



- **Latin Name:** Cynara scolymus L
- **Active Ingredient:** phenolic acids, flavonoids, cynarin and sesquiterpenes
- **CAS No.:**
- **Test method:** HPLC
- **Specifications:** 4:1,10:1,20:1,25:1,40:1,50:1

#### **Product Description:**

**Name :**Artichoke Extract

Source: Artichoke Leaf

Botanical Name : Cynara scolymus L

Extract part: Leaf

Composition ratio :50 to 1

Appearance: Fine Brown powder

Country of origin:P.R. China

#### **Source**

Cynara scolymus L is commonly known as artichoke or the globe artichoke ,it is a species of thistle cultivated primarily as a food but also a medicinal plant .The edible portion of the plant consists of the flower buds before the flowers come into bloom. And the leaf of artichoke is the part that used as one of the world's oldest herbal medicine with multiple health benefits.It has been known by the ancient Egyptians, and the ancient Greeks and Romans used it as a digestive aid. Long known as an herbal medicine, the dried leaves of artichoke have been used in folk medicine because of their hypolipidemic and hepatoprotective activities.

#### **Main bio-actives**

The artichoke leaves contain a number phenolic acids, flavonoids (rutin, luteolin), cynarin and sesquiterpenes (especially caryophyllene and beta-selinene). It also contains tannins, sugar substances, inulin, mucus substances, phytosterols (taraxasterol), essential oil, provitamin A and several enzymes.

Cynarine is a chemical constituent in Cynara scolymus. The majority of the cynarine found in artichoke is located in the pulp of the leaves, though dried leaves and stems of artichoke also contain it. It inhibits taste receptors, making water (and other foods and drinks) seem sweet.

#### **Functions**

**Antioxidative**

The antioxidative effect of artichoke extract was investigated in 2002. The report on J Agric Food Chem showed the methanol and water of blanched (thermally treated) artichoke yielded (24.3 grams per 100 g of dry extract) more antioxidant phenolics than other byproducts with possible industrial applicability.

Further studies were conducted to examine the antioxidative characteristics of *Cynara scolymus* in consideration of its application in food industry and health-promoting products. One study published on Food and Nutrition Sciences in 2014 determined the extract exhibited a good polyphenol content (528 µg GAE/g) and antioxidant activity (EC<sub>50</sub> less than 5 mg). Further investigation shows the extract exhibited antimicrobial activity against *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Enterococcus faecalis* and *Bacillus cereus* pathogen strains. These findings suggested that *Cynara scolymus* extract is a good source of health-promoting polyphenols, encouraging a nutraceutical use of such ecotype, for several phyto-pharmaceutical applications.

### **Anti-inflammatory**

There are researches investigate the anti-inflammatory activity of artichoke leaf extracts. One of the investigation was released on Molecules in 2014 demonstrated that artichoke exert anti-inflammatory activity by downregulating the expression of Inducible Nitric Oxide Synthase (iNOS) in human coronary smooth muscle cells. As iNOS produces large quantities of NO upon stimulation, such as by proinflammatory cytokines and associates with a key pathogenic mechanism in many pathological conditions such as septic shock and stroke. The study result shows the polyphenolic compounds, caffeoylquinic acid, flavones and the anthocyanidins from artichoke all downregulated iNOS mRNA expression with cynarin being the most potent one both in HCASMC and at the protein level.

### **Gastrointestinal**

Artichoke (*Cynara scolymus* L) contains indigestible organic matter that reaches the colon and is substrate for intestinal microbiota. A study of the capacity of artichoke to modify metabolic activities of colonic bacterial enzymes were conducted in the cecal content of Wistar rats. In administrated rats, Artichoke modified bacterial enzyme activities (increased β-glucuronidase, β-glucosidase, and nitroreductase and reduced nitrate reductase and azoreductase activities), which enhances the capacity of microbial enzymes to metabolize glycosides and nitrocompounds.

Another research published on Biol. Pharm. Bull in 2010 demonstrated that artichoke leaf extract is effective against acute gastritis due to its cynaropicrin in study on rats. Cynaropicrin from the artichoke leaf extract prevented gastric mucosal injury in animal models as it dose dependently prevented the decrease in gastric mucus content and gastric juice by absolute ethanol. These findings suggest that the extract of artichoke may be beneficial to the gastrointestinal health.

### **Hypotensive and anti-hyperlipidemic**

Artichoke has been long known as an herbal medicine for treating hypertension, hyperglycemic and hyperlipidemic.

Study reported on Journal of Dietary Supplements showed significant activity of artichoke leaf extract in modulating both systolic and diastolic blood pressure in a randomized, placebo-controlled human trial.

Further investigation conducted in 2012 to study the effects of artichoke leaf extract in treatment of hypercholesterolemic type 2 diabetic patients. The clinical trial reported on Journal of Medicinal Plants showed the significant lowering effect of artichoke leaf extract on the blood levels of total cholesterol and LDL cholesterol without any significant effects on the blood levels of fasting glucose, postprandial glucose, glycosylated hemoglobin, other lipids, SGOT, SGPT and creatinine ( $P > 0.05$ ) compared with placebo at the endpoint and any adverse effects. Such results suggest that fiber-free artichoke extract may be a safe anti-hypercholesterolemic agent but does not improve glycemic control in hypercholesterolemic type 2 diabetic patients, suggesting the involvement of fibers in the anti-hyperglycemic effect of artichoke.

### Anticancer

The apoptotic and cytotoxic activity of artichoke has been studied. One investigation was focus on artichoke activity against DLD1 colorectal cancer cells. The report on Asian Pacific Journal of Cancer Prevention showed hexane extracts from wild and cultivated artichoke were all found to induce pro-apoptotic (BAX) gene expression and a cell cycle inhibitor (p21). In contrast, anti-apoptotic BCL-2 gene expression was reduced compared to the control group. In addition DNA fragmentation results demonstrated DLD1 cell death via apoptosis.

### Applications

In various pharmacological tests artichoke leaf extracts have shown hypotensive, anti-hyperlipidemic, anti-hyperglycemic, choleric activity, hepatoprotective and prebiotic effects. In addition, artichoke leaf extracts contain compounds with antifungal and antimicrobial activities.

Recent studies indicate that artichoke leaf extracts may also have therapeutic potential for cardiovascular disease. The plant contains multiple compounds with high antioxidant properties. Extracts of the leaves and root are helpful in arteriosclerosis, jaundice, dyspepsia, liver insufficiency, chronic albuminuria, and postoperative anemia, reduces cholesterol blood levels. In some countries, considered an aphrodisiac.

--Artichoke;Wikipedia, the free encyclopedia;[https://en.wikipedia.org/wiki/Artichoke#cite\\_note-18](https://en.wikipedia.org/wiki/Artichoke#cite_note-18)

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--Llorach R, et al; "Artichoke (Cynara scolymus L.) byproducts as a potential source of health-promoting antioxidant phenolics";Journal of Agricultural and Food 2002

--Ning Xia, et al; "Artichoke, Cynarin and Cyanidin Downregulate the Expression of Inducible Nitric Oxide Synthase in Human Coronary Smooth Muscle Cells";Molecules 2014

--Florinda Fratianni, et al; "Polyphenol Composition, Antioxidant, Antimicrobial and Quorum Quenching Activity of the "Carciofo di Montoro" (Cynara cardunculus var. scolymus) Global Artichoke of the Campania Region, Southern Italy";Food and Nutrition Sciences, 2014

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--Fallah Huseini H (Ph.D.),et al; "Cynara scolymus L. in Treatment of Hypercholesterolemic Type 2 Diabetic Patients: a Randomized Double-Blind Placebo-Controlled Clinical Trial";Journal of Medicinal Plants 2012

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