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Polypodium leucotomos

Polypodium leucotomos extract comes from a tropical fern plant grown in Central and South America. Native Americans have used the plant extract for centuries for the treatment of inflammatory disorders and skin diseases. Recently, clinical research has shown that it has antioxidant and photoprotective properties and taken orally provides protection against the harmful effects of ultraviolet (UV) radiation from the sun and other sources.

Polypodium leucotomos extract (PLE) is currently marketed in New Zealand as Heliocare®. It is combined with two other [antioxidants](#), green tea extract and beta-carotene.

How does PLE work?

To gain a better understanding of how PLE works, you need to understand the effects of UV radiation on the body. These are described in the article on [sunburn](#).

The mechanism of action of PLE is fairly complex but has been summarized into the following main points:

- PLE acts as a scavenger to mop up free radicals and reactive oxygen species (ROS), particularly superoxide anions (these high energy molecules cause direct cell damage and have long been associated with all types of cancer)
- PLE inhibits the depletion of Langerhans cells
- PLE reduces the number of sunburn cells
- PLE protects DNA by inhibiting the formation of cyclobutane pyrimidine dimers (cancer-causing cells) induced by UVB radiation
- PLE preserves skin tissue structure by inhibiting the infiltration of mast cells into skin (mast cells release chemicals in the body that cause inflammation, redness and itching)

What is PLE used for?

PLE is an addition to the armamentarium against the damaging effects of UV radiation exposure. It should be considered as another layer of protection and used in conjunction with a good sunscreen and protective clothing.

PLE is particularly suitable for people whom are [photosensitive](#), especially those with [polymorphous light eruption](#). Clinical trials have been performed in people with skin types II to IV and results show that PLE provides significant protection of skin against UV radiation.

PLE can also be used as a chemophotoprotector against PUVA-induced skin phototoxicity. Extensive PUVA treatment results in premature aging changes in the skin (i.e. increased dryness, freckling and wrinkling) and can increase the chance of skin cancer. Fair skinned individuals or those with previous sun or radiation damage are most at risk. In clinical trials, PLE has proven to be the first oral agent effective in reducing the harmful side effects of PUVA treatment.

PLE has been used as a naturopathic medicine during the last three decades for the alleviation of [vitiligo](#), [psoriasis](#), [dermatitis](#) and multiple sclerosis.

How is PLE given?

In New Zealand PLE is currently marketed as Heliocare, a dietary supplement, containing a combination of the

antioxidants Polypodium leucotomos extract (PLE), green tea extract and beta-carotene. The recommended dose of Heliocare is one capsule taken daily. It is rapidly absorbed and provides early protection that lasts up to 2 hours after administration, against the initial signs of sunburn, ie: erythema reaction. However, its photoprotective effect extends beyond just decreasing the erythema reaction. The antioxidant properties of orally administered PLE work at protecting the skin at a deeper cellular level which is not achieved with topically applied antioxidants.

Precautions

PLE has not been clinically tested in patients less than 18 years, and in pregnant or breastfeeding women. Hence there is no data to support its use in these groups.

Heliocare should not be taken during pregnancy.

Side Effects

PLE supplements have been used over the last 20 years in Europe without any side effects being reported. There are no known side effects associated with Heliocare taken as a dietary supplement.

PLE has not been thoroughly tested for interactions with other supplements and drugs. Some concern has been expressed that it may interact with medications that affect the function of the heart or blood pressure, as cardiac effects have been demonstrated with a related fern species, *Polypodium vulgare*.

Related information

References:

- Edlich RF, Winters KL, Lim HW et al. Photoprotection by sunscreens with topical antioxidants and systemic antioxidants to reduce sun exposure. *Journal of Long-Term effects of Medical Implants* 2004;14(4):317-340
- Middelkamp-Hup MA, Pathak MA, Parrado C et al. Oral Polypodium leucotomos extract decreases ultraviolet-induced damage of human skin. *J AM Acad Dermatol* 2004;51:910-8
- Middelkamp-Hup MA, Pathak MA, Parrado C et al. Orally administered Polypodium leucotomos extract decreases psoralen-UVA-induced phototoxicity, pigmentation, and damage of human skin. *J AM Acad Dermatol* 2004;50:41-9
- Product information supplied by Douglas Pharmaceuticals Ltd

On DermNet NZ:

- [Sun protection](#)
- [Oral antioxidants](#)

Other websites:

- [Polypodium leucotomos extract and anapsos](#) MedlinePlus Herbs and Supplements

Books about skin diseases:

See the [DermNet NZ bookstore](#)

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DermNet does not provide an on-line consultation service.

If you have any concerns with your skin or its treatment, see a [dermatologist](#) for advice.

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