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## Lei Gong Teng (Radix Tripterygii Wilfordii): A Blessing or a Time Bomb?

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Pinyin name: *Lei Gong Teng*

Literal name: "thunder vine"

Original source: *Zhong Guo Yao Ci Dian (Journal of Chinese Medicinal Plants)*

English name: tripterygium, common broad lily root

Botanical name: *Tripterygium Wilfordii* Hook F.

Pharmaceutical name: *Radix Tripterygii Wilfordii*

Properties: bitter, acrid, cool

Channels entered: Liver

Safety index: toxic

Background

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From left: The Chinese characters, dried herb and fresh plant of *lei gong teng*.

*Lei gong teng* (*radix tripterygii wilfordii*) is a native plant that grows in many parts of China and Burma. It is a deciduous climbing vine that grows up to 12 meters in length. The twigs are brown, angular and downy. The leaves are light green, smooth on top, and pale gray with light hairs underneath. The flowers are hermaphroditic, and usually bloom in September. The fruits are three-

winged and brownish red, about 1.5 centimeters long. The root is the medicinal part of the plant, and is generally collected in autumn.

### Traditional Chinese Medicine

Traditionally, *lei gong teng* dispels wind and dampness, and is usually used to treat *bi zheng* (painful obstruction syndrome). *Lei gong teng* relieves pain and reduces swelling in patients who have swollen joints and difficulty moving. It can be used alone or with other antirheumatic herbs.

This herb is also known as *qi bu si*, literally, "seven steps to death," implying that it is extremely toxic. Because of its toxicity, the daily dose should be kept between five and 12 grams, with a maximum of 15 grams. Classic texts specifically instructed users to peel and discard the root bark of this herb before decocting. In addition, *lei gong teng* should be cooked for at least 60 minutes before the addition of other herbs, then cooked for another 15 minutes. Prolonged decoction (between one and two hours) is recommended to decrease its toxicity. Side-effects are minimal when this herb is prescribed following the proper dosage and preparation.

*Lei gong teng* is contraindicated in pregnancy. It should be used with caution in geriatric and pediatric patients. It should also be used with caution for patients with heart, stomach and spleen disorders. Finally, *lei gong teng* is toxic, and should not be used by patients who have compromised hepatic functions.<sup>1</sup>

### Clinical Studies and Research

There have been many studies published on the potential use of this herb for treatment of arthritis. These *in vitro* and *in vivo* studies confirm the therapeutic benefits of this Chinese herb.

According to *in vitro* studies, administration of an extract of *lei gong teng* once daily for 14 days exhibited a marked effect to suppress the development of arthritis, antibody production and delayed-type hypersensitivity to type II collagen. On the other hand, therapeutic administration of the herbal extract did not affect the clinical course of the disease.<sup>2</sup>

In research from the University of Texas and the National Institute of Health, it was reported that the use of a *lei gong teng* preparation showed that the herb has anti-inflammatory and immunosuppressive effect comparable to prednisone.<sup>3</sup>

According to one randomized, double-blind trial involving 70 patients with rheumatoid arthritis, the study reported approximately 90 percent of the patients treated experienced significant improvement.<sup>4</sup>

According to another study, the combination of *lei gong teng* and *fen fang ji* (radix stephaniae tetandreae) was found to have a powerful suppressive effect on human immune responses for treatment of rheumatoid arthritis. The mechanisms of action included inhibition of prostaglandin E2 secretion from monocytes, and inhibited IL-1, IL-6, IL-8, and tumor necrosis factor-alpha.<sup>5</sup>

According to a double-blind, placebo-controlled study, use of a *lei gong teng* extract for 20 weeks showed therapeutic benefit in patients with rheumatoid arthritis refractory to standard Western drug treatment. Efficacy was defined as 20 percent improvement in disease activity according to the American College of Rheumatology criteria.<sup>6</sup>

### Overdosage

The entire tripterygium plant is toxic. The toxicity of the root and bark is greater than that of other parts of the plant. The fresh form is more toxic than the dried form which has been stored for at least a year. Toxic signs include local irritation of the gastrointestinal tract, damage to the central nervous system, internal bleeding and necrosis of the organs. In severe cases, gross overdose of *lei gong teng* may cause bleeding in the stomach, intestines, liver and lungs. Other symptoms include dizziness, dry mouth, palpitations, necrosis of mucous membranes and irregular menstruation.

Any adverse reactions generally occur within two to three hours after ingestion of the herb. Early reaction is characterized by headache, dizziness, palpitation, fatigue, severe vomiting (sometimes with blood), chills, fever (up to 40° C), continuous abdominal pain, diarrhea (with dark watery stools), generalized aches and pain, tachycardia and irregular heart rhythms. In some cases, patients may present with frequent urination with urgency, and feelings of stabbing pain during urination. Other patients may exhibit delayed symptoms after two to three days, such as low back pain, hair loss, facial edema, decreased or increased urinary output, and in severe cases, low blood pressure, low body temperature, altered consciousness, convulsions, difficult respiration and purple lips. Hematological disorders have also been noted following chronic use of the herb, with decreased white blood cell and platelet counts due to bone marrow suppression.<sup>7</sup>

### Treatment of Overdosage

Early-stage overdose (within four hours of ingestion) should be treated with emetic methods or gastric lavage to eliminate the offending agent from the body. Successful cases of detoxification have been reported using gastric lavage, even with gross overdose.<sup>8</sup>

Systemic reaction to the herb is generally treated with *feng wei cao* (herba pteris) or *san qi* (radix notoginseng) given as decoction (*Hu Nan Yi Yao Za Zhi* [Hunan Journal of Medicine and Herbology] 1977;5:3). While this herb is toxic to humans, it has no toxicity for goats and rabbits. It was found that goats or rabbits that consume *lei gong teng* regularly have developed resistance and antibodies to the toxicity of the herb. The consumption of fresh blood (200 to 300 ml) from goats and rabbits has been used successfully to treat overdose of the herb, using the rationale that the blood of these two animals contains substances that act as an antidote to the herb.<sup>9</sup>

### Chemical Composition

Alkaloids (wilfordine, wilforine, wilforidine, wilforgine, wilfortrine, wilforzine, wilformine, wilfornine, euonine, celacinnine, celafurine, celabenzine, neowilforine, regilidine), terpenoids (triptolide T13, triptiolide, tripterolide, triptonide, triptolidenol T9, hypolide, triptonoterpenol, triptophenolide methylether, neotriptophenolide, isotriptophenolide, isoneotriptophenolide, triptonoterpene, triptonoterpene methylether, triptioltonide, triptiolide T8, triptiolide T11, triptolide T10, wilforlide AT1, triptotriterpenoidal lactone A, wilforlide B, triptotriterpenic acid AT3, triptotriterpenic acid BT2, triptoterpenic acid CT28, selaspermic acid, wilforlide, triptofordin A,B,C-1,C-2, D).<sup>10</sup>

### Toxicology

While the side-effects of *lei gong teng* are related mostly to gastrointestinal upset, infertility and suppression of lymphocyte proliferation, one fatality has been reported. After ingesting the herb, the patient developed hypovolemic shock and cardiac damage, and died three days later. There was no information available on the prior physical condition of the deceased, nor what dosage of the herb was consumed.<sup>11</sup>

## Author's Comment

*Lei gong teng* is not used often in traditional Chinese medicine. However, with publications from numerous journals, the use of this herb is certainly on the rise. A quick search on the Internet or at the herb stores will yield several sources that sell this product. Despite the increased evidence that this herb treats arthritis effectively, it must be prescribed and monitored carefully. Careless and indiscriminate use will only result in potential side-effects and toxic reactions.

## References

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- Calligraphy of Chinese character: courtesy of Dr. Chen
- Photograph of plant: [www.biologie.uni-ulm.de/systax/dendrologie/Triptwilffw.htm](http://www.biologie.uni-ulm.de/systax/dendrologie/Triptwilffw.htm)
- Photograph of dried herb: John K Chen and Tina T Chen, *Chinese Medical Herbology and Pharmacology*, Art of Medicine Press, City of Industry, CA 91715-0878

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