

Fu Zi (Radix Aconiti Lateralis Praeparata)



附子

Pinyin Name: *Fu Zi*

Literal Name: “appendage”

Original Source: *Shen Nong Ben Cao Jing* (Divine Husbandman’s Classic of the Materia Medica) in the second century

English Name: aconite, prepared daughter root of common monks’ hood

Botanical Name: *Aconitum carmichaeli* Debx. (*Wu Tou*)

Pharmaceutical Name: Radix Aconiti Lateralis Praeparata

Properties: acrid, hot

Channels Entered: Heart, Kidney, Spleen

Safety Index: toxic

CHINESE THERAPEUTIC ACTIONS

1. Restores Depleted Yang

Yang failure: Acrid and hot, *Fu Zi* (Radix Aconiti Lateralis Praeparata) is used in emergency situations in which there is a complete void of yang energy in the body. This critical condition is characterized by profuse perspiration with clear and cold sweats, intolerance of cold, faint respiration, icy extremities, diarrhea containing undigested food, and faint or imperceptible pulse. *Fu Zi* restores depleted yang by tonifying Heart yang, thus opening channels and collaterals, and by tonifying Kidney yang to augment fire.

- Intolerance of cold, icy extremities, and diarrhea with undigested food because of depleted yang: use *Fu Zi* with *Gan Jiang* (Rhizoma Zingiberis) and *Gan Cao* (Radix Glycyrrhizae). **Exemplar Formula:** *Si Ni Tang* (Frigid Extremities Decoction).
- Profuse perspiration with shortness of breath and increased respiration due to depletion of yang with qi escaping the body: add *Ren Shen* (Radix Ginseng).
- Shock or heart failure: *Fu Zi* is used as an injectable substance in China for this application.
- Lower body edema, dysuria: combine *Fu Zi* with *Fu Ling* (Poria).

2. Tonifies Yang, Augments Fire

Fu Zi treats any type of yang deficiency, as it warms all of the organs and opens all of the channels and collaterals. The organs that are most susceptible to yang deficiency are Kidney, Spleen and Heart.

Kidney yang deficiency: Kidney yang deficiency, the most severe of yang deficiencies, is characterized by cold extremities (especially the lower extremities), intolerance

to cold, weakness, coldness and soreness of the low back and knees, impotence, frequent urination (especially during the night), clear polyuria, pale complexion, cough, and wheezing. Secondary symptoms may include impotence or spermatorrhea, profuse and clear leukorrhea, diarrhea (especially during the early morning), edema and infertility.

- Kidney yang deficiency: use *Fu Zi* with *Rou Gui* (Cortex Cinnamomi) and *Shu Di Huang* (Radix Rehmanniae Preparata). **Exemplar Formula:** *You Gui Wan* (Restore the Right [Kidney] Pill), or *Ba Wei Di Huang Wan* (Eight-Ingredient Pill with Rehmannia).
- Infertility: use this herb with *Lu Jiao* (Cornu Cervi), *Shu Di Huang* (Radix Rehmanniae Preparata), *Rou Gui* (Cortex Cinnamomi), *Tu Si Zi* (Semen Cuscutae), *Yang Qi Shi* (Actinolitum), *Ba Ji Tian* (Radix Morindae Officinalis), *Dang Gui* (Radix Angelicae Sinensis) and *Gou Qi Zi* (Fructus Lycii).
- Impotence: combine it with *Tu Si Zi* (Semen Cuscutae), *Yin Yang Huo* (Herba Epimedii) and *Rou Gui* (Cortex Cinnamomi).

Spleen yang deficiency: Spleen yang deficiency is more severe than Spleen qi deficiency. Patients suffering from this disorder manifest all signs of Spleen qi deficiency, plus abdominal fullness, coldness and dull pain, decreased intake of food, loose stools or diarrhea, edema, profuse watery leukorrhea, cold limbs and a preference for pressure and warmth applied to the abdomen.

- Spleen yang deficiency: use *Fu Zi* with *Ren Shen* (Radix Ginseng), *Gan Jiang* (Rhizoma Zingiberis) and *Bai Zhu* (Rhizoma Atractylodis Macrocephalae). **Exemplar Formula:** *Fu Zi Li Zhong Tang* (Prepared Aconite Pill to Regulate the Middle).

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- Spleen and Kidney yang deficiency with edema: use it with *Bai Zhu* (Rhizoma Atractylodis Macrocephalae) and *Fu Ling* (Poria). **Exemplar Formula:** *Zhen Wu Tang* (True Warrior Decoction).

Heart yang deficiency: Clinical manifestations include palpitations, shortness of breath, chest pain, dull purplish complexion, cold extremities, a flabby, pale or dark purple tongue, and a deep, weak pulse. In the range of Heart conditions, Heart qi deficiency is least serious, followed by Heart yang deficiency, and then Heart yang collapse being most serious.

- Heart yang deficiency: use *Fu Zi* with *Ren Shen* (Radix Ginseng) and *Gui Zhi* (Ramulus Cinnamomi).
- Heart yang collapse with vomiting, fading pulse, icy extremities and profuse perspiration: combine this herb with *Gan Jiang* (Rhizoma Zingiberis), *Zhi Gan Cao* (Radix Glycyrrhizae Preparata) and *Ren Shen* (Radix Ginseng).
- Shock: use it with *Ren Shen* (Radix Ginseng), *Mai Men Dong* (Radix Ophiopogonis), and *Wu Wei Zi* (Fructus Schisandrae Chinensis) as a decoction, administered through the nose.
- Yang deficiency with exterior wind-cold: use this herb with *Ma Huang* (Herba Ephedrae) and *Xi Xin* (Herba Asari).

3. Warms Channels, Disperses Cold and Dampness, Relieves Pain

Bi zheng (painful obstruction syndrome) due to cold: *Fu Zi* dispels cold and dampness from the peripheral channels and collaterals to treat *bi zheng*.

- *Bi zheng* caused by cold and dampness: use *Fu Zi* with *Gui Zhi* (Ramulus Cinnamomi), *Bai Zhu* (Rhizoma Atractylodis Macrocephalae), and *Gan Cao* (Radix Glycyrrhizae).
- Joint and muscle pain, numbness and difficulty of movement: use it with *Qiang Huo* (Rhizoma et Radix Notopterygii), *Du Huo* (Radix Angelicae Pubescentis), *Wei Ling Xian* (Radix Clematidis), and *Sang Ji Sheng* (Herba Taxilli).

Menstrual Pain: *Fu Zi* can be used with *Dang Gui* (Radix Angelicae Sinensis), *Wu Ling Zhi* (Excrementum Troglodyteri seu Pteromi), and *Yan Hu Suo* (Rhizoma Corydalis) for menstrual pain caused by cold.

Yin sores: *Fu Zi* disperses cold and opens collaterals to facilitate the healing of yin sores that do not ulcerate, or ulcerate but do not heal.

- Yin sores: use *Fu Zi* with *Ren Shen* (Radix Ginseng) and *Huang Qi* (Radix Astragali).

DOSAGE

The normal dosage is 3 to 15 grams. *Fu Zi* must be pre-decocted for 30 to 60 minutes.

There are two major schools of thought regarding appropriate dosages of *Fu Zi*. Some scholars have proposed dosages of up to 100 grams for severe cases. Others proposed small dosages only.

When prescribing this herb, the condition of the individual must be taken into consideration. An individual with a weak constitution will react to the toxicity of *Fu Zi* even when it is prescribed at a low dose. Another individual with a stronger constitution and thus higher tolerance may not experience adverse effects even at a large dose. This difference in response depends on the individual constitution as well as geographic, weather and lifestyle differences. In some areas of China, *Fu Zi* is commonly used with other vegetables to make stew. Naturally, these people will have higher tolerance for the toxicity of *Fu Zi*. In short, the dosage should be selected cautiously according to the condition of each patient.

Fu Zi is generally sold in the processed form only, as the unprocessed form is quite toxic. Though there are multiple ways to process this herb, the most common way is for the manufacturer to cook the herb at boiling temperature for 4 to 6 hours before drying and distribution. Prior to use, the patient should again pre-decoct *Fu Zi* for 30 to 60 minutes before the addition of other herbs.

Use of unprocessed *Fu Zi*, or overdose of the herb, are responsible for the majority of possible adverse reactions. Proper processing reduces the toxicity of *Fu Zi* to between 1/2000 and 1/4000th of the toxicity of the unprocessed herb.¹

CAUTIONS / CONTRAINDICATIONS

- *Fu Zi* is contraindicated during pregnancy.
- *Fu Zi* is contraindicated in patients with yang excess and yin deficiency (also referred to as false cold and true heat).
- Some classic texts have suggested that *Fu Zi* is incompatible with *Bei Mu* (Bulbus Fritillaria), *Ban Xia* (Rhizoma Pinelliae), *Gua Lou Shi* (Fructus Trichosanthis), *Bai Ji* (Rhizoma Bletillae), and *Bai Lian* (Radix Ampelopsis).
- Consumption of alcohol is contraindicated with *Fu Zi*, as absorption of the toxic elements will be greatly enhanced.
- Side effects and adverse reactions are usually due to overdose, to improper processing, or to inappropriate combination with other herbs, and/or inaccurate diagnosis.

OVERDOSAGE

Signs and symptoms of *Fu Zi* overdose include involuntary salivation, nausea, vomiting, diarrhea, dizziness,

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blurred vision, dry mouth, vertigo, numbness of the body and extremities, slowed pulse, difficulty breathing, twitching limbs, convulsions, disorientation, urinary and fecal incontinence, decreased blood pressure and body temperature, arrhythmia, tachyarrhythmia, bradycardia, and possible death.²

One text divided *Fu Zi* overdose into acute and chronic cases. Symptoms in acute cases are described as numbness, tremor, irregularity, and deterioration. Numbness is characterized by numbness starting at the lips, tongue, and mouth, and gradually spreading to the body and extremities. Tremor is characterized by involuntary movement and tremor of the tongue and extremities, which will impair normal speech and movement. Irregularity describes the heart rate and rhythm, which may be fast, slow, knotted, or unpredictable. Lastly, deterioration refers to compromise in all aspects of physical functioning, with altered consciousness, weak respiration, extremely weak pulse, hypotension, and extreme coldness of the extremities. Chronic cases of overdose are characterized by numbness of the legs, dysuria, painful urination, and blurred vision.³

A hospital-based study in Hong Kong reported that up to 61% of all serious poisonings attributed to herbal medicines were associated with the use of various types of aconite root. The study, however, did not clearly describe whether the toxic reactions were due to overdosage, incorrect use, accidental ingestion, or other causes.⁴

TREATMENT OF OVERDOSAGE

Rou Gui (Cortex Cinnamomi) is usually used to reverse early-stage overdose within 4 to 6 hours of the ingestion of *Fu Zi*. According to one report, acute *Fu Zi* poisoning in 14 patients was treated by oral ingestion of *Rou Gui* tea that was prepared by soaking 5 to 10 grams of the herb in hot water. The tea should induce vomiting of the toxin within 5 to 15 minutes, and relieve overall symptoms within 15 to 30 minutes. If toxic symptoms persist, repeat the process by using 3 to 5 grams of *Rou Gui* in tea. Resolution of poisoning is characterized by warmth at the extremities, increased contractility of the heart, and gradual sensory recovery from numbness of the mouth, lips, and extremities.⁵

Overdose of *Fu Zi* can also be treated with a decoction containing *Sheng Jiang* (Rhizoma Zingiberis Recens), *Gan Cao* (Radix Glycyrrhizae), *Gan Jiang* (Rhizoma Zingiberis), *Lu Dou* (Semen Phaseoli Radiati), *Hei Dou* (Semen Glycine Max), *Huang Lian* (Rhizoma Coptidis), *Ren Shen* (Radix Ginseng) and *Huang Qi* (Radix Astragali). The dosage of each of the herbs will vary depending on the specific condition of the patient.

Overdose characterized by irregular heartbeat can be

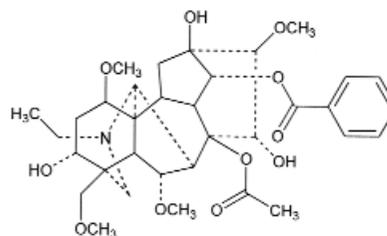
treated with a decoction of 20 grams of *Ku Shen Gen* (Radix Sophorae Flavescentis) and 10 grams of *Gan Cao* (Radix Glycyrrhizae).

Overdose characterized by extreme coldness of the extremities, extremely weak pulse, and shortness of breath, can be treated with a decoction of *Ren Shen* (Radix Ginseng), *Gan Cao* (Radix Glycyrrhizae), and *Gan Jiang* (Rhizoma Zingiberis).

[Note: Gross overdose of *Fu Zi* is potentially life-threatening. Therefore, treatment of overdose should be performed carefully, and only by qualified health-care professionals.]

CHEMICAL COMPOSITION

Aconitine, mesaconitine, hypaconitine, isodelphinine, benzoylmesaconitine, coryneine, atisines, aminophenols, neoline, 15- α -hydroxyneoline, higenamine, dl-demethyl coclaurine, salsolinol.^{6,7}



Aconitine

PHARMACOLOGICAL EFFECTS

- **Cardiovascular:** Administration of *Fu Zi* is associated with positive inotropic and chronotropic effects. In animal experiments, intravenous injection of *Fu Zi* increased cardiac contractility, dilated blood vessels, and increased cardiac output. It also increases heart rate and treats patients with bradycardia or bradyarrhythmia. Experiments in cats and rats have also shown *Fu Zi* to be beneficial in the treatment of shock, as it increases blood pressure and cardiac contraction.⁸
- **Anti-inflammatory:** Oral administration of a 20% *Fu Zi* decoction at the dosage of 2.5 ml/100g in rats has demonstrated marked effectiveness to reduce inflammation and swelling in the joints. The exact mechanism of action is unclear. Some studies show that it stimulates secretions by the adrenal cortex, leading to anti-inflammatory activity. Other studies, however, show that *Fu Zi* has anti-inflammatory influence even in animals whose adrenal glands have been removed.⁹
- **Analgesic:** Intraperitoneal injection of *Fu Zi* significantly increased pain tolerance in mice and rats.¹⁰

CLINICAL STUDIES AND RESEARCH

- **Abdominal coldness and pain during pregnancy:** A

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classic text reported that *Fu Zi* was used to treat 4 women who were 4 months pregnant with coldness in the lower abdominal region, abdominal distention and pain, and aversion to cold. All 4 women had previous history of early deliveries. The diagnosis according to traditional Chinese medicine was coldness in the internal organs requiring the use of warm herbs. After herbal treatment, the symptoms improved and all delivered after full-term pregnancies.¹¹ [Note: The use of *Fu Zi* is generally considered contraindicated during pregnancy. This is a rare report that discussed the use of *Fu Zi* during pregnancy. This should not be attempted unless the benefit clearly outweighs the risks.]

- **Deficiency syndrome:** According to one report, 13 patients with generalized deficiency were treated with injections of *Fu Zi* one time daily at night for 2 weeks per course of treatment, with a total of 1 to 2 courses. The study reported an overall improvement of symptoms, and was especially effective in patients characterized by yang deficiency.¹²

HERB-DRUG INTERACTION

- **Antiarrhythmics:** Patients who have a past history of cardiovascular disorders or are taking antiarrhythmic medications should take *Fu Zi* with extreme caution.¹³ [Note: Examples of antiarrhythmics include quinidine, procainamide (Pronestyl), disopyramide (Norpace), flecainide (Tambocor), propafenone (Rythmol), and amiodarone (Cordarone).]

TOXICOLOGY

The LD₅₀ for unprocessed *Fu Zi* in mice is 5.49 g/kg via oral administration and 0.49 g/kg via intravenous injection. The LD₅₀ for processed *Fu Zi* is 161 g/kg via oral administration and 3.516 g/kg via intravenous injection. The LD₅₀ for water extract of *Fu Zi* in mice is 26.30 g/kg.^{14,15}

AUTHORS' COMMENTS

Fu Zi is an extremely important herb to tonify yang, and there is no other herb in the entire pharmacopoeia with equivalent functions that can be used as a substitute. However, it should also be used with great caution, as it has a relatively narrow range of safety.

There is a saying: "*Fu Zi* is not hot without *Gan Jiang* (Rhizoma Zingiberis)." When used together, the two herbs have a synergistic interaction that enhances the warming influence of the formula, compared to when either is used alone. *Gan Jiang* also decreases the toxicity of *Fu Zi*.

Fu Zi is generally used in combination with other herbs that increase the therapeutic effect and minimize potential side effects. For example, the use of *Fu Zi* as a single herb treatment for its cardiostimulant effect is not appropriate, as it

only has moderate potency, short duration and numerous side effects. However, when combined with *Gan Cao* (Radix Glycyrrhizae) or *Gan Jiang* (Rhizoma Zingiberis), the combination has more potent cardiostimulant effect and prolonged duration of action. Furthermore, the addition of these two herbs will decrease the potential for side effects of *Fu Zi* by just over fourfold.

Fu Zi, extremely acrid and hot, is highly effective in restoring yang and warming the body. It is an important herb for treating yang deficiency with excess accumulation of cold. In cases of yang collapse, this herb is indispensable in restoring life, or the vital yang, to the body. However, because of the powerful effect this herb exerts, accurate diagnosis is essential. Essential indications for the use of *Fu Zi* include: a flabby, pale tongue with a white or greasy coating, a thready, weak pulse or deep and slow pulse, a bland taste in the mouth with no desire to drink, cold limbs, intolerance to cold, soreness, coldness and weakness of the lower back and knees; and clear polyuria.

Fu Zi can be used in patients with mixed yin and yang symptoms. *Fu Zi* is often combined with warm herbs such as *Rou Gui* (Cortex Cinnamomi), *Gan Jiang* (Rhizoma Zingiberis), *Gan Cao* (Radix Glycyrrhizae), *Bai Zhu* (Rhizoma Atractylodis Macrocephalae), *Ren Shen* (Radix Ginseng), *Huang Qi* (Radix Astragali) and other qi-tonic or interior-warming herbs. However, it is also used with cold herbs such as *Da Huang* (Radix et Rhizoma Rhei) to treat cold-type constipation. It is combined with *Huang Lian* (Rhizoma Coptidis) to treat epigastric fullness due to yang deficiency. The combination of *Fu Zi* and *Yin Chen Hao* (Herba Artemisiae Scopariae) treats yin-type jaundice caused by cold and dampness. With *Long Dan Cao* (Radix Gentianae), it treats damp-heat in the Liver and Gallbladder affecting a yang-deficient Spleen. To nourish blood or stop bleeding due to yang deficiency, *Fu Zi* can be combined with *Sheng Di Huang* (Radix Rehmanniae). Also, interestingly, it can also be used in Heart yang deficiency patients who have febrile disorders.

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