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A REVIEW ON PHOTOCHEMISTRY AND PHARMACOLOGICAL ACTIONS OF YASTHI MADHU

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ABSTRACT

Plants are the most important sources of medicines for human being and animals. Yasthi Madhu is also known as Glycyrrhiza Glabra. It is also known as Liquorice and Sweet Wood. Glycyrrhiza Glabra is a herb belonging to the Family Leguminosae. The Mediterranean and certain areas of Asia is the native of Yasthi Madhu. This plant consists of different Phytoconstituents such as glycyrrhizin, 18β-glycyrrhetinic acid, glabrin A and B, and isoflavones, they are demonstrated various Pharmacological actions. The Pharmacological actions are demonstrated that different extracts and pure compounds from this species exhibit a board range of biological properties, including Antibacterial, Anti-Inflammatory, Antiviral, Anti-oxidant etc. The article object to comply all the updated information on its Phytochemistry and Pharmacological actions which are performed by various methods. It also possess various actions such as Antibacterial, Antioxidant, Antimalarial, Antispasmodic, Anti-inflammatory, Anti-hyperglycemic properties are discussed.

KEYWORDS: Glycyrrhiza glabra, Chemical constituents, Pharmacological actions, Phytochemistry, uses.

INTRODUCTION

Herbal medicines are in great demand in the developed world for the primary health care because of their Efficacy, safety and they have lesser side effects. Glycyrrihza is derived from

the Greek term glykos meaning Sweet, and rhiza means Root. Glycyrrhiza glabra is also known as Liquorice and Sweet wood.

Many traditional healers have claimed the efficacy and safety of Glycyrrihza species for a variety of pathological conditions such as choleretic, diuretic, used as insecticide, and used as the medicine for the cold, coughs, and painfull swellings. The Glycyrrhiza glabra native to the Mediterranean and certain areas of the Asia.

Scientific classification

Kingdom: Plantae

Division: Angiospermae

Class: Dicotyledoneae

Order: Rosales

Family: Leguminosae

Genus: Glycyrrihza

Species: Glabra Linn

Fig. 1: Yasthi Madhu.

Binominal Name: Glycyrrhiza glabra Linn.

Synonyms: Glycyrrhiza glandulifera, Liquorice, Sweet Wood.

Vernacular Names:

Sanskrit: Yasthi-madhu, madhuka

Bengali: Jashtimadhu, Jaishbomodhu

Gujarat: Jethimadhu

Hindi: Jothi-madh, mulaithi

Kannada: Yasthimadhuka, atimaddhu

Malayalam: Iratimadhuram

Marati: Jeshtamadha

Oriya: Jatimadhu

Tamil: Atimadhuram

Telugu: Atimadhuram, Yashtimadhukam

English: Licorice, Liqorices, Sweet Wood

Habitat

Yasthi Madhu plant is cultivated in Russia, UK, USA, Italy, France, Germany, Spain, China and Northern India (Punjab and Sub-Himalayan tracts). It is widely distributed in the Southern Europe, Syria, Iran, Afghanistan, Russia, China, Pakistan and Northern India. Large scale Cultivation is seen in Spain and England.

Morphology

It is a herb, the leaves are imparipinnate, Multifoliolate. The flowers are in axillary spikes, Papilionaceous. The colour is violet in colour. The pods are compressed and contain seeds. The roots are stout, throws off a large number of perennial roots. The dried, peeled and unpeeled underground stems and roots contains the drug known as Licorice.

Fig. 2: Morphology of Yasthi Madhu.

Leaves, Stem and Root

- It is a herbaceous Perennial. It is 1-2 meters high and has a long primary taproot.
- It is 15 cm long and it subdivides into 3-5 subsidary roots.
- There are many woody stolons, it may reach 8m.

- They are erect, branched either from the base and are generally rough at top.
- The leaves are alternate, odd pinnate and 10-20cm long.

  Flower and fruit:
- The inflorescences are upright and spike-like.
- The flowers are 1-1.5cm in long, bluish to pale violet.
- The calyx is bell-shaped and glandular-haired.
- The tips of the calyx are pointed lanceolate and longer than the tube.
- The fruit is 1.5-2.5cm long, and it is a pod.

Therapeutic uses

1. Piles- It is used in piles patients. The Ghrita mixed with Yasthimadhu should be applied.
2. Constipation- It is used in constipation. In case of pain in head and shoulders the parts should be sprinkled with milk and decoction of madhuka.
3. Hoarseness of voice- It is used in hoarseness of voice. It is prepared by mixing the Yasthimadhu with Ghrita should be taken.
4. Hiccough- It is used to reduce the hiccoughs. It can be used in 2 methods Madhuka mixed with honey and Pippali mixed with fine sugar.
5. Thirst- Ghrita extracted from milk meat-soup or decoction of Madhuka.
6. Retention of Urine- Madhuka with the seeds of Ervaru should be taken with rice water.
7. Accidental Wound: By applying warm Ghrita mixed with Yasthimadhu can remove accidental wound.

Side Effects of Yasthi Madhu

- The chemicals in Licorice are thought to decrease swelling, decrease cough and increase in our body.
- The people may develop muscular problems, weakness and headaches.
- It can result in the presence of myoglobin protein in the urine.

Phytochemistry of Yasthi Madhu

Glycyrrhiza glabra roots consists of various active compounds including flavonoids, such as the Liquiritin, rhamnoliquirin, Liquiritigenin, prenyllicoflavone A, glisoflavone, Licoarylcoumarin, Coumarin-GU-12 and Saponins namely glycyrrhizin. In addition four Isoprenoid-substituted phenolic constituents are present they are (Isoagustone A, semillicoisoflavone B, Licoriphenone, and 1-methoxyficifolinol).

The raw and tea licorice infusions contains protein, fat, raw ash, silica, fiber, carbohydrates, minerals such as calcium, phosphorous, sodium, potassium, copper and zinc and some amino acids such as aspartic, valine, serine, glycine, lysine, tyrosine, leucine, phenylalanine, histidine and tyrosine are present.

The main chemical constituents of Yasthi Madhu are Saponins, flavonoids, Coumarins, Chalcones, minerals, volatile compounds and essential oils.

Saponins

The Saponins are the structurally and functionally the largest group of secondary metabolites, they are produced in plants and play a very critical role in the plant defence mechanisms. On mixing with the water, they show the foaming ability and due to this unique property of Saponins they are called Saponins meaning ‘Soap’. Chemically the Saponins consists of the Triterpenoids, Steroids and Steroidal Glycoalkaloids.

The new Triterpenoid Saponins are uralsaponin-F, uralsaponin-V, uralsaponin-D, licorice-saponin-G2, licorice-saponin-H2, Licorice-saponin-K2, Yunganoside-K2 and 3-O-β-d-glucuronopyranosyl-glycyrrhentic acid.

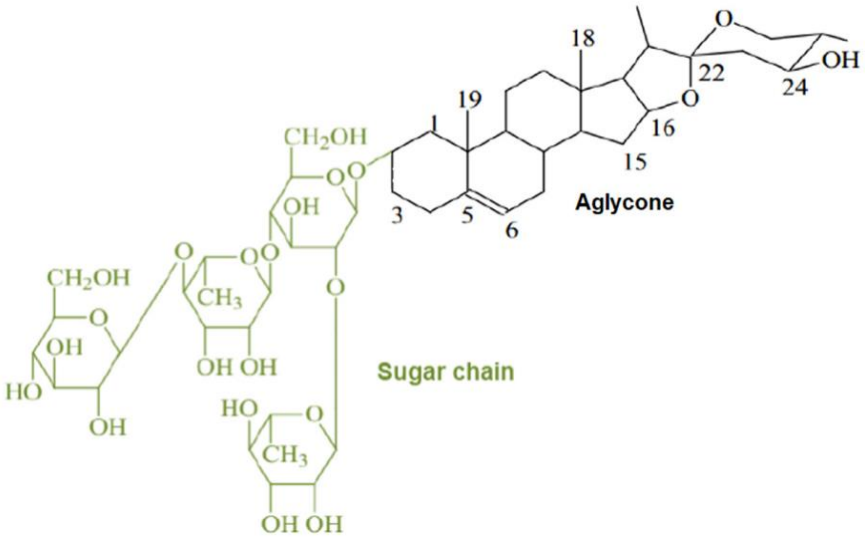

Fig. 3: Saponin chemical constituents of Yasthi Madhu.

Flavanoids

The flavonoids are the low molecular weight phenolic phytochemicals are synthesized. The colour of the licorice roots are retained by flavonoids. The major group of flavonoids are

isoflavones, flavones, isoflavane and flavanones. The chemical structure and well-known pharmacologically active flavonoids are reported from licorice.

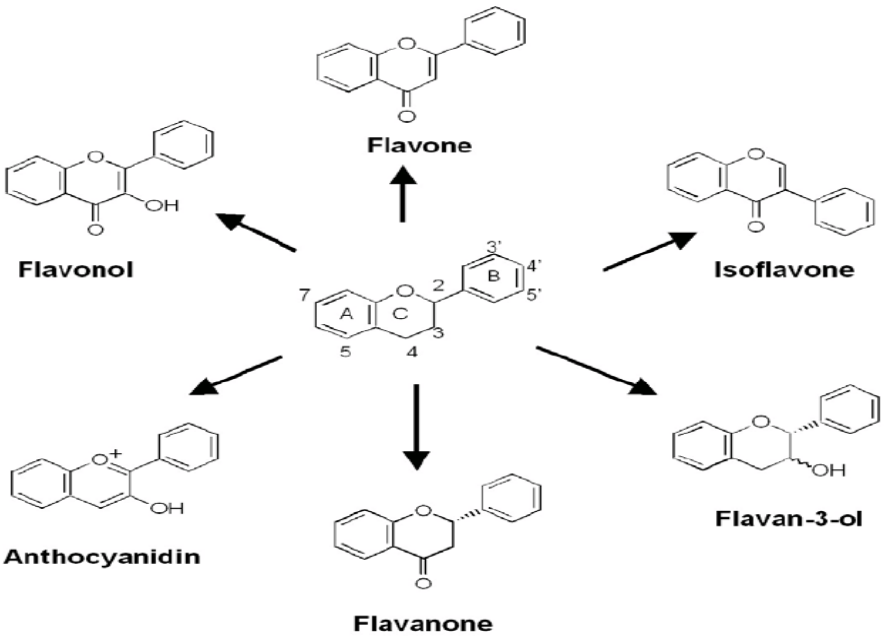

Fig. 4: Flavanoids chemical constituents of Yasthi Madhu.

Coumarins

Coumarins are naturally occurring heterocyclic compounds that are made by the fusion of benzene ring to the α-pyrone ring. Several Coumarins from different species of licorice such as glycyrol, glycerin, glycycoumarin, isoglycyrol, glabrocoumarnone-A, glabrocoumarnone-B, licofuranocoumarin, glabrocoumarin, herniarin, licocoumarone.

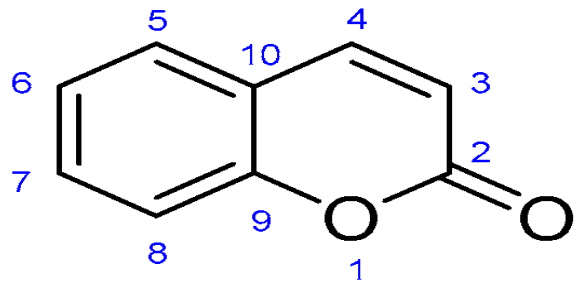

Fig. 5: Coumarin chemical constituent of Yasthi Madhu.

Pharmacological actions of Yasthi Madhu

Glycyrrhiza glabra is one of the oldest and most herbal medicines in the world. There are many uses of licorice plant. The most important pharmacological actions of Glycyrrhiza Glabra.

The pharmacological actions are

1. Antioxidant activity

The antioxidant activity of Glycyrrhiza Glabra is one of the reason for its uses. The phenolic content of Glycyrrhiza glabra is responsible for the powerful antioxidant activity observed attributed this activity to flavonoids, isoflavones such as hispaglabrin A, glabrin and 30-hydroxy-4-O-methylglabrin are responsible compounds.

The phenolic compounds are more effective in the protection of biological systems against oxidative stress, it inhibit's the onset of action of skin damages.

2. Anti-Malarial activity

The licorice consists of Licochalcone A is responsible for the Anti-malarial activity. It eradicate the malarial parasite completely.

3. Anti-Fungal activity

The Glycyrrhiza glabra possess the good antifungal activity. Licorice extract with 80% of methanol was found to possess the high fungicidal effect against the Arthrinium sacchari M001 fungi.

4. Immunostimulatory activity

The Glycyrrhiza glabra at 100µg/mi concentration possess Immunostimulatory effects. The licorice root extract was found to prevent the rise in the amount of immune complexes related to the autoimmune diseases.

5. Peptic ulcer activity

The peptic ulcer activity is done on the licorice root. The potent in vitro activity of the Glycyrrhizic acid against the H. pylori concludes the beneficial effect on the peptic ulcers.

6. Anti-Inflammatory activity

The Glycyrrhetinic acid in licorice extracts gives the anti-inflammatory effect similar to the Glucocorticoids and Mineralocorticoids. The licorice root extracts promotes the healing of stomach and mouth. Glycyrrhizic acid inhibits factors responsible for the inflammation.

7. Anti-Viral activity

The Oral liquorice preparations containing the glycyrrhetinic acid are used for the treatment of the viral infections, viral hepatitis and common cold.

8. Anti-Thrombic activity

The in-vivo effects of Glycyrrhiza glabra extract and combined with vitamin k and Heparin were evaluated in the rats. It is found that the bleeding time is increased when the extract is given in doses. This indicates that Glycyrrhiza glabra is an effective Anti-Thrombic activity.

9. Anti-Carcinogenic activity

The extract of Glycyrrhiza glabra may be potential supplemental source for different cancer treatments. This activity is due to the 18β-glycyrrhetinic and glycyrrhizic acid that induces the mitochondrial permeability transition.

10. Skin Lightening activity

The extract of liquorice is an effective pigment lightening agent. The liquorice extracts such as glabrene, isoliquiritin, Licochalcone are responsible for inhibition of the tyrosinase activity. Liquiritin disperse the melanin, thereby inducing the skin lightening activity.

CONCLUSION

Yasthi Madhu is also called as the Glycyrrhiza glabra. It consists of many phytochemical molecules. Which are isolated from the Glycyrrhiza glabra. Glycyrrhizic acid, 18-β-glycyrrhetinic acid, glycyrrhizin, Saponins, flavonoids, Coumarins and licochalcones are the main constituents of the Glycyrrhiza glabra extracts.

The pharmacological actions present in this review confirm the therapeutic value of Glycyrrhiza glabra. Presence of some chemical compounds that indicates the plant could serve as ‘lead’ for the development of novel agents for disorders in the coming years. The presence of the chemical constituents show various Pharmacological Actions on anti-malarial activity, anti-viral activity, anti-oxidant activity, anti-carcinogenic activity, anti-Thrombic activity, anti-inflammatory effect, Immunostimulatory activity and anti-fungal activity.

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