

WHITE PAPER



***Clear and Notable Benefits of
Molecular BioLife International's
"Citricogen"***

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Abstract

This discourse explores the potential benefits associated with Molecular BioLife International's (MBI) Citricogen formulation, which tests positively for excellent levels of DPPH (free radical scavenging activity), ORAC, and phenolic and flavonoid content. As such, Citricogen has the potential to afford consumers a multitude of health benefits, including promoting ocular and cognitive health.

MBI's Citricogen, a citrus blend, has superlative levels of free radical scavenging activity, oxygen radical absorbance capacity (ORAC), and phenolic and flavonoid content.

Consequently, it holds much promise in, for example, reducing the instance of cerebrovascular accident, preventing the formation of blood clots, exerting anti-cancer properties, and promoting longevity. It is important to note that the benefits explored in this work are not exhaustive; new benefits are continuously being found and are beyond the scope of this discourse.

Potential Benefits of MBI'S Citricogen

MBI's citrus blend appears to be promising source of a multitude of health benefits, as evident by ORAC values, DPPH activity, and total flavonoid and phenolic content, which can be seen below.

ORAC Analysis:

Sample Description	Total ORAC Value
MBI Citrus Blend – Sample Submission 1	14,445 mmol TE/g
MBI Citrus Blend – Sample Submission 2	15,005 mmol TE/g
MBI Citrus Blend – Sample Submission 3	14,990 mmol TE/g
MBI Citrus Blend – Sample Submission 4	14,870 mmol TE/g
Method	MG.OR-5.01

DPPH (Free Radical Scavenging Activity):

Sample Description	DPPH Free Radical Scavenging Activity (IC50 mg/ml)
MBI Citrus Blend – Sample Submission 1	40.087
MBI Citrus Blend – Sample Submission 2	41.03
MBI Citrus Blend – Sample Submission 3	41.38
Method	MGDPH.3.01

Total Flavonoid Content:

Sample Description	Total Flavonoid Content (g/100g CE)
MBI Citrus Blend – Sample Submission 1	2.65
MBI Citrus Blend – Sample Submission 2	2.63
MBI Citrus Blend – Sample Submission 3	2.67
Method	MGFC.4.01

Total Phenolic Content:

Sample Description	Total phenolic content (g/100g GAE)
MBI Citrus Blend – Sample Submission 1	3.32
MBI Citrus Blend – Sample Submission 1	3.25
MBI Citrus Blend – Sample Submission 1	3.41
Method	MGFC.4.01

Top Flavonoids and Phenolic Compounds Present in the Citrus Blend:

- **Nobiletin:** Flavonoid isolated from citrus peels. It is an O-methylated flavone that has the activity to rescue bullectomy-induced memory impairment.
- **Tangeritin:** O-polymethoxylated flavone that is found in tangerine and other citrus peels. Tangeritin strengthens the cell wall and acts as a plant's defensive mechanism against disease-causing pathogens.
- **Naringenin:** Has an inhibitory effect on the human cytochrome P450 isoform CYP1A2, which can change pharmacokinetics in a human (or orthologous) host of several popular drugs in an adverse manner, even resulting in carcinogens of otherwise harmless substances. It has been shown to reduce oxidative damage to DNA in vitro and in animal studies. It has been shown to reduce hepatitis C virus production by infected hepatocytes (liver cells) in cell culture). The antiviral effects of naringenin are currently being investigated and thus far, clinical investigation is showing positive antiviral combating capabilities.
- **Hesperidin:** A compound in orange peels that gives the flavonoid hesperetin to the body, and this flavonoid mediates most benefits of hesperidin, including an increase in circulation and possible brain protective effects. Hesperidin and naringenin are widely known as the main citrus flavonoids.

- **Nobiletin:** Has anti-inflammatory and anti-tumor invasion, proliferation, and metastasis in vitro and in animal studies. It is also found to potentially inhibit cartilage degradation.
- **Eriocitrin:** Eriocitrin and its metabolites are powerful antioxidants. Additional benefits include capillary permeability and a decrease in lipids.
- **Didymin:** Flavonoid glycoside isolated from citrus fruits that displays anti-oxidative and anti-cancer chemotherapeutic activities.
- **Rutin:** Supports blood circulation, is an antioxidant, and can treat allergies, viruses, arthritis and other inflammatory conditions.
- **Hydroxybenzoic acid.**
- **Vanillic acid.**
- **Chlorogenic acid.**
- **Caffeic acid.**
- **Coumaric acid.**
- **Ferulic acid.**
- **Sinapic acid.**
- **Protocatechuic acid.**

Typical analyses are also promising, and the formulation tests negative for pesticide residues as well as toxic metals (Mortec Scientific Group, 2016).



Positive Attributes Associated With The Aforementioned Substances:

- Enhancing the immune system.
- Potent antioxidant.
- Powerful anti-inflammatory agent.
- May be related to cancer prevention.
- Neurodegenerative disease prevention, including Alzheimer's, multiple sclerosis, Huntington disease, amyotrophic lateral sclerosis and Parkinson's.
- Prevents cognitive decline and subsequently enhances cognitive performance/ functioning (e.g., boost in working memory and increases blood flow to the brain).
- Lower one's risk of atherosclerosis by promoting the health of blood vessel walls and protecting LDL cholesterol from free radical damage.
- Invokes endothelium-dependent vasorelaxation.
 - The dilation of blood vessels may be helpful in preventing vascular diseases, such as coronary heart disease, by improving blood flow and concurrently preventing the formation of blood clots (by preventing platelet aggregation).
- Cardiovascular disease prevention.
- Reduction in the risk of hypertension.
- Reduction in the incidence of cerebrovascular accident.
- Weight loss.

- Fights bacteria and viruses.
- Lowers one's risk of developing upper respiratory tract infections.
- Reduce incidence of erectile dysfunction.
- Skin protection.
- Blood pressure and blood sugar regulation.
- Increased longevity.
- Helps prevent bruising and bleeding abnormalities.
- Ocular benefits.
 - Protecting the eye from oxidative stress.
 - Remediating symptoms of glaucoma.
 - Protection against the development of cataracts.
 - Prevention of macular degeneration.
 - Maintains the health of the cornea and blood vessels.
 - Increases blood flow.
 - Improves eyesight in low-contrast conditions.
- Prevents cell death, including ocular and cognitive cells.
- These findings are supported by clinical trials and anecdotal reports.

Molecular BioLife International (MBI) is an innovative and reputable leader in the health field, as evident by, for example, the scrupulous testing of their products. Its Citricogen formulation yields high numbers when tested for its ORAC (14,445 mmol TE/g – 15,005 mmol TE/g), DPPH (40.087 IC50 mg/ml – 41.38 IC50 mg/ml), flavonoid (2.63 g/100g CE – 2.67 g/100g CE) and phenolic (3.25 g/100g GAE – 3.41 g/100g GAE) content. Consequently,

Citricogen has the potential to enhance the immune system, promote anti-cancer effects, prevent an array of neurodegenerative diseases, and prevent the onset of vascular diseases, including coronary heart disease. It is important to note that the benefits listed in this discourse are merely a snapshot of the various benefits afforded by products that yield high ORAC, DPPH, flavonoid and phenolic values.

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