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## A review on the ethnobotanical importance of *Cosmostigma racemosum* (Roxb.) Wight (*Vaattuvalli*)

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### Abstract

Ethnobotany deals with the inter relationship between the humans and plant resources of a particular region. *Cosmostigma racemosum* (Roxb.) Wight is an ethnobotanically important plant of Apocynaceae family, having many traditional and folklore usages. A compilation of botanical description, ethnobotanical uses and research works of the plant are done. *Cosmostigma racemosum* (Roxb.) Wight which is known as *Vaattuvalli* in *Malayalam* is a twiner with simple, opposite, cordate leaf, terete, puberulous stem and racemose axillary or sublateral cymose inflorescence. Leaves have a peculiar chilly like odour. Leaf paste is used for healing of wounds by the tribal healers. Root bark of the plant are said to be excellent cholagogue. The bark is useful in chronic fevers. The flowers are edible and the plant is also eaten as a vegetable in diabetes among the tribals. Ethnobotanically important plants are to be documented and validated scientifically as it may lead to the preservation of many valid folklore knowledges and also that particular plant species.

**Keywords:** *Cosmostigma racemosum* (Roxb.) Wight, *Vaattuvalli*, *Wattuvalli*, Ethnobotany, Hortus Malabaricus

### 1. Introduction

Man has always been dependent on plant resources for his various needs from the very ancient period itself whether it is for food, medicines or shelter. Acharya Vagbhata, in his book *Ashtanga Hridaya*, mentions that there is nothing on this word which is non medicinal [1]. This can be implied for plants too. But the fact is that we have only a little knowledge about the pharmacological properties of the nearly one lakh identified species of flora. The Ayurvedic classics have descriptions of about one thousand vegetable drugs only. There are also a lot of medicinal plants which are being used by the tribal healers and traditional practitioners which are less known to the outside world. *Hortus malabaricus*, a botanical treatise of 16<sup>th</sup> century, written by Hendrik Van Rheed, also contains descriptions about several medicinal plants with pictures and their therapeutic uses [2]. Proper identification, documentation and scientific validation of these plants and their uses, through further studies are to be done for the advancement of science. This also helps in the sustainable utilization of plants in this declining era of plant resources. *Cosmostigma racemosum* (Roxb.) Wight (Figure 1 a, b) [abbreviated as CR], is a green milky weed climber found in almost all districts of Kerala. Descriptions of the plant are found in the 7<sup>th</sup> volume of *Hortus malabaricus* and also in various ethnobotanical surveys. The plant is also being used by the tribals and traditional healers of Northern part of Kerala for various ailments.

### 2. Materials and Methods

Information regarding CR were collected from literatures on traditional practices primarily *Hortus malabaricus* and from search engines as PubMed, Google Scholar etc.

### 3. Results and Discussion

The results obtained from the literature review are presented under the headings vernacular names, taxonomy, botanical descriptions, conservation status, parts used, phytoconstituents, ethnobotany and therapeutic use.

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**Fig 1a):** *Cosmostigma racemosum* (Roxb.) Wight whole plant b) Flower

### 3.1 Vernacular names <sup>[2-5]</sup>

The vernacular names of CR are:-

**Malayalam:** Vattolam, Wattouvali/Vaattuvali, Kuruppakkodi, Kariveppilakkurunji

**Tamil:** Perum kahmughan kodi

**Kannada:** Ghara hoovu gida

**Goa:** Ghurphul

**Marathi:** Jaati, Marvel, Shendvel

**Rajasthani:** Raidhodi

**English:** Green milkweed creeper

**Portuguese:** Torique

**Belgian:** Penshout

### 3.2 Botanical description <sup>[3]</sup>.

**Botanical name:** *Cosmostigma racemosum* (Roxb.) Wight

**Synonyms:** *Asclepias racemosa* Roxb, *Cosmostigma acuminata* Wight

**Family:** Apocynaceae (as per The APG System III)

### Taxonomical position <sup>[6]</sup>

**Kingdom:** Plantae

**Phylum:** Tracheophyta

**Class:** Magnoliopsida

**Order:** Giales

**Family:** Apocynaceae

**Subfamily:** Asclepiadoideae

**Genus:** *Cosmostigma*

**Species:** *racemosum*

### Habitat and Distribution <sup>[3, 4, 6]</sup>

**Habitat:** CR generally grows in moist deciduous forests, scrub jungles and sacred grooves.

**Distribution:** Globally it is found in Indo Malaysian regions. In India it is found in all districts of Kerala (all districts), Maharashtra (Pune, Raighad, Thane), Karnataka (Hassan, North Kanara), Tamil Nadu (Namakkal, Nilgiri)

### Morphology <sup>[3-4]</sup>

**Habit:** A shrubby twiner,

**Roots:** Light brown and scabrous, 0.25 to 1 inch in diameter, fracture is starchy, a transverse section shows a central woody column and a very thick greyish white cortex.

**Stem:** Stout, terete, puberulous.

**Leaves:** Simple, opposite, deciduous, 7.5 - 12.5 cm by 5 - 7.5 cm, broadly ovate, acuminate at the apex and cordate at the base. Leaves are glabrous on the adaxial surface and sparsely pubescent, nerves anastomosing at the margin. Petioles 1.5-3.8 cm long. Leaves have a chilly like odour.

**Flower:** Small, greenish yellow in colour, corymb inflorescence. The peduncles of flowers arise from the leaf axils or just outside them and are sometimes equal or exceed the length of petioles; Calyx is divided almost to the base, segments 2mm long, broadly oblong, rounded at the apex and with membranous ciliate margins. Corolla is deeply penta-fid, 4mm long, lobes 3mm long, obtuse, fleshy with brown dots. Corona is usually bifid with broad membranous erect scales, staminal column arising from near the base of corolla. Pollen masses are clavate, slightly curved, erect and waxy; style apex is broad pentagonous with a distinct rim slightly umbonate in the centre.

**Seeds:** 1.3 cm long, ovate, margined.

**Flowering season:** April - June

**Conservation status:** Not evaluated

**Useful parts:** Leaves, Root bark, Flowers

**Phytoconstituents:** There is no adequate data available regarding the phytochemical constituents of CR. The roots

contains some crystalline fatty acids, a glucosidal acid – resin related to Jalapin, a sugar having the properties of dextrin and a substance giving the reaction of alkaloids [4].

### 3.3 Ethnobotany and therapeutic use

#### 3.3.1 Descriptions in *Hortus malabaricus* [2]

Van Rheede's *Hortus malabaricus* is a literary treasure which has mention about several hundreds of medicinal plants which were found and being used various ailments during the 16<sup>th</sup> century Kerala. Various therapeutic uses of CR along with a small description about the morphology can be found in the book. Leaves were said to have an unpleasant smell. The plants were said to grow around the town of Cochin. Its flowering season was mentioned as rainy season and fruits were rarely found. The roots were described as fibrous, spreading nature and of bitter taste.

Uses: The crushed leaves were said to be useful for drying up chronic wounds. The bark with sandalwood and woman's milk used in the form of nodules was described as a remarkable remedy for "causon" (chronic fever)

#### 3.3.2 Descriptions in different text books

Various textbooks like Dr K M Nadkarni's Indian material medica, Indian medicinal plants by Kritikar K R and Basu B D, Father Rapheil Tharayil's Oushadha sasyangal etc describes the medicinal uses of CR. The external application of leaf paste aids in faster wound healing [3-7]. The external application of leaf juice is also done for curing neck inflammation of bullocks. The internal administration of root bark is used in Vataka, a disease in which lumps of undigested food are passed. It is useful in dyspepsia associated with fever and absence of bile in stools. In the book Pharmacographia Indica, it is said that the root bark given 3 times in five grains doses is an efficient cholagogue. It restored the natural colour of stool without any purgative effect. It was found to be more efficient than podophyllin and euonymin [3-4]. Flowers are sweet and are eaten by the tribal people [4]. It is also widely used in Sidha medicine [7].

#### 3.3.3 Descriptions in ethnobotanical survey articles

- Floristic composition and ethnomedicinal practices of Iriveri Sree Pulideva Temple, Kannur district, Kerala [8]; The study was carried out in places around Iriveri Sree Pulideva temple, Kannur District, Kerala. In the survey, gathered information about 87 plant species belonging to

46 families and with its exact botanical name, family, local name and therapeutical use. Some redlisted species were also noted from this sacred grove. *Cosmostigma racemosum* (Roxb.) Wight and use of its leaves as a wound healer was also enlisted.

- Survey and Comparison of Floristic Diversity and Ethnic culture in Punikkolkavu and Chirakkakavu Sacred Groves of Thalassery, Kannur District, North Kerala, India [9]; The survey study dealt with the floristic comparison and ethnobotanical practices of the two sacred groves, Punikkolkavu and Chirakkakavu, Kannur District, Kerala. 70 plant species of 36 families identified in Punikkolkavu and 41 plant species of 22 families identified in Chirakkakavu were recorded. Various practices for conservation of these plants and their mythological and therapeutical uses practiced by the local people have been recorded. The twiner *Cosmostigma racemosum* (Roxb.) Wight said to be used by local people as a wound healer was enlisted with its photographs.
- Wild Edible plants Used by Tribals of North-east Chhattisgarh (Part-I), India [10]. The survey study was about the diversity, indigenous uses and availability status of wild edible plants of North – East Chhattisgarh. 80 species of plants of 40 families were identified and documented from the study area. The tribals of North East Chattisgarh reported that the flowers of *Cosmostigma racemosum* (Roxb.) Wight were edible.
- Folk herbal medicines from tribal area of Rajasthan, India [11] The survey study was to find out the ethnomedicinal plants occurring in the tribal area of Rajasthan thereby assessing the potentiality of plant resources for treatments of various modern diseases. 61 ethnomedicinal plant species of 38 families were recorded from this region. A list of plant species along with the parts used and the mode of administration in different diseases were recorded in this article. *Cosmostigma racemosum* (Roxb.) Wight was reported to be used as a vegetable drug for diabetes by local tribal people of Rajasthan.

Thus the ethnomedicinal uses of CR can be summarized as shown in (Table 1).

**Table 1:** Ethnomedicinal uses of *Cosmostigma racemosum* (Roxb.) Wight

Plant part	Uses	Location
Leaves	External application for chronic wounds	Northern districts of Kerala like Kannur, Kasaragod
Leaf juice	External application for neck inflammation of bullocks	Tribals of Western Coast of India
Root bark	Internal administration for restoring normal colour of stool, cholagogue	
Flowers	Sweet, eaten as a vegetable	Tribals of North east Chattisgarh
Aerial parts of plant	Used as a vegetable in diabetes	Tribals of Rajasthan

### 3.4 Research works

Eventhough a plant of ethnobotanical importance, the data regarding research of CR available in various search engines like PubMed, Google Scholar etc are few.

- Morpho-Anatomical Analysis of *Cosmostigma racemosum* (Asclepiadoideae) Flowers [12].

The method of research was based on observation method and exploration of plant systematics evidence or taxonomy evidence, including analyses and description of morphology and anatomy of flower structure and its development. The

results showed that the characteristics of flower morphology are in accordance with the existing description in literatures. Characteristics of pollinia are specific characters of morphological aspect of flower. Data of anatomy of flower and its parts development are the new ones which confirm the position of *Cosmostigma racemosum* (Roxb.) Wight as a member of the tribe Marsdenieae. The data of anatomy also show new information of the ontogeny of the important parts of flower.

### 4. Conclusions

The acceptance of herbal medicines has considerably increased during the past few decades. 80% of the people round the world use them as a part of primary healthcare. But scientific data regarding most of these plants are lacking. Ethnobotanical surveys play a crucial part in the identification and documentation of folklore and traditional usages of plants. The descriptions about *Cosmostigma racemosum* (Roxb.) Wight found in books of traditional practices and ethnobotanical surveys are compiled and presented in this work. The plant is reported to have many therapeutic uses which have to be confirmed by further research studies.

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