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A brief review on pharmacological, phytochemical study on glycyrrhiza glabra

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Abstract---Flora has been one of the crucial assets of drug treatments considering the start of human cultivation. There may be a developing demand for plant-based medicines, health products, pharmaceuticals, meals dietary supplements, cosmetics, and so on. An overview of chemical components presents in numerous parts of Glycyrrhiza glabra and their pharmacological action is given in the present article. Glycyrrhiza glabra Linn is a usually used herb in Ayurvedic medicinal drug. Even though the assessment articles in this plant are already published, this evaluation article is supplied to comply with all of the updated data on its phytochemical and pharmacological sports, which have been executed through broadly special strategies. Research indicates that Glycyrrhiza glabra Linn possesses antibacterial, antioxidant, antimalarial, antispasmodic, anti-inflammatory, and anti-hyperglycemic homes. Diverse different results like antiulcer, antiviral, antihepatotoxic, antifungal, and herpes simplex have additionally been studied. These effects are very encouraging and indicate this herb ought to be studied greater drastically to verify those consequences and monitor different ability therapeutic consequence.

Keywords---Glycyrrhiza glabra, Antibacterial, Antimalarial Antioxidant, Glycyrrhizin, Liquorice, Expectorant, Biological activity.

Introduction

It's far interesting to discover that even to these days liquorice is preserving its vicinity in medication and pharmacy. Liquorice continues to be used as a pharmacological agent as well as an aspect in tobacco and confectionery at some stage in India inside the East and West. For many centuries China has used

large quantities of liquorice, and many preparations of it are nonetheless in Chinese language apothecary shops. Research over the past 50 years have yielded statistics which has induced new hobby inside the pharmacological and physiological results of this plant. The principles taproot, that is harvested for medicinal use, is gentle, fibrous, and has a bright yellow interior. In conventional Siddha machine of drugs, liquorice is used as a demulcent, expectorant, anti-tussive, laxative and sweetener. In old Chinese pharmacy, it was taken into consideration to belong to pills of the primary class and to it turned into ascribed the rejuvenating property when fed on for lengthy periods. In historical Egypt, Greece and Rome liquorice turned into often used. Glycyrrhiza is derived from the historical Greek time period glykos, that means sweet, and rhiza, meaning root ^[1]. Present day tablets like aspirin, atropine, ephedrine, digoxin, morphine, quinine, reserpine and tubocurarine are examples, which had been firstly found through observations of conventional remedy strategies of indigenous people ^[2]. It is distributed in Southern Europe, Syria, Iran, Afghanistan, Russia, China, Pakistan and northern India ^[3]. The liquorice shrub is a member of the pea own family and grows in subtropical climates in wealthy soil to a peak of 4 or 5 ft. The earliest report of its use in medicine is found in "code Hammurabi" (2100 BC) ^[4]. At the start its structure and activity were concept to be much like adrenal steroid hormones inclusive of aldosterone and cortisol, seeing that ingestion of liquorice mimicked hyperaldosteronism and changed into advised as a treatment for Addison's disease ^[5,6]. Human beings have used flowers for medicinal functions for centuries. Glycyrrhiza plays a vital component in Hindu remedy and is one in every of the principal tablets of the 'susruta'. These days an incredible percent of the arena populace, particular in growing international locations, makes use of flora for dealing with primary needs of scientific assistance. It turned into additionally one of the vital plant life stated in Assyrian herbal (2000 BC). Liquorice is referred to by means of Theophrastus. In historic Egypt, Greece and Rome Glycyrrhiza became also frequently used. Glycyrrhiza glabra has been recognized in pharmacy for heaps of years. It became used to allay thirst, feverishness, pain, cough and distress of breathing ^[7]. G. glabra or liquorice has been acknowledged in pharmacy for hundreds of years. It has oval leaflets, white to purplish flower clusters, and flat pods. It has been predicted that such use of medicinal flowers probable pass again in time to round 3000 years. Persia, Afghanistan and to little quantity in a few elements of India ^[8]. In India the plant is cultivated in Punjab and sub-Himalayan tract ^[9,10]. The plant is meant to hold glycyrrhizin, glycyrrhizin acid, glycyrrhizin acid, asparagine, sugars, resin and starch as primary constituents ^[8,7]. Massive scale commercial cultivation is visible in Spain, Sicily and England. Hippocrates (four hundred BC) mentioned its use as a treatment of ulcers and quenching of thirds.

In vintage Chinese language pharmacy, it was taken into consideration to belong to the drug of first elegance and to it changed into ascribed the assets of rejuvenating folks who eat it for lengthy periods ^[11]. The drug was also referred to via Theophrastus and Discords. Leguminosae consists of dried, unpeeled, stolon and root. The plant is a tall perennial herb, up to 2 m high discovered cultivated in Europe. Below floor, the liquorice plant has an intensive root system with a major taproot and numerous runners. This plant is cultivated in Russia, United Kingdom, USA, Italy, France, Germany, Spain, China and northern India (Punjab and Sub-Himalayan tracts) ^[3]. This research has found out that the

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chemical structure of one of the precept agents in the root of the liquorice plant is a glycoside of a triterpene known as Glycyrrhizin acid.

Scientific Classification:

Kingdom: Plantae

Sub kingdom: Tracheobionta – Vascular plant ^[12] Super division: Spermatophyta -

Seed plant Division: Magnoliophyta ^[13]

Class: Magnoliopsida Order: Fabales ^[14]

Family: Fabaceae -Pea family Genus: *Glycyrrhiza liquorice* ^[15]

Species: *Glycyrrhiza glabra* L



Figure 1 Leaves of liquorice



Figure 2 Bark of *liquorice*

Chemical constituents

Glycyrrhizinic acid Liquiritin Glucosyl Glycyrrhizin Glabridin Isoliquiritigenin Isoliquiritin Licoisoflavonone **Traditional uses:**

1. A decoction of madhuka or its powder is typically prescribed with honey in anemia.
2. After mixing with cow's milk, it is used for promoting lactation ^[18].
3. 10g powder of it combined with 10g sugar, pounded with rice water is generally prescribed in guys metrorrhagia.
4. A confection of rice milk, prepared with Yashtimadhu, is used remedy of hoarseness of voice.
5. Charaka prescribed 10 g madhuka powder blended with honey, followed through intake of milk as an aphrodisiac and as a mind-promoting tonic ^[19].
6. Charaka prescribed paste of liquorice and Picirrhiza kurroa with sugar water as a cardio-tonic.
7. Charaka prescribed Yashtimadhu and Santalum album, powdered with milk in hematemesis.
8. Sushrata prescribed the paste of Yashti Madhu 10g in intrinsic hemorrhage ^[20].
9. In oedema, paste of liquorice and sesamum indicum milk combined with butter is used.
10. Warm clarified butter combined with liquorice is used topically on wounds, bruises and burns.
11. A decoction of madhuka is used on erysipelas.
12. A decoction of the root is a superb wash for falling and greying of hair ^[21].

Pharmacological activities:

Antitussive and Anti demulcent:

Liquiritin apio side, an active compound present in the methanolic extract of liquorice which inhibits capsaicin induced cough. It is antitussive and expectorant loosening tracheal mucus secretion ^[22]. The demulcent action is attributed to glycyrrhizin. Liquorice has been shown to work as efficiently as codeine in sore throat. Carbenoxolone (a semi synthetic compound derived from Glycyrrhiza) stimulates gastric mucus secretion. It decreases irritation and produces expectorant effects Anti-tussive and Anti demulcent activity. The liquorice powder and extract were found to be effective in the treatment of sore throat, cough and bronchial catarrh. Glycyrrhizin is responsible for demulcent action of liquorice. Antitussive and Anti demulcent activity. The extract of the powdered drug in water was found to be effective in the treatment of sore throat cough bronchial catarrh ^[23].

Antioxidant activity

Glycyrrhiza have an extensive free-radical quenching impact. Liquorice flavonoids have exceedingly robust antioxidant hobby. Antioxidant hobby of liquorice flavonoids was determined to be over 100 instances stronger than that of antioxidant activity of nutrition E. as a consequence, liquorice extract can be

effectively used to formulate beauty merchandise for the protection of pores and skin and hair against oxidative damage [24,25].

Antimalarial activity:

Licochalcone A (a chalcone) found in liquorice is liable for antimalarial interest. A previous study examined towards *P. yoelii* in mice with oral doses of a thousand mg kg⁻¹ have shown to remove malaria parasite completely [26].

Anti-fungal activity:

Glycyrrhiza glabra possess correct antifungal interest. In a preceding reported have a look at of screening for antifungal compounds from diverse plant substances, liquorice extract with 80% methanol (oil-primarily based extract of liquorice; OEL) changed into found to possess high fungicidal impact in opposition to *Arthrrium sacchari* M001 and *Chaetomium funicola* M002 and its lively compound turned into recognized as glabridin [27]. Accordingly, liquorice extract has a remarkable capability in formulating beauty products with antiseptic sports.

Immunostimulatory activity:

A Research proved that *Glycyrrhiza glabra* at one hundred µg/ml attention, possess immunostimulatory consequences. It will increase manufacturing of TCD69 lymphocytes and macrophages from human granulocytes. In a preceding pronounced take a look at, liquorice root extract turned into discovered to save you the upward push in the amount of immune-complexes associated with autoimmune sicknesses like systemic lupus erythematosus [28].

Anti-ulcer activity:

Glycyrrhizinic acid, a major element of liquorice, has antiulcer effect by using raising the local attention of prostaglandins that promote mucous secretion and cellular proliferation in the belly. In a previous pronounced have a look at hobby of *Extractum liquiritiae* (EL), glycyrrhizin acid, glycyrrhetic acid and a singular lipophilic by-product of glycyrrhetic acid monoglucuronide (GAMG), acetylated GAMG (AGAMG), have been energetic in opposition to 29 *Helicobacter pylori* lines. The potent in vitro interest of glycyrrhizic acid in opposition to *H. pylori* concludes its beneficial effect on peptic ulcers [29].

Anti-bacterial activity:

Secondary metabolites which include; saponins, alkaloids and flavonoids found in hydro-methanolic root extract of *Glycyrrhiza glabra*, possess effective antibacterial interest towards *Staphylococcus aureus*. Further more diverse studies on aqueous and ethanolic extracts of liquorice proved its inhibitory hobby on cultures of *Staphylococcus aureus* and *Streptococcus pyogenes* [30].

Anti-viral activity:

It's far said that liquorice extract inhibits the boom of viruses, which includes herpes simplex, Varicella zoster, jap encephalitis, influenza virus, vesicular stomatitis virus and sort A influenza virus. Glycyrrhizin does no longer allow the virus cellular binding. hence, it is observed to have an outstanding antiviral activity [31].

Antithrombotic effect:

In a previous study observe the in-vivo results Glycyrrhiza glabra extract and mixed impact with nutrition okay and Heparin were evaluated in Sprague Dawley Rats. It was determined that extract of G. glabra extended the bleeding time whilst given in the doses of a hundred and eighty mg/kg and 360 mg/kg. Blood loss turned into evaluated 60 minutes later as a characteristic of absorbance at 540 nm due to haemoglobin content in water answer. Altogether information indicates that Glycyrrhiza glabra is an effective anti-thrombotic agent [32].

Anti-inflammatory activity:

It's far pronounced that glycyrrhetic acid in liquorice extract offers effect just like glucocorticoids and mineralocorticoids. Liquorice root (Glycyrrhiza) extract promotes the healing of ulcers of the stomach and mouth and this reality was recognized for over 2000 years. according to studies, Glycyrrhizic acid inhibits all factors accountable for inflammation. It inhibits cyclooxygenase and prostaglandin formation. it's also responsible for circuitously inhibiting platelet aggregation [33,36,37].

Anti-diabetic activity:

In a previous look at Kuroda M et al., said that ethyl acetate extract of liquorice exhibited a massive PPAR (peroxisome proliferator-activated receptors) that characteristic as transcription elements regulating the expression of genes involved in glucose and lipid metabolism binding. In the end reduces the blood glucose level in knockout diabetic mice [34].

Anticancer activity:

G. glabra extract has been used in natural formulations for preventing cancers like computer- SPES, a polyherbal composition used for prostate cancer. The liquorice extract induced the BCL2 phosphorylation and G2/M cycle arrest in tumor cell traces.

Side Effects and caution [35]

- In massive amounts, liquorice containing glycyrrhizin can motive high blood pressure, salt and water retention, and low potassium stages, that may result in coronary heart troubles. DGL merchandise are thought to purpose fewer facet effects.
- The safety of the usage of liquorice as a supplement for more than four to 6 weeks hasnot been very well studied.
- Taking liquorice collectively with diuretics (water pills), corticosteroids, or other medicines that lessen the body's potassium ranges ought to purpose dangerously low potassium ranges.
- Human beings with coronary heart disease or high blood stress have to be cautious approximately using liquorice. whilst taken in huge quantities, liquorice can affect the frame's stages of a hormone referred to as cortisol and related steroid capsules, which includes prednisone.
- Pregnant women should avoid using liquorice as a supplement or consuming large amounts of liquorice as food, as some research suggests it could increase the risk of preterm labor.

Conclusion

Presence of chemical substances shows that the plant may want to serve as “lead” for development of novel marketers for problems within the coming years. The plant has been used seeing that centuries for allergies, bronchitis, ulcers, and an anti-Inflammatory. This paperwork a basis for the choice of plant for similarly phytochemical and pharmacological investigation. The observe might similarly help for the renaissance of different pharmacological activities on the plant. At present situation there has been a growth in demand for the phytopharmaceuticals all around the international because of the reality that the allopathic tablets have extra aspect outcomes. So, the prevailing overview gives a path for destiny investigators to carry out research on the plant so that they may get some medicinally vital tablets or may also design new dosage form of lively materials. The present have a look at turned into centered to convey the pharmacological activities of *Glycyrrhiza glabra* inside the attention of all issue researchers. It's miles suggested to incorporate important oil, coumarins, alkaloids and flavonoids. The pharmacological sports pronounced in the gift evaluation verify the healing value of *Glycyrrhiza glabra*. Extract of root may be found in various herbal arrangements that are in market nowadays. On this regard, in addition research need to be accomplished to discover *Glycyrrhiza glabra* Linn for its capability in preventing and treating sicknesses.

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