

REVIEW ARTICLE

A REVIEW ON GLYCYRRHIZA GLABRA (LIQUORICE) AND ITS PHARMACOLOGICAL AC- TIVITIES

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Date Received: 14th May 2016; Date accepted: 26th May 2016; Date Published: 28th May 2016

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Abstract

Liquorice is a plant of old cause ever. Liquorice extracts and its principle segment, glycyrrhizin, have broad use in foods, tobacco and in both herbal medicine and traditional. Subsequently, there is a high level utilization of Liquorice and glycyrrhizin affirmed for use in foods and medicines of different ailments, for example, including against ulcer, anti-inflammatory, anti-viral and hepatoprotective reactions. Traditional applications crosswise over various societies incorporate as both a demulcent and a mitigating agent to calm respiratory or gastrointestinal (GI) manifestations. Modern botanical uses of the herb include the treatment of gastric ulcers, bronchitis, hack, and dyspepsia. While Liquorice is imperative in these and numerous other home applications, it accompanies a slight yet quantifiable danger of symptoms when utilized overall.

Keywords: Liquorice, Active Constituents, Pharmacological Activities, Patent.

INTRODUCTION:-

Glycyrrhiza garb, also called Liquorice and sweet wood, having a place with family Leguminaceae is local to the

Mediterranean and certain ranges of Asia. Liquorice has been utilized as a part of pharmaceutical for over 4000 years. The soonest record of its utilization in solution is found in code Humnubari (2100 BC). It was additionally one of the vital plants said in Assyrian natural (2000BC). Glycyrrhiza glabra, otherwise called licorice and sweet wood, is meaning sweet, and rhiza, which means root. Local to the Mediterranean and certain regions of Asia. Generally, the dried rhizome and base of this plant were utilized therapeutically by the Egyptian, Chinese, Greek, Indian, and Roman human advancements as an expectorant and carminative. Glycyrrhiza glabra Linn is a hardy perennial shrub, accomplishing a tallness up to 2.5 m. The leaves are compound, imparipinnate, substitute, having 4-7 pairs of oblong, elliptical or lanceolate leaflets. The flowers are narrow, normally papilionaceous, borne in axillary spikes, lavender to violet in shading. The calyx is short, campanulate, with lanceolate tips and bearing glandular hairs. The fruit is a compressed legume or pod up to 1.5 cm long, erect, glabrous, fairly reticulately hollowed, and for the most part contains 3-5 chestnut, reniform seeds. The taproot is around 1.5 cm long and subdivides into 3-5 backup roots, around 1.25 cm long, from which the level woody stolons emerge. These may achieve 8 m and when dried and cut, together with the root, constitute business liquorice.¹ In present day prescription, licorice extracts are regularly utilized as a flavoring agent to mask astringent taste in arrangements, and as an expectorant in hack and cold preparations. Licorice separates have been utilized for over 60 years in Japan to treat perpetual hepatitis, furthermore have restorative advantage against different infections, including human immunodeficiency infection (HIV), cytomegalovirus (CMV), and Herpes simplex. De glycyrrhizinated licorice (DGL) arrangements are helpful in treating different sorts of ulcers, while topical licorice arrangements have been utilized to sooth and mend skin ejections, for example, psoriasis and herpetic lesions.^{2,3}

CLASSIFICATION

Kingdom: Plantae

Division: Angiospermae

Class: Dicotyledoneae

Order: Rosales

Family: Leguminosae

Genus: Glycyrrhiza

Species: glabra Linn

VERNACULAR NAMES

Sanskrit: Yashti-madhuh. Madhuka

Bengali: Jashtimadhu, Jaishbomodhu

Persia: Ausareha mahaka

Gujarat: Jethimadhu

Kannada: Yastimadhuka, atimaddhura

Malayalam: Iratimadthuram

Marathi: Jeshtamadha

Oriya: Jatimadhu

Tamil: Atimaduram

Telugu: Atimadhuranu, Yashtimadhukam

English: Licorice, Liquorice, Sweet wood

Hindi: Jothi-madh OR Mulhatti

Arab: Aslussiesa

France: Boisdoux

ACTIVE CONSTITUENTS

Various parts have been Isolated from licorice, including a water-soluble, biologically active complex that records for 40-50 percent of aggregate dry material weight. This complex is made out of triterpene saponins, flavonoids, polysaccharides, pectins, straightforward sugars, amino acids, mineral salts, and different substances. Glycyrrhizin a triterpenoid compound, represents the sweet taste of Liquorice root.⁴⁻⁵ This compound speaks to a blend of potassium-calcium-magnesium salts of glycyrrhizic corrosive that varies inside a 2-25 percent range. Among the characteristic saponins, glycyrrhizic corrosive is a particle made out of a hydrophilic section, two particles of glucuronic corrosive, and a hydrophobic part, glycyrrhetic corrosive. The yellow shade of Liquorice is because of the flavonoid substance of the plant, which incorporates liquiritin, isoliquiritin (a chalcone), and other mixes.⁶⁻⁷

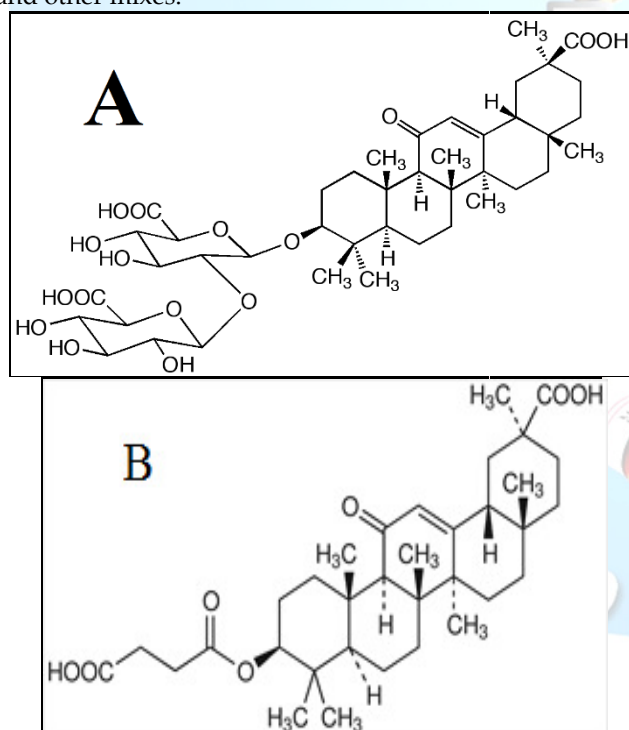


Figure 1: Chemical structure of Glycyrrhizin (A) and Carbenoxolone (B).⁸⁻⁹

Mechanism of action

The gainful impacts of licorice can be ascribed to various instruments. Glycyrrhizin and glycyrrhizic corrosive have been appeared to repress development and cytopathology of various RNA and DNA infections, including hepatitis A and C, herpes zoster, HIV, Herpes simplex, and CMV.¹⁰⁻¹² Glycyrrhizin and its metabolites repress hepatic digestion system of aldosterone and smother 5-[beta]-reductase, properties capable for the well-documented pseudo aldosterone disorder. The comparability in structure of glycyrrhetic corrosive to the structure of hormones discharged by the adrenal cortex represents the mineralocorticoid and glucocorticoid action of glycyrrhizin corrosive.¹³

TRADITIONAL USES¹⁴⁻¹⁷

- A decoction of madhuka or its powder was endorsed with honey in iron deficiency.
- Yashti mixed with dairy animals s milk was recommended for advancing lactation.
- 10g madhuka powder blended with 10g sugar, beat with rice water was recommended in men-metrorrhagia.
- A sweet of rice-milk, arranged with yashtimadhu, was recommended in raspiness of voice.
- Charaka recommended 10g madhuka powder mixed with honey, trailed by admission of milk, as a love potion and as a mind advancing tonic.
- Charaka additionally recommended a glue of liquorice and Picrorhiza kurroa with sugar-water as a heart tonic.
- Charaka datta recommended yashtimadhu and santalum collection, powdered with milk, in hematemesis.
- Sushruta recommended the glue of yashtimadhu 10g, in intrinsic hemorrhage
- In oedema, the paste of licorice, sesamum indicum and milk blended with spread was recommended.
- Warm cleared up spread blended with licorice, was connected topically on wounds, wounds and blazes.
- A decoction of madhuka was connected on erysipelas.
- A decoction of the root is a decent wash for falling and turning gray of hair.

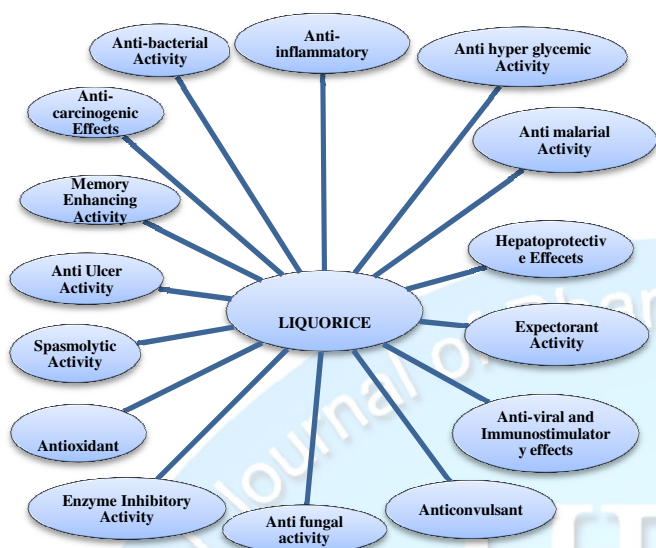


Figure 2: Pharmacological Activities Liquorice

PHARMACOLOGICAL CLAIMS

Anti-bacterial activity

A study was led to decide the antibacterial exercises of Licorice root extract in ether, chloroform, CH₃CO on microscopic organisms utilizing the well dispersion strategy. The concentrates demonstrated critical Antibacterial exercises against two gram positive (*Bacillus subtili* and *Staphylococcus aureus*) and two gram-negative (*Escherichia coli* and *Pseudomonas aeruginosa*) bacteria. The study finished up as it can be utilized as a part of the society drug at various parts of the world to treat numerous sicknesses including bacterial diseases. It showed antimicrobial activity against both Gram-positive and Gram-negative bacteria.¹⁸⁻¹⁹

Anti-oxidant activity

Glycyrrhiza has additionally been appeared to have a Significant free-radical extinguishing impact glabridin is accounted for to be a strong prevention agent towards LDL oxidation.²⁰ The hydroalcoholic extracts of *Glycyrrhiza glabra* Linn which displayed distinctive calming exercises were assessed for the conceivable method of activity by concentrating on their Anti-oxidant activity. In the present study we examined if institutionalized hydroalcoholic concentrates of plants, for example, *Glycyrrhiza glabra* Linn produced by Hofigal Stock Organization could balance the respiratory burst of human enacted neutrophils, as a result of their Antioxidant capability.²¹

Expectorant Activity

While the particular component of activity stays obscure, *Glycyrrhiza* have been performed as viably as codeine in the throat, diminishing disturbances and delivering expectorant impacts. One proposed clarification is that similarly that carbenoxolone, a semisynthetic compound in-

ferred Murray from *Glycyrrhiza*, can empower gastric bodily fluid discharge, it is additionally ready to empower tracheal bodily fluid discharges and consequently create demulcent and expectorant effects. Licorice is a useful solution for hacks as it encourages the development of bodily fluid from the respiratory tract.²²

Spasmolytic Activity

Liquiritin present in the bases of *Glycyrrhiza* is idle as an antispasmodic. However when hydrolyzed by warmth and changed over to isoliquiritigenin, it was appeared to show solid spasmolytic activity.²³

Ant allergic activity

Glycyrrhiza glabra Linn (*Glycyrrhizin*, 18 *glycyrrhetic* corrosive and *Liquiritigenin*) have ant allergic action, which can remember IgE instigated unfavorably susceptible sicknesses, for example, dermatitis and asthma.²³

Anti tussive activity

A study was completed to assess anti-tussive movement of mix of home grown medications as details in sulfur dioxide (SO₂) -induced hack model in mice. Pale skinned person mice of either sex, weighing 25-30 g were separated into eight gatherings, (n = 6). Bunch 1 served as ordinary control, bunch 2 mice were given refined water, bunch 3 was certain control and got codeine sulphate (10 mg/kg,_) and bunch 4, 5, 6, 7 got coded 1 definitions 1, 2, 3 and 4 separately at a measurement of 0.3 ml/mice, orally, while bunch VIII was the vehicle control. After thirty minutes, the mice were uncovered to sulfur dioxide again for 45 sec. The mice were then set in a perception chamber for tallying of hack sessions, by two free eyewitnesses, for five minutes. Every one of the details utilized demonstrated huge antitussive movement in sulfur dioxide instigated hack model. Subsequently, these definitions can turn out to be helpful for reducing cough. *glycyrrhetic* corrosive from liquorice is available in that detailing.²⁴

Oral lichen planu

Patients with constant hepatitis C frequently encounter oral lichen planus, a provocative infection described by lymphocytic hyperkeratosis of the oral mucosa. It is once in a while cured and viable medications are restricted. In an open clinical trial, 17 hepatitis C positive patients with oral lichen planus were given either normal dental consideration or 40 mL IV *glycyrrhizin* day by day for one month. Among nine patients taking *glycyrrhizin*, six (66.7%) noted moved forward clinical manifestations, for example, diminished redness, less white papules, furthermore, less disintegration of the mucosa. In the non-*glycyrrhizin* gathering of eight patients, one and only (14.3%) reported any change.²⁵

Anticonvulsant

The anticonvulsant movement of ethanolic concentrate of roots and rhizomes of *Glycyrrhiza glabra* Linn (10, 30, 100 and 500 mg/kg, i.p.) in mice was evaluated utilizing greatest electroshock seizure (MES) test and pentylenetetrazol (PTZ) utilizing pale skinned person mice. The lithium-pilocarpine model of status epileptics was likewise utilized. The evaluate the anticonvulsant movement in rats. The ethanolic concentrate of *G. glabra* did not lessen the span of tonic rear leg expansion in the MES test even in the dosage of 500 mg/kg. In any case, the remove altogether and dosage conditionally deferred the onset of clonic shakings prompted by pentylenetetrazol. The dosage of 100 mg/kg managed insurance to all creatures. The concentrate additionally ensured rats against seizures instigated by lithiumpilocarpine.²⁶

Anti-inflammatory

Glycyrrhizin has since quite a while ago exhibited its fortifying activity on hydrocortisone mitigating action in rats. Alonso demonstrated calming action of aglycone (glycyrrhetic corrosive) with 1/8 power when contrasted with cortisol; this action achieves 1/5 intensity, if glycyrrhetic corrosive is regulated as sodium hemi succinate (whose concoction structure is indistinguishable to carbenoxolone). Other flavonoid parts of licorice root, for example, liquiritoside, have additionally appeared in vitro hostile to incendiary movement. The action of 18-glycyrrhetic corrosive was observed to be more grounded than that of its isomer, and comparable to that of glucocorticoids. Together glycyrrhizin or its aglycone have mineralocorticoid impacts because of the hindrance of hepatic D - 5- reductase. The alterations that glycyrrhetic corrosive also, hydrocortisone produce on the movement of certain chemicals have been associated with their hostile to joint pain impacts, because of the auxiliary similitude of both mixes and their movement at the suprarenal level. Both glycyrrhizic corrosive and its aglycone (glycyrrhetic corrosive) restrained leukocyte relocation towards swollen ranges in creature models. Glycyrrhizin restrained actuated peritoneal macrophages, phospholipase A movement and prostaglandin E₂ union. Liquiritoside exhibited test hindrance of cyclooxygenase, lipooxygenase and platelet peroxidase. In creature examines, glyderinine (a glycyrrhizic corrosive subsidiary) demonstrated more grounded antipyretic, pain relieving and mitigating exercises than hydrocortisone and amidopyrine; dissimilar to other mitigating drugs, it didn't harm the gastro duodenal mucosa. Connected as a balm, it demonstrated great infiltration in the skin and tolerability.²⁷

Anti-carcinogenic Effects

The potential hostile to anti-carcinogenic effects of licorice concentrate and glycyrrhizate compounds. The in vitro hostile to mutagenic properties of triterpene mixes, for example, glycyrrhizin, have been well archived, in spite of the fact that the instrument of this activity is still inadequately caught on. An early provide details regarding the counter mutagenic impacts of glycyrrhizin and glycyrrhetic corrosive illustrated, utilizing an adjusted Ames test, that both of these mixes restrained the mutagenicities of 3-amino-1-methyl-5H-pyrido[2,3-b]indol (Trp-p-2), 2-acetyl aminofluorene, and benzo[*a*]pyrene, in the nearness S9 division hepatic enzymes.²⁸

Memory Enhancing Activity

To explore the impacts of *Glycyrrhiza glabra* Linn (prominently known as liquorice) on learning and memory in mice. Raised in addition to labyrinth and aloof evasion worldview were utilized to test learning what's more, memory. Three dosages (75, 150 and 300 mg/kg p.o.) of fluid concentrate of *Glycyrrhiza glabra* Linn were managed for 7 progressive days in partitioned gatherings of creatures. The dosage of 150 mg/kg of the watery concentrate of liquorice fundamentally enhanced learning and memory of mice. Besides, this dosage altogether turned around the amnesia incited by diazepam (1 mg/kg i.p.) and scopolamine (0.4 mg/kg i.p.). Mitigating and cancer prevention agent properties of liquorice might contribute positively to the memory improvement impact. Since scopolamine-affected amnesia was turned around by liquorice, it is conceivable that the useful impact on learning and memory was because of assistance of cholinergic transmission in mouse cerebrum. Notwithstanding, further studies are required to recognize the careful system of activity. In the present examination, *Glycyrrhiza glabra* Linn has demonstrated guarantee as a memory upgrading specialist in all the research center models employed.²⁹

Anti-fungal activity

Glycyrrhiza glabra have great hostile to contagious movement. Over the span of screening for antifungal mixes from different plant material, licorice (*Glycyrrhiza glabra*) separates with 80% methanol (oil-based extract of licorice; OEL) was found to have high fungicidal impact against *Arthrrium sacchari* M001 and *Chaetomium funicola* M002, and its dynamic compound was distinguished as glabridin (3-(2',4'-dihydroxyphenyl)-8-dimethylpyrano[8,7-e] chroman). OEL was compelling against filamentous growths as well as a few microscopic organisms, particularly thermo-resistant bacilli, for example, genera of *Bacillus* and *Alicyclobacillus*. Moreover OEL lessened microorganism tainting in polyethylene terephthalate (PET) packaged tea based drinks.³⁰

Table 1: Patent of *GLYCYRRHIZA GLABRA* (LIQUORICE)

Sr No	Patent No.	Inventor,	Title	Reference no
1	US 3131175 A	Kalkstein Samuel I	Process of preparing licorice root extract	31
2	US 1849569 A	Antonino Coco Biagio, Pietro Condorelli	Process for extracting the juice from liquorice	32
3	US 4163067 A	Harold A. Hartung	Glycyrrhizin-free fractions from licorice root and process for obtaining such fractions	33
4	US 8236360 B2	Chantal Bergeron, Stefan Gafner	Supercritical CO ₂ liquorice extract and products made there from	

CONCLUSION

Glycyrrhiza glabra (licorice, Fabaceae/Papilionaceae) is a plant with a rich ethno botanical history. The roots are utilized as a people medication both in Europe and in Eastern nations. It is utilized as a conventional pharmaceutical, people cures and as a sweetening and flavoring agent. Pharmacological concentrates on have assessed a few of the customary wellbeing from history. Glycyrrhizin is extricated from Licorice (*Glycyrrhiza glabra* Linn) root. The nearness of dynamic fixings other than glycyrrhizin, albeit different studies have indicated it has no useful impacts. Licorice and glycyrrhizinate mixes have been utilized as antibacterial, cancer prevention agent, antimalarial, antispasmodic, mitigating and against hyper glycemie properties. Different impacts like antidiuretic, antihapatotoxic, antifungal and herpes simplex viral diseases, for example, hepatitis. The potential use against ulcer and hostile to viral activity of glycyrrhizin are obscure; in any case, balance of the invulnerable reaction in by all accounts is demonstrated.

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