



## The Package: Pycnogenol®

*French maritime **pine bark extract**  
**plus** continuous  
**scientific support**  
for your marketing*



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***Pycnogenol<sup>®</sup>, the unique extract of the bark of the French maritime pine***

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*The bark of  
French maritime  
pines grown in  
large plantations  
is the base for  
Pycnogenol<sup>®</sup>*



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## History

Pine bark bioflavonoids were used by the native Indians of North America in a tea brewed from the bark of pine trees growing along the Atlantic. The French explorer Jacques Cartier was introduced to the tea when Indians saved most of his crew from death by scurvy during the winter of 1534. More than 400 years later universities began studies on flavonoids. Their search for bioactive flavonoids eventually led them to the bark of the French maritime pine where they found a rich source of a distinct group of highly bioavailable and bioactive flavonoids.

Horphag Research's continuing studies in Australia, China, Finland, France, Germany, Hungary, Italy, Japan, Romania, Switzerland, the United Kingdom and the United States over the last 30 years have confirmed Pycnogenol®'s composition, beneficial effects and absence of toxicity. Pycnogenol® was launched commercially in the United States in 1987.

## Extraction of Pycnogenol®

Pycnogenol® is extracted by an automated, patented, multi-step procedure, avoiding potentially toxic solvents. The automated procedure guarantees excellent batch-to-batch conformity. Pycnogenol consists solely of the pure extract of the bark of the French maritime pine and contains no additives. The closed extraction circuit excludes any possibility of contamination; the extract is free of germs.

## Composition of Pycnogenol®

Pycnogenol® is a concentrate of water-soluble bioflavonoids consisting of procyanidins, catechin, taxifolin and fruit acids in constant and normalised proportions. Because the bark is grown layer by layer over a period of more than 30 years, there are neither seasonal nor annual variations in the composition of its ingredients, in contrast to other herbal extracts. All constituents of Pycnogenol® are potent scavengers of free radicals.

## Bioflavonoids

For centuries, herbalists have recommended plant extracts – from barks, roots, leaves – to treat people's illnesses.

Today, nutritionists and doctors recommend diets rich in fruits and vegetables to prevent the same diseases. The scientific reason for the success of these diets has recently become apparent. Fruits, vegetables and herbs contain bioflavonoids – the type of polyphenolic antioxidants also found in Pycnogenol®. While all these bioflavonoids are found in a broad range of fruits, vegetables and teas, Pycnogenol® provides an optimal combination of polyphenols in a very concentrated form in this unique food supplement.



## Source of Pycnogenol®

Pycnogenol® is a registered trademark of Horphag Research Ltd. for a standardised extract from the bark of the French maritime pine. This tree grows in large plantations in South-Western France. No fertilisers or pesticides are used in these forests. The bark is harvested during timber production from 30–50 year old trees.



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## ***Properties of Pycnogenol®***

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*Pycnogenol®  
is a free flowing  
powder.*



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### Properties

Pycnogenol® is a fine, free flowing powder. It smells aromatic, tastes astringent and has a light reddish-brownish colour. It is very stable in a non-humid atmosphere and should be stored in a dry place protected from light for periods of up to 5 years. The procyanidins content decreases only 1% per year. Pycnogenol® is easy to handle for the production of tablets, capsules, ointments, gels, lotions or chewing-gum.



### Safety

Pycnogenol® is safe. It has been tested intensively. It has no allergenic potential and does not irritate the skin or eyes. Its acute toxicity is very low and its low chronic toxicity has been proven in several species. It is not mutagenic or teratogenic. Pycnogenol® has been on the market for 30 years. Clinical studies on more than 2,000 patients have shown, very rarely, only mild side-effects such as gastro-intestinal upsets. These problems can be overcome by taking Pycnogenol® with meals.

### Bioavailability

Pycnogenol® is bioavailable. After intake of Pycnogenol®, some of its constituents have been detected as metabolites in the urine of human volunteers. Moreover, clinical studies demonstrate unequivocally that the active constituents of Pycnogenol®, causing these effects, are absorbed from the gastro-intestinal tract.



### Quality control

Pycnogenol® is controlled by three independent laboratories. Two governmental laboratories control the absence of germs and pesticides. The certificate accompanying each batch guarantees its identity, purity and constant composition. Pycnogenol® contains 95% bioflavonoids and fruit acids.

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## *The biochemical basis for the pharmacological actions of Pycnogenol®*

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*In extensive testing,  
Pycnogenol® rendered  
every kind of free radical  
tested inactive.*



### High binding to proteins

Absorption of Pycnogenol® protects proteins, the constituents of blood vessels and tissues, from the action of decomposing enzymes. Furthermore, leaky blood vessels are "sealed" by the interaction of their proteins with Pycnogenol®. This is the reason for the prevention of microbleedings and oedema formation in diabetic retinopathy and chronic venous disorders.

Inactivation of free radicals

US patent No. 4,698,360

In extensive testing, Pycnogenol® rendered every kind of free radical tested inactive. It was found to be superior to other herbal antioxidants and more potent than vitamin C or E. Pycnogenol® is able to regenerate vitamin C or E when they become oxidised.

An exceptional benefit of Pycnogenol® is its ability to increase the quantity of antioxidative enzymes inside the cells, so that free radicals pro-

duced in the interior of the cells are scavenged as well as the free radicals produced in the blood stream.

Therefore supplementation with Pycnogenol® is recommended in all the many conditions where free radicals are involved; for instance, the anti-inflammatory action of Pycnogenol® is closely related to its radical scavenging effect.

### Pycnogenol® stimulates the production of endothelial nitric oxide

Pycnogenol® stimulates nitric oxide synthase, the enzyme responsible for the production of nitric oxide. Nitric oxide, produced in the innermost layer of blood vessel cells, has two important effects. Firstly, the very small molecule travels to the muscle cells surrounding the blood vessel and relaxes these muscles. This counteracts the effect of stress hormones which constrict the blood vessels, causing increased blood pressure.

The second effect is that nitric oxide inhibits the clotting of blood platelets, which helps to prevent thrombus formation. This is the basis for another Horphag Research patent:

US patent No. 5,720,956

"Method of controlling the re-activity of human blood platelets by oral administration of the extract from the bark of the French maritime pine." These two actions of nitric oxide, mediated by Pycnogenol®, are of outstanding importance for a healthy circulation.

### Pycnogenol® contains fruit acids with spasmolytic activity

Some of the fruit acids contained in Pycnogenol® possess spasmolytic activity. Spasms of the uterus can be inhibited by these compounds. The reduction of menstrual disorders or cramps by Pycnogenol® is most probably caused by these acids.



Newsweek:

SUN DAMAGE – Saving Your Skin

*NEW RESEARCH SUGGESTS that a rare tree could protect your skin this summer – and not with its shade. When the sun's ultraviolet rays hit skin cells, molecules called free radicals go on a rampage, leading to sunburn, wrinkles and even cancer. Antioxidants, including such common nutrients as vitamins E and C, can halt their advance. But an antioxidant supplement sold under the name Pycnogenol® is especially effective at protecting skin cells. Extracted from the bark of a pine tree that grows only in South-Western France, Pycnogenol® is the latest in a centuries-old tradition of pine-based healing remedies. Yet this particular permutation is backed by science. "Pycnogenol® is one of the best antioxidants I've studied," says Lester Packer, antioxidants expert at the University of California, Berkeley. "It affects the skin in very special ways." But remember, while Pycnogenol® might help prevent damage, it won't make you sunproof, so keep using sunblock.*

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***Who should take Pycnogenol®***

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*A placebo controlled  
study demonstrated  
that Pycnogenol®  
increases endurance.*

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### Everybody

Free radicals develop continuously as by-products during normal metabolism in our bodies and they continuously cause damage to our cells.

When we are younger, the consequence is relatively minor. However, as we age, the cumulative effects of this process begin to take their toll.

A large variety of diseases is known to involve free radical damage. Neutralising free radicals with Pycnogenol®, one of the most powerful antioxidants, is necessary to delay this harmful process and its prevention should begin at an early age.

### Sportspeople

Pycnogenol® increases endurance as demonstrated by athletes on a treadmill in a placebo-controlled study. Supplementation with Pycnogenol® enhanced endurance by about 20%, most probably as a result of the improved circulation and scavenging of free radicals.

### Managers

Men and women are at ever-increasing risk of heart infarction and stroke, exacerbated by stress in the workplace. In a clinical study, Pycnogenol® prevented the aggregation of blood plate-

lets, reducing the risk for heart infarction and stroke and keeping the circulation normal even under conditions of heavy stress.

### To reduce symptoms of chronic venous insufficiency

Many people (women more often than men) suffer from venous disorders with swollen ankles, cramps and pain in the lower legs. Trials conducted on 600 patients showed that these symptoms are greatly reduced after intake of Pycnogenol®.

### Women

#### For beauty

Pycnogenol® protects elastic fibres, collagen and elastin, from degradation and helps to rebuild skin tissue. Pycnogenol® reduces the intensity and size of irregular pigmentation of the skin. Moreover, it acts as an internal sunscreen, reducing the skin damage caused by UV-irradiation. Pycnogenol® makes the skin look fresh and healthy.

#### To reduce menstrual disorders

Clinical studies in Japan have shown that intake of Pycnogenol® 14 days before menstruation reduces the intensity of cramps and pain related to menstrual disorders.

### Men

#### To improve fertility

Clinical observations show that intake of Pycnogenol® improves the quality of sperms in men whose infertility is caused by malformed sperms. This effect is likely the result of scavenging of deleterious free radicals.

#### The elderly

According to the free radical theory of ageing, the process of ageing is accelerated by free radical production. Consequently, the regular intake of a potent scavenger of free radicals should retard this process. It has been demonstrated that intake of Pycnogenol® increases memory and learning ability, an additional positive effect beside protection of the circulation.

Sportspeople often have an impaired immune system similar to elderly people. Pycnogenol® boosts the immune system by enhancing the activity of so-called killer cells and by increasing the production of immune-competent cells.



### Dosage

Pycnogenol® is sold in tablets or capsules containing 20-100 mg Pycnogenol®. Daily dosage should be 1 mg/kg body weight. A loading dose for the first week of 1.5 mg per kg body weight is recommended. Pycnogenol® should be taken with meals to avoid gastric irritation. Sensitive persons should refrain from taking Pycnogenol® in the evening as they may feel too energetic to fall asleep.

Creams and lotions may typically contain between 0.5 - 2% Pycnogenol®.

Pycnogenol® can be incorporated in chewing gum in amounts of 5 mg per gum.

## *Horphag Research, a long-established leader in research*



*The Horphag factory  
control department  
(pictured here in 1956)*

### **History**

Since its foundation in Berlin in 1925, Horphag Research has specialised in nutritional supplements. The company has consistently devoted a large part of its attention to research in what was

at the time a new area. For many years, it produced the food supplement Okasa and marketed it worldwide, developing expertise that has contributed to Horphag's success in nutritional supplements.

In the 1960s Charles Haimoff initiated a visionary concept of 'healthy ageing'. In his Berlin-based laboratories, he developed the product we know today as Pycnogenol®. Horphag Research Ltd

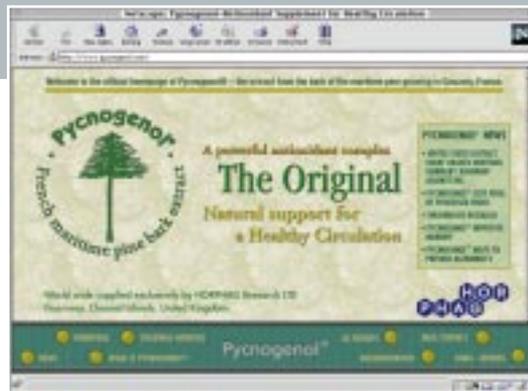
now leads the world in Pycnogenol® research, with more

than sixty published papers on the product. Comprehensive research and development programmes continue to be carried out in partnership with researchers and specialist companies around the world, and new applications for Pycnogenol® are explored every year.



*Charles Haimoff, Chairman  
of Horphag Research,  
in the late 1950s*

Horphag Research has grown to become a global company, with offices in major markets and representations worldwide. It continues to be proudly science-based, offering the highest quality product fully backed by scientific research.



### Local Representations

Please visit our homepage to find your local representation:  
[www.pycnogenol.com](http://www.pycnogenol.com)

### Detailed information on the following subjects is available on request:

- Botany
- Technical data
- Clinical data
- Pharmacology
- Safety
- Labelling policy
- Analytics
- References



Pycnogenol®  
is a registered trademark of  
Horphag Research Ltd,  
Guernsey, and its applications  
are protected by U.S. patents  
#4,698,360 / #5,720,956 and  
other international patents.



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These statements have not been evaluated by the U.S. Food and Drug Administration. This product is not intended to treat, prevent or cure any disease.

