



**Licorice:** *Glycyrrhiza glabra root, Chinese licorice, kanzo, alcacuz, liquorice*

**Common Indications:**

- Adrenal stress
- Expectorant
- Hormone regulation support
- Infection, including viral, bacterial, fungal, and parasitic

**General Comments:**

The use of licorice has a long history stemming from Traditional Chinese Medicine but also used by the ancient Greeks and Egyptians. It has served as an agent that soothes and stimulates protective mucous within the gastrointestinal and urinary tracts. It also helps with coughs and sore throats as soothing agent.<sup>1,2,3</sup> Traditional Chinese Medicine has also employed licorine in the treatment of diabetes and tuberculosis.<sup>4,5</sup>

**Benefits & Mechanism of Action:**

Adrenal stress

Licorice has an interesting effect on cortisol. It counteracts the effects of cortisol by inhibiting adrenal and thymus atrophy, as well as by reducing cholesterol manufacturing. There are two mechanisms by which this happens. The glycyrrhetic acid in licorice catalyses the conversion of cortisol to cortisone and licorice also sits on mineralocorticoid and glucocorticoid receptors and displaces cortisol from the carrier molecule.<sup>6,7</sup> Licorice is claimed to inhibit antibody formation and support the stress response and the inflammatory response.<sup>8,9,10</sup>

Expectorant

Licorice reportedly inhibits inflammatory prostaglandin formation and leukotrienes by inhibiting the enzymes responsible for their metabolic activation and manufacture.<sup>11,12</sup> Licorice was also found to stimulate tracheal mucus secretion.<sup>13</sup> Licorice may also stimulate interferon production in the body, which could support its antiviral activity.

Hormone regulation support

Licorice has phytoestrogenic activity due to its isoflavone content (formononetin). Because of the weak affinity for binding to estrogen receptors, estrogenic side effects are not seen.<sup>14,15,16,17,18,19,20</sup>

Infection, including viral, bacterial, fungal, and parasitic

Licorice has been tested both orally and by injection and has shown effective against multiple strains of viruses. Reduction of symptoms and viral activity was seen with hepatitis B and C, herpes simplex, encephalitis, influenza A virus pneumonia, HIV-1, severe acute respiratory syndrome, coronavirus, hand foot and mouth-related enterovirus, and vasicular stamatitis virus.<sup>21,22,23,24,25,26,27,28,29,30,31,32</sup>

The components responsible for antibacterial activity are the phenolic compounds, licochalcone A, and isoflavones. They were found to be active against methicillin-resistant and sensitive *Staphylococcus aureus*.<sup>33,34</sup> The component, glabridin, has shown activity against *Mycobacterium tuberculosis*, gram-positive and gram-negative bacteria, including *E. coli*, *B. subtilis*, *E. aerogenes*, *K. pneumoniae*, and *S. aureus*.<sup>35,36</sup>

The licochalcone A and glabridin in licorice had antifungal activity against *Candida albicans*.<sup>37</sup>

Licorice has also shown activity against the parasites *Plasmodium berghei* and *Plasmodium falciparum*.<sup>38,39</sup>

Peptic Ulcer

The deglycyrrhizinised (DGL) form of licorice has been shown effective in treating peptic ulcers. This occurs due to the inhibition of the enzyme that converts prostaglandins to their inactive form. The increase in prostaglandins promote mucus secretion and cell proliferation, allowing ulcers to heal<sup>40</sup>.

**Dose:**

- Root - 5 to 15g per day, equivalent to 200-600mg of glycyrrhizinic acid, 3 times a day
- Fluid extract (1:1)
  - 15-30 drops of liquid extract, 3 times a day in juice or other beverage
  - 2-4mL three times daily
  - 15-40mL per week (Australian manufacturer recommendations)
- Tea - pour 150mL boiling water over 2-4 g licorice, steep for 5 minutes and filter through a tea strainer after cooling
- Chronic gastritis – one cup of licorice tea after each meal
- Chronic duodenal ulcers – 3800 mg per day of DGL in five divided doses before meals and at bedtime (according to clinical studies)

**Standardization:** Licorice should be standardized to contain 20% glycyrrhizinic acid or contain greater than 30 mg/ml glycyrrhizinic acid.

## **Cautions & Side Effects:**

Licorice has been reported to be safe in recommended doses.

Symptoms that may indicate acute toxicity include:

- Hypercortisolism and pseudohyperaldosteronism
- Hypokalemia
- Rhabdomyolysis
- Visual disturbance
- Contact dermatitis
- Thrombocytopenia
- Increased sodium retention

## **Medication interactions**

Medications with increased effects while taking licorice include:

- Anticoagulant medications
- Antiplatelet medications
- Drugs metabolized by P-glycoprotein
- Drugs metabolized by CYP 450 enzymes
- Paclitaxel and vinblastine chemotherapy<sup>41</sup>
- H<sub>2</sub> antagonist medications
- Corticosteroids
- Diclofenac sodium
- Digoxin
- Diuretics
- Oral contraceptives

Medications with decreased effects while taking licorice include:

- Cyclosporine<sup>42,43</sup>
- Potassium
- Drugs metabolized by P-glycoprotein
- Drugs metabolized by CYP 450 enzymes
- Blood pressure medications
- Testosterone<sup>44,45,46,47,48</sup>

Patients with the following disease states or conditions should not use licorice

- Pseudohyperaldosteronism
- Hypertension<sup>49,50,51</sup>
- Pregnancy<sup>52</sup>
- Fluid retention
- 11HSD deficiency or genetic mutation of HSD11B2 gene

## **Nutrient Interactions:**

Potassium: Licorice may reduce the effect of potassium when potassium is given as a

supplement.

## References:

### General Comments

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