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PHYTOCHEMICAL SCREENING OF LEAF EXTRACT WITH MORPHOLOGICAL STUDY OF *Cissus quadrangularis* LINN

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Abstract: The medicinal plant *Cissus quadrangularis* Linn is a succulent climber, which belonging to the family Vitaceae (Grape family). In Hindi it is well known as Hadjod, Hadkankan, Gathjod whereas in English edible stemmed vine. Using the plant stem in Ayurveda can alleviate certain diseases such as piles, bone fractures, joint pain, swelling, scurvy, gout, asthma and bleeding in the ear and nose. Strength can be attributed to the *Cissus quadrangularis* Linn stem structure being similar to the bones and joints in the body. The research has focused on evaluating the structural features and physiochemical behaviours of *Cissus quadrangularis* Linn. The aim of this study is to determine the phytochemical qualities of the leaves. Methanolic and ethanolic leaf extracts were used to examine phytochemical compounds in this plant. The study can be beneficial in identifying and verifying plant materials. Preliminary phytochemical evaluation and analysis can be made easier by using biochemical assays.

Key words: Succulent, Vitaceae, Hadjod, Structural, Analysis, Biochemical

INTRODUCTION

Ayurveda, Siddha, Yunani and other traditional practices used worldwide to cure disease are based on traditional medicine. Natural products are essential for both modern and traditional herbal medicine. The importance of traditional medicine is significant in Indian culture. Botany studies revolve around morphology, flowering and fruiting times, growth behaviour and distribution patterns etc. Hadjod is synonymous with *Cissus quadrangularis* Linn in the Vitaceae family because of their abilities and properties to repair bones (Mishra Garima *et al.,* 2010)[1]. Among all the plant resources leaves, stems and roots can be utilized, but stems are the most commonly used treatment for bone fractures (Fernandes Gabriel *et al.,* 2012)[2]. *Cissus quadrangularis* Linn plant is widespread in India, with a special focus on tropical areas such as Sri Lanka, Java, Africa and Thailand (Chanda Sumitra *et al.,* 2013)[3]. Phytochemicals are natural compounds that

can be found in plants. The ethnomedicinal plant *Cissus quadrangularis* Linn leaves contain numerous phytochemicals including alkaloids, amino acids, flavonoids, steroids, reducing sugars, gums, tannins and saponins which may have potential benefits (Puri Payal *et al.,* 2022)[4].

MATERIALS AND METHODS

Plant material

Fresh leaves were taken from Ranchi, Jharkhand. After being collected, the leaves were thoroughly washed. The materials were collected and then air dried in the shade for a period of 3-4 weeks. A fine powder was obtained from the leaves stored in plastic bags for phytochemical analysis. The plant needs to be described since it was used in this study. Plant identification is a requirement for research. Identification can be made easier with the use of botanical descriptions and morphological characteristics of the plant (Haines, 1924)[5]. The plant parts of *Cissus quadrangularis* Linn were utilized by local people, medicinal practitioners and herbalists. Stems, leaves, root and flowers were more preferred by plants than fruits and seeds.

Morphological characters

The succulent climber (plant) is comprised of simple leaves and tendrils, along with short peduncle cymes flowers and cup shaped calyx with tetramerous petals. The stem is quadrangular with internodes and globular barriers seeds are present along with large succulent drupe fruits that flower from June to December (Panna Nisha and Kumar Jyoti 2022)[6].

Preparation of leaf extract

The extraction process involved soaking 5 gm of leaf powder in 80% ethanol and methanol solvents for 48 hours to prepare the ethanolic and methanolic leaf extract.

Phytochemical analysis:

1) Test for Alkaloids

1.2 ml extract + 0.2 ml dil. HCl + 0.1 ml Mayer's reagent, yellowish buff colour precipitate confirms the presence of alkaloids.

2) Test for Amino acids

1 ml extract + Ninhydrin, purple colour indicates the presence of amino acid.

3) Test for flavonoids

2 ml extract + 2 ml 40% NaOH, yellow colour gives positive result.

4) **Test for Steroids**

2 ml extract + 1 ml chloroform + 4 drops of Conc. H_2SO_4, reddish blue and green florescence colour, indicates presence of steroids.

5) Test for Reducing sugars

5 ml extract + 5 ml Benedicts reagent and heated few minutes, brick red precipitate confirms presence of reducing sugar.

6) Test for Gums

2 ml of 10% extract + 2 ml conc. H_2SO_4 + 2 ml of 15% Molish reagent, red violet ring at the junction of sulphuric acid layer indicates the presence of gum,

7) Test for Tannins

5 ml extract + 1 ml of 10% aqueous potassium dichromate, yellowish brown precipitate indicates presence of tannins.

8) Test for Saponins

1 ml extract + 1% lead acetate, white precipitate indicates the presence of saponins.

RESULTS AND DISCUSSION

Phytochemical characteristics of the medicinal plant *Cissus quadrangularis* Linn being examined are briefly described in Table-1. Based on the findings, it can be concluded that certain compounds possess medical properties (Kumar Manoranjan and Kumar Jyoti 2010)[7]. Methanol leaf extract of *Cissus quadrangularis* Linn show positive results for alkaloids, amino acids, flavonoids and tannins, but negative results for steroids, gums, reducing sugars and saponins whereas in the Ethanol leaf extract of *Cissus quadrangularis* Linn exhibits positive effects on alkaloids, amino acids, flavonoids, gums and tannins, while negatively results affecting steroids, reducing sugars and saponins.

The morphologically, ethnomedicinal perennial herb *Cissus quadrangularis* Linn has found buff coloured with greenish leaves, thick, fleshy and quadrangular stems. Flowers are small and polygamous showed in fig-1. Calyx is short and petals are imbricate in shape.

A

B

C **D**

Fig. 1: Morphological view of *Cissus quadrangularis* Linn:

A- Entire plant, **B**- Leaf, **C** & **D** - Flower

Fig.2: Leaf extract of Methanol and Ethanol solvents

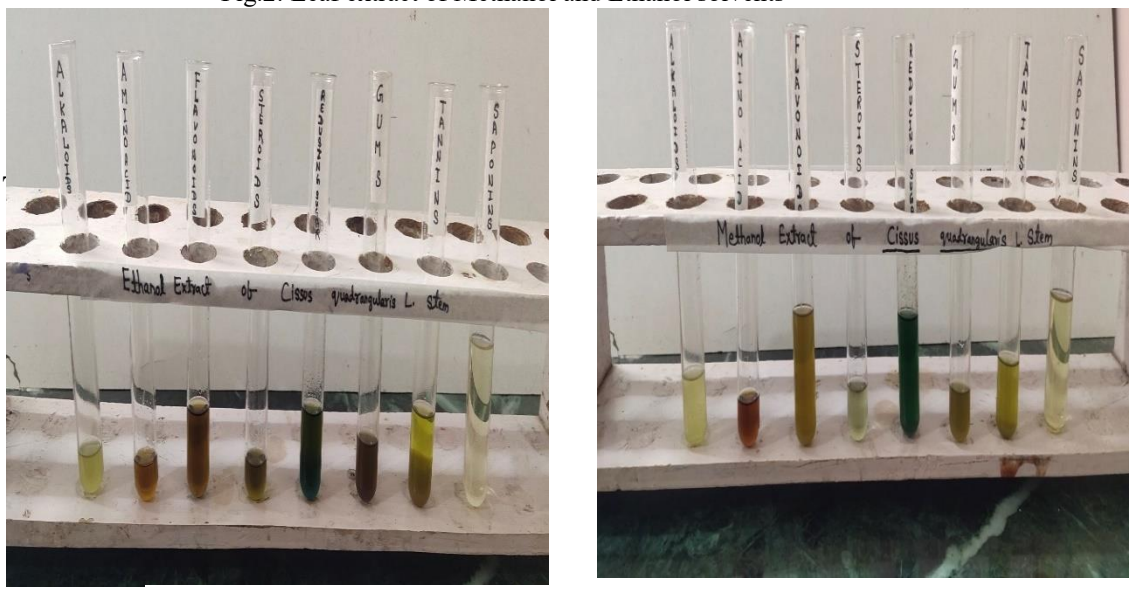

Fig.3: Phytochemical analysis of leaf extract of Ethanol and Methanol solvents

Table – 1: Showing phytochemical analysis of leaf extract of *Cissus quadrangularis* Linn using methanol and ethanol solvents.

1	Alkaloids (Mayer's Test)	+	+
2	Amino acids (Ninhydrin Test)	+	+
3	Flavonoids (Ferric chloride)	+	+
4	Steroids	–	–
5	Reducing sugars	–	–
6	Gums	+	+
7	Saponins Foam test	–	–
8	Tannins	+	+

+ Present, - Absent

CONCLUSION

The plant extracts were analyzed phytochemically and found to contain components known to have medicinal and physiological effects (K. B. Sadhana *et al.,* 2018)[8]. Phytochemical components such as alkaloids, amino acids, flavonoids, steroids, reducing sugars, gums, saponins, and tannins were confirmed through the testing conducted during the present study. The phytochemical compounds found in the leaf extract of *Cissus quadrangularis* Linn show their traditional uses and efficacy in clinical studies (Siddaiah M. *et al.,* 2011)[9]. Ethanolic and Methanolic extract of leaves of *Cissus quadrangularis* Linn gave maximum number of phytochemical components, which indicates its high medicinal value (Katare Vivekanand *et al.,*2012 and Anusha L. Vinjavarapu et al., 2023)[10,11].

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REFERENCES

1. Mishra Garima, Srivastava Saurabh, Nagori B.P. 2010. Pharmacological and Therapeutic Activity of *Cissus quadrangularis*: An overview. International Journal of PharmTech Research.Vol.2, No.2, p.p 1298-1310.
2. Fernandes Gabriel, Banu Jameela. 2012. Medicinal properties of plants from the genus Cissus: A review. Journal of Medicinal Plants Research. Vol. 6(16). pp.3080-3086.
3. Chanda Sumitra, Baravalia Yogesh, Nagani Krunal 2013. Spectral analysis of Methanol extract of *Cissus quadrangularis* L. stem and its fractions. Journal of Pharmacognosy and Phytochemistry. 2(4): 149-157.
4. Puri Payal, Vaijapurkar Amey, Dohare Nitin, Barskar Nitisha, Pagare Mansi, Prakash Ishita, Tamrakar Satya, Kapoor Purva, Sharma Tripti, Prakash Bindiya 2022. Invitro Antioxidant and Anti-inflammatory Studies of Hadjod Plant: An Important Traditional Indian Medicinal Plant. International Journal of Creative Research Thoughts. ISSN: 2320-2882.
5. Haines. H.H 1924. The Botany of Bihar and Orissa, Adlard & Son & West Newman, Part V, p.p, 703-726.
6. Panna Nisha, Kumar Jyoti 2022. Ethnomedicinal importance and utilization of *Cissus quadrangularis* Linn. in Ranchi District. The Biobrio An International Quarterly Journal of Life Sciences 9 (1&2): 807-812.
7. Kumar Manoranjan, Kumar Jyoti 2010. HPTLC profile of Costus speciosus (Koen.) Sm. Rhizome extract. Biospectra: Vol.5 (2), Spl. Issue, pp 455-460.
8. K. B. Sadhana., Gopinath, R. L., S. Archaya., P Rajamuni, Kumar Suresh, T. B. 2018. Qualitative and Quantitative Analysis of *Cissus Quadrangularis* Using Different Extracts. IQSR Journal of Pharmacy and Biological Sciences. Volume 13, Issue 3 Ver. III, PP 57 – 60.
9. Siddaiah M., N K. Jayaveera, Souris K., P J. Krishna Yashodha, Kumar Vasanth P. 2011. Phytochemical Screening and Anti Diabetic Activity of Methanolic Extract of Leaves of Ximenia Americana in Rats. International Journal of Innovative Pharmaceutical Research. 2(1), 78-83.
10. Katare Vivekanand, Pathak A.K., Kori M.L., Chakraborty Bodhisattwa, Nandy Subhangkar 2012. PHYTOCHEMICAL AND PHARMACOGNOSTICAL STUDIES OF *MARTYNIA ANNUA* PLANT. International Research Journal of Pharmacy. ISSN 2230 – 8407.
11. Anusha L. Vinjavarapu., Shanthi K., Sravya K., Venkatesh K., Suhana P. 2023. INVITRO EVALUATION OF ANTI OXIDANT, ANTI HELMINITIC ACTIVITY OF CISSUS QUADRANGULARIS LINN. Journal of Emerging Technologies and Innovative Research. Volume 10, Issue 5. ISSN-2349-5162.