



## A LITERATURE REVIEW ON SOME MEDICINAL PLANTS USED FOR THE MANAGEMENT OF THE LIVER DISORDERS IN TRADITIONAL MEDICINE

Dr. Ansar Mansur Patel\*<sup>1</sup>, Sachin Rangrao Patil<sup>2</sup> and Isak Ismail Mujawar<sup>2</sup>

<sup>1</sup>Principal, Sant Gajanan Maharaj Rural Pharmacy College, Mahagaon.

<sup>2</sup>Lecturer, Sant Gajanan Maharaj Rural Pharmacy College, Mahagaon.

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### \*Corresponding Author

**Dr. Ansar Mansur Patel**

Principal - Sant Gajanan  
Maharaj Rural Pharmacy  
College, Mahagaon.

### ABSTRACT

Recently there is a greater global interest in non synthetic, natural drugs derived from plant / herbal sources due to better tolerance and minimum adverse drug reactions. Medicinal plants have been playing an essential role in the development of human culture. Medicinal plants are regarded as rich resources of secondary metabolites i.e active chemical constituents and from these plants many of the modern medicines are produced. For thousands of years medicinal plants have been used to treat health disorders and to prevent diseases. The use of natural remedies for the treatment of liver diseases has a long history.

In this review we gave general overview of some medicinal plants used for the treatment of Jaundice / liver disorders.

**KEYWORDS:** Medicinal plants, secondary metabolites, Jaundice, traditional medicine.

### INTRODUCTION

Medicinal plants are the “backbone” of traditional medicine, which means more than 3.3 billion people in the less developed countries utilize medicinal plants on a regular basis.<sup>[1]</sup> These medicinal plants consider as a rich resources of ingredients which can be used in drug development and synthesis. Besides that these plants play a critical role in the development of human cultures around the whole world. Plants produce several chemical compounds that have biological functions, as well as provide defense against insects, fungi and anthophagous mammals. A minimum of 12,000 such compounds are isolated till now; which is considered to be only accounting to 10% of the total availability.

The Indian sub-continent has a very rich diversity of plant species in a wide range of ecosystems. There are about 17,000 species of higher plants, of which approximately 8,000 species, are considered medicinal and used by village communities, particularly tribal communities, or in traditional medicinal systems, such as the Ayurveda. The use of traditional medicine and medicinal plants in most developing countries, as a basis for the maintenance of good health, has been widely observed by UNESCO, 1996.<sup>[2]</sup>

During the past decade, traditional systems of medicine have become a topic of global importance. Current estimates suggest that, in many developing countries, a large proportion of the population relies heavily on traditional practitioners and medicinal plants to meet primary health care needs. Although modern medicine may be available in these countries, herbal medicines (phytomedicines) have often maintained popularity for historical and cultural reasons.

Medicinal plants frequently used as raw materials for extraction of active ingredients which used in the synthesis of different drugs. Like in case of laxatives, blood thinners, antibiotics and anti-malarial medications, contain ingredients from plants. Moreover the active ingredients strychnine, vincristine, and ephedrine isolated from *Nux Vomica*, periwinkle, and ephedra respective are the examples of this.

Medicine, in several developing countries, using local traditions and beliefs, is still the mainstay of health care. As defined by WHO, health is a state of complete physical, mental, and social well being and not merely the absence of disease or infirmity. Medicinal plants can make an important contribution to the WHO goal to ensure, by the year 2000, that all peoples, worldwide, will lead a sustainable socio-economic productive life.<sup>[3]</sup>

The practice of traditional medicine is widespread in China, India, Japan, Pakistan, Sri Lanka and Thailand. In China about 40% of the total medicinal consumption is attributed to traditional tribal medicines. In the mid-90s, it is estimated that receipts of more than US\$2.5 billion have resulted from the sales of herbal medicines and in Japan, herbal medicinal preparations are more in demand than mainstream pharmaceutical products. Medicinal plants are an integral component of research developments in the pharmaceutical industry. Such research focuses on the isolation and direct use of active medicinal constituents, or on the development of semi-synthetic drugs, or still again on the active screening of natural products to yield synthetic pharmacologically-active compounds.

The world market for plant-derived chemicals – pharmaceuticals, fragrances, flavours, and colour ingredients, alone exceeds several billion dollars per year. Classic examples of phytochemicals in biology and medicine include taxol, vincristine, vinblastine, colchicine as well as the Chinese antimalarial - artemisinin, and the Indian ayurvedic drug-*forkolin*. Trade in medicinal plants is growing in volume and in exports. It is estimated that the global trade in medicinal plants is US\$800 million per year.

#### List of some medicinal plants used in liver diseases

| Sr. No. | Name                                     | Synonym     | Active constituents      | Use                                   |
|---------|--|-------------|--------------------------|---------------------------------------|
| 1       | Aloe vera <sup>[4,5]</sup>               | Korphad     | Aloe emodin, and aloesin | Hepatopathy, and spleenopathy         |
| 2       | Melia azadirachta <sup>[5,6]</sup>       | Neem        | Azadirachtin.            | Spleen and liver diseases.            |
| 3       | Phyllanthus niruri <sup>[4,5,7]</sup>    | Bhui amalki | Phyllanthin.             | Jaundice, diarrhea and as a diuretic. |
| 4       | Andrographis paniculata <sup>[4,5]</sup> | Kalmegh     | Andrographolide.         | In liver problem and as a digestant.  |
| 5       | Berberis aristata <sup>[8,9]</sup>       | Daruhadal   | Berberine                | stomachic, and in jaundice            |
| 6       | Tephrosia purpurea <sup>[5, 10]</sup>    | Sharpankha  | Tephrosin, Purpurin.     | Laxative and in liver problems.       |
| 7       | Boerhavia diffusa <sup>[4,5]</sup>       | Punarnava   | Punarnavoside, Rotenoid. | Asthama & jaundice.                   |
| 8       | Lawsonia alba <sup>[9,11]</sup>          | Mendhi      | Lawson                   | Liver problems                        |
| 9       | Picrorrhiza kurroa <sup>[9,12]</sup>     | Kutki       | Kutkosides.              | Liver complaints                      |
| 10      | Plumbago zeylanica <sup>[5,13]</sup>     | Chitrak     | Plumbagin.               | Jaundice, arthritis.                  |
| 11      | Eclipta alba <sup>[5,9]</sup>            | Maka        | Ecliptal                 | Jaundice & dropsy                     |
| 12      | Croton oblongifolius <sup>[5,13]</sup>   | Ghansur     | Fatty oils.              | Liver disorders.                      |



Figure No: 01: Aloe vera. Figure No: 02: Azadirachta indica



Figure No: 03: Phyllanthus niruri. Figure No: 04: Andrographis paniculata.



Figure No: 05: *Berberis aristata* Figure No: 06: *Tephrosia purpurea*



Figure No: 07: *Boerhavia diffusa*. Figure No: 08: *Lawsonia alba*.



Figure No: 09: *Picrorhiza kurroa* Figure No: 10: *Plumbago zeylanica*

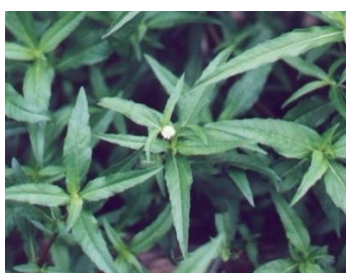


Figure No: 11: *Eclipta alba* Figure No: 12: *Croton oblongifolius*

1) *Aloe vera* (Linn.) Burm . (*Aloe barbadensis* Mill.)<sup>[4,5]</sup>: Family: Liliaceae

**Common names:** Indian aloe, Kumari, Ghrtakumari .

**Distribution:** Cultivated or seen wild in hedge - row in the dry lands of India.

**Part used:** leaf - juice.

**The plant:** A coarse perennial with short stem and shallow root system ;leaves flashy in rosettes, sessile, of ten crowded with horny prickles on the margins, convex below, 45-60 cm

long, tapering to a blunt point surface pale green with irregular white blotches; flowers yellow or orange in racemes; fruits loculicidal capsule.

**Chemical constituents:** A plant contains aloesone, aloesin. Mucilage contains sugars. leaves contains barbaloin, glycoside & isobarbaloin and  $\beta$  barbaloin, free anthraquinone like aloemodin, iso-emodin, free & cinnamoylate 8-methyl-7-hydroxyaloin. dried leaves contain aloemodin, feralolide, aloin A&B, elongica dimerin A&B.

**Macroscopy:** Dried leaf juice is dark chocolate to black in color and of irregular masses. Odor, characteristic; taste very bitter.

**Uses:** The plant is bitter, sweet, cooling, anthelmintic, aperient, carminative, deobestruent, diuretic, stomachic, ophthalmic and alexeteric.. The juice is used in dyspepsia, amenorrhoea, burns, colic, hyper adenosis, **hepatopathy, splenopathy**, skin diseases, constipation. The aloe is used for helminthiasis in children and is a purgative, anthelmintic and emmenagogue.

2) *Melia azadirachta* Linn.<sup>[5,6]</sup>: Family: Meliaceae

**Common names:** Pride of China, Pride of India, Mahanimb, Mahanimbah.

**Distribution:** Throughout India up to 1800 m, often cultivated.

**Part used:** roots, leaves, seeds, flowers.

**The plant:** **Medium** sized tree with dark grey longitudinally furrowed bark. Leaves bi or tri pinnate. Flowers lilac, fragrant, in panicles. Fruits ellipsoid-globose 4-seeded drupes, yellow when ripe.

**Chemical constituents:** roots contain flavone glycoside apigenin 5- 0-galactoside. Root bark contains cytotoxic azadirachtin- type limonoids- meliacarpinins. Stem bark contains limonoid glycoside-kuline & triterpenoids kulactone, kulolactone & kulinone. Leaves contain kaemferol-3-L rhamno-D-glucoside & rutin. Fruits contain melianoninol, melianol, melianone, vanillin & vanillicacid, bakayanin, alkaloid azaridine. Seeds contain limonoid glycoside, drying oil.

**Uses:** Leaf juice anthelmintic, diuretic, emmenagobue, gum used in spleen enlargement, infusion of bark in ascariasis. Ftuits considered tonic. oil of seeds used in **spleen and liver diseases**.

3) *Phyllanthus amarus* Linn.<sup>[4,5,7]</sup>: Family: Euphorbiaceae

**Common names:** Jangli amlī, Jaramla, Bhuiavali

**Distribution:** Widespread throughout the tropics and subtropics in sandy regions as a weed in cultivated and wastelands.

**Part used:** Whole plant.

**The Plant:** A herb that grows upto 10-60 cms tall, erect, stem terete, younger parts rough, cataphylls 1.5-1.9 mm long, deltoid acuminate; leaf 3.0-11.0 x 1.5-6.0 mm, elliptic oblong to ovate, obtuse or minutely apiculate at apex, obtuse or slightly inequilateral at base; Flowers axillary, proximal 2-3 axils with unisexual 1-3 male flowers and all succeeding axils with bisexual cymes.

#### Chemical constituents

**Major:** Lignans - a diarylbutane, Phyllanthin (~0.5%) and an aryltetrahydronaphthalene, hypophyllanthin(~0.2%).

**Minor:** Hydrolysable tannins viz., phyllanthusin D, amariin, amarulone and amarinic acid; alkaloids viz., ent – norsecurinine sobubbialine, epibubbialine; diarylbutane, nyrphyllin and a neolignan, phyllnirurin.

**Use:** The plant is bitter, astringent, cooling, diuretic, stomachic, febrifuge and antiseptic. It is useful in dropsy, **jaundice**, diarrhoea, dysentery, intermittent fevers, diseases of urino-genital system, scabies ulcers and wounds.

4) *Andrographis paniculata* (Burm.f.)<sup>[4,5]</sup>: Family: Acanthaceae

**Common names:** Kalamegh, Kalpanath, Green chiratta, Kalmegh

**Distribution:** Throughout India, in the plains, also in forests as undergrowth.

**Part Used:** Whole plant.

**The plant:** An erect, branched annual herb, 0.3m to 0.9m in height with quadrangular branches; leaves simple. lanceolate, acute at both ends; flowers small, pale but blotched & spotted with brown & purple distant in lax spreading axillary & terminal racemes or panicles, fruits linear capsules, acute at both ends; seeds numerous, yellowish brown, subquadret.

**Chemical constituents:** plant contains lactone- andrographolide, 14-deoxy-11-oxo-andrographolide, 14-deoxyandrographolide; iridoid glucoside 5-hydroxy-3,7,8,2'-

tetramethoxyflavone, flavonoid 5-hydroxy-7,8,-dimethoxy flavone, glucoside neoandrographolide. Roots contain andrographin, panicolin, apigenin, andrographolide, flavone andrographone, andrographane, flavonoid glycoside-2'5-dihydroxy-7,8-dimethoxy flavone-2'-0-β-(D)-glucoside.

### Uses

Plant is bitter, acrid, cooling, laxative, antipyretic, antiperiodic, anti-inflammatory, expectorant, digestive, anthelmintic, stomachic. It is used to **treat liver** & digestion complaints. It is useful in wounds, ulcer, chronic fever, inflammations, cough, bronchitis, skin diseases, leprosy pruritus, intestinal worms, dyspepsia, flatulence, colic, diarrhea, dysentery, haemorrhoids & vitiated conditions of pitta.

5) *Berberis aristata* DC.<sup>[8,9]</sup>: Family: Berberidaceae.

**Common names:** Daruhald, rasaut, Daruhalad, Indian Berberry.

**Distribution:** It is a shrub found in the northern mountainous region of Pakistan and India, as well as in the Nilgiri Hills of Southern India.

**Part Used:** The Root and stem.

**The plant:** large deciduous shrub usually 1.8-3.6 m in high but attaining 4.5 m with stem 20 cm diameter. Twigs whitish or pale yellowish brown .Bark pale brown, rough,Leaves-3.8-10 by 1.5-3.3 cm; ovate or elliptic, entire or spinous-toothed, base gradually narrowed.

### Chemical constituents

The isoquinoline alkaloid berberine as the major bioactive constituent. Other alkaloids include berbamine, aromoline, karachine, palmatine, oxyacanthine, oxyberberine, taxilamine.

**Uses:** Berberine is reported to be useful in the treatment of oriental sores caused by *Leishmania tropica*; the alkaloid berberine possesses antibacterial and anti-inflammatory activities. The plant is also reported to be used as an intestinal antiseptic and bitter stomachic. It exhibits anti-neoplastic properties in addition to **its hepatoprotective activities**.

6) *Tephrosia purpurea* (Linn.)<sup>[5, 10]</sup>: Family: Papilionaceae

**Common names:** Sarphonka, Sarapunkhah,banah, purple tephrosia

**Distribution:** Throughout India, on waste lands & along roadsides.

**Part used:** whole plant.

**The plant:** A much branched suberect herbaceous perennial, 30-60 cm in height with spreading branches; leaves imparipinnate, leaflets 11-21, narrow, oblanceate; flowers red or purple in extra axillary racemes; fruits slightly curved pods, 3-4.5 cm, long; seeds 5-10 per pod, grey, smooth.

#### **Chemical constituent**

whole plant contains  $\beta$ -sitosterol, ursolic acid, spinasterol- $\acute{a}$ . Roots contains flavonoids purpurenone, purpurin, maackiain, pongamol, lancelatins A and B. leaves contain  $\beta$ -sitosterol, lupeol, rutin and rotenoids. Flowers contains cyanidins. Seeds yield fatty oil, caffeic acid, flavanone purpurin, sitosterol etc.

**Uses:** Tonic, laxative, diuretic & deobstruent; used in bronchitis & bilious febrile attacks, also for boils, pimples & bleeding piles. Decoction of roots given in dyspepsia, diarrhoea, rheumatism, asthma & urinary disorders. Whole plant & roots given **in liver** disorders and in spleenic disorders.

7) *Boerhavia diffusa* Linn.<sup>[4,5]</sup>: Family: Nyctaginaceae.

**Common names:** Sant, Bhauma, krishnakhya, Raktavasu, kharaparya.

**Distribution:** Throughout India, Baluchistan, Ceylon. Tropical & sub tropical Asia, Africa & America.

**Part used:** whole plant.

**The plant:** Herbaceous, diffuse; root large, fusiform; stems prostrate or ascending reaching 0.6-0.9 m long. Branched, slender, cylindric thickensd at nodes, leaves at each node in unequal pairs, the larger 2.5-3.8 cm, the smaller 1.3-2.0 cm long, both nearly as broad as long, broadly ovate or suborbicular; rounded at apex, green & glabrous, flowers very small, shortly stalked or nearly sessile. 4-10 together. fruit 3mm long, clavate, rounded, broadly & bluntly 5-ribbed, very glandular.

#### **Chemical constituent**

**Major:** Punarnavoside, an antifibrinolytic glycoside, 0.03-0.05%.

**Others:** include rotenoids viz., boeravinones A,B,C,D & E; lignans viz., liridoderdin and syringaresinol mono  $\beta$ -D-glucosides; flavones and sterols; an isofuroxanthone, boeravine and hypoxanthine -9- L-arabinofuranoside.



**Uses:** It is diuretic and laxative . Also used in the treatment of asthma, **jaundice** and intestinal inflammation.

**8) *Lawsonia alba* Linn.<sup>[9,11]</sup>:** Family: Lythraceae.

**Common names:** Heena, Mehndi, Henna, Egyptian privet, Mendi.

**Distribution:** It is indigenous to India & dwells very well in tropical to subtropical regions of the country.

**Part used:** Aerial parts.

**The plant:** The plant is a small elegant bush with white fragrant flowers. The leaves are Simple, opposite, sub-sessile, elliptic, entire, acute or obtuse, petiole short; odour aromatic; mucilaginous and slightly astringent.

#### **Chemical constituent**

**Major:** A colouring matter lawsone chemically 2-hydroxy- $\alpha$  Naphthaquinone; lacoumarin, chemically 5-allyloxy-7-hydroxycoumarin and three laxanthes.

**Others:** Esculetin and scopoletin.

**Uses:** Antimicrobial agent. Leaves are used for treatment of typhoid and haemorrhoea. Bark is given in **jaundice** and enlargement of the spleen.

**9) *Picrorhiza kurroa* Royle ex .Benth.<sup>[9,12]</sup>:** Family: Scrophulariaceae.

**Common names:** Katuka, Titka, Kutki, Kuru, Kutaki.

**Distribution:** the plant is widely distributed in north- western Himalayas at an altitude of 2700-4500 m.

**Part used:** Roots & rhizomes.

**The plant:** Rhizome 2.5-6.0 cm long and 0.5- 1.0 cm thick, sub- cylindrical, straight, externally grayish brown, surface rough due to longitudinal wrinkles, circular scars of roots and bud scales attached; tip ends a growing bud surrounded by tufted crown of leaves. Roots thin, cylindrical, 5-10 cm long 0.05-0.1 mm in diameter, straight or slightly curved, mostly attached to rhizome, dusky grey; inner surface black with whitish xylem. Odour- pleasant ; taste - bitter.

**Chemical constituent**

**Major:** iridoid glycosides, picroside I and kutkoside.

**Minors:** include picroside III, veronicoside; minecoside ; phenol glycosides viz, picein and androsin; a number of cucurbitacin glycosides and 4-hydroxyl –3 – methoxy acetaophenone.

**Uses:** Rhizomes are given in fever and gastralgia. Powder rootstock is used in abdominal pain and also as a laxative. It is administered **in liver complaints**.

10) *Plumbago Zeylanica* Linn.<sup>[5,13]</sup>: Family: Plumbaginaceae.

**Common names:** Agni, Chita, Chitraka, Ceylon Leadwort

**Distribution:** Through out the India, much cultivated, wild in W. peninsula & probably in Bengal, Ceylon-Tropics of the Old world.

**Part used:** Roots and Roots Bark.

**The plant:** Subscandent under shrubs. Leaves elliptic-ovate. Flowers white, in terminal spiciform racemes; calyx with stalked glands. Capsule ellipsoid. Corolla white, slender tube 2-2.5cm. long, lobes 8mm. long, obovate- oblong, acute, apiculate. Filaments as long as the corolla-tube, anthers exserted just beyond the throat.

**Chemical Constituent:** Aerial parts contains free amino acids. Roots contain plumbagin, droserone, dihydroserone, elliptone, nisoshinanolone, plumbazeylanone, napthaquinone, chitranone, zeylanone, and isozeylinone.

**Uses:** Roots abortifacient, vesicant and diuretic, used in dyspepsia, piles, diarrhoea and skin diseases. In siddha roots are used **in jaundice**, epilepsy, and in inflammation and arthritis.

11) *Eclipta Alba* (Linn.) Hassk.<sup>[5,9]</sup>: Family: Asteraceae.

**Common names:** Ajagara, Kesaraja, Bhangra, Maka

**Distribution:** Distributed through out India.

**Part used:** whole plant.

**The plant:** The plants are erect or Prostrate or decumbent hairy herbs, well developed root system, cylindrical, grayish, secondary branches up to 7mm in diameter arise from the main root. Stem greenish, herbaceous, branched, cylindrical or flat. Leaves linear-oblong, sessile. Flowers white, in solitary or paired heads.

**Chemical constituent:** plant contains ecliptal, demethylwedelolactone-7-glucoside, 0.078% nicotine. Aerial parts contain steroids, triterpenoids and flavonoid. Root contains dithienylacetylene ester (I), (II), (III).

**Uses: used in Jaundice,** skin diseases, inflammation, anaemia, dental diseases, cough, ear and eye diseases, dropsy, diseases of liver and spleen.

**12) *Croton oblongifolius* Roxb.**<sup>[5,13]</sup> Family: Euphorbiaceae.

**Common names:** Bhutankusa, Chucka, Ghansura.

**Distribution:** North Kanara, South Kanara, India, Srilanka.

**Part used:** Bark, root, & stem.

**The plant:** medium sized tree clothed with silvery scales on young parts. Leaves crowded at the ends of branchlets, oblong-lanceolate, crenate or serrate. Flowers pale yellowish green solitary or fascicled, in the axils of minute bracts on long erect often fascicled racemes. Capsule subglobose, depressed, slightly 3-lobed, clothed with small, orbicular scales.

**Chemical constituent:** seed yield fatty oil

**Uses:** seeds and oil considered purgative. Bark is used in **liver disease**

## CONCLUSION

Without any hesitation one can say that natural medicine is better for the treatment of many small ailments and also life-threatening conditions. Natural medicine, however, has much to offer in the treatment and management of a wide range of dreadful diseases that do not necessarily have medical emergencies.

This literature review provides useful documented evidence on the management of liver disorders in traditional medicine. However, there is a need for further reviews related to the chemical composition, chemical elements, phytochemicals, physicochemical properties, toxic substances. Extensive scientific studies should also to be carried out to justify its clinical potential in the management of liver disorders in future.

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