

Screening of Siddha Medicinal Plants for Anti Cancer Activity - A review

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ABSTRACT

India is a peninsula of herbal hub, in which Siddha system of medicine has flourished as an enlightenment in the field of Medicine. Currently medicinal plants have become the paramount source of drug discovery in research for treating diverse form of diseases including Cancer. In this review Siddha classical literature and evidence based research data were emphasized to explore the Siddha medicinal plants with potent anticancer activity. This literature analysis based on both Siddha philosophy and modern parameters reveals that each medicinal plant has its own specific effects on specific type of Cancer.

INTRODUCTION

Medicinal herbs play an important role in primary health care system among rural population since synthetic anti-cancer remedies are beyond the reach of common man because of the cost factor. The herbal medicines have a vital role in the prevention and treatment of cancer which execute their therapeutic effect by inhibiting cancer activating enzymes and hormones, stimulating DNA repair mechanism, promoting production of protective enzymes inducing anti-oxidant action and enhancing immunity (Thakore et al,2001). Siddha system of medicine provides a good base for scientific exploration of potent anti-cancer herbs.

Cancer and Its causes

The term neoplasm denotes a mass of tissue formed as a result of abnormal, excessive, uncoordinated, autonomous and purposeless proliferation of cells. The most common cause of cancer is due to genetic factors where the incidence is higher among patients with positive family history. Next common cause is exposure to radiations in which nearly all tissues are susceptible to tumour induction with variable sensitivity. The principle carcinogenic agent in our environment is inhaled tobacco smoke in which the incidence of lung cancer is tenfold higher in smokers

than non smokers. Furthermore it can induce cancer in oral cavity, oesophagus, kidney, bladder and pancreas. Unfortunately occupational exposure is a dreadful cause of inducing cancer in working sectors. Although there has been extensive research on viral oncogenesis, there are number of situations in which viruses are linked to the occurrence of specific cancers with high incidence like Hepatitis B infection and are correlated with hepato-cellular carcinoma. The ultimate cause regardless of above discussion is often exposure to carcinogenic chemicals (Harrison,1998).

Aim of Cancer therapy

The primary aim of cancer therapy is to act at cellular level which includes inhibiting cancer cells proliferation, promoting apoptosis of cancer cells, enforcing the necrosis of tumour and blocking its metastasis. The secondary aim is to maintain the haemopoietic functions to remain normal and to promote the reverse transformation from tumour cells to normal cells. Thereby to alleviate the symptoms of anorexia, insomnia, pain and to make the patient feel comfortable(Harrison,1998).

Cancer – Siddha Perspective

Tridosha is the physiological base around which the Siddha system of medicine revolves. Three basic functions operating through a constant interplay between the environment and

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the individual are thought to be required to maintain the integrity of a living system. In benign neoplasm one or two of the three bodily systems are out of control and is not too harmful to the body as the body could overcome this condition. Malignant tumours (*Vippuruthi*, *Putru*) (Sambasivam pillai,1998) are very harmful because all the three major humours lose mutual coordination and thus cannot prevent tissue proliferation resulting in deadly morbid condition. Here, Siddha literature deals with various types of malignancies, mentioned by Siddhars. Saint *Yugi*, used the term *Vippuruthi* and *Dhumangism* in his text *Yugi vaidhya chinthamani* (*Yugi vaithya chinthamani*,1998) which can be correlated with cancer. Some of other interesting texts like *Agathiyar rana vaithyam*, *Nagamuni nayanavithi*, *Agathiyar nayanavithi* deals with cancer as *Putru* (*Naaku putru*, *Sevi putru*, *Vaai putru*) which are cancer of tongue, ear and mouth (Utthamarayan, 2005). Several medicinal plants are mentioned in Siddha texts for cancer. The concept of single drug administration has been mentioned in Siddha as *Yega mooligai prayogam* (Single drug therapy). Siddha literature is based on the three humours of subtle energy such as *Vatham* (Wind), *Pitham*(Fire) and *Kapham*(Water) which mutually coordinate to perform the normal functions of the body. *Yugi vaidhya chinthamani*, a book on Siddha pathology addresses in detail about the *Vippurudhi roga nidhanam* (Diagnosis of the disease) according to which seven types are established on functional disorders and organ involvement. Based on the functional disorders, they are classified as *Vadha vippurudhi*, *Pitha vippurudhi*, and *Kapha vippurudhi*. Based on the organs involved, they are classified as *Kuvalai(lung) vippurudhi*, *Karpa(uterine) vippurudhi*, *Sandu (Bone and joints) vippurudhi*, *Oodu(metastatic) vippurudhi*. The etiological factors for *Vippurudhi* are excessive intake of salty and spicy food, excessive intake of meat, excessive intake of minerals, frequent sexual intercourse and sexual contact with elderly women.

According to another text *Anubava vaithya dheva raghasiyam*, there are 10 major areas which are prone to *Vippurudhi*. They are *Nabi* (Umbilicus), *Vasthi* (Bladder), *Kalleeral* (Liver), *Manneeral* (Spleen), *Kanaiyam* (Pancreas), *Iraipai* (Stomach), *Abanam* (Anorectal), *Karuppai* (Uterus), *Thodai iduku* (Groin), *Moothira kiranthi* (Prostate gland) (Seetharam Prasath,1997).

Noi Guna Iyal (Pathophysiology)

Pitham which is responsible for digestion and various metabolic functions is present in each and every cell. In cancer, there is a decrease in *agni* (fire) which is inversely proportional to *Kapham* (\downarrow agni = \uparrow Kapha) resulting in excessive tissue growth. *Vatham* can be related to the anabolic growth phase. *Kapham* can be related to the catabolic phase of morbidity. In cancer, the metabolic crisis develops with decrease in *agni* followed by counter increase in *Vatham* and *Kapham* forces, both interacting with each other resulting in proliferation. According to Siddha system of medicine, the stages of cancer can be categorized based on the type of humour deranged and the choice of traditional medicinal plants and their preparations based on their taste

potential whereby it compensates the suppressed or vitiated humours. The decrease in *Pitham* is pacified by *Kaippu* (bitter), *Inippu* (sweet) and *Thuvarpu* (astringent) tastes. The increase in *Vatham* is pacified by *Inippu* (sweet), *Pulipu* (sour) and *Uppu* (salt) tastes. The increase in *Kapham* is pacified by *Kaippu* (bitter), *Karppu* (pungent) and *Thuvarpu* (astringent) tastes (Shanmugavelu,2006). Many herbs that have been used for cancer in traditional system of medicine constructed on the Siddha philosophy of three humours, have now gained predominant focus in research and paving way for new drug discovery.

Significance of Herbs in Cancer Therapy

Plant derived phytochemicals possessing anticancer activities have received considerable attention in recent years due to the adverse effects produced by chemotherapy and radiation therapy. Phytochemicals derived from traditional medicinal plants have been found to possess anticancer and chemo protective effects. They are safer for long-term use in cancer patients. They provide nutrition and reduce the side effects of conventional cancer therapy due to effective antioxidant activity.

DISCUSSION

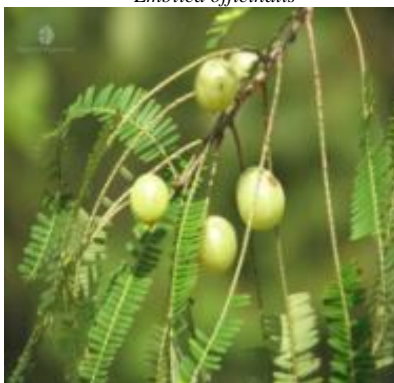
In an attempt of screening the traditional medicinal plants for anticancer activity the present review of literature has identified the presence of several compounds such as flavanoids, polyphenols, saponins, etc with specific anti cancer activity against particular type of cancer (Table 1.1). Further analysing the stage of cancer based on the derangement of three humours and selecting the herbs based on its taste could pacify the deranged humours. Plants with sweet, sour, salty taste pacify the symptoms of deranged *Vatham*. Plants of bitter, pungent and astringent taste pacify the symptoms of deranged *Kabam*. Plants of bitter, sweet and astringent taste pacify the symptoms of deranged *Pitham*(Table 1.2). Thus they alleviate clinical manifestations of cancer such as cancer pain, mental depression, insomnia, anxiety, cough, shortness of breath, loss of appetite, diarrhoea, constipation, anorexia and cancer cachexia (Table 2).

CONCLUSION

The literature evidences quoted in various Siddha texts and recent pharmacological studies on medicinal plants, inferred that medicinal plants represent a good source of pharmacologically active agents treating various type of malignancies. Also, since many herbs play chemo protective action, a combination of Siddha medicine and conventional therapy could also be recommended to inhibit the growth of cancer cells and to reduce the side effects of radiation and chemotherapy.

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Plumbago indica*Picrorhiza kurroa**Crocus sativus**Vitex negundo**Allium sativum**Taxus buccata**Rhus succedanea**Emblia officinalis**Aloe vera**Withania somnifera**Momordica charantia**Semicarpus anacardium*

Curcuma longa



Zingiber officinale



Tinospora cardifolia



Andrographis paniculata



Glycyrrhiza galbra



Bacopa monnieri



Ocimum santum



Albezia lebbek



Linum usitatissimum



Asparagus recemosus



Boerhavia diffusa



Vitis vinefera



Rubia cordifolia



**PHOTOGRAPHS OF HERBS
WITH ANTICANCEROUS ACTIVITY**

Table . 1.1: Anti cancerous activity of Siddha medicinal plants.

S.N	Botanical name/ family	Tamil name	Phytochemicals	Action against specific cancer	Siddha view (Mudhaliar,2006)	
					Taste (S/ T/ P) *	Pacifies (V,P,K)**
1.	<i>Plumbago indica</i> (Plumbaginaceae)	<i>Kodiveli</i>	Plumbagin, Apigenin, Glycosides (Parimala,1993).	Prostate cancer (Hafeez et al,2012)	S- <i>Karpu</i> T- <i>Veppam</i> P- <i>Karpu</i>	<i>Kapham</i>
2	<i>Allium sativum</i> (Liliaceae)	<i>Poondu</i>	Allin, allicin, alliinase,s-allylc cysteine,diallyl disulphide, methyl allyl trisulphide(Sabnis,2001).	Carcinoma of mammary gland, Hepato carcinoma (Sabnis,2001).	S- <i>Karpu</i> T- <i>Veppamm</i> P- <i>Karpu</i>	<i>Kapham</i>
3	<i>Aloe vera</i> (Liliaceae)	<i>Kumari</i>	Emodin, aloien, glycoproteins, polysaccharides(Sabnis,2001).	Anti angiogenic activity (Sabnis,2001).	S- <i>Kaippu</i> T- <i>Seetham</i> P- <i>Ennipu</i>	<i>Kapham,</i> <i>Pitham</i>
4	<i>Curcuma longa</i> (Zinziberaceae)	<i>Manjal</i>	Tumerone,Curcumine (Baatout et al,2004).	Oral cancer and Stomach cancer (Agarwal et al,2003)	S- <i>Karpu, kaippu</i> T- <i>Veppamm</i> P- <i>Karpu</i>	<i>Kapham</i>
5	<i>Glycyrrhiza galbra</i> (Leguminaceae)	<i>Athimathuram</i>	Licochadcone & flavanoides (Fuy et al,2004)	Prostate cancer (Fuy et al,2004)	S- <i>Ennipu</i> T- <i>Seetham</i> P- <i>Ennipu</i>	<i>Pitham</i>
6	<i>Linum usitatissimum</i> (Linaceae)	<i>Allisi vithai</i>	Cynogenetic glycosides, Lignans (Sakarkar,2011)	Breast cancer (Sakarkar ,2011)	S- <i>Ennipu, thuvvarpu</i> T- <i>Seetham</i> P- <i>Ennipu</i>	<i>Pitham</i>
7	<i>Picrorrhizia kurroa</i> (Scrophulariaceae)	<i>Kadugurrhogni</i>	Picosides. (Sakarkar ,2011)	Liver cancer (Sakarkar ,2011)	S- <i>Kaippu, karppu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Kapham</i>
8	<i>Taxus buccata</i> (Taxaceae)	<i>Thalisabathari</i>	Taxanes,Taxol, Cepholomannine (Baatout et al,2004).	Leukemia, Breast cancer, Sarcoma, Cancer of larynx, ovary and colon (Fuy et al,2004)	S- <i>Karppu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Kapham</i>
9	<i>Withania somnifera</i> (Solanaceae)	<i>Ammukura</i>	Withanolides, Withaniferin(Devi,1996)	Antitumor and Radio sensitizing effect (Devi,1996)	S- <i>Kaippu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Kapham,</i> <i>Pitham</i>
10	<i>Zingiber officinale</i> (Zingiberaceae)	<i>Ennchi</i>	GingerenoneA, gingeols Zingerone, oleoresin(Sabnis,2001).	Leukemia, Skin cancer (Sabnis,2001).	S- <i>Karppu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Kapham</i>
11	<i>Bacopa momieri</i> (Scropularaciae)	<i>Brami</i>	Saponins-mannitol, Hersaponin, Monerin (Premalatha,2005)	Carcinosarcoma (Premalatha,2005)	S- <i>Thuvvarpu,</i> <i>kaippu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Pitham,</i> <i>Kapham</i>
12	<i>Asparagus recemosus</i> (Liliaceae)	<i>Thannirvitan</i>	Saponin, Fructooligo saccharide (Sabnis,2001).	Leukemia (Sabnis,2001).	S- <i>Ennipu</i> T- <i>Seetham</i> P- <i>Ennipu</i>	<i>Pitham,</i> <i>Vatham</i>
13	<i>Corcus sativus</i> (Iridaceae)	<i>Kunguma poo</i>	Crocetin(Sabnis,2001).	Skin tumours (Sabnis,2001).	S- <i>Kaippu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Kapham,</i> <i>Pitham</i>
14	<i>Rhus succedanea</i> (Anacardiaceae)	<i>Karkadagasingi</i>	Hirokiflavone, Robustaflavone (Ruchen et al,2009)	Brain, breast, colon, lung, liver cervical and prostate cancer Shirin et al,2001)	S- <i>Thuvvarpu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Kapham,</i> <i>Pitham</i>
15	<i>Momordica charantia</i> (Cucurbitaceae)	<i>Paagal</i>	Charantin, sitosterol, Ascorbigin (Sabnis,2001).	Colon cancer, Leukemia (Sabnis,2001).	S- <i>Kaippu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Kapham,</i> <i>Pitham</i>
16	<i>Tinospora cardifolia</i> (Menispermiceae)	<i>Seenthil</i>	Tinosporin (Matthew,1999)	Breast cancer, leukemia and cervical cancer (Premalatha,2005).	S- <i>Kaippu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Kapham,</i> <i>Pitham</i>
17	<i>Ocimum sanctum</i> (Laminaceae)	<i>Thulasi</i>	Orientin & vicenin(Premalatha,2005)	Radioprotective antioxidant (Premalatha,2005)	S- <i>Karppu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Kapham</i>
18	<i>Boerhavia diffusa</i> (Boraginaceae)	<i>Mukirratai</i>	Punarnavine, Boeravionones G & H (Merina et al,2012).	Malignant melanoma, breast cancer (Merina et al,2012).	S- <i>Kaippu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Kapham,</i> <i>Pitham</i>
19	<i>Vitex negundo</i> (Verbanaceae)	<i>Nochi</i>	Chrysoplenetin (Awale et al,2011)	Human pancreatic cancer. Effective against myelo suppression and anaemia during chemotherapy (Merina et al,2012).	S- <i>Karppu,</i> <i>Kaippu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Kapham</i>
20	<i>Emblica officinalis</i> (Euphorbiaceae)	<i>Nelli</i>	Polyphenols, flavones ,tannins (Merina et al,2012).	Lymphoma, Anti metastatic activity, melanoma (Merina et al,2012).	S- <i>Pullipu,</i> <i>thuvvarpu, ennipu</i> T- <i>Seetham</i> P- <i>Ennipu</i>	<i>Vatham,</i> <i>Pitham,</i> <i>Kapham</i>
21	<i>Semicarpus anacardium</i> (Anacardiaceae)	<i>Seerankottai</i>	Semicarpin, anacardin (Premalatha,1999)	Leukemia, Melanoma, Glioma, Hepato carcinoma (Premalatha,1999)	S- <i>Kaippu</i> T- <i>Veppam</i> P- <i>Karppu</i>	<i>Pitham,</i> <i>Kapham</i>

22	<i>Andrographis paniculata</i> (Acanthaceae)	Nilavembu	Andrographolide, Andrographiside (Trivedi,2001).	Squamous cell carcinoma of nasopharynx, Lymphatic leukemia(Trivedi,2001).	S-Kaippu T- Veppam P- Karppu	Pitham, Kapham
23	<i>Albezia lebbek</i> (Mimosaceae)	Vagai	Budmunchiamine, flavonoids(Premalatha,2005).	Sarcoma, Human epidermal carcinoma of nasopharynx(Premalatha,2005).	S- Karrpu, Kaippu T- Veppam P- Karrpu	Kapham
24	<i>Vitis vinefera</i> (Vitaceae)	Thiratchai	Resveratrol (Jang et al,1997).	Breast cancer, Prostate cancer, Non -hodgkins lymphoma(Sakarkar,2011).	S- Thuvarpu T- Seetham P- Karppu	Pittham, Kapham
25	<i>Rubia cordifolia</i> (Rubiaceae)	Manjitti	Rubiadin (Karnick,1996).	Melanoma, Sarcoma, Lung carcinoma, Lymphatic leukemia. (Sabnis,2001).	S- Karrpu, kaippu T- Veppam P- Karrpu	Kapham

* S – Suvai,(Taste) T – Thanmai,(Character) P – Pirivu (Division) ; ** V – Vatham, P – Pitham, K – Kapham;
Enippu (Sweet), Pulippu (Sour), Kaippu (Bitter), Karppu (Pungent), Thuvarppu (Astringent), Veppam (Hot), Seetham (Cold)

Table: 1.2: The role of three humours in Cancer clinical symptoms.

S.NO	Humours	Cancer Symptoms
1	Increased Vatham	Wasting, Constipation or diarrhoea, Insomnia and Pain
2	Decreased Pitham	Loss of appetite, Indigestion, Pallor, Chills and Rigor
3	Increased Kapham	Indigestion, Lethargic, Fatigue, Pallor and heaviness of the body.

Table. 2: A view of Herbs in the management of Cancer manifestations(Fuy et al,2004).

S.no	Manifestation of cancer	Herbs used
1	Cancer pain	<i>Allium sativum</i>
2	Mental depression & Insomnia	<i>Bacopa monnieri, Ocimum sanctum</i>
3	Anxiety & Insomnia	<i>Withania somnifera, Asparagus racemosus, Hydrocotyle asiatica, Nardostachys jatamansi, Elettaria cardamomum, Tribulus terrestris, Zingiber officinalis, Eclipta alba</i>
4	Cough, shortness of breath	<i>Curcuma longa, Zingiber officinale, Glycyrrhiza glabra, Terminalia chebula, Osimum sanctum, Adathoda vasica</i>
5	Appetizers	<i>Asparagus racemosus, Vitis vinifera, Plumbago zeylanica, Tinospora cordifolia, Zingiber officinale, Coptidis rhizoma</i>
6	Anti diarrhoeals	<i>Agele marmelos, Holarrhena anti dysenterica, Punica granatum, Cyperus rotundus, Emblica officinalis, Plumbago zeylanica.</i>
7	Constipation	<i>Terminalia chebula</i>
8	Anorexia / Weight loss or cancer cachexia	<i>Withania somnifera</i>

REFERENCES

- Agarwal BB, Kumar A, Bharti AC. Anticancer potential of curcumin: preclinical and clinical studies. *Anticancer Res*, 2003; 23:363-98.
- Anonymous, Yugi vaithya chinthamani. 1998.Chennai, India; Directorate of Indian Medicine and Homeopathy Publications.
- Awale.S et al,Identification of Chrysopenetin from *Vitex negundo* as a potential cytotoxic agent PANC – 1 human cancer cells.*Phytotherapy research*,2011;25(12) : 1770-5.
- Baatout S, Derradji H, Jacquet P,et al. Effect of curcuma on radiation-induced apoptosis in human cancer cells. *Int J Oncol*, 2004; 24: 321-329
- Bilal Bin Hafeez, Weixiong zhong et al. Plumbagin inhibits prostate cancer development in TRAMP mice via targeting PKCε, Stat3 and neuroendocrine markers. *Oxford journals,Carcinogenesis*2012;33(3):644 -651.
- Devi PU. *Withania somnifera* Dunal (Ashwagandha) a potential plant source of a promising drug for cancer chemotherapy and radiosensitisation. *Indian J Exp Biol*, 1996; 34:927-32.
- Fu Y, Hsieh TC et al. Licochalcone -A novel flavanoid isolated from licorice root (*Glycyrrhiza glabra*) arrests prostate cancer cells. *Biochemical and biophysical research communications*, 2004; 10:332(1) : 322(1): 263-270.
- Harrison T.R.1998,Principles of internal medicine,14th edition, Mc Graw-Hill Book Company.
- Jang M et al, Cancer chemopreventive activity of Resveratrol, a natural product derived from Grapes. *Science* 10, Jan 1997; 275 no. 5297:218-20.
- Karnick CR. 1996. Pharmacology of Ayurvedic medicinal plants. Newdelhi, India; Sri Satguru Publications.
- Matthew S, Kuttan G.Immunomodulatory and antitumour activities of *Tinospora cordifolia*. *Fitoterapia*, 1999;70:35-43.
- Mukund sabnis VD 2006. Chemistry and Pharmacology of Ayurvedic medicinal plants.Varanasi,India; Chaukhamba Amarabhati Publications.
- Murugesu mudhaliar KS. 2006. Siddha materia medica-medical plant division. Chennai, India: Directorate of Indian medicine and Homeopathy Publications.
- Narah Merina, Kalita Jogen Chandra et al. Medicinal plants with potent anticancer activity -A review. *International research journal of pharmacy*, 2012;3(6):26.
- Ohnuma T et al. Phase I study of indicine N-oxide in patients with advanced cancer. *Cancer Treat Rep*,1982;66:1509-15.
- Parimala R, Sachdanandam P. Effect of Plumbagin on some glucose metabolising enzymes studied in rats in experimental hepatoma. *Mol Cell Biochem*, 1993; 1: 125:59-63.
- Premalatha Balachandran, Rajgopal Govindarajan.Cancer -An Ayurvedic Perspective. *Pharmacological research*, 2005;51: 19-30.
- Premalatha B, Sachdanandam P. *Semecarpus anacardium* L nut extract administration induces the in vivo antioxidant defense system in aflatoxin B1 mediated hepatocellular carcinoma,*J Ethnopharmacol*,1999;66:131-9.
- Sakarkar DM, Deshmukh VN. Ethnopharmacological review of traditional medicinal plants for anti cancer activity. *International journal of Pharm Tech research*, Jan – mar 2011;3(1):298-308
- Sambasivampillai TV.1998.Dictionary based on Indian medicinal science. Chennai, India; Directorate of Indian Medicine and Homeopathy Publications.
- Seetharam Prasath J. 1997.Anuboga vaithya dheva ragasiyam. Chennai, India; Rathna Nayakkar & Sons.

Shanmugavelu. M. 2006. Siddha maruthuva Noi naadal Noi mudhal naadal thiratu. Chennai, India; Directorate of Indian Medicine and Homeopathy Publications.

Shirin H et al, Antiproliferative effects of S-allylmercaptocysteine on colon cancer cells when tested alone or in combination with sulindac sulfide. *Cancer Res*, 2001; 61:725-31

Thakore et al. A brief review of plants having anti cancer property. *International journal of pharmaceutical research and development*, 2001;3(11): Jan2012:129-136.

Trivedi NP, Rawal U.M. Hepatoprotective and antioxidant property of *Andrographis paniculata* in BHC induced liver damage in mice. *Indian J Exp Biol*, 2001;39:41-6.

Yun Ruchen et al. Identification of an Alkyl hydroquinone from *Rhus succedanea* as an inhibitor of Tyrosinase and melanogenesis. *Journal of agricultural and food chemistry*, 2009;7: 2200-2205.

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