



- **Latin Name:** *Andrographis paniculata*
- **Active Ingredient:** Andrographolide
- **CAS No.:**
- **Test method:** HPLC
- **Specifications:** 4:1,10:1

Product Description:

Name :Andrographis paniculata Extract

Source: *Andrographis paniculata*

Botanical Name :*Andrographis paniculata*

Extract part: Aerial part

Composition ratio:10:1

Identification measure :HPLC

Appearance: Fine White powder

Country of origin:P.R. China

Source

Andrographis paniculata, commonly known as 'king of bitters' in India, is an annual herb in the family Acanthaceae. *Andrographis paniculata* is extremely bitter in taste in all parts of the plant body. The plant is native to India and Sri Lanka and widely cultivated in Southern and Southeastern Asia as it has been effectively used in traditional medicines in these areas for centuries. *Andrographis paniculata* is commonly available, less expensive medicinal plant used for the treatment of scabies, boils, skin eruptions, and chronic undetermined fevers. The aerial part of *Andrographis paniculata* attributes most reported medicinal properties of this plant. Nowadays researches revealed a broad range of pharmacological effects including anticancer, antidiarrheal, antihepatitis, anti-HIV, antihyperglycemic, anti-inflammatory, antimicrobial, antimalarial, antioxidant, cardiovascular, cytotoxic, hepatoprotective, immunostimulatory, and sexual dysfunctions.

Main bio-active

The aerial part *Andrographis paniculata*, used medicinally, contains a large number of chemical constituents, mainly lactones, diterpenoids, diterpene glycosides, flavonoids, and flavonoid glycosides. Andrographolide is the major constituent extracted from the leaves of the plant and is a bicyclic diterpenoid lactone. This bitter principle was isolated in pure form by Gorter (1911). Systematic studies on chemistry of *A. paniculata* have been carried out.

Functions

Antineoplastic effects

Several in vitro studies have indicated that andrographolide has anticancer effects by slowing the spread of cancer cells. Study published in 2003 suggested Andrographolide isolated from *Andrographis paniculata* plant inhibited the in vitro proliferation of different tumor cell lines. The study showed The compound exerts direct anticancer activity on cancer cells by cell-cycle arrest at G0/G1 phase through induction of cell cycle inhibitory protein p27 and decreased expression of cyclin-dependent kinase 4 (CDK4). The in vivo anticancer activity of the compound is further substantiated against B16F0 melanoma

syngenic and HT-29 xenograft models. Furthermore, study reported on Chem Pharm Bull (Tokyo) showed andrographolide and isoandrographolide have ED50 values of 6.5 and 5.1 mcg/mL, respectively, when added to KB cells. These results suggest that andrographolide is an interesting pharmacophore with anticancer and immunomodulatory activities and hence has the potential for being developed as a cancer therapeutic agent.

Skin infections

Recent researches revealed the antifungal and antibacterial activity of *Andrographis paniculata* against skin infections. Ethnobotanical Leaflets published a study that indicates antibacterial activity of *Andrographis paniculata* against 12 skin disease causing bacterial strains in vitro. The extracts showed significant antibacterial activities against both the Gram-positive and Gram-negative bacterial strains tested. Moreover, antifungal activity of Dichloromethane (DCM) and methanol (MEOH) extracts of *Andrographis paniculata* against seven pathogenic fungal species responsible for skin infections was investigated in vitro and the study reported on Pharmaceutical Biology justified the use of *Andrographis paniculata* in folk medicines for the treatment of fungal skin infections. With DCM extract revealed lowest minimum inhibitory concentration (MIC) value (100 µg/mL) against *Microsporum canis*, *Candida albicans*, and *Candida tropicalis*, whereas MEOH extract revealed lowest MIC (150 µg/mL) against *C. tropicalis* and *Aspergillus niger*.

Common cold

Andrographis paniculata has been used for treating common cold in various traditional medicine for centuries. Early report of a randomized placebo-controlled double blind study was published by Phytomedicine to justify the preventive effect against common colds. After two month trial, The rate of incidence of colds among the subject treated with *Andrographis paniculata* was 30% (16/54) compared to 62% (33/53) among the placebo group. The relative risk of catching a cold was therefore 2.1 (1.32-3.33, 95% confidence interval) times lower for the *Andrographis paniculata* group.

Anti-inflammatory

Andrographolide exerts anti-inflammatory activity via numbers pathways. Studies showed the ability of andrographolide in down-regulate Mac-1 up-expression is highly possible cause the inhibition of ROS production via modulation of PKC-dependent pathway. Investigations also showed Andrographolide inhibits NK-kappaB binding to DNA in vitro, reducing expression of a variety of inflammatory proteins, including COX-2. And on THE JOURNAL OF

PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS in 2005, a report of a set of in vitro and in vivo study indicated that andrographolide is able to efficiently block T cell activation in vitro, as well as in vivo, a feature that could be useful for interfering with detrimental T cell responses.

Antidiabetic and antihyperlipidemic effect

Investigation reported on Indian J Pharmacol in 2012 stated that both *Andrographis paniculata* purified extract and andrographolide shows beneficial effects on high-fructose-fat diet induced type 2 DM rats. The study showed the purified extract or its active compound andrographolide has similar effects with Metformin by significantly ($P < 0.05$) decreased the levels of blood glucose, triglyceride, and LDL compared to controls. However, no changes were observed in serum cholesterol and rat body weight.

Cardiovascular effects

Early study showed *Andrographis paniculata* possesses beneficial activities in cardiovascular conditions.

One study in 1992 showed *Andrographis paniculata* potent alleviating activities in the Ca^{2+} -overloading in dog model during the process of ischemic reperfusion. Researchers suggested the decrease in myocardial reperfusion injury following ischemic events is possibly mediated by a decrease in the level of free radicals generated by ischemia. The result indicate that APN may improve the activity of sarcolemma ATPase in alleviating the Ca^{2+} and Na^{+} -overloading by decreasing the harmful effect of oxygen free radicals. In 1994, more studies in rabbits report that andrographolide may help reduce restenosis after angioplasty by reducing the secretion of endothelial growth factors that contribute to restenosis.

Hepatoprotective effects

Early studies showed hepatoprotective effects of Andrographolide from the herb *Andrographis paniculata* in animals. A studies reported on *Planta Med* found andrographolide possesses more potent activities than silymarin in inhibition of paracetamol induced decrease in volume and contents of bile flow, bile salt, and bile acids in conscious rats and anaesthetized guinea pigs.

The further investigation of protective effects against hepatotoxicity of *Andrographis paniculata* isolated components were published on *Biochem Pharmacol* in 1993. The report indicated in mouse models of chemically-induced hepatotoxicity, andrographolide, neoandrographolide, and andrographiside all reduced levels of lipid peroxidation, glutathione depletion, and enzymatic leakage, possibly through antioxidant effects.

Applications

Andrographis paniculata possess many phytochemical activitiies including antineoplastic, anti-inflammatory, hepatoprotective, cardiovascular-protective, antifungal and antibacterial, antidiabetic and antihyperlipidemic. Such properties extented the possible applications into veterinary, pharmaceutical field.

--*Andrographis paniculata* - Wikipedia, the free encyclopedia;

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