



(REVIEW ARTICLE)



A review on role of Indian medicinal plants in treatment of Icterus

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Abstract

Indian medicinal plants play the very effective and important role in human's life. Numerous medicinal plant species, particularly those used to treat Icterus, are regarded as a crucial therapeutic resource in the fight against these illnesses. When the blood level of bilirubin rises, a chronic condition called Icterus (Jaundice) develops. This review article highlights various medicinal plants that Indian tribal and rural populations utilize to treat Icterus. The study reveals 13 medicinal plant species, which are used for treating Icterus in India. The main aim of this review is to highlight the indigenous information of medicinal plants, which are specifically used for the prevention of Icterus. The plant species that are most frequently observed and utilized as medicines for treating Icterus are *Acacia Nicotica*, *Abrus precatorius*, *Aloe barbadensis*, *Arhenome maxicanal*, *Boerhaavia diffusa*, *Carica papaya*, *Cajanus cajan*, *Cassia angustifolia*, *Curcurma angustifolia*, *Eclipta alba*, *Emlica officinalis*, *Ficus hispida*. In order to create new medications that may be significantly more effective than the ones now available, plants that are often used to treat Icterus must first undergo scientific validation through pharmacological study.

Keywords: Icterus; Bilirubin; Medicinal Plants; Treatment; Plant Species

1. Introduction

Liver, the largest gland is a vital organ in human body. It is the metabolic "engine-room" of the human body[1]. The liver plays fundamental role in maintenance, performance, regulation of homeostasis, secretions of bile, storage of vitamins and detoxification in the body[2]. The production of crucial proteins, the assembly of lipoprotein and lipids, the production and secretion of bile acids[3]. Almost all the drugs, foods and water constituents are metabolized and detoxified in the liver, and as such it is often exposed to maladies resulting in a number of clinical syndromes[1].

It take part in all the biochemical pathways to growth, immune system, nutrient supply, energy provision and reproduction so, the right functioning of liver is essential for the healthy living of an individual[2]. Many chemicals, foods, drugs and infections (parasitic, bacterial, viral or fungal) can cause wide range of liver diseases such as hepatitis, Icterus, cirrhosis, liver cancer, etc. Because of variations in liver dysfunctions and difficulties encountered in reaching to a proper diagnosis, a physician is rarely able to provide specific treatment. At the most, supportive and symptomatic treatments are given but the multiplicity of deranged functions renders the treatment still more complicated. Besides this, modern (allopathic) drugs show evidence of severe toxicity, thus there is a definite need to search alternate drugs having maximum therapeutic value with no or slightest toxicity. Liver diseases are among the most serious disorder[1]. Icterus is a very common symptom principally in the developing countries. It is related with a number of hepatic diseases which are still major causes of death. Icterus can be treated in a variety of ways, and the rising body of research on medicinal plants demonstrates just how potent a field plant pharmacology is. Many medicinal plants are used for the treatment of Icterus. The use of medicinal plants in drug discovery is highly emphasized (based on their traditional and safe uses in different folk medicine systems from ancient times) The pharmaceutical industry is seeing the emergence

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of several advanced analytical tools to confirm and identify new chemical compounds that are derived from plants that are physiologically active[4].

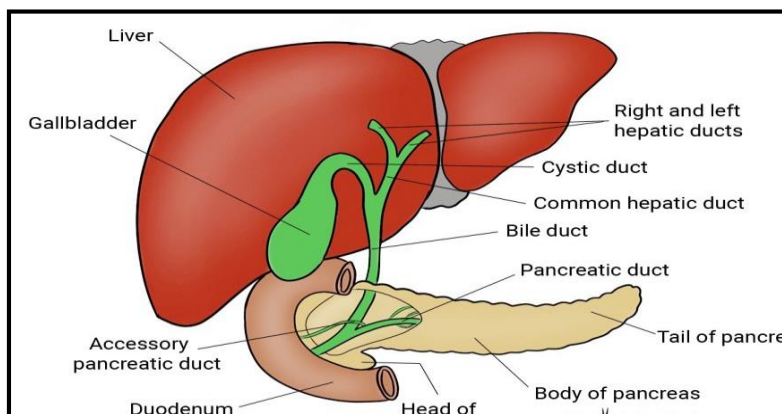


Figure 1 Anatomy of Liver

Medicinal plants have been a vital source for the treatment of Icterus since time immemorial. Medicinal plants were used as juice, latex or in dried powder form. In India a variety of polyherbal commercial formulations reputed to have hepatoprotective action are being used. Hepatoprotective medicinal plants contain a wide range of chemical constituents like phenols, essential oils, coumarins, lignans, alkaloids, acids, lipids, and xanthines. Plant extracts of many crude drugs are used to treat liver conditions like Icterus^[4]. In India there are various medicinal plants which are used in the treatment of Icterus. About 90 percent of these are found growing wild in different climatic regions of the country [5].

2. History

Medicinal plants are generally used for curing various ailments like diabetes, dysentery, typhoid, and Icterus. Various parts of the plant, including fruits, and flowers, roots, leaves, are used for the treatment of Icterus. Additionally, Icterus is not merely a disease but rather a symptom of a liver disease that denotes a dysfunction of the liver. According to the most important ancient literature, the Latin word "iecur" was once used to describe the term "liver." The word jaundice is derived from the French word "jaune," which means "yellowness," and refers to a condition in which the skin and eyes typically exhibit yellow coloring. It happens as a result of excessive bilirubin secretion. The body naturally produces bilirubin, also known as unconjugated bilirubin, as a result of hemolysis brought on by the activity of liver cells. This mechanism is considerably improved when biliverdin reductase is present [7].

3. Classification and features of Icterus

Based on pathophysiology, Icterus may result from one or more of the following mechanisms:

- Increased bilirubin production
- Decreased hepatic uptake
- Decreased hepatic conjugation
- Reduce excretion of bilirubin into bile

Accordingly, a simple classification of Icterus is into predominant types: Pre hepatic (haemolytic), Hepatic, and Post-hepatic cholestatic. The first three pathways of hyperbilirubinemia are primarily unconjugated. While the last variety yields mainly conjugated hyperbilirubinemia [8].

3.1. Pathophysiology of Icterus

An average adult produces 250 mg of bilirubin a day through the breakdown of the hem molecule. Haem is released when red blood cells are broken down. It is converted by macrophages first into biliverdin and then into unconjugated bilirubin in the reticuloendothelial system. In contrast to free (unbound) bilirubin, which is absorbed by liver hepatocytes and converted into conjugated bilirubin, unconjugated bilirubin is lipid soluble and readily crosses cell membranes to bind to albumin in blood. Hepatocytes in the liver carry water-soluble conjugated bilirubin into the biliary tract system. Once within the intestines, it moves on to be removed in the stool. The kidneys expel some conjugated bilirubin as urobilinogen after it is partially reabsorbed in the intestines. When this metabolic process is

disrupted, it results in an increase in unconjugated bilirubin (through increased red blood cell oxidation or decreased bilirubin conjugation, for example) or conjugated bilirubin, which leads to Icterus (e.g., from hepatocellular damage or biliary tract obstructions)[8]

3.2. Types of Icterus

On the basis of causes Icterus (Icterus) can be classified into three types[6].

- Pre-hepatic Icterus
- Hepatic Icterus
- Post hepatic Icterus

3.2.1. Pre-hepatic icterus

Pre-hepatic Icterus is characterized by unwanted red cell destruction that exceeds the liver's ability to conjugate bilirubin. Unconjugated hyperbilirubinemia is the result of this.

Any bilirubin that manages to become conjugated will be eliminated normally; however, the Icterus is brought on by the unconjugated bilirubin that stays in the bloodstream [5].

3.2.2. Hepatic icterus

A form of Icterus known as hepatic Icterus has its root cause primarily in the hepatocytes of the liver. The liver absorbs bilirubin from plasma proteins, primarily albumin, and excretes it in the bile via the biliary system following conjugation. Hepatic Icterus can be brought on by any liver pathology that results in a failure in capture, conjugation, or excretion[6].

3.2.3. Post hepatic icterus

Obstructive Icterus, also known as post-hepatic Icterus, is brought on by a blockage in the biliary system's bile drainage. The most frequent causes are pancreatic cancer in the head of the pancreas and gallstones in the common bile duct. The skin and the colour of the eyes turn yellow when it reaches 3 mg/dL or more. Between 0.2 mg/dL to 1.2 mg/dL is the typical range for total bilirubin in blood serum. distinctly yellow[7].

3.3. Symptoms of icterus

Following are the major Icterus symptoms:

- Extreme weakness
- Headache and fever
- Loss of appetite
- Severe constipation
- Nausea
- Yellow coloration of the eyes, tongue, skin and urine
- Dull pain in the liver region[7].

3.4. Causes of icterus

- Increased production of bilirubin
- Immediate liver inflammation
- Chronic liver diseases
- Chronic liver diseases

3.5. Medicinal plants used in treatment of icterus:

Medicinal plants are thought of as nature's gift to human beings. Icterus is treated with a variety of plant parts, containing herbs, shrubs, and trees. In line with World Health Organization,(WHO)"medicinal plant is a plant, within which one or more of its part contains the substances, which can be further used for various therapeutic purposes,andservesasaprecursororforchemo-pharmaceuticalsemi-synthesis"[7].Medicinal herbal formulations belong to the conventional systems of medication have been considered as liver protective agents from so long[2].

Ancient societies have used herbal medicines to promote health conditions including hepatoprotection. The reputation of herbal drugs is increasing, and at least 25% of patients with liver disease use medicinal plants. The World Health Organization estimates that 80% of the population of some Asian and African countries currently uses herbal medicines for some aspects of primary health care. Some medicinal plants create strong and optimal hepatoprotective effects. Given medicinal plants and plant antioxidants are used to detoxify and cure the liver disorders, this review was conducted to report the most important medicinal plants affecting liver disorders and diseases[3].

Icterus is a viral disease and spread through poor sanitation and contaminated water and foods in urban and rural areas of India. In this context, the present study is carried out with special focus on documentation of medicinal plants utilized by rural and tribal people for Icterus and hepatitis. Hepatoprotective properties have been attributed to numerous plants and formulas. Nearly there have been claims that 160 phytoconstituents from 101 plants have liver-protective properties[8].

3.5.1. *Acacia nilotica*

- Synonyms:- *Acacia arabica* (Lam.)

Willd. *Mimosa arabica* Lam.

Mimosa nilotica Linn.

English Name:- Babul, Black Babul,

Indian, Gum arabic tree

- Biological source

It obtains from plant *Acacia Nicoticalinn*. Belonging to family Fabaceae[9].

Plant part used are root, gum, stem bark, leaf, seeds, pods[10].

- Chemical Composition:-

The *Acacia nilotica linn*. contains presence of alkaloids, anthraquinones, cardiac glycosides, flavonoids, saponins, tannins, and terpenoids phenol and total flavonoid.[11] The leaves contain polyphenols, phytosterols, fixed oils, and fats. The root of plant catechin, gallic, caffeic and ellagic acids, quercetin, alkaloids, glycosides, tannins[9].

- Uses:-

The Bark of plant is used to treatment liver disorders such as a Icterus, and inflammation[9].

nilotica pods and provides evidence of anti hypertensive activities independent of muscarinic receptor stimulations[12].

Plant is broadly used for the dealing of many diseases such as earache, dysentery, diabetes and diarrhea, and as a tonic. The pods are also used for primogenital disorder treating impotency, and dry cough[12].

A cough, toothache, diarrhoea, dysentery, Icterus, and skin diseases can all be successfully treated with acacia[11].

3.5.2. *Abrus precatorius*:-

- Synonyms:- Marathi:- Gunja

Hindi:- Gunj

English: - Crab Eyed Creeper.

- Biological Source

It is obtained from *Abrus Precatorius linn*. belonging to family Fabaceae[13].

- Chemical composition

The roots of *abras* are rich in numerous chemical components such, and precasine, abrol, abrasine, precol. Serine, alanine, valine, choline, and methyl ester are just a few of the numerous essential amino acids that are abundant in seeds. Abrine, Abraline, Abrasine, Abricin, Abrin, Abrusgenic Acid, Abrusgenic Acid-methyl-ester, Abruslactone, Abrussic Acid, Anthocyanins, Calcium, Campesterol, Choline, Delphinidin, Gallic Acid Glycyrrhizin, and Hypaphorine are all harmful substances found in seeds. Pectin, Pentosans, Phosphorus, Delphinidin, Gallic-acid, N-dimethyltryptophan[13].

- Uses

Icterus and haemoglobinuric bile are both treated with the roots of the *Abrus* plant.[13]

3.5.3. *Aloe barbadensis*

- Synonym:-English:-Aloe

Hindi:-Kumari

Marathi:- Korphad[15].

- Biological source

It is obtain from fresh as well dry leaves of *Aloe barbadensis Miller*, Belonging to family Alliaceae[16].

- Chemical Composition

Aloe contains anthraquinones, chromones, polysaccharides, and enzymes as its active ingredients. The anti-cancer, anti-inflammatory, and evacuation properties are due to the chromones and anthraquinones. It has also been claimed that aloe vera gel contains the elements Al, B, Ba, Ca, Fe, Mg, Na, P, and Si, among others[16].

- Uses:-

It have Antifungal and Antidiabetic acitivity, It have Anti-inflammatory acitivity, Analgesic effect, it is shoes Anticancer, Antimicrobial acitivity, Antioxidant, Antiproliferative, Gastric mucosal protection, it shows Hepatoprotective activity, Neuroprotective, Hypolipidaemic, Immunomodulatory, Antimutagenic, Antileishmanial, Radioprotective and Wound healing[15].

3.5.4. *Arhenome maxicanal*

- Synonym: -English:-Mexican Poppy, Prickly poppy, Yellow Mexicanpopp

Hindi:-PhirangiDhotra

Marathi:-Satyanashi.[17]

- Biological Source

It is plant obtained from *Argemone Mexicana* belonging to family Papaveraceae[21].

- Chemical Composition

A. mexicana was shown to have a number of active phytochemicals in various plant sections, including berberine. Dehydrocorydalmine, Reticuline, Protopine, Allocryptopine, Chelerythrine, Sanguinarine, Argemoxine, Higenamine, Oxyberberine, methyloxysanguinarine, Pancorine. (±)-6-Acetyl Dihydrochelerythrine, Angoline, β-Amyrin, Cysteine, Phenylalanine, Isorhamnetin-3-O-β-D-Glucopyranoside, β-sitosterol, Dihydropalmatine Hydroxid. Argemone found in seed and also contains argemoneic acid, palmitic acid, stearic acid, myristic, oleic and linoleic acids, arachidic acid[21].

- Uses

Argemone mexicana has been used since ancient times and exhibits excellent pharmacological efficacy. According to conventional wisdom, the extract from the entire plant is effective for several pharmacological actions, including anti-fertility, influence on ileum constriction in guinea pigs, antimalarial, antifungal, cytotoxic, molluscicidal, and anti-HIV activity [21]. Bark and roots have hepatoprotective properties that are used to treat Icterus [18].

3.5.5. *Boerhaavia diffusa*

- Synonym:-Marathi:-Ghetuli,Vasuchimuli,Satodimula,Punarnava,Khaparkhuti,

Hindi:-Gadahpurna, Lalpunarnava, Snathikari, Biskhafra, Beshakapori

English:- Horse Purslane,spreading Hog – Weed.[19]

- Biological Source

Boerhaaviadiffusa commonly known as Punarnava belongs to family Nyctaginaceae. It is branched , prostrate herbs widely occurring as a weed allover India. [20].

- Chemical Composition

Flavone,C-methyl,2-O-Methyl, abron isoflavone ,isoflavone, borhaavone, palmitic, Isoflavone Tetracosanoic, hexacosanoic, stearic and arachidic acids, as well as quercetin and kaempferol. Boerhaavic acid and boerhaavin. Flavonoid, Boeravinones. Boeravinones G, H. BoeravinonesI, and J. E. diffuseroetic acid [24].

- Uses

B. diffusa is commonly used as, hepatoprotective, hypoglycemic, antifungalanti-inflammatory, immunostimulant, antioxidant, anti-proliferative, antiestrogenic, analgesic, antibacterial and other ethnopharmacological applications among local people and medical practitioners.

Leaves of plant used as hepatoprotectiveactivity due to 6, 11-dihydroxy-9-10dimethyl-4-methoxyrotenoid present in leaves[19].

3.5.6. *Bryophyllum pinnatum*

- Synonym: -Marathi:-Gayamari

Hindi:-: Zakhmhaiyat, Patharchoor

English:-Air plant

- Biological Source

Bryophyllumpinnatum plant belongs to family Crassulaceae, commonly used as traditional medicines. The name *Bryophyllumpinnatum* comes from the Greek words "Bryo" for sprout and "phyllon" for leaf[21].

- Chemical Composition

It consists ofBryophyllol, Bryophollone,Bryophollenone, and Bryophynol. The leaves are originated to hold several chemical constituents including 1-octane3-O- α -L-arabinopyranosyl-(1-6)-glucopyranoside isorhamnetin-3O-a-L-1C4-rhamnopyranoside[26].

- Uses

According to research, leaf juice has hepatoprotective properties and is also used to cure Icterus. [25]Anti-inflammatory, antiallergic, antianaphylactic, antileishmanial, antitumor, antiulcer, antibacterial, gastroprotective, immunosuppressive, insecticidal, muscle relaxant, sedativesystem depressant, and analgesic properties are all present in *Bryophyllum pinnatum*. It has historically been used to treat a variety of ailments, including fever, constipation, and hair nutriment [26].

3.5.7. *Carice papaya*: -

- Synonym: -Marathi:-Papai

Hindi:-Papita

English:-Papaya

- Biological source

It is obtained from the *Carica papaya* plant, a member of the Caricaceae family, and is frequently referred to as "papaya." [23].

- Chemical Composition

Carpaine, pseudocarpaine, and dehydrocarpaine I & II are alkaloids found in *Carica papaya* L. leaves. The drug Carpaine (first isolated by Greshoff in 1890)

The only difference between pseudocarpaine and carpaine's is the arrangement of the alcoholic carbon atom. In terms of melting point and rotation, it differs from carpaine. There are further reports of the occurrence of anthraquinone, choline, carposide, vitamin C, and vitamin E. The biological functions of these molecules are extremely diverse. Alkaloids including tannins, insulin, and other chemicals have been reported to accumulate in plant leaves, which may be where their therapeutic effects come from^[24].

- Uses

Seeds:- Carminative, emmenagogue, vermifuge, abortifacient, counterirritant, the paste of seed used in ringworm disease, psoriasis, antifertility agent in males.

Seed juice: - Bleeding piles and in large liver and spleen.

Root:-Abortifacient, diuretic, is checking irregular bleeding from uterus and piles.

Leaves:-Icterus, urinary complaints, urinary tract infection, gonorrhoea, dressing wounds, antibacterial action, abortion, and asthma are among the conditions for which young leaves are used.

Flowers:-Emmenagogue, Icterus, febrifuge and pectoral properties.

Stem bark: -Icterus, antifungal activity, antihelmintic activity.[27]

3.5.8. *Cajanus cajan*

- Synonym:-Marathi:- Toor

Hindi:-Arhar

English:- Pigeon pea[25].

- Biological Source

Cajanus Cajan, a member of the Fabaceae family, provides it. In tropical and subtropical parts of the world, the pigeon pea plant, or *Cajanus cajan*, is farmed as a food crop[26]

- Chemical Composition

The chemical components found in *c.cajan* leaves are rich in stilbenes and flavonoids. Additionally, it has saponins, a notable amount of tannins, as well as modest amounts of reducing sugars, resins, and terpenoids. According to chemical investigations, there are isoflavones, cajanin, cahanones, 2'-hydroxy genistein, and 2'-methyl cajanone[31].

- Uses

Plants have a variety of medical qualities, including those that are anti-bacterial, anti-microbial, anti-inflammatory, hypocholesterolemic, anti-diabetic, anti-cancer, neuroactive, antioxidant, hepatoprotective, anthelmintic, glycemic, and many others. Its extracts, which include polyphenols, luteolin, apigenin, isorhamnetin, flavonoids, cajaninstilbene acid quercetin, , etc., are highly useful for treating diabetes, bronchitis, bladder stones, diarrhea, ulcers, and Icterus[26].

3.5.9. *Cassia angustifolia*

- Synonym: -Marathi:-sonamukhi

Hindi:-Senna

English:- Indian Senna.[28]

- Biological Source

Senna is broadly used for its abundant benefits. Scientifically, it is known as *Cassia angustifolia*, and belongs to family Leguminosae. There are a number of species of Senna used throughout the world for medicinal purposes. Indian senna is obtained from cultivated plants mainly in Asian country like South India [31]

- Chemical Composition

Sennoside A, B, C, and D are chemical components of *Cassia angustifolia*. Diglucosides of sennidins called sennosides are found in the leaf and pod of this plant. Senna has been linked to several sennosides, according to reports. Senna also contains myricyl alcohol flavonoids, phytosterols, salicylic acid, chrysophenic acid, mucilage, resin, and calcium oxalate in addition to naphthalene glycosides (tinnevellin glycoside and 6-hydroxy musizin glycoside) [33].

- Uses

Senna (*Cassia angustifolia*), a moderate laxative, is also used to treat epilepsy, black Icterus, hepatitis, herpes simplex, skin cracking, migraine headaches, hair loss, lice, scabies, skin pimples, itching, and angina of the heart (angina pectoris). Senna also purifies the yellow and black bile[32].

3.5.10. *Curcuma angustifolia*

- Synonyms:-Marathi:-Tevakeera

Hindi:--Tekhur, tikhur

English:--East Indian arrow root, Curcuma starch^[30]

- Biological source

It is obtain from plant *Curcuma (C.) angustifolia* belonging to family Zingiberaceae, commonly known as East Indian Arrowroot, is widely grown throughout the Central, Southern and Eastern India[31].

- Chemical Composition

The main active components of the rhizome are the nonvolatile curcuminoids and the volatile oil[32].

C. angustifolia also contain secondary metabolites such as alkaloids, flavonoids, terpenoids, phenols, tannins, saponins, curcumin, steroids, glycosides, and oils. It also contains starch, glucose, sugar, sesquiterpenoids[30].

- Uses

Rhizome pulp, commonly use to cure hepatic disease like Icterus. Rhizome pulp is also used for the prevention of headache and also gives cooling effects. Starch of *C. angustifolia* used as Tugaksheeree is an essential ingredient in many Ayurvedic medicines. The Indian tribal people largely used the rhizomes of the *C. angustifolia* plant to treat inflammation, bone fractures, and digestive ailments. The plant *C. angustifolia* has a range of pharmacological properties, including as anti-inflammatory, anti-microbial, antifungal, and antioxidant properties[31].

3.5.11. *Eclipta alba*

- Synonym: -Marathi: -Bhringraj

Hindi:-Bhangara

English: - Trailing Eclipta

- Biological Source

It is obtain from plant *Eclipta alba* (L.) Hassk. Belonging to family Asteraceae, a small, branched annual herb with white flower heads, is native to the tropical and subtropical regions of the world[33].

- Chemical Composition

This species contains a wide range of chemical components that have been extracted, including alkaloids, coumentans, flavonoids, polyacetylenes, triterpenes, and thiopenes[35].

Leaves: -

Stigmasterol, a-terthienymethanol,

Roots:-Hentriacontanol, Heptacosanol&Stigmastero, Ecliptal

Aerial parts: - β -amyrin & Luteolin-7-0-glucoside, Apigenin, Cinnaroside, Sulphur compounds.

Stems: - Wedelolactone

Seeds:-Sterols

Whole plant:-bulky amounts of resin, Ecliptine, Reducing sugar⁶, Nicotine, Stigmastero, Triterpene saponin, Eclalbatin together with a-amyrin, Ursolic acid, Oleanolic acid [37]

- Uses

It is used as a tonic and diuretic in hepatic and spleen enlargement. Additionally, it is used in treatmentskin conditions and catarrhal Icterus. The plant is frequently used in hair oil all over India for healthy black and long hair. The fresh juice of leaves is used for stimulating appetite, increasing movement of digestion and act as a mild bowel regulator. The plant has a standing antiageing agent in Ayurveda. *Eclipta alba* is used as a general tonic for debility. Externally it is also used for inflammation, minor cuts and burns and the fresh leaf juice is considered very effective in stopping bleeding [37].

3.5.12. *Emblia officinalis*:-

- Synonym: -Marathi: - Amla

Hindi: - Amla

English:- Emblic myrobalan^[36].

- Biological Source

It is also known as *Phyllanthus emblica* or Indian gooseberry and is derived from the Euphorbiaceae plant *Emblia officinalis*. Amla is a native of India and also grows in Pakistan, Sri Lanka, South East Asia, China, Uzbekistan, and Malaysia in tropical and subtropical climates [40].

- Chemical Composition

The most well-known and extensively researched plants include amla. Alkaloids, phenols, and tannins are among the many biochemical components that have been found to be present, according to research. Fruit contains about 28% of the plant's total tannic content. Emblicanin A and Emblicanin B are the two hydrolysable forms of this tannin, both of

which are antioxidants. Emblicanin A hydrolyzes to make ellagic acid, glucose, and gallic acid, whereas Emblicanin B only produces ellagic acid and glucose. Phyllembin can also be found in this fruit. Other fractionation revealed a large number of additional phytochemical components[38].

- Uses

The fruits have a variety of medicinal properties, including those listed below: aphrodisiac, carminative, digestive, stomachic, laxative, alterant, aphrodisiac, rejuvenative, diuretic, antipyretic, and tonic. They are beneficial for treating vitiated conditions such as tridosha, , dyspepsia, colic, flatulence, hyperacidity, peptic ulcer, erysipelas, skin diseases, diabetes, cough, asthma, cephalalgia, ophthalmopathy, leprosy, haematogenesis, bronchitis, inflammations, anaemia, emaciation, hepatopathy, Icterus, stran[40].

3.5.13. *Ficus hispida*

- Synonym:-Marathi:-bokeda, bokhada, bokheda, dhedumbar,

Hindi:-Gobla

English:-Rough-leaved fig or hairy fig

- Biological Source

It is obtained from plant *Ficus Hispida linn* belonging to family Moraceae *Ficus hispida linn*. (FH) is a valuable plant due to its various pharmacological activities. It is a rough leaves[39].

- Chemical Composition

Phenanthrolindolizidine alkaloids, triterpenoids, flavonoids, oxyterpene, n-alkanes, coumarins, tannins, and saponins make up the majority of the plant. Oleanolic acid, bergapten, -sitosterol, -amyrin, and hispidin can all be found in the leaves and roots of *F. hispida*. The bark contains triacontanol acetate, lupeol acetate, -amyrin, and 10-ketotetracosyl arachidate. the fruit are 2,6-dimethyl-1,7octadiene-3,6-diol, linalool, linalool oxide, terpeneol, and linalool.

The plant also contains icusin A, ficushispidine, hispiloscine, N-triacontanyl acetate, and ficushispimines A and B[41].

- Uses

The plant is bitter, astringent and anti-dysenteric and in imitation of hold recreation against piles, Icterus, psoriasis, anemia, then hemorrhage.

Fruit used as:-

The juice is used as a light purgative and as a cooling. From a medical standpoint, the base and leaves are particularly interesting since they have an antidiarrheal and anti-inflammatory activity, and the juice is an excellent anti-hemorrhagic.

Almost all parts of the crops are employed as medicinal drugs in Indian folklore to treat a variety of illnesses. The plant is renowned for its ability to protect the liver in rats and for acting as a powerful antioxidant to prevent anomalies in the rat heart caused by cyclophosphamide [45]

4. Conclusion

In this review we have presented the scientific appraisal of 13 medicinal plants used as traditional medicine for the treatment of Icterus. The effect of medicinal plants against the icterus has been summarized. Beside review of hepatoprotective efficacy, other uses of this plant are mentioned.

Our review highlights that the medicinal plants used in traditional medicine are rich sources of medicinally active chemical constituents such as phenols, coumarins, lignans, terpenoids, carotenoids, glycosides, flavonoids, organic acids, alkaloids, and xanthene. etc possess potent hepatoprotective activity and used in treatment of Icterus.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest.

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