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MEDICINAL PLANT: *Cissus quadrangularis*

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ABSTRACT

In India, *Cissus quadrangularis* has been used as a medicinal plant. The plant contained numerous bioactive compounds. This review reveals a brief account of *Cissus quadrangularis*, its medicinal uses, phytochemical properties and cultivation practices.

Key Words:

Medicinal plant, *Cissus quadrangularis*,
Therapeutic properties, Phytochemical
properties, Cultivation practices.

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INTRODUCTION

From ancient times medicinal plants have been used as herbal medicine for treatment of various human diseases in many parts of the world. Herbal medicine is based on the principle that plants contain natural substances that can improve health and reduce illness. From the environmental point of view the herbal products today indicate safety to human. The most important of these biologically active constituents of medicinal plants are alkaloids, flavonoids, tannins and phenolic compounds. *Cissus quadrangularis* is a perennial herb of the Vitaceae family. It is commonly known as Veldt Grape or Devil's Backbone. It is one of the most frequently used medicinal plants in India. It is used to heal broken bones, injured ligaments and tendons (Udupa and Prasad, 1963). The whole plant including all parts such as stem, leaves, and roots possess medicinal properties. It is known as *Asthisandhani* in Sanskrit and *Hodjod* in Hindi because of its ability to join bones. This is found in the warmer regions of India, Sri Lanka, Malaysia, Java and West Africa.

Therapeutic Properties: The plant *Cissus quadrangularis* is useful in osteoarthritis, rheumatoid arthritis, osteoporosis, helminthiasis, anorexia, dyspepsia, colic, flatulence, skin diseases, leprosy, hemorrhoids, epilepsy, convulsion, haemoptysis, obesity, tumors, chronic ulcers, swellings, asthma, cough and gonorrhoea (Chidambara *et al.*, 2003; Mallika, and Devi, 2003; Jainu and Devi, 2004; Julius *et al.*,

2007; Greenway and Bray, 2010; Joseph *et al.*, 2017). The fresh stem and leaves are used for the treatment of hemorrhoids, menstrual disorders, scurvy and flatulence. The roots and stems are most useful for healing of fracture of the bones. A paste of stem is useful for muscular pains and applied topically in broken bones (Mishra *et al.*, 2010). The stout fleshy quadrangular stem is used for treatment of gastritis constipation, eye diseases, piles and anemia. The herb is fed to cattle to induce flow of milk. The ash of plant is useful as a substitute for baking powder. A paste of stem is given in burns and wounds, bites of poisonous insects and for saddle sores of horses and camels. Decoction of shoots with dry ginger and black pepper is given for body pain. Leaves and young shoots are administering in certain bowel infections connected with indigestion. The stem boiled in lime water is useful as a stomachic.

Botanical Description: *Cissus quadrangularis* L. is a succulent plant. It is commonly found throughout India. It reaches up to a height of 11.5 m with sticky tendrils. It has quadrangular sectioned branches with internodes 8 to 10 cm long and 1.2 to 1.5 cm width. The surface is smooth, glabrous, buff colored with greenish tinge, angular portion reddish-brown. Leaves are 2.5-5cm long and simple, broadly ovate or reniform, sometimes 3-7 lobed, denticulate, glabrous, cordate, rounded, truncate or cuneate at the base; petioles are 6-12 mm long (Khan *et al.*, 1991; Kumbhojkar *et al.*, 1991); stipules are small broadly ovate, obtuse. Flowers are small, white, yellowish, or greenish in appearance. Flowers are in axillaries cymes, and are 4 or 5-merous; calyx is cup shaped, truncate or very obscurely lobed, thin membranous, pubescent outside,

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petals are ovate-oblong, short, stout, forming a cap that falls off when the flower opens. Fruits are globular berries and are red in colour when ripe. Seeds are ovoid-oblong, irregularly rugous, generally 2-3 numbers.

Phytochemical Properties: Laboratory analysis showed that *Cissus quadrangularis* contained numerous bioactive compounds such as alkaloids, resveratrol, piceatannol, pallidol, parthenocissin A, quadrangularin A, ascorbic acid, carotene, calcium, flavinoids, enzymes, nicotinic acid, tyrosin, and triterpenoids (Austin *et al.*, 2004; Chen *et al.*, 2009; Shah, 2011). The main chemical components include tetracyclic triterpenoid, onocer-7-en-3 α , 21 beta-diol and onocer-7-en-3 β , 21 alpha-diol and two steroidal principles steroid I and II, alpha-sitosterol, delta-amyrin. The stem contains two asymmetric tetracyclic triterpenoids, and two steroidal principles. The presence of -sitosterol, - amyrin, -amiron, and flavanoids (quercetin) having different potential metabolic and physiological effects have also been reported. The stem has revealed unique stilbene derivatives, which are termed *quadrangularins* A, B and C (Pluenjai and Saifah, 1986; Adesanya and Rene, 1999; Saburi *et al.*, 1999). Other lipids and several phytosterols like magnesium octadecanoate, heptadecyl octadecanoate, icosanyl icosanoate 4-Hydroxy-2-methyltricos-2-en-22-one, 9-methyl-octadec-9-ene, -amyrin, -amiron, taraxeryl ethyl, friedelan-3-one, taraxerol, p-sitosterol and isopentacosanoic acid are also identified in this plant (Gupta and Verma, 1991; Murthy *et al.*, 2003; Mallika and Devi, 2005). Stem extract contains a high percentage of calcium ions and phosphorus, both essential for bone growth (Rao *et al.*, 2007; Potu *et al.*, 2009). Calcium oxalate, methyl tritriacontanoic acid, taraxeryl acetate, taraxerol and isopentadecanoic acid A and -amyrins, -sitosterol, ketosetosterol, phenols, tannins, vitamin, carotene, and saponins are present in stem. Aerial parts having 7-oxo-onocer-8-ene-3 21 diol. Root powder having potassium, calcium, zinc, sodium, iron, lead, cadmium, copper and magnesium (Enechi and Odonwodo, 2003). Ash of plant having sodium, potassium, magnesium and calcium, potassium. Leaves having resveratrol, piceatannol, pallidol, parthenocissus, alicyclic lipids.

Cultivation Practices: *Cissus quadrangularis* is a common climber in mixed forest area and scrub forests. It can be cultivated in plains, coastal areas, jungles and wastelands up to 500m elevation. It requires warm tropical climate and propagated by stem cuttings in the month of June and July. Mature stems with four or five node and internodes of about 30 cm to 40 cm. length should be cut. One or two internodes are pressed vertically inside the already prepared gardening soil. Care should be taken that the basal part of the stem cutting is dipped into the soil. Watering is not necessary in rainy season. Watering should be done once a day in winter and twice a day in summer. The roots arise from nodes inside soil and newer leaves come within a week (Sharma *et al.*, 2011; Garg and Malik, 2012). The plant reaches up to 2-5 m height in a year. The flowering to fruiting period is October to December.

CONCLUSION

To meet the requirement of pharmaceutical industries, there has been an increased interest in the cultivation of *Cissus quadrangularis* in our country. Interest should be generated

for proper agronomic practices, improved varieties as well as plant protection measures.

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