



HEPATOPROTECTIVE MEDICINAL PLANTS OF AYURVEDA- A REVIEW

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ABSTRACT

Excessive drug therapy, environmental pollutants, hepatic cancer and alcoholic intoxicants are the main causes of liver disorders. In spite of consistent human effort and drug discovery, modern drug has very little to offer. In Ayurveda about 77 herbal drugs and in Unani nearly 42 herbal drugs are employed to cure liver diseases. The present review describes the literature survey on liver protective drugs; herbal drugs used as hepatoprotectives in Ayurvedic system of medicine and the Ayurvedic formulations employed to cure liver disorders.

Keywords: Hepatic disorder, Hepatoprotective herbs, Ayurvedic formulation.

INTRODUCTION

The liver is a vital organ of paramount importance involved in the maintenance of metabolic functions and detoxification of the exogenous and endogenous challenges like xenobiotics, drugs, viral infections and chronic alcoholism.¹ Diverse homeostatic mechanisms are affected if liver function is impaired, with potentially serious consequences. About 20,000 deaths occur every year due to liver diseases. Hepatocellular carcinoma is one of the ten most common tumors in the world with over 2,50,000 new cases each year. Although viruses are the main cause of liver diseases, excessive drug therapy, environmental pollution and alcoholic intoxication are not uncommon. Liver disease is a worldwide problem; Conventional drugs used in the treatment of liver diseases are sometimes inadequate and can have serious adverse effects. Herbal medicines are in great demand in the developed as well as developing countries for primary healthcare because of their wide biological and medicinal activities, higher safety margins and lesser costs.² Modern drugs have very little to offer for alleviation of hepatic ailments, whereas most important representatives of phytoconstituents used for liver diseases chiefly on regional basis include drugs like silymarin (*Silybum marianum*) and catechin (*Anacardium occidentale*) in Europe, Glycyrrhizin (*Glycyrrhiza glabra*) in Japan and chizandrins (*Schizandra chinensis*) in China.³

DISCUSSION

A lot of medicinal plants, traditionally used for thousands of years, are present in group of herbal preparation of the Indian traditional health care system. In India, over 40 polyherbal commercial formulations reputed to have hepatoprotective action are being used. Scrutiny of the literature indicates that 160 phyto-constituents from 101 plant families have antihepatotoxic activity.^{4,5} Silymarin; a phytoconstituent from (*Silybum marianum*) has been widely used from ancient times because of its excellent hepatoprotective action. *Pichrorhiza kurroa* Royle contains kutokoside and picroliv which are potential hepatoprotectant.⁶⁻⁹ *Phyllanthus amarus* is another most important plant selected for clinical trials. The present paper describes literature survey on liver protective herbal drugs; herbal drugs used as a hepatoprotective in Ayurvedic system of medicine. From hundreds of year, the Ayurvedic formulations are being employed in Indian subcontinent to cure liver disorders, natural chemical constituents and inorganic salts are prescribed to treat the liver complications of minor to severe type of liver toxicity. Liver protective herbal drugs contains a variety of chemical constituents like phenols, coumarins, lignans, essential oil, monoterpenes, carotenoids, glycosides, flavonoids, lipids, alkaloids and xanthines. Sesquiterpenes have been reported from *Atracyclodes macrocephala*. *Andrographis panicles* and *Gardenial florida* are the only source of diterpenes and carotenoids respectively. Extract of about 25 different plants have been reported to cure liver disorders. Some herbal drugs such as like *Adenosma indiana*, aromatic amides

of *Clausena lansium*, Ginseng saponins and polysaccharides of *Auricularia auricular* and *Tremella fuciform* also possess hepatoprotective property (Table 1). In Ayurveda about 77 herbal drugs are used as hepatoprotective agents. There are different plants and their parts used for liver treatment, such as *Sanguinaria canadensis* (roots), grown in U.S.A. and Canada is advised in hepatic enlargement and in the hysteric without any organic lesion. *Tarazacum officinale* roots, found in Europe, Himalaya, Nigeria, North-West Provinces and North America, are advised in chronic liver infection.¹⁰ *Chelidonium majus* whole plant of Europe and North America is given in both acute and chronic hepatitis. When the patient suffers from gout in addition to hepatitis, *Colchicum* is useful. *Linseed* alone or with opium is used as poultices over the hepatic region in acute hepatitis. *Hydastis* is useful in malarial jaundice and that due to catarrh of the bile ducts. *Podophyllin* is useful in catarrhal or malarial jaundice when stool are clay colored and exhibit no trace of bile; *stillinea* is used to relieve torpid liver following intermittent fever had to cure jaundice. *Bryonia alba* root, a perennial plant of southern Europe and East Indies, is useful in various hepatic diseases chiefly hepatalgia. (Table 2).

Various drug formulations are employed in Ayurvedic system of medicine. The most widely used formulations are: *Jawarish amla*, *Jawarish al-tursh*, *Jawarish al-sirin*, *Jawarish mastagi*, *Dawa-e-jigarpath*, *Dawa-e-Karim*, *Salajin bajuru* and *Sharbat bajuri*. Most of these formulations contain *Andrographis paniculata* Nees, *Asteracatha longifolia* Nees, *Boerrhaavia diffusa* Linn, *Cinchorium intybus* Linn, *Eclipta alba* Hassk, *Oldenlandia corymbasa* Linn., *Picrorrhiza kurroa*, *Rolex benth*, *Solanum nigrum* Linn., *Terminalia chebula* Retz, *Tinosphora cordifolia* (Wild) Miers, etc. are widely used for liver complications. The marketed formulations such as Mandoor Bhasma and Loha Bhasma having single constituents are Bitters and vegetable tonics, e.g. gentian, are useful in functional disorders.¹⁰ Torpid liver with accompanying headache is treated with *Livomyn*. *Ipecachunha* is reported to promote the flow of bile and given in large doses to dysenteric patients suffering also with hepatitis. A formulation prepared by mixing *Nux vomica*, *podophyllum* and mercury is useful in small doses in hepatic diseases. The important formulations are *Acilvan*, *Hep-10*, *Liva-16*, *Livodin*, *Livosin*, *Livotrit*, *Livocin*, *Vilmiv*, *Livomycin*, *Liv-52*, *Amlycure*, *Sanliv* etc. *Livin*, *Livokin*, *Livomin* and *Livosin* formulations are composed of excessive number of herbal constituents while least number of drugs are present in *Livertone*, *Stimuliv*, *Tefroli* and *Vimliv*. The preparation 'Trisoliv' possesses only *Andrographis paniculata* Nees. The quantity of each herbal drug varies in each formulation (Table.3). This review includes classification of hepatoprotective herbal drugs according to their major phytoconstituents, parts used and family. It also includes the standard marketed Ayurvedic formulation along with the name of their manufacturers. So, the present data will be a helpful guide for identifying the different parts of the medicinal plants for hepatoprotective potential in various liver complications.

Table 1: Table Shows Liver Protective Herbal Drug Along With Their Main Phytoconstituents.

Sr. no.	Main phytoconstituent	Liver protective drug	Part used
1	Phenols	1. <i>Arnica Montana</i> Linn. ¹¹	Plant
		2. <i>Cichorium intybus</i> Linn. ^{12,13}	Plant
		3. <i>Picrorrhiza kurroa</i> Royle ¹⁴	Root
		4. <i>Syzygium aromaticum</i> Linn. ¹⁵	Plant
2	Coumarin	1. <i>Armillaria tabescens</i> Scop. ¹⁶	Fungus
		2. <i>Artemisia capillaries herba</i> ¹⁷	Plant
		3. <i>Hemidesmus indicus</i> ¹⁸	Roots
3	Lignans	1. <i>Schisandra chinensis</i> Turcz. ¹⁹	Fruit
		2. <i>Schisandra sphenanthera</i> ²⁰	Fruit
		3. <i>Silybum marianum</i> Gaertn ^{21,22}	Seed
		4. <i>Thujopsis dolabrata</i> ²³	Leaves
4	Essential oil	1. <i>Anethum graveolens</i> Linn. ²⁴	Fruit
		2. <i>Apium graveolens</i> Linn. ^{25,26}	Seed
		3. <i>Azadirachta indica</i> ²⁷	Leaves
		4. <i>Carapa guianensi</i> Aublet ²⁸	Seed
		5. <i>Cynara scolymus</i> Linn. ²⁹	Leaves, Flower
		6. <i>Foeniculum vulgare</i> Mill. ^{30,31}	Plant
		7. <i>Petroselinum sativum</i> Hoffm. ³²	Plant
		8. <i>Pimpinella anisum</i> Linn. ³³	Plant
5	Monoterpens	1. <i>Murraya koenigii</i> Linn. ³⁴	Rhizome
6	Sesquiterpens	2. <i>Atractylodes lanceae</i> Rhizoma ³⁵	Root
		3. <i>Lindera strychnifolia</i> (Sieb. & Zucc.) ³⁶	Leaves
7	Diterpens	1. <i>Andrographis paniculata</i> Nees ^{37,38}	Whole plant
8	Triterpens	1. <i>Glycyrrhiza glabra</i> Linn. ^{39,40}	Root
		2. <i>Hedyotis corymbosa</i> Linn. ⁴¹	Whole plant Trunkwood
		3. <i>Protium heptaphyllum</i> Aubl. ⁴²	Plant
		4. <i>Sambucus chinensis</i> Lindley ⁴³	Leaves
		5. <i>Tetrapanax papyriferus</i> ⁴⁴	
9	Carotenoids	1. <i>Gardenia florida</i> ⁴⁵	Fruit
10	Glycosides	1. <i>Aloe barbadensis</i> Mill ⁴⁶	Leaves
		2. <i>Dianthus superbus</i> Linn. ⁴⁰	Plant
		3. <i>Panax ginseng</i> ⁴⁰	Rhizome
		4. <i>Polygonum cuspidatum</i> ⁴⁷	Root
11	Flavonoids	5. <i>Polygonum multiflorum</i> Thunb. ⁴⁷	Root
		1. <i>Acacia catechu</i> Willd. ⁴⁸	Hard wood
		2. <i>Aegiceras corniculatum</i> ⁴⁹	Stem
		3. <i>Artemisia capillaries</i> Thunb. ¹⁶	Plant
		4. <i>Calotropis gigantea</i> R. Br. ⁵⁰	Leaves
		5. <i>Canscora decussate</i> Roxb. ⁵¹	Plant and Juice
		6. <i>Cassia occidentals</i> Linn. ⁵²	Leaves
		7. <i>Clausena dentate</i> Willd. ⁵³	Plant
		8. <i>Garcinia kola</i> Heckel ⁵⁴	Inflorescences
		9. <i>Helichrysum arenarium</i> Linn. ⁵⁵	Plant
		10. <i>Mentha longifolia</i> Linn. ⁵⁶	Leaves
		11. <i>Phyllanthus emblica</i> Linn. ⁵⁸	Leaves
		12. <i>Scrophularia grossheimi</i> ⁵³	Plant
		13. <i>Tagetes patula</i> Linn. ⁵⁴	Seeds
14. <i>Uncaria gambir</i> (Hunter)Roxb ⁵⁵	Heartwood		
12	Alkaloids	1. <i>Aristolochia clematis</i> ⁶¹	Plant
		2. <i>Fumaria parviflora</i> Lam. ⁶²	Plant
		3. <i>Fumaria officinalis</i> Linn. ⁶²	Plant
		4. <i>Herniaria glabra</i> Linn. ⁶³	Whole Plant
		5. <i>Peumus boldus</i> Molina. ⁶⁴	Plant
		6. <i>Physalis peruviana</i> ⁶⁵	Plant
13	Xanthines	1. <i>Coffea Arabica</i> ⁶⁶	Seed
		2. <i>Thea sinensis</i> ⁶⁷	Leaves

Table 2: Table Shows Hepatoprotective Medicinal Plants Mentioned In Ayurveda

Sr. no.	Scientific Name	Family	Parts used
1	<i>Achille millefolium</i> Linn.	Compositae	Plant
2	<i>Aconitum herterophyllum</i> wall.	Ranunculaceae	Root
3	<i>Aegal marimelos</i> Corr.	Rutaceae	Leaves
4	<i>Aegiceras corniculatum</i>	Aegicerataceae	Stem
5	<i>Allium sativum</i> Linn.	Liliaceae	Bulb
6	<i>Aloe barbadensis</i> Mill.	Ranunculaceae	Plant
7	<i>Aloe perry</i> Baker.	Ranunculaceae	Plant
8	<i>Andrographis paniculata</i> Nees.	Acanthaceae	Plant
9	<i>Aphanamixis polystachya</i> Wall. Parkar	Meliaceae	Bark
10	<i>Apium graveolens</i> Linn.	Umbelliferae	Seeds

11	<i>Asteracantha longifolia</i> Nees.	Acanthaceae	Leaves, root & seeds
12	<i>Azadirachta indica</i> A. Juss	Meliaceae	Exudates
13	<i>Berberis lycium</i> Royle.	Berberidaceae	Leaves
14	<i>Boerhaavia diffusa</i> Linn.	Nyctaginaceae	Root
15	<i>Bryonia alba</i> Linn.	Cucurbitaceae	Root
16	<i>Calotropis gigantea</i> (Linn)R.Br.	Asclepiadaceae	latex, flower, stem
17	<i>Canavalia ensiformis</i> DC	Leguminosae	Root
18	<i>Carapa Guianensis</i> Aublet.	Meliaceae	Seed
19	<i>Carthamus tinctorius</i> Linn.	Compositae	Flower
20	<i>Cephaelis ipecacuanha</i> Rich.	Rubiaceae	Draught
21	<i>Cichorium intybus</i> Schard.	Compositae	Plant
22	<i>Citrullus colocynthis</i> Schrad.	Cucurbitaceae	Root
23	<i>Clausena dentate</i> Willd.	Rutaceae	Stem bark
24	<i>Colchicum luteum</i> Baker.	Liliaceae	Corma
25	<i>Coptis teeta</i> Wall.	Ranunculaceae	Rhizome
26	<i>Cosmpstigma racemosa</i> Weight.	Asclepidaceae	Root, Bark
27	<i>Croton oblongifolius</i> Roxb.	Euphorbiaceae	Bark
28	<i>Cuscita reflexa</i> Roxb.	Convolvulaceae	Stem
29	<i>Cyprus pertunuis</i>	Cyperanceae	Plant
30	<i>Delphinium zalil</i> Atich & Hemse	Ranunculaceae	Plant
31	<i>Desmodium biflorum</i> Linn.	Fabaceae	Whole plant
32	<i>Eclipta alba</i> Hassk.	Compositae	Plant juice
33	<i>Emblica officinalis</i> Gaertn.	Euphorbiaceae	Fruit
34	<i>Euphorbia nerifolia</i> Linn.	Euphorbiaceae	Fruit
35	<i>Ferula alliacea</i> boiss.	Umbelliferae	Gum resin
36	<i>Ficus asperrima</i> Roxb.	Moraceae	Juice and bark
37	<i>Ficus benjamina</i> Linn.	Moraceae	Bark juice
38	<i>Ficus carica</i> Linn.	Moraceae	Fruit
39	<i>Ficus hetrophylla</i> Linn. F.	Moraceae	Root juice
40	<i>Flacoutia indica</i> Merr.	Flacourtiaceae	Bilangra
41	<i>Fumaria officinalis</i> Linn.	Fumariaceae	Whole plant
42	<i>Fumaria parviflora</i> Lam.	Fumariaceae	Whole plant
43	<i>Garcinia indica</i> chois.	Guttiferae	Fruit
44	<i>Garcinia kola</i> Heckel.	Guttiferae	Seeds
45	<i>Gentiana kurroo</i> Royle.	Gentianaceae	Root
46	<i>Gymnema sylvestre</i> R. Br.	Asclepiadaceae	Leaves
47	<i>Hedyotis corymbosa</i> Linn.	Rubiaceae	Whole plant
48	<i>Hemidesmus indicus</i>	Asclepiadaceae	Roots
49	<i>Hermodactylus gol</i>	Colchicaeae	Tubers
50	<i>Herniaria glabra</i> Linn.	Caryophyllaceae	Flowers
51	<i>Hygrophila spinosa</i> T. Anders	Acanthaceae	Leaves, roots, stem, seeds
52	<i>Hyssopus officinalis</i> Linn.	Labiatae	Plant
53	<i>Jatropha gossypifolia</i> Linn.	Euphorbiaceae	Leaves
54	<i>Lawsonia inermis</i> Linn.	Lythraceae	Bark
55	<i>Luffa echinata</i> Roxb.	Cucurbitaceae	Fruit and seed
56	<i>Lycopersicon esculentum</i> Mill.	Solanaceae	Fruit
57	<i>Mentha longifolia</i> Linn.	Labiatae	Leaves
58	<i>Momordica cochimchinesis</i> spreng.	Cucurbitaceae	Fruit
59	<i>Moringa oleifera</i> Lam.	Moringaceae	Root
60	<i>Murraya koenigii</i> Linn.	Rutaceae	Leaves
61	<i>Myristica fragrans</i> Houtt.	Myristicaceae	Seed
62	<i>Nelumbo mucifera</i> Gaertn.	Nymphaceae	Flower
63	<i>Paeonia emodi</i> Wall.	Ranunculaceae	Tubers
64	<i>Phyllanthus niruri</i> Linn.	Euphorbiaceae	Plant
65	<i>Picrorhiza kurroa</i> Royle.	Scrophulariaceae	Root
66	<i>Pinus roxburghii</i> Sargent	Pinaceae	Volatile oil
67	<i>Podophyllum emodi</i> Wall.	Berberidaceae	Rhizome
68	<i>Portulaca oleracea</i> Linn.	Potulacaceae	Herb
69	<i>Protium heptaphyllum</i> March.	Bursaceae	Trunk wood
70	<i>Prunus armeniaca</i> Linn.	Rosaceae	Fruit
71	<i>Pyrenthrum indicum</i> DC.	Compositae	Flowers
72	<i>Rhem emodi</i> Wall.	Polygonaceae	Rhizome
73	<i>Rumex crispus</i> Linn.	Polygonaceae	Root
74	<i>Solanum dulcamara</i> Linn.	Solanaceae	Berries
75	<i>Solanum indicum</i> Linn.	Solanaceae	Fruit, plant
76	<i>Solanum nigrum</i> Linn.	Solanaceae	Dried fruit
77	<i>Sphaeranthus hirtus</i> Willd.	Compositae	Herb
78	<i>Swertia chirata</i> Buch-Ham.	Gentianaceae	Plant
79	<i>Symplocos racemosa</i> Roxb.	Symplocaceae	Bark
80	<i>Taraxacum officinale</i> Weber.	Compositae	Root
81	<i>Terminalia chebula</i> Retz.	Combretaceae	Fruit
82	<i>Tinospora cordifolia</i> Willd.	Menispermaceae	Stem
83	<i>Trichosanthes cordata</i> Roxb.	Cucurbitaceae	Root

84	<i>Trigonella foenumgraecum</i> Linn.	Leguminosae	Seed
85	<i>Triticum sativum</i> Lam.	Gramineae	Roots
86	<i>Vitex negundo</i> Linn.	Verbenaceae	Plant
87	<i>Woodfordia fruticosa</i> Kurz.	Lythraceae	Flower
88	<i>Zinziber officinale</i> Rose.	Zingiberaceae	Rhizome

Table 3: Table Shows Ayurvedic Formulations Used In Liver Complications

Sr. No.	Plants used in formulation	Formulation containing the plant (Manufacturer)
1.	<i>Achillea millefoliiven</i> Linn.	Acilvan [1], Hefiaye [17], Amlycure [24], Liv-52 [3], Livex [4], Suliv [5], Neoliv-100 [32], Syliv [33]
2.	<i>Aconitum heterophyllum</i> wall.	Livex [4]
3.	<i>Acorus calamus</i> Linn.	Livin [2]
4.	<i>Adhatoda vasica</i> Nees.	Livol [21]
5.	<i>Aloe</i>	Livarin [6]
6.	<i>Aloe barbadensis</i> Mill.	Hepa-10 [7], Livodin [8], Adliv-75 [9], Amlycure [24] Biligen [10]
7.	<i>Andrographis paniculata</i> Nees.	Hepa-10[7], Kalmegh compound[11], Liva[12], Livarin [6], Livona [3], Livergen [4], Livosin [7], Livospin [25], Lierin [15], livotone[26], Livotrit [27], Livin [16], Livodin [8], Livokin [20], Livol [21], Livomin[22], Livoped[23], Stimuliv[28], Tefroli [3], Trisoliv[30], Jaundex syrup [36]
8.	<i>Andropogon muricatus</i> Retz.	Adliv -75 [9]
9.	<i>Aphnamixis polystachya</i> (Wall.) Parker	Livin [16], Livodin [8], Hepa-10 [7], Livomin[22], Livospin [25], Jaundex syrup [36], Triguliv-15 [37], Biligen [14]
10.	<i>Apium graveolens</i> Linn.	Kalmegh compound [11], Liva [12], Livergen [14], Livokin [20], Livoped [23], Livotone [26]
11.	<i>Artemisia absinthium</i> Linn.	Livomap [35]
12.	<i>Asteracantha longifolia</i> Nees. Syn. <i>Hygrophila spinosa</i> T.	Adliv-75 [9], Biligen [14], Liva-16 [8], Livergen [14], Livodin [8], Livatona [13], Livokin [20], Livotone [26], Syliv [33]
13.	<i>Avena sativa</i> Linn.	Livosin [7]
14.	<i>Baliospermum montanum</i> Muell. Arg	Livin [16]
15.	<i>Berberis lyceum</i> Royle.	Amlycure [24], Liva [12], Liv-77 [19], Livokin [20], Livomap [35], Livotrit [1], Livol [21], Triguliv-15 [37]
16.	<i>Boerhaavia diffusa</i> Linn.	Acilvan [1], Amlycure [24], Hepex [17], Hipex [18], Liv-77 [19], Jaundex syrup [35], Liva [12], Liva-15 [8], Livomap [35], Triguliv-15 [37], Livarin [6], Livin [16], Livodin [8], Livomycin [22], Neolin-100 [32], Vimliv [34]
17.	<i>Calotropis gigantea</i> (Linn) R. Brex Ait	Jaundex syrup [36]
18.	<i>Carica papaya</i> Linn.	Liva [12], Livosin [7]
19.	<i>Capparis spinosa</i> Linn.	Acilvan [1], Liv-52 [3], Livomyn [22], Syli[33]
20.	<i>Carthamus tinctorius</i> Linn.	Triguliv-15 [37]
21.	<i>Carum copticum</i> Benth. Syn. <i>Trachyspermum ammi</i> (Linn.) Sprague	Adliv-75 [9], Kalmegh compound [11], Livokin [20], Syliv [33]
22.	<i>Casearia esculenta</i> Roxb.	Avilvan [1]
23.	<i>Cassia angustifolia</i> Vahl.	Adliv-75 [9], Liva-16 [8], Livatona [13], Livergen [14], Lierin [15], Livodin [8], Liva [12], Livosin [7]
24.	<i>Cassia fistula</i> Linn.	Livarin [6]
25.	<i>Cassia obtusifolia</i> Linn.	Amlycure DS [24]
26.	<i>Cassia occidentalis</i> Linn.	Acilvan [1], Hipex [18], Livomycin [22], Liv-52 [3], Livex [4], Neoliv-100 [32], Syliv [33]
27.	<i>Cassia sophera</i>	Livin [16]
28.	<i>Cassytha filliformia</i> Linn.	Amlycure [24]
29.	<i>Cedrus deodara</i> (Roxb.) Loud.	Livomap [35]
30.	<i>Centella asiatica</i> (Linn.) Urban	Adliv-75 [9]
31.	<i>Cichorium intybus</i> Linn.	Acilvan [1], Amlycure [24], Hipex [18], Liv-52 [3], Liv-77 [19], Livokin [20], Neoliv-100 [32], Syliv [33], Vimliv [34]
32.	<i>Citrullus colocynthis</i> Scharad.	Livin [16]
33.	<i>Crataeva religiosa</i> Hook and	Livomap [35]

	Thoms. non Forst. f. syn. <i>Crataeva nurvala</i> Buch. Ham.	
34.	<i>Eclipta alba</i> Hassk.	Acilvan [1], Amlycure [24], Hepa-10 [24], Liv-77 [19], Liva-16 [8], Livin [17], Livodin [8], Livokin [20], Livol [21], Livomyacin [22], Livosin [7], Livotrit [27], Stimulin [28], Tefroli [29], Vimliv [34], Trignliv-15 [37]
35.	<i>Embelia ribes</i> Burm. f.	Hipex [18], Livex [4], Livodin [8], Livomin[22], Livosin [7], Livospin [25], Livotrit [27]
36.	<i>Ferula foetida</i> Regel.	Livosin [7]
37.	<i>Fumaria officinalis</i> Linn.	Amlycure [24], Hepa-10 [7], Livomin[22], Stimulin [28], Trignliv-15 [37]
38.	<i>Glycyrrhiza glabra</i> Linn.	Livatona [13], Livomap[35]
39.	<i>Grewia asiatica</i> Linn.	Trignliv-15 [37]
40.	<i>Heliotropium strigosum</i> .	Liv-17 [19]
41.	<i>Helleborus niger</i> Linn.	Trignliv-15 [37], Amlycure [24]
42.	<i>Hemidesmus indicus</i> R. Br.	Livosin [7]
43.	<i>Holarrhena antidysenterica</i> Wall.	Adliv-75 [9], Livodin [8], Livotone [26], Livosin [7], Livotrit [27]
44.	<i>Ipomoea turpethum</i> R. Br.	Biligen [14], Amlycure [24], Livomin[22], Livospin [25], Livokin [20], Livin [16], Livotrit [27]
45.	<i>Jatrochiza palmate</i> Miers.	Livin [16]
46.	<i>Lawsonia inermis</i> Linn.	Livin [6]
47.	<i>Latsea chinensis</i> Lam.	Trignliv-15 [37]
48.	<i>Luffa echinata</i> Roxb.	Hepia-10[7]
49.	<i>Melia azadirachta</i> Linn. Syn. <i>Azadirachta indica</i> A.Juss.	Lierin [31], Livomap[35]
50.	<i>Mentha viridis</i> .	Livosin [7]
51.	<i>Moringa Pterygosperma</i> Gaertn.	Livomap[35]
52.	<i>Ocimum sanctum</i> Linn.	Amlycure [24], Livin[16], Acilvan [1], Livomin[22], Tefroli [29]
53.	<i>Oldenlandia corymbasa</i> Linn.	Lierin [15], Liva-16 [8], Livatona [13], Livodin[8], Livokin [20], Livoped [23], Livospin [24], Syliv [33]
54.	<i>Panicum milliare</i> Lam.	Amlycure [24]
55.	<i>Phyllanthus emblica</i> Linn. Syn. <i>Emblca officinalis</i> Gaertn.	Hepex , Livertone , Livol, Livosin , Neoliv-100 , Vimlin
56.	<i>Phyllanthus amarus</i> Linn.	Hepex [17], Livomap[35], Amlycure [24], Trignliv-15 [37], Jaundex syrup [36]
57.	<i>Picrorhiza kurroa</i> Royle ex Benth.	Acilvan [1], Livarin [6], Lierin [15], Livertone [31], Livomap[35], Livokin [20], Livol [1], Livotrit [27], Vimlin [34]
58.	<i>Piper chaba</i> Hunter.	Livin [16]
59.	<i>Piper longum</i> Linn.	Lovex [4], Livomap[35]
60.	<i>Piper nigrum</i> Linn.	Liva-16 [8], Livodin [8]
61.	<i>Plumbago indica</i> Linn.	Amlycure [24]
62.	<i>Plumbago zeylanica</i> Linn.	Livokin [20], Livomin[22], Liva [12], Livin [16], Livospin [25], Livotrit [27]
63.	<i>Podophyllum</i>	Hepa-10 [7], Livosin [7]
64.	<i>Prunus domestica</i> Linn.	Liv-77[25]
65.	<i>Ptychotis ajowan</i> DC.	Hepa-10 [7]
66.	<i>Rhammus wightii</i> W. and A.	Livotone [26], Livotrit [27]
67.	<i>Rheum palmatum</i> Linn.	Livertone [31]
68.	<i>Ricinus communis</i> Linn.	Jaundex [36]
69.	<i>Salsola kali</i> Linn.	Trignliv-15 [37]
70.	<i>Salvadora persica</i> Linn.	Livin [16]
71.	<i>Salvia plebeian</i> R. Br.	Livospin [25]
72.	<i>Solanum nigrum</i> Linn.	Acilvan [1], Amlycure [24], Hepa-10 [7], Hepex [17], Hipex [18], Liv-52 [3], Liva [12], Liva-16 [8], Livarin [6], Livex [4], Livokin [20], Livomin[22], Neoliv-100 [32], Syliv [33], Trignliv-15 [37]
73.	<i>Solanum Lanthocarpum</i> Schrad and Wendl.	Adliv-75 [9], Liva-16 [8], Livodin [8]
74.	<i>Swertia angustifolia</i> Buch. Ham.	Livospin[25]
75.	<i>Swertia chirata</i> Buch. Ham.	Biligen [14], Livex [4]
76.	<i>Swertia decussate</i> Nimmo ex Grah.	Livomin[22], Amlycure [24]
77.	<i>Tamarix gallica</i> Linn.	Acilvan [1], Liv-52 [3], Livex [4], Neoliv-100 [32], Syliv [33]
78.	<i>Tecoma undulate</i> G. Don.	Livarin [6], Neoliv-100 [32], Livomap[35]
79.	<i>Tephrosia hirta</i>	Liva [12], Trignliv-15 [37]
80.	<i>Tephrosia purpurea</i> Linn. Pers.	Livin [16], Livokin [20], Livomin[22], Livospin [25], Neoliv-100[32], Livomap[35], Amlycure [24], Tefroli [29]
81.	<i>Terminalia arjuna</i> W. and A.	Acilvan [1], Liv-52 [3], Liva [12], Livokin [20], Livosin [7], Neoliv-100 [32], Syliv [33]
82.	<i>Terminalia belerica</i> Roxb.	Livertone [31], Livol [21], Livosin [7], Amlycure [24]
83.	<i>Terminalia chebula</i> Retz.	Hipex [18], Livertone [31], Livin [16], Livokin [20], Livol [21], Tefroli [29], Terminaalia chebula [7]
84.	<i>Tinospora cordifolia</i> Willd. Miers	Acilvan [1], Liv-77 [19], Liva-16 [8], Livin [17], Livodin [8], Livol [21], Livomin[22], Livotrit [27], Livomap[35], Trignliv-15 [37]
85.	<i>Trachyspermum ammi</i> Linn.	Biligen [14], Liva [12], Livatona [13], Livergin [14], Livin [16], Livoped [23]

86.	<i>Trigonella foenum - graecum</i> Linn.	Biligen [14], Liv-77 [19], Livatona [13], Livergin [14], Livin [16], Livoped [23], Livokin [20], Livotone [26]
87.	<i>Varnonia anthelmintica</i> Willd. Syn. <i>Centra therum anthelminticum</i> Willd. Kuntze.	Liva-16 [8]
88.	<i>Withania somnifera</i> Dunal.	Livosin [7]
89.	<i>Zingiber officinalis</i> Rose.	Livin [16], Livomap[35], Livomycin[22], Livosin [7]

The number in the square bracket indicates the manufacturer.

Note: The List of Manufacturers

[1] = Acis laboratories, Kanpur

[2]= H. V. Pharm., Rajkot (Gujarat)

[3] = Himalaya Drugs Co., Bombay

[4]= Bhartiya Aushadh Nirmanshala, Rajkot (Gujarat)

[5]= Systemic Pharmaceuticals, Allahabad

[6] = Patiala Ayurvedic Pharm., Sirhind

[7] = Jupiter Pharmaceuticals Pvt. Ltd., Calcutta

[8] = Madona Pharmaceuticals Research, Calcutta

[9] = Abala Drugs House, Calcutta

[10] = Standard Pharma Remedies, Calcutta

[11] = Bengal Chemicals Pharmaceuticals Pvt. Ltd., Calcutta

[12] = Herbid (India) Pvt. Ltd., Calcutta

[13] = Scientific Research Industries Pvt. Ltd., Calcutta

[14] = Standard Pharmaceuticals, Calcutta

[15] = Herbs Era Pharmaceutical Udayrajpur (West Bengal)

[16] = Araya Aushadhi Pharmaceutical Works, Indore

[17] = The Anglo-French Drug Co. (Eastern) Ltd., Bombay

[18] = H. V. Pharmaceuticals, Rajkot (Gujarat)

[19] = Gobe Pharmaceuticals, Jalandhar City (Punjab)

[20] = Herbo-Med, Calcutta

[21] = Vedic Pharm, Calcutta

[22] = Charak Pharmaceuticals (India) Pvt. Ltd., Umbargaon (Gujarat)

[23] = Anakem Laboratories Pvt. Ltd., Calcutta

[24] = Aimil Pharmaceuticals Pvt. Ltd., Calcutta

[25] = Herbals (APS) Pvt. Ltd., Patna

[26] = East India Pharmaceutical Works Ltd., Calcutta

[27] = Zandu Pharmaceutical Works Ltd., Bombay

[28] = Franco-Indian Pharmaceutical Works Ltd., Bombay

[29] = TTL Pharma Pvt. Ltd., Madras

[30] = Medley Pharm Pvt. Ltd., Bombay

[31] = Gampers Laboratories, Bombay

[32] = Bharat Pharmaceuticals, Delhi

[33] = Systemic Pharmaceuticals, Allahabad

[34] = Solumiks, Bombay

[35] = Maharishi Ayurveda Corporation Ltd., New Delhi

[36] = D. K. Sandu Bros. Chember Pvt. Ltd., Bombay

[37] = Triguna Ayurveda Research Lab, New Delhi

CONCLUSION

Considering the enormous biodiversity resources of Indian traditional system and the high incidence of liver complications, the present review extensively focuses on collection of data for different plants, which are available in India. These medicinal plants claimed as liver protective agents are classified according to their biological source, phytoconstituents; part used and plants in formulations. People from India are still dependent on conventional therapies to treat liver complications. Because of their easy availability and low cost. Since large mass of populations used preferable herbal preparation, therefore there is need to be evaluate for their proportion, their dose and rational behind combination in different polyherbal preparation.

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