



**INTERNATIONAL JOURNAL OF
PHARMACEUTICAL SCIENCES**
[ISSN: 0975-4725; CODEN(USA):IJPS00]
Journal Homepage: <https://www.ijpsjournal.com>



Review Article

A Review On Application And Scopes For Dosage Forms Of Cissus Quadrangularis Extracts

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ARTICLE INFO

Received: 01 Jan 2024

Accepted: 04 Jan 2024

Published: 06 Jan 2024

Keywords:

Medicine, Plant Extract,
Dosage forms, Excipients,
Effectiveness, Stability.

DOI:

10.5281/zenodo.10462742

ABSTRACT

Traditional values of *Cissus quadrangularis* have its own importance in medicinal field. Which have been used from ancient times and still its effective in many cases such as maintain broken bone health and healing of tissues, anti-ulcer properties, as analgesic and promote diet through weight loss property. This review highlights the effective dosage form which maintains the stability and effectiveness. *Cissus quadrangularis* plant extract identified the various chemical constituents those are steroids, flavonoids, stilbenes, triterpenes derivatives whether these are being suitable with the excipients are discussed by this study. There are various dosage forms already been produced and evaluated by this extract but the biggest challenge to see the effectiveness, stability and patient convience towards these dosage forms are been discussed by this study. It is important to choose of dosage form according to the pharmacological effect and their therapeutic dose to maintain the safety standards. There are different types of techniques are used to produce the effective dosage form such types are also mentioned in this study. Stability study by the various evaluation parameter which being discussed such stability studies are mentioned according to dosage forms.

INTRODUCTION

Medicinal plants were tackled the several life-threatening challenges in ancient era and also proved the safest way to take against such

conditions. As we are in 21st century the patients are not convenient and familiar to takes as it is plant parts for the medicinal use but many of the diseases are giving the very well response to the

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Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



herbal medicine. In the way to fulfill these conditions we have to make them in suitable dosage form is important one [1]. *Cissus quadrangulus* L. is widely used in the India for the various treatments but commonly this plant came in mind when someone got fractures on the bones so it also called the veldt grape or 'hadjod'. Biological name synonyme is *Cissus Bifida* Schum, *Cissus Edulis* Dalz and *cissus Quadrangulus* L. This belongs to family vitaceae. This plant is known by various names according the regional languages such as in Sanskrit: Asthibhanga, Asthisamharaka, Hindi: Hadjod, Marathi: Ghanasvel, Bengali: Harajora, Gujarati: Asthisrnkhala, Kannada: Mangaravalli, Konkani: Sandu balli, Malyalam: Chagalamparande, Odia: Asthibhang, Tamil: Aurukani, Chandalaparanda and Telugu: Nalleru. It grows in the tropical climate and flowering frightening occurs genrally in the June to January. Stem development finely produced in the starts of the monsoon season. It requires the support of other tree Cause it is climbing stem when it gets older the leaves and other parts becomes damaged and only stem remained adjuvant to the suporting tree. Leaves are simple or lobed broadly ovate or reniform serrate, dented and globrous. Leaf base is round and leaf margin is serrate. Flowers are umbellate cyme, leaf opposed, greenish-yellow and red tipped. Generally flowering occurs throughout the year. Extents direct in the group of many on the stem which are small and bisexual, tetramerous. Frutes are globose berry, apiculate at unmaturred stage greenish when gets mature turns to red when ripe. Seeds are smooth and fruitenig also same as flowering throughout year. Stem is buff colored with greenish ting, dichotomously branched [2][3].



Fig. 1: Habit of *cissus quadranguris*

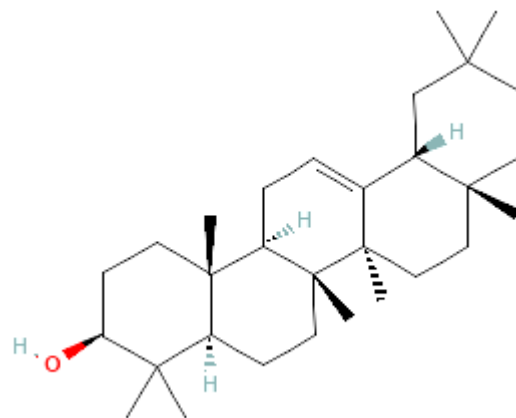
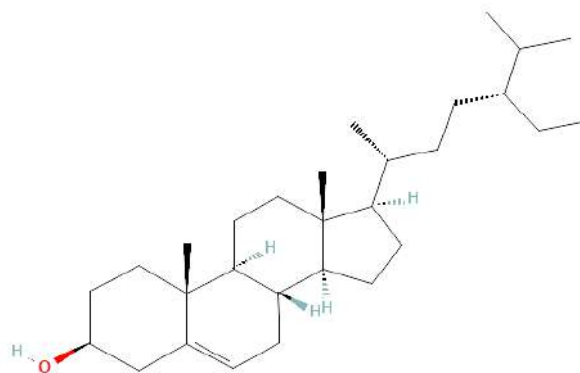
Cissus quadranguris proved itself with a different phytochemical which gets separated by the solvent extraction the following data will gets idea about for the choice of ideal solvent according to the pharmacological action. For the specific action we can use the specific solvent for the extraction to avoid the unwanted effect. The plant species are cut and shade dried for 15-20 days then dried parts are milled into the fine powder. Extraction is done with the specific quantity of the dried powder weights 50gm for each solvent cycle and the following results occurs for the phytochemical screening those are as follows

Table No.1: Phytochemical from Different Solvent Extract of *Cissus quadrangularis*

Sr No.	Name of Solvent	Names of Phytochemicals
1	Ethanol	Alkaloids, Saponins, Cardiac glycosides, Tannins, Terpenoids, Amino acids and Proteins, Flavonoids, Steroids.
2	Water	Alkaloids, Amino acids and Proteins.
3	Chloroform	Saponins, Cardiac glycosides, Tannins, Terpenoids, Amino acids and Proteins, Steroids and Carbohydrates.
4	Petroleum Ether	Alkaloids, Saponins, Cardiac glycosides, Tannins, Terpenoids, Amino acids and Proteins, Flavonoids, Steroids.
5	Ethyle acetate	Saponins, Cardiac glycosides, Tannins, Terpenoids, Amino acids and Proteins, Steroids.

According to desired action produced by the phytochemical we can choose the extraction procedure. As we are using for the topical action then not concerns about the method of extraction can go with the potent extract end product method but at the systemic action we have to think about the specific ingredient through which can gets that ingredients. [4][5] Chemical Constituents and Phytochemical studies on methanol extract revealed the presence of triterpenes including α - and β - amyrins, β sitosterol, ketosteroids, phenols, tannins, carotene and vitamin C. Seven alicyclic lipids constituents have also been reported from *Cissus quadrangularis*. unsymmetrical tetracyclic triterpenoids such as d-amylin, onocer-7-ene-3a, 21b-diol, damyrone and 3,3',4,4'-tetra hydroxy biphenyl, 3,3',4,4'tetrahydroxybiphenyl have been isolated from plant and were quantitatively determined by HPTLC and HPLC methods in samples collected from five different geographic zones of India. Several other constituents such as flavonoids quercetin and kaempferol, and stilbene

derivatives, quadrangularins A, B, C. and many others e.g. resveratrol, piceatanon, pallidol, perthenocissi and phyto-sterols have been isolated from plant. Stem extract contains a high percentage of calcium ions and phosphorus, both essential for bone growth.[6]

**Fig 3: Chemical Structure of β - amyrins****Fig 3: Chemical Structure of β sitosterol**

Application

1. Anti-diabetic action:

This action is shown on the animal Wister albino rats when given the ethyl acetate extract 200mg/kg and AS2 Hydro-alcoholic extract, 200mg/kg reconstituted in the suspension of Gum acacia. This preparation given parenterally shows the same action as Glibenclamide (10mg/kg) and other groups by stimulation of surviving β -cell to release more insulin.[7]

2. Bone healing and Osteogenic:

fractures take few weeks to heal and this healing property is shown by the *Cissus quadrangularis*

linn. Due to its high amount of vitamin C, Vitamin A, anabolic steroids substance and high amount of calcium. The steroids in this plant have the significant influence on the regeneration of all connective tissue of mesenchymal origin, and thereby improve the bone health.[8]

3. Analgesic effect:

C. quadrangularis shows the significant analgesic effect which is as good as our allopathic drugs like aspirin. Steroid of the extract obtained from it which having better effect during the pain at the fracture site. With the small amount of dose, it produces good effect on the Haffner's tail flip and Eddy's hot plate methods were given at potent response. This response is verified by the oral and iv route. The duration of analgesic activity is persisted for 4 hours which is better than the analgesic activity of aspirin and another drug. This extract activity is compared with activity of aspirin.[9][10]

4. Antiulcer activity:

Cissus quadrangularis is has been using against gastric ulcer as a home remedy mentioned in the Ayurveda. The ulcer-protective effect of a methanolic extract of *Cissus quadrangularis* was comparable to that of the reference drug sucralfate. It shows the desirable effect of ulcerogenic and also heals the cellular proliferation and strengthen the mucosal resistance. This effect will get on the dose of 500mg/kg given for the 10 days. From these results we can conclude as this preparation is having the potential effect against the treatment of peptic ulcer.[11][12]

5. Antioxidant activity:

The stem part of the *c. quadriangularis* contain vitamin C, Carotenoids calcium, Steroids which possess the very good antioxidant property. Many studies suggested that the dietary antioxidant helps to positive impact on the oxidative stress related pathology. These antioxidative constituents present in *C. quadriangularis* might be responsible for the free radical scavenging activity.[13]

6. Anti-microbial and antibacterial activity:

Dichloromethane and Methanolic extract of stems possess antibacterial activity against *S. aureus*, *E. coli*, and *P. aeruginosa* and mutagenicity against *Salmonella* microsome. Antimicrobial activity has also been reported from stem and root extract. The alcoholic extract of aerial part was found to possess antiprotozoal activity against *Entamoeba histolytica*. Alcoholic extract of the stem showed activity against *E. coli*. Methanol and dichloromethane extract of whole plant were screened for in vitro anti plasmodial activity.[14]

7. Sedative Activity:

The root extract possesses depressant activity indicated by decrease in exploratory behavior. Methanol extract of roots contains saponins which show potent sedative activity and also inhibit spontaneous motor activity in mice.

8. Weight Loss and Metabolic syndrome:

Cissus quadrangularis formulation has efficacy in the management of weight loss and metabolic syndrome, particularly for central obesity. The use of formulation contains green tea, soy, chromium, selenium and vitamin B. over an 8-week period brought about a significant reduction in many of the anthropomorphic measures. [15]

9. Miscellaneous:

Stem paste of the plant may also be useful for muscular pains, burns, wounds, bites of poisonous insects and for saddle sores of horses and camels. The powder of dry shoots is given in digestive troubles. A decoction of the shoots with dry ginger and black pepper is given for body pains. The infusion of the plant is anthelmintic. The plant extracts also exhibit cardiotoxic property. Young shoots are used in dyspepsia and indigestion. The powdered stem is mixed with pulses and fried in sesame oil, used as a remedy for several vata diseases. It is also used in skin diseases Leprosy, Cough, Epilepsy and Convulsions.[16]

Present Formulations:

1. Herbal Cream:



Topical herbal cream formulation shown the antimicrobial activity. This formulation is prepared using the dry powder grinded and made the aqueous extract of *Cissus quadrangularis* which shows the effective healing of cuts and wounds. The prepared cream formulation was screened for their antimicrobial and antifungal activity using gentamycin and Amphotericin B as standard drug for bacterial and fungal respectively. This study observed the topical herbal cream formulation showed significant antimicrobial activity.[17]

2. Nanoparticles:

The anticancer activity of the crude ethanol extract and nanoparticles were compared using MCF7 cell lines. Percentage cell inhibition showed a gradual increase in value for increase concentration of crude extract with 20.85% cell inhibition was observed at 18.75 microgram of concentration. This formulation shows the antioxidant activity was evaluated through ferric reducing antioxidant power assay (FRAP) method which depicted that, the nanoparticles obtained from ethanol extract. Anti-inflammatory activity studied by in vitro method for different concentration of crude extract and its respective nanoparticles were compared and percentage inhibition. The results clearly depicted that the nanoparticles possessed greater anti-inflammatory activity at lower concentration whereas the crude extract sample showed better activity only at higher concentration. The crude extracts of ethanol and petroleum ether had greater activity compared to the standard reference drug diclofenac sodium.[18][19]

3. Antifungal Nail lacquer:

Onychomycosis need targeted drug delivery. The treatment of onychomycosis is difficult because of barrier properties of nail plate. They can inhibit entrance of antifungal drugs in required concentration to treat fungal infection, beneath the nail plate. Therefore, selection of good penetration enhancer was required to pass maximum more amount of active constituent through the nail plate.

The antifungal activity of extract was performed against *C. albicans*. The extract 10mg/ml showed the less zone of inhibition (12 ± 2 mm), while 50mg/ml showed highest zone of inhibition 18 ± 2 mm [20]

4. Scopes for Formulation:

As we discussed about the whole plant profile of *Cissus quaranguris* and the constituent which are present in it. These are separated in various proportion from the different solvent through the extract. Number of beneficial components are included in it having some important role in the human health. According to its use we can prepare the different dosage form. But there are only few formulations studied are identified which discussed above. As this drug having use in Osteoporosis, anti-inflammatory and analgesic use it may give the good result as a local application like ointment, cream or gel. However, the presence of herbal materials in an herbal ointment may lead to quick deterioration of the product. The stability of herbal ointments is necessary to provide appropriate labelling instructions for storage and shelf-life.[21] Creams are semi-solid emulsions that are mixtures of oil and water (hydrophilic). Herbal creams normally contain the herbal material in either finely sifted form or incorporated as an extract. Creams normally contain antimicrobial preservatives due to the presence of water in the base and may have a relatively shorter shelf life compared to ointments.[22] If this drug we are using as a weight management, ulcer protective and antidiabetics this type of results are gets better in the oral administration which includes tablet, capsules and oral liquid dosage forms, these are having good stability and more potent than the local application. Capsules are solid dosage forms containing drug and usually, appropriate filler (s) enclosed in a gelatin container. Capsules may be available in hard gelatin for dry powdered herbal ingredients or granules. [23]



Herbal powders These are preparations that come as powdered herbal materials meant for direct use or by incorporation into foods, beverages for drinking, insufflations, and wounds. They may be finely sifted herbal materials from various parts of plants meant for a particular therapeutic effect. [24] Oral liquid is generally in the form of Tinctures are normally alcohol and water extracts of plant materials. Many plant constituents dissolve more easily in a mixture of alcohol and water than in pure water. The preparation of tinctures by maceration of herbal parts in water-ethanol solutions results in the extraction of many structurally diverse compounds with varying polarities. The wide chemical diversity of the chemical constituent's demands quality control analytical tools optimized for the detection of single chemical compounds or a specific group of compounds. [25] A tablet is a hard, compressed medication in round, oval or square shape. The excipients or formulation additives may include: binders, glidants (flow aids) and lubricants to ensure efficient tableting; disintegrates to ensure that the tablet breaks up in the gastrointestinal tract; sweeteners or flavors to mask the taste of bad tasting active ingredients; and pigments to make uncoated tablets visually attractive. A coating may be applied to a tablet to: hide or mask the taste of the tablet's components; make the tablet smoother and easier to swallow; protect drug from the acid secretions of the stomach; and make it more resistant to environmental factors for stability purposes and extend its shelf life. [26][27]

CONCLUSION:

According to the need of human being in current situation all peoples want the quick action and also, they concern about the adverse drug reaction. We know very well about the trust of every Indians towards the herbal formulation. *Cissus quadrangularis* one of the trees well known in our society which have the several medicinal values and effective against various disorders from the

above study there are many scopes to produce the beneficial dosage form. In the Osteogenic to heal the bone fracture we can use the extract of plant but there is scope to make that extract converted in the suitable dosages form to achieve the patient compliance. In case of Diabetes, peptic ulcer and weight loss these can take as oral route to get the desirable action so again there is scope to make the suitable oral dosage form with high efficacy and stability according to therapeutic use. In the current scenario of market there is only few formulations of *Cissus quadrangularis* which are mainly the anticancer nanoparticles and some creams which are used as antibacterial and antimicrobial property. So according to their therapeutic profile of plant the formulation having the scopes to make different dosage form it easy to available and produce the values in human health.

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HOW TO CITE: Rohit R. Eklare*, Mahesh M. Biradar, Anita S. Chavhan, Vaishnavi K. Chavhan, Anjali G. Chopade, A Review on Application and Scopes for Dosage Forms of Cissus Quadrangularis Extracts, *Int. J. of Pharm. Sci.*, 2024, Vol 2, Issue 1, 56-63. <https://doi.org/10.5281/zenodo.10462742>