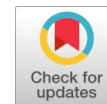


Review on Ventilago Maderaspatana



Velayutham Mani Mala, Ponnudurai Pon Malar, P. Essly Selva Jasmine, Anitha Pramanayakam

Abstract: The plant *Ventilago maderaspatana* belongs to the genus *Ventilago*, within the family *Rhamnaceae*. It's commonly known as the "Red Creeper" and in Tamil as "Surulbattaikkoti". It is a medium-sized plant. Panicles axillary and terminal, to 15 cm long, grey pubescent; pedicels to 3 mm, pubescent; calyx tube obconic, 1 mm, lobes to 2 mm, triangular; petals 1 mm, obovate; stamens 5, opposite to the petals, filaments 1 mm, disc flattened, 5-angled; ovary half inferior, pubescent, style 0.5 mm, stigma shortly bifid. Different qualitative tests for alkaloids, catechin, coumarin, glucoside, flavonoids, saponins, fixed oils, terpenoids, phenols, steroids, anthroquinones, quinines, xanthoprotein and sugar. It exhibits effective pharmacological activity, including antimicrobial, antidiabetic, anti-inflammatory, antibacterial, hepatoprotective, cardioprotective, antihyperlipidemic, antiulcer, antioxidant, and anticancer properties [1]. It contains crucial medical constituent compounds, such as Anthraquinone derivatives Ventinone A and B, chrysophyll, emodine, and islandicin—naphthalene derivatives of naphthalene and maderona. Fruits contain lupeol and sitosterol. Leaf and stem contain their glycosides. Stem bark contains friedelin. The results from this review are quite promising for the use of *Ventilago maderaspatana*, a multipurpose medicinal agent, which has been successfully utilised in Siddha medicine in various countries. More clinical trials should be conducted to support its therapeutic use [2].

Keywords: Chemical Constituents, Pharmacological Activities, Red Creeper, *Rhamnaceae* and *Ventilago Maderaspatana*

I. INTRODUCTION

Man's existence on this earth has been made possible only because of the vital role played by the plant kingdom. Nature always stands as a golden mark to amplify the outstanding phenomenon of symbiosis. Medicinal plants have existed even before human beings made their appearance on the earth. Plants [3] are the primary source of numerous well-established and essential drugs. Additionally, they are the source of some chemical intermediates needed for the production of several drugs.

The active components are generally extracted from all plant structures, but the concentration of these compounds varies.

Vary from structure to structure, however, parts known to contain the highest concentration of the principle are preferred over leaves, stems, barks, roots, bulbs, corms, rhizomes, wood, flowers, fruits, or seeds. Nowadays, natural products are an integral part of the human healthcare system, due to widespread concerns over toxicity and resistance to modern drugs [4]. India is one of the 12 leading biodiversity hotspots, home to over 45,000 different plant species, 15,000-18,000 flowering plants, 23,000 fungi, 16,000 lichens, 18,000 bryophytes, and 13 million marine organisms. From this flora, 15,000 to 20,000 have good medicinal value. Among these, only about 7,000 plants are used in Ayurveda, 600 in Siddha, 700 in Unani, and 30 in modern medicine [5]. Today, due to the development of science and technology, such as chromatography techniques and spectroscopic techniques [6], it is possible to isolate almost all the components of plants and characterise them. Isolating and characterising are very important to improve effectiveness, minimising the dose and onset of action [7]. In this modern era, 75–80% of the world's population still uses herbal medicine, mainly in developing countries, for primary healthcare, due to its better cultural acceptability, compatibility with the human body, and fewer side effects [8].

Ventilago maderaspatana is a large, woody, evergreen climber with branches hanging down in festoons. It is commonly known as red creeper. Bark is dark grey with vertical cracks exposing the vermilion inner bark surface. Leaves are pale green, alternate, oblong lanceolate or elliptic ovate to orbicular, pubescent beneath when young, base generally rounded, apex acute or sub-acuminate, margins crenate; lateral nerves 4- 8 pairs ascending and covering near the margin [9].

II. PLANT DESCRIPTION

Ventilago Maderaspatana plants belong to the genus *Ventilago*, family *Rhamnaceae*. It's commonly known as the "Red Creeper" and in Tamil as "Surulbattaikkoti". It is a medium-sized plant. *Ventilago maderaspatana* is also known as "Vempata" in Malayalam. It is one of the most traditional systems of medicine in Ayurveda and Siddha [11].

Family	<i>Rhamnaceae</i>
Genus	<i>Ventilago</i>
Species	<i>Ventilago Maderaspatana Gaertner</i>
Phylum	<i>Tracheophyta</i>
Domain	<i>Eukaryote</i>
Kingdom	<i>Plantae</i>
Sub Kingdom	<i>Tracheobionta</i>
Division	<i>Magnoliophyta</i>
Sub Division	<i>Radiatopses</i>
Class	<i>Magnoliopsida</i>
Sub Class	<i>Rosidae</i>
Order	<i>Rhamnales</i>
Sub Order	<i>Rhamnanae</i>

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[Fig.1: Leaf with Flowers of Ventilago Maderaspatana]

Table-I: Vernacular Name

Tamil	Surilbattaikkoti
English	Red Creeper
Sanskrit	Raktavalli and Dinesavalli
Hindi	Pitti and Kenwti
Marathi	Sakalvel and Lokhandi
Kannada	Haruge and Kanvel
Telugu	Suralatiga
Malayalam	Vempata
Gujarati	Ragatarohado
Khasi	Mei Bynoh
Oriya	Roktopitta
Konkani	Khamdvel
Assamese	Bor - Kalia
Other Name	Male Mythala and Vembada

III. MORPHOLOGICAL CHARACTERS

A. Leaves

Climbing shrubs have young branchlets that are black when dry. Leaves to 8 x 3.5 cm, ovate-elliptic, apex and base obtuse, crenate along the lower half, coriaceous; petiole to 1 cm. Panicles axillary and terminal, to 15 cm long, grey pubescent; pedicels to 3 mm, pubescent; calyx tube obconic, 1 mm, lobes to 2 mm, triangular; petals 1 mm, obovate; stamens 5, opposite to the petals, filaments 1 mm, disc flattened, 5-angled; ovary half inferior, pubescent, style 0.5 mm, stigma shortly bifid [10].



[Fig.2: Leaves of Ventilago Maderaspatana]

B. Roots

The root bark contains several pigments, the most important being *Ventilago*, a reddish-brown resinous product, and emodine. The colours produced on clothes are pretty fast when a mordant is used [12].

The root bark is used as a carminative, stomachic, and stimulant. The powder of the stem bark, mixed with ginger

oil, is applied externally to treat skin diseases and itching [13].



[Fig.3: Roots of Ventilago Maderaspatana]

C. Flowers

Flower is Small, greenish-yellow coloured, with an offensive odour, in drooping terminal panicles, fascicled on leafless branches. It flowers in winter [14].



[Fig.4: Flowers of Ventilago Maderaspatana]

D. Fruits

Fruit is 5-6 cm, yellowish, globular nuts, supported by the persistent calyx, wing linear oblong, densely velvety, a pea-sized part and an oblong wing, 0.9-1.1 cm wide, surrounded by sepal tube at base. Some fishermen used the long climbing stems as ropes [15].



[Fig.5: Fruits of Ventilago Maderaspatana]

IV. DISTRIBUTION

- **Global Distribution:** Indo Malesia
- **Indian Distribution:** Kerala, Wayanad and Idukki

A. Uses of Ventilago Madraspatana

i. Edible Uses

Seeds – cooked
Oil extracted from the seed is used for cooking.

ii. Medicinal Uses

- The powdered root bark, mixed with gingelly oil, is sometimes used as an external application to treat itch and other skin diseases.
- Medicinal plant traditionally used for the control of various diseases such as dyspepsia, leprosy, pruritus, etc.

iii. Ayurvedic Uses

- The whole plant is used in the treatment of bronchial asthma, jaundice, abdominal disorders, piles and as an aphrodisiac.

iv. Other Uses

- The root bark is used for colouring mordant cotton, wool and silk. Reddish shades are obtained.
- In combination with the root of *Hedyotis umbellata*, a beautiful dark brown colour is obtained.
- The root bark contains several pigments, the most important being *Ventilago*, a reddish-brown resinous product, and emodine. The colours produced on clothes are pretty fast when a mordant is used.
- The bark is a source of tannins.
- A gum is obtained from the plant.
- A fibre obtained from the bark is used for cordage.
- The long stems are sometimes used instead of ropes.

- The wood is pale yellow, porous and soft.
- It is used as fuel

B. Physicochemical Parameter

Physicochemical screening of *Ventilago Maderaspatana* revealed that it possesses good physicochemical parameters, such as total ash, acid insoluble ash, water soluble ash and sulphated ash, which are also determined.

Table-II: Physicochemical Parameter for Whole Plant of *Ventilago Madraspatana*

S. No	Parameters	Observation of the Whole Plant
1	Total ash	10.84 ± 0.26
2	Water-soluble ash	5.04 ± 0.04
3	Acid insoluble ash	2.34 ± 0.03
4	Sulphated ash	12.87 ± 1.21

C. Extractive Value

The extractive values, such as petroleum ether, benzene, chloroform, acetone, methanol, ethanol, and distilled water, are also determined [17].

Table-III: Extractive Values for the Whole Plant of *Ventilago Madraspatana*

S. No	Solvent of extraction	Extractive values (%)
1	Petroleum ether	7.67 ± 0.34
2	Benzene	5.36 ± 0.12
3	Chloroform	5.21 ± 0.17
4	Acetone	8.12 ± 0.13
5	Methanol	8.67 ± 0.11
6	Ethanol	8.88 ± 0.16
7	Distilled water	10.21 ± 0.28

V. PRELIMINARY PHYTOCHEMICAL INVESTIGATION

They are individually tested using different qualitative methods for alkaloids, catechin, coumarin, glucoside, flavonoids, saponins, fixed oils, terpenoids, phenols, steroids, anthroquinones, quinines, xanthoproteins, and sugars [16].

Table-IV: Phytochemical Investigation of Whole Plant of Ventilago Madraspatana

S. No	Type of Phyto Constituents	Petroleum ether extract	Benzene Extract	Ethyl acetate extract	Methanol extract	Ethanol extract
1.	Alkaloids	+	+	+	+	+
2.	Catechin	-	+	-	+	+
3.	Coumarin	+	+	-	+	+
4.	Glycosides	-	+	-	-	-
5.	Flavonoids	-	-	-	-	-
6.	Saponins	-	-	-	-	-
7.	Fixed oil	+	+	+	+	+
8.	Terpenoids	-	-	-	-	-
9.	Phenols	+	+	-	-	-
10.	Steroids	+	+	+	+	+
11.	Anthroquinones	-	+	-	+	+
12.	Quinones	-	-	-	-	-
13.	Tannins	+	+	+	+	-
14.	Xanthoprotein	+	+	-	-	-
15.	Sugar	-	-	-	-	-

VI. PHARMACOLOGICAL USES

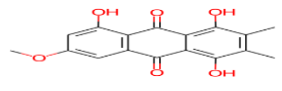
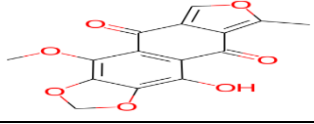
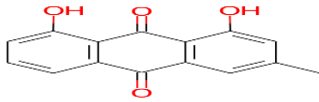
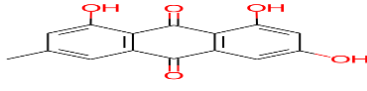
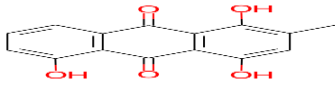
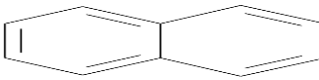
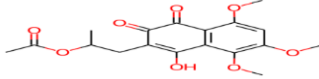
Table-VI: Review of Ventilago Maderaspatana.

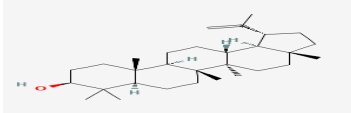
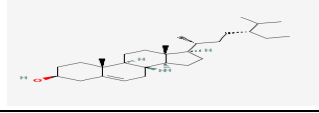
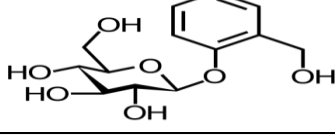
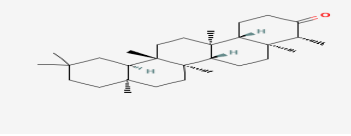
S. No	Part of the Plant used	Solvent used for extraction	Pharmacological Activity
1	Roots	Ethanol, hydro alcoholic and chloroform extract	Antidiabetic activity, Antihyperlipidemia activity, and Antioxidant activity
2	Leaves and Stem	Ethanol and aqueous extract	Antioxidant activity
3	Whole plant	Petroleum ether, benzene, ethyl acetate, methanol and ethanol extract	Antibacterial activity
4	Bark	Ethanol and chloroform extract	Antiulcer activity
5	Leaf	Methanol extract	Antidiabetic activity
6	Roots	Ethanol, hydro alcoholic extract	Antioxidant activity
7	Stem bark	Petroleum ether, benzene, ethyl acetate, methanol and ethanol extract	Antimicrobial and antibacterial activity
8	Whole plant	Methanol extract	Cardio protective activity
9	Bark	Ethanol extract	Hepatoprotective activity
10	Stem bark	Ethanol extract	Anti-inflammatory and anticancer activity

A. Chemical Constituents of Ventilago Maderaspatana

- The root bark contains Anthraquinone derivatives Ventinone A & B, chrysophyll, emodine and islandicin.
- Napthalene derivatives of napthalene and maderona.
- Fruits contain lupeol and sitosterol.
- Leaf and stem contain their glycosides.
- Stem bark contains friedelin.

Table-: Phytochemical Constituents for the Whole Plant of Ventilago Maderaspatana

S. No	Part of Plant	Chemical constituents	Chemical structure
1	Root bark (Anthroquinone Derivatives)	Ventinone-A	
2	Root bark (Anthroquinone Derivatives)	Ventinone-B	
3	Root bark (Anthroquinone Derivatives)	Chrysophrol	
4	Root bark (Anthroquinone Derivatives)	Emodine	
5	Root bark (Anthroquinone Derivatives)	Islandicin	
6	Root bark (Anthroquinone Derivatives)	Napthalene	
7	Root bark (Naphthoquinone Derivatives)	Maderona	

8	Fruits	Lupeol	
9	Fruits	Sitosterol	
10	Leaves	Glycosides	
11	Stem bark	Friedelin	

VII. RESULT AND DISCUSSION

The survey of literature on *Ventilago madraspatana* has determined physicochemical parameters, including total ash ($10.84 \pm 0.26\%$), acid-insoluble ash ($5.04 \pm 0.04\%$), water-soluble ash ($2.34 \pm 0.03\%$), and sulphated ash ($12.87 \pm 1.21\%$). The extractive values such as petroleum ether (7.67 ± 0.34), benzene (5.36 ± 0.12), chloroform (5.21 ± 0.17), acetone (8.12 ± 0.13), methanol (8.67 ± 0.11), ethanol (8.88 ± 0.16) and distilled water (10.21 ± 0.28) extractive are also determined. They are individually tested using different qualitative methods for alkaloids, catechin, coumarin, glucoside, flavonoids, saponins, fixed oils, terpenoids, phenols, steroids, anthroquinones, quinines, xanthoproteins, and sugars. It exhibits effective pharmacological activity, including antimicrobial, antidiabetic, anti-inflammatory, antibacterial, hepatoprotective, cardioprotective, antihyperlipidemic, antiulcer, antioxidant, and anticancer properties. It contains crucial medical constituent compounds, such as Anthraquinone derivatives Ventinone A and B, chrysophyll, emodine, and islandicin. Naphthalene derivatives of naphthalene and maderona. Fruits contain lupeol and sitosterol. Leaf and stem contain their glycosides. Stem bark contains friedelin. The results from this review are promising for the use of *Ventilago madraspatana*, a multi-purpose medicinal agent. Although *Ventilago madraspatana* has been used successfully in Siddha medicine for centuries, further clinical trials are needed to support its therapeutic use. Moreover, the therapeutic potential of the plant should also be checked when used in combination with other herbal drugs.

VIII. CONCLUSION

Ethnobotanical and traditional uses of natural compounds, especially those of plant origin, have garnered significant attention in recent years, as they have been well-tested for their efficacy and are generally considered safe for human use. Traditionally, plants have been used in the treatment of various infections and systemic disorders. Hundreds of chemical compounds are derived from plants, which have medicinal values due to their health-enhancing and therapeutic properties, and are referred to as herbs. Through

the screening of available literature on *Ventilago madraspatana*, it is evident that it is a popular remedy among various ethnic groups, possessing Siddha and Ayurvedic properties.

DECLARATION STATEMENT

After aggregating input from all authors, I must verify the accuracy of the following information as the article's author.

- **Conflicts of Interest/ Competing Interests:** Based on my understanding, this article has no conflicts of interest.
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- **Ethical Approval and Consent to Participate:** The content of this article does not necessitate ethical approval or consent to participate with supporting documentation.
- **Data Access Statement and Material Availability:** The adequate resources of this article are publicly accessible.
- **Authors Contributions:** The authorship of this article is contributed equally to all participating individuals.

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