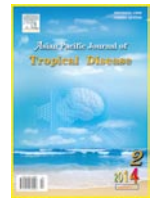




Contents lists available at ScienceDirect

Asian Pacific Journal of Tropical Disease

journal homepage: www.elsevier.com/locate/apjtd



Document heading

doi: 10.1016/S2222-1808(14)60742-8

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A review of the health effects and uses of drugs of plant licorice (*Glycyrrhiza glabra* L.) in Iran

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To the editor,

Liquorice or licorice (*Glycyrrhiza glabra* L.) is a perennial plant of the family Fabaceae (Figure 1) as weeds in wheat fields, cucurbits and kitchen garden, cotton, potato, sugar beet and fodder, hay, clover and sainfoin. It can lead to large reduction in farm products and gardens because of the development of roots and rhizomes[1,2]. It is called licorice, liquorice, glycyrrhiza, sweet wood, *Liquiritiae radix* in English; süssholz and lakritzenwurzel in German, réglisse and bios doux in French, shirin baian or mak in Persian (Farsi) and also liquirizia regaliz in Italian and Spanish languages[3–7]. Using licorice can be dated back to several thousand years ago[8]. It was widely used as gastritis, peptic ulcers, respiratory infections, tremor, *etc.* in traditional Persian medicine[8–10], and as the global paradigm of medicine in medieval age[11,12].

Based on current findings, it is experimented that licorice is beneficial for the growing congestion of the upper respiratory tract and gastric as well as duodenal ulcers[1]. Licorice (dried licorice root) increases secretion of serotonin and prostaglandins in the stomach, causing gastric disinflation effects[13]. Glycyrrhizinic acids (a

flavonoid) derived from licorice have anti *Helicobacter pylori* effect[14]. Other proven effects of this plant are anti-mutagenic, antioxidant, reducing cortisol and aldosterone effects as well as inhibition of thrombin and increasing bile[15–19].

Licorice helps enhancement memory, plays a role as antidepressant, and reduces blood cholesterol levels[20–22]. Also, glyderinine possesses antipyretic, anti-inflammatory and anti-vascular permeability effects[23]. Although licorice can reduce diabetes symptoms such as polydipsia and frequent urination, but cannot reduce blood glucose[24]. Licorice is a plant that is used as relief for menopausal symptoms[25]. Furthermore, it is used in renal and liver complications because of its strong anti-inflammatory effects[26,27]. Licorice is a good antioxidant agent[28]. It is reported that glycyrrhizin can play inhibitory role to control pulmonary carcinoma in mice[29]. Recent works show licorice has antiviral properties[30]. Licorice root contains a variety of components including sugars, flavonoids, sterols, amino acids, resins, starch, essential oil and saponins. It is composed mainly of saponins glycyrrhizic acid or glycyrrhizin (C₄₂ H₆₂ O₁₆; Figure 2). The root includes 6%–20% dry weight of glycyrrhizic acid[31–33].

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Article history:

Received 18 Jun 2014

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



Figure 1. Licorice (*Glycyrrhiza glabra* L.).

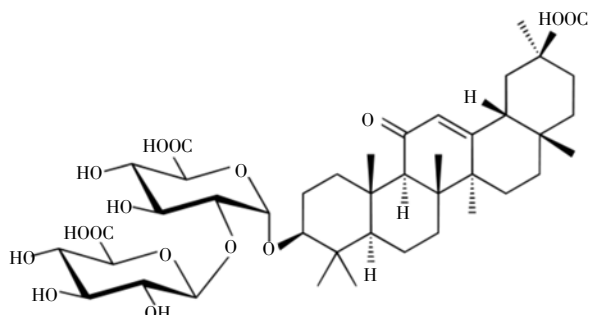


Figure 2. Chemical structure of glycyrrhizic acid.

Licorice root mainly contains acid-2-β-glycyrrhizic, glucuronic acid, glycyrrhetic acid (enoxolone), tannic acid, asparagine, resins, volatile oils, flavonoids such as liquiritigenin, liquiritin, isoliquiritigenin, isoliquiritin and coumarin compounds, such as herniarin and umbelliferone. The most famous flavonoids found by International Standardization Organization in licorice root are glabridin compounds, glycerin flavone, glabrene, glabryl, formononetin, isoliquiritigenin^[1,6]. Licorice leaves have rutin and isoquercetin and also dihydrostilbenes as antioxidant agent^[34,35].

In Iran, many formulations are produced from licorice nowadays. “D-Reglis” is a pharmaceutical product manufactured from licorice tablets prescribed for prevention of peptic ulcer in the concomitant use of nonsteroidal anti-inflammatory drugs. “Mentazin” pill is another drug used to relieve gastrointestinal pain, and improve gastric ulcer. It is used also as carminative and laxative agent. “Reglis” tablets are used to treat gastric and duodenal bloating, excess

acid secretion and gastric distention. “Gastrin” as another licorice preparation is anti-inflammatory and analgesic tablets prescribed for stomach pain and swelling accelerate healing of ulcers in the stomach and duodenum.

Another product is “Licophar”. It is used as an anti-inflammatory pill for throat, cough, and sputum binding. “Reglisidin” is another product used as oral drug therapy for bloated stomach, duodenum and gastritis. “Altadin” chewable tablets are used for the treatment of inflammation and irritation of mucous membranes, throat, and throat painful stimulation. “Shirinnoush” as cough syrup affects on gastric ulcer, duodenal ulcer and gastritis.

Licorice is one of Iran’s indigenous medicinal plants. This plant was used traditionally for centuries in Iran, and also current findings support its numerous health effects such as antioxidant, anti-cancer, anti-inflammatory, anti-microbial as well as its beneficial on immune system, skin diseases, lung, liver, heart failure, etc^[36–42]. Also some drugs are produced regarding to its some effects in Iran. But, it has a good potential capacity to produce more pharmaceutical products, not only as a limited local use, but for export and introduction as a valuable therapeutical remedy.

Conflict of interest statement

We declare that we have no conflict of interest.

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