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**A Review on Anti-cancerous potential of
*Cissus quadrangularis***

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Abstract

Cissus quadrangularis is a herb used in many aspects especially for its medicinal use from ancient days. Though it is being in use for bone setting it has wide range of anti-cancerous property in nature. Cancer is a dangerous disease causing high mortality among human population. The drug development towards challenging the severity of cancer is an emergence need. This article review and analyse the anti-cancerous potential of *Cissus quadrangularis*. Researchers found that the herb *Cissus quadrangularis* having some anti cancerous potential against cells proliferation in HeLa, Vero, MCF7, KB oral epidermoid carcinoma cells, EAC (Ehrlich Ascites Carcinoma) cell line. This article might be highly useful one for further research in drug development and clinical use of this plant in a wide range for the management of cancer worldwide.

Keywords: Herbal, Anti-Cancer, Herbal Medicine, Anti-Cancer Therapy, Cell Lines

Introduction

Cissus quadrangularis is a Perennial herb. It belongs to the family Vitaceae. The plant is a cactus like, fleshy, jointed climber in nature¹. It is widely distributed in all over India. The stem is quadrangular in shape having four winged internodes constricted at nodes². In ancient medical texts the plant *Cissus quadrangularis* is indicated as a best drug for the treatment of Peptic ulcer, various bone fractures, Gastro intestinal disorders etc., The plant has high source of Vitamin C. *Cissus quadrangularis* have phytochemicals such as Alkaloids, Tannins, Saponins, Phytosterol, Flavonoids etc., aqueous extract of *Cissus quadrangularis* has many

compounds such as n - Hexadecanoic acid, Tetradecanoic acid, ethyl ester, 13 - Tetradecene - 11 - yn - 1 - ol, Phytol, 1, 2, 3 - Propanetriol, monoaceta, Oleic acid, Linoleic acid ethyl ester etc³., Some research findings possess that the plant *Cissus quadrangularis* having some bioactive ingredients to treat cancer. The abnormal division of cells cause cancer. Cancer is the leading cause of the death worldwide. Though various medications are available to treat cancer, still it is a challenging to find a proper drug to control cancerous growth. In siddha literatures *Cissus quadrangularis* is one of the ingredient of drug formulation which is indicated to treat cancer.

Materials and Methods

The information collected from various online databases regarding the results of study conducted on the plant *Cissus quadrangularis* for the evaluation of anticancer activity.

In HeLa cell lines:

Research study confirmed through MTT assay that the ethanol and methanol extracts of the herb *Cissus quadrangularis* showed anticancer activity in two cell lines such as HeLa and Vero cell line. The IC₅₀ value was calculated at the concentration of 62.5 µg/ml for HeLa and 125µg/ml for Vero cell line⁴.

Cissus quadrangularis inhibit the growth of tumoroid in HeLa cell lines without producing any harm to normal skin cells at IC₅₀ dose (200µg/ml). It induces ROS liberation only in cancer cells detected through DCFDA staining which mediates apoptosis and G1 phase cell cycle arrest was observed by flow cytometry in HeLa cancer cells but doesn't shows cell cycle arrest in Normal skin HaCaT cells at the same concentration⁵.

In MCF7 cell line:

The plant *Cissus quadrangularis* has some flavonoids such as quercetin and rutin etc., Research findings states that isolated flavonoid fraction and ethanol extract showed anti-cancer activity in MCF7 cell lines which was evaluated through MTT Assay. Isolated flavonoid fraction and ethanolic extract of *Cissus quadrangularis* showed potent cytotoxic effects with the IC₅₀ values of 10 µg/mL and 40 µg/mL in MCF7 cell line respectively⁶.

In KB oral epidermoid carcinoma cell lines:

Cissus quadrangularis stem ethanolic extract showed anti cancer property against KB oral epidermoid carcinoma cells. Through Hematoxylin/eosin staining Morphological changes such as cell shrinkage, plasma membrane blebbing, loss of cell membrane asymmetry were seen on KB cells after the treatment with *Cissus quadrangularis* stem ethanolic extract, therefore it confirms the apoptosis activity⁷.

A431 cell lines

The ethanolic extract of the plant *Cissus quadrangularis* can be able to induce cell death in human skin epithelial carcinoma cell lines (A431 cell lines) was confirmed by research findings⁸.

Cissus quadrangularis stem ethanolic extract showed the results of decreased cell viability on KB Cells through MTT Assay evaluation. In addition it induces G1 arrest was confirmed by flow cytometry assay. At the level of 200 µg/ml of *Cissus quadrangularis* stem

ethanolic extract treated KB cell line showed the up-regulation of p53 and down regulation of Bcl-2 during Western blot analysis of p53 and Bcl-2 protein⁴.

In EAC (Ehrlich Ascites Carcinoma) cell line

The chloroform extract of *Cissus quadrangularis* showed 80.60% and ethanol extract of *Cissus quadrangularis* showed 85.40% of cytotoxicity (1000µl) on EAC (Ehrlich Ascites Carcinoma) cell line⁹.

The methanolic extract of *C. quadrangularis* possesses proliferation inhibitory activity against A549 and HeLa cell lines¹⁰.

Results and Discussion

The collection of data from cytotoxicity activity of the herb *Cissus quadrangularis* in various cell lines such as HeLa, Vero, MCF7, KB oral epidermoid carcinoma cells, EAC (Ehrlich Ascites Carcinoma) cell line clearly indicates that it will be useful for the management of cancer such as oral cancer, breast cancer, cervical cancer. In addition to that one more research study confirmed that the combined extract of *Cissus quadrangularis* with *Aegle marmelos* possessed cytotoxic activity against the Colon cancer HT-29 cell lines¹¹.

The biosynthesized silver nano particles using the aqueous stem extract of *Cissus quadrangularis* possessed cytotoxic effects in Hep2 and Vero cell line than the normal cell lines and their observed IC₅₀ value was 64µg and 90 µg for Hep2 and Vero cell line respectively¹². Herbs are natural things so the usage of this kind of medicinal plant will never cause any adverse effects.

Conclusion

This review summarizes the anticancerous potential of the medicinal herb *Cissus quadrangularis*. Due to the medicinal effect of this herb it was used by traditional practitioners to treat cancerous growth. The presence of bioactive molecules in this herb are the chief responsible factor for its high anticancerous property. This review might be helpful in knowing the knowledge of anticancerous effect of *Cissus quadrangularis* for better clinical use.

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References

1. The Wealth of India. A dictionary of Indian raw materials and industrial products, 1992, Raw Materials, Vol. 3: Ca-Ci, Publications & Information Directorate, Council of Scientific and Industrial Research (CSIR), K.S.Krishnan Marg, New Delhi. Page no. 593.
2. The Ayurvedic Pharmacopoeia Of India, Part 1, Vol III, Page no. 22
3. T. Sathish Kumar, A. Anandan , M. Jegadeesan, Identification of chemical compounds in *Cissus quadrangularis* L. Variant-I of different sample using GC-MS analysis, Archives of Applied Science Research, 2012, 4 (4):1782-1787
4. Aayush Dwivedi, I. Seethalakshmi and D. Sharmila , Anticancer properties of *Cissus quadrangularis*, Journal of Chemical and Pharmaceutical Research, 2013, 5(5):135-139
5. Saba Sheikh, Anupam Dhasmana, Sahabjada Siddiqui, .Safia, EjazulHaque, Mohd. Kamil, MohtashimLohani, Mohd. Arshad, Snober S. Mir, Anticancer Activity of *Cissus quadrangularis*: An in vitro 2D Model Based Study, International Journal of Sciences: Basic and Applied Research (IJSBAR) (2015) Volume 23, No 1, pp 93-105
6. A.Vijayalakshmi, P.R.Kumar, S.Sakthi Priyadarsini, C.Meenaxshi, In Vitro Antioxidant and Anticancer Activity of Flavonoid Fraction from the Aerial Parts of *Cissus quadrangularis* Linn. against Human Breast Carcinoma Cell Lines, Journal of Chemistry, Volume 2013 (2013), Article ID 150675, 9 pages.
7. Saba Sheikh, Sahabjadasiddiqui, Anupamdhasmana, Safia, Ejazul Haque, Mohammed kamil, Mohrashimlohani, Mohammad arshad, Snobershabham Mir, *Cissus quadrangularis* Linn. Stem Ethanolic Extract Liberates Reactive Oxygen Species and Induces Mitochondria Mediated Apoptosis in KB Cells, PharmacognMaq 2015 Oct; 11(Suppl 3): S365–S374.
8. Induction of apoptosis in A431 skin cancer cells by *Cissus quadrangularis* Linn stem extract by altering Bax–Bcl-2 ratio, release of cytochrome from mitochondria and PARP cleavage
9. Anusiya Kumar, Deepa B, Renuka Saravanan, Sheik Abdulla Shahul Hameed, Reactive Oxygen And Nitrogen Species Scavenging And Anticancer Potential Of *Cissus quadrangularis* L. Against Eac Cell Line, International Journal of Pharmacy and Pharmaceutical Sciences, Int J Pharm Sci, Vol 6, Issue 8, 269-274
10. Nagani Krunal, Chanda Sumitra, Antioxidant and Anticancer Activity of *Cissus quadrangularis* L. Stem, LAP Lambert Academic Publishing (2013-06-17), 76 Pages.
11. Rathinam Prema, Dhana Sekaran Sathish Sekar, Kothapalli Bannoth Chandra Sekhar, Somasundaram Jeevanandham, *In vitro* cytotoxicity study on combined plants extracts (*Cissus quadrangularis* and *Aegle marmelos*), European Journal of Experimental Biology, 2012, 2 (4):882-888
12. K. Renugadevi, D. Inbakandan, M. Bavanilatha, V. Poornima, *Cissus quadrangularis* Assisted Biosynthesis Of Silver Nanoparticles With Antimicrobial And Anticancer Potentials , Int J Pharm Bio Sci 2012 July; 3(3): (P) 437 – 445

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