

# Indian Medicinal Plant *Cissus quadrangularis* Linn. : An Ethnobotanical And Ethnomedicinal Review

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## Abstract

The plant *Cissus quadrangularis* commonly known as 'Hadjodi' in Oriya belongs to family Vitaceae. The plant is medicinally important, specially stem which is used to cure various diseases in Indian traditional system of medicine particularly Ayurveda and Unani. All most all parts of the plant are utilized by tribal people. In this review, an attempt has been made to provide utmost information associated with plant *Cissus quadrangularis* to confirm its identity and it has been predicted that this information will be ready to lend a hand for pharmacognostical, phytochemical, pharmacological, toxicological and clinical research in near future.

## Introduction

*Cissus* is a genus of approximately 350 species of woody climber in the grape family (Vitaceae). Among the most common species, *Cissus antarctica* and *Cissus rhombifolia* are garden plants. *Cissus striata* is a woody vine native from South America, mainly from Chile. *Cissus* species are used as food plants by the larvae of some Lepidoptera species including *Hypercompe eridanus* and *Hypercompe icasia*. *C. quadrangularis* is a perennial plant of the grape family. It is commonly known as 'Hadjodi' in Oriya which belongs to family Vitaceae [http, 2010]. In India the plant has several other names in different languages such as in Oriya: Hadjodi; Hindi: Hadjora; Bengali: Harjora; Gujrati: Hadasankala; Punjabi: Hadjor; Malayalam: Piranta; Tamil: Pirantai; Telgu: Nalleru and English: Edible stemmed vine [Gupta, 2003].

## Plant Taxonomy [http, 2010]

Kingdom	:	Plantae
Division	:	Magnoliophyta
Class	:	Magnoliopsida
Order	:	Vitales
Family	:	Vitaceae
Genus	:	<i>Cissus</i>
Species	:	<i>C. Quadrangularis</i>
Binomial name	:	<i>Cissus quadrangularis</i>
Synonyms	:	<i>Cissus quadrangula</i> <i>Vitis quadrangularis</i>

## Plant Habitat

*C. quadrangularis* is a fleshy cactus like jointed climber with 4-winged internodes and a tendril at some of the nodes [Haines, 1925]. *C. quadrangularis* is a succulent shrubby climber reaches a height of 1.5 m. Stems sharply 4-angled, jointed at nodes, internodes are 8 to 10 cm long and 1.2 to 1.5 cm wide, tendrils simple long and slender emerging from the opposite side of the node. Leaves simple, lamina ovate or reniform,  $\pm 5$  cm wide, crenate-serrate, base truncate-cordate; petiole  $\pm 2$  cm long. Flowers is umbellate cymes, pedicellate; calyx copular, slightly lobed; petals white; disk 4- angular; stamens 4. Berries globose,  $\pm 0.7$  cm in diameter, apiculate, red on ripening, 1-seeded [Panda, 2004 & The Wealth of India, 2005].

## Distribution

*C. quadrangularis* is not a very common plant. In Orissa it is found in Puri, both in the north and common on rocks near the Chilika lake, Angul district, near villages and some what in the



Figure.1. *Cissus quadrangularis* Linn. Plant

district of Bargarh & Bolangir [Haines, 1925]. Besides Orissa, it is distributed throughout the hotter part of the India and Sri Lanka to Malaysia and Africa [Panda, 2004 & The Wealth of India, 2005].

## Review



Figure.2. Part of *Cissus quadrangularis* Linn.  
Plant showing Tendrils & Leaves

### Traditional Medicinal Uses

Almost entire plant is used for medicinal value [Gupta, 2003, Ayurvedic Pharmacopoeia, 2008, Brahma, 1994, Kirtikar, 1999, Joshi, 2003, Nadkarni, 2007, Prajapati, 2003, Khan, 2005 & Guhabakshi, 2001]. The Medicinal uses of different parts of *C. quadrangularis* is described as follows -

#### Uses of Stem:

Stem of *Cissus quadrangularis* Linn. is very important part of the plant and accepted as raw drug of known properties in both Ayurvedic and Unani system of medicine. Among the 'Santals' the stem is used for bone fracture. It is useful in piles, bone fracture, pain in joints, swelling and asthma. Stem juice is used for the treatment of Scurvy, irregular menstruation, disease of ear and nose-bleeding. Stem paste is also useful in bone fracture, swelling, muscular pain, asthma, burns, wounds and bites of poisonous insects.

#### Uses of Root:

Root powder is used in fractured bone, cuts.

#### Uses of Shoots:

Dry shoots powder is used for digestive troubles, stomachic, colonopathy, scurvy, otorrhoea, and asthma. Fresh shoot paste is used in burns and wound. Stem and leaf is useful in labour pain at Bihar. Decoction of shoot along with dry ginger and black pepper is used in body pain. Shoot is used for the treatment of piles, worm infection, stiffness in thigh muscles, chronic ulcer, colic, epilepsy, convulsion, anorexia, skin diseases, dyspsia, indigestion, rejoin broken bones. It is used as aphrodisiac, carminative, laxative, digestive and decoction is used as blood purifier and immunomodulator.

#### Marketed products:

Plant is one ingredient of an Ayurvedic preparation i.e. Lakha Gogulu which is used for alleviating pain, reducing swelling, and promoting healing of simple fracture. Plant has been prescribed in ancient Ayurvedic text by Bhava Prakash and Chakra Dutta as a general tonic especially for the fractured patient. It is an ingredient of 'Bonton' capsules (Vasu Healthcare).

### Pharmacology

According to Potu (2009), the Petroleum ether extract of *Cissus quadrangularis* stimulates osteoblastogenesis and can be used as preventive/ alternative natural medicine for bone diseases such as osteoporosis and it might be a potential candidate for prevention and treatment of postmenopausal osteoporosis. The biological activity of *Cissus quadrangularis* on bone may be attributed to the phytochemicals present in it [Potu, 2009].

Further, when we consider about herbal formulation containing *Cissus quadrangularis*, it was found to be effective in the management of obesity. Studies with *Cissus quadrangularis*, *Sambucus nigra*, *Asparagus officinalis*, *Garcinia atroviridis*, ephedra and caffeine, Slimax (extract of several plants including *Zingiber officinale* and *Bofutsushosan*) showed a significant decrease in body weight. In 41 animal studies, significant weight loss or inhibition of weight gain was found. No significant adverse effects or mortality were observed except in studies with supplements containing ephedra, caffeine and *Bofutsushosan*. Hence, compounds containing ephedra, *C. quadrangularis*, ginseng, bitter melon, and zingiber were found to be effective in the management of obesity. Attention to these natural compounds would open a new approach for novel therapeutic and more effective agents [Hasani, 2009].

After studying the multi drug formulation in the management of obesity, the study forwarded to evaluate the effects of two formulations, *Cissus quadrangularis*-only and a *Cissus quadrangularis*/*Irvingia gabonensis* combination, on weight loss in overweight and obese human subjects. From this investigation it was revealed that, the *Cissus quadrangularis*-only group showed significant reductions on all variables compared to the control group, the *Cissus quadrangularis*/*Irvingia gabonensis* combination resulted in even larger reductions. This apparently synergistic formulation should prove helpful in the management of obesity and its related complications [Oben, 2008].

The plant *Cissus quadrangularis*, is a medicinal plant indigenous to Asia & Africa, is used for many ailments, especially for the treatment of hemorrhoid. The effects associated with hemorrhoid, i.e. analgesic and anti-inflammatory activities as well as the venotonic effect of the methanol extract of *C. quadrangularis* were assessed in comparison with reference drugs. The results obtained confirmed the traditional use of *C. quadrangularis* for the treatment of pain & inflammation associated with hemorrhoid as well as reducing the size of hemorrhoids [Lans, 2006].

The extract of *Cissus quadrangularis* was studied against the non-steroidal anti-inflammatory drugs (NSAIDs) including aspirin which cause gastric ulcer. The extract of *C. quadrangularis* shows the gastroprotective effect. The finding suggests that the extract of *C. quadrangularis* promotes ulcer protection by the decrease in ulcer index, gastric

secretions and increase in the glycoprotein level, gastric mucin content and NPSH concentration. The extract of *C. quadrangularis* may protect the gastric mucosa against ulceration by its antisecretory and cytoprotective property [Jainu, 2006].

The further investigation suggested that, the plant extract of *C. quadrangularis* shows antioxidant activity & antimicrobial activity. The ethyl acetate fraction of both fresh and dry stem extracts at a concentration of 100 ppm showed 64.8% antioxidant activity in the beta-carotene linoleic acid system and 61.6% in the 1,1-diphenyl-2-picrylhydrazyl system. This fraction showed the presence of sterols, vitamin C, and tannins as phytoconstituents. The antioxidant activity of methanol extract and aqueous extract were comparatively less significant than that of ethyl acetate extract, and n-hexane extract showed the least activity. The ethyl acetate extract and methanol extract of both fresh and dry stems further exhibited antimicrobial activity against Gram-positive bacteria, including *Bacillus subtilis*, *Bacillus cereus*, *Staphylococcus aureus*, and *Streptococcus species* [Chidambara, 2003].

## Conclusion

*Cissus quadrangularis* L. is a medicinally important plant and used in the treatment of various diseases in Indian system of medicine. This paper provides valuable information about plant. Such information may serve as a base for new pharmacognostical, phytochemical, pharmacological, toxicological and clinical research.

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