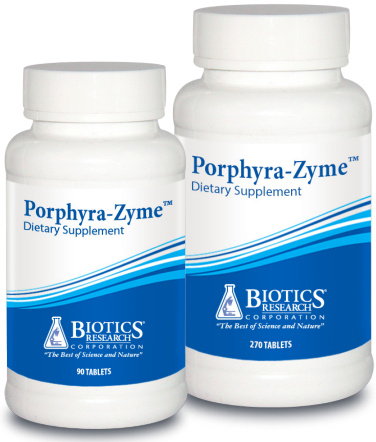
Porphyra-Zyme™

Binds Heavy Metals



In 1980, Biotics Research Corporation began investigating the use and production of Spirulina plankton. A leading expert from the University of Texas provided insight into methods of production, as well as pure Spirulina cultures that were the starting culture for our research and production.

Production was halted when scientists at Biotics isolated what they considered the "active" principal of Spirulina, the porphyrin ring of chlorophyll. While many claims for the nutritional value of Spirulina have been made, the consensus was the most significant value in Spirulina was chlorophyll. However, the chlorophyll content in Spirulina is low (typically less than 1%).

Porphyra-Zyme™ — A Concentrated Porphyrin Product

Unlike traditional chlorophyll products, **Porphyra-Zyme™** is a concentrated porphyrin supplement. By increasing the porphyrin content, the heavy metal binding capability is also increased, providing clinicians with a natural, effective "chelating" tool.

Porphyrins have the ability to bind divalent metal ions due to the nitrogen atoms of the tetrapyrrole nucleus. The central ion in chlorophyll is magnesium, which is freed from chlorophyll under acidic conditions, permitting other metals to bind in its place. Toxic metals, such as mercury, lead and arsenic, are complexed first. Then excess amounts of other divalent metals, such as calcium, can be complexed by porphyrins.

Investigational Data on Porphyra-Zyme™

Scientists at Biotics Research Corporation studied the ability of **Porphyra-Zyme™** to bind heavy metals *in vitro*. **Porphyra-Zyme™** was dialyzed against aqueous solutions of heavy metal ions. Afterward, the concentration of heavy metal ion remaining in the dialysis medium was determined. As can be seen by the Investigational Data chart, **Porphyra-Zyme™** proved to be very effective in binding heavy metals.

Using dialysis, the following exchange range for toxic metals was established:

Initial Concentration		After Dialysis against a solution of **Porphyra-Zyme™**	Amount Complexed	Percent
Lead	**20 ppm**	**4.8 ppm**	**15.2 ppm**	**76%**
Mercury	**10 ppm**	**0.8 ppm**	**9.2 ppm**	**95%**
Cobalt	**30 ppm**	**3.4 ppm**	**26.6 ppm**	**88%**
Cadmium	**15 ppm**	**3.6 ppm**	**11.4 ppm**	**76%**
Arsenic	**10 ppm**	**1.4 ppm**	**8.6 ppm**	**86%**
Aluminium	**20 ppm**	**7.0 ppm**	**13.0 ppm**	**65%**
Nickel	**10 ppm**	**3.3 ppm**	**6.7 ppm**	**76%**

Measurements were made using atomic absorption techniques (flame, furnace and hydride methods), using a Perkin-Elmer 603 spectrophotometer.

Supplement Facts

Serving Size: 1 Tablet

	Amount Per Serving	% Daily Value
Vitamin C (as ascorbic acid)	120 mg	200%
Proprietary Blend	210 mg	
Spinach Concentrate (Spinacea oleracea) (leaf & stem)		*
Mulberry (Morus alba) (leaf) (extract)		*
Organic Beet Concentrate (Beta vulgaris) (leaf)		*
Vegetable Culture Concentrate (from non-soy legumes)		*

*** Daily Value not established**

Other ingredients: Stearic acid (vegetable source), magnesium stearate (vegetable source), modified cellulose gum and food glaze.

Porphyra-Zyme™ supplies botanical extracts and concentrates providing naturally occurring Chlorophyllin, Galactoglycerides, Chlorophyll (a and b), Phospholipids, Carotenoids, Sulfolipids, Plastoquinones (a, b, and c), Menadione, Cytochrome B6 and F, Plastocyanine, Ferridoxin and trace minerals.

This product is gluten and dairy free.

RECOMMENDATION: One (1) tablet one (1) to three (3) times each day as a dietary supplement or as otherwise directed by a healthcare professional.

KEEP OUT OF REACH OF CHILDREN
Store in a cool, dry area.
Sealed with an imprinted safety seal for your protection.

Product # 3202 Rev. 09/14

BIOTICS® RESEARCH CORPORATION
Utilizing "The Best of Science and Nature" to Create Superior Nutritional Supplements

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(800) 231-5777
6801 Biotics Research Drive • Rosenberg, TX 77471
biotics@bioticsresearch.com • www.bioticsresearch.com

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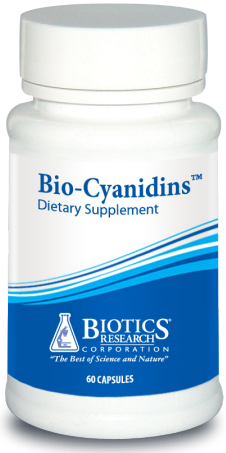

Plant Polyphenols

All higher plants contain an extensive array of polyphenols, flavonoids and complex aromatic compounds. The ability to synthesize these materials probably evolved in order to protect plant tissues from the potentially harmful effects of sunlight and oxygen.

Oligomeric proanthocyanidins (abbreviated as OPCs) represent a major class of polyphenols, consisting of dimers, trimers, and tetramers of flavones. Individual members are designated as procyanidin B series or procyanidin C series.

Pycnogenol®

Pycnogenol® refers to water-soluble proanthocyanidins extracted from the bark of a European pine, *Pinus maritime*, by a process patented by Dr. Jacques Masquelier.[2] The extraction process separates **Pycnogenol®** from tannins and polymeric procyanidins. This standardized extract contains 85% proanthocyanidins, together with smaller amounts of ferulic acid, gallic acid and catechin, among others.

Grape Seed Extract (OPCs)

Grape seed OPCs refer to proanthocyanidins extracted from grape seeds (pips) using the same procedure developed for pine bark. Grape pip OPCs contain gallic esters of proanthocyanidins, especially procyanidin B2-3'-O-gallate, and related esters. Historically, isotopically labeled OPCs were isolated from grape vines grown with 14 – CO_2 for bioavailability studies. **Pycnogenol®** and grape seed OPCs are similar, though not identical, in composition.

Polyphenols and Antioxidants

Polyphenols, such as proanthocyanidins, are common in the diet and have broad physiologic effects. As an example, many polyphenols and flavonoids have been shown to trap free radicals and prevent oxidative damage in a number of model systems.[2] **Pycnogenol®** and grape pip OPCs have been studied extensively in Europe and their antioxidant activity has been noted.[3]

Reactive forms of oxygen, such as hydrogen peroxide and superoxide, occur frequently in the body. They are generated by mitochondria and cytochrome P450 detoxication systems; by pollutants such as cigarette smoke, ozone and nitrogen oxides; and by chronic inflammation. Nutrition plays an important role in antioxidant defenses. The body employs protective enzymes, antioxidant nutrients and non-nutrients from food, as well as metabolites, to counter the action of oxidants and free radicals. However, when these defenses are depleted, proteins, lipids in membranes and DNA can be damaged.[4,5]

References

1. Masquelier J. *United States Patent No. 4,698,366. Oct. 6, 1987.*
2. Roback J, Gryglewski RJ. Flavonoids are scavengers of superoxide anions. *Biochem Pharmacol 1987; 5:837-41.*
3. Facino RM et al. Free radical scavenging action and anti-enzyme activities of procyanidins from *Vitis unifera.* A mechanism for their capillary protective action. *Arzneim-Forsch 1994; 44:592-601.*
4. *Stadtman ER. Metal ion-catalyzed oxidation of proteins; biochemical mechanism and biological consequences. Free Radic Biol Med 1990; 9:315-25.*
5. Moslen TM, Smith CV. Free radical mechanisms of tissue injury. *CRC Press, Boca Raton 1992; pp. 2-20.*

Supplement Facts

Serving Size: 1 Tablet

	Amount Per Serving	% Daily Value
Pycnogenol® (Maritime Pine Bark Extract)	15 mg	*
Grape Seed Extract (95% OPCs)	35 mg	*

*** Daily Value not established**

Other ingredients: Cellulose, calcium carbonate, stearic acid (vegetable source), magnesium stearate (vegetable source) and modified cellulose gum.

This product is gluten and dairy free.

RECOMMENDATION: One (1) tablet one (1) to two (2) times each day as a dietary supplement or as otherwise directed by a healthcare professional.

KEEP OUT OF REACH OF CHILDREN
Store in a cool, dry area.
Sealed with an imprinted safety seal for your protection.

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