



Science Based Natural Health

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*Citrus bergamia* Risso, grows in the Ionic coast of Southern Calabria Italy. The Calabria region of Italy controls 80% of the worldwide supply. The active compounds in Citrus bergamot have been identified as **naringin, neoeriocitrin, neohesperidin, Poncerin, rutin, neodesmin, rhoifolin, Melitidine, and Brutelidine**. These compounds have been shown in research to significantly reduce total cholesterol, LDL, Triglycerides, blood glucose level, while increasing HDL.

### Health Benefits of Citrus Bergamot:

- Cardiovascular Health
- Reduce Total Cholesterol
- Reduce LDL
- Increase HDL
- Reduce Triglycerides
- Reduce blood sugar level (diabetic)



### How Does Citrus Bergamot Work?

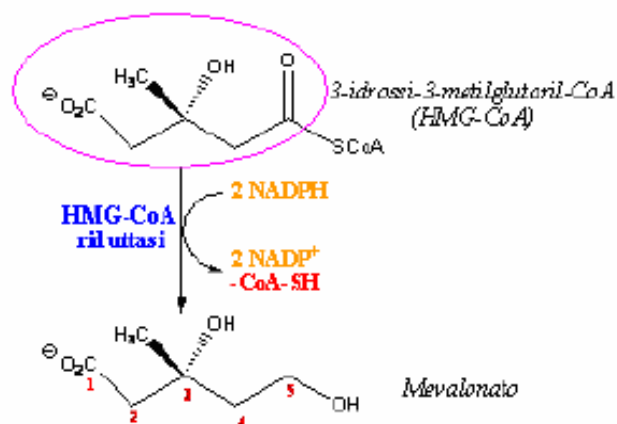
Citrus Bergamot blocks a key enzyme in the production of cholesterol. Cholesterol is a natural product of the liver and in the right amounts does not pose a problem to the body. The body, however, sometimes produces too much cholesterol. Citrus Bergamot **inhibits the HMG-CoA** (3-hydroxy-3-methylglutaryl COA) reductase, an enzyme linked to the liver's cholesterol production, thus inhibiting the liver's ability to produce LDL.

These results in reduced cholesterol levels in liver cells, which then meet their cholesterol requirements by taking up cholesterol circulating in the blood, via a protein on the liver cell surface called an LDL receptor. LDL receptors break down the circulating cholesterol, which results in reduced levels of LDL cholesterol in the bloodstream, and a reduction in risk for high-cholesterol related diseases.

## “Statin Like” Principles in Citrus Bergamot †

HMG-CoA reductase is active when blood glucose is high. Thus, by lowering blood sugar levels, Citrus bergamot also indirectly affect the activity of HMG-CoA reductase. A recently published research on Journal of Natural Products 2009 showed Citrus Bergamot has “statin like” principles, carrying the 3-hydroxy-3-methylglutaric acid (HMG) moiety. † Four flavonoids have been identified that are able to interfere with the natural synthesis of cholesterol in human body, by inhibiting the activity of the first enzyme in the cholesterol synthesis pathway: HMG-CoA reductase (3-hydroxy-3-methyl glutaryl-coenzyme A reductase). These flavonoids is linked to 3-metil-3-hydroxy glutarile portion, which is exactly the substrate of HMG-CoA reductase, suggesting that these compounds mimic endogenous HMG-CoA substrate and interfere with the synthesis of mevalonate, a critical compound at the top of the cholesterol synthesis pathway

By interfering with mevalonate synthesis, the polyphenolic flavanoids block the cholesterol production in the human body in a way similar to statins. The presence of these flavones in the bergamot juice explains popular knowledge and recent clinical data on blood cholesterol reducing potential of citrus bergamot.





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## The Science of Bergamonte:

- 2 of the active compounds in Bergamot have 3-hydroxy-3-methylglutaric acid (HMG) bound to neohesperidin (Brutieridin) and naringin (Melitidin).
- Brutieridin and Melitidin have shown in research to inhibit HMG reductase, which leads to the catalyze of mevalonate biosynthesis (key intermediate in cholesterol metabolism)
- Consumption of Bergamot in 30 days reduces MVA Concentration (end product of HMGC<sub>o</sub>A reductase)
- Bergamot reduce oxidative stress, neutralize free radicals in vascular walls, enhance vasodilatation, and restore endothelial function
- Consumption of bergamot enhances fecal sterol excretion, binding bile acids and increase the turnover rate of blood and liver cholesterol
- Bergamot significantly reduces Triglycerides level via reduction in hepatic Triglycerides accumulation
- The active compound Neeriocitrin has been proven to inhibit LDL Oxidation

## Active Ingredients in Bergamot

- Neeriocitrin
- Naringin
- Neohesperidin
- Melitidine
- Brutieridine

## Lower LDL and Raising HDL

Human clinical trials have shown Citrus Bergamot to **Lower LDL levels from 20% - 59%** (Statin 18% to 55%), and to **Raise HDL levels from 7% to 83%** (Statin 5% - 15%). According to the Mayo Clinic, raising your HDL cholesterol level 1 milligram per deciliter (mg/dL) of blood can reduce your heart attack risk by 3 percent. In human clinical, bergamot juice raises HDL by an average of 56% while bergamot polyphenolic extract raise HDL by an average of 43%. **There are no other products that can raise HDL like citrus bergamot.**

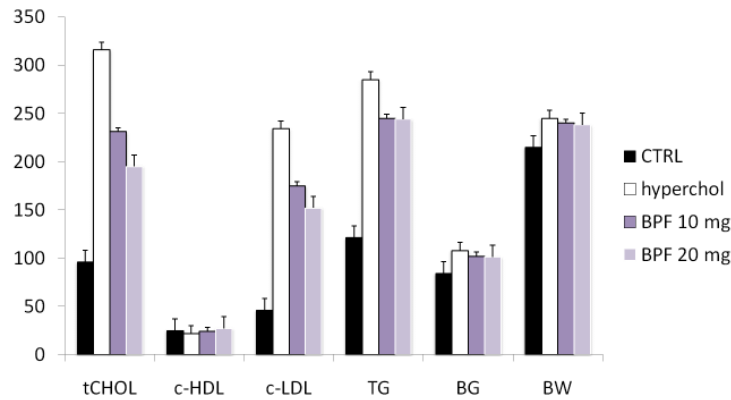
## Cardiovascular Health

In vitro studies have also shown that citrus Bergamot may help the body to absorb cholesterol that has accumulated on the artery walls. In addition, in vitro study also showed that Citrus bergamot help to reduce the scar tissue of injured arteries.

Citrus Bergamot is high in antioxidant value and may reduce oxidative stress of body tissue, reduce inflammation, and contribute to cardiovascular health.

## Bergamonte Animal Research Summary

Bergamonte (BPF; 10 and 20 mg/Kg/day) reduces total cholesterol (tChol), LDL cholesterol (c-LDL) and triglycerides (TG) in Wistar rats fed a hyperlipemic diet



	Total cholesterol	HDL Cholesterol	LDL cholesterol	Tryglycerides	Blood glucose
Bergamot juice (20ml/kg/day)	-42±4%	+31 ±3%	-44±5%	-25±%	-10±3%
Pastazzo (5ml+5ml/kg/day)	-44±4%	+36 ±3%	-40±5%	-32±%	-20±3%
Bergamonte (20mg/kg/day)	-38±3%	+26 ±4%	-35±5%	-15±5%	-16±4%

Bergamonte reduces blood levels of triglycerides, cholesterol and glucose in Zuker rats (diabetic rats)

	Total cholesterol	HDL Cholesterol	LDL cholesterol	Tryglycerides	Blood glucose
Bergamonte (20 mg/Kg/Day)	-31±4%	+26 ±3%	-28±5%	-45±%	-40±3%



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## Bergamot Human Clinical with Bergamonte Extract

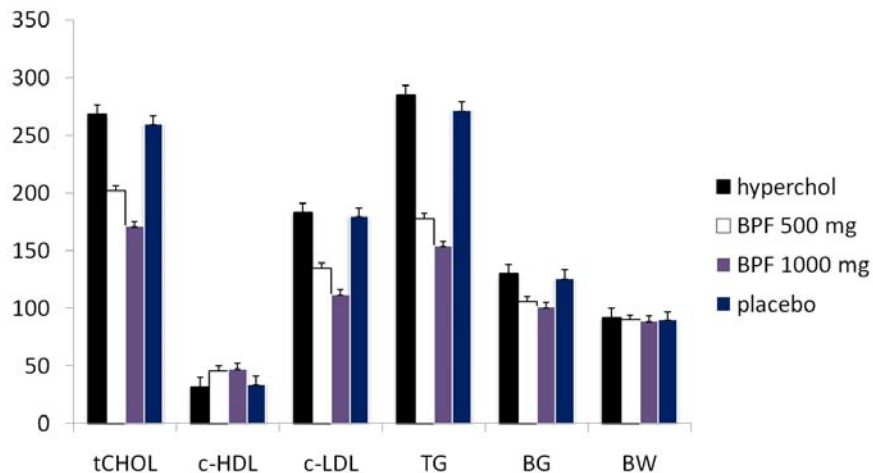
In another human clinical trials of 238 patients taking placebo, 500mg, 1000mg or 1500mg (Previous Statin patients), we have showed the following result after patients consume Citrus Bergamot extract for 30 days.

	Total-Chol	HDL-C	LDL-C	Triglycerides	Blood glucose
Placebo	+0.14%	+1.2%	-1.1%	+0.1%	+0.5%
Bergamonte (500mg/Day)	-20.69%	+22.9%	-24.1%	-29.9%	-18.8%
Bergamonte (1000mg/Day)	-26.53%	+40.1%	-36.00%	-38.8%	-22.3%

**Bergamot polyphenolic fraction (BPF; 500 to 1000 mg/day for 30 days, n=238) reduces total cholesterol (tChol), LDL cholesterol (c-LDL), triglycerides (TG), and blood glucose (BG)**

Data is polled from 238 patients:

- (1) 82 patients with isolated hypercholesterolemia (LDL>130)
- (2) 76 patients with mixed dyslipidemia (hypercholesterolemia and hypertriglyceridemia)
- (3) 48 patients with mixed hyperlipemia and glycemia)
- (4) 32 patients previously on statin, 60 days wash out period

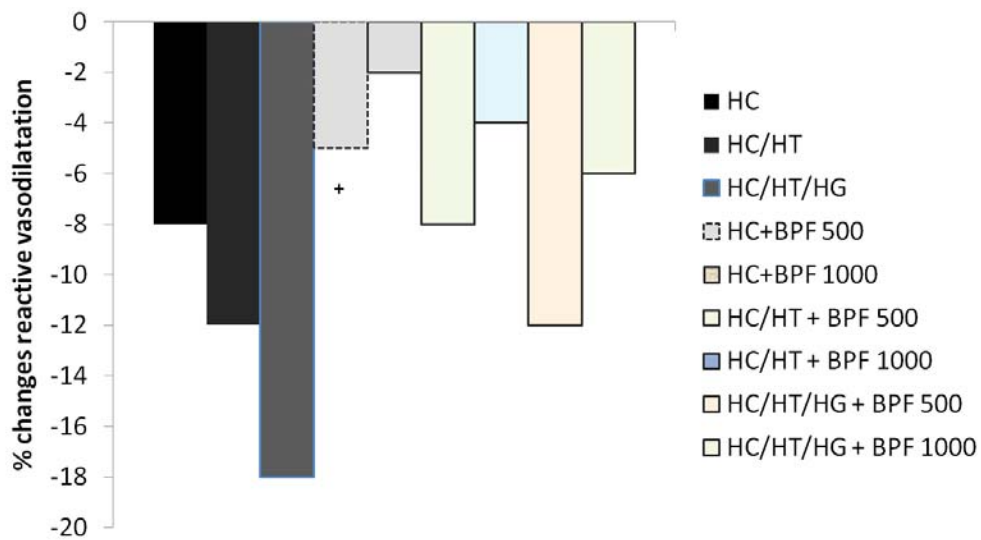




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The effect of BPF (500 and 1000 mg/daily) on reactive vasodilatation in patients suffering from isolated (HC) or mixed hyperlipidemia (HC/HT) and associated hyperglycemia (HC/HT/HG)



**Urinary mevalonic acid (MVA) concentrations**

	Baseline	500mg/ 30 days	1000mg/ 30 days
	2.12	1.56	1.34
1 week after discontinuation		1.82*	1.65*
Patients Previously Treated with Statin (n=32)	1.65		1.12



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## Product Comparison:

	Total Chol	LDL	Triglycerides	HDL	Blood Glucose
Bergamot	12%-48%	20%-59%	30%-55%	7%-83%	15%-30%
Policosanol	15%-29%	17%-21%	7-12%	8-15%	unknown
Citrus PMF with Tocotrienol	20%-30%	19%-27%	24-34%	0%	0%
Citrus PMF	12%-18%	12%-16%	0%	0%	0%
Phytosterols	15%	9%	0%	0%	0%

## Neuroprotection effects of Citrus Bergamot

According to a research published on British Journal of Pharmacology (2007) 151, 518–529, citrus bergamot reduces neuronal damage caused in vitro by excitotoxic stimuli and that this neuroprotection was associated with prevention of injury-induced engagement of critical death pathways. Bergamot helps to maintain GSK-3b phosphorylation in NMDA treated cells and are able to prevent deactivation of Akt kinase and the downstream activation of GSK-3b induced by NMDA, suggests an intriguing mechanism of neuroprotection.

† These statements have not been evaluated by the FDA. This product is not intended to diagnose, treat, cure or prevent any disease.