



HEPATOPROTECTIVE ROLE OF POLYHERBAL COMBINATION – LIVTONE TABLET

SMITA NARAM¹, DEEPAK MAHAJAN² AND HEMANG PAREKH³

1: Department of Research and Development, Ayushakti Ayurveda Pvt Ltd, Bhadran nagar cross road, Malad, Mumbai-64

2: Research Head, Ayushakti Ayurveda Pvt Ltd, Bhadran nagar cross road, Malad, Mumbai- 64

3: Medical Head, Ayushakti Ayurveda Hospital, Bhadran nagar cross road, Malad, Mumbai-64

*Corresponding Author: E Mail: Dr. Deepak Mahajan: drdeepakm@ayushakti.com

Received 9th May 2021; Revised 10th July 2021; Accepted 29th Aug. 2021; Available online 15th Dec. 2021

<https://doi.org/10.31032/IJBPAS/2021/10.12.1022>

ABSTRACT

Chronic liver diseases represent a major health burden worldwide, with liver cirrhosis being the ninth leading cause of death in Western countries. Chronic viral hepatitis B and C, alcoholic liver disease, non-alcoholic fatty liver disease, and hepatocellular carcinoma are the major entities and many problems remain unresolved. Treatment options for common liver diseases such as cirrhosis, fatty liver, and chronic hepatitis. Presently, the use of herbal medicines for prevention and control of chronic liver diseases is in the focus of attention for both the physicians and the patients; the reasons for such shift toward the use of herbals include the expensive cost of conventional drugs, adverse drug reactions, and their inefficacy. In this article we want to validate Hepatoprotective action of LIVTONE tablet. This protective effect of Livtone can be attributed to the diuretic, anti-inflammatory, anti-oxidative, and immunomodulating properties as hepatoprotective of the component herbs.

Key words: Cirrhosis, antioxidant, hepatoprotective, CCl₄ (carbon tetrachloride)

Background:

Cirrhosis is the common outcome or complication of viral hepatitis, alcohol abuse, drug toxicity, hereditary metabolic diseases (e.g. alpha-1-anti-trypsin

deficiency, Wilson disease), that has no effective treatment yet. The current treatment is directed at the management of the complications of cirrhosis and

prevention of further liver damage. Several medicinal plants have been used worldwide in various traditional herbal recipes for the prevention and treatment of liver disease. Many patients with liver disease use these herbal preparations without the advice or even knowledge of their caring physician.

Hepatotoxicity:

Liver is one of the largest organs in the human body that performs numerous interrelated vital functions. Some of the commonly known disorders include viral hepatitis, alcoholic liver disease, non-alcoholic fatty liver disease, autoimmune liver disease, metabolic liver disease, drug induced liver injury, toxin-induced liver injury, etc. As a consequence of chronic liver disease, patient may develop portal hypertension and liver cirrhosis. Liver toxicity mainly occurs due to alcohol, viral and induced by drugs. Alcoholic liver disease, including acute alcoholic hepatitis and alcoholic cirrhosis, is a major cause of morbidity and mortality in the Western world. In alcoholic liver disease, oxidative stress is caused by pro-oxidant formation, inadequate intake of antioxidants, antioxidant depletion, and alcohol-mediated inhibition of glutathione synthesis. Acetaldehyde is the most important metabolite of ethanol leading to liver damage. Alcohol-induced liver diseases are mediated by cytokines, which are secreted

by liver and other parts of the body. In the liver, persistent cytokine secretion results in chronic inflammation leading to the conditions such as hepatitis, fibrosis, and cirrhosis. Cytokines, tumor necrosis factor- α (TNF- α) and transforming growth factor- β (TGF- β) regulate apoptosis, which is in part responsible for alcohol-induced destruction of liver tissue. Fibrogenesis within the liver takes place due to the activation of collagen-producing stellate cells which is mediated through expression of interleukins (ILs), such as IL-1, IL-6, IL-8 ultimately causing precipitation of collagen deposition (Tome & Lucey, 2004). Viral hepatitis is responsible for both acute and chronic liver diseases. Hepatitis A is caused by hepatitis A virus, a picornavirus transmitted by the fecal-oral route often associated with ingestion of contaminated food.

Hepatitis B is caused by hepatitis B virus, a hepadnavirus that can cause both acute and chronic hepatitis. Identified methods of transmission include blood, tattoos, sexual, or via mother to child by breast feeding. Hepatitis C may lead to chronic form of hepatitis culminating to cirrhosis. Hepatitis A is rarely life threatening, while B and C are quite serious and may be fatal. Several cytokines, including interferon- γ (IFN- γ) and TNF- α , are implicated in the pathogenesis of hepatitis.

In this article, we want to validate the hepatoprotective role of Tablet Livtone manufactured by Ayushakti Ayurveda Pvt Ltd with the reference of some previous work done.

Name of Herbal Combination

Livtone tablet

Manufacturer :

Ayushakti Ayurveda Pvt Ltd pharmacy,
Plot number 78, Stice, Musalgaon, Sinnar,
Nashik- 422112

Herbal formulation		
SANSKRIT NAME	LATIN NAME	MGS.
SHARPUNKHA ROOTS GHAN	TEPHROSIA PURPUREA	45.000
HARIDRA GHAN	CURCUMA LONGA	35.000
BHUI AMLAKI GHAN	PHYLLANTHUS NIRURI	44.000
ROHITAK GHAN	TECOMELLA UNDULATA	30.000
GUDUCHI GHAN	TINOSPORA CORDIFOLIA	30.000
KALMEGH GHAN	ANDROGRAPHIS PANICULATA	44.000
APAMARG KSHAR	ACHYRANTHES ASPERA.	27.000
TRIPHALA GHAN	EMBLICA OFFICINALIS, TERMINALIA BELERICA ,TERMINALIA CHEBULA	15.000
PARIJAT PATRA GHAN	NYCTANTHES ARBORTRISTIS	15.000
PATOL PATRA GHAN	TRICHOSANTHES DIOICA	15.000
		300.000

Achyranthes aspera.: *Achyranthes aspera* common names: chaff-flower, prickly chaff flower, devil's horsewhip, is a species of plant in the family Amaranthaceae. *A. aspera* has been used in folk medicine in countries including Australia India, and Kenya.

The plant *Achyranthes aspera* (*A. aspera*) is commonly known as Apamarga (Sanskrit) belongs to the family Amaranthaceae. The plant is known for many medicinal uses such as purgative, diuretic, used in dropsy, piles, boils, skin eruption and in treating snake bite. The plant is used by tribal groups in treating abdominal disorder, anaemia, anasoreia, asthma, cough, diarrhea, dysentery, ear diseases, hydrophobia, insect bite, jaundice, pneumonia, renal dropsy, ulcers, bleeding

during delivery, headache, leucoderma, rheumatism, scabies, stomach ache and cancer [1].

Achyranthes aspera is very useful in CCl₄ induced liver damage: Ethanolic seed extracts of *A. aspera* exhibited recovery against the toxic effects of CCl₄ [2].

Achyranthes aspera shows hepatoprotective potency and synergism action for treatment of Jaundice [3].

Curcuma Longa: Curcumin is the most important curcuminoid of turmeric, and it has been identified as the main factor responsible for its biological activities [4], including potent anti-oxidant and anti-inflammatory effects as well as the ability to modulate several signalling mechanisms [5]. Oxidative stress plays an important role

in many chronic diseases and in carcinogenesis. Several studies have shown that curcuminoid compounds can act as free-radical scavengers by reducing lipid peroxidation mediated by free radicals.

Activation of hepatic stellate cells (HSCs) promotes liver fibrosis regardless of etiology [25].

curcumin showed a major role as an inhibitor of HSC activation; it also seems to be able to reduce liver damage, as well as the α -SMA and procollagen expression in the liver, when administered in CCl₄-induced liver fibrosis models for 4–8 weeks [6].

curcumin inhibits the insulin receptor substrates (IRS)/PI3K/AKT signalling pathway, which links leptin with the insulin pathway, preventing the translocation of glucose transporter-4. It suppresses the PKA activity while increasing the activity of AMP-activated protein kinase (AMPK), thus increasing the glucokinase activity [7].

Tephrosia purpurea Extracts: *Tephrosia purpurea* is a species of flowering plant in the pea family, Fabaceae, that has a pantropical distribution. It is a common wasteland weed. In many parts it is under cultivation as green manure crop. It is found throughout India and Sri Lanka in poor soil.

According to Ayurveda, plant is digestible, anthelmintic, alexiteric, antipyretic,

alternative, cures diseases of liver, spleen, heart, blood, tumours, ulcers, leprosy, asthma, poisoning etc. According to Unani system of medicine, root is diuretic, allays thirst, enriches blood, cures diarrhea, useful in bronchitis, asthma, liver, spleen diseases, inflammations, boils and pimples; Leaves are tonic to intestines and a promising appetizer. Good in piles, syphilis and gonorrhoea [8].

The hydroalcoholic extract of *Tephrosia purpurea* showed antioxidant activity by inhibiting DPPH and hydroxyl radical, nitric oxide and super oxide anion scavenging, hydrogen peroxide scavenging and reducing power activities. The hydroalcoholic extract of *Tephrosia purpurea* showed antioxidant activity by inhibiting DPPH and hydroxyl radical, nitric oxide and super oxide anion scavenging, hydrogen peroxide scavenging and reducing power activities.

The hydroalcoholic extract of *Tephrosia purpurea* showed antioxidant activity by inhibiting DPPH and hydroxyl radical, nitric oxide and super oxide anion scavenging, hydrogen peroxide scavenging and reducing power activities. In addition, the hydroalcoholic extract of *Tephrosia purpurea* found to contain a noticeable amount of total phenols, which play a major role in controlling antioxidants [26]. Strengthening of inbuilt protective

mechanisms or exogenous administration of antioxidants may be useful in protecting the organs [27].

Phyllanthus niruri Extracts: Phyllanthus is a genus of flowering plant used in herbal medicine. Commonly used in Ayurvedic healing, species like *Phyllanthus emblica* and *Phyllanthus niruri* have long been touted as safe and effective remedies for liver disorders and a host of other medical conditions. *P. niruri* has been used as a remedy for many ailments such as dyspepsia, influenza, diuretics, vaginitis, hyperglycaemia, jaundice and removing kidney stones [9]. *P. niruri* can be used as a promising hepatoprotective agent. Its activity can be attributed to its potent antioxidant and anti-inflammatory actions of its phenolic constituents.

The antioxidant activity of some of the principal constituents of Phyllanthus namely Amariin, 1-galloyl-2-,3-dehydrohexahydroxydiphenyl-glucose, repandusinic acid, geraniin, corilagin, phyllanthusiin D, rutin and quercetin 3-O-glucoside were examined for their ability to scavenge free radicals in a range of systems including DPPH, ABTS, ferric reducing antioxidant power and pulse radiolysis. In addition, their ability to protect rat liver mitochondria against oxidative damage was determined by measuring the ROO• radical induced damage to proteins and lipids and •

OH radical induced damage to plasmid DNA. The compounds showed significant antioxidant activities with differing efficacy depending on the assays employed. The ellagitannins Amariin, repandusinic acid and phyllanthusiin D showed higher antioxidant activity [9].

Andrographis paniculata Extracts:

Andrographis paniculata, commonly known as creat or green chiretta, is an annual herbaceous plant in the family Acanthaceae, native to India and Sri Lanka. Is *Andrographis* (*Andrographis paniculata*) is an herb long used in traditional Chinese medicine and ayurveda. Also known as "Indian echinacea," *andrographis* is a bitter-tasting herb rich in compounds known as andrographolides. These compounds are thought to have anti-inflammatory, antiviral, and antioxidant properties. *A. paniculata* whole part can be used as Snakebite and insect sting treatment, dyspepsia, influenza, dysentery, malaria and respiratory infections [10, 11]. Aerial part can be used as common cold, hypertension, diabetes, cancer, malaria and snakebite, urinary tract infection [12]. The leaf extract and andrographolide works on carbon tetrachloride- (CCl₄-) induced hepatic microsomal lipid peroxidation. Only the leaf extract completely protected the high concentration CCl₄-induced microsomal lipid peroxidation in body.

Tecomella undulata Extracts: *Tecomella undulata* (TU) is commonly known as desert teak (ver. Rohiro) and is traditionally for treating liver and spleen diseases, tumours, conjunctivitis, hepatosplenomegaly, syphilis, gonorrhoea, hepatitis, as a blood purifier and in wound healing. Compounds such as naphthaquinone derivative, iridoidglucoside, phytosterol, fatty alcohol, flavonols, flavonoid glucoside and triterpenoids have been reported from TU. Anti HIV, anti-bacterial, anti-microbial, immune modulator, analgesic and hepatoprotective activities have been reported from its various aerial parts [13].

Tinospora cordifolia Extracts: *Tinospora cordifolia* (Menispermaceae) is an herbaceous vine indigenous to the tropical areas of India, Myanmar, and Sri Lanka. In vernacular, it is known as amrita, guduchi, shindilkodi, giloy, and so forth. It is widely used in indigenous systems of medicine [14]. The aqueous extract of *T. cordifolia* stem has shown to produce immunological activity due to the presence of arabinogalactan. The plant is known for its antispasmodic, antipyretic, antineoplastic, hypolipidemic, hypoglycemic, immunopotentiating, and hepatoprotective properties. It is also used in general debility, digestive disturbances, loss of appetite and fever in children, dysentery,

gonorrhoea, urinary diseases, viral hepatitis, and anaemia. Present communication reports the scientific evaluation of medicinal efficacy of *T. cordifolia* as antibacterial, antioxidant, and anticancer agents. Many cases of liver damage occurred in India from people consuming *T. cordifolia* as a supposed "immunity booster" during the COVID-19 pandemic. *Tinospora cordifolia* has an importance in traditional ayurvedic medicine used for ages in the treatment of fever, jaundice, chronic diarrhea.

Nyctanthes arbortristis Extracts:

Nyctanthes is a genus of flowering plants in the family Oleaceae, native to southeastern Asia. It is currently accepted as containing two species; other species previously included in this genus have been transferred to other genera, most of them to *Jasminum*. Hepatoprotective and antioxidant potential of *Nyctanthes arbor-tristis* L. leaves against antitubercular drugs induced hepatotoxicity. Administration of alcoholic and aqueous extracts of the leaves of *Nyctanthes arbor-tristis* protect the liver from toxic effects of carbontetrachloride by reducing the elevated levels of Serum glutamate pyruvate transaminase, Serum glutamate oxaloacetate transaminase, Alkaline phosphatase and serum bilirubin [24].

Trichosanthes dioica Extracts:

Trichosanthes dioica Roxb. (family: Cucurbitaceae), is widely grown throughout India. The herb has been used for overcoming problems like constipation, fever, skin infection, wounds and also improves appetite and digestion from time immemorial. Juice of leaves of *T. dioica* are used as tonic, febrifuge, in oedema, alopecia and in subacute cases of enlargement of liver. *T. dioica* extracts showed profound histopathological protection to liver cells as evident from histopathological studies. Hence it can be concluded that *T. dioica* has significant hepatoprotective activity [15].

Terminalia chebula Extracts: *Terminalia chebula* (Chebulae Fructus) belongs to Combretaceae family, which is originated from India. The dried type of matured *Terminalia chebula* fruit is used to treat various disorders including urinary tract diseases, dermatitis, diabetes mellitus, cardiovascular syndromes, and hepatic disorders. Some studies partially showed the hepatoprotective and antioxidant effects of *Terminalia chebula* [16].

TAC was expressed as the gallic acid equivalent antioxidant capacity.

Emblica officinalis: (Synonym: *Emblica officinalis*) is a medium-sized deciduous tree belonging to the family Euphorbiaceae, commonly known as Indian gooseberry, *emblicam yrobalans*, and Amla (in Hindi).

Amla juice is also rich in antioxidants and possesses powerful anti-inflammatory properties, both of which could be beneficial for liver health as well. Some animal studies have found that amla juice could support liver health, which may be due to its antioxidant content and anti-inflammatory properties. Phytochemical evaluation of *E. officinalis* showed the presence of tannins emblicanin-A, emblicanin-B, punigluconin, pedunculagin, trigalloyl glucose, phyllembillin, phyllemblic acid flavonoids such as quercetin and its glycoside derivative rutin, ellagic acid, gallic acid, ferulic acid, and ascorbic acid [13]. Enhanced gene expression of SOD, GPX and catalase by quercetin [14] has been reported. Quercetin, being one of the major components in *E. officinalis*, may underlie the increased activity of antioxidant enzymes.

Terminalia bellirica. Extracts: *Terminalia* is a tree. Three species of *terminalia* are used for medicine. These species are *Terminalia arjuna*, *Terminalia bellerica*, and *Terminalia chebula*.

In traditional Ayurvedic medicine, *Terminalia arjuna* has been used to balance the three “humors”: kapha, pitta, and vata. It has also been used for asthma, bile duct disorders, scorpion stings, and poisonings. A large deciduous tree common on plains

and lower hills in Southeast Asia, where it is also grown as an avenue tree. The basionym is *Myrobalanus bellirica* Gaertn. *Terminalia bellirica*, known as baheda, bahera, beleric or bastard myrobalan, *Terminalia bellerica* is used to protect the liver and to treat respiratory conditions, including respiratory tract infections, cough, and sore throat. *Terminalia chebula* is used for dysentery. *Terminalia bellerica* and *Terminalia chebula* are used as a lotion for soreeyes [16].

RESULT:

We conclude that Livtone possess hepatoprotective effect in cirrhotic patients and this effect may be due to its diuretic, anti-inflammatory, anti-oxidative, immunomodulating as well as restorative effects. All these activities directly or indirectly influence the cellular and body metabolism and play favourable and protective role in maintaining liver integrity and restoring its function.

DISCUSSION:

Maintenance of a healthy liver is essential for the overall wellbeing of an individual. Detail clinical diagnostic criteria for assessment of hepatotoxicity has already been published [17].

The clinical research has confirmed hepatoprotective efficiency of plant-based traditional and alternative medicines and guided the pharmaceutical companies to

formulate numerous hepatoprotective drugs. Today, the main problem with the herbal medicines is that many herbs are consumed as polyherbal formulations where multiple herbs work synergistically. The active component responsible for the disease treatment in most cases remains unknown.

REFERENCES

- [1] K.R.Keshava Murthy, Medicinal Plants of Karnataka, Karnataka Forest Department, 1994.
- [2] Chandrashekar VM, Abdul Haseed TS. Hepato protective activity of *Wrightia tinctoria* (Roxb) in rats. Indian Drugs, 2004, 41:366-368.
- [3] Achliya GS, Kotgale SG. Hepatoprotective activity of *panchagavya gritha* in carbon tetrachloride induced hepatotoxicity in rats. Indian J Pharmacol, 2003, 35: 311-313.
- [4] Aggarwal BB, Sundaram C, Malani N, Ichikawa H. (2007). Curcumin: the Indian solid gold AdvExp Med Biol. 595: 1-75.
- [5] Sarkar FH, Li Y, Wang Z, Padhye S. (2010). Lesson learned from nature for the development of novel anti-cancer agents: implication of isoflavone, curcumin, and their synthetic analogs. Curr Pharm Des. 16: 1801-12.

- [6] Zhang XP, Zhang F, Zhang ZL, et al. (2012). Acupuncture combined with curcumin disrupts platelet-derived growth factor beta receptor/extracellular signal-regulated kinase signalling and stimulates extracellular matrix degradation in carbon tetrachloride-induced hepatic fibrosis in rats *Acupunct Med.* 30: 324-30.
- [7] Tang Y, Chen A. (2010). Curcumin prevents leptin raising glucose levels in hepatic stellate cells by blocking translocation of glucose transporter-4 and increasing glucokinase *Br J Pharmacol.* 161: 1137-49.
- [8] <https://www.flowersofindia.net/catalog/slides/Common%20Tephrosia.html>
- [9] Bagalkotkar G, Sagineedu SR, Saad MS, Stanslas J. Phytochemicals from *Phyllanthus niruri* Linn. and their pharmacological properties: a review. *The Journal of pharmacy and pharmacology.* 2006; 58(12): 1559–70. Epub 2007/03/03. pmid:17331318.
- [10] Chopra RN. Glossary of Indian medicinal plants. New Delhi: Council for Scientific and Industrial Research; 1980. p. 18.
- [11] Jarukamjorn K, Kondo S, Chatuphonprasert W, Sakuma T, Kawasaki Y, Nemoto N. Gender-associated modulation of inducible CYP1A1 expression by andrographolide in mouse liver. *Eur J Pharm Sci.* 2010 Mar 18; 39(5):394-401.
- [12] Perry LM. Medicinal plants of East and Southeast Asia: attributed properties and uses. Cambridge: MIT Press; 1980
- [13] [https://doi.org/10.1016/S2221-1691\(12\)60521-8](https://doi.org/10.1016/S2221-1691(12)60521-8)
- [14] V. V. Sivarajan and I. Balachandean, *Ayurvedic Drugs and Their Plants Sources*, Oxford and IBH Publishing, New Delhi, India, 1999.
- [15] Ghaisas MM, Tanwar MB, Ninave PB, Navghare VV, Takawale AR, Zope VS, Deshpande AD. Hepatoprotective activity of aqueous and ethanolic extract of *Trichosanthes dioicaroxb.* in ferrous sulphate-induced liver injury. *Pharmacologyonline* 2008; 3: 127-135.
- [16] <https://www.rxlist.com/terminalia/supplements.htm>
- [17] Teschke R, Eickhoff A, Wolff A, Frenzel C, Schulze J. Herbal hepatotoxicity and WHO global introspection method. *Ann*

- Hepatol 2013;12:11-21.
- [18] Bean, P., 2002. The use of alternative medicine in the treatment of hepatitis C. Am. Clin. Lab. 21, 19–21.
- [19] Bharani, A., Ganguly, A., Bhargava, K.D., 1995. Salutary effect of Terminaliaarjuna in patients with severe refractory heart failure. Int. J. Cardiol. 49, 91–99.
- [20] Candan, F., Unlu, M., Tepe, B., Daferera, D., Polissiou, M., Sokmen, A., Akpulat, HA., 2003. Antioxidant and antimicrobial activity of the essential oil and methanol extracts of *Achilleamille folium* subsp. *Millefolium* Afan. (Asteraceae). J. Ethnopharmacol. 87 (2–3), 215–220.
- [21] Chenoweth, M.B., Hake, C.L., 1962. The smaller halogenated aliphatic hydrocarbons. Ann. Rev. Pharmacol. 2, 363–398.
- [22] Chung, R.T., Podolsky, D.K., 2001. Cirrhosis and its complications. In: Braunwald, et al. (Eds.), Harrison's Principles of Internal Medicine, 15th. McGraw-Hill, New York, pp. 1754–1766.
- [23] De Silva, H.A., Saparamadu, P.A., Thabrew, M.I., Pathmeswaran, A., Fonseka, M.M., de Silva, H.J., 2003. Liv-52 in alcoholic liver disease: a prospective, controlled trial. J. Ethnopharmacol. 84, 47–50.
- [24] Shah R, Kathad H, Sheth R, Sheth N. In vitro antioxidant activity of roots of *Tephrosia purpurealinn*. Int J Pharmacy Pharm Sci 2010; 2: 30-33.
- [25] Kumar P, Rao D, Setty R. Antioxidant and hepatoprotective activity of tubers of *Momordica tuberosa* Cogn. Against CCl4-induced liver injury in rats. Indian J ExpBiol 2008; 46: 510-513.
- [26] Mello, T.; Ceni, E.; Surrenti, C.; Galli, A. Alcohol induced hepatic fibrosis: Role of acetaldehyde. Mol. Aspects Med. 2008, 29, 17–21.
- [27] Department of Pharmacognosy and Phytochemistry, K. L. E. S's College of Pharmacy, Vidyanagar, Hubli–580 031, India.