AMERICAN JOURNAL OF EDUCATION AND LEARNING
ISSN: 2996-5128 (online) | ResearchBib (IF) = 10.91 IMPACT FACTOR
Volume-3| Issue-9| 2025 Published: |30-10-2025|

HEALING PROPERTIES OF GLYCYRRHIZA GLABRA (SWEETWARE)

https://doi.org/10.5281/zenodo.17470066

Fayziyev Xayrullaxon Omonilloyevich
Independent researcher at Andijan State University, PhD
fayziyevxayrullaxon@gmail.com
Islomov Akmaljon Xushvaqovich
Senior Researcher, Laboratory of Chemistry of Complex Compounds, Institute of Bioorganic Chemistry, Academy of Sciences of the Republic of Uzbekistan, Doctor of Chemical Sciences
Atqiyayeva Sanobarxon Ismoilxon qizi
Researcher, Institute of Chemistry of Plant Substances, Academy of Sciences of the Republic of Uzbekistan
atqiyayevasanobarxon1992@gmail.com

Annotation

The article briefly explains the composition, properties, medicinal value, and role and importance of the Shirinmiya plant, which occupies a unique place among medicinal plants, as the Uzbek people call it, in the language of the Uzbek people.

Keywords

Licorice, glycyrrhiza glabra L, Licorice root, licorice, Stomach, Heart, Blood vessel, flavanoids, saponins, DNA, glycyrrhizic acid, root, rickets.

Licorice (*Glycyrrhiza glabra L.*) is a perennial plant of the family Fabaceae, which grows as a weed in wheat fields, pumpkin and vegetable gardens, cotton, potatoes, sugar beets and fodder crops, hay, and leguminous crops. It can cause significant reductions in agricultural production and orchards due to the development of roots and rhizomes. It is called licorice, licorice, glycyrrhiza, sweet wood, in English Liquiritiae radix; in German süssholz and lakritzenwurzel, in French reglisse and bios doux, in Persian (Persian) shirin baian or maak, and in Italian and Spanish liquirizia regaliz.

The use of licorice may have originated several thousand years ago. It was widely used in traditional Persian medicine for gastritis, ulcers, respiratory infections, tremors, etc., and was used as a global paradigm of medicine in the Middle Ages.

Based on the available findings, licorice has been shown to be beneficial for the upper respiratory tract and stomach, as well as for the progressive congestion of the duodenum. Licorice (dried licorice root) increases the secretion of serotonin and

prostaglandins in the stomach, causing a gastric disinflation effect. Glycyrrhizic acids (flavonoids) extracted from licorice have anti-Helicobacter pylori activity. Other proven effects of this plant include antimutagenic, antioxidant, and cortisol and aldosterone-reducing effects. Licorice helps improve memory, acts as an antidepressant, and lowers blood cholesterol levels. Glycerin is also known to have antipyretic, anti-inflammatory, and anti-vascular permeability effects [1].

Infections, oxidative stress, and the most common cause of peptic ulcers and gastritis are H. pylori. These conditions can be treated with antacids, histamine antagonists and/or proton pump inhibitors, but they have many side effects, including arrhythmia, hypertension, asthenia and some liver diseases. Therefore, the use of natural medicinal herbs is usually preferred for treatment, among which licorice is the most widely used therapeutic agent due to its antimicrobial effects and pharmacological properties. Licorice is mainly used for the treatment of peptic ulcers due to its antioxidant, anti-inflammatory and prostaglandin-enhancing effects.

Flavonoid-enriched licorice extract reduces H. pylori activity through another potential mechanism of enhancing protein synthesis and two enzymes; hydroxyl-folate reductase and DNA gyrase. In addition, some components of licorice have the ability to increase mucus secretion in the digestive tract and prolong the life of cell surfaces, which creates an anti-pepsin effect in the stomach. In the study, licosio-flavan B, licochalcone A, glabridin, licoricidin and glabren were observed to inhibit the growth of Helicobacter pylori (H. pylori). Therefore, licorice can be considered to have anti-helicobacter pylori activity [2].

Regarding the antioxidant and structural values of this plant, some studies of G. glabra have reported that aqueous, methanolic, and ethanolic extracts have antioxidant potential using various methods (β-carotene-linoleate scavenging, hypochlorous acid scavenging activity, myeloperoxidase-chlorination system inhibition, nitric oxide radical scavenging and hydroxyl radical scavenging activity, scavenging activity, DPPH radical scavenging activity, ABTS+ cation radical scavenging, Fe^{+2}/ascorbate induced lipid peroxidation assay, Reducing power). In our study, TAS, TOS, and OSI values were determined for the first time using Rel Assay kits of G. glabra. As a result of the studies, it was found that G. glabra has significant antioxidant activity. In addition, TAS values of R. coriaria var. zebaria, M. longifolia subsp. longifolia, A. calocephalum, S. papposa, F. platycarpa, T. spicata, G. tournefortii, R. crispus and A. millefolium reported in the literature were 7.342, 3.628, 5.853, 5.314, 5.689, 8.615 and 5.689. respectively and 2.436 mmol/L. TOS values were reported as 5.170, 4.046, 16.288, 24.199, 15.552, 6.530,

3.712, 5.802 and 2.839 µmol/L, respectively. The OSI values were reported as 0.071, 0.112, 0.278, 0.456, 0.273, 0.078, 0.054, 0.086, and 0.083, respectively.

In comparison with these studies, the TAS value of G. glabra was found to be higher than R. ncoriaria var. zebaria, M. longifolia subsp. longifolia, A. calocephalum, S. papposa, F. platycarpa, T. spicata, G. tournefortii, R. crispus and A. millefolium. The TAS value indicates all the antioxidant compounds produced in the plant. As can be seen from our study, G. glabra was found to have a very significant antioxidant potential [3].

Phytochemical components isolated from licorice:

Flavonoids - More than 300 flavonoids have been identified in Glycyrrhiza species and are responsible for its yellow color. Several flavonoids have been identified in licorice roots, including licuritin, licuritigenin, rhamnolicuritin, licuritin apioside, glabranin, glabrol, lycoflavanone, isoliquiritigenin, neoisoliquiritin, lycurazide, licochalconicor, licochalconicor, hispaglabridin A and B, lycoflavon A and B, licoflavanol, glycyrrhizaglabrin, licoisoflavanone, glabroisoflavanone, glabron, lycoricone, and gankaonin (Öztürk et al., 2017).

Saponins - Glycyrrhiza roots contain triterpenoid saponins, specifically glycyrrhizin and glycyrrhizic acid, which are the main characteristic components responsible for the sweet taste in licorice. The main triterpenoid saponin found in licorice root is glycyrrhizic acid, which is the main taste-providing compound in the plant and is almost 50 times sweeter than sugar (Nomura et al., 2002). In addition, other triterpenes have been identified, including liquiritic acid, glycyrrhetol, glabrolide, isoglaborlide, and licorice acid (Isbrucker and Burdock, 2006; Öztürk et al., 2017).

Phenolic compounds - Primary phenolic compounds include licuritin, isolicuritin, licuritin apioside, and flavonoids, which are substituted with isoprenoids, chromium, coumarins, and dihydrostilbenes (Öztürk et al., 2017). (Zhang and Ye 2009) Various phenolic compounds extracted from Glycyrrhiza species include glycicumarin, glabrocoumarin, glycyrin, inflacoumarin A, lycopyranocoumarin, isoglycerin, ne-glycerin, lycobenzofuran, glycerin, lycobenzofuran, glycolabcoumarin, carnosol.

Coumarins - Other important components include coumarins such as lycomarin, glabocoumarin A and B, herniarin, umbelliferone, glycyrin, glycocoumarin, lycofuranocoumarin, and glabrocoumarin (Öztürk et al., 2017).

Essential oils - Ali (2013) studied the composition of the essential oil of G. glabra and found the presence of compounds such as α-pinene, β-pinene, octanol, γ-terpinene, stragol, isophenone, β-caryophyllene, citronellyl acetate, hexanolphyllate, and caryophyllene [4].

AMERICAN JOURNAL OF EDUCATION AND LEARNING
ISSN: 2996-5128 (online) | ResearchBib (IF) = 10.91 IMPACT FACTOR
Volume-3| Issue-9| 2025 Published: |30-10-2025|

The three original licorice plants are G. uralensis, G. inflata, and G. glabra. They contain many naturally occurring active compounds, including more than 20 triterpenes and 300 flavonoids. 73 bioactive compounds and 91 potential targets have been identified for this medicinal plant (Li et al. 2011; Liu et al. 2013). Of these, 3 are triterpenes, 18β-GC, 18α-GC and 18β-glycyrrhetinic acid (18β-GA) and 13 flavonoids, licochalcone A (LCA), licochalcone B (LCB), licochalcone C (LCC), licochalcone (LCC), licochalcone (ECD), isoliquiritigenin (ISL), echinatin (EC), glabridin (GLD), isoangustone A (ISOA), licoricidin (LID), licorisoflavan A (LIA), dehydroglyasperin C (DGC), as well as dehydroglyasperin D (DGD), all of which have been reported to have anti-lamellar activity [5].

Licorice is one of the oldest and most widely used herbs in traditional Chinese medicine. It contains more than 20 triterpenoids and 300 flavonoids. In recent years, numerous studies have shown that active compounds isolated from licorice have antitumor, antimicrobial, antiviral, anti-inflammatory, immunoregulatory, and a number of other effects that contribute to the restoration and protection of the nervous, digestive, respiratory, endocrine, and cardiovascular systems. This article summarizes nine different pharmacological activities of licorice. The active compounds responsible for these pharmacological activities, the molecular mechanisms, and in vivo and in vitro studies are listed in detail. In addition, the clinical therapeutic and toxicity studies of licorice are also discussed. A picture of the licorice plant and the chemical formulas of the substances isolated from it are shown in Figures 1 and 2 below.

Figure 1. Glycyrrhiza uralensis Fisch.

AMERICAN JOURNAL OF EDUCATION AND LEARNING
ISSN: 2996-5128 (online) | ResearchBib (IF) = 10.91 IMPACT FACTOR
Volume-3| Issue-9| 2025 Published: |30-10-2025|

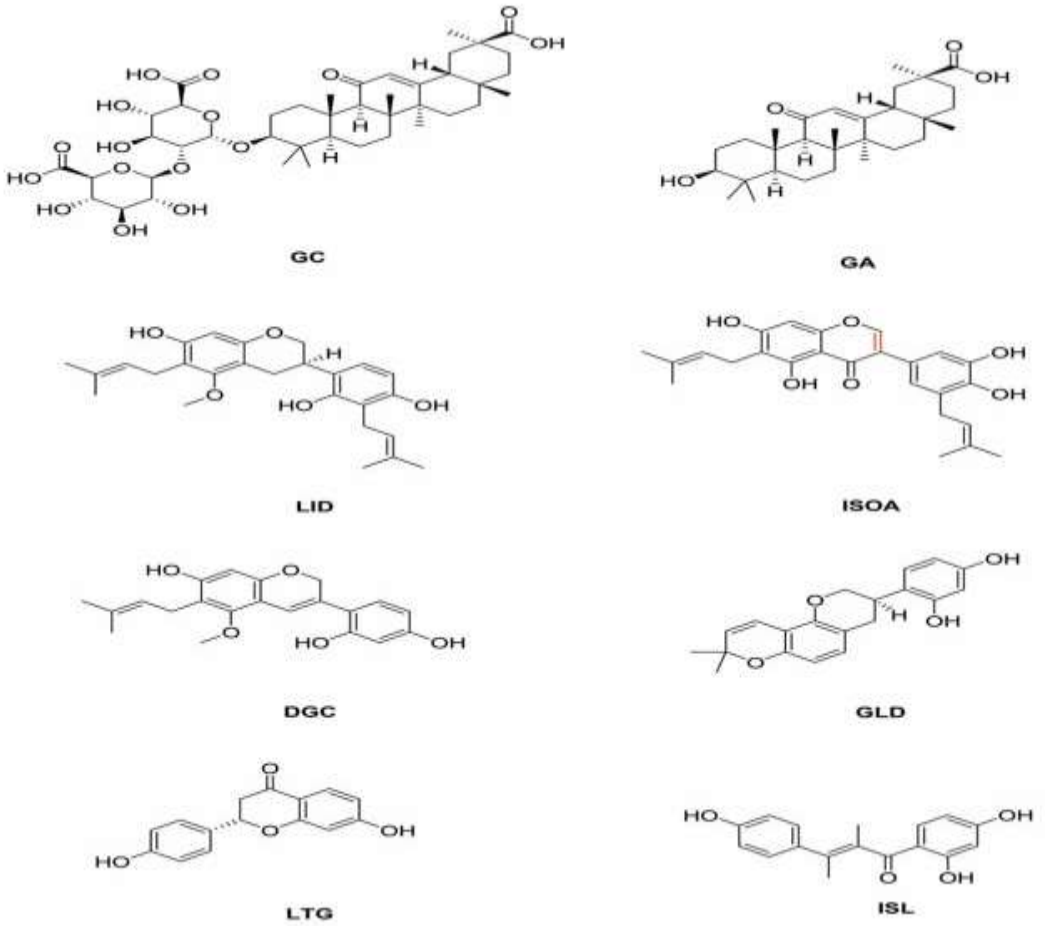

Figure 2. Chemical structures of GC, GA, LID, ISOA, DGC, GLD, lLTG, and ISL.

The above data indicate that the compounds in licorice exert their antitumor activity mainly by suppressing cytokine levels, blocking cell cycle progression, and inducing apoptosis of cancer cells. In addition to several unique compounds isolated from licorice, some researchers have reported that ethanol extract and hexane/ethanol extract of roasted licorice also have antitumor activity [6].

One of the problems in medicine is the presence of viral hepatitis B and C in some pregnant women. It is worth noting that antiviral treatment with α-interferon and nucleoside analogues is not recommended during pregnancy. In this regard, the discovery and application of natural biologically active drugs that specifically activate cellular immune responses and have antiviral activity remains one of the urgent issues. In this regard, the use of GC-based drugs is recommended. There is information that in medicine, licorice root extract is recommended for respiratory, digestive, biliary tract, kidney diseases, paralysis, anemia, infectious viral diseases, anti-inflammatory, and as an antidote for snake bites to reduce the effects of poisons [7].

We can see from the data that the licorice plant is one of the most important sources for treating and preventing several common diseases today.

Conclusion

The information provided in this resource mainly indicates that in the future, the licorice plant can be studied more thoroughly and become a highly effective link for the development of science and knowledge. It is also worth emphasizing that the history of medicine goes back to medicine and the development of chemistry clearly proves that we can achieve high results for human health by connecting these sciences.

The intensity of the current era does not leave any field aside, that is, it is tested by both crisis and development, which has made preserving human health and naturalness one of the most important factors in each field. In this regard, the use of natural bioactive compounds is the best way, and we hope that this will also increase the spiritual education of people, that is, further improve their sense of respect for nature.

REFERENCES:

1. Mahmoud Bahmani, Mahmoud Rafieian-Kopaei, Mahyar Jeloudari, Zohre Eftekhari, Bahram Delfan, Arman Zargaran, Shirin Forouzan. **A review of the health effects and uses of drugs of plant licorice (Glycyrrhiza glabra L.) in Iran**// Asian Pacific Journal of Tropical Disease Received in revised form 22 Jun, 2nd revised form 26 Jun, 3rd revised form 2 Jul 2014 Accepted 15 Jul 2014 Available online 28 Jul 2014 doi: 10.1016/S2222-1808(14)60742-8

2. Sana Noreen, Fizza Mubarik, Fatima Farooq, Mudassir Khan, Ahasan Ullah Khan, Yunita Sari Pane. **Medicinal Uses of Licorice (Glycyrrhiza glabra L.): A Comprehensive Review**// November 2021 Open Access Macedonian Journal of Medical Sciences 9(F) DOI:10.3889/oamjms.2021.7526

3. Falah Saleh Mohammed, Nuh Korkmaz, Mehmet Doğan, Ali Erdem Şabik, Mustafa Sevindik. **Some Medicinal Properties Of Glycyrrhiza Glabra (Licorice) Glycyrrhiza Glabra'nin Bazi Tibbi Özellikleri** (Meyan Kökü)// J. Fac. Pharm. Ankara / Ankara Ecz. Fak. Derg., 45(3): 524-534, 2021 Doi:10.33483/jfpau.979200

4. ROȘCA Maria-Florina, Adriana PĂUCEAN, Simona Maria MAN, Maria Simona CHIȘ, Anamaria POP. Liquorice: **The Sweetener with Medicinal Properties**// Hop and Medicinal Plants, Year XXXI, No. 1-2, January 2023 DOI:10.15835/hpm.v31i1-2.14738

5. Rui Yang, Bo-Chuan Yuan, Yong-Sheng Ma, Shan Zhou & Ying Liu. **The anti-inflammatory activity of licorice, a widely used Chinese herb**// anti-inflammatory activity of licorice, a widely used Chinese herb, Pharmaceutical Biology, 55:1, 5-18, DOI: 10.1080/13880209.2016.1225775

6. Rui Yang, Li-qiangWang, Bo-chuan Yuan, Ying Liu. The **Pharmacological Activities of Licorice**// Planta Med 2015; 81: 1654–1669

7. ISLOMOV AKMAL XUSHVAQOVICH. "**LAGOCHILUS *INEBRIANS* O'SIMLIGI ASOSIDA QON TO'XTATUVCHI TOVARLAR OLISH VA ULARDAN XALQ TABOBATIDA"** mavzusidagi doktorlik dissertatsiyasi. Andijon 2024.