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A Review on Copious Therapeutic Role of *Cissampelos Pareira* Linn

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Abstract

Cissampelos pareira Linn, an important medicinal plant, mainly found in tropical and sub-tropical parts of the world. The plant consists of plentiful isoquinoline alkaloids. *C. pareira* Linn has profound therapeutic and beneficial role in various medical and non-medical conditions, and is used as traditional medicine. The occurrence of plant can be seen in various regions of India. The present review encompasses botanical information, description, geographical distribution, phytochemical, constituents and different therapeutic roles of *C. pareira* Linn.

Keywords: *Cissampelos Pareira* Linn; Isoquinoline Alkaloids; Hayatine; Anticancer.

Introduction

Ancient heritage of traditional medicines is very rich in India. Natural products play significant role in traditional therapeutic aspect with development in the techniques of molecular biology, from last few decades there has been an increase of interest in the use of naturally occurring therapeutic agents. Various stakeholders are trying to bring out different therapeutic approaches to develop drug molecule(s) from natural sources [1].

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Phytochemical drug discovery process has been a vital function in obtaining useful drugs [2]. About 2000 drugs of the natural original from different tradition system have been mentioned in Indian *Materia medica.* Medicinal plants have been inducted as a common source of alternative remedy for treating human diseases because of copious phytoconstituents and therapeutic role [3].

Cissampelos pareira Linn is one of the most ancient sources of traditional medicine with ample potent phytoconstituents available in different dosage form used in the treatment of various diseases [4]. This review discusses one of the most important plants *Cissampelos pareira* Linn, which is enriched in active phytoconstituents with copious therapeutic role.

Geographical Occurrence

In India, the plant occurrence can be seen in tropical and sub-tropical parts. It is mainly found in Himachal Pradesh, Chota Nagpur, Bihar, West Bengal, Punjab, Rajasthan. Particularly in the east of Aravalli hilly forests of Marathwada, Konkan, Deccan, Bababuden hills of Mysore Tamil Nadu. In North Eastern Region of India, it is reported to be threatened. [9, 10]

Morphology and Microscopy

Roots: Cylindrical, often tortuous, 1-1.5 cm in diameter, light brown to yellowish in colour, surface rough and at places rugged due to transverse wrinkles cracks and fissures. Fracture is short and splintery, odour faint aromatic, taste bitter. Transverse section (T.S.) of root shows 6-10 layers of thin walled, rectangular cork cells [11].

Table 1: Botanical Information of *Cissampelos pareira* Linn

Botanical Name [5-8]	
Cissampelos pareira L. var. hirsuta (DC.)	
Synonyms	
Hirsute Buch. Ham ex DC; C pareira (pro parte)	
Vernacular Names: (The wealth of India Raw Material, 1952)	
Hindi :	Akanadi
Sanskrit :	Patha
English :	Velvet leaf
Kanad :	Kodupalli
Malyalum :	Katuvlli
Tamil :	Appatta
Telgu :	Adavibankateega
Marathi :	Pahadmud
Bengal :	Akaleja
Punjabi :	Baphbel
Oriya :	Akarnamini
Urdu :	Pahata
Kashmiri :	Butter bail
Gujrati :	Karemdhiu
Botanical Classification:	
Kingdom :	Plantae
Subkingdom :	Tracheobionta
Super division :	Spermatophyta
Division :	Magnoliophyta
Class :	Magnoliopsida
Subclass :	Asteridae
Order :	Ranunculales
Family :	Menispermaceae
Genus :	Cissampelos
Species :	*C. pareira*
Ayurvedic Properties:	
(The Ayurvedic Pharmacopeia of India)	
Rasa :	Tikta
Guna :	Laughu Tikshna
Veery :	Ushna
Vipak :	Katu
Dosshaghnata :	Tridoshamaka
Karma :	Veana ropana

Secondary Cortex: Consist of 1-3 layers tangentially elongated cells. Discontinuous ring consisting of 2-3 rows of stone cells with simple pits and groups of phloem fibres.

Phloem: Small trands of sieve elements and parenchyma just below the ring of stone cells [12].

Xylem: Consist of vessels, transchieds fibres and xylem parenchyma. Vessels of tracheids show simple pits on the walls. Xylem parenchyma cells are typically thin walled and lignified but due to delignification, patches of thin walled parenchyma appear in xylem region [11, 13].

Medullary Rays: 1-3 Seriate. Ray cells are generally thin walled, a few lignified and thick walled, while some show reticulate thickening. Plenty of starch grains are present in some of the ray cells [11, 12]

Seeds: Horse-shoe shaped [11, 14].

Flowers: Greenish yellow. Male in axillary, fascicled. Pilose cymes or panicles. Female in 6-15 cm long pendulous racemes [13, 14]

Inflorescence: Pistillate longer than staminate ones [11,13]

Leaves: Peltate or orbicular- reniform or ovate-sub-reniform with a truncate-cordate base [13, 14]

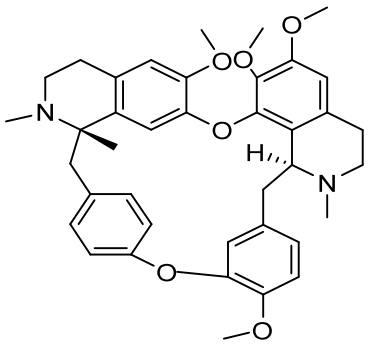
Physical Constants: [15, 16]

Foreign matter:	Not more than-2%
Total ash:	7%
Acid insoluble ash:	1%
Alcohol soluble extractive:	Not less 11%
Water soluble extractive:	Not less than 13%

Phytochemical Constituents

Cissampelos pareira contains a group of

phytochemicals called isoquinoline alkaloids. Thirty-eight alkaloids have been discovered in the plant including an important alkaloid named tetrandrine **1** which is found to possess potent pharmacological actions [17-19]. Protoberberine **2** alkaloids have been found in the roots. A range of other active phytoalkaloid named hayatinine **3** and some non-nitrogenous components quercitol were also found in *Cissampelos pareira* [20-23]. A non-phenolic tetra hydroisoquinoline chromphore known as cyclanoline is found to be main component of the plant [24-27]. Many other alkaloids viz., pelosine **4**, seepeerine, bebeerines, cissampeline, (or bebeering), hayatin, hayatinin, 1-curine and d-isochondrodendrine are some of the other chemical constituents of the plant. Quaternary ammonium bases, d-quercetol, sterol, cycleamine, hayatinin (4"-O-methyl bebeerines and hayatidin (++)-4"-O-methyl bebeerines) and water soluble bases menismin iodine, cissamin chloride and pareirin **5**, cissamine chloride, cissampareine **6** were also found in the plant. Minor alkaloids which *C. pareira* posses includes (++)- 4"-O-methyl curine **7**, tetrandrine, dehydrodicentrine, dicentrine **8**, insularine **9,** and bis benzylisoquinoline alkaloids (isochondodendrin **10**, tetrandrinemono-N-z-oxide), chondocurine, DL-curine dimethiodide (daijisong), cycleanine **11**, 1-bebeerine, d-quercitol **12**, hayatinin **13** [28-32]. Tropoloisoquinoline alkaloid- pareitropone **14** and grandirubrine **15** are also found to be important constituent of this plant. A novel azafluoranthene alkaloid- norimeluteine **16** has been isolated as a cytotoxic substance from *C. pareira* which plays a significant therapeutic role [33-37].



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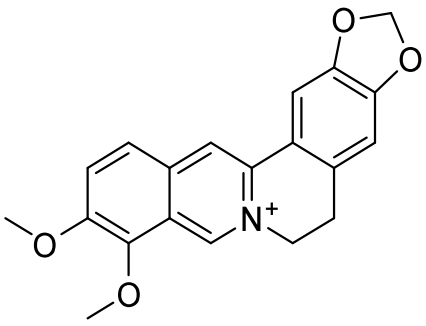

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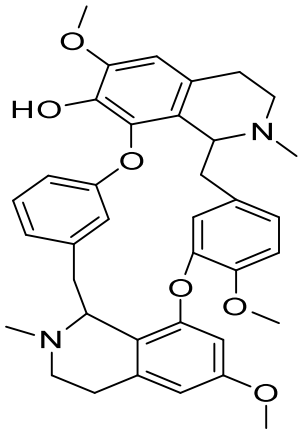

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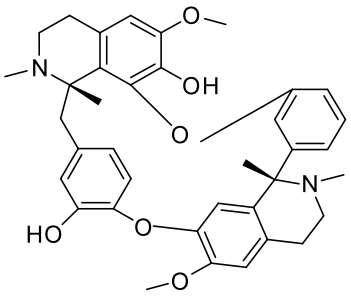

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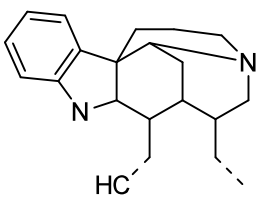

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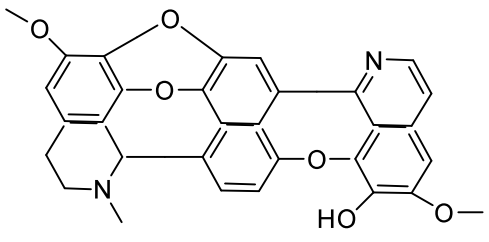

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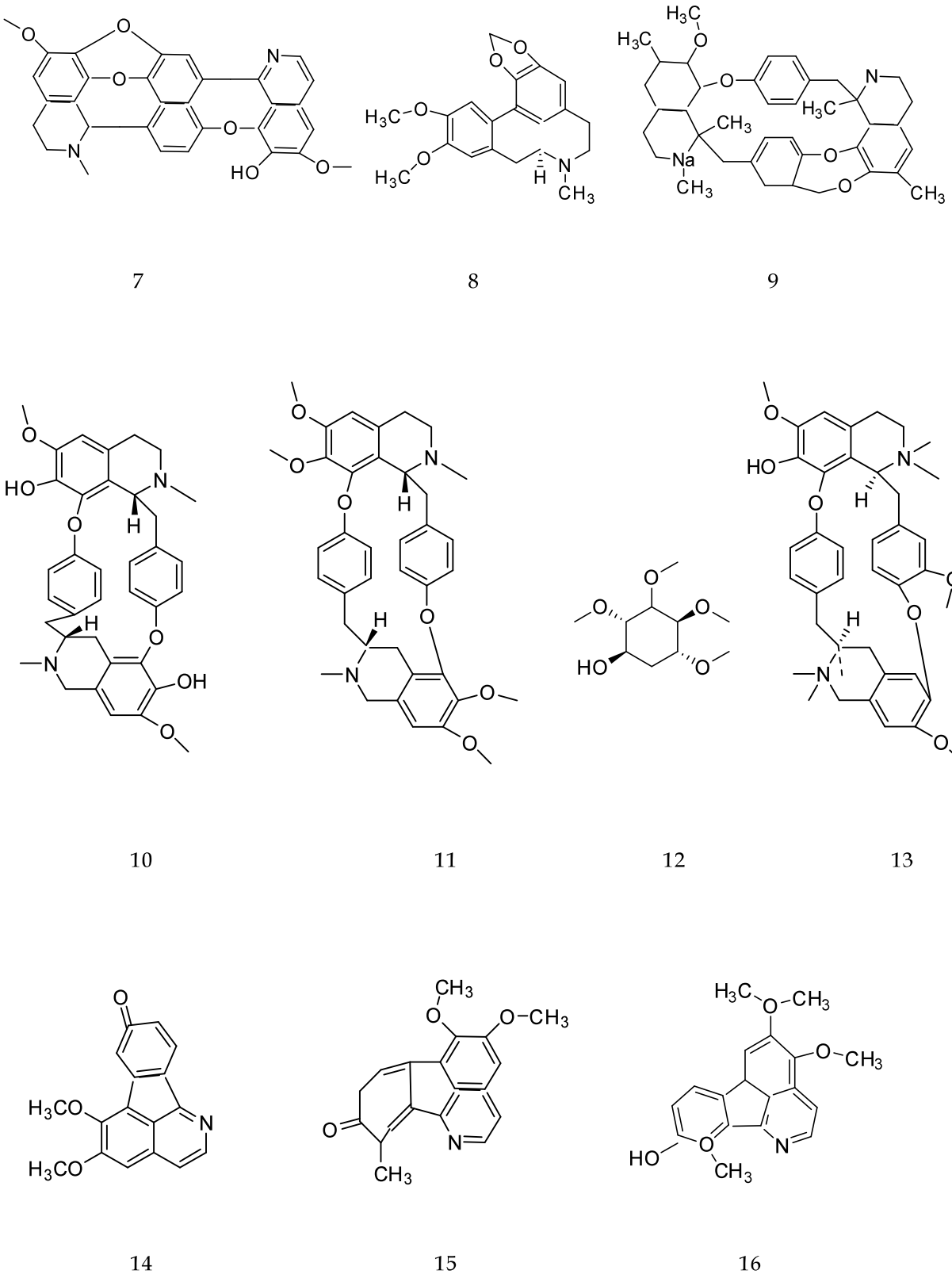


Fig. 1: Some important chemical constituents of *Cissampelos pareira* Linn

Different Formulations of Cissampelos Pareira Linn: Several different formulations have been prepared of the plant, and are used for various conditions. Following is the details of formulations-

S. No	Formulation	Example
1	Kwatha	Avartadi Kwatha, Abhayadi Kwatha, Aragwadhadi Kashaya, Ashwatthadi Kwatha, Bhadradi Asthapana, Bilwadi Kwatha, Brahmiyadi Kwatha, Bruhad Guduchyadi Kwatha, Bruhanmanjisthadi Kwatha, Bruhat pippalyadi Kwatha, Bruhatyadi Kwatha, Chitrakadi Kashaya, Dashamooladi Asthapana Basti, Devadarvyadi Kwatha, Drakshadhyastadashanga Kwatha, Dwipanchamuladi Basti, Eladi Kwatha, Gomutra Basti, Guduchyadi Kwatha, Hriberadi Kwatha, Indrayavadi Kwatha, Katphaladi Pachana Kwatha, Katukadi Kwatha, Kavala, Khada Yoga, Koshataki Niruha Basti, Krimishtrvadi Kwatha, Kushadhya Kwatha, Kutajadi Kwatha, Kwatha, Laghupanchamooladi Yavagu, Madri Kwatha, Mustadi Kwatha, Traivruta Yoga , Vashistha Rasayana, Vatsakadi Kwatha, Vidadi Kwatha, Pippalyadi, Yapan Rajbasti [38-40].
2.	Churna	Abhayadi Churna, Ajajyadi Churna, Bruhada gangadhara Churna , Bruhsadagnimukh Churna, Chandanadi Churna, Chavarnatha, Chitrakadi Churna, Devadarvyadi Churna, Dhuma, Duralabhadi kshara, Gangadhara Churna, Hingvadi Churna, Hingvadimaha Kshara, Kalaka Churna, Krushnadi Churna, Kusthadi Churna, Kutajadi Churna, Lakshadi Churna, Lavan tritatyadhya Churna, Marichyadi Churnapratisaran, Mrudvikadi churna, Mustadi churna, Mustadi churna, Nagaradhyam churna, Pathadi Churna, Pippalyadi Churna, Pusyanuga Churna, Sarsvata Churna, Shadadharan Yoga, Sharengastadi Churna, Swarnakshiryadi Churna, Tejovatyadhya Churna-Pratisaran, Triphaladi Churna, Tryushanadi Churna, Vachadhya ChurnaPratisaran, Vachadi Churna , Vatsakadi Churna , Vijaya Churna , Virechana Yoga, Vrukshamladhya Churna, Vyoshadhya Saktu, Yavanyadi Churna [38,41].
3.	Swarasa	Lodhradi Putapaka, Svarasa [40].
4.	Kalka	Kalingadi Kalka, Pathadi Kalka, Pathadhyalvala [38, 40].
5.	Taila	Chitrakadi Taila Basti, Danti Taila, Dashmuladi Taila, Jyotishmati Taila, Karanja Taila, Karanja Taila, Pathadi Taila, Shirisha Taila, Vidangadi Taila, Vishyandana Taila [38,42].
6.	Ghrita	Agastya Ghrita, Amruta Ghrita, Brahmyadi Ghrita, Chandanadhya Ghrita, Changeri Ghrita, Chavikadi Ghrita, Chavyadi Ghrita, Dadhika Ghrita, Dwipanchamuladi Ghrita, Guduchyadi Ghrita, Hriberadi Ghrita, Kasamardadi Ghrita, Katu Sarpi, Katurohinyadi Ghrita, Kultthadi Ghrita, Ksharaghrita, Madhukadighrita, Mahapanchagavya Ghrita, Mahatikta Ghrita, Nagaradhya Ghrita, Nimbadi Ghrita, Panchagavya Ghrita, Panchakoladhya Ghrita, Pathadi Ghrita, Pathadighrita, Pathadikamghrita, Rasnadi ghrita, Saraswata Ghrita, Sunishankachangeri Ghrita, Talishadighrita, Tiktaka Ghrita, Tryushanadi Ghrita, Vachadi Ghrita, Vidangadi Ghrita [39, 41,42].
7.	Leha	Agastya Avaleha, Avaleha, Ayorajiyam Leha, Dashamoola Guda, Dashmoola Haritaki, Jivantyadi Leha, Kalyana Guda, Kutajashtaka Avaleha, Kutajashtakadhya Avaleha, Mahabhallatak Avaleha, Murvadi Leha, . Panchanimbaka Avaleha, Triphaladi Leha, Lodhrasava, Pathadhya Asava, Pippalyadhyasava, Sharengesthadi Asava, Useerasava [40, 43].
8.	Arishta	Amlakarishta, Duralabharishta, Dwittya Phalarishta, Gandirarishta, Kanakarishta, Phalarishta, Vidangarishta [42, 44].
9.	Peya	Panchakoladhya Peya, Pathadi Peya [39].
10.	Yavagu	Laghupanchamooladi Yavagu, Yavagu [40].
11.	Kshirapaka	Pathadi Kshirapaka [41, 45].
12.	Gutika	Ankota Vataka, Bhallatakadi Vati, Dashamuladikshara Gutika, Gokshuradi Churna Gutika, Hingvadichurna Gutika, Khadiradi Vati, Kshara Gutika, Mahayogaraja Guggulu, Trikatukadhya Modaka, Triphaladi Gutika, Varti, Vruddhibadhika Vatika, Yavaksharadi Gutika, Yogaraja Guggulu, Anjandi Lepa, Lepa, Patha Lepa, Dashanga Agada, Karviradi Agada, Ksharagada, Kushthadi Agada, Meshashrungyadi Agada, Param Agad Param Agad, Rushabha Agada [39, 41, 44, 46].

Therapeutic Roles of *Cissampelos Pareira*

Following important biological activities are associated with ***Cissampelos pareira.***

Antianxiety

C. pareira have been reported to show significant antianxiety activity with 70% hydroethanolic extract of leaves by using elevated plus maze test (EPM), light dark (LandD) model, and forced swim test (FS) models in rats. The efficacy of extract (100, 200, 400 mg/kg) was compared with control as well as standard diazepam (DZ; 2 mg/kg, p.o.) in EPM, LandD model, and imipramine (IM; 2.5 mg/kg, p.o.) in FS model. The results showed that DZ and extract significantly increased the number of entries, time spent in open arm, head dip counts, and rearing time, while they decreased fecal count in EPM. DZ and extract also significantly increased the number of crossings and time spent in light compartment, while they decreased duration of immobility in LandD model. In case of FS model, IM and extract significantly increased mobility and swimming time. The study proposes that hydroethanolic extract of *C. pareira* has the potential to be used in the management of anxiety-like behaviour in a dose of 200 and 400 mg/kg [47].

Antiarthritis

Aqueous ethanolic extract (50%) of *Cissampelos pareira* at the dose levels of 100-400 mg/kg, once daily for 3 days exhibited significant reduction in mechanical pain in experimental mice. In acetic acid (0.6%; i.p.) inducing writhing, *Cissampelos pareira* significantly ($P< 0.05$) decreased the writhing episodes; the degree of percent protection at 200 and 400 mg/kg was 22.73 and 51.63. The hot plate reaction time was increased by 2.07 ($p<0.05$) and 2.70 ($P< 0.001$) folds respectively. Further *Cissampelos pareira* showed the dose dependent significant protective effect against complete Freund's adjuvant induced arthritis. The increased pain threshold and protective effect against CFE by *Cissampelos pareira* indicated its medicinal value in treatment pain and arthritis [48].

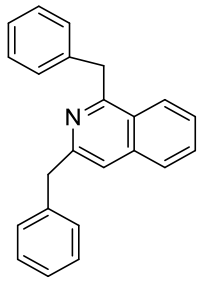
Antibacterial

C. pareira is rich in alkaloids, and phytochemical results showed that it contains alkaloids, flavanoids, terpenoids, steroids, etc. The ethanol extracts of *Cissampelos pareira* possess antiplasmodial and antimycobacterial activities. The extracts demonstrated activity against *Plasmodium falciparum in vitro* (50%–100% parasite suppression at 5 μg/mL) [49].

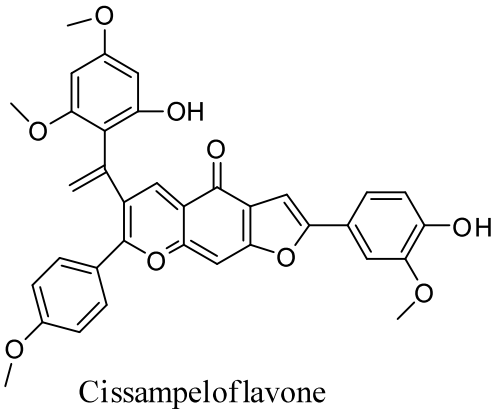
Anticancer

C. pareira is a significant medicinal plant of herbal materia medica. It shows potent anticancerous activity. Plenty research have been done to evaluate the anticancerous activity of the plant *C. pareira* [50]. The study of effect of hydroalcohol (50% ethanol) extract of roots of *Cissampelos pareira* in stomach cancer proved the significant anticancerous action of this plant. The activity increases significantly and in dose depend manner of glutathione S-transferase (GST), DT-diaphorase (DTD), and superoxie dismutase (SOD). *Cissampelos pareira* contains abundant amount of isoquinoline alkaloids, which is the reason for potent antitumour activity of this plant [51].

The protective effect of *C. pareira* extract was studied against benzo (a) pyrene [B(a)P]-induced gastric cancer in mice, and the tumor incidence was reduced and the mean number of tumors and the tumor multiplicity were reduced significantly and dose dependently. The modulatory effect of *C. pareira* extract was also examined on carcinogen metabolizing phase I and phase II enzymes, antioxidant enzymes, glutathione content, lactate dehydrogenase, and lipid peroxidation in liver. The extract of the plant increases the level of acid-soluble sulfhydryl (-SH) and cytochrome P450 contents and decreases malondialdehyde (MDA). Bisbenzyliso-quinoline alkaloids are the main anticancerous active components consist of grisabine and grisabutine, panurensine and norpanurensine, krukovine and limacine1, peinamine, 7 demethylp-eninamine, N-methyl, 7-O-demethyl peninamine, krukovine and macoline. Cissampeloflavone, a chalcone-flavone dimmer from the aerial parts of the *C. pareira* L, has been reported to have activity against *Trypanosoma cruzi* and *T.brucei* rhodesiense and to have low toxicity to human KB cell line [52].



Bisbenzylisoquinoline



Cissampeloflavone

Anti Dengue

Dengue is becoming a serious health problem day by day. It can be lethal if not treated on time. If dengue virus titer is reduces then the infection of dengue virus can also be reduced. The alcoholic extract of *C. pareira* found to be effective as an anti dengue agent, which reduces the virus titer [53]. It inhibits DENVs (dengue virus) in cell-based assays. The extract showed potent action in the AG129 mouse model against dengue virus. The formation of TNF-α cytokine reduces by this extract [54]. In the conventional assay, study reveals the anti viral action of the plant for all types of dengue virus with PRNT50 values in the range of 1.2-11.1 μg/mL [55].

Antidiabetic

The *C. pareira* found to exhibit potent anti diabetic action. When the *C. pareira* extract administrated orally to 50 mg/kg, 100 mg/ kg and 150 mg/kg body weight, it lowered the glucose level significantly in experimental animals. The glucose level was lowered in a dose dependent manner. The extract showed 55%, 57% and 55% low in the glucose level by the three doses respectively as comparison to the standard drug. The p value was found to be ≤ 0.05 [56].

Antidiarrhoeal

Traditional *C. pareira* extract being used as antidiarrhoeal drug. *C. pareira* roots showed dose dependent antidiarrhoeal activity in various models in rats. The extract of *C. pareira* roots of 25 mg kg-1 had no effect, 50 and 100 mg kg-1 doses inhibited defection by 100% in the initial 2 h compared normal defecation in mice [57]. The activity was reduced to 40.0% and 73.0% respectively, at the higher doses in the third hour. The effect of the *C. pareira* root extract at the dose of 25-100 mg kg-1 caused a dose dependent decrease in the total faecal matter (29.2 and 60.0%). Diphenoxylate HCl, a standard anti-diarrhoeal drug, inhibited the diarrhoea by 70.8% [58].

Antifertility

C. pareira leaves extract reported to be a possess anti-fertility activity, when administered orally it altered the estrous cycle pattern in female mice, prolonged the length of estrous cycle with the significant increase in the duration of diestrus stage and reduced significantly the number of litters in albino mice. The oral LD_{50} of the extract was found to be 7.3 g/kg in mice [59]. The analysis of the principal hormones involved in estrous cycle regulation showed that the plant extract altered gonadotropin release (LH, FSH and prolactin) and estradiol secretion [60].

Anthelmintic

Anthelmintic activity of the whole plant of *C. pareira* was checked through in-vitro model by using earthworm. The alcoholic and aqueous extract of various concentrations were used and studied for paralysis and death of earthworm. It was observed that extract have significant activity especially aqueous extract was found to be more effective to execute the earthworm [61].

Antihemorrhagic

The skin of mice was injected by aqueous extract from leaves of *C. pareira* and venom. It was found that extract produced a total inhibition and found to be potent anti hemorrhagic agent [62].

Anti-Inflammatory

C. pareira roots phytoconstituents also exhibits anti-inflammatory action, 50% ethanolic extract of *C. pareira* roots in acute, subacute and chronic models of inflammation was assessed in rats. In acute inflammation as produced by carrageenin 59.55% and 64.04%, by histamine 15.38% and 30.77%, by 5-hydroxytryptamine 17.78% and 31.11% and by prostaglandin E_2-induced hind paw edema 19.23% and 30.77% protection was observed. While in subacute anti-inflammatory models using formaldehyde-induced hind paw edema (after 1.5 h) 38.36% and 47.95% and in a chronic anti-

inflammatory model using cotton pellet granuloma 15.02% and 19.19% protection from inflammation was observed. Both acute, as well as chronic administration of *C. pareira* roots (100, 200 and 400 mg/kg, p.o.), did not produce any gastric lesion in rats. These data indicate that *C. pareira* root possesses significant anti-inflammatory activity without ulcerogenic activity suggesting its potential as an anti-inflammatory agent for use in the treatment of various inflammatory diseases [63].

Phytoactive constituent hayatine, isochondrondendrine, pelosine, sepeerine, and warifteine were found to present in *C. pareira*. These constituents exhibit potent anti-inflammatory action in ligand-based-virtual screening study. MAPK p38 alpha, PKC beta, PKC theta and PKC zeta enzymes found to be inhibited by its phytoactive constituents [64].

Antioxidant

C. pareira extract was found to significantly scavenge superoxide, hydrogen peroxide, hydroxyl radicals, and nitric oxide. The alkaloidal fraction of roots of *C. pareira* was screened for in-vitro antioxidant activity and immunomodulatory activity in mice. The HPTLC finger print profile was also established for the identification of alkaloid fraction which was found to contain 0.176% of barbering. Alkaloids fraction posses strong Antioxidant activity which was revealed by its ability to scavenge the stable free Radical DPPH, super oxide ion and to inhibit lipid per oxidation in rat liver Homogenate induced by iron/ADP/Acerbate complex. Alkaloids fraction was found to have Significant immunosuppressive activity at lower doses (25 and 50 mg/kg) while No activity was observed at higher doses (75 and 100 mg/kg). humoral antibody Titre was significantly ($p < 0.01$) lowered by AFCP at the doses of 25 and 50 mg/kg delayed type hypersensitivity response was also significantly ($p<0.01$). Suppressed by the alkaloidal fraction at the dose of 75 mg/kg thus, *C. pareira* proved to be a potent immunosuppressive and antioxidant agent [65].

The roots of the *C pareira* (50% ethanol extract) were found to contain a large amount of polyphenols and exhibit significant and dose-dependent reducing ability, indicative of potent antioxidant ability both in vitro and in vivo. It showed significant antioxidant activity in the 1,1-diphenyl-2-picrylhydrazyl assay at a dose regimen of 50 to 400 μg/kg in vitro. It was found to exhibit a potent protective activity in an acute oxidative tissue injury animal model: benzo(a)pyrene-induced gastric toxicity in mice. The extract significantly and dose-dependently also afforded protection against gastric lipid peroxidation, glutathione levels, and activities of other antioxidant enzymes, namely, superoxide dismutase, catalase, glutathione peroxidase, and glutathione *S*-transferase [66]. The alcoholic and ethyl acetate extract of *C. pareira* show potent antioxidant activity in the study. The extract found to low the IC50 values. The alcoholic extract showed IC50 of 98.23±0.47 mg/ml [67].

Cardiac Hypertrophy

The *C. pareira extract found to* relapse the hyperthyroid induced cardiotoxicity. A significant decrease in the ratio of heart weight and body weight was observed. The extract results in the amelioration of calcineurin activity and augmentation of antioxidant enzyme activities due to which it reverts the effects of cardiotoxicity [68].

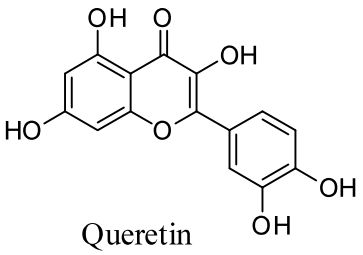
Diuretic

In recent times, bioactive constituents from *C. pareira* L have been used in the treatment of several diseases. Study of alcoholic extract of roots of *C. pareira* by the Lipschitz method in albino rats was carried out [69]. Five groups of Albino rats were used to evaluate the diuretic activity of alcoholic extract of roots of *C. pareira* by using metabolic cages. The group I serves as normal control received vehicle (2% CMC in normal saline), group II with Furosemide (10 mg/Kg, p.o), Groups III, IV and V with low (100 mg/kg), medium (200 mg/kg), and high (400 mg/kg) doses of alcoholic extract of roots of *C. pareira* respectively. In this model when compared to control group the alcoholic extract of roots of *C. pareira* treated groups at different dose levels (100,200 and 400 mg/kg) have noted with a significant increase in the urine volume and also a significantly enhanced the excretion of sodium, potassium and chloride ions in urine. Results showed that single dose administration of standard Furosemide and alcoholic extract of roots of *C. pareira* significantly ($p<0.05$*, $p<0.01$**, $p<0.001$***) increased the urine output along with an increase in the elimination of ions. Hence the study showed that alcoholic extract of roots of *C. pareira* 400 mg/Kg produced a comparable diuretic activity with standard Furosemide. The methanolic root extract of *C. pareira*, in saline primed, normal rats after oral administration show the significant increase in urinary output and proved to be a diuretic agent [70]. From *C. pareira*, Pareirubrines A and B which are tropoloisoquinoline alkaloids had been isolated which exhibit potent diuretic action in rats after oral administration. The plant also contains

grandirubrine and isoimerubrine phytoactive constituents [71].

Ulcer Protective

A flavonoid Queretin, isolated from *C. pareira*, showed considerable antiulcer property against gastric ulcers in different acute models [72]. Ethanolic extract of *C.pareira* roots has been examined in various acute and chronic ulcers in validated experimental models in rats. The extract showed a dose-dependent, ulcer-protective effect. It significant demonstrated the protection against 100% ethanol ($p<0.5$), aspirin ($P<0.001$), cold-restraint, stress ($p<0.01$) and pyorus ligation- ($p<0.001$) induced acute gastric ulcer in rats. The extract significantly enhanced the defence factors as total hexose and sialic acid while significantly reducing the ulcer index in the lipid peroxidase product malondialdehyde in ethanol induced ulcers [73].



Queretin

Conclusion

Cissampelos pareira Linn. is a prospective herb belongs to the family Menispermaceae. The plant has potential medicinal activity and can be used in the treatment of various diseases. It is also found that plant contains an extensive range of phytoconstituents. The plant is used as anti-inflammatory, anticancerous, antiulcer, antioxidant, antifertility, antianxiety, antiarthritis, antidengue, antibacterial, anthelmenthic, antidiarrhoeal, antihemorrhagic and as a diuretic. Scientists are continuously working to find out its new uses.

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