REPUTATION OF HERBAL DRUGS IN TREATMENTS OF LIVER CANCER

NEHA SHARMA, HEMRAJ VASHIST*, ANIL KUMAR,
Department of pharmacy L.R Institute of Pharmacy JubliKyar, Oachghat Solan - 173223 (HP).Email: rajhem732@gmail.com

Received 2018.04.26-Accepted 2018.05.30

ABSTRACT
Plants Used in Hepato-protective Remedies in Traditional Indian- Medicine :- All the plants in universe has some importance of having medicinal properties, Herbal plants or botanical medicines have been used traditionally by herbalist worldwide for the prevention and treatment of liver disease. Medicinal plants play a key role in human health care. About 80% of the world population relies on the use of traditional medicine, which is predominantly based on plant material. The present review discusses different types of medicinal plants containing hepato-protective activity.the present work is the compilation of herbal drugs for the treatment of liver cancer.

Key word: Plants, Hepatoprotective, Medicinal plants.

INTRODUCTION
Cancer is characterized by rapid and uncontrolled formation of abnormal cells which may mass together to form a growth or tumor, proliferate throughout the body, initiating abnormal growth at other sites. The liver, which is located below the right lung and under the ribcage, is one of the largest organs of the human body [2]. It has two parts, a right lobe and a smaller left lobe. The liver has a wide range of functions including detoxification various metabolites, protein synthesis, filtering harmful substances from the blood, making bile to help digest fats from food, storing glycogen(sugar), which the body uses for energy and the production of biochemicals necessary for digestion. The liver's main job is to filter the blood from the digestive tract, before passing it to the rest of the body. The liver also makes proteins important for blood clotting and other functions [1]. There are two ways in which cancer can involve the liver. The cancer can arise from the liver itself (primary liver cancer) or it can spread to the liver from a primary tumor at another site (secondary or metastatic cancer). Primary liver cancer is difficult to treat. Surgical removal is the best option but these tumors are often too large and too extensive for surgery. Chemotherapy is occasionally used for tumors but any benefit is usually short lived. Unfortunately liver cancer cure is difficult. Surgeons may also resect one or two isolated, metastatic liver tumors. Metastatic cancers are tumors that spread from the organ or origin. Because of its blood supply, the liver is a common site for some cancers to spread. Liver cancer is sometimes called a “silent disease” because in its early stages it often does not cause symptoms. But, as the tumor grows, liver cancer symptoms may include- Pain in the upper abdomen on the right side, nausea and vomiting, swollen abdomen, weight loss, loss of appetite and feelings of fullness, fatigue and weakness, yellow skin and eyes, and dark urine from jaundice and fever.

Many herbs and nutrients have an influence on liver cancer prevention and treatment. These are: Indole-3-carbinol- inhibits tumorigenicity of hepatocellular carcinoma. Indole-3-carbinol is available as a dietary supplement. Inositol hexaphosphate(IP-6) is a naturally occurring polyphosphorylated carbohydrate abundantly present in many plant sources and in certain high fibre diets, such as cereals and legumes and in vitro its anti-cancer activity, Fish oil benefit - Consumption of n-3 fatty acids and fish reduces risk of hepatocellular carcinoma. Fish is a rich source of n-3 polysaturated fatty acids (PUFAs), such as eicosapentaenoic acid (EPA), docosapentaenoic acid (DPA), and docosahexaenoic acid (DHA). AHCC -- Active Hexose-correlated Compound - is a mushroom extract that has been tested as an immune enhancing, liver protective anti-cancer supplement, BCAA - Branched chained amino acids, Cornus officinalis herbs. Certain foods, among them milk and fruit, appear to reduce the likelihood of developing liver cancer. The role of coffee- it is possible that those who drink coffee could lower risk of liver cancer. Drinking more than three drinks a day increases the risk for liver cancer. In my opinion it is safe for most people to have one drink a day. After all, many French people drink a little bit of wine daily without major harm to their health.

Dr. Renato Talamini and colleagues studied 185 patients with liver cancer and a comparison group of 412 “controls” without cancer. As intake of various foods went up, the risk of liver cancer went down. High intakes of milk and yoghurt reduced the chances of developing liver cancer. High consumption of white meat lowered the risk by 56 percent, and with high intake of fruit, it went down by 52 percent. Dr. Renato Talamini advised that, to ward off liver cancer, one should “adopt a correct diet, rich in fruits and vegetables.” Also important, he added, “is limiting consumption of alcoholic beverages and avoiding HCV infection . A good example of herbal medicine is “Chinese herbal medicine”, one branch of traditional Chinese medicine which focuses on naturalism and holistic health that can be traced back as far as 2100 BC in ancient China. In the western world, most people who develop liver cancer usually also have a condition called cirrhosis of the liver. This is a fine scarring throughout the liver which is due to a variety of causes including infection and heavy alcohol drinking over a long period of time. However, only a small proportion of people who have cirrhosis of the liver develop primary liver cancer. Infection with either the hepatitis B or hepatitis C virus can lead to liver cancer and also be the cause of cirrhosis. Steroid abuse , smoking and exposure to toxins are additional cause of liver cancer. People who have a rare condition called haemochromatosis, which causes excess deposits of iron in the body , have a higher chances of developing liver cancer. In Africa and Asia a poison called Aflatoxin Found in moldy peanuts and grain, is an important causes of liver cancer. Women with long-standing hypothyroidism, commonly referred to as an “underactive thyroid,” are at increased risk of liver cancer [3].

Review Of Literature
HCC is the fifth most common malignancy worldwide, and with a continuously increasing incidence [24]. Three curative methods are currently available: orthotopic liver transplantation (OLT), surgical resection and local destruction (LD). However, only few patients qualify for the “curative therapies” because these strategies depend largely on the extent and location of the tumor and the underlying liver disease such as cirrhosis. Many hepatoprotective monomers are derived from natural herbs, especially those from China. Glycyrrhizic acid (GA) is an example of one of these hepatoprotective compounds. Glycyrrhizic acid (GA) is a triterpene glycoside found in the roots of licorice plants (Glycyrrhiza glabra). GA is the most important active ingredient in the licorice root, and possesses a wide range of pharmacological and biological activities.
GA coupled with glycyrrhetic acid and 18-beta-glycyrrhetic acid was developed in China or Japan as an anti-inflammatory, antiviral, and anti-allergic drug for liver disease. This review summarizes the current biological activities of GA and its medical applications in liver diseases. The pharmacological actions of GA include inhibition of hepatic apoptosis and necrosis; anti-inflammatory and immune regulatory actions; antiviral effects; and antitumor effects [4]. This paper will be a useful reference for physicians and biologists researching GA and will open the door to novel agents in drug discovery and development from Chinese herbs. With additional research, GA may be more widely used in the treatment of liver diseases or other conditions.

The traditional Chinese medicine Gancao (licorice root) is the dried roots of Glycyrrhiza uralensis Fisch (licorice), G. inflata Bar., or G. glabra L. Gancao which was first described in the Chinese book "Shen Nong Ben Cao Jing" in 200 A.D. as an antitox to toxic substances, ache, and other diseases. Gancao can complement other drugs to reduce toxicity and increase efficacy. The traditional use of Gancao involves a decoction of dried plant roots and stems. Some of the possible therapeutic properties of Gancao include - antiarthritic, anti-allergic, antiviral, antitoxic, anti-inflammatory, antitumor, and antitoxicogenic effects. It is commonly used for the treatment of acute and chronic liver injury, viral hepatitis, hepatic steatosis, liver fibrosis, hepatoma, viral myocarditis [6]. The known chemical components of Gancao include saponins (mainly glycyrrhizin (GA)), 3.63-13.06/%, flavonoids (1.5%), coumarin, alkaloids, polysaccharides, sitosterol, and amino acids [7]. GA and glycyrrhetic acid are well-characterized components of Gancao. GA has been developed as a hepatoprotective drug in China and Japan. GA can generate glycyrrhetic acid through metabolic processes in the human body. Therefore, the pharmacological effects of GA are essentially the same as glycyrrhetic acid [8]. GA, also called glycyrrhizin, is a triterpene glycoside from licorice root (Glycyrrhiza glabra) and consists of one molecule of 18β-glycyrrhetic acid and two molecules of glucuronic acid (18β-glycyrrhetic acid-3-O-β-D-glucuronopyanosyl-[1 → 2]-β-D-glucuronide) [9]. Glycyrrhizin is considered to be the major active component of Gancao as demonstrated by studies with experimental animal models and clinical studies [10]. GA has been used clinically for more than 20 years in patients with chronic hepatitis in China and Japan [11] and shows a satisfactory therapeutic effect in many other diseases. GA is also widely used as a sweetening and flavoring agent in food.

Important hepatoprotective botanicals in ISM - Liver diseases are among the most serious ailments and can be classified as acute or chronic hepatitis (inflammatory liver disease), hepatosis (non-inflammatory diseases) and cirrhosis (degeneration disorders resulting in fibrosis of the liver). By proper identification and standardization, the herbal treatment can be used as best remedies for human being. This review is focused on important botanicals standardized for chemical markers, which have shown promising results as hepato-protective agents [12].

A comprehensive review on herbal drugs for hepato-protection of 21st Century- Liver is a vital organ that plays a major role in metabolism and excretion of xenobiotics from the body. Liver injury or liver dysfunction is a major health problem that challenges not only health care professionals but also the pharmaceutical industry and drug regulatory agencies. Liver cell injury caused by various toxic chemicals (certain antibiotics, chemotherapy agents, carbon tetrachloride (CCl4), thioacetamide (TAA),etc.), excessive alcohol consumption and microbes is well studied. The synthetic drugs in practice have side effect on lungs and sometimes may fatal to liver. Hence, to avoid this herbal drugs have become increasingly popular. Herbal medicines have been used in the treatment of liver diseaeses for long time [18]. A number of herbal preparations are available in the market. The present review is aimed at compiling data on promising phytochemicals from medicinal plants that have been tested in hepatotoxicity models using modern scientific system.

Types of Primary Liver Cancer

The different types of primary liver cancer originate from the various cells that make up the liver. Primary liver cancer can start as a single lump growing in the liver, or it can start in many places within the liver at the same time. People with severe liver damage are more likely to have multiple cancer growth sites. The main types of primary liver cancer are:

Hepatocellular carcinoma: - Hepatocellular carcinoma (HCC), also known as hepatoma, is the most common type of liver cancer, accounting for 75 percent of all liver cancers. This condition develops in the hepatocytes, which are the predominant liver cells. It can spread from the liver to other parts of the body, such as the pancreas, intestines, and stomach. HCC is much more likely to occur in people who have severe liver damage due to alcohol abuse.

Cholangiocarcinoma: - Cholangiocarcinoma, more commonly known as bile duct cancer, develops in the small, tube-like bile ducts in the liver. These ducts carry bile to the gallbladder to help with digestion. Bile duct cancer accounts for approximately 10 to 20 percent of all liver cancers. When the cancer begins in the section of the ducts inside the liver, it’s called intrahepatic bile duct cancer. When the cancer begins in the section of the ducts outside the liver, it’s called extrahepatic bile duct cancer.

Liver Angiosarcoma: - Liver angiosarcoma is a rare form of liver cancer that begins in the blood vessels of the liver. This type of cancer tends to progress very quickly, so it’s typically diagnosed at a more advanced stage.

Hepatoblastoma: - Hepatoblastoma is an extremely rare type of liver cancer. It’s nearly always found in children, especially those under age 3. With surgery and chemotherapy, the outlook for people with this type of cancer can be very good. When hepatoblastoma is detected in the early stages, the survival rate is higher than 90 percent.

Stages of liver cancer

Staging a cancer allows a doctor to decide the course of treatment. Liver cancer is categorized into four stages:

- **Stage I:** The tumor is in the liver and has not spread to another organ or location.
- **Stage II:** Either there are several small tumors that all remain in the liver, or one tumor that has reached a blood vessel.
- **Stage III:** There are various large tumors or one tumor that has reached the main blood vessels. Cancer may have also reached the gallbladder.
- **Stage IV:** The cancer has metastasized. This means that it has spread to other parts of the body.

Once the stage has been found, a course of treatment can be start.

Causes of Liver Cancer

The exact cause of liver cancer is not known. However, most cases are linked to scarring of the liver, also referred to as cirrhosis. According to the American Cancer Society, hepatitis C is the most common cause of liver cancer in the U.S. People with both hepatitis B or C have a significantly higher risk of developing liver cancer than other healthy individuals, as both forms of the disease can result in cirrhosis. Some inherited liver diseases, such as hemochromatosis, cause cirrhosis and also increase the risk of liver cancer.

Other risk factors for liver cancer development include:

**Type 2 diabetes:** People with diabetes, especially if they also have hepatitis, or regularly consume a lot of alcohol, are more likely to develop liver cancer.

**Family history:** If a person’s mother, father, brother, or sister has had liver cancer, the person has a higher risk than others of developing the cancer themselves.

**Heavy alcohol use:** Consuming alcohol regularly and in excessive amounts is one of the leading causes of cirrhosis in the U.S.

**Long-term exposure to aflatoxins:** An aflatoxin is a substance made by a fungus. It can be found in moldy wheat, groundnuts, corn, nuts, soybeans, and peanuts. The risk of liver cancer only increases following long-term exposure. This is less of a problem in industrialized nations.

**Low immunity:** People with weakened immune systems, such as those with HIV/AIDS have a risk of liver cancer that is five times greater than other healthy individuals.
Obesity: Being obese raises the risk of developing many cancers, including liver cancer.

Gender: A higher percentage of males get liver cancer compared to females. Some experts believe this is due to gender but lifestyle characteristics. On average, males tend to smoke and drink alcohol more than females.

Smoking: Individuals with hepatitis B or C face a higher risk of liver cancer if they smoke.

Arsenic: People who rely on water wells that contain naturally-occurring levels of the toxin arsenic may eventually have a significantly higher risk of developing several conditions or diseases, including liver cancer.

Diagnosis
An early liver cancer diagnosis drastically improves the chances of survival. A doctor will, first of all, ask questions about medical history to rule out any potential risk factors for liver cancer. They will then give a physical examination, focusing on any swelling in the abdomen and any yellow coloring in the whites of the eyes. These are both strong indicators of liver problems.

Following these signs, if a doctor suspects a liver cancer diagnosis, they will run further tests, including:

- **Blood tests**: These will include tests to see how the blood clots, check levels of other substances in the blood and measure the proportions of red and white blood cells and platelets.
- **Tests for viral hepatitis**: The doctor will check for the presence of hepatitis B and C.
- **Imaging scans**: Either an MRI or CT scan can show the size and spread of the cancer.
- **Biopsy**: A small sample of tumor tissue is removed and analyzed. The analysis can reveal whether the tumor is cancerous or non-cancerous.
- **Laparoscopy**: This is an outpatient surgical procedure under general or local anesthesia. A long, flexible tube with a camera attached is inserted through the abdomen. This allows the doctor to observe the liver and surrounding area.

Once the doctor has assessed the stage, location, and type of liver cancer, they will be able to decide the likelihood of safely and effectively curing it. This will dictate the course of treatment.

Prevention
There is no way to completely prevent liver cancer. However, the following measures may help to reduce the risk:

Moderate alcohol intake: Regularly consuming high volumes of alcohol on a long-term basis significantly increases the risk of cirrhosis of the liver. This, in turn, greatly increases the likelihood of developing liver cancer. Moderating the consumption of alcohol, or giving it up completely, can significantly reduce the risk of developing liver cancer. Limiting tobacco use can also help avoid cancers of the liver and other organs.

Hepatitis B vaccination: The following individuals should consider receiving the hepatitis vaccine:

- people with a drug dependency who share needles
- individuals who engage in unprotected sex with partners who are at risk of having hepatitis B
- nurses, doctors, dentists, and other medical professionals whose occupations raise their risk of becoming infected
- frequent travelers, especially those who go to parts of the world where hepatitis B is common

There is no sure way to prevent hepatitis C and no vaccination. However, using a condom during sex may help reduce the risk of infection.

Maintain a healthy body weight: As obesity is a risk factor and fatty liver disease can lead to liver cancer and diabetes, looking after your physical health and weight can be key to reducing the risk of liver cancer.

### MECHANISM OF NATURAL ANTICANCER DRUGS

- **Curcumin (Turmeric)**

  **DESCRIPTION**: Curcuma longa is a member of the ginger family. It is a tropical plant extensively cultivated in the tropical areas of Asia, and to a lesser extent in Africa. It is the source of the spice turmeric, which is derived from the dried, ground rhizome [11]. Natural compounds are emerging as effective agents for the treatment of malignant diseases. Turmeric (diferuloylmethane), the active constituent of turmeric extract, has gained significant interest as a plant-based compound with anti-cancer properties. Turmeric is physiologically very well tolerated, with negligible systemic toxicity observed even after high oral doses administration. Despite curcumin's superior properties as an anti-cancer agent its applications are limited due to its low solubility and physico-chemical stability, rapid systemic clearance and low cellular uptake.

  **ACTIVE CONSTITUENTS**: Turmeric is comprised of a group of three curcuminoids: curcumin (diferuloylmethane) demethoxycurcumin and bisdemethoxycurcumin, as well as volatile oils sugars, proteins, and resins. The curcuminoid complex is also known as Indian saffron [13]. Curcumin is a lipophilic polyphenol that is nearly insoluble in water but is quite stable in the acidic pH of the stomach [29].

  **Uses**

  - **Curcumin Fights Cancer (Breast, Colon, Leukemia, Lung, Prostate, Pancreatic, Brain)**: Curcumin has been shown to not only reduce the growth of new blood vessels in tumors, Curcumin stops the growth of malignant cells in oral cancer but doesn’t affect normal cells.
  - **Curcumin is Anti-Viral, Anti-Bacterial & Anti-Fungal**.
  - The antioxidant and anti-inflammatory properties of turmeric’s main active ingredient curcumin, which may offer protection against certain cancers.
  - Turmeric is beneficial for its influence on the liver. It is said to shrink engorged hepatic ducts, so it can be useful to treat liver conditions such as hepatitis, cirrhosis, and jaundice [17].
  - **Bacterial Infection / Wounds**: Turmeric is useful as an external antibiotic in preventing bacterial infection in wounds.

  **Ingredients**

  Curcuminoids 250mg, Turmeric Extract

  **Directions**

  Take 1 capsule a day, preferably post lunch or dinner.
GREEN TEA (Camellia sinensis)

Scientific Classification

<table>
<thead>
<tr>
<th>Kingdom: Plantae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order : Ericales</td>
</tr>
<tr>
<td>Family : Theaceae</td>
</tr>
<tr>
<td>Genus : Camellia</td>
</tr>
<tr>
<td>Species : C.sinensis</td>
</tr>
</tbody>
</table>

Description

Green, black, and oolong teas all derive from the leaves of the Camellia sinensis, which is cultivated widely in China, India, Japan, and Indonesia. Originally from East Asia, the wild plant grows as a well-trimmed bush with alternating evergreen leaves. Green tea is made from unfermented leaves which are lightly steamed to inactivate the enzymes which would allow fermentation, then dried. The leaves of oolong tea are partially fermented, and black tea is fully fermented. The greater the fermentation, the lower the polyphenol content and the higher the caffeine content. Black tea has 2-3 times the caffeine content of green tea.

Hepatoprotective activity: Green tea has been found to provide protection to the liver against a variety of toxins, including the industrial solvent 2-nitropropane (also found in cigarette smoke), alcohol, d-galactosamine and 1,4-naphthoquinone. In addition, the anti-carcinogenic effect of green tea on the liver and other organs has been well researched. Much is known about the hepatoprotection afforded by green tea. Catechins have been discovered to be powerful antioxidants, which is thought to be at least in part responsible for green tea’s hepatoprotective activity [22]. Histopathological examination revealed effective protection against induction of hepatic degenerative changes by 2-nitropropane at 15 mg/kg [23]. Protein thiols have been shown to inhibit lipid peroxidation due to other toxins, including tert-butyl hydroperoxide and bromotrichloromethane, 1,4-naphthoquinone, and singlet oxygen. The hepatoprotective effect of green tea is not dependent on its direct antioxidant effects alone. Green tea catechins have been shown to maintain intracellular protein thioredoxin levels [23]. Protein thiols help maintain the intracellular reduction-oxidation (redox) balance. Protein tertiary configuration (shape), and therefore cellular function, is dependent on the maintenance of the redox balance. In rat liver cells exposed to 1,4-naphthoquinone, green tea extract prevented the expected cellular damage. This protective effect was suggested to be due to maintenance of protein thioredoxin levels by green tea [24]. Much of the green tea research involves its effects on cancer prevention and treatment. Green tea has been found to reduce or prevent the growth of hepatic neoplasms in rodents and treated animals [25].

Available Packing

- 100g Loose Leaves / Pouch Pack / Tea Bag

RESVERATROL

Resveratrol, naturally occurring in some plant foods, but especially contained in grapes and red wine, is the most investigated and well-known member of this class of compounds. Resveratrol (trans-3,4',5-trihydroxystilbene) is a non-flavonoid polyphenol belonging to the stilbenes. In plants, the molecule exists in two isomers, trans-resveratrol and cis-resveratrol, and their glucosides, trans-piceid and cis-piceid.

Resveratrol is the beneficial compound found in red wine that is associated with life extension and some of the health benefits in wine. It is produced in grapes as a defense against toxins, and is contained in the skins.

Structure:

![Resveratrol Structure](image)

Plant Source: Polygonum cuspidatum

Part Used: rhizomes

Biological Activity: Cardioprotective effects; Antidiabetic effects and antioxidant effects

Marketed formulation

Resveratrol with Pterostilbene

100 mg, 60 vegetarian capsules

The lower end of supplementation tends to be for cardiovascular health, insulin sensitivity, and longevity for somebody who is otherwise unhealthy is 5-10mg daily. For persons who are otherwise healthy, dosages between the range of 150-445mg have been used (with no clear indication for what is the optimal dose).

VINCA ALKALOIDS

Vinca alkaloids are obtained from the Madagascar periwinkle plant. They are naturally occurring or semi synthetic nitrogenous bases extracted from the pink periwinkle plant Catharanthus roseus [42].

They have been used to treat diabetes, high blood pressure and have been used as disinfectants. The vinca alkaloids are also important for being cancer fighters. There are four major vinca alkaloids in clinical use: Vinblastine (VBL), vincristine (VCR), vindoline (VCR), and vinblastine (VDS). VCR, VBL, and VRL have been approved for use in the United States [44].

MECHANISM OF ACTION

![Mechanism of Action](image)

The main mechanisms of vinca alkaloid cytotoxicity is due to their interactions with tubulin and disruption of microtubule function, particularly of microtubules comprising the mitotic spindle apparatus, directly causing metaphase arrest [44]. However, they can do many other biochemical activities that may or may not be related to their effects on microtubules. Many of the effects that do not include microtubule interruption happen only after treatment of cells with clinically irrelevant doses of the vinca alkaloids. Nevertheless, the vinca alkaloids and other anti-microtubule agents also have an effect on both non-malignant and malignant cells in the non-mitotic cell cycle, because microtubules are involved in many non-mitotic functions.

MEDICINAL USES

The vinca alkaloids have been generally included in combination chemotherapy regimens for medicinal therapies. They do not have cross-resistance with drugs that alkylate deoxyribonucleic acid (DNA) and have a different mechanism of action.
• VBL has been used as an integral part of medicinal treatment regimens for testicular carcinoma and both Hodgkin and non-Hodgkin lymphomas. [51]
• VRL is same to VBL. It has significant antitumor activity in patients with breast cancer and can be affected on bone tumor cells.
• VCR has been approved to treat acute leukemia, rhabdomyosarcoma, neuroblastoma, Wilm’s tumor, Hodgkin’s disease and other lymphomas. [52]
• VDS has similar effects to VBL. Antineoplastic activity of VDS has been reported in acute lymphocytic leukemia, blast crisis of chronic myeloid leukemia, malignant melanoma, pediatric solid tumors and metastatic renal, breast, esophageal and colorectal carcinomas.

Marketed formulation

PLUMBAGO ZEYLANICA
Botanical source: Plumbago Zeylanica Linn
Family: Plumbaginaceae
Sanskrit Synonyms: Agni, Vahini
Regional names:- English: Lead wort, Ceylon lead wort
Hindi: Chira, Chitra

Plumbago zeylanica is isolated and extracted as plumbagin, whose major role is to inhibit spread and growth of cancers including liver cancer. Plumbago zeylanica has a robust neuroprotective, antioxidant, immuno-enhancing and hepatoprotective properties. Results have confirmed a significant inhibition of metastasis liver cancer by introducing 1, 4-naphthoquinone extract derived from plumbagin medicinal plant. [49]

It is a perennial sub-scandent shrub, grows throughout India, especially in Bengal, Uttar Pradesh, South India and Sri Lanka, in moist places. It is also cultivated commercially. The flowering occurs from September to November. The red flowered variety of chitraka grows abundantly on Khasi hills. Found wild in Peninsular India and west Bengal, and cultivated in gardens throughout India. The plant grows 0.5-1.0 meters in height.

FLOWERING BRANCH OF PLUMBGO ZEYLANICA
Pharmacology and traditional uses

Flower: Digestent.
Leaves: Leaves are caustic, vesicant, aphrodisiac, good for scabies, stimulant, and also use in sore and swelling. They are used to treat infections and digestive problems such as dysentery. Externally a paste is applied to painful rheumatic areas or to chronic and itchy skin problems. 1
Roots: root is bitter, laxative, expectorant, tonic, abortifacient, good appetite, useful in rheumatism, laryngitis, scabies and disease of spleen. 6
Fruit: Digestant
Seeds: Seed decoction is prescribed to reduce muscular pain.

Uses

Anti-inflammatory activity: The phosphate buffered saline extract of the roots of Plumbago zeylanica was investigated for anti-inflammatory activity.

Antimalarial Activity: Plumbagin shows antimalarial effects on Plasmodium falciparum enzyme, the succinate dehydrogenase (SDH) .

Anticarcinogenic Activity: Male F344 rats; administered with plumbagin at 200 ppm in the diet for two weeks beginning one week before azoxymethane (AOM) injection had a lower incidence and multiplicity of tumors in the small intestine than those administered AOM alone. This suggests that plumbagin could be a promising chemopreventive agent for human intestinal neoplasia. Hexokinase, phosphor-glucosomerase and aldolase levels increased in hepatoma-bearing rats, but they decreased to near-normal levels in animals administered plumbagin. Levels of the gluconeogenic enzymes, glucose-6-phosphatase and fructose-1, 6-diphosphatase decreased in hepatoma-bearing animals but increased in the animals treated with plumbagin.

Anti bacterial Activity: The aqueous extract and its partition (Petroleum ether, dichloromethane, methanol, aqueous residue) were effective against Salmonella gallinarum, Escherichia coli, Proteus vulgaris and Klebsiella pneumoniae.

Ingredients:- Plumbago zeylanica -30mg

PSORALEA CORYLIFOLIA
• Botanical Name : Psoralea Corylifolia
• Family Name : Fabaceae
• Common Name : Psoralea Seed, Malay Tea, Cot Chu, Ku Tzu
• Malaysia, Scurf pea, Malaysian Scurfpea, Po Ku Chih, Pha Cot Chi
• Part Used : Seeds, Roots And Fruits
• Habitat : Found in many parts of india.
• Product offered : Seeds, Oil

Uses

Psoralea Corylifolia is valued in Chinese herbal medicine as a tonic remedy and is used to improve general vitality.

It is also of value in the treatment of skin disorders, including vitiligo.

The seed is anthelmintic, antibacterial, aphrodisiac, astringent, cardiac, cytotoxic, deobstruent, diaphoretic, diuretic, stimulant, stomachic and tonic.

The root is used for treating dental caries. [50]

PODOPHYLLUM HEXANDRUM
The major lignans from Podophyllum hexandrum are podophyllin and podophyllotoxin known as Himalayan Mayapple. The active ingredient role of podophyllotoxin among all natural anticancer components as it possesses hematopoietic and radioprotective properties. A study done by Ganie et al suggests that ethyl acetate extract of P. hexandrum pos-sesses in vitro antioxidant functions and acts as a liver-protective agent against CCl4-induced hepatotoxicity. [51]

FAMILY: - Podophyllaceae
SYNONYM -: Vanyakarkati ,Papra ,Bankakri

CHEMICAL CONSTITUENT:- Rhizomes and root contain resinous mixture called podophyllum resin or podophyllin .The primary constituent are lignin glycoside , podophyllotoxin ,podophyllinic acid .

TAXANES

Biological source:- Taxus Brevifolia
Family:–Taxaceae
Parts used : Stem Bark
Chemical Constituent:- Taxol, Paclitaxae, Docetaxel
MECHANISM OF ACTION

Glycyrrhiza glabra

Glycyrrhiza glabra, a plant consists made up of various medicinal properties with pharmacological actions and could be used as a template for designing new herbal medicines. Flavonoids components derived from this herbal plant have strong antioxidant, antimutagenic, anticancer and hepatoprotective properties. Its active compound licochalcone-A inhibits spread of various cancers and growth by arresting cancer cell division. Glycyrrhizic acid isolated from Glycyrrhiza glabra has powerful protection against aflatoxins and the value to cure varieties of ailments from a simple cough to hepatitis. Various studies have reported the chief phytochemical constituents such as glabrin A&B, glycyrrhizin, triterpene sterols, glycyrrhizinic acid, and isoflavones saponin. [58]

Aloe vera

Aloe vera is also another natural plant that has to be processed correctly to maintain it cancer-fighting properties. [59] Aloe vera plant extract is acemannan that stimulates the immune system to accelerate wound healing as well as it possesses anticancer property. Aloe vera consists of super carbohydrates that protect against especially liver cancer. It plays a unique role of extraordinary antioxidant and thereby reduces side effects of radiotherapy and chemotherapy. [59]

Andrographis paniculata

The bioactive components of Andrographis paniculata are and rograholide which has strong anticancer and immuno enhancing activity. This extract directly exerts on tumor cells by stopping the GO/G1 phase of cell cycle thereby inducing apoptosis. Andrographis paniculata augments the activity of protective liver enzymes and thereby reducing side effects of radiotherapy & chemotherapy. Hepatoprotective effect of ethanolic Andrographis paniculata leaf extract in rats could lead to a reduced level of thioacetamide stimulated toxicity, the normalized level of reactive oxy-gen species, inhibited cellular proliferation, and stimulation of apoptosis in HepG2 cells. [60]

Astragalus membranaceus

Astragalus membranaceus is used to treat advanced cases of HCC by the Chinese medicines. One of the derivatives for Astragalus membranaceus is swainsonine which is known to prevent metastases. Research studies have also showed a high prevalence of patients administered with As-tragalus membranaceus compared to the patients treated with conven-tional treatment alone. Astragalus membranaceus is also used with Li-gastrum lucidum herb in China. Astragalus membranaceus is combined with Panax ginseng, and has regulatory effect on natural killer cell and improves immune cells activity and regulate secretion of cortisol stress hormone, followed by antitumor activity in vivo, increasing host im-mune response, and effective for anti-tumor therapy. [62]

Foeniculum vulgare

Studies have evaluated the efficiency of Foeniculum vulgare seed methanol extract for its antitumor, antioxidant and cytotoxic, events and for its ability to serve as non-toxic radioprotector in Swiss albino mice. Foeniculum vulgare seed methanol extract may defend mouse cells from injury via reduce oxidative stress due to reactive oxygen species. It is an effective, safe, and easily accessible source of natural antioxidants to recover the oxidative strength of fatty foods through storage. Foeniculum vulgare seed methanol extract also presented an anti-tumor property through augmentation of antioxidant defense system modulating lipid peroxidation in EAC-bearing mice with or without radiation exposure. Also known as wild pepper fennel, it has been reported to have remarkable anticancer property by targeting the HepG2 liver cells lines. [63]

CAT’S CLAW (Uncaria tomentosa)

Botanical Name of Cat’s Claw: Uncaria tomentosa.

Synonym:- Cat’s claw; Paraguavo; Garabato; Healing vine of Peru

Description: Uncaria tomentosa (cat’s claw) is a woody vine that may reach over 30 m in height into the rain forest canopy. The vine has hook-
like thorns that resemble the claws of a cat, giving the plant its name and allowing the vine to attach to tree bark. The vine may reach several centimeters in diameter and often develops roots from the nodes. Its sap is clear and watery with an astringent taste.

The leaves are bright green, simple, opposite, compound, and dimorphic, with small wide leaflets that are ovate or lanceolate when mature. The curved, hook like thorns grow at the base of the leaves. The yellow flowers are trumpet-shaped, either solitary or in axillary clusters, 3 inches long and 4 inches across.

**Plant Part Used:** Bark, root, leaves.

**Uses:** Cat’s claw is thought to have the following health properties; antibacterial, anti-inflammatory, antimutagenic, antioxidant, antitumour, anti viral, cytostatic, de purative, diuretic, hypotensive, immunostimulant, vermifuge.

It has been used as an herbal medicine for generations by several native tribes in South America. It has been used traditionally to treat intestinal complaints, asthma, wounds, cancer, tumors, arthritis, inflammations, diabetes, irregularities of the menstrual cycle, fevers, ulcers, dysentery and rheumatism.

**PHYLANTHUS AMARUS:** It consists of whole dried plant of Phyllanthus amarus; common in Central and Southern India extending to Sri Lanka.

**FAMILY:** Euphorbiaceae

**SYNONYM:** Bhaumla Kirunelli

**Chemical Constituent:** The plant contains crystalline lignans, phyllanthin and hydrocinnamollignan, flavonoids – quercetin, astragalin, quercitrin, isoorsercerin, leucodelphinidine alkaloids.

**Parts used:** Whole plants

**Pharmacological action:** - Hepatoprotective activity

- Antimicrobial activity

- Antilucre effects

**DOSAGE FORMS:** It is a chief component of hepatoprotective formulations like Livosin, Liv 52 etc.

Herbohep, a hepatoprotective agent. Other ingredients of the formulation include Picrorhiza kurroa and Andrographic paniculata.

**CONCLUSION**

From the above survey of information it can be well known that liver cancer is a group of the abnormal growth of liver cells in the liver. Cancer is characterized by rapid and uncontrolled formation of abnormal cells which may mass together to form a growth or tumor, proliferate throughout the body. Normally, our body forms new cells as we need them, replacing old cells then die. Sometimes these processes go wrong. New cells grow even when you don’t need them, old cell don’t die when they should. The herbal drug treatment may highly be suggested to the rural and poor people to treat effectively the cancers of various type. Based on that the siddha medicines are coming up in combination with metals and other essential supplements to improve the immune status of the cancer patients in India. The above survey reveals the role of Indian medicinal plants and the various phytochemicals that may be used effectively for cancer treatment. Some herbs and nutrients have an influence on liver cancer prevention and treatment. These are: Indole-3-carbinol, Indole-3-carbinol,inositol hexaphosphate(IP-6), Fish oil benefit, (AHCC) Active Hexose-correlated, Reaveratro and Foeniculm vulgare etc.

**Authors have no conflict of interest**

**REFERENCE**


3. Sahelian Ray, M.D. Liver cancer diet, food, supplements herbs vitamins Natural cure, treatment, therapy; April 2 2017


17. Suman Pattanayak, Siva Sankar Nayak, Durga Prasad Panda, Subas Chandra Dinda, Vikas


Hemraj Vashist et al.

Shivananda Nayak B, Julien R Marshall, Godwin Istor, Andrew Adogwa, Hypoglycemic and hepatoprotective activity of fermented fruit juice of Morindacitrifolia (Noni) in diabetic rats, Evidence-Based Complementary and Alternative Medicine 2011;1-5.


Sahelian R. Alkaloid substances in plants, information on vinca, ergot and ephedra alkaloid compounds. [Cited on 2011 Jul 9];


Sahelian R. Alkaloid substances in plants, information on vinca, ergot and ephedra alkaloid compounds. [Cited on 2011 Jul 9];

