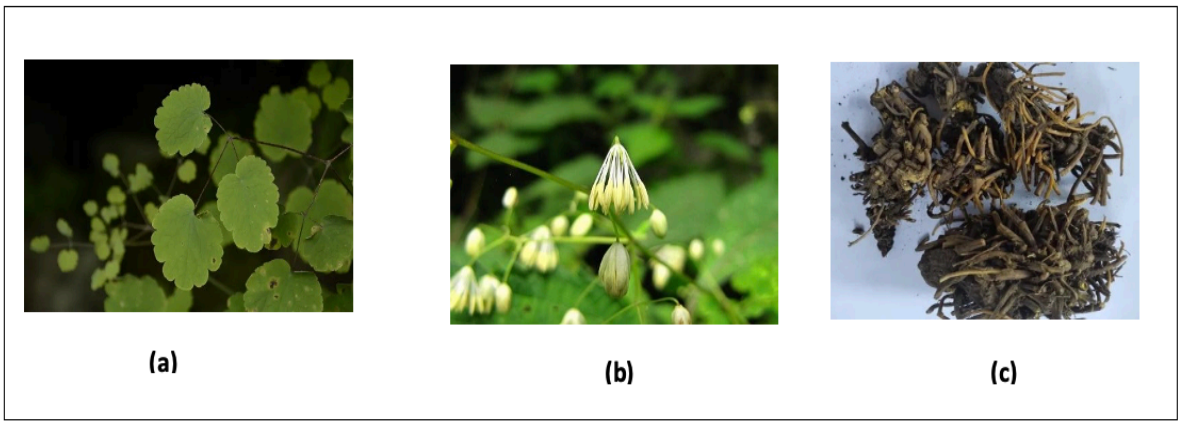

FIGURE 1:

Siyentipikinhong Pagklasipikar	
Kaginharian:	Plantae
Kabahig:	Tracheophyta
Kahutong:	Magnoliopsida
Kahanay:	Ranunculales
Kabanay:	Ranunculaceae
Kahenera:	'**Thalictrum**'
Espesye:	"***Thalictrum foliolosum"***
Siyentipikinhong Ngalan	
Thalictrum foliolosum	
Siyentipikinhong Pagklasipikar	
Kaginharian:	Plantae
Kabahig:	Tracheophyta
Kahutong:	Magnoliopsida
Kahanay:	Ranunculales
Kabanay:	Ranunculaceae
Kahenera:	'**Thalictrum**'
Espesye:	"***Thalictrum foliolosum"***
Siyentipikinhong Ngalan	
Thalictrum foliolosum	

T. foliolosum, a conventional ayurvedic plant, is used by different native population groups in multiple ways because of the various therapeutic uses of its rhizomes, leaves, and stem. The various ethnomedicinal usagesof these herbal medicines are summarized in Table 2.1.

Table 2.1. Ethnomedicinal uses of *T. foliolosum*

Plant part	Uses	Region/Tribe
Leaves	Skin disorder	Himalayan, India
Roots	Antiperiodic	Himachal Pradesh
Dried root powder	Stomach pain and gastric trouble	Shimla (H.P), India
Rhizomes	Cures corneal ulcer, night blindness	Himalayan, India
Roots	Diuretic, febrifuge	Himachal Pradesh, India
Leaves, Roots	Dyspepsia, edema	Meghalaya, India
Roots	Diarrhea, trachoma, hypercholesterolemia	India
Leaves, Roots	Jaundice, rheumatism, and snakebite	Meghalaya, India
Roots	Toothache	Himalayan, India

Phytochemical constituents

Preliminary phytochemical screening revealed the presence of several classes of secondary metabolites such as phenols, alkaloids, saponins, triterpenes, and phytosterols (Bagai and Walter, 2015; Akhilesh et al., 2017). Investigators identified 290 alkaloids from about 80 species of *Thalictrum* (Schiff, 1996). Since the *Thalictrum* genus is rich in benzylisoquinoline-derived alkaloids (Hao, 2018), several reports identified many alkaloids from the leaves, stems or rhizomes of *T. foliolosum*. Several alkaloids such as berberine, jatrorrhizine, palmatine, thalrugosidine, thalrugosaminine, thalisopine (thaligosine), thalirugidine, thalirugine, 8-oxyberberine (berlambine), noroxyhydrastinine, N,O,O-trimethylsparsiflorine, thalicarpine, thalidasine, thalfoliolosumines A and thalfoliolosumines B were reported from T. foliolosum. Ethnomedicinal studies revealed much wider scope of T. foliolosum in developing various drugs to solve multiple challenges in the health sector. Therapeutic effects were attributed to the bioactivities of the secondary metabolites present in T. foliolosum.

Pharmacological properties of *T. foliolosum*

All parts of *T. foliolosum* were reported for the treatment of various diseases, exhibiting a wide range of crucial activities. Many biological assays were used to evaluate the potential pharmacological activities, which can be further exploited to devise formulative cures against widespread diseases in tropical countries like India. Thalictrum foliolosum is a flowering herb with many pharmacological properties, including:

- **Antimicrobial**: Thalictrum foliolosum contains benzylisoquinoline alkaloids (BIQ) that have antimicrobial properties.
- **Anti-inflammatory**: Thalictrum foliolosum is used to treat rheumatism, snakebite, and jaundice.
- **Antipyretic**: Thalictrum foliolosum is used as a febrifuge.
- **Anti-tumor**: Whole-plant extracts of Thalictrum foliolosum have been shown to inhibit cancer cells.
- **Anti-malarial**: Whole-plant extracts of Thalictrum foliolosum have been shown to inhibit the progression of malignant malarial fever.
- **Diuretic**: Thalictrum foliolosum is used as a diuretic.
- **Purgative**: Thalictrum foliolosum is used as a purgative.
- **Stomachic**: Thalictrum foliolosum is used as a stomachic.

Conclusions and future directions

T. foliolosum is widely used in traditional systems of medicine in India since ancient times and its pharmacological properties

was documented revealing the ethnomedicinal importance of this herb. Alkaloids, mainly belonging to the class of benzylisoquinoline are the secondary metabolites found in *Thalictrum* species. Much of the therapeutic potential of this plant can be attributed to them. In addition to the dried roots, the aerial parts of this herb are helpful in antiplasmodial,

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