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Some Important Hepatoprotective Medicinal Plants In *Ayurveda*- A Review

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ABSTRACT:

The liver is the chief site of Metabolism of nutrients and energy production in the human body. Environment, pathogenic micro-organisms, viruses, drugs and chemical agents are the main factors of the many type of Liver disease. Hepatic necrosis, Hepatitis, Liver fibrosis and Liver cirrhosis etc. are the common disease found in the community related to the liver. *Berberis aristata, Andrographis paniculata, Achyranthes aspera* etc. plants are renowned for their satisfactory activity against certain hepatic related diseases. About 80% of the world population relies on the use of traditional medicine, which is predominantly based on plant material. The present review discusses different types of medicinal plants in *Ayurveda* containing hepatoprotective activity with other important activities too. Therefore, the present review is aimed to compiling data on hepatoprotective medicinal plants.

Key words: Medicinal Plants, Hepatoprotective Medicinal Plants, Traditional Medicine, Herbal Drugs.

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INTRODUCTION:

The liver plays a major role in detoxication and excretion of many endogenous and exogenous compounds. Any impairment to its functions may lead to many implications on one's health. The global crude annual incidence rate for liver disease is 14 per 100000 populations, while standardized annual incidence rate is 8.1 per 100000 and recent reports have shown that 10% of world population is affected with liver diseases[1]. Considering the above problems, hepatoprotective Herbal Medicine should be studied. The Herbal medicines to treat the hepatic problems are increasing day by day in the world. Herbal medicines are considered as a Harmless, no any more side effect and the less Adverse effects[2]. It is estimated that about 7,500 plants are used in local health traditions. Out of these, the real medicinal value of the 4,000 plants is either little known hitherto unknown to the mainstream population. The classical systems of medicine such as *Ayurveda, Siddha, Amchi, Unani* and *Tibetian* use about 1,200 Plants. A detailed investigation and documentation of the plants used in the local traditional and pharmacological evaluation of these plants and their taxonomical relatives can lead to the development of the invaluable plants drugs for many dreaded diseases. Random screening of the plants has not proved economically effective[3,4].

MATERIAL AND METHODS

A Bibliographic investigations were done by analyzing Articles, Classical Text Books, Peer-reviewed paper, Google Scholar, Hinari, PubMed., Reference

books, Worldwide accepted scientific databases. The Hepatoprotactive Drugs, Antihepatitis Herbal Medicine, Hepatic Diseases, Traditional Medicinal Plants, words were used to search in the Online Databases.

1.1 Achyranthes aspera Linn.

Achyranthes aspera Linn. belonging to the family Amaranthaceae is a stiff erect annual herb. Stems are angular, ribbed, and simple or branched from the base, often with tinged purple colour, branches terete or absolutely quadrangular, striate, pubescent with thick leaves. The plant grows in tropical and warmer regions. It is found in tropical asian and africian countries[5,6]. The plants have been reported to contain fatty acids[7] oleonic acid, bisdesmosidic[8] triacontanol[9], spinasterol[10], dihydroxy ketones, spathulenol, alkaloids, D-glucuronic, Betaine, Achyranthine and various amino acids[11]. All parts are useful but in *Ayurveda*, The useful part of *Apamargha* plant is Seeds, Roots and Shoots are the most which are mainly used for medicinal purpose[12]. The Plant is used for the antiperiodic, antiasthmatic, hepatoprotective, antiallergic, expectorant, stomach tonic, laxative, antihelmintic, diuretics, linthontriptic, sudorific, demulcent, anti-inflammatory, anticataract, antifungal, antibacterial, hypoglycemic, antihyperlipidemic and haematinic action[13,14].

1.2 Andrographis Paniculata Nees.

Andrographis paniculata Nees. belonging to the Acanthaceae family. It is an annual and branched plant with lanceolate green leaves and attains heights of 60-70 cm[15]. It grows abundantly in Asian countries like India, Nepal, Sri Lanka. In India it is commonly known as *kalmegh* and is one of the commonly used medicinal plants in *Ayurvedic* and *Unani* system of Medicines. The Plant is also Known as the king of Bitter[16,17]. The phytochemical constituents chemical in the aerial parts of the *Andrographis paniculata* are andrographolide, which is diterpene lactone, colourless crystalline, bitter in taste[18]. Other compounds include 14-deoxy-11-oxoandrographoide, didehydroandrographoide/ andrographoide D, 14-deoxyandrographolide, non-bitter compound is neo andrographolide, homoandrographolide, andrographosterin, andrographolide, stigmasterol. Apigenin-7, 4-dio-methyl ether, 5-hydroxy 7,8,2,3-tetramethoxy flavones, monohydroxy trimethyl flavones, andrographin,

dihydroxy di-methoxy flavoue, panicolin, andrographoneo, andrographoside, andropani-culoside A[19,20,21]. The Chemical constituents of *Andrographis paniculata* was reported to improve gall bladder function, increase bile flow and has been found as liver protective. It also shows anti-diabetic effect[22].

1.3 Berberis aristata DC.

Berberis aristata DC. belonging to family Berberidaceae, is a medicinal plant that is native to Nepal, India, Pakistan, Bhutan. It is a large deciduous shrub, usually 1.7-3.5 m in Height. The plant has glossy dark green and ovate leaves, stalked flowers and woody, yellowish brown roots with thin covering of Bark[23,24,25,26]. The roots, stems, leaves and fruits of *B. aristata* are traditionally used to treat Wounds, Diabetes, Inflammations and Jaundice[27,28,29]. The Chemical constituent of Berberis is berberine[30], xyacanthine, berbamine, berberrubine, columbamine, isotetrandrine, jatrorhizine, zyacanthine, palmatine, stigmasterol glucoside, carbohydrates, organic acids, some vitamins, polyphenolic compounds, pectin, tannin and mineral elements. The most important constituents of the plant is berberine, a quaternary isoqiunoline alkaloid that is typically found in the roots and stems[31,32,33,34,35]. Clinical trials on this alkaloid have established its therapeutic effects against Cholera, severe diarrhea, amoebiasis, malaria, neurological and cardiovascular disorders[36,37,38]

1.4 Cichorium intybus Linn.

Cichorium intybus Linn. plant belonging to family Asteraceae. The Plant is widely distributed in Africa, Asia-temperate, Asia tropical Europe, Austrelia, Northen America and Southen America[39]. This is the Herbeceous plant 40-110 cm tall, perennial, with a strong taproot. Stem usually solitary, erect; branches spreading ascending, subglabrous. basal leaves rosulate, obovate to oblanceolate[40]. Phytochemical analysis showed that the different parts of the plant contained sesquiterpene lactones (especially lactucin, lactucopicrin, 8-desoxy lactucin, guaianolid glycosides, including chicoroisides B and C, sonchuside C), caffeic acid derivatives (chiroric acid, chlorogenic acid, isochlorogenic acid, dicaffeoyl tartaric acid), inulin, sugars, proteins, hydroxycoumarins, flavonoids, alkaloids, steroids, terpenoids, oils, volatile compounds, coumarins, vitamins and polyynes[41,42,43]. The parts used of the Plant

is Aerial part, flowers, seeds and roots. This Plant is used for the treatment of diarrhoea, to strengthen the prostate and other reproductive organs, for the treatment of pulmonary disease and cough, cancer, hangover, for purification of biliary tract, liver complaints, as spasmolytic, to relief of symptoms related to mild digestive disorders traditionally[44,45].

1.5 Mahonia nepalensis DC.

Mahonia nepalensis DC. belongs to the family Berberidaceae. It is medium sized fully hardy perennial evergreen shrub with yellow flowers in winter, have a compound leaves, spineless stem and inflorescence of several dense spikes. This shrub has an ultimate height of 6m/19.7ft. Its origin is in Nepal. It is widely distributed in the high mountainous areas at altitude of 1000-2000 m in Nepal, Sikkim, Bhutan, China, Vietnam[46,47].The stem and wood of this plant have anti-inflammatory, anti-bacterial, anti-fungal activity. It is particularly used for the treatment of skin disease like eczema, psoriasis, etc. This plant contains alkaloids as the major compounds which belong to the class protoberberines and bisbenzylisoquinoline[46], Berberin[48]. Jattrrorzhine, O-methyl puljabine[49], Isotetradine, Homoaromaline etc. were isolated from the stem of this plant[50].

1.6 Nyctanthes arbor-tristis Linn.

Nyctanthes arbor-tristis Linn. is an erect shrub or a small tree of the family of oleaceae growing upto 10 m. *Nyctanthes arbor-tristis* Linn. is a widely spread plant from Northen Pakisthan, Nepal, South and North India and Thailand. *N. arbor-tristis* is a beautiful and fragrant plant. It flowers bloom at night, drop off and fall early next morning for this reason it is called as 'sad tree'. It is used in traditional medicine as stomachic, carminative, intestinal astringent, expectorant, in biliousness, piles, and various skin diseases and hair tonic[51]. The important phytochemicals in medicinal plant D-Mannitol, Tannin, Linoleic acid, Flowers contains Essential oil, tannin, glucose, caratenoid and glycosides. Seeds contains Arbortristoside A and B, Glycerides of linolelic, oleic, steraric, palmatic and myristic acids[52]. It has also been reported to possess hepatoprotective, anti-viral, antifungal[53] and analgesic, anti-pyretic, ulcerogenic activities[54]. *Nyctanthes arbor-tristis* are very useful to provoke menstruation, treatment of scabies and other skin infections, as hair tonic, chalogogue,

laxative, diaphoretic, diuretic, treatment of arthritis, malaria, bronchitis and anti-helmintic[55].

1.7 Taraxacum officinale Linn.

Taraxcum officinale Linn. Belonging to the family Asteraceae. It part used is Root. The Chemical constituents of this plant shows the hepatoprotective actions[56,57]. *Taraxacum officinale* contains large amounts of polysaccharides (Primarily fructosans and inulin), smaller amounts of pectin, resin, and mucilage and various flavonoids[59]. Three flavonoid glycosides, luteolin 7-glucoside and two luteolin 7-diglucosides, have been isolated from the flowers and leaves. Hydroxycinnamic acids, chicoric acid, monocaffeyltartic acid and chlorogenic acid are found throughout the plant, and the coumarins, cichoriin, and aesculin have been identified in the leaf extracts[59]. The Chemical constituents of the root of this Plant is pentacyclic triterpenoids of which taraxasterol and taraxerol are important compound that possess important pharmacological activites. Taraxerol has been used as anti-microbial potential, anti-allergic, anti-oxidant and anti-inflammatory and anti-carcinogenic. Also these compounds are known for their activity in Alzheimer's[60].

1.8 Tecomella undulata (Sm.) Seem

Tecomella undulata (Sm.) Seem is the tree belonging to Bignoniaceae is a medically and economically important plant that originated in India, Arabia[61]. The Chemical constituents of *Tecomella undulata* is iridoid glucoside undulatin assigned as 4'-O-P-coumaroyl-7, 8-dihydro- 8-dehydroxymethyl bartsioside structurally by chemical and spectroscopic analysis. Presence of quinonoid in heartwood and an iridoid glucoside, 6-O-veratryl catalposide from the plant[62,63]. It is found that traditional medicinal practitioners uses *Tecomella undulata* for the treatment of ailments like cancer, snake bite, skin disorders, gastrointestinal disorders, respiratory tract disorders, gynecological disorders, hepatic disorders, epilepsy, cholera, pain, urinary problems, malaria, heart problem and sexually transmitted diseases[64]. The Plant have the activitiy on analgsics, anti-inflammatory[65]. and stem bark have the Hepatoprotective activity[66].

1.9 Tephrosia purpurea Linn.

Tephrosia purpurea Linn. is a plant which belongs to family Fabaceae. *Tephrosia purpurea* is commonly known as wild indigo. *Tephrosia purpurea* is a branched,

suberect, slender, herbaceous perennial herb, found in dry, gravelly or rocky sandy soil. These plants has branched, suberect, slender, herbaceous perennial green climber. *Tephrosia purpurea* plant possess antibacterial and antifungal property. The plant is well documented in various traditional system of medicine to cure diseases as bronchitis, wounds, pimples, boils, inflammation, liver disorders[67]. The whole plant have rich of flavonoid and polyphoenol content[68]. The whole plant and its roots are used for medicinal purposes. This plant parts have been used for hydrophobia, asthema, cough, heart disease and kidney problems. The plant has antipyretic-inflammatory depurative, styptic, alexiteric and antipyretic properties, also used in thermogenic, antihelminthics, digestive, laxative, diuretics and as antioxidents[69.70].

DISCUSSION AND CONCLUSION

Liver diseases which are still a global health problem may be classified as acute or chronic hepatitis, hepatosis and cirrhosis. Liver diseases are mainly caused by toxic chemicals such as certain antibiotics and Excess consumption of alcohol also affects liver. This study compiled the some important medicinal plants in *Ayurveda* which are active in Hepatoprotactive and other medicinally important for different diseases. In Conclusion, The aim of this review is to document medicinal plants having Potential Hepatoprotective action and other action given in *Ayurveda.* This article may help to the researchers, Pharmaceutical companies and Investigators to further uses of these Plants in the Clinical research Purpose and further to Prepare the Effective Hepatoprotective Drugs.

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