

The most important herbs used in the formulas described in *Chapter 10, Ayurvedic Medicine* for the treatment of liver disorders are provided below. Their botanical names, distribution, parts used, and medicinal uses are described. In addition, information on the dosage forms and side effects are provided.<sup>1-10</sup>

### Bhringaraj

Botanical Name:	<i>Eclipta alba, Eclipta erecta</i>
	The name means “ruler of the hair.”
Family:	Compositae
Distribution:	This herb is found throughout India as well as the southwestern part of the United States.
Parts Used:	Herb, roots, and leaves
Actions:	Roots and leaves stimulate the flow of bile into the intestine. The root is used as an emetic and purgative. The leaf juice is used as a liver tonic. This is the main herb for the hair, and cirrhosis. It is believed to prevent aging, maintain and rejuvenate hair, teeth, bones, memory, sight, and hearing. It is a rejuvenative for pitta, kidneys, and liver. The root powder is used in Ayurvedic medicine for hepatitis, enlarged spleen, and skin disorders.
Dosage:	Infusions, <i>decoction</i> , powder, medicated oil, and ghee (clarified butter)
Safety Caution:	This herb can cause severe chills. <u>Do not use this herb without the supervision of a qualified health care provider.</u>

### Bhuamalaki

Botanical Name:	<i>Phyllanthus niruri, Phyllanthus urinaria, Phyllanthus amarus</i>
Family:	Euphorbiaceae
Distribution:	This perennial herb is found from central and southern India to Sri Lanka. <i>Phyllanthus</i> species are also found in other countries including China (e.g., <i>Phyllanthus urinaria</i> ), the Philippines, Cuba, Nigeria, and Guam.
Parts Used:	Leaves, roots, and whole plant
Active Compounds:	<i>Phyllanthus</i> primarily contains lignans (phyllanthine and hypophyllanthine), alkaloids, and <i>flavonoids</i> (quercetin). While it remains unknown which of these ingredients has an <i>antiviral</i> effect, research shows that this herb acts primarily on the liver. This action in the liver confirms its historical use as a remedy for jaundice.
Actions:	<i>Phyllanthus</i> has been used in Ayurvedic medicine for over 2,000 years and has a wide number of traditional uses. It is the main herb for treating liver disorders. Other uses include using the whole plant for jaundice, gonorrhoea, frequent menstruation, and diabetes. It is also used topically as a poultice for skin ulcers, sores, swelling, and itchiness. The young shoots of the plant are administered in the form of an infusion for the treatment of chronic dysentery.

Dosage:	Infusion, juice, poultice, powder, or pill
Safety:	No side effects have been reported using <i>Phyllanthus</i> as recommended. Researchers have used the powdered form of <i>Phyllanthus</i> in amounts ranging from 900-2,700 mg per day for three months.

## Guduchi

Botanical Name:	<i>Tinospora cordifolia</i> , <i>Menispermum cordifolium</i> , <i>Cocculuc cordifolia</i>
Family:	Menispermaceae
Distribution:	This herb is found in the Himalayas and in many parts of southern India.
Parts Used:	Whole plant, roots, and stems
Actions:	This herb is used to treat HIV/AIDS, other immune diseases, and pitta diseases. It is used as a blood purifier, to treat fever, and to aid recovery from fevers. It is also used for jaundice, digestion, constipation, hemorrhoids, dysentery, and cancer (strengthens persons before and after chemotherapy).
Dosage:	Extract, powder, concoctions for serious illnesses like cancer. Use one or more ounces daily.
Safety:	No information available.

## Haridra (Turmeric)

Botanical Name:	<i>Curcuma longa</i>
Family:	Zingiberaceae
Description:	This herb is found throughout India especially in Bengal, Mumbai and Chennai.
Parts Used:	Rhizome
Actions:	The active ingredient is curcumin. This herb is dry and light. The plant is bitter, astringent, and heating. It is used as an anti-inflammatory, anti-oxidant, and hepato-protective agent. It is useful in gastrointestinal colic, flatulence, hemorrhage, hematuria, menstrual difficulties, jaundice, hepatomegaly, skin disorders, fever, and wounds.
Dosage:	Juice extract 10-20 mL, powder 1-3 gm
Safety Caution:	No information about the safety of this plant is available.

## Haritaki (Myrobalan)

Botanical Name:	<i>Terminalia chebula</i> , <i>Terminalia reticulata</i>
Family:	Combretaceae
Description:	This tree grows in many parts of India.
Parts Used:	Fruit

Actions:	This fruit is a blood purifier and is used to treat jaundice, colic, anemia, cough, asthma, hoarse voice, hiccups, vomiting, hemorrhoids, diarrhea, malabsorption, abdominal distention, gas, fevers, parasitic infections, tumors, and spleen and liver disorders. Small doses are good for constipation and diarrhea. It also improves digestion.
Dosage:	Decoction, powder, paste, and gargle
Safety Caution:	<u>Do not take this fruit if you are pregnant or are suffering from dehydration, severe exhaustion, and/or emaciation.</u> No other information about the safety of this plant is available.

## Kalmegha (King of Bitters)

Botanical Name:	<i>Andrographis paniculata</i>
Family:	Acanthaceae
Distribution:	This herb is found throughout India and southeast Asia.
Part used:	Leaves
Active ingredient:	Andrographolide
Actions:	This herb is reported to possess astringent, anodyne, and tonic properties. The plant is bitter, acrid, and cooling. It is used as a laxative, anti-inflammatory, expectorant, and digestive. It is useful in treating dysentery, cholera, diabetes, influenza, bronchitis, hemorrhoids, gonorrhea, <i>hepatomegaly</i> , skin disorders, fever, worm infestations, burning sensations, wounds, ulcers, leprosy, itching, flatulence, colitis, and diarrhea.
Dosage:	Powder, decoction, and extract
Safety:	No information about the safety of this plant is available.

## Katuka or Kutki

Botanical Name:	<i>Picrorrhiza kurroa</i>
Description:	This plant is found in the western Himalayas from Kashmir to Sikkim.
Parts Used:	Dried rhizome
Actions:	This herb is used with equal parts of licorice and raisins to treat constipation. It is also used with neem bark for bilious fever, and with aromatics to treat fevers, malaria, and worms in children.
Dosage:	Tincture, extract, powder, or pills
Safety:	No information about the safety of this plant is available

## Musta (Nutgrass)

Botanical Name:	<i>Cyperus rotundus</i>
Family	Cyperaceae

Description:	This plant is found in southern India.
Parts Used:	Rhizome
Actions:	This plant is used to treat poor appetite, diarrhea, dysentery, fevers, gastritis, indigestion, and sluggish liver. It is also used to harmonize the liver, spleen, and pancreas and to treat malabsorption.
Dosage:	Decoction or powder
Safety Caution:	Prolonged use of this herb may cause constipation and excess flatulence or gas. No further information about the safety of this plant is available.

## Pippali (Long Pepper)

Botanical Name:	<i>Piper longum</i>
Distribution:	This plant is indigenous to northeastern and southern India and Sri Lanka. It is cultivated in eastern Bengal.
Family:	Piperaceae
Parts Used:	Fruit
Actions:	<i>Piper longum</i> is used to treat abdominal tumors and distention, and to improve the digestive fire. It is used to treat flatulence, gout, laryngitis, paralysis, rheumatic pain, sciatica, and worms. It is also used to enhance the <i>immune system</i> .
Dosage:	Infusion, powder, and oil
Safety Caution:	This herb causes high pitta. No information about the safety of this plant is available.

## Punarnava (Red Hogweed)

Botanical Name:	<i>Boerhavia diffusa</i>
Family:	Nyctaginae
Description:	This herb is found throughout India. It can be white or red.
Parts Used:	Herb or root
Actions:	White and red species are used to treat <i>edema</i> , <i>anemia</i> , heart disease, cough, intestinal colic, jaundice, <i>ascites</i> , peritoneal concerns such as urethritis, and kidney disorders.  Other uses of red plant include hemorrhoids, skin diseases, rat and snake bites, alcoholism, wasting diseases, insomnia, rheumatism, eye diseases, and asthma (moderate doses). It induces vomiting in large doses. Leaf juice is used to treat jaundice. Root decoction or infusion is used to treat constipation, gonorrhea, and internal <i>inflammations</i> . It is used externally to treat <i>edema</i> , and rat and snake bites.
Dosage:	Juice, decoction, infusion, powder, paste, oil, sugar water or honey paste
Safety Caution:	No information about the safety of this herb is available. However, large doses are known to cause vomiting.

## Current Ayurvedic Research on Plants for the Treatment of Liver Disorders

Research regarding plants traditionally used in Ayurveda for the treatment of liver disease has advanced significantly in the past 15 years. Much of what has been discovered supports traditional knowledge.

The following descriptions of some of these research studies are technical and may be somewhat difficult to understand. They are provided here for reference only. If you choose to incorporate Ayurvedic medicine into your treatment *protocol*, you should give this information to your non-Ayurvedic health care providers. It will help them understand what you are taking and how it may or may not affect any other treatments you are using.

The *hepatoprotective* effect of the ethanol to water (1:1) extract of *Eclipta alba* (Ea) has been studied at subcellular levels in rats against carbon tetrachloride-induced *hepatotoxicity*. Its hepatoprotective action is created by regulating the levels of hepatic microsomal drug metabolizing *enzymes*.<sup>11</sup>

Studies on *Phyllanthus niruri* have revealed that it blocks *DNA polymerase*, the enzyme needed for the *hepatitis B virus (HBV)* to *replicate*. Fifty-nine percent of those infected with chronic viral hepatitis B lost one of the major blood markers of HBV infection (hepatitis B surface antigen) after using *Phyllanthus* for 30 days. While *clinical studies* on the outcome of *Phyllanthus* and HBV have been mixed, the species *P. urinaria* and *P. niruri* seem to work far better than *P. amarus*. Many previous studies on the hepatoprotective effects of *P. niruri* corroborated traditional knowledge of its role in liver disorders.<sup>12</sup>

Turmeric has shown evidence of hepatoprotective effects in laboratory and animal studies. However, there are no human clinical studies. Like silymarin, turmeric has been found to protect animal livers from a variety of hepatotoxic substances including carbon tetrachloride, galactosamine, pentobarbitol, 1-chloro-2,4-dinitrobenzene<sup>7</sup>, 4-hydroxy-nonenal, and *acetaminophen*. Giving curcumin along with piperine (long pepper) can enhance its absorption when taken orally. The hepatoprotective effects of turmeric may stem from its potent *antioxidant* effects. Turmeric contains several water and fat soluble antioxidant compounds. Curcumin was found to be the most active of these compounds. The antioxidant effects of other components of turmeric are also significant. A heat-stable *protein* isolated from the aqueous extract of turmeric was found to be more effective against superoxide than was curcumin, and more effective in inhibiting oxidative damage to DNA. In addition to its antioxidant effects, curcumin has also been shown to enhance liver detoxification by increasing the activity of *glutathione S-transferase*.<sup>10,20</sup> Glutathione S-transferase is an enzyme that joins glutathione with a wide variety of *toxins* to facilitate their removal from the body.<sup>13-15</sup>

Glycyrrhiza (licorice) has been shown to have a direct hepatoprotective effect. Glycyrrhiza flavonoids provide protection to *hepatocytes* exposed to carbon tetrachloride and galactosamine. Research points to the antilipid peroxidation effect of glycyrrhiza as the central mechanism contributing to its protective action against carbon tetrachloride-induced hepatotoxicity. Glycyrrhiza has also been shown to significantly quench *free radicals*. Recent studies have shown glycyrrhiza to enhance the detoxification of medications and toxins. Several mechanisms seem to be involved, one of which is increased liver glucuronidation. Glycyrrhiza exerts *antiviral* activity *in vitro* toward a number of viruses, including *hepatitis A*, varicella zoster, *HIV*, herpes simplex type 1, Newcastle disease, and vesicular stomatitis viruses. Intravenous glycyrrhizin has been shown to be effective in a double blind study against viral hepatitis, chronic viral hepatitis in particular. Administered in a physiologic saline solution in combination with cysteine and glycine (a product called Stronger Neo Minophagen-C, or SNMC), glycyrrhiza has been shown to stimulate *endogenous interferon* production in addition to its antioxidant and detoxifying effects.<sup>16-18</sup>

Picoliv, the active constituent isolated from the plant *Picrorhiza kurroa*, was evaluated as a hepatoprotective agent against ethanol-induced *hepatic* injury in rats. Alcohol feeding (3.75 g/kg x45 days) produced 20-114% alteration in selected *serum (AST, ALT and ALP)* and liver markers (lipid, glycogen and protein). Further, it reduced the viability (44-48%) of isolated hepatocytes *ex vivo* as assessed by Trypan blue exclusion and rate of oxygen uptake. Its effect was also seen on specific alcohol-metabolizing enzymes (aldehyde dehydrogenase, 41%; acetaldehyde dehydrogenase, 52%) in rat hepatocytes. The levels of these enzymes were reduced in the cells following alcohol intoxication. Ethyl alcohol also produced cholestasis (41-53%), as indicated by reduction in bile volume, bile salts, and bile acids. Picroliv treatment (3-12 mg/kg p.o. x45 days) restored the altered parameters in a dose-dependent manner (36-100%).<sup>19,20</sup>

Andrographolide, a chief constituent of *A. paniculata*, exhibits protective effects in galactosamine and paracetamol induced toxicity in rats. Andrographolide was demonstrated to possess antihepatotoxic effects in carbon tetrachloride-induced hepatotoxicity in albino rats. The LD50 of aqueous ethanolic extract of whole plant was determined to be >215 mg/kg, i.p. in mice. Andrographic paniculata (Kalamegh) was used in an uncontrolled study at Kaya Chikitsa Dept. BHU Varanasi, India. Average duration of treatment was 23 days. In 90% of patients, clinical as well as liver function parameters improved significantly.<sup>21</sup>

## Sample Panchkarma and Rasayana Therapy for Treatment of Liver Disease

As noted in *Chapter 10, Ayurvedic Medicine*, panchakarma and rasayana are two treatments commonly used to treat chronic liver disorders. Following are sample protocols for each of these Ayurvedic treatments. However, keep in mind that Ayurvedic treatments are customized for each individual, and these are just sample protocols. Further, these treatments can only be done under the supervision of a qualified Ayurvedic practitioner.

If you are interested in adding Ayurvedic therapy to your hepatitis C treatment plan, you will need to see a qualified Ayurvedic practitioner. He or she can evaluate you, and then decide on the treatments that are appropriate for your unique situation.

### Panchakarma Therapy (Body Cleansing)

Panchakarma is used in Ayurveda to eliminate excess doshas from the body. This therapy is widely used throughout India and the United States. It is used to balance humors and eliminate toxins from the body, thus treating various physical and psychiatric disorders.

Most liver disorders are typically aggravated conditions of pitta, which is also the predominant humor for the liver.

Panchakarma consists of three parts: *poorva karma*, *pradhana karma*, and *paschat karma*.

### Poorva Karma (Pre-Purification Measures)

This procedure helps prepare the body for the main purification process. This treatment includes *abhyanga* (massage) and *pinda svedana* (warm massage with a small cotton bag containing the warmed herbs).

Abhyanga: The term abhyanga is used as a synonym for oil bath. Oil is anointed all over the body, especially on the head and feet.

Pinda Sveda (fomentation): This treatment is very efficacious wherever sweating is advised. The subject is massaged with warm oil all over the body. Then the subject is massaged with small bags containing cooked old rice that is warmed in a milk decoction mixture. The heat of the bags is maintained by re-warming them whenever necessary.

### Medicaments for Panchakarma

For abhyanga: *Balaguduchyadi taila*

Main Ingredients: *Sida cordifolia (bala)*, *Tinospora cordifolia (guduchi)*, *Santalum album (candana)*, *Pluchea lanceolata (rasna)*, *Valeriana wallichii (nata)*, *Withania somnifera (ashwagandha)*

For pinda sveda: Old rice/rice powder cooked with milk and *Sida cordifolia (bala)* decoction.

### Pradhan Karma (Main Purification Measures)

Pradhan karma includes *virechana* (purgation), *pizhichil*, and *yapana vasti*.

#### VIRECHANA (PURGATION)

This treatment is advised for the pitta disorders to eliminate aggravated pitta. Pitta disorders include liver disorders. The subject's physical constitution (*prakruti*) and strength will determine the dosage of the purgative herbs. Subjects are advised to consume purgative herbs in the early morning.

**PIZHICHIL (MEDICATED WARM LIQUID OIL MASSAGE)**

This is a modified form of sarvangadhara. Warm liquid is poured from a certain height all over the body of the patient with unctuous liquids. After anointing the head with *ksheerabala* oil, warm *trivrit* oil is applied all over the body. The patient is then laid in a wooden compartment and again smeared with the warm unctuous fluid all over the body.

**YAPANA VASTI**

This treatment is in the form of an enema. It helps improve strength and builds up muscle and tissue. It is intended to improve quality of life by alleviating ailments. This treatment is used only in subjects who can tolerate the procedure.

**Medicaments for Pradhan Karma**

For Virechana: Based on the subject's physical constitution and strength either Avipattikara choorna (a mild powder laxative) or triphala churna powder (a combination of Terminalia chebula, Terminalia bellirica, and Emblica officinalis) is administered.

For Yapana Vasti: An herbal concoction is used along with milk and honey. The herbs used are Glycyrrhiza glabra (yasti madhu), Tinospora cordifolia (guduchi), Picrorrhiza kurroa (katuki), Hemidesmus indicus (sariva), and Rubia cordifolia (manjista). The dose of each herb is 500 mg for a total treatment dose of 2.5 grams.

**Paschat Karma**

This treatment includes diet and lifestyle guidelines to bring about balance in the tridoshas after the subject has undergone the main purification procedure. Subjects are advised to follow the diet and lifestyle that will reestablish the balance of pitta. Paschat karma should be practiced during the entire treatment process.

Lifestyle: Patients should avoid sleeping in the afternoon, exposure to hot sun, exertion, anxiety, alcohol abuse, smoking, and irregular eating habits.

Diet: Vegetarianism is best for liver disorders. After mild purgation, subjects will be managed with a wholesome diet including non-spicy food, barley, wheat, basmati rice (old rice), and soup of lentils and mung bean. The consistency of food should be gradually increased from a thin consistency on the first meal to thicker one on seventh meal. A drink of warm water should follow each meal.

**Rasayana Therapy (Rejuvenation Therapy)**

Rasayana therapy is advised after the subject has undergone panchakarma therapy. Rasayana is a clinical specialty in Ayurveda wherein a specialized rejuvenating diet, herbs, and lifestyle are advised. Rasayana promotes tissue repair and the formation of healthy tissues. It alleviates exertion, lassitude, exhaustion, and debility. In other words, it builds up all the body tissues, improves immunity against diseases, and enhances the mental competence.

By its immunomodulatory and antioxidant effects, rasayana helps enhance the immune system, and prevent diseases and premature aging. The diet, herbs and lifestyle also help alleviate already existing ailments and restore health. Therapy ensures proper transportation and absorption of nutrients, and builds normal tissues. Through rasayana, one attains longevity, memory, intelligence, youthful age, optimum strength of physique, and optimum sensory ability.

There are two types of rasayana treatments, kutipravesika (indoor) and vataatapika (outdoor). In this sample protocol, we discuss an outdoor rasayana.

People with liver disorders are prescribed rasayana therapy that is both hepatoprotective and immune enhancing. The therapy includes rejuvenation of the liver with herbs (mainly Piper longum in a powder formula, in a graded dose) and diet.

**PIPPALI RASAYANA**

Mainly indicated for fever, fatigue, inflammation, liver and spleen enlargements, cough, and/or *dyspnea*.

Main Ingredient: *Pippali*

Dose: 1 tablespoon twice a day with warm water

### ASHWAGANDHA RASAYANA

Mainly indicated in fatigue and immunodeficiency. It is an immune enhancer and a rejuvenator. Used when antioxidants are needed. Therapy is intended to decrease viral load.

Main Ingredients: *Withania somnifera* (ashwagandha), *Hemidesmus indicus* (sariva), *Cuminum cyminum* (jiraka), *Vitis vinifera* (draksha)

Dose: 1 tablespoon twice a day with warm water or milk

### TRIPHALA RASAYANA

Mainly indicated in immunodeficiency and chronic illness.

Main Ingredients: *Terminalia chebula* (haritaki), *Terminalia bellirica* (bibhitaki), *Embllica officinalis* (amalaki), *Madhuca indica* (madhuka), *Piper longum* (pippali)

Dose: 1 tablespoon at night with warm water

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