



RESEARCH ARTICLE

**Preliminary Phyto-Chemical Analysis of Various Parts of Indigenous Medicinal
Plant *Cissus Quadrangularis* (Vitaceae)**

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Manuscript No: IJPRS/V2/I4/00217, Received On: 28/11/2013, Accepted On: 23/12/2013

ABSTRACT

The present paper shows the medical constituents of various parts of *Cissus quadrangularis*. The stem, root and root bark were shade dried, ground into fine powder and subjected to series of phytochemical screenings. The plant compounds were extracted with ethanol, methanol, ethyl acetate, and benzene. Different types of secondary metabolites as alkaloids, flavonoids, triterphenoids glycosides, phenols, steroids and tannins were present in the above mentioned solvents where as in hexane extract all these constituents were present very negligible. Protein constituent is highest but saponins and thiols are totally absent in stem, root and root bark of *C. quadrangularis*.

KEYWORDS

Alkaloids, Flavonoids, Triterphenoids, Glycosides, Proteins, *Cissus quadrangularis*

INTRODUCTION

The forests of India is the treasure of biodiversity and medicinal plants. Thousands of years the indigenous knowledge of curing diseases by medicinal plants are followed by forest dwellers. Now it spreads in to the modern society. It can be understood by the awareness among people about their importance of medicinal plants. Natural products in plant medicines are having the potentiality to do the physiological process in our body which contains alkaloids, flavonoids tannins, carbohydrates, terpenoids, steroids and phenols⁵. The traditional plant *Cissus quadrangularis* has the medicinal property in all its parts such as stems, leaves and roots. The plant has its native India, Sri Lanka, Africa, Arabia, and Southeast Asia⁷. This plant has utilized to prepare medicine for various complaints in our body.

Finding out the secondary metabolites in various plant organs and their similarities or dissimilarities leads to the drug discovery. More than 2000 tons of a medicinal plants and their raw material has been utilized in India every year for the preparation of traditional medicines and herbal products⁸. Hence the present study is focused on the analysis of secondary metabolites of *Cissus quadrangularis*.

MATERIALS AND METHOD

Cissus quadrangularis Linn were collected from the interior villages of Tamilnadu. The standard methods of analysis were followed in this study to know about the presence of various compounds³. The plant species were identified with the help of regional Floras Gamble⁴. The fresh plant parts collected were washed under running tap water and dried in shade. The dried stem, root and root bark of *Cissus quadrangularis* was grinded in to fine powder and stored. The powdered plant parts were subjected to qualitative phytochemical tests for alkaloids,

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flavonoids, triterpeoids, steroids, saponins, phenols, glycosides, carbohydrates, proteins, tannins and thiols. The secondary metabolites such as alkaloids, flavonoids, phytosterols, saponins, glycosides, tannins, alkaloids, phenolic compounds, aromatic acids, proteins and gums were reported⁸⁻¹¹.

RESULTS

Phytochemicals play an important role in drug and cosmetic preparations. Analysis of the plant extracts revealed the presence of phytochemicals such as alkaloids, steroids, triterpenoids, flavonoids, phenols, carbohydrates, tannins, saponins, carbohydrates, proteins, glycosides, and thiols. Table 1 shows ethanolic and methanolic extracts of stem of *Cissus quadranglaris* the steroids,

triterpenoids, flavonoids, phenols and tannins show high percentage.

Table 1 and 2 shows the proteins present in stem is high in ethanolic and ethyl acetate extracts. The proteins present in root sample shows the highest percentage in methanolic and ethyl acetate extracts.

Also the root samples shows high percentage of steroids, triterpenoids, flavonoids, in both these extracts. Glycosides alone present high in methanolic extracts for the root, were shown in table 2. Phyto-chemicals such as phenols, carbohydrates and tannins present in root bark shows high percentage in ethanolic and methanolic extracts (Table 3). Saponins and thiols were totally absent in all the plant parts of almost all extracts.

Table 1: Phytochemical constituents of the stem of *Cissus quadranglaris*

S. No	Phyto-chemical constituents	Ethanol	Methanol	Ethyl acetate	Hexane
1.	Alkaloids				
	• DR Reagent	+	+	-	-
	• Mayer's Reagent	+	+	-	-
	• Wagner's Reagent	+	-	-	-
2.	Steroids	++	++	+	+
3.	TriTerpenoids	++	++	+	+
4.	Flavonoids	++	++	+	-
5.	Phenols	++	++	+	-
6.	Carbohydrate	+	-	+	-
7.	Tannins	++	++	+	-
8.	Saponins	-	-	-	-
9.	Proteins	++	+	++	-
10.	Glycosides	+	++	-	-
11.	Thiols	-	-	-	-

Table 2: Phytochemical constituents of the root of *Cissus quadranglaris*

S. No	Phyto-chemical constituents	Ethanol	Methanol	Ethyl acetate	Hexane
1.	Alkaloids				
	• DR Reagent	+	+	-	-
	• Mayer's Reagent	+	+	-	-
	• Wagner's Reagent	+	+	+	-
2.	Steriods	++	++	+	+
3.	TriTerpenoids	++	++	+	+
4.	Flavonoids	++	++	+	-
5.	Phenols	++	++	+	-
6.	Carbohydrate	+	-	+	-
7.	Tannins	++	++	+	-
8.	Saponins	-	-	-	-
9.	Proteins	+	+++	+++	-
10.	Glycosides	+	++	-	-
11.	Thiols	-	-	-	-

Table 3: Phytochemical constituents of the root bark of *Cissus quadranglaris*

S. No	Phyto-chemical constituents	Ethanol	Methanol	Ethyl acetate	Hexane
1.	Alkaloids				
	• DR Reagent	+	+	+	-
	• Mayer's Reagent	+	++	-	-
	• Wagner's Reagent	+	+	-	-
2.	Steriods	+	-	++	+
3.	TriTerpenoids	+	-	++	+
4.	Flavonoids	+	+	+	-
5.	Phenols	++	++	+	+
6.	Carbohydrate	++	++	+	+
7.	Tannins	++	++	+	+
8.	Saponins	-	-	-	-
9.	Proteins	+	+	+	-
10.	Glycosides	+	+	-	-
11.	Thiols	-	-	-	-

DISCUSSION

In the present study almost all the secondary metabolites were found highest percentage in root and stem samples of methanolic extracts. The flavonoids, steroids, alkaloids, mucilage, phenol were present in the young stem and other phytochemicals were absent where as in ethyl acetate and petroleum ether extracts of stem the flavonoids alone present was reported by Anitha et al.¹. Most of the secondary metabolites were identified in the ethanol and aqueous extracts². *Cissus quadrangularis* root contains constituents such as phenolic compounds, tannins, proteins, saponins, steroids, carbohydrates, glycosides and triterpenoids etc in alcoholic and aqueous extract. For both stem and root glycosides has present high in methanolic extracts⁶. The methanolic root extract of *Cissus Quadrangularis* shows the presence of triterpenoides, flavonols, saponins, and alkaloids in the extract was reported¹⁰. The present investigation has given the report that the alkaloids present high in methanolic extract of Mayer's reagent whereas the steroids and triterphenoids too present high in ethyl acetate extracts of root bark. The phenols, carbohydrates and tannins of root bark of ethanol and methanol extracts show the high percentage. There is not much report has found about the phytochemicals present in root bark of *Cissus quadrangularis*.

CONCLUSION

The phyto-chemical constituents present much in ethanolic and methanolic extracts compare to ethyl acetate, and in hexane extracts they were meager. The present study shows the presence of proteins is highest of all phytochemicals in methanol and ethyl acetate extracts of root sample of *Cissus quadrangularis*. The amount of alkaloids, flavonoids, triterphenoids, saponins and proteins percentage in stem and root of *Cissus quadrangularis* has high. The presence of these phytochemicals in *C. quadrangularis quadrangularis* is the good sources of medicinal value, and it can be confirmed that it is a useful drug for further pharmacological studies.

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