Review Article

SGVU Journal of Pharmaceutical Research & Education

ISSN: 2456-4508

JPRE

Journal homepage: http://www.gyanvihar.org/researchjournals/

A Review on study of underutilized plant *Cissus Woodroii* (Stapf ex Cooke) and genus *Cissus*.

Mrs. Pallavi Nemgonda Patil* 1, Dr. Santosh K.Sing2, Dr. Kiran A.Wadkar3

1, 2.Suresh Gyan Vihar University, Jaipur, Rajastan India.

3. Appasaheb Birnale College of Pharmacy, Sangli, Maharashtra, India.

ABSTRACT-

Cissus woodroii grows in hilly regions in Maharashtra (Pune, Kolhapur, Pasarni ghat area Satara), Andhra India. It belongs to genus *Cissus*, family vitaceae. *Cissus woodroii* also serves as a good source of Maximum per cent yield (13.49%), total phenolic content (24.14 mg TAE/g dry weight), and total flavonoid content (18.45 mg QE/g dry weight) were recorded in the methanolic leaf extract. Proximate analysis of fruits showed a calorific value of 168.86 kcal/100 g dry weight (DW). These fruits were found to be rich in macro- (sodium, potassium, calcium, magnesium, and phosphorus) and micro- (iron, manganese, zinc, and copper) mineral elements and vitamins (carotenoids and ascorbic acid)(Rupali M. Kolap et.al.2022). Such plants are termed as "underutilized" as scientific evidence regarding their potential is lacking. Taxonomically, it is a unique plant species of *Cissus* due to its shrub-like habit (Rupali Mukesh Kolap et al 2020).*cissus woodroii* is also used for various treatments like Antioxidant activity, nutritional value of underutilized wild *C. woodrowii* fruits. This article throws light on various recent knowledge of scientific research in various aspects of this genus cissus (Gabriel Fernandes et al.,2012) and *cissus woodroii and* remarkable pharmacological activities such as antioxidant and antitumour.

Keywords: Antioxidant, nutraceuticals, flavonide, *Cissus woodroii*, Phytochemical and pharmacological study, *Cissus,Vitaceae.*

1. INTRODUCTION (Shankara Rao K et al.,2019), (SingN.P et al 2000)

The plant designed as medicinal is implied that it is useful as a drug or therapeutic agent or an active ingredient of a medicinal preparation.

Various medicinal plants have been applied for years in daily life to treat disease all over the world (Nair et al.2004).The low or no harmful effect of medicine derived from natural sources has received a great deal of attention in both developed and developing countries (Lawal D et al.2013). According to a World Health Organization (WHO) report, herbal plants are widely used to treat and manage dangerous ailments (by approximately 80% of the world's population) (WHO 2019).Medicinal plants are important for pharmacological research and drug development because plant constituents are not only used directly as therapeutic agents, but also as starting materials for the synthesis of drugs or as models for pharmacologically active compounds. Herbal-derived remedies need a powerful and deep assessment of their pharmacological qualities and safety issues due to the large and growing use of natural-derived substances all over the world, which cannot rely only on the traditional knowledge. Plants are used medicinally in different countries and are a source of many potent and powerful drugs. On the other hand, there are several plants which possess various phytochemicals that can be beneficial to humans but are not explored yet. (Murthy HN et al.2020).

Vitaceae (the grape family) consist of 16 genera and ca. 950 species (Jun Wen et al 2018)and represented by the woody climbers with leaf opposed tendrils, some of them are shrubs and succulents too. Genus *Cissus* belongs to the family Vitaceae consists of about 350 species, among these a number of species used globally in traditional medicine to treat various ailments.(M. Manokariet al 2019) (Tasadduq R et al.2017; Dhanasekaran S et al.2020).

The present plant *Cissus woodroii* grows in hilly regions in Maharashtra (Pune,Kolhapur), on Buleshwar hill, near Yawat, Pune, Peddamandyam mandal, Chittoor district, in Andhra Pradesh. Andhra. It belongs to genus *Cissus*, Vitaceae family. It has erect shrubs with stems terete or obscurely angled, leaves large and more or less orbicular.The leaf-size is used to key out them (Lamina 20-30 × 20-25 cm and petioles 15-25 cm; these measurement may be of basal leaves while our herbarium specimens have distal leaves which are usually smaller characterize *C. woodrowii*.

It is shrub and wild variety. According to information collected in local area of Kolhapur

it was observed that, it's flowering season start's in month of September and bears fruits from month of October and losses leaves from November to December. The baby leaves comes in month of May to June. It's roots are used traditionally as a antitumor in animal treatment in Maharashtra. In Andhra Pradesh the paste of the stem is applied externally to relieve rheumatic pains.

To date, hundreds of plant species of *Cissus* have been explored for their phenolic compounds and antioxidant activities, since it is associated with cardiovascular diseases, pulmonary diseases, liver diseases, chronic kidney diseases, neurodegenerative diseases, cancer, etc.(Coulibaly AY et al.2014; Liguori I et al.2018).

Cissus woodrowii (Stapf ex Cooke) Santapau is commonly known as 'Woodrow's grape tree'. (Shankara Rao K et al.2019). Taxonomically, it is a unique plant species of *Cissus* due to its shrub-like habit, while the remaining taxa of the Vitaceae are woody lianas.(Cooke T.1902)

Bioprospecting of *Cissus woodrowii* for its phytochemicals and bioactivities is unnoticed.

Sr.No.	**Tribe**	**Genus**	**Species**
1	Ampelopsideae	Ampelopsis Michx. Nekemias Raf. Clematicissus Planch. Rhoicissus Planch.	18 9 6 14
2	Cisseae	Cissus L.	300
3	Cayratieae	Cayratia Juss. Causonis Raf. Acareosperma Gagnep. "Afrocayratia" Cyphostemma (Planch.) Alston Pseudocayratia J.Wen, L.M.Lu & Z.D. Chen Tetrastigma (Miq.) Planch.	25 30 1 7 200 5 100
4	Parthenocisseae	Parthenocissus Planch. Yua C.L.Li	14 2
5	Viteae	Vitis L.	75

		Ampelocissus Planch. (including Nothocissus and Pterisanthes)	115

Table 1 -Phylogenetic Tribal Classification of Vitaceae with Tribes and genera. (Jun Wen et al 2018)

1.	*Cissus acreensis*	1.	*Cissus fuliginea*	1.	*Cissus pileatus*
2.	*Cissus acris*	2.	*Cissus furcifera*	2.	*Cissus pingtungensis*
3.	*Cissus acuminata*	3.	*Cissus fusifolia*	3.	*Cissus pinnatifolia*
4.	*Cissus adamii*	4.	*Cissus gambianus*	4.	*Cissus planchoniana*
5.	*Cissus adeyana*	5.	*Cissus gardneri*	5.	*Cissus planchonii*
6.	*Endeavour River-vine - Cissus adnata*	6.	*Cissus geniculata*	6.	*Cissus platanifolia*
7.	*Venezuela treebine - Cissus alata*	7.	*Cissus glandulosa*	7.	*Cissus pobeguini*
8.	*Cissus albida*	8.	*Cissus glaucophylla*	8.	*Cissus poilanei*
9.	*Cissus albiporcata*	9.	*Cissus glaucotricha*	9.	*Cissus politus*
10.	*Cissus amapaensis*	10.	*Cissus glossopetala*	10.	*Cissus polyantha*
11.	*Cissus ambongensis*	11.	*Cissus glyptocarpa*	11.	*Cissus polydactyla*
12.	*Cissus amoena*	12.	*Cissus gongylodes*	12.	*Cissus populnea*
13.	*Cissus anemonifolia*	13.	*Cissus gossweileri*	13.	*Cissus producta*
14.	*Cissus angustata*	14.	*Cissus gossypiifolia*	14.	*Cissus prunifera*
15.	*Cissus anisophylla*	15.	*Cissus goudotii*	15.	*Cissus pseudofuliginea*
16.	*Cissus annamicus*	16.	*Cissus grandifolia*	16.	*Cissus pseudoguerkeana*
17.	*Cissus antandroy*	17.	*Cissus granulosa*	17.	*Cissus pseudopolyantha*
18.	*Kangaroo vine - Cissus antarctica*	18.	*Cissus grisea*	18.	*Cissus pseudoverticillata*
19.	*Cissus anulata*	19.	*Cissus guerkeana*	19.	*Cissus psoralifolia*
20.	*Cissus apendiculata*	20.	*Cissus haematantha*	20.	*Cissus pteroclada*

21.	*Cissus aphylla*	21.	*Cissus hamaderohensis*	21.	*Cissus pubinervis*
22.	*Cissus aphyllantha*	22.	*Cissus hastata*	22.	*Cissus pulcherrima*
23.	*Cissus apoensis*	23.	*Cissus heteroma*	23.	*Cissus pynaertii*
24.	*Cissus araguainensis*	24.	*Cissus heterophylla*	24.	*Veldt grape - Cissus quadrangularis*
25.	*Cissus aralioides*	25.	*Cissus heterotoma*	25.	*Cissus quadricornuta*
26.	*Cissus arguta*	26.	*Cissus hexangularis*	26.	*Cissus quarrei*
27.	*Cissus aristata*	27.	*Cissus heyneana*	27.	*Cissus quinquangularis*
28.	*Cissus aristolochiifolia*	28.	*Cissus hookeri*	28.	*Cissus reniformis*
29.	*Cissus aristolochioides*	29.	*Cissus humbertianus*	29.	*Cissus repanda*
30.	*Cissus arnottiana*	30.	*Cissus humbertii*	30.	*Cissus - Cissus repens*
31.	*Cissus assamica*	31.	*Five-leaved Grape - Cissus hypoglauca*	31.	*Cissus reticulata*
32.	*Cissus astrotrichus*	32.	*Cissus incisa*	32.	*Cissus retivenia*
33.	*Cissus atacorensis*	33.	*Cissus integrifolia*	33.	*Cissus rhamnoidea*
34.	*Cissus aubertiana*	34.	*Intermediate treebine - Cissus intermedia*	34.	*Cissus rheifolia*
35.	*Cissus auricomus*	35.	*Cissus inundata*	35.	*Cissus rhodotricha*
36.	*Cissus austroyunnanensis*	36.	*Cissus javalensis*	36.	*Cissus robinsonii*
37.	*Cissus bachmaensis*	37.	*Cissus javana*	37.	*Cissus rondoensis*
38.	*Cissus bahiensis*	38.	*Cissus kawensis*	38.	*Cissus rostrata*
39.	*Cissus barbeyana*	39.	*Cissus kerrii*	39.	*Venezuelan treebine - Cissus rotundifolia*
40.	*Cissus barteri*	40.	*Cissus koordersii*	40.	*Cissus rubiginosa*
41.	*Cissus bathyrhakodes*	41.	*Cissus kouandeensis*	41.	*Cissus rubricaulis*
42.	*Cissus bauerlenii*	42.	*Cissus kouilouensis*	42.	*Cissus rubropilosa*

43.	*Cissus bequaertii*	43.	*Cissus lamprophylla*	43.	*Cissus rufescens*
44.	*Cissus bicolor*	44.	*Cissus laneus*	44.	*Cissus ruginosicarpa*
45.	*Cissus biformifolia*	45.	*Cissus lanyuensis*	45.	*Cissus ruspolii*
46.	*Cissus blanchetiana*	46.	*Cissus latifolia*	46.	*Cissus sagittifer*
47.	*Cissus blumeana*	47.	*Cissus lebrunii*	47.	*Cissus saponaria*
48.	*Cissus boivinii*	48.	*Cissus leemansii*	48.	*Cissus schmitzii*
49.	*Cissus boliviana*	49.	*Cissus lemuricus*	49.	*Cissus schumanniana*
50.	*Cissus bosseri*	50.	*Cissus lenticellata*	50.	*Cissus sciaphila*
51.	*Cissus bracteosa*	51.	*Cissus leonardii*	51.	*Cissus senegalensis*
52.	*Cissus brevipes*	52.	*Cissus leucophlea*	52.	*Cissus serroniana*
53.	*Cissus cactiformis*	53.	*Cissus lineata*	53.	*Cissus serrulatifolia*
54.	*Cissus cacuminis*	54.	*Cissus lonchiphylla*	54.	*Cissus setulosa*
55.	*Cissus caesia*	55.	*Cissus longicymosa*	55.	*Cissus siamica*
56.	*Cissus calcicola*	56.	*Cissus louisii*	56.	*Cissus silvestris*
57.	*Cissus camiriensis*	57.	*Cissus luzoniensis*	57.	*Cissus simsiana*
58.	*Cissus campestris*	58.	*Cissus macrobotrys*	58.	*Cissus smithiana*
59.	*Cissus cardiophylla*	59.	*Cissus macrophylla*	59.	*Cissus spectabilis*
60.	*Cissus carrissoi*	60.	*Cissus madecassa*	60.	*Cissus spinosa*
61.	*Cissus cerasiformis*	61.	*Cissus marcanii*	61.	*Long-leaved Grape - Cissus sterculiifolia*
62.	*Cissus clematidea*	62.	*Cissus mauritiana*	62.	*Cissus stipulata*
63.	*Cissus coccinea*	63.	*Cissus megacarpa*	63.	*Minature grape ivy - Cissus striata*
64.	*Cissus cochinchinensis*	64.	*Cissus mexicana*	64.	*Cissus subaphylla*
65.	*Cissus colombiensis*	65.	*Cissus microcarpa*	65.	*Cissus suberecta*
66.	*Cissus comosus*	66.	*Cissus microdonta*	66.	*Cissus subhastata*
67.	*Cissus compressiflora*	67.	*Cissus miegei*	67.	*Cissus subramanyamii*
68.	*Cissus conchigera*	68.	*Cissus migeodii*	68.	*Cissus subrhomboidea*
69.	*Cissus convolvulacea*	69.	*Cissus milnei*	69.	*Cissus subtetragona*

70.	*Cissus cornifolia*	70.	*Cissus mirabilis*	70.	*Cissus sue*
71.	*Cissus corylifolia*	71.	*Cissus modeccoides*	71.	*Cissus sulcicaulis*
72.	*Cissus coursii*	72.	*Cissus morifolia*	72.	*Cissus sulfurosus*
73.	*Cissus craibii*	73.	*Cissus narinensis*	73.	*Cissus sumatrana*
74.	*Cissus crusei*	74.	*Cissus neei*	74.	*Cissus surinamensis*
75.	*Cissus cucumerifolia*	75.	*Cissus nervosa*	75.	*Cissus sylvicola*
76.	*Cissus cucurbitina*	76.	*Cissus nicaraguensis*	76.	*Cissus teysmannii*
77.	*Cissus cuspidata*	77.	*Cissus nigropilosa*	77.	*Cissus thalictrifolia*
78.	*Cissus cussonioides*	78.	*Cissus nobilis*	78.	*Cissus tiliacea*
79.	*Cissus darik*	79.	*Javanese treebine - Cissus nodosa*	79.	*Cissus tiliiformis*
80.	*Cissus dasyantha*	80.	*Cissus novemfolia*	80.	*Cissus timoriensis*
81.	*Cissus dealbata*	81.	*Cissus nymphaeifolia*	81.	*Cissus tinctoria*
82.	*Cissus debilis*	82.	*Cissus obliqua*	82.	*Cissus touraensis*
83.	*Cissus decaryi*	83.	*Cissus oblonga*	83.	*Cissus trianae*
84.	*Cissus decidua*	84.	*Cissus oblongifolia*	84.	*Sorrelvine - Cissus trifoliata*
85.	*Cissus descoingsii*	85.	*Spoonleaf treebine - Cissus obovata*	85.	*Cissus trigona*
86.	*Cissus dewevrei*	86.	*Cissus oliveri*	86.	*Cissus triloba*
87.	*Cissus dichotoma*	87.	*Cissus oreophila*	87.	*Cissus triternata*
88.	*Cissus diffusiflora*	88.	*Cissus osaensis*	88.	*Cissus trothae*
89.	*Cissus dinklagei*	89.	*Cissus oxyodonta*	89.	*Cissus tweedieana*
90.	*Cissus diversilobata*	90.	*Cissus palmata*	90.	*Cissus ulmifolia*
91.	*Cissus doeringii*	91.	*Cissus palmatifida*	91.	*Cissus umbellata*
92.	*Cissus duarteana*	92.	*Cissus paniculata*	92.	*Cissus ursina*
93.	*Cissus duboisii*	93.	*Cissus paraensis*	93.	*Cissus uvifer*
94.	*Cissus egestosa*	94.	*Cissus parviflora*	94.	*Cissus venezuelensis*
95.	*Cissus ellenbeckii*	95.	*Cissus patellicalyx*	95.	*Princessvine - Cissus verticillata*
96.	*Cissus elongata*	96.	*Cissus paucinervia*	96.	*Cissus vinosa*

97.	*Caro de tres hojas - Cissus erosa*	97.	*Cissus paullinifolia*	97.	*Cissus viridescens*
98.	*Cissus evrardii*	98.	*Cissus peltata*	98.	*Cissus vitiginea*
99.	*Cissus fanshawei*	99.	*Cissus penninervis*	99.	*Cissus voanonala*
100.	*Cissus farinosa*	100.	*Cissus pentaclada*	100.	*Cissus wallacei*
101.	*Cissus faucicola*	101.	*Cissus pentagona*	101.	*Cissus wellmanii*
102.	*Cissus flavens*	102.	*Cissus perrieri*	102.	*Cissus welwitschii*
103.	*Cissus flaviflora*	103.	*Cissus peruviana*	103.	*Cissus wenshanensis*
104.	*Cissus flavifolia*	104.	*Cissus petiolata*	104.	*Cissus woodrowii*
105.	*Cissus floribunda*	105.	*Cissus phymatocarpa*	105.	*Cissus wrightiana*
106.	*Cissus forsteniana*	106.	*Cissus picardae*	106.	*Cissus xerophila*
107.	*Cissus fragilis*	107.	*Cissus parviflora*	107.	*Cissus youngii*
Total=107+107+108=322species				108.	*Cissus zombitsy*

Table 2 –Cissus genus Classification of Vitaceae family.

(https://observation.org/taxa/10104/?genus=Cissus)

Synonym

Cissus woodroii, Vitis woodroii (Stapf ex Cook) Santapaue

Common names

Woodrow's grape tree**,** Girnool

Taxonomy of *Cissus woodroii* L. (flora of Bombay Presedency) (India Biodiversity portal)

Kindom-Plantae

Phylum-Tracheophyta

Class : Magnoiliopsida

Order : Vitales

Family : Vitaceae

Genus : *Cissus*

Species : *woodroii*

2. BOTANICAL DESCRIPTION OF *CISSUS WOODROII*-(Cooke. T 1902,Tetali, *et al*. 2000) (Rupali Mukesh Kolap et al .,2020),(Sharma BDet al 1984,1988)

It is an erect shrub 5 -6 ft. high ;trunk 3—4 in. thick at the base ; bark rough, grey ; lower branches2—3 ft. long, annual , ecirrhose , slightly tomentose at t he apex. Leaves up to 9 in. long and broad, pale green, cordate-ovate or cordate -rotund(with a broad sinus), usually shortly (rarely obscurely) 3 —lobed, acute or acuminate,re pand-cre nat e (t he cre nature s re curve d) ,at first sparingly tomentose , at length glabrate ,rather firm, palmi—nerved ; petiole s nearlye quallingt he blade,more or less tomentose when young ; stipules triangular-ovate , reddish,caducous. Flow e rs tetrame rous,in compoundumbe ls ; peduncle s 1 in. or afterwards 2 in. long ; primary rays usually 4 about —5 in. long at time of flowering, afterwards up t o 1 ; in.“long ;pedice ls at time of flow e ring 71ih . , afterwards in. long, thick, straight. Calyx sauce r-shaped : limb membranous, truncate or very obscurely lobed. Petal s 4 calyptrately deciduous, hooded and thickened at t he apex. Disk 4-lobed. Style the root contains starch-granule s in abnudance , of variable form,also raphides.

Which are pointed at one end and 2—3-furcate at the other Large shrubs or small trees, 1.5-3.0m high, bark rough, grey.Leaves, large, 8-20 cm as long as broad, ovate, sometimes obscurely3-lobed, apex acute, acuminate, base cordate, margins crenate-repand. Flowers green, apex tinged red, 0.3 –0.5 cm across, in compound umbels; calyx saucer shaped; petals deciduous. Berries 0.7 –1.0 cm across, subglobose, reddish when ripe.

Fig. 1. *Cissus woodroii(Vitis woodroii)* (Stapf ex Cook) Santapaue plant growing under natural conditions.

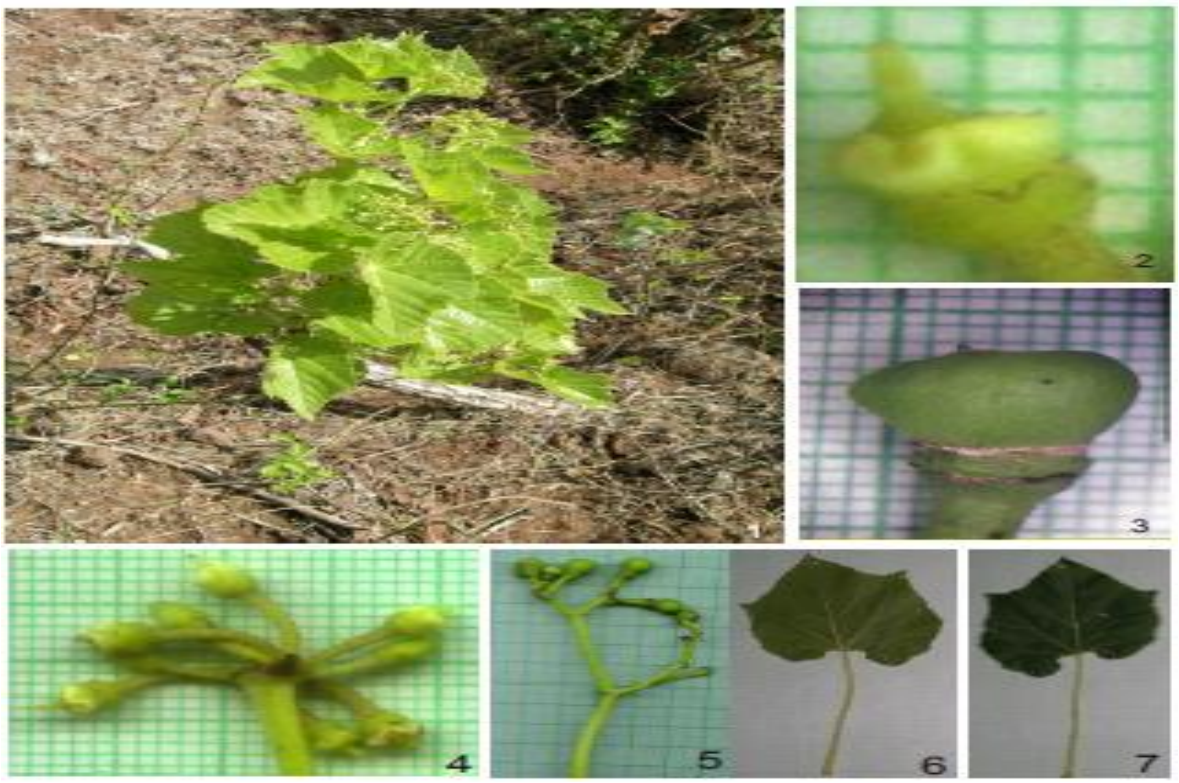

Fig. 2. *Cissus woodroii(Vitis woodroii)* (Stapf ex Cook)-1,Habit, 2.Flower, 3.Fruit, 4.&.5Inflorescence,6.Leaf-Dorsal view.

3. STUDY OF SOME SPECIES FROM GENUS CISSUS-

(Bhanumathi Natarajan et al.,2000),(Chidambara Murthy KN et al,.2003), (Rein Hui,2007), ,(AA Ahmadu et al 2010), (Anna Trias-Blasi et al.,2010),(Gabriel Fernandes et al., 2012),(Kashikar ND et al,. 2012),(Atiku, I et al 2013),(Sani, Y.M.1 etal.,2014),(Jacek Drobnik et al., 2015), (Ganapathymuru Ganalagu Lakshmanan et al., 2016,(Hari Sasidharan et al., 2016),(Ganalagu Lakshmanan et al.,2016),(Poornima R et al., 2016),(Sujata Tetali et al., 2016), (Alina K Sebastian et al 2017),(Harisha C. R et al.,2017),(Md. Nazim Uddin Chy et al., 2017), (Selvi P et al 2017),(Sudha Parimala et al., 2017), (Chukwuebuka et al., 2018), (Marielba de los et al., 2019), (M. Manokari et al 2019) ,(Mosaib MG et al., 2020),(Ozimede et al 2020) (Jayanthi Chenniappan et al,. 2020),(María del Rayo Camacho-Corona et al., 2020),(Arti Singh et al,.2021), (LailyRahamawatiet al.,2021),(India Biodiversity portal),(Rajesh kumar S et al., 2021).

Sr.no	**Name of species**	**Location**	**Common name**	**Chemical constituent**	**Pharmacological activity**	**Part used**	**Habitat**
1.	*Cissus adnata*	Bhatiary, Chittagong-Bangladesh	Bhatia lot,down – rang in Assamees ,pani-lara in Nepali	alkaloids, carbohydrates, flavonoids, phenols, tannins, saponins, proteins, amino acid, glycosides, and terpenoids	antibacterial, pesticidal, antiviral, antitumor, anti-inflammatory and antinociceptive agents	leaves	Climber
2.	*Cissus aralioides*	Cameroon ,Obio/ Akpor Local Government Area of Rivers State, Nigeria	kindamina	alkaloid, saponin, tannin, flavonoid, steroid, terpenoid, cardiac glycoside, proteins and reducing sugar	anti-microbial and toxicological agent against microorganisms of the gastrointestinal and urogenital ,tracts, arthritis, edema, treatment for fever and malaria	Leaf, roots	climber
3.	*Cissus araneosa*	India : Evergreen	Hindi: Kamraj; Mar.:	Sterols, Quinones, and Phenolic			Slender, far climbin

		forests of western Ghats, up to 1500 m. Maharashtra, Karnataka and Tamil Nadu.	Bendri, Bendervel, Ghorvel; Tarn.: Kattuthiratcha	compounds, Anthocyanins, Saponins and flavonoids			g shrub
4.	*Cissus amplexicaulis*	Thailand					Slender climber
5.	*Cissus aristata*	hilly regions of Mangad, Thrissur Kerala, India		alkaloids, tannins (condensed), flavanoids, phytosterols, triterpenoid, lactones, volatile oil and saponin.	antibacterial activity on Klebsiella pneumoniae and Staphylococcus aureus.	dried root and stem	Scandent shrub
6.	*Cissus arnottiana*	Periyar Palkalai Nagar, Salem ,Tamil Nadu,	"Nanaminukki" in Tamil and "Nelagummadi" in Telugu	(Eugenol, Phenol, 4-(ethoxymethyl)-2-methoxy, 3, 5-Cyclohexadiene-1, 2-dione,	antimicrobial, anti-inflammatory, antiarthritic, antiasthma,	Stem,root	erect woody tree ,erect shrubs

		India		3, 5-bis (1, 1-dimethylethyl), Diisooctyl phthalate)	diuretic, hepatoprotective and antioxidant, protection against chronic diseases, anti-viral activity.		
7.	*C. Assamica*	china, india, cambodia, bhutan, nepal, thailand		lupeol, n-hexacosinc acid, isolariciesinol-9-O-beta-D-glucopyranoside, daucostenin, 3,3'-dimethyl ellagic acid, b sitosterol and bergenin	anti-snake venom		
8.	*Cissus austroyunnanensis*	tropical regions of India, Srilanka, Africa, Arabia, and South Asia		Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids			

9.	*Cissus cornifolia baker (planch)*	Kufenia, Zaria,Arica ,Zimbabwe	splanch and riigarbirri	Saponin, flavonide,glycoside,alkaloid, hydroquinone, resorcinol, vanillin and n - hexanoic	Anti-inflammatory, diabetes, gonorrhea, sedative malaria, septic tonsils, and pharyngitis, central nervous system depressants and sedative	leaf and root	semi-scandent woody shrub
10.	*Cissus discolor*	tropical regions of India, Srilanka, Africa, Arabia, and South Asia	"Sangharhmai"	Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids	treat stomach troubles and is also applied to itching sores	leaves	Creeping or climbing shrubs
11.	*C. Debilis*	Cameroon		Sterols, Quinones, and Phenolic compounds, Anthocyanins,	antiproliferative activity on human CaCo-2		slender climber

				Saponins and flavonoids	cells		
12.	*Cissus elongata*	Goa, Maharashtra, Karnataka, Tamil Nadu and Kerala in India, Srilanka, Africa, Arabia, and South Asia	Talbot	Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and Flavonoids, Tannins, Terpenoids	skin and nerve diseases, gastrointestinal abnormalities, infections, cardiac ailments, antipoisonous	tubers	very large glabrous climber
13.	*C. Hamaderohensis*	Yemen, West Asia		Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids	inhibit angiotensin converting enzyme (ACE), neutral endopeptidase (NGP) and aminopeptidase N (APN) ,anti-viral,		

					anti ace, ngp and apn		
14	*Cissus hexangularis*	tropical regions of India, Srilanka, Africa, Arabia, and South Asia		Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids			
15	*C. Hypoglauca*	australia	jungle grape, water vine, five leaf water vine	Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids	sore-throat		
16.	*C. Ibuensis hook*	Nigeria (africa)		Flavonoids, Kaempferol, Quercitin ,Stilbenes, triterpenoids and steroids	rheumatism, arthritis, gastrointestinal disturbance	Leaves, stem,fruit	
17.	*Cissus incisa*	northern mexico	ivy treebine, marine ivy, or grape ivy	fatty acyls, sphingolipids, sterols, glycerolipids, prenol lipids, and terpenes	antimicrobial, cytotoxic skin infections, abscesses and tumors		
18.	*Cissuss*	Nigeria	Cipopuca,	flavonoids,	anti-		

	icyoides		Bejuco de porra, Bejucocaro, Puci, and Aniltrepad or	Linalool, and α-tocopherol, coumarin glycoside 5,6,7,8-tetrahydroxycoumarin- 5β -xylopyranoside which was obtained together with known coumarinsabandin, two flavonoids kaempferol 3-rhamnoside and quercetin 3- rhamnoside, and two steroids, itosterol and 3β-O-β-dglucopyranosylsitosterol	inflammatory Anti – Diabetic,		
19.	*Cissus kerrii*	tropical regions of India, Srilanka, Africa, Arabia,		Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids			

		and South Asia					
20	*Cissus javana*	tropical regions of India, Srilanka, Africa, Arabia, and South Asia		Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids			
21.	*Vitis latifolia*	tropical regions of India, Srilanka, Africa, Arabia, and South Asia	Panibel;	Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids			climbing shrubs
22	*Cissus lageniflora Gilg*	Obio/Akpor Local Government Area of Rivers State,		Phenols, Alkaloids, Aglycone Glycosides, Cardiac Glycosides, Steroidal Aglycone			

		Nigeria		Glycosides			
23	*Cissus luzoniensis*	tropical regions of India, Srilanka, Africa, Arabia, and South Asia		Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids			
24.	*C. Populnea*	nigeria (africa), Brazil and the Caribbean	food gum, ager, okoho, Ager	phenolic content	increase proliferation of sertoli cells, antibacterial	Leaves, stem and root, bark	
25.	*Cissus petiolata (Cissus pallid)*	Obio/Akpor Local Govern, Nallamalla forest of Kurnool district, Telangana, India	In tamil Nanaminukki,in Irula-Malangikodi.	Phenols, Alkaloids, Aglycone Glycosides, Cardiac Glycosides, Steroidal Aglycone Glycosides, , flavonoids - Gallic acid and Quercetin, .	anticancer activity, antioxidant action, protective effect on the haemopoietic system	stem & roots	Climbing shrub

		ment Area of Rivers State, Nigeria					
26	*Cissus polyantha*	Turunku, Igabi Local Government Area of Kaduna State. Nigeria		carbohydrates, flavonoids, saponins, tannins steroids and triterpenes.	conjunctivitis and inflammation.	root	
27	*Cissus pteroclada*	tropical regions of India, Srilanka, Africa, Arabia, and South Asia		b-sitosterol, bergenin, 11-O-galloylbergenin, 11-O-(4-hydroxy benzoyl) bergenin, gallic acid and daucosterol The leaves of C. ibuensis contained Quercetin 3-O and flavanoid			
28.	*C. Quadrangularis*	sri lanka (asia) india,	veldt grape ,climbing cactus, cactus vine,	alkaloids, steroids, tannins, saponins,	fracture healing, increases bone	Stem,leaves,root	a moderate grower.

		Nigeria	Edible stemmed Vine	phytoestrogen steroids, cardio glycosides and terpenoids. Flavanoids , carotenoids, steroids, calcium ,flavonoids Beta-sitosterol and luteolin8 , Triterpenoids, lead, iron, potassium, zinc, calcium, sodium, cadmium, copper and magnesium, parthenocissus , resveratrol, piceatannol, pallidol, alicyclic lipids, calcium, phosphorous and	strength, protects bone from postmenopausal bone loss, Anti-ulcer activity Anxiolytic, antipyretic and antidiabetic properties Antibacterial activity Women health and osteoporosis Anti-inflammation Antioxidant		It flourishes in sun or light shade in a warm tropical climate

				phytoestrogenic steroids			
29.	*Cissus repens*	Southern China, Philippines, Malaysia, and Taiwan		Stilbene C glucosides	snake bites, rheumatic pain nephritis, long-term coughs, and diarrhea ,hepatoprotective	roots and stems,leaf	perennial climber
30.	*Cissus repanda*	Kumanto Arunachal Pradesh, Tripura, Assam, Bihar, Orissa, Madhya Pradesh, and Western Ghats	"Panivel"		hpatoprotective	leaf	large climber
31.	*C. Rotundifolia*	africa, south America,Endau hill,	Arabian wax Cissus, Peruvian grape Ivy	Sterols, Quinones, and Phenolic compounds, Anthocyanins,	Anti-parasitic ,diabetic	Leaves,stem,root	

		Kitui County, Kenya		Saponins and flavonoids			
32.	*C. Rubiginosa*	congo		Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids	anti dysentery, anti diarrhoea		
33.	*Vitis rugosa*	India : Himalaya, from Garhwal eastwards and Khasia Hills, between 1200-2500 m. Uttar Pradesh, Sikkim, Arunachal Pradesh and		Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids			Climbing or scrambling shrubs

		Meghalaya. Nepal and Myanmar					
34	*C. Sicyoides*	brazil (south america)	princess vine, curtain ivy, millionaire vine	Flavanoids, linalool and a-Tocopherol, carotenoids and phenolic compounds (resveratrol, coumarins, and tannins)	anti-diabetic, diuretic, anti-inflammatory, anticonvulsant, anxiolyte, stroke, abscesses, arthritis	leaf	
34	*Cissus subtetragona*	Guangdong, Guangxi, Hainan, Yunnan,(Laos, Vietnam) China	si leng ,bai fen teng	Flavonoid-kaempferol, genistin, and apigenin)	anti-inflammatory effects, gastritis, acute lung injury	aerial parts-dried branch with leaves	
36	*Cissu sverticillata*	tropical regions of		terpenoids	decrease blood sugar level		

		India, Srilanka, Africa, Arabia, and South Asia					
37.	*C. Triloba*	tropical regions of India, Srilanka, Africa, Arabia, and South Asia		Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids			
38	*Cissus trifoliata*			alcohols, alkanes, esters, fatty acids, terpenes and phenolic compounds	e management of infectious diseases and tumors,	stems	
39.	*C. Verticillata*	trinidad and tobago (carribean)		Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids quercetin	anti-cholesterol, anti-diabetic, antioxidant activity, action to teeth and gums	Root, sole bark	

40.	*Cissus vitiginea L.*	south India and Sri Lanka	south indian treebine	alkaloids, flavonoids, triterpenoids, steroids, glycosides, coumarin, tannins, sugar, proteins	cure wounds, diabetes, cardiovascular illness, cancers, particularly bone diseases and arthritis	leaves and stem	woody Climber
41.	*Cissus wenshanensis*	tropical regions of India, Srilanka, Africa, Arabia, and South Asia		Sterols, Quinones, and Phenolic compounds, Anthocyanins, Saponins and flavonoids			
42.	*Cissus woodroii*	Girnool, 'Woodrow's grape tree'.	Kolhapur, Mumbai, Nasik, Pune, Raigad, Ratnagiri, Satara, Sindhudurg ,Thane,Andhra India.	phenolic, and flavonoid content	antioxidant activities,nutraceutical, The roots were made into a powder and applied to cut wounds where puss had formed	Fruit,leaves, roots	Woody shrub

4. PHYTOCHEMISTRY-(Rupali M. Kolap et.al.,2022, Rupali Mukesh Kolap et al .,2020)

The moisture, ash, and crude fiber content of *C. woodrowii* fruits were 13.71%, 23.88%, and 21.15 g/100 g DW, respectively. In *C. woodrowii* fruits, fat, protein, and carbohydrates contents were 2.71 g/100 g DW, 5.78 g/100 g DW, and 15.23 g/100 g DW, respectively.Based on this analysis, the oxidizable energy of the *C. woodrowii* fruits was 706.54 kJ/100 g DW or 168.86 kcal/100 g DW. Presence of sodium (37.23 mg/100 g DW), potassium (71.9 mg/ 100 g DW), calcium (78.29 mg/100 g DW), magnesium (118.77 mg/ 100 g DW), and phosphorus (30.45 mg/100 g DW) was recorded in *C. woodrowii* fruits .

Higher phenolic and flavonoid contents in the methanolic extract of *C. woodrowii*. LC-HRMS analysis has revealed 20 phenolic compounds in the leaves of *C. woodrowii* . Profiling of phenolic compounds in methanolic leaves extracts of *C. woodrowii* by LCHR-MS on (a) positive like Rutin, Quercitrin, Cosmosiin, Dihydrorobinetin, Hesperetin and (b) negative mode *like* Catechin, Rutin, Gallic acid, Diosmetin, Phloridzin, Ellagic acid, Rhoifolin, Cosmosiin, Epicatechin, Centaurein, Norstictic acid pentaacetate, Quercitrin, Naringenin-7-o-glucoside, Dihydroquercetin, Lomatin, Cosmosiin hexaacetate, Dihydrorobinetin, Hesperetin, Embelin, Harderoporphyrin, Rhoifolin

5.PHARMACOLOGICAL ACTIVITIES-(Rupali M. Kolap et.al.,2022, Rupali Mukesh Kolap et al .,2020)

Nutritional value-

Clinical trials have shown that the intake of macro-mineralsfrom fruit helps to reduce the chances of non-communicable diseases.

Antioxidant activity-

20 phenolic compounds in the leaves of *C.woodrowii* which might play an important role in the

antioxidant activity.

6.TRADITIONAL MEDICINAL USES/ETHANOBOTANICAL USES-

From survey of local regeion of distribution of *C.woodrowii* in Kolhapur district found that the root ofplant is used for treatment of tumor in veterinary practice.

7.CONCLUSION-

C.woodrowii has been claimed for a antioxidant activity,nutritional value and number of

ethanobotanical uses or traditional medicinal uses. The phytoconstituents presented in this review could help researchers to explore the plant at next extent. Emphasis should be laid on the novel methods of propagation of this plant and further exploration in drug research. By considering majority of species in *Cissus* shows activity on bone fracture healings,dibetis,hepatoprotective,antibacterial activity, Anti-Ulcer Activity ,obesity, gastrointestinal tract(Gabriel Fernandes et al 2012) and the medicinal values and other uses of *C.woodrowii* so there is future scope for research on *C.woodrowii.* therefore conservation of this plant is also recommended.

8. ACKNOWLEDGEMENTS -
Authors are grateful to the Suresh Gyan Vihar Univrsity, Jaipur, India, Principal Dr.Shitalkumar S.Patil providing support to their work..

9.REFERENCES-

1. Arti Singh, Jitendra Kumar, Vijay Kumar Sharma, Dheeraj Kumar Singh, Puja Kumari, Jay Hind Nishad, Veer Singh Gautam, and RavindraNathKharwar. "Phytochemical analysis and antimicrobial activity of an endophytic Fusarium proliferatum (ACQR8), isolated from a folk medicinal plant Cissus quadrangularis L." *South African journal of botany* 140, 2021: 87-94.

2. AA Ahmadu,* A Onanuga, and R Aquino, Flavonoid Glycosides from the Leaves of *Cissus Ibuensis* Hook (Vitaceae), African Journal of Traditional Complementary Alternative Medicine,2010;(3):225-230.
3. Alina K Sebastian and Anto P V, evaluation of antibacterial activity of cissus aristata blume against human pathogenic bacteria. Int. J. Adv. Res. 5(5), 1246-1250,2017.
4. Anna Trias-Blasi , John A. N. Parnell & Kongkanda Chayamarit Cissus amplexicaulis (Vitaceae), a new endemic species from Thailand The Board of Trustees of the Royal Botanic Gardens, Kew, 2010 KEW BULLETIN VOL. 65: 487–490 (2010)
5. Atiku, I*, Musa, A.M and Sule, M.I, Isolation of stigmasterol from methanolic extract of Cissus Cornifolia baker (planch), Nigerian Journal of Pharmaceutical Sciences,Vol. 12, No.1, March, 2013.
6. Bhanumathi Natarajan & Berit Smestad Paulsen An Ethnopharmacological Study from Thane District, Maharashtra, India: Traditional Knowledge Compared with

Modern Biological Science Pharmaceutical Biology Vol. 38, No. 2, pp. 139–151, 2000,

7. Chidambara Murthy KN., Vanitha A, Mahadeva Swamy M, and Ravishankar G A, Antioxidant and Antimicrobial Activity of *Cissus quadrangularis* L. Journal of Medicinal Food. Jul 2003; 99-105.
8. Cooke T, The Flora of Presidency of Bombay, (Botanical survey of India, Calcutta), 1902, Vol.2: 264(rep. Ed.1958)
9. Coulibaly AY, Hashim R, Sulaiman SF, Sulaiman O, Ang LZ, et al., Bioprospecting medicinal plants for antioxidant components, Asian Pac J Trop Biomed, 2014, 7(1), S553-S559.
10. Gabriel Fernandes*, Jameela Banu Medicinal properties of plants from the genus *Cissus*:A review, Journal of Medicinal Plants Research Vol. 6(16), pp. 3080-3086, 30 April, 2012
11. *Ganapathymuru Ganalagu Lakshmanan,* Review on Phytochemical and Pharmacological activities of the genus *Cissus* Linn, *International* Journal of Pharmaceutical Research,Oct – Dec 2016,Vol 8 , Issue 4,1-7.
12. Jayanthi Chenniappan , Sankaranarayanan A, Arjunan S, Evaluation of Antimicrobial Activity of *Cissus quadrangularis* L. stem extracts against Avian Pathogens and Determination of its Bioactive Constituents using GC-MS, Journal of Scientific Research; Volume 64, Issue 1, 2020;90-96.
13. Dhanasekaran S, Phytochemical characteristics of aerial part of *Cissus quadrangularis*(L) and its in-vitro inhibitory activity against leukemic cells and antioxidant properties, Saudi J Biol Sci, 2020, 27(5), 1302-1309.
14. Hari Sasidharan,*, Anto Puthur Varghese, Taxonomy of selected species of *Cissus* (Vitaceae) fromThrissur district, South Indian Journal Of Biological Sciences 2016; 2(1); 222-228.
15. Harisha C. R, Rabinarayan Acharya, Maltiben G. Chauhan, Development of Random Amplifi ed Polymorphic DNA markers for authentifi cation of *Cissus repanda* vahl.,ayujournal August 10, 2017, IP: 49.35.9.246.
16. India Biodiversity portal, https://indiabiodiversity.org/species/show/264112
17. Jacek Drobnik,AndreiaBarroncas De Oliveira, Cissus verticillata (L.) Nicolson and C.E. Jarvis (Vitaceae): Its identification and usage in the sources from 16th to 19th century Journal of Ethanopharmacology,volume 171, 317-329,2 August 2015.

18. Jun Wen*, Li-Min Lu , Ze-Long Nie, Xiu-Qun Liu, Ning Zhang, Stefanie Ickert-Bond , Jean Gerrat,Steven R. Manchester, John Boggan, and Zhi-Duan Chen, Review A new phylogenetic tribal classification of the grape family (Vitaceae), Journal of Systematics and Evolution, July 2018 , Volume 56 ,Issue 4 ,262–272.
19. Kashikar ND and Indu george, Antibacterial Activity of Antibacterial Activity of Antibacterial Activity of *Cissus quadrangularis* Linn, Indian Journal of Pharmaceutical Sciences; November 18, 2012; IP: 59.182.181.110.
20. Lawal D,Yunusa I, Dodonaeaviscosalinn: Its medicinal, pharmacological and phytochemical properties, Int. J. Innov. Appl. Stud. 2, 2013; 477–483.
21. Laily Rahamawatiet al., *Cissus subtetragona* Planch. Ameliorates Inflammatory Responses in LPS-induced Macrophages, HCl/EtOH-induced Gastritis, and LPS-induced Lung Injury via Attenuation of Src and TAK1,NationalLibrary of Medicine,MDPI,2021.
22. Luis Fernando Méndez-López 1 , Elvira Garza-González 2 , María Yolanda Ríos 3 , M. Ángeles Ramírez-Cisneros 3 , Laura Alvarez 3 , Leticia González-Maya 4 , Jessica N. Sánchez-Carranza 4 and María del Rayo Camacho-Corona 1,*, Article Metabolic Profile and Evaluation of Biological Activities of Extracts from the Stems of Cissus trifoliate,Internal journal of molecular science,MDPI. 31 January 2020.
23. Liguori I, Russo G, Curcio F, Bulli G, Aran L, et al., Oxidative stress, aging, and diseases, ClinInterv Aging, 2018, 13, 757-772.
24. Marielba de los Angeles Rodriguez Salazar, Glides Rafael Olivo Urbina, Priscila do Nascimento Bezerra, Vânia Maria Borges Cunha, Marcilene Paiva da Silva, Flávia Cristina Seabra Pires, Ana Paula de Souza e Silva, Sérgio Henrique Brabo de Sousa and Raul Nunes de Carvalho Jr, Antioxidant and Biological Activity of Cissus sicyoides and Rosmarinus officinalis Extracts, open access peer-reviewed chapter ,IntechOpen Journals March 20th, 2019.
25. Mohammed Shoibe, Md. Nazim Uddin Chy,* Morshed Alam, Md. Adnan, Md. Zobidul Islam, Shababa Wajida Nihar, Nishat Rahman, and Ehsan Suez, In Vitro and In Vivo Biological Activities of Cissus adnata (Roxb.),Natural Library of Medicine,vol5:4,Dec2017.
26. Mosaib MG, Maruf MAA, Islam R, Mahmud S, Sohana SN, Imran MAS, Rony MH, Islam M, Zuhora FT, and Islam S., Antibacterial activity of *Cissus quadrangularis*

stem extract on the pathogenic and industrial waste watered bacteria. *Eur. J. Med. Health Sci.*, 2020;2(2):28-38.

27. M. Manokari*, Mahipal S. Shekhawat, An updated review on *Cissus vitiginea* L. (Family: Vitaceae) - An important medicinal climber,World News of Natural Sciences an International scientific Journal, WNOFNS 22 (2019) 75-83 EISSN 2543-5426.
28. Murthy HN and Bapat VA, Importance of underutilized fruits and nuts, in Bioactive Compounds in Underutilized Fruits and Nuts, edited by H N Murthy and V A Bapat (Springer Nature Switzerland), 2020, 3-19.
29. Nair, Milliken, W., Albert, B.,. The use of medicinal plants by the Yanomami Indians of Brazil, Part II. Eco. Botany,2004; 51, 264–278.
30. Nwogueze Bartholomew Chukwuebuka*, Anachuna Kenneth Kelechi, Eke Chidinma Nwanneamaka and Ufearo Chibueze Stephen,Toxicity Studies and Phytochemical Screening of Aqueous Extract of Cissus aralioides Plant, Journal of Advances in Medical and Pharmaceutical Sciences17(1): 1-7, 2018
31. https://observation.org/taxa/10104/?genus=Cissus.
32. ONYEWEAKU, GC; NYANANYO, BL; *OZIMEDE, CO, Taxonomic Studies on the Genus *Cissus* L. (Vitaceae) Present in Obio/Akpor Local Government Area of Rivers State, Nigeria, J. Appl. Sci. Environ. Manage.Vol. 24 (1) 139-145 January 2020.
33. Poornima R. Kunder and Vidya SM, Ethnomedicinal importance of rare family member of Vitaceae, Cissus elongata Roxb, Lake 2016: Conference on Conservation and Sustainable Management of Ecologically Sensitive Regions in Western Ghats, [the 10th biennial lake conference], 28-30th December 2016.
34. Rajesh kumar S, Soumya Menon, Venkat Kumar S, et.al., Anti-inflammatory and Antimicrobial Potential of *Cissus quadrangularis*-Assisted Copper Oxide Nanoparticles; Hindawi Journal of Nanomaterials Volume 2021; Article ID 5742981: 1-11.
35. Rein Hui, Flora of China 12: 184–188. 2007
36. Rupali M.Kolap, Prachi S. Kakade Ganesh D. Mankar Rajkumar B, Barmukh Rajesh N. GaccheSaurabhaB.Zimare,Bioprospection of underutilized wild *Cissus woodrowii* fruits for nutritional value and characterization of green-extracted

antioxidant phenolic compounds,Journal of Applied Research on Medicinal and Aromatic Plants ;Volume 29, May 2022, 100379.

37. Rupali Mukesh Kolap, Akshay Bharat Gulave and Saurabha Bhimrao Zimare, Bioprospecting of the underutilized endemic taxon *Cissus woodrowii* (Stapf ex Cooke) Santapau for its antioxidant activity and phenolic profiling, Indian Journal of Natural Products and Resources; Vol. 11(4); 2020: 250-259.
38. Sabeerali Ansarali, Selvarasuvasuki MAnikandan,GAnapathymuru Ganalagu Lakshmanan*,Review on Phytochemical and Pharmacological activities of the genus Cissus Linn., International Journal of Pharmaceutical Research | Oct – Dec 2016, Vol 8,Issue 4-1.
39. Sani, Y.M.1, Musa, A. M.1, Pateh, U.U1,. Haruna,1 A.K., Yaro, A.H.2, Sani, M.B3., Haruna,A.3 and Magaji, M.G.2 phytochemical screening and preliminary evaluation ofAnalgesic and anti-inflammatory activities of the methanol Root extract of Cissus Polyantha Bayero Journal of Pure and Applied Sciences, 7(1): 19 – 23,June2014.
40. Shankara Rao K, Swamy R K, Kumar D, Arun Singh R and Bhat K G, Flora of Peninsular India, Herbarium JCB, Indian Institute of Science, 2019, http://florapeninsulaindica.ces.iisc.ac.in/herbsheet.php?id=9653&cat=7.)
41. Sharma BD, 1984 - Flora of Karnataka Analysis; N.P.Singh, 1988- Flora of Eastern Karnataka.
42. SingN.P&Karthikeyan S, Flora of Maharashtra, 2000; vol 1 Botanical survey of India, Govt. India.
43. Sudha Parimala and A Tamil Selvan, Anticancer and Antioxidant activity of Cissus pallida and Cissus vitegenia, Journal of Pharmacognosy and Phytochemistry 2017; 6(4): 1521-1526.
44. Sujata Tetali* and S.P. Karkamkar, Cayratia sps. of family Vitaceae for utilization in grape improvement programme, International Journal of Minor Fruits, Medicinal and Aromatic Plants Vol. 2 No. 2, 2016.
45. Tasadduq R, Gordon J, Ghanim KA, Lian J B, Van Wijnen A J, et al., Ethanol extract of *Cissus quadrangularis* enhances osteoblast differentiation and mineralization of murine preosteoblastic MC3T3 E1 cells, J Cell Physiol, 2017, 232(3), 540-547.
46. Selvi P* and Murugesh S, identification of phytoconstituents from the methanolic extracts of Cissus arnottiana using gc-ms analysis, IJBPAS, February, 2017, 6(2): 253-262.

47. Tetali,et al. (2000):Endemic Plants of India (A status report of Maharashtra State). Naoroji Godrej Centre for Plant Research, Shirwal.

48. World Health Organization WHO Global Report on Traditional and Complementary Medicine, World Health Organization, 2019. https://apps.who.int/iris/handle/10665/312342.