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Pomegranate Extract

Pomegranate extract is extracted from the peel of the common fruit pomegranate (Pome granate L.). Pomegranate is native to Central Asia, Afghanistan, Iran and other places, also known as An Pomegranate and Danruo. It was introduced to China by the Silk Road more than 2,000 years ago, and has developed into many well-known production areas such as Lintong in Shaanxi, Suzhou in Jiangsu, Huaiyuan in Anhui, etc.

Pomegranate extract contains a variety of natural active ingredients, including polyphenols, organic acids, alkaloids, etc., with anti-oxidation, anti-aging, hypoglycemic, moisturizing and whitening effects, and has great application value in the fields of food, medicine and cosmetics .

We have a patent for the identification method of pomegranate ellagic acid

APPCHEM
Bon Natural Life

Product Introduction

Main component

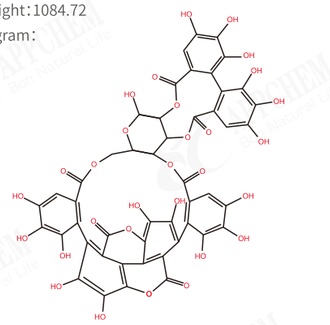
punicalagin

Brown-yellow amorphous powder with strong polarity, easily soluble in water, soluble in methanol, ethanol, acetonitrile and other organic solvents, unstable under conditions of acid, alkali, light or high temperature, and can be degraded into pomegranate and Ellagic acid, etc.

molecular formula：$C_{48}H_{28}O_{30}$

molecular weight：1084.72

Structure diagram：



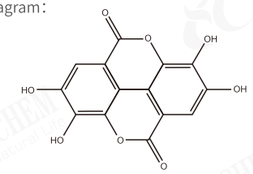
Ellagic acid

The most typical monomer in pomegranate peel tannin is a dimerized derivative of gallic acid, usually in the form of free or ellagitannin or glucoside in pomegranate peel, slightly soluble in water, alcohol, soluble in alkali, pyridine , insoluble in ether. The company has a complete patented method for identification of ellagic acid, which can accurately identify ellagic acid from non-pomegranate sources and ensure product safety.

molecular formula：$C_{14}H_6O_8$

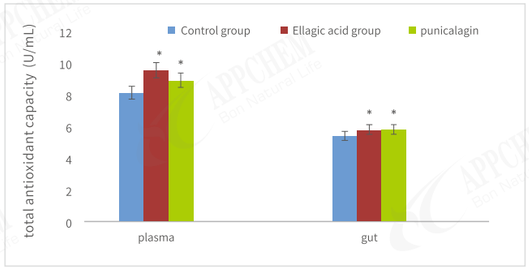
molecular weight：302.28

Structure diagram：

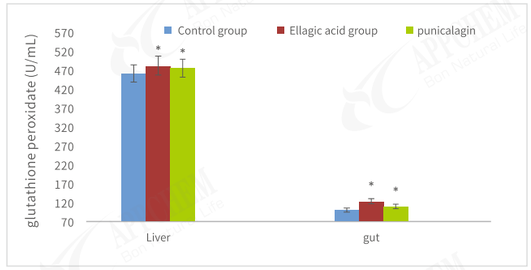


Physiological activity

❶ Anti-oxidation



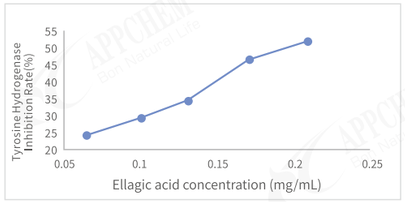
Effects of pomegranate extract on total antioxidant capacity



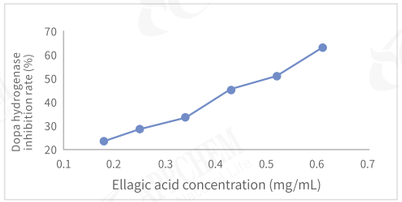
Effects of pomegranate extract on glutathione peroxidase

Ellagic acid can exert its antioxidant effect through the following three pathways. (1) Ellagic acid has ortho-diphenol hydroxyl group, which has a scavenging effect on a variety of reactive oxygen species, and can also generate phenoxy free radicals with lower activity through hydrogen extraction reaction, interrupting the chain reaction of free radicals; (2) ortho The diphenolic hydroxyl group can chelate with metal ions to reduce the catalytic effect of metal ions on the oxidation reaction; (3) ellagic acid has a significant inhibitory ability to a variety of oxidase systems in vivo, reducing the production of lipid peroxides[1] .

❷ Whitening



Inhibitory effect of ellagic acid on tyrosine hydrogenase



Inhibitory effect of ellagic acid on dopa hydrogenase

Tyrosine hydroxylase can produce dopa from tyrosine, and dopa oxidase can catalyze dopa to produce dopaquinone, which is the precursor of melanin, and ellagic acid can inhibit tyrosine hydroxylase by inhibiting dopaquinone. And dopa oxidase to inhibit the production of melanin, and then play a whitening effect[2].

❸ Antibacterial

Test bacteria	concentration (mg · ml^{-1})									positive control	negative control
	10	5	2.5	1.25	0.625	0.312	0.156	0.078	0.039		
Staphylococcus aureus	-	-	-	-	-	-	-	+	+	+	-
Bacillus cereus	-	-	-	-	-	+	+	+	+	+	-
Listeria monocytogenes	-	-	-	-	+	+	+	+	+	+	-
Escherichia coli	-	+	+	+	+	+	+	+	+	+	-
Salmonella typhimurium	-	+	+	+	+	+	+	+	+	+	-

Antibacterial activity of punicalagin against 5 strains

sample	Inhibition zone diameter (mm)							
	Escherichia coli			average value	Staphylococcus aureus			average value
Crude extract	16.78	16.82	16.80	16.80	19.92	20.02	20.64	20.19
Ellagic acid	26.00	26.14	26.70	26.28	22.86	23.06	22.88	22.93

The inhibition zone size of pomegranate peel crude extract and ellagic acid

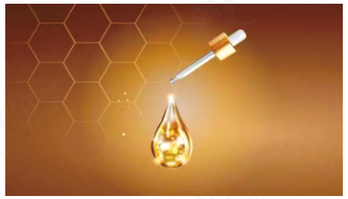
Both ellagic acid and punicalagin have a certain inhibitory effect on common harmful bacteria. They can complex with bacterial cell proteins to make them agglomerate and destroy the integrity of their cell walls; they can also maintain life activities through metabolism with bacteria. The combination of enzymes changes its molecular structure, and then plays a bacteriostatic effect[3].

❹ Improve immunity / Anti-cancer

Ellagic acid can exert anti-cancer effects by reducing the activity of NF-κB factor and DNA damage in cancer cells, inhibiting protein kinase C pathway and angiogenesis, activating mitochondrial apoptosis pathway, and improving immunity. Multiple pathways such as mTOR, ATM, and NF-κB induce autophagic death of cancer cells, thereby playing an anticancer effect. In addition, ellagic acid can also improve the sensitivity of conventional anticancer drugs and reduce the risk of multidrug resistance[4].

Practical application of pomegranate extract

Bon-Natural-Life ellagic acid and punicalagin are all derived from pure pomegranate, and the material is authentic; We hold a patent for the identification method of pomegranate ellagic acid to ensure that the product is safe and effective; the water-soluble technology of ellagic acid has been upgraded, and the solubility is as high as 7g/ 100g, launched high-quality water-soluble ellagic acid*.



1. Cosmetics (whitening, anti-ultraviolet, moisturizing, anti-aging, anti-wrinkle, improving skin elasticity, brightening skin tone, reducing fine lines, etc.), product forms include essence, water, cream, milk, facial cleanser, mask, etc.
2. Raw materials for health care products (antioxidant, improve immune function), product forms include capsules, powders, tablets, beverages, etc.
3. Functional food raw materials (antioxidant), product forms include solid beverages, tablet candies, yogurt, etc.
4. Ordinary food raw materials, product forms include beverages, candies, biscuits, baked products, etc.

*Water-soluble ellagic acid: The solubility of water-soluble ellagic acid can reach 7g/100g

Product Specifications and Applications

source	product	Specification	shape	Application range
pomegranate peel	Ellagic acid	HPLC40-98%	Powder	Functional Food, Beverage, Cosmetics
	water soluble ellagic acid*	HPLC40% (Solubility7%)		
	punicalagin	HPLC20-40%		

References

[1] Sun Y Q . In vitro and in vivo antioxidant activities of three major polyphenolic compounds in pomegranate peel: Ellagic acid, punicalin, and punicalagin[J]. Journal of Integrative Agriculture, 2017(8):1808-1818.

[2] Ortiz-Ruiz C V, Berna J, Tudela J, et al. Action of ellagic acid on the melanin biosynthesis pathway[J]. Journal of dermatological science, 2016, 82(2): 115-122.

[3] 杨笑笑. 石榴中活性物质的提取及应用研究[D]. 江南大学, 2014.

[4] Yoganathan S, Alagaratnam A, Acharekar N, et al. Ellagic Acid and Schisandrins: Natural Biaryl Polyphenols with Therapeutic Potential to Overcome Multidrug Resistance in Cancer[J]. Cells, 2021, 10(2): 458-467.