

## Dong Quai – Monograph



1. **Scientific name** – *Angelica Sinensis*, *Angelica atropurpurea*. Common name is Dong Quai or Dang Gui.
2. **Active ingredients:** The coumarins derivatives bergapten, imperatorin, oxypeucedanin, osthole, psoralen, sen-byak-angelicole, ferulic acid and 7-demethysuberosin may be found in this plant.<sup>1</sup> The root is known to contain various lactones and lactone derivatives and 40% sucrose.<sup>1-2</sup> volatile oil and Various vitamins including vitamin A, vitamin B12, nicotinic acid, folic acid, biotin, and vitamin E have been found.<sup>3</sup>
3. **Mechanism of Action (MOA):**
  - a. Anticoagulation – ferulic acid inhibits the polymerization of platelets in the blood and retards platelet release of 5-hydroxytryptamine (5-HT) and adenosine diphosphate (ADP). 5-HT and ADP may cause platelets to

- become more sticky.<sup>3</sup> In vitro study showed that osthole inhibited platelet thromboxane formation and phosphoinositides breakdown in washed rabbit platelets, which resulted in inhibition of platelet aggregation.<sup>4</sup>
- b. Vasodilatory effects – Various coumarins in Dong Quai are thought to have vasodilating actions that dilate blood vessels and increase blood flow to uterus.<sup>5</sup> However, the mechanism is unclear.
  - c. Cardiovascular effects – Animal studies showed that Dong Quai may transiently reduce blood pressure and tachycardia in animal models.<sup>3, 9</sup> Mechanism is unclear.
  - d. Uterine effects – Animal experiments have shown Dong Quai aqueous extract increased uterine excitability that stimulant uterine contractions.<sup>3</sup>
  - e. Anti-constipation – Animal experiments showed that Dong Quai increased contraction of intestinal smooth muscle,<sup>3</sup> and have mild laxative effects.<sup>6</sup> MOA is unclear.
  - f. Tonic effects – Animal study showed that, in rats given 5% dong quai in their diet, metabolism was enhanced, hepatic oxygen utilization was increased, and glutamic acid and cysteine oxidation was increased.<sup>3</sup>
  - g. Anti-bacterial effects – In vitro data showed that Dong Quai aqueous extract inhibited the growth of Gram-negative bacteria and some Gram-positive bacteria,<sup>3</sup> but the minimum inhibitory concentrations were not available in this article. Mechanism is unclear.
  - h. Immunomodulatory effects: in vitro lymphocyte proliferation tests using missed lymphocyte culture (MLC) assay showed that Dong Quai increased all responsiveness in MLC. The immunostimulatory effects of Dong Quai were consistently seen in both cell-mediated immune response and nonspecific lymphoproliferation.<sup>11</sup>

#### **4. Indications and efficacy:**

- a. Anticoagulation:<sup>3,4,13</sup>

Efficacy: Adult, possibly effective. A 20-day controlled study conducted in a Chinese hospital showed that the prothrombin times (PT) were significantly prolonged with intravenous (IV) dong quai solution over IV dextran-40 (P<0.0001). Specific PT values were not provided.<sup>13</sup>

- b. Anti-hypertension effect and myocardial protection:<sup>3,9</sup>

Efficacy: animal data only. In the study, “Dong-Gui Decoction for Enriching the blood “ (BE), a traditional Chinese formulation comprising Angelica sinensis and Astragalus membranaceus, is used for stimulating red blood cell production as well as enhancing cardiovascular function. It was found that BE pretreatment against ischaemia reperfusion (IR) injury in isolated-perfused rat hearts afforded myocardial protection effect.<sup>9</sup>

- c. Anti-constipation:<sup>3</sup>

Efficacy: animal data only

- d. Anti-bacterial effect:<sup>3</sup>

Efficacy: in vitro data only (See MOA above)

- e. Menopause:

Efficacy: adult, ineffective and no estrogenic effects in postmenopausal women.<sup>7</sup> Seventy-one postmenopausal women, who had

follicle-stimulating hormone levels (third-generation assay) of > 30 mIU/mL with hot flashes, were randomized to treatment with either dong quai or placebo for 24 weeks. Endometrial thickness was measured by transvaginal ultrasonography; vaginal cells were evaluated for cellular maturation; menopausal symptoms were evaluated by reviewing the Kupperman index and the diary of vasomotor flushes. The results showed that there were no statistically significant differences between groups in endometrial thickness, in vaginal maturation index, in number of vasomotor flushes, or in the Kupperman index. This study concluded that dong quai alone does not produce estrogen-like responses in endometrial thickness or in vaginal maturation and was no more helpful than placebo in relieving menopausal symptoms.<sup>7</sup>

- f. Tonic:<sup>3</sup>  
Efficacy: animal data only
- g. Immunomodulatory/antineoplastic effects:<sup>10</sup>  
Efficacy: animal data only

**5. Contraindications and allergies:<sup>10</sup>**

- a. hypersensitivity to Dong Quai
- b. diarrhea
- c. hemorrhagic disease
- d. hypermenorrhea
- e. pregnancy, particularly the first trimester

(All the listed above are not documented in any research study)

**6. Dosages forms, recommended doses, and duration:**

- a. Fluid extract tablets: 2-3 grams by mouth 2-3 times a day.<sup>3,10</sup>
- b. Fluid extract: 3-5 ml by mouth 3 times daily.<sup>3,10</sup>
- c. Dried root: 8-15 gm daily.<sup>6,10</sup>

There is not data about clear treatment duration.

**7. Drug interactions and drug-disease interactions:**

- a. Warfarin: There are several case reports showed increased bleeding risk in patients taking warfarin and dong Quai (increased PT and INR). Discontinuing Dong Quai returned the coagulation parameters to an acceptable level.<sup>8</sup>

**8. Adverse effects and toxicity:**

- a. Gynaecomastia: There was a case report about a man who developed gynaecomastia after ingestion of “Dong Quai” pills. This report highlights the potential adverse effects associated with its consumption in the male.<sup>12</sup>

- b. Toxicity:<sup>3,10</sup>

LD50 (rats) (oral): 1.0 gm/10kg of body weight of a 200% to 400% concentrated Dong Quai extract. All animals died at a dose of 2.0g/kg. A 1 dose of 100% Dong Quai extract is approximately equivalent to 4 grams of raw Dong Quai root.<sup>3,10</sup>

Overdose: Oral, high dose administration of Dong Quai volatile oil in rats may cause nephrosis. The extent of the damage is proportional to the concentration of the volatile oil in the serum.<sup>3,10</sup>

## 9. Monitoring parameters:

Prothrombin time(PT):

Patients taking large doses of Dong Quai or in combination with an anticoagulant should be monitored for increases in PT and INR.<sup>13</sup>

## 10. Regulatory and safety information:<sup>10</sup>

American Herbal Products Association rated Dong Quai as a Class 2b herb, which means that it cannot be used in pregnancy unless directed to do so by an expert trained to use the herb. Angelica root oil is approved by the FDA as a food additive. Dong Quai is available as a dietary supplement in the United States under the Dietary Supplement Health and Education Act of 1994 (DSHEA).

## Reference:

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