

SOME USEFUL AYURVEDIC HERBS HAVING ANTI-CANCER PROPERTIES

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ABSTRACT

Ayurveda contains a wealth of knowledge on health sciences since ancient times. It deals with good, bad, happy and unhappy life, its promoters and non-promoters, span and nature. And this science of life-Ayurveda deals with life as a whole which is conjunction of body, sense organs, mind and self. Now a day's modern science and allopath now believe in its principle and more and more research is being directed towards ancient herbs and natural therapies. All medical practitioners believe that prevention is better than cure and Ayurveda provides the path to a healthy lifestyle. Ayurveda sees health as a perfect balance between mind, body and consciousness. To achieve this it accepts a daily regimen of exercise, emotional balance and a healthy diet. This is a great way to prevent the onset of many life style diseases in itself. Ayurveda recommends a number of herbs for preventing cancer and there is a growing body of scientific studies that backs this ancient knowledge. Some common herbs are available which are proven to have anti-cancer properties.

Keywords: Ayurveda, Herbs, Diet, Body, Cancer

INTRODUCTION

Ayurveda is a Sanskrit word derived from two roots: *Ayu (Life) + Veda (Science)*
The Literal meaning of the term is 'Science of Life'. The Origin of Ayurveda has been said to be from '*Brahma*' the Creator. In India more than 5000 years ago but modern science and allopathy now believe in its principle and more and more research is being directed towards ancient herbs and natural therapies. The specific characteristic of this science is that it emphasizes on the protective aspect, to protect the health of the healthy and normal individual. The *Charak Samhita* is an ancient text that systematizes much of this knowledge, especially related to diet.

Ayurveda sees health as a perfect balance between mind, body and consciousness. It disseminates a daily regimen of exercise, emotional balance and a healthy diet to achieve this. So it is a great way to suppress the rise of many life style diseases.

Ayurveda, the ancient Indian medicine system of herbal drugs are known from very early times for preventing or suppressing various tumors using these natural drugs. And nowadays scientists are willing to researches on interdependent and another medicine for the management of cancer. In Ayurvedic theory, according to '*Charaka*' and '*Sushruta Samhitas*' cancer is described as inflam-

matory or non-inflammatory swelling and mentioned either as ‘*Granthi*’ (minor neoplasm) or ‘*Arbuda*’ (major neoplasm). The *Vata* or air (nervous system), the *Pitta* or fire (venous system) and the *Kapha* or water (arterial system) are three fundamentals of Ayurveda and very important for normal body function. In malignant tumors all three humours get out of control (*Tridoshas*) and lose mutual coordination that causes tissue damage, resulting critical condition. *Tridoshas* cause excessive metabolic crisis resulting in escalation.^{1,2}

The National Cancer Institute collected about 35,000 plant samples from 20 countries and has screened around 114,000 extracts for anticancer activity. Over 3000 species of plants with anti-tumour properties have been reported. Cancer is one of the most prominent diseases in humans and currently there is considerable scientific and commercial interest in the continuing discovery of new anticancer agents from natural product sources.³

Anticancer properties of many natural compounds isolated from different Indian plant extracts have been reported. Research is being carried out throughout the world to find a lead compound which can block the development of cancer in humans. Nature has always been a great contributor towards this goal. Plant-derived natural products such as flavonoids, terpenoids and steroids have received considerable attention due to their diverse pharmacological properties, which include cytotoxic and chemopreventive effects.⁴

With the recent report of AIIMS planning to come together with All India Institute of Ayurveda and the Central Council for Research in Ayurvedic Sciences to delve deeper into the probability of treating cancer with Ayurvedic drugs, it brings a sense of hope to many who have been turning to Ayurveda for an alternative treatment. Ayurveda, as we all know, consists of many remedies that have been successfully treating various health problems of people for centuries. While many claim that it has the power to treat cancer as well, medical experts disagree for the lack of scientific research. However, various health

institutions are including Ayurveda in their treatment, along with radiotherapy and chemotherapy to reduce the side effects. A pilot study done by AIIMS also found that Ayurvedic drugs significantly reduced side effects in breast cancer patients.⁵

Ayurveda recommends a number of herbs for preventing cancer and there is a growing body of scientific studies that backs this ancient knowledge. Here are some common herbs which are proven to have anti-cancer properties.

Amla (*Emblica officinalis*) is one of the richest sources of Vitamin C and also contains quercetin, phyllaemblic compounds, gallic acid, tannins, flavonoids, pectin and various polyphenolic compounds, making it the king of rejuvenation. Scientific research of three decades has proven the traditional use of amla to be correct. Research found that amla is beneficial to treat different types of cancers.⁶

Ardraka (*Zingiber officinale*) has been commonly used as a spice for dietary as well as medicinal purpose since ancient time. The active constituents of Ginger have potent anti-oxidant and anti-inflammatory properties and the methanolic extract of *Zingiber officinale* rhizome for anticancer activity against human cervical cancer cells and breast cancer in a study conducted by the University of Michigan, ginger caused ovarian cancer cells to die. Since, *Zingiber officinale* has been commonly used throughout the world as a spice for dietary as well as for medicinal purposes since long times.⁷

Arka (*Calotropis procera*) has been identified as a very potent and poisonous plant. In Ayurveda the plant is attributed with important therapeutic properties, such as abortifacient and anti-cancer, amongst others. Although the latex of *C. procera* has been extensively investigated for its medicinal properties, there are very few studies on the potential use of the roots of this plant. *Calotropis procera* root bark Alcoholic extract has been investigated for anti-cancer activity.⁸

Ashoka (*Saraca asoka*) has been reported to contain phyto constituents like flavonoids, steroids, glycosides, saponins, tannins, carbohydrates, proteins

along with lot of pharmacological activities such as spasmogenic, oxytocic, uterotonic, anti-bacterial, anti-menorrhagic, anti-cancer, anti-estrogenic, anti-progestational, dermato-protective, anti-mutagenic and geno-protective activities. Cisplatin is the most active anticancer agents and have broad clinical application. Hyperthermia is found to potentiate the action of several anti tumour agents including cisplatin. The extract of 'Ashoka' (*Saraca asoca*) showed potential antitumour activity and chemoprotective effects on toxicities induced by cisplatin. Cisplatin is the most active anticancer agents and have broad clinical application especially for, testicular, ovarian, head, neck, bladder and lung cancers.⁹

Ashwagandha (*Withania somnifera*) also know as the Indian ginseng, it has been used to help the body deal with stress in Ayurveda. Its anti-cancer value was realized about 40 years ago when researchers isolated a crystalline steroidal compound (withaferin A) from this herb. Further research on these extracts which were taken from the leaf of ashwagandha showed that they were able to kill activity in human cervical and prostate cancerous cells.¹⁰

Bhallataka (*Semecarpus anacardium*) has been used in traditional system of medicine for different ailments and diseases. Bhallataka (*Semecarpus anacardium*) have anti-tumours activity. The nut milk extract has reported to have anticancer activity. The ethanolic extract was carried out on cervix cell lines for determination of the anticancer potential of *Semecarpus anacardium*.¹¹

Bhumyamalaki (*Phyllanthus niruri*) is a well known medicinal plant which has been used in Ayurvedic medicine as hepatoprotective, antiviral, antibacterial, analgesic, antispasmodic and antidiabetic. The methanolic extract of hairy root as a potential source of anticancer drug in breast cancer therapy.¹²

Bilva (*Aegle marmelos*) phytochemicals possess antineoplastic, radioprotective, chemoprotective, and chemopreventive effects, properties efficacious in the treatment and prevention of cancer and

antimicrofilarial, antifungal, hypoglycemic, astringent, antidiarrheal, antidysenteric, demulcent, analgesic, anti-inflammatory, anti-pyretic, hypoglycemic, antidyslipidemic, immunomodulatory, anti-proliferative, wound-healing, insecticidal, anti-cancer, antidiabetic, and cardioprotective properties.¹³

Candan (*Santalum album*) leaf and bark extract may be responsible for antibacterial. The constituent of essential oil is santalol and medicinal properties of sandal wood oil are mainly due to the santanol. HESP (Hydrolysed exhausted sandal powder) oil showed significant *antitumorogenic*, anti-inflammatory, anti-mitotic, antiviral and anticancer activities.¹⁴

Dhattur (*Datura metel*) is well known for its insecticidal, herbicidal, anti-fungal, anti-bacterial, anti-cancer, anti-inflammatory and anti-rheumatoid activity. Datura is also rich in Alkaloidal compounds. The methanol extract of *Datura metel* shows the anticancer activity.¹⁵

Draksa (*Vitis vinifera*) have a lot of medicinal properties. They contain flavonoids, which are very powerful antioxidants. Grapes are a good source of bioflavonoids (vitamin P). The fruits are vitaminics, tonics, anticancer, hepatoprotective, promote hair growth and prevent ischemic processes.¹⁶

Guduchi (*Tinospora cordifolia*) is the herb with bitter taste and helps in stimulating digestion, alleviating vata and kapha dosha. *Tinospora cordifolia* contains many different chemicals that might affect the body. It is antibiotic, anti-inflammatory, anti-cancer and immune stimulating herb.¹⁷

Gunja (*Abrus Precatorius*) seeds possess various pharmacological activities such as antidiabetic, antioxidative, antiviral, antihelminthic, antidepressant, memory enhancing, antimicrobial, anti-inflammatory, antiarthritic, anticancer, anti-fertility, antimalarial, antiallergic, antiasthmatic, anticataract, antiinsecticide, antitoxicity activity.^{18, 19}

Haridra (*Curcuma longa Linn*) is one of the most researched herbs for its anti-cancer properties. It is attributed with anti-oxidant, analgesic, anti-

inflammatory and antiseptic values. The principle component of turmeric is curcumin which is a potent antioxidant scavenging free radicals and inhibiting the growth of cancerous cells. Almost 2000 published scientific papers have shown that curcumin has the ability to kill cancer cells while not harming the healthy cells. The combination of two plant compounds- curcumin and silymarin – holds promise in treating **colon cancer** as both have medicinal properties.²⁰

Jambu (*Syzygium cumini*) contains anthocyanins, glucoside, ellagic acid, isoquercetin, kaempferol, and myricetin as its chief active constituents. These active constituents isoquercetin, kaempferol tituents impart multiple pharmacological activities to the plant which includes antidiabetic, anticancer, antioxidant, antibacterial, antifungal and antidiarrhoeal activity. The ethyl acetate, methanol and ethanolic extracts of *Syzygium cumini* seeds investigated against MCF-7 breast cancer cells and antioxidant activity.²¹

Jatiphala (*Myristica fragrans*) is used for various medicinal properties. The fruit and seed extracts show various activities like hepatoprotective activity, anti-oxidant activity, memory enhancing activity, anti-cancer activity, aphrodisiac activity, antidiabetic activity, anti-depressant activity, hypolipidaemic and hypocholesterolemic effect, anti-microbial activity, anti-bacterial, anti-inflammatory and anti-carcinogenic activity.²²

Kanchanara (*Bauhinia variegata*) possess many medicinal properties. Kanchanara guggula is an ayurvedic preparation made from the bark of *Bauhinia variegata* against scrofulous tumours. The ethanolic extract of bark possesses anti cancer properties.²³

Kalmegha (*Andrographis paniculata* Wall) is one of the most popular medicinal plants used traditionally for the treatment of array of diseases such as **cancer**. The extract and pure compounds of the plant have been reported for their anti-microbial, cytotoxicity, anti-protozoan, anti-inflammatory, anti-oxidant,

immunostimulant, anti-diabetic, anti-infective, anti-angiogenic, hepato-renal protective, sex hormone/sexual function modulation, liver enzymes modulation insecticidal and toxicity activities.²⁴

Karavellika (*Momordica charantia*) has a number of claim uses including cancer prevention, treatment of diabetes, fever, HIV and AIDS, and infections. The different parts of the plant are used as claimed treatments for diabetes (particularly Polypeptide-p, an insulin analogue), and as a stomachic, laxative, antibilious, emetic, anthelmintic agent, for the treatment of cough, respiratory diseases, skin diseases, wounds, ulcer, gout, and rheumatism.²⁵

Kiratatikta (*Swertia chirata*) has large number of chemical constituents some of them are swertinin, swerchirin, mangiferin, amarogentin, amaroswerin, gentianine, swertiamarin, xanthones, lignan, triterpenoids, pentacyclic triterpenoids, etc. In Ayurveda, the plant is used as stomachic, febrifuge, anti-helminthic, diuretic as well as for treatment of some types of mental disorders. The Anticancer activity of this medicinal plant was essential to cure the disease.²⁶

Kutaki (*Picrorrhiza kurroa*) rhizome nano encapsulated extract formulation enriched with **anticancer** activity indicator. The pharmacological properties of *Picrorrhiza kurroa* include anti-microbial, hepatoprotective, anti-oxidant, anti-bacterial, anti-mutagenic and anticancer activities.²⁷

Lavanga/ Clove (*Syzygium aromaticum*) essential oil relates to its anti-cancer benefits. Clove oil has been found to have cancer cell killing properties, but as a natural chemo preventive (cancer prevention) agent. Clove is a natural anti-coagulant anti-fungal, antioxidant, anti-bacterial, anti-tumor, anti-viral, and anti-inflammatory properties.²⁸

Madhuka (*Madhuca longifolia*) flower is not only used in preparation of liquor but can also utilized as a food ingredient for preparation of biscuit, cake, laddu, candy, bar, jam jelly, sauces etc. The Bioactive Compounds Obtained from the Fruit-Seeds of *Madhuca longifolia* (L) acts as Potential Anticancer Agents. The ethanolic extract of all parts of

Madhuca indica plant shows in vitro cytotoxicity against different human cancer cell lines such as lung, neuroblastoma, and colon.^{29, 30}

Manjishtha (*Rubia cordifolia*) has anti-cancer activity especially in the roots which is responsible for anti-tumor activity. The chiefly valuable plant part is its root stocks, which contains phytochemicals like anthraquinone, terpenes, glycosides etc and recognized as the active curative agents to wide and diverse forms of ailments. The study results show that root extracts of *Rubia cordifolia* is likely cytotoxic against human cervical cancer.³¹

Methi (*Trigonella foenum graecum* Linn) seed extract induces cell death, growth inhibition and morphological change indicative of apoptosis in acute lymphoblastic leukemia.³²

Mulak (*Raphanus sativus*), a common cruciferous vegetable has been attributed to possess a number of pharmacological properties to reduce the risk of cancer and to possess health-promoting properties. It is also good source of phytonutrients, which are plant-based compounds that may help lower inflammation and reduce the risk of developing cancer. The ethanolic extract of its aerial parts was found to have potent anticancerous effect against human breast cancer cells.³³

Neem (*Azadirachta indica*) shows therapeutics role in health management due to rich source of various types of ingredients. Neem extracts have been shown to possess anti-bacterial, anti-fungal, potent antiviral and anticancerous. The Active principles in form of various compounds present in bark, leaves, seeds and seed oil reduces tumors and cancers very efficiently without producing side effects. Nimbolide, a limonoid present in leaves and flowers of the neem tree, have apoptosis-inducing property (Srivastava *et al.*, 2012; Kavitha *et al.*, 2012), thus beneficial in human breast cancer (Elumalai *et al.*, 2012).³⁴

Punarnava (*Boerhaavia diffusa*) is a tropical herbaceous plant being used in various Ayurvedic treatments since ancient times. The various parts of the plant are reported to have anticancer, antidiabetic, hepatoprotective and anti-inflammatory

effects. The extracts of plants have been widely evaluated for possible antiproliferative and anticarcinogenic properties.^{35, 36}

Putikaranja (*Holoptelea integrifolia*) leaves and stem bark were used by tribals for skin diseases, obesity and in the management of cancer and for wound healing in the form of paste. The ethanolic extract of leaves of *Holoptelea integrifolia* has potential agent in the area of cancer chemotherapy. The flavonoids have a chemopreventive also.^{37, 38}

Rason (*Allium sativum* Linn) contains sulphur, arginine, flavonoids and selenium. The bio-active compounds of garlic are formed from alliin when the bulb is chopped or crushed. Garlic is a known anti-bacterial agent with the ability to stop the formation and activation of cancer causing agents. The World Health Organisation recommends at least 2-5 grams or one bulb of garlic daily for adults. *Allium sativum* has free radical scavenging activity, immune system modulation and direct cytotoxic effect on cancer cells. The considered cell lines are breast cancer, lung cancer and ovary cancer.³⁹

Sadapushpi (*Vinca Rosea*) stems and leaves contain anti-cancer alkaloids like Vinblastine and Vincristine, which inhibit the growth of certain human cancers. The alkaloids are used as “antineoplastic agents to treat leukemia, Hodgkin's disease, malignant lymphomas, neuroblastoma, rhabdomyosarcoma, Wilms' tumor and other cancers. Its vasodilating and memory-enhancing properties have been shown to alleviate vascular dementia and Alzheimer's disease”.⁴⁰

Saptaparna (*Alstonia scholaris* Linn.) ethanolic extract indicated the potent anticancer effect against all skin cancers. About 25% of drugs in the modern pharmacopoeia are derived from plants, including several anticancer drugs currently in clinical use.⁴¹

Sigru (*Moringa oleifera* Linn) / Drum stick has chemo preventive potential. Anti tumor promoting activity of the leaves and pods of drumstick has also been reported. It is an important source of glucosinolate precursors of the group of chemopreventives that can inhibit carcinogenesis. It

contains the phytochemical niaziminin, which is found to have molecular components that can prevent the development of cancer. Niazimicin, a compound isolated from *Moringa oleifera* have also been reported to have potent anti tumor promoting activity.⁴²

Syonaka (*Oroxylum indicum*) the plant used in this study is one among the group of ten drugs named Dasamoola, widely used in Ayurvedic system of medicine. The biological study of the fruits and stem bark of *Oroxylum indicum* have anti cancer property.⁴³

Tulsi (*Ocimum sanctum* Linn), this sacred herb is known for its healing powers. It shows various biological activities such as immunomodulation, anti-ulcer, anti-inflammation, antimicrobial, antihypertensive, cardioprotective, hepatoprotective, antidiabetic, antifertility, radio protective and anticarcinogenesis, etc. The effects of alcoholic root extract of *Ocimum sanctum* act on human non-small cell lung carcinoma cell.^{44, 45}

Vata (*Ficus bengalensis*) is widely used in diabetes and commonly known as a Banyan tree. The details on its traditional, phytochemical and pharmacognostic properties such as antioxidant, anticancer, analgesic, anti-inflammatory and antipyretic activities.⁴⁶

Yastimadhu (*Glycyrrhiza glabra*) have the saponin glycoside, Glycyrrhetic acid present as a major chemical constituent. Glycyrrhetic acid is an outstanding example of natural anticancer compound, which is a hydrolyzed derivative of Glycyrrhetic acid extracted from *glabra*. Glycyrrhizin and other *Glycyrrhiza glabra* components appear to possess anti-carcinogenic properties. They inhibit abnormal cell proliferation as well as tumor formation and growth in breast, liver and skin cancer.^{47, 48}

CONCLUSION

Ayurveda can cure cancer or not still debatable, but a combination of Ayurveda and Chemopathy is considered to be the best, since the side effects are reduced or eradicated by Ayurveda. The anticancer

property of medicinal plants used in the traditional Indian medicine System and further evaluation of the selected medicinal plants for an effective anti-cancer drug with minimal side effects. Our herbs can be used for therapeutic purposes with some advancement and research, therefore additive a balanced diet may have beneficial effect. While scientific research continues to discover deeper into the prevention and cure of cancer given its growing hazard, People should take all precautions to safeguard our self. "Be active and eat well". The healthier you live, the less risk you are at. If you have a positive family history, Should go for regular checks-up. Earlier detection of cancer makes it easier to treat.

REFERENCES

1. Charaka Samhita by Sharma PV. Varanasi: Choukhamba Orientalia; 1981.
2. Sushruta Samhita by Bhishagratha KL. Varanasi: Choukhamba Orientalia; 1991.
3. Kinghorn AD, Farnsworth NR, Soejarto DD, et al., Novel strategies for the discovery of plant-derived anticancer agents. *Pharmaceutic Biol* 2003; 41: 53-67.
4. Abdullaev FI. Plant derived agents against cancer. In: Gupta, S. K., editor. *Pharmacology and therapeutics in the new millennium*. Narosa Publishing House: New Delhi, India, 2001; p. 345-354.
5. <https://food.ndtv.com/health/power-of-ayurveda-6-herbs-that-can-prevent-risk-of-cancer-1674778>
6. <http://www.alwaysayurveda.com/emblicaofficinalis/>, <http://www.mchemist.com/ayas/pdf/12%20aamla.pdf>
7. <http://nopr.niscair.res.in/bitstream/123456789/36899/1/IJEB%2054%2811%29%20767-773.pdf>
8. <https://pdfs.semanticscholar.org/e4f0/a7d7cfcf75428b1d76d4c4bf5c975d7fcb57.pdf>
9. Schmalbach, T. K., and Borch, R. F., (1989), *Cancer Res.* 49:6629-6633.
10. https://en.wikipedia.org/wiki/Withaferin_A
11. Joseph JP, Raval SK, Sadariya KA, Jhala M, Kumar P. Anti cancerous efficacy of ayurvedic milk extract of *Semecarpus anacardium* nuts on hepatocellular carcinoma in Wistar rats. *Afr J Tradit Complement Altern Med* 2013; 10:299-304.
12. http://www.anticanceractivity.com/2016/06/a-brief-review-on-anticancer-activity_2.html

13. Maity P, Hansda D, Bandyopadhyay U, Mishra DK. Biological activities of crude extracts and chemical constituents of Bael, *Aegle marmelos*(L.) Corr. Indian J Exp Biol. 2009; 47:849-861.
14. The Wealth of India, First Supplement Series (Raw Materials) Vol. 5: R-Z, page 49-52, 2004
15. <https://innovareacademics.in/journals/index.php/ajpcr/article/view/876>
16. <https://www.medicinalplants-pharmacognosy.com/herbs-medicinal-plants/grape-benefits/>
17. <http://www.planetaryurveda.com/library/guduchitinospora-cordifolia>
18. Gogte VM, Ayurvedic pharmacology and therapeutic uses of medicinal plants (Dravyagunavignyam), India, Bharatiya Vidya Bhavan, 2000, 600-601.
19. Panerselvam K, Lin SC, Liu CL, Lin JY, Lu TH, Crystallization of agglutinin from the seeds of *Abrus precatorius*, Acta Crystallographica section D Biological Crystallography, 56(7), 2000, 898-899.
20. http://turmeric-curcumin.com/curcumin_research/
21. <http://www.jocpr.com/articles/anticancer-and-antioxidative-potential-of-syzygium-cumini-against-breast-cancer-cell-lines.pdf>
22. Prakash E, Gupta DK. Cytotoxic activity of ethanolic extract of *Myristica fragrans* (Houtt) Against seven human cancer cell lines. Universal J Food Nutrition Sci 2013; 1:1-3.
23. Raj Kapoor B, Jayakar B, Muruges N. Antitumor activity of *Bauhinia variegata* on Dalton's ascitic lymphoma. J Ethnopharmacol 2003; 89: 107-109.
24. <https://www.sciencedirect.com/science/article/pii/S222180814605090>
25. "Bitter Melon". Memorial Sloan-Kettering Cancer Center. Retrieved 17 October 2013.
26. <http://www.gmferd.com/journalcra.com/sites/default/files/9916.pdf>
27. <https://www.pharmatutor.org/articles/review-on-indian-medicinal-plants-having-anticancer-property>
28. <https://thetruthaboutcancer.com/oil-of-cloves/>
29. The Bioactive Compounds Obtained from the Fruit-Seeds of *Madhuca longifolia* (L) Act as Potential Anticancer Agents: Asish Bhaumik¹, M. Upender Kumar¹, Kaleem Ahmed Khan Ch. Srinivas. SJAMS. 2014; 2(4A):1235-1238.
30. <https://www.omicsonline.org/open-access/phytochemistry-ethnomedical-uses-and-future-prospects-of-mahua-madhuca-longifolia-as-a-food-a-review-2155-96001000573.php?aid=84604>
31. <http://www.eumundimedicineman.com/wp-content/uploads/2014/02/Rubia-cordifolia.pdf>
32. Shaban Alizadeh. Antineoplastic Effect of Fenugreek (*Trigonella Foenum Graecum*) Seed Extract against Acute Myeloblastic Leukemia Cell Line (KG-1). IJBC 2009; 4: 139-146
33. Kim WK, Kim JH, Jeong DH, Chun YH, Kim SH, Cho KJ, Chang MJ, Radish (*Raphanus sativus* L.) leaf ethanol extract inhibits protein and mRNA expression of ErbB2 and ErbB3 in MDA-MB-231 human breast cancer cells, Nutrition Research and Practice, 5, 2011, 288-293.
34. <https://scialert.net/fulltextmobile/?doi=jbs.2014.110.123&org=11>
35. Chipuk, E. Jerry, et al. Mechanism of apoptosis induction by inhibition of the anti-apoptotic BCL-2 proteins. Proceedings of the National Academy of Sciences, 2008, 105.51: 20327-20332
36. AR Mahesh, H.Kumar, M.K.Ranganath and R.A.Devkar, Detail Study on Boerhaavia Diffusa Plant for its Medicinal Importance- A Review Res. J. Pharmaceutical Sci., 2012, 1(1): 28-36.
37. Graham JG, Quinn ML, Fabricant DS, Farnsworth NR. Plants used against cancer-an extension of the work of Jonathan Hartwell. J Ethnopharmacol 2000; 73:347-77.
38. <https://www.greenpharmacy.info/index.php/ijgp/article/download/118/161>
39. <http://globalresearchonline.net/journalcontents/v29-1/25.pdf>
40. <http://www.desimd.com/healthy-living/diet-nutrition/6-life-saving-vinca-rosea-medicinal-uses>
41. Ramawat KG, Goyal S. Natural products in cancer chemo-prevention and chemotherapy. In Ramawat KG, ed. Herbal Drugs: Ethnomedicine to Modern Medicine. Berlin, Germany: Springer-Verlag; 2008:153-171.
42. <http://pharmacologyonline.silae.it/files/archives/2010/vol1/66.Jain.pdf>
43. http://www.japsonline.com/admin/php/uploads/951_pdf.pdf
44. Godhwani, Savitri, Godhwani JL, Vyas DS. *Ocimum sanctum*: an experimental study is evaluating its anti-inflammatory, analgesic and antipyretic activity in animals. J Ethnopharmacol 1987; 21:153-63.

45. Govind Pandey, Madhuri S. Pharmacological activities of *Ocimum Sanctum* (Tulsi): a review. Int J Pharm Sci Rev Res 2010; 5:61-6.
 46. <https://pdfs.semanticscholar.org/e6bf/b91a95e6b6bb306ba8b30037237fef77f28d.pdf>
 47. Kumara H. Long-term treatment of chronic hepatitis C with glycyrrhizin [Stronger Neo-Minophagen C (SNMC)] for preventing liver cirrhosis and hepatocellular carcinoma. Oncol 2002; 62:94-100
 48. Arase Y, Ikeda K, Murashima N. The long term efficacy of glycyrrhizin in chronic hepatitis C patients. Cancer 1997; 79:1494-500.
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Source of Support: Nil

Conflict Of Interest: None Declared

How to cite this URL: Sneh Lata Jain & Avinash Pastore: Some Useful Ayurvedic Herbs Having Anti-Cancer Properties. International Ayurvedic Medical Journal {online} 2018 {cited May, 2018} Available from: http://www.iamj.in/posts/images/upload/1132_1139.pdf