



Andrographis (*Andrographis paniculata*)

Common Indications:

- Immune support, especially upper respiratory tract infections including sinusitis
- Colds and influenza prevention and management
- Anti-inflammatory
- Ulcerative colitis
- Antiviral
- Cancer; anti-tumor
- Blood sugar regulation
- Antioxidant
- Liver support

General Comments:

Andrographis (*Andrographis paniculata*), also known as “King of Bitters”, is a plant found in China, India and Southeast Asia and is commonly used in Traditional Chinese Medicine and Ayurvedic Medicine. Andrographis is traditionally used to support digestion and healthy cardiovascular and urinary systems. The major interest in andrographis currently is for immune support, especially in colds and influenza (upper respiratory tract infections).

The most widely tested product is a product called Kan Jang® (Swedish Herbal Institute). This product is available with andrographis alone and also in combination with eleuthero, formerly known as Siberian ginseng (*Eleutherococcus senticosus*)¹.

Benefits & Mechanism of Action:

Immune Support

In clinical studies, andrographis supplements have been found to decrease severity and duration of upper respiratory tract infections¹. Also, andrographis has been reported to relieve the inflammatory symptoms of sinusitis.

Laboratory studies have found that andrographis increases lymphocyte production and proliferation, along with key cytokines such as tumor necrosis factor alpha (TNF-alpha), natural killer cell (NK) function and interleukin-2 (IL-2)^{2,3}.

Several double-blind clinical trials have found that andrographis can help reduce symptom severity in people with the common cold^{4,5}.

Blood Sugar Regulation

Andrographis has been reported to have blood sugar regulating properties⁶. A study found that andrographis helps increase glucose metabolism and may also decrease elevated triglycerides⁷. Part of the pharmacology behind blood sugar regulation is the antioxidant potential of andrographis. In laboratory studies, andrographis has been reported to increase the activity of superoxide dismutase (SOD), catalase (CAT), leading to a decrease in oxidative stress⁸.

Antiviral and antimicrobial

The constituent andrographolide is reported to have in vitro activity against herpes simplex virus 1 (HSV-1)⁹ and dengue virus serotype 1¹⁰.

Andrographolide may inhibit HIV-induced cell cycle dysregulation, leading to a rise in CD4(+) lymphocyte levels in HIV-1 infected individuals. However, dosages used in this study caused side effects, including headache, fatigue, a bitter/metallic taste in the mouth, and elevated liver enzymes (which returned to normal after the medication was stopped)¹¹.

- In vitro studies have demonstrated antifungal and antibacterial activity against *E. coli*, *Pseudomonas aeruginosa*, *staphylococcus aureus*, *Bacillus subtilis*, and *Candida albicans*^{12,13}

Anti-Inflammatory

Andrographolide may be useful in the treatment of inflammatory conditions, such as asthma, by inhibiting the NF-kappaB pathway at the level of inhibitory kappaB kinase- beta activation¹⁴.

Based on anti-inflammatory properties, patients with mild to moderate ulcerative colitis are reported to have positive clinical response when administered Andrographis at doses of 1,200 and 1,800mg daily¹⁵. Andrographis is reported to have similar clinical efficacy to mesalamine in these individuals.

Cancer

The constituent andrographolide is reported to have anti-tumor activity in gastric cancer, liver cancer¹⁶, lung cancer and breast cancer. Andrographolide was found to induce the apoptosis of cancer cell, inhibit the cell cycle, and increase the antitumor activity of lymphocytes¹⁷.

Andrographolide is reported to cause cell-cycle arrest at G0/G1 phase through induction of cell-cycle inhibitory protein p27 and decreased expression of cyclin-dependent kinase 4 (CDK4). Andrographolide also is reported to increase tumor necrosis factor-alpha (TNF-alpha) production and CD marker expression, resulting in increased cytotoxic activity of lymphocytes against cancer cells¹⁸.

Addition of andrographis to 5-FU (5-fluorouracil), a commonly used chemotherapeutic agent, was found to produce synergistic apoptosis¹⁹. The compound increased caspase-8, p53 activity and

significantly changed Bax conformation in these cells, resulting in increased losses of mitochondrial membrane potential, increased release of cytochrome c, and activation of caspase-9 and caspase-3¹⁹

Cardiovascular health

- Studies in animal models have demonstrated antihypertensive effects which appear to result from relaxation of smooth muscle and decrease in heart rate^{21,22}.
- Hypolipidemic activity has also been seen in experimental rat models with a decrease in LDL cholesterol, triglycerides and blood sugar levels²³.

Hepatoprotective

Hepatoprotective activity attributed to angiographolide constituents of andographis has been demonstrated invivo and invitro

In rat models, hepatoprotective activity has been identified against liver toxicity induced by paracetamol, galactosamine, carbon tetrachloride and tertbutylhydroperoxide. Several mechanisms have been identified^{21,24}

Mice studies have demonstrated hepatoprotective and nephroprotective activity against ethanol induced toxicity attributed to angiographolide and arabinogalactan protein²⁵.

Antiplatelet activity

Antiplatelet activity by Andographis is due to inhibition of platelet-activating factor (PAF)-induced human platelet aggregation^{21,26}.

Dose:

- 150mg daily of a standardized extract for prevention of colds/influenza. If taken for prevention, 3 weeks on and 2 weeks off is recommended.
- Doses of 300-600mg daily for 3-5 days of a standardized extract can be used when symptoms of colds/flu appear. These higher dosages are also used in cancer and liver support.
- Doses of 200-400mg, 3 times daily standardized to 5% andrographolide have been used with success in clinical studies. Doses as high as 1,000 to 2,000mg, 3 times daily standardized to 5% andrographolide have been used in some studies. *Note: There are various products with different dosages and standardizations to choose from. When choosing a dietary supplement, select those from reputable manufacturers.
- Doses of 1,200 – 1,800mg daily have been used with clinical efficacy in patients with ulcerative colitis (Sandborn et al, 2013).

Standardization:

Andrographis supplements should be standardized to contain 5% andrographolides. The proprietary Kan Jang® is standardized to 4-6% andrographolides.

Cautions & Side Effects:

- Andrographis has been reported to be safe in recommended doses.
- High doses may lead to side effects such as headache, fatigue, a bitter/metallic taste in the mouth, and elevated liver enzymes.
- Use with caution in pre-existing liver conditions.
- Based on a laboratory study, andrographis may decrease fertility in males. Do not use andrographis if pregnancy is trying to be achieved.

DISCLAIMER: Statements made are for educational purposes and have not been evaluated by the US Food and Drug Administration. They are not intended to diagnose, treat, cure, or prevent any disease. If you have a medical condition or disease, please talk to your doctor prior to using the recommendations given.

References:

Immune support

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Blood sugar regulation

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Antiviral and antimicrobial

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Anti-inflammatory

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Anticancer

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Cardiovascular

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Antiplatelet

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