

## Qualitative and Quantitative Analysis of *Cissus Quadrangularis* Using Different Extracts

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**Abstract:** *C. quadrangularis* Linn is very important medicinal plant which has potassium, calcium, zinc, sodium, iron, lead, cadmium, copper, calcium oxalate and magnesium. In this study qualitative and quantitative analysis of extracts of *C. quadrangularis* with different solvents was analysed and the presence of the phytochemicals were noticed. The quantity of Alkaloids, Flavonoids, Terpenoids, Glycosides and Saponins were found to be higher in methanol extract, tannins and steroids was high in aqueous extract.

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### I. Introduction

*Cissus quadrangularis* belongs to the family Vitaceae. *C. quadrangularis* Linn is very important part of the plant and used in piles, for bone fracture, pain in joints, swelling, scurvy, gout, asthma, disease of ear and nose bleeding. *Cissus quadrangularis* stem resembles the shape of bones and joints in the body and indeed it is very effective in strengthening the bones and joints. Modern research has shed light on *Cissus*' ability to speed bone healing by showing it acts as a glucocorticoid antagonist. The stem is used with sesame oil and is very useful to treat Sandhivata caused by chromosome aberrations, sperm deformation.

*Cissus quadrangularis* has been found to include antioxidant, anti-flatulence, antibacterial, antifungal, anti-inflammatory, analgesic, antibacterial, and cancer suppressive microorganisms have antagonistic effects, thus demonstrating the role of genetic toxicity and it also play an important role in obesity and obesity-related complications. The stem juice of the plant is used to treat scurvy and irregular menstruation, otorrhoea and epistaxis.

The roots and stem are most useful for healing of fracture of the bones. Phytoestrogenic steroids have been isolated from *Cissus quadrangularis* plant, has been shown to influence early regeneration and quick mineralization of bone fracture healing process. Dry shoots powder is used for digestive troubles, stomach ache, colonopathy, scurvy, and asthma. Fresh shoot paste is used in burns and wounds. Stem and leaf is useful in labour pain. 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 and stiffness in thigh muscles, chronic ulcer, colic, epilepsy, convulsion, anorexia, skin diseases, dyspsia, and indigestion, rejoin broken bones. It is used as aphrodisiac, carminative, laxative, digestive and decoction is used as blood purifier and immune modulator. The present study was analyzed for phytochemical analysis of *C. quadrangularis*.

### II. Materials And Methods

The samples of *Cissus quadrangularis* stem were collected from Trichengode. Collected samples were shade dried and powdered for further analysis. The powdered plant materials were dissolved in different solvents like (Methanol, Ethanol, Acetone, Petroleum ether, Ethyl acetate and Water) for 42 hrs at 75 rpm in orbital shaker. After the incubation the extracts were filtered by using Whatmann No.1 filter paper. The filtrates were used for further analysis. The Phytochemical analysis of the secondary metabolites like alkaloids, flavonoids, saponins, proteins, carbohydrates, phenols, tannins, terpenoids and Phytosteroids with the extracts. The quantitative analyses of the extracts were analysed secondary metabolites present in the each sample. The amount of alkaloids, Flavonoids, saponins, tannins, terpenoids, steroids, glycosides and phenolics was estimated.

### III. Results

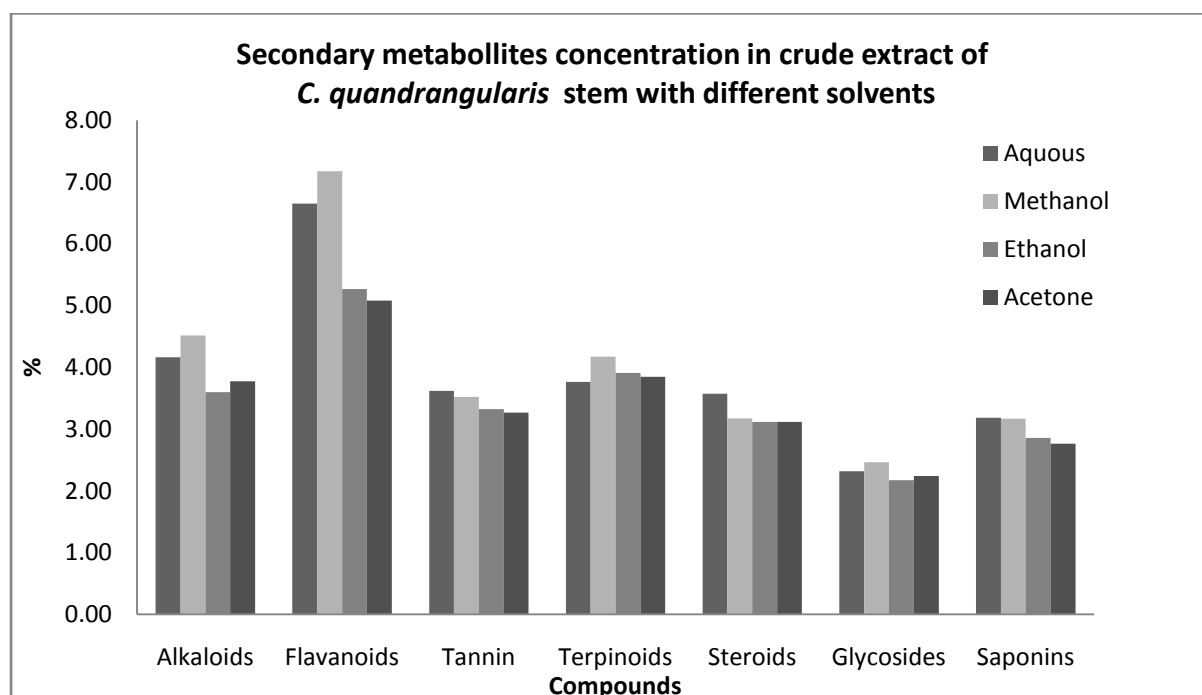
Phytochemical analysis of *Cissus quadrangularis* was done for alkaloids, Flavonoids, Lignin, Tannins, Phenols, Terpenoids, Steroids, Glycosides, Saponins, Proteins and Carbohydrate in stem, using different solvents like Chloroform, Ethanol, Methanol, Petroleum ether, Acetone and Water (Table 1).

Table 1. Phytochemical test of *Cissus quadrangularis* stem crude extract with different solvents

S. No.	Phytochemical test	Solvents					
		Chloroform	Methanol	Ethanol	Petroleum Ether	Acetone	Water
<b>I</b>	<b>ALKALOIDS</b>						
1	Alkaloids	-	+	+	+	+	+
<b>II</b>	<b>PHENOLIC COMPOUNDS</b>						
2	Flavonoids	+	+	+	+	+	+
3	Lignin	+	+	+	-	+	+
4	Tannins	-	+	+	+	-	+
5	Phenols	-	+	+	+	+	+
<b>III</b>	<b>TERPENOIDS</b>						
6	Terpenoids	+	+	-	+	-	+
7	Sterols	+	+	+	+	+	-
8	Glycosides	+	+	+	+	+	+
9	Saponins	+	+	+	+	-	+
<b>IV</b>	<b>PROTEINS</b>						
10	Protein	+	+	+	+	+	+
<b>V</b>	<b>CARBOHYDRATES</b>						
11	Carbohydrate	+	+	+	+	+	+

#### Quantitative analysis

The concentrations of the Secondary metabolites in the crude extracts of *Cissus quadrangularis* stem for the fixed solvents like water, Ethanol, Methanol and Acetone. Alkaloids, Flavonoids, Terpenoids, Glycosides and Saponins were found to be higher in methanol extract, tannins and steroids was high in aqueous (Figure 1).



#### **IV. Discussion**

In the recent years, there was a tremendous growth in herbal medicines due to their protected action against many dreadful diseases without any harmful side effects. As a result, the herbal drugs have become a major share of all medicinal systems like Ayurveda, Unani, Yoga, Siddha, Homeopathy and Naturopathy. In spite great emphasis on allopathic medicine More than 70% people still use non-allopathic system of medicine for many general ailments (Kiritikar and Basu, 1991). But only now these herbal medicines are evaluated for specific diseases like infection, cancer, AIDS, Hepatitis, etc.

Screening of plants for such herbal medicines with specific therapeutic values is the need of the hour. *Cissus quadrangularis* is one such species which is not only known for its nutritional value but also for various other diseases and their root, bark, gum, leaf, fruit (pods), flowers, seed and seed oil were used for various ailments in the indigenous system of medicine for treatment of inflammation and infectious diseases along with cardiovascular, gastrointestinal, hematological and hepatorenal disorders (Morimitsu *et al.*, 2000). In the present study secondary metabolites were isolated from *Cissus quadrangularis* using different solvents showed the presence of Alkaloids, Saponins, Flavonoids, Terpenoids, Phenols, Glycosides and Phytosteroids.

Different samples of *Cissus quadrangularis* were dissolved in different solvents to find out the Phytochemical chemical compounds present in the samples. The phytochemical present in the different samples have many medicinal properties and it can able to cure many ailments. Phytochemicals is a greek word which means the biologically active substances present in the plant which were also contributes many health benefits as it contains many macro and micro nutrients (Hasler and Blumberg, 1999).

The alkaloids were considered as one of the secondary metabolite which consists of heterocyclic nitrogen atom. Alkaloid in *Cissus quadrangularis* stem is one of the largest phytochemical groups of compounds which have variety of medicinal properties such as it was used as a pain killer for much kind of diseases (Kam and Liew, 2002). The stem of *Cissus quadrangularis* was rich in Flavonoids and it also has the antidiabetic activity. This type of flavones has the ability to inhibit the enzyme which regulates the glucose level in the blood (Farooq, *et al.*, 2007). Lignins were commonly called as phenolic substances which was polymeric in nature and it can able to precipitates the gelatin from any solution (Scalbert, 1991). Tannins were frequently called as natural polyphenols and the plant extracts with the tannins were used to treat the diseases like allergy, diarrhea, urinary infections, stomach and duodenal cancer (Blytt, *et al.*, 1988) and it also possessed to have the anti-inflammatory effect (De Bruyne, 1999 and Dolara, *et al.*, 2005). Tannins also have the ability to stop the replication process of the HIV virus (Blytt, *et al.*, 1988). Phenols were considered as the biggest group of phytochemicals present in the different plant kingdom and also distributed extensively in the plant species. The main biochemical activity of the phenols was it served as an antioxidant (Lafay and Gil-Izquierdo, 2008). The plant terpenes were called as Terpenoids, one of the secondary metabolite compounds present in different parts of the plant. This type of compound exists as phytoalexin in the plants and it was involved in the defense mechanism against pathogens (McCaskill and Croteau, 1998). The Phytosteroids was one of the secondary metabolite compound present in the plants which seems like cholesterol and these compounds were naturally occurs in the nuts, beans and some other sources (Katcher, *et al.*, 2009). The Canadian researchers reported that the phytosterols have the ability to arrest breast, ovary and lung the cancer cell proliferation (Woyengo, *et al.*, 2009). Thus in the above study it was identified that the steroid content was found to be very high in the stem of *Cissus quadrangularis* especially in the Methanolic extract followed with the bark and it was found to be very low in the pods of *Cissus quadrangularis*.

Saponins were found to be acts as a protective agent for the plants such that it was called as plant protectant (Lacaille-Dubois and Wagner, 2000). The medicinal property of the Saponins includes antioxidant, anticancer, antifungal and antiviral (Takechi, *et al.*, 1991). The nutritional supplement like carbohydrates, protein, fat, fiber and ash contents have been determined from the different types of samples taken from the *Cissus quadrangularis*. The higher amount of protein in the plant species will promotes the health and prevents it from the diseases. The deficiency of carbohydrates will affects the function of the body system; whereas optimum level of carbohydrate was needed for the functioning of brain, heart and immune system (Barker, 1996). Phytochemicals and the nutrients have been quantified in the *Cissus quadrangularis*.

#### **V. Conclusion**

*Cissus quadrangularis* a traditionally important medicinal plant used to treat various ailments. In the present view phytochemical constituents of different extracts of *Cissus quadrangularis* was studied. This plant has a very rich source of minerals useful for functioning of human body and more research is needed to study the plant to treat various ailments.

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