

COSMECEUTICAL CRITIQUE

Angelica: Part I

Angelica sinensis, better known as dong quai, is a fragrant perennial plant that has been used for medicinal purposes for more than a thousand years in China, Japan, and Korea. *A. sinensis* is best known as a traditional treatment for dysmenorrhea, amenorrhea, menopause, and related conditions in women.

The herb is used throughout the world, including the United States, as an unregulated oral supplement and in some topical multibotanical formulations.

The dried root of *A. sinensis* is included in several herbal formulations, typically for amenorrhea, endometriosis and premenstrual syndrome, and as a hormone replacement therapy alternative, even though Western medicine has not established whether such indications are appropriate or justified (Integrative Cancer Therapies 2003;2:120-38; Nurse Pract. 1997;22:55-6, 61-6).

Despite numerous anecdotal reports of its effectiveness in exerting estrogenic effects, a study of 71 postmenopausal women showed that *A. sinensis* alone failed to produce estrogenic effects on endometrial thickness or vaginal maturation. In addition, the herb eased menopause symptoms no better than placebo (Fertil. Steril. 1997;68:981-6).

Although the reported effects of this reputed "women's herb" remain dubious in the West, evidence is increasing that *A. sinensis* possesses anticarcinogenic properties, which are often associated with antioxidant potential and implications for dermatologic use.

In this vein, the potent antioxidant ferulic acid, which was featured in this column in October 2005, has been identified as a major active component of *A. sinensis*, along with ligustilide (J. Pharm. Biomed. Anal. 2005;38:664-9).

Antitumor Action

Investigators assessing the antitumor effects, in vitro and in vivo, of a chloroform extract of *A. sinensis* on glioblastoma multiforme brain tumors reported that the herb strongly inhibits the growth of malignant brain tumor cells, via cell cycle arrest and apoptosis induction, without damaging fibroblasts.

In vitro, angelica spurred p53-dependent and -independent pathways, resulting in apoptosis. In human DBTRG-05MG and rat RG2 glioblastoma multiforme tumor cells, angelica suppressed malignant growth and reduced tumor volume. Researchers concluded that *A. sinensis* merits more research and consideration as a potential brain tumor therapeutic agent (Clin. Cancer Res. 2005;11:3475-84).

In a study that assessed the antioxidant activities of three herbs used frequently in traditional Chinese medicine—*A. sinensis*, *Lycium barbarum*, and *Poria cocos*—aqueous extracts of these herbs concentration-de-

pendently displayed antioxidant activities. *L. barbarum* extract was the strongest, but all the extracts inhibited ferric chloride-ascorbic acid-induced lipid peroxidation in rat liver homogenate in vitro, and demonstrated significant superoxide anion-scavenging activity as well as antisuperoxide formation activity (Phytother. Res. 2004;18:1008-12).

Another study revealed that the total polysaccharide from *A. sinensis* confers antitumor effects on in vivo murine models and, in vitro, inhibits invasion and metastasis of hepatocellular cancer cells (World J. Gastroenterol. 2003;9:1963-7).

In a study of the effects of 14 commonly used herbs on cellular proliferation and apoptosis of a hepatic stellate cell line in rats, *A. sinensis* was among five herbs that exhibited both antiproliferative and proapoptotic properties in association with upregulation of Fas and Bax and downregulation of Bcl-xL. Investigators suggested that further research is warranted into the antifibrotic potential of these herbs to promote apoptosis in hepatic stellate cells, which are integral in hepatic fibrosis and are known to possess antifibrotic activity (J. Ethnopharmacol. 2005;100:180-6).

Action in the Skin

Perhaps the evidence providing the most direct link to dermatologic application comes from a study of the effects of *A. sinensis* on melanocytes and tyrosinase activity. The potent herb was noted for significantly promoting melanocytic proliferation, which substantially increased cell counts, and fostering melanin synthesis and melanocytic tyrosinase activity. Such actions, the investigators concluded, suggest a mechanism that may justify the use of this fragrant botanical in the treatment of skin dyschromias (Di Yi Jun Yi Da Xue Xue Bao 2003;23:239-41).

In addition, *A. sinensis* is an ingredient in Si-Wu-Tang, a traditional Chinese formula used to treat pruritus, chronic skin inflammation, and other conditions (Biol. Pharm. Bull. 2002;25:1175-8).

Gastrointestinal Protection

Polysaccharides isolated from the root of *A. sinensis* have been found to impart an ulcer-protective effect.

Specifically, angelica extract dose-dependently inhibited various neutrophil-dependent gastrointestinal lesions induced in rats by orally administered ethanol or indomethacin. The investigators concluded that angelica exhibits anti-inflammatory action, and might be effective in preventing neutrophil-dependent gas-



Although little dermatologic research has been done, the *Angelica sinensis* plant, also known as dong quai, appears to have antioxidant and antitumorigenic activity.

trointestinal damage (Planta Med. 2000;66:348-51).

Some of the same researchers followed up by demonstrating that *A. sinensis* extract has a direct wound-healing effect on gastric epithelial cells. The herb significantly promoted epithelial cell migration over an artificial wound, and dose-dependently stimulated DNA synthesis as well as concurrent epithelial growth factor mRNA expression (Life Sci. 2001;68:961-8).

Subsequent research confirmed that *A. sinensis* crude extract does dose-dependently confer a direct healing effect on gastric mucosal lesions in rats, and it also promotes wound repair in culture (Biochem. Pharmacol. 2001;61:1439-48).

Other Actions

An evaluation of the therapeutic activity of *A. sinensis* on focal ischemic injury in rats showed reduced volume of cerebral infarction, reduced Bax protein expression, and significant decreases in the number of neuronal apoptosis cells (Clin. Hemorheol. Microcirc. 2005;32:209-15). Improvement in microcirculation, with obvious implications for various organs, was achieved by the intravenous injection of *A. sinensis* in a study examining the mechanism of microcirculation disorder in the tongue in the common oral disease glosodynia (Hua Xi Kou Qiang Yi Xue Za Zhi 2000;18:101-2, 108).

Aqueous extract of *A. sinensis* has been shown in a rabbit model to impart myocardial protective effects caused by ischemia reperfusion (Zhongguo Zhong Xi Yi Jie He Za Zhi 1995;15:486-8).

A study of the effects of two herbs used in traditional Chinese medicine to treat bleomycin-induced pulmonary fibrosis in rats revealed that ligustrazini and, to a lesser extent, *A. sinensis*, lessened the severity of alveolitis symptomatic of pul-

monary fibrosis (Zhonghua Jie He He Hu Xi Za Zhi 1996;19:26-8).

Similarly, a traditional Chinese medicinal decoction containing *A. sinensis* and *Astragalus membranaceus*, which is used for stimulating production of red blood cells and bolstering cardiovascular function, was shown in a rat model to confer myocardial protection against ischemia-reperfusion injury (Phytother. Res. 2000;14:195-9).

Injection of Qi-Xue, another Chinese herb combination containing *A. sinensis*, *Panax ginseng*, and *Astragalus monogolicus*, is thought to prevent severe hypoxic pulmonary hypertension by enhancing heart function (Zhongguo Yi Xue Ke Xue Yuan Xue Bao 1990;12:51-5).

In high doses, *A. sinensis* may increase susceptibility to photosensitivity reactions, so sun exposure should be curtailed. It also is contraindicated for patients taking warfarin (Lancet 2000; 355:134-8; J. Am. Med. Womens Assoc. 1999;54:191-2, 195).

Conclusions

A. sinensis is one of the oldest and most popular herbs used in traditional Chinese medicine. While there is an expanding body of research on the broad medical applications of this botanical product, and it is being used in multibotanical formulations, there is minimal evidence as yet to warrant its use for dermatologic purposes.

Recent studies, however, do seem to indicate that *A. sinensis* has antioxidant and antitumorigenic activity and that it warrants further investigation, including for its potential benefit to the skin. Research associating angelica with melanocytic, anti-inflammatory, and antipruritic properties also deserves attention and further study. ■

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