

# A Review on ethnomedicinal claims of *Merremia gangetica* Linn.

## Review Article

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### Abstract

**Aim:** The medicinal plant *Merremia gangetica* Linn., family - Convolvulaceae, traditionally being used by the local healers due to its multiple therapeutic indications. Present review aims to collect currently available data on ethno-medicinal information and research updates on *M. gangetica*. **Material and Methods:** Available books related to traditional folklore uses of *M. gangetica* were searched from ethno-medicinal plants and published research articles. Along with various researches, name of reporting tribe and their place using the plant, vernacular names, parts used along with the therapeutic uses with specific methods of administration, if any, through either external or internal usages were also noted. **Results:** Across the globe in 2 countries and 8 states of India, *M. gangetica* has been reported for its traditional folklore therapeutic uses and in the management of 32 diseases conditions, various parts of the plants like whole plant, leaf, root and seed alone or along with other drugs are used either through external applications or internal administration. Maximum indicated in the treatment of rheumatism, neuralgia, headache, cough, etc. were reported. Whole plant has maximum application in 14, followed by leaf in 8, root in 4 and seed in 1 diseases condition. Pharmacological studies such as anti-arthritis, hepatoprotective, nephroprotective activities, etc. were also reported. **Conclusion:** *M. gangetica* is a folklore ethnomedicinal plant being used as medicine in rheumatism, neuralgia, headache, cough, etc. and also to establish its ethnic claims, plant need scientific evaluation through pharmacological and clinical studies.

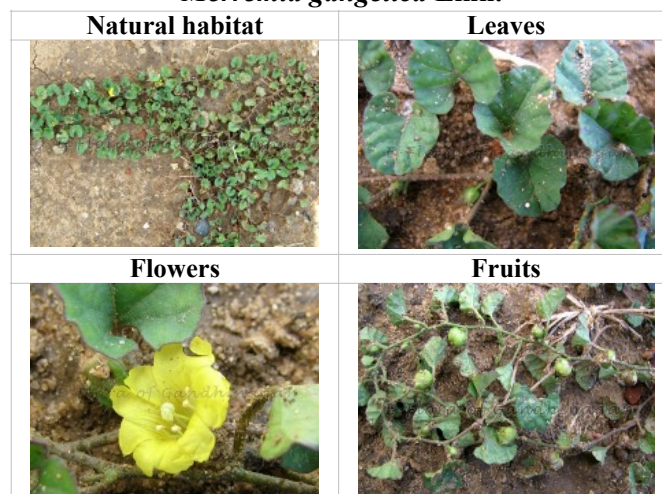
**Key Words:** *Akhukarni*, Convolvulaceae, Ethnomedicine, Folklore, *Merremia gangetica*.

### Introduction

The World Health Organization (WHO), has estimated that 80% of the global populations rely mainly on traditional medicine. In India 70 % of the population and more than 550 tribal communities relies on ethno-medicine which is the major source of their primary health care needs. So, it is necessary to collect all information from the tribe for the use of human kind (1).

*Akhukarni* (*Merremia gangetica* Linn.), syn. *Ipomoea reniformis* (Roxb) Choisy. is a folklore medicinal plant with encouraging ethnomedicinal claims belonging to the, family Convolvulaceae. Information on ethno-medicinal uses of the *M. gangetica* is scattered over the multiple years, different platforms i.e. journals, reports, book, web-based sources and in different presentation formats i.e. surveys, glossaries, reviews and notes amongst other. Hence, in the present article, an attempt has been made to collect the currently available data information in one treatise.

**Fig.1: General plant morphology of *Merremia gangetica* Linn.**



### Materials and Methods

#### Data collection

Information on all reported ethno-medicinal uses and claims of the *Merremia gangetica* Linn. were compiled from ethno-medicinal research articles from library source as well as from Google scholar, Shodhganga and Researchgate web-based search engines, journal and presented in systematic manner.

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## Study selection

### Inclusion criteria

Publication that described the ethno-medicinal use of *M. gangetica* (alone or with any combination of other herbs) to treat any diseases condition on human either with external or internal application were included in the review with no language restriction and date limitation.

### Exclusion criteria

Other species of *Merremia* were excluded from the present review.

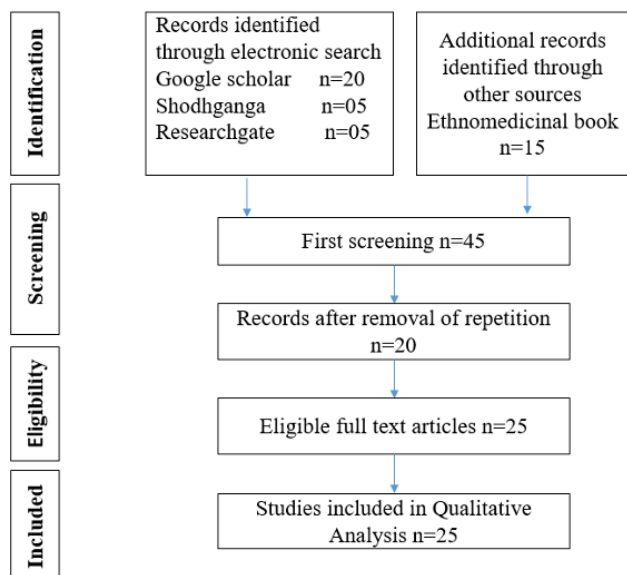
The obtained data are arranged systematically in a tabular form, with regard to various local names, as known by different tribes across India, name of the tribe and their area of presence, part used, therapeutic indication, external (E) and internal (I) usage of the drug are also noted in a separate column with individual references.

## Result and Discussion

### Literature acquired

In the present study, a total of 45, i.e. 15 from ethnomedicinal book and 30 abstracts were identified from electronic search. The search identified 30 articles, 20 with from Google scholar, 5 from Shodhganga and 5 from Researchgate. After the removal of repetition, as well as screening from relevant titles and abstracts, a total of 25 articles underwent a full text review (Fig.2).

**Fig 2: Graphical presentation of collected Ethnomedicinal data**



### Availability

*Merremia gangetica* is a procumbent herb, with leaves reniform, glabrous and possess yellow colour flowers, which mainly grows in rainy & winter season and widely distributed all over the India, especially in damp places in upper gangetic plain, Gujarat, Bihar, West Bengal, Western-Ghats, ascending up to 900m in the hills, Goa, Karnataka in India, Ceylon and Tropical Africa (2) (Fig.3).

### Plant description

*Merremia gangetica* Linn. is a procumbent herb. Stems numerous, filiform, creeping, rooting at the nodes and twining, clothed with scattered long soft hairs. Leaves 1.3-2.5 cm. broad, usually broader than long, reniform or ovate-cordate, obtuse, crenate, glabrous; petioles 6-25 cm. long, hairy. Flowers yellow, axillary, solitary or few (usually 2-30 together on a very short (often almost obsolete), peduncle; bracts small, ovate, acute, hoary; pedicels short; sepals slightly hairy on the back, strongly ciliate on the margins, the 2 outer 4mm.long, ovate mucronate, the 3 inner longer reaching nearly 6 mm. long, sub-quadrate, deeply divided at the apex into 2 truncate divaricate lobes; corolla 6 mm long, lobes of the limb acute. Capsules 4-5 mm diameter, sub-globose, smooth, surrounded by the slightly enlarged ciliate sepals. Seeds glabrous, dark chestnut coloured, strongly ciliate 2-lobed inner sepals are marked character (3) (Fig.1).

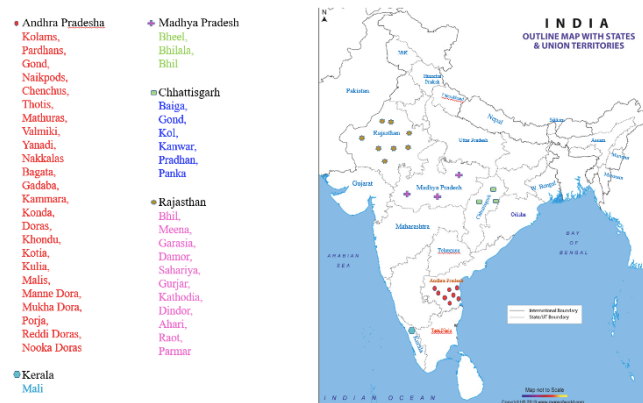
### Used by tribes

*M. gangetica* is used by 45 different tribes/communities to combat various diseases condition in 8 states of India (Table 2, 3 & Fig.3).

### Local name

*M. gangetica* is known by 15 names in 8 language. In eastern part of India, it is known as **Hindi:** *Musakani, Chuhakani*. **Bengali:** *Indurkani, Bhuikamri*. Central part in **Madhya Pradesh:** *Phopshina, Sarsundari, Karah, Undirkani*. **Chhattishgarh:** *Muskenibhaji, Udirkani*. Northern part in **Marwadi:** *Poli*. Western part in **Gujarati:** *Udiramani, Underakani*. **Marathi:** *Udiramani, Underkani, Udircani*. Southern part in **Malyalam:** *Elika jeevaku*. **Tamil:** *Elikatu kirai, Elikathu keerai or paratai keerai, Paerattae-kirae*. **Telugu:** *Elukachevi Aku, Elikajimudu, Yelakachevikoora, Yelakajeevaku Nallakula tiga, Toinnuatali*. Other countries in **English:** *Kidney leaf morning glory*. **Pakistan (Urdu):** *Chukakani*. **Iran (Persian):** *Chukakani* (4),(5),(6),(7),(8),(9),(10),(11), (12),(13),(14),(15),(16) (Table 2, 3).

**Fig.3: Use of *M. gangetica* by different tribes in various Indian states**



### Area of reporting

It is observed that *M. gangetica* is being used as medicine in 8 states of India, namely Andhra Pradesh, Chhattisgarh, Kerala, Rajasthan, Madhya Pradesh, Maharashtra, Telangana, Tamil Nadu. (Table 2, 3).

### Therapeutic uses

Various parts such as whole plant, leaf, root, seed and unspecified plant part are observed to be used in 32 different disease condition (Table 1).

**Table 1: Reported uses of *M. gangetica* in various disease conditions**

Sr. No.	No. of claims	Diseases condition	Area of reporting (part used)
1	4	Rheumatism	Chhattisgarh (-); Andhra Pradesh, Maharashtra (Wp); - (-)
2	3	Cough	Chhattisgarh (-); Maharashtra (Wp); - (-)
		Headache	Chhattisgarh (-); Maharashtra (Wp); - (-)
		Neuralgia	Chhattisgarh (-); Maharashtra (Wp); - (-)
3	2	Diuretic	- (R); - (-)
		Eye disease	Andhra Pradesh (R); - (R)
4	1	Inflammation	Tamil Nadu (Wp); - (-)
		Anti-bacterial	Chhattisgarh (-)
		Anti-cancer	Chhattisgarh (-)
		Antidote to snake bite	Madhya Pradesh (Wp)
		Fever	- (-)
		Blister	Andhra Pradesh (L)
		Diabetes	- (L)
		Epileptic seizures	- (L)
		Gum disease	- (R)
		Haemorrhoids	Tamil Nadu (Wp)
		Hair growth	Madhya Pradesh (L)
		Hemiplegia	Tamil Nadu (Wp)
		Jaundice	Andhra Pradesh (L)
		Kidney disease	- (-)
		Kidney stone	Andhra Pradesh (Wp)
		Laxative	Tamil Nadu (Wp)
		Nose problem	- (-)
		Pimples	Chhattisgarh (L)
		Purgative	-
		Rheumatoid arthritis	- (Wp)
Sexual debility	Rajasthan (S)		
Stomach problem	Telangana (Wp)		
Swelling	Maharashtra (L, F, R)		
Swelling throat	Kerala (Wp)		
Uropathy	Tamil Nadu (Wp)		
Wound	Andhra Pradesh (L)		

Not reported “- “; Whole plant (Wp); Root (R); Leaf (L); Flower (F); Seed (S); (-)-Unspecified plant part

### Parts used

It was observed that various parts of the plant are claimed for ethnomedicinal uses, among them the highest claim was reported for whole plant followed by leaf, root and seed of *M. gangetica*, alone or along with other drugs in the management of 32 diseases conditions either through external applications or internal administration. About 12 internal application and 4 external administration are reported, among them the highest in claims are for leaf (8) (internal 6, external 2); whole plant (4) (internal 4); root (2) (internal 1, external 1); seed (1) (internal 1) diseases condition, but for various plant parts, it was reported that the application or administration method external or internal are not reported. In some study plant parts are not specifically noted (Table 2, 3).

### Dosage form

Whole plant, leaf, root and seed of *M. gangetica* are used in 3 dosage form i.e. juice (6), decoction (4) and infusion (1) (Table 2, 3).

**Table 2: Ethno-medicinal claims of *M. gangetica***

Sr. No.	Local names	Tribes/Areas	Dosage form Internal(I)/External(E)	Therapeutic claims
1	<i>Phopshina</i>	Bheel / Guna, M.P.	Whole plant	Antidote-Snakebite (14)
2	<i>Elika jeevaku</i>	Mali / Kerala	Whole plant	Swelling throat (18)
3	<i>Kupit-Kupit</i>	-	Whole plant	Rheumatoid arthritis (13)
4	<i>Elikathilai</i>	Namakkal, T.N.	Whole plant	Laxative, Hemiplegia, Inflammations, Uropathy Hemorrhoids (15)
5	<i>Yelakachevikoora</i>	Anatapura, A.P.	Whole plant (50 ml twice a day for 15 days) (I)	Kidney stone (12)
6	-	Adilabad, Telangana	Whole plant Decoction (I)	Stomach problems (19)
7	<i>Undircani</i>	Yavatmal, Maharashtra	Whole plant in form of Decoction (I)	Cough, Headache, Neuralgia, Rheumatism (6)
8	<i>Elika jimudu</i>	Valmiki / Gangaraju Madugula, A.P.	Whole Plant decoction take internally (I)	Rheumatic pain (11)
9	<i>Sarsundari, Karah</i>	Bhil, Bhilala / Jhabua, M.P.	Leaves Juice is massaged on head (E)	Hair growth (14)
10	<i>Yelakajeevaku</i>	Kolams, Naikpods, Pardhans, Gonds, Thotis, Chenchus, Mathuras / Adilabad, A.P.	Leaf juice orally twice in a day for three days (I)	Blisters (4)
11	-	-	Leaves juice (I)	Purgative (5)
12	<i>Yelakajeevaku</i>	Kolams, Naikpods, Pardhans, Gonds, Thotis, Chenchus, Mathuras / Adilabad, A.P.	Leaf extract 10ml orally (I)	Wounds (4)
13	<i>Undirkani</i>	Bhil, Bhilala / Jhabua, M.P.	Leaves decoction (I)	Pimples (16)
14	<i>Elikajemudu</i>	Yanadi, Chenchu, Nakkalas / Nellore, A.P.	Leaf powder Infusion 30 ml orally twice for a week daily (I)	Jaundice (10)
15	-	-	Leaves powder (I)	Diabetes (17)
16	-	-	Leaf powder as Snuff (E)	Epileptic seizures (5)
17	<i>Nallakula tiga</i>	Bagata, Gadaba, Kammara, Konda Doras, Khondu, Kotia, Kulia, Malis, Manne Dora, Mukha Dora, Porja, Reddi Doras, Nooka Dora and Valmiki / Pedabayalu Mandalam, A.P.	Root	Eye disease (8)
18	-	-	Root (E)	Eye & gum disease (5)
19	-	-	Root (I)	Diuretic & Laxative (5)
21	<i>Popli</i>	Bhil, Meena, Garasia, Damor, Sahariya, Gujar, Kathodia, Dindor, Ahari, Raot, Parmar / Rajasthan	Extract of 10-12 Seeds is taken orally by the tribal men for 10-12 days (I)	Sexual debility (9)
22	<i>Undircani</i>	Yavatmal, Maharashtra	A mixture of the root and powdered leaves of plant and flowers (E)	Swellings (6)

-- "Not Reported; Andhra Pradesh (A.P.); Tamil Nadu (T.N.); Madhya Pradesh

**Table 3: Ethno-medicinal claims of *M. gangetica* with unspecified plant parts**

Sr. No	Local Names	Tribes/Areas	Dosage form Internal(I)/ External(E)	Therapeutic claims
1	<i>Udirkani</i>	Baiga, Gond, Kol, Kanwar, Pradhan, Panka / Bilaspur, Chhattisgarh	-	Cough, Headache, Neuralgia, Rheumatism (9)
2	<i>Muskenibhaji</i>	Bilaspur, Chhattisgarh	-	Anti-cancer, Anti-bacterial (20)
3	-	-	-	Cough, Headache, Neuralgia, Rheumatism, Diuretic, Inflammation, Troubles of nose, Fever & Kidney diseases (5)

-- "Not Reported

### Recent Researches

#### Phytochemistry

Very few researches have been reported on pharmacognostical characters of *M. gangetica*. The plant reported presence of carbohydrates, reducing

sugars, glycosides, stigma steroids, alkaloids, triterpenoids, phenolic compounds, tannins, flavonoids, tartaric acid, malic acid, ferulic acid, gums and mucilage (13),(21),(22),(23),(24) .



### Pharmacology study

Different parts had been reported for their anti-arthrititis, anti-bacterial, anti-urolithiatic, nephroprotective, anthelmintic, antimicrobial,

antidiabetic, hepatoprotective and antioxidant activities (Table 4).

**Table 4: Research updates of *Merremia gangetica* Linn.**

Sr. No	Part Used	Ethnomedicinal claims	Extraction medium	Activity reported
1	Whole plant	Rheumatism, Rheumatoid Arthritis, Swelling	Ethanol	Anti-arthrititis Activity (13)
		Cough	Methanol	Anti-bacterial activity (25)
		Kidney stone	Methanol	Anti-urolithiatic activity (26)
		Uropathy	Ethanol	Nephroprotective activity (27)
		Stomach problem	Ethyl acetate	Anthelmintic activity (28)
2	Leaf	Pimples, wounds	Ethyl acetate	Anti-microbial activity (29)
		Diabetes	Methanol	Anti-diabetic activity (30)
		Jaundice	Methanol, Ethanol	Hepatoprotective Activity (31)
3	Seed	Sexual debility	Methanol	Anti-oxidant activity (32)
4	Root	Eye & Gum disease	Methanol	Anti-bacterial activity (25)

### Discussion

*Akhukarni (Merremia gangetica* Linn.), is a folklore medicinal plant with encouraging ethnomedicinal claims belonging to the, family Convolvulaceae. *Merremia gangetica* is a procumbent herb, with leaves reniform, glabrous and possess yellow colour flowers, which mainly grows in rainy & winter season and widely distributed all over the India. The plant also known by 15 names in 8 language and being used as medicine in 8 states of India, by 45 tribes to cure 32 disease condition such Rheumatism, Cough, Headache, Neuralgia, Fever, Kidney diseases, etc. Various parts of the plant i.e. whole plant, leaf, root and seed are being commonly used by tribes as 12 internal administration i.e. in 3 dosage form i.e. juice (6), decoction (4) and infusion (1) and 4 external application.

It was observed that the administration or application method i.e. internal or external and some plant parts are not specifically reported, hence, those claims are noted separately of unspecified plant part (Table 3). Various therapeutic claims had been reported without noting the exact parts used of the plant, the same therapeutic claims i.e. Cough, Headache, Neuralgia, Rheumatism made by different authors with specific parts used i.e. whole plant and this may be considered as the parts used.

The plant reported presence of carbohydrates, reducing sugars, glycosides, stigma steroids, alkaloids, triterpenoids, phenolic compounds, tannins, flavonoids, tartaric acid, malic acid, ferulic acid, gums and mucilage. So, in the detection of the bioactive principles present in medicinal plants, phytochemical serves as a valuable tool. Hence, may help in drug discovery and development by pharmaceutical companies. The plant extract could be explored for its highest therapeutic efficacy in order to develop safe drugs for various diseases (33).

Flavonoids one of the most powerful water soluble antioxidants and free radical scavengers, help

in preventing oxidative cell damage and exhibit anti-cancer effect (33). The phytochemical provides usefulness in various pharmacological activities and these phytoconstituents are responsible for anti-arthrititis (13), anti-bacterial (25), anti-urolithiatic (26), nephroprotective (27), anthelmintic (28), anti-microbial (29), anti-diabetic (30), hepatoprotective (31), anti-oxidant (32), and anti-cancer (33) activities.

### Conclusion

*M. gangetica* is a folklore ethnomedicinal plant being used as medicine in 8 states of India, by 45 tribes to cure 32 disease condition. Various parts of the plant i.e. whole plant, leaf, root and seed are being commonly used by tribes as 12 internal administration and 4 external application. Some unspecified plant part and special folklore claims can be taken as mains for further studies and future research being used in Cough, Headache, Neuralgia, Rheumatism, Diuretic, Inflammation, Troubles of nose, Fever, Kidney diseases, etc. and also to establish its ethnic claims, plant need scientific evaluation through pharmacological and clinical studies.

### Consent

It is not applicable.

### Ethical Approval

It is not applicable.

### Acknowledgement

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### Competing interest

Authors have declared that no competing interest exist.

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