REPORT

Unleash Your Skin’s Internal Defenses

By Rona Cherry

NOVEL PLANT COMPOUNDS HALT PHOTOAGING

Normally you think of protection from ultraviolet skin aging as something that must take place from outside your body, by blocking out solar radiation. But new research reveals that internal factors are just as critical for optimal skin protection.

Clinical research shows that upon ingestion, safe and readily-metabolized plant extracts furnish your skin with extraordinary protection from photoaging. They slow the absorption of harmful ultraviolet (UV) rays and blunt potentially cancer-causing DNA damage inflicted by sun-generated free radicals.

Much has been written about how the sun’s burning ultraviolet rays harm our health and appearance. Yet despite the warnings, more than two million people in the US will be diagnosed with skin cancer this year alone. Rates of melanoma—the most dangerous form of skin cancer—have not only doubled over the past 10-20 years, but continue to rise 3% to 7% annually.

In one study, novel plant extracts demonstrated an impressive 54% reduction in activity of collagen-degrading enzymes and an 86% inhibition of enzymes that break down hyaluronic acid—your skin’s natural moisturizer!

In this article, you will learn of the mechanisms by which certain phytonutrients can significantly offset the ravages of excessive UV exposure that lead to premature skin aging.

BOLSTERING SKIN DEFENSES

For centuries, natives of Honduras have protected themselves against sunburn, tumors, psoriasis and other skin disorders by ingesting a fern extract known as Polypodium leucotomos. An initial report on its effects was published in Nature more than 40 years ago and since then clinical trials have demonstrated that the antioxidant-rich extract bolsters the skin’s defenses against damaging UV rays.

A 2004 study by Harvard researchers on nine healthy volunteers tested whether Polypodium leucotomos would protect fair-to-light-skinned subjects from sun damage. Some were given oral doses of the fern extract (7.5 mg/kg body weight daily, or about 525 mg for a 154-pound person), some were not, and then all were exposed to different doses of artificial solar radiation. After 24 hours, the researchers took biopsy samples to determine the amount of skin redness due to inflammation (erythema).

The results showed that those who had taken the extract had experienced less UV-induced damage, including “significantly” fewer sunburn cells, indicators of light-induced tissue injury. The extract inhibited the infiltration of mast cells, which release chemicals into the body that cause inflammation, redness, and itching. It also had a protective effect on radiation-sensitive Langerhans cells, key cancer-fighting immune cells found in the outer layer of skin (the epidermis). The Harvard researchers concluded that Polypodium leucotomos is an “effective systemic chemoprotective agent.”

Another study conducted in 2007 by scientists in Milan, Italy, found that Polypodium leucotomos extract was beneficial to those individuals with a high sensitivity to the sun often referred to as “sun poisoning.” Recruited for the trial were 26 patients who suffered from polymorphic light reaction, a condition in which skin rashes can develop after fairly limited sun exposure. Two others had solar urticaria, a rare form of hives caused by exposure to UV light. All subjects had previously not responded to the usual available treatments.

Twenty-five of the patients met the criteria for evaluation and were exposed to sunlight while taking an oral dose of 480 mg of
Polypodium leucotomos a day. Their responses were compared to their previous experiences to sunlight exposure without the benefit of the Polypodium leucotomos extracts.

The researchers reported that the subjects responded well to the fern extract, with 80% of the patients reporting benefit from its use. The “photoprotective activity of Polypodium leucotomos was significant,” wrote researchers. In addition, the fern extract was well-tolerated and did not cause any unwanted side effects.

ROLE IN SKIN AGING

A recent study found that Polypodium leucotomos could potentially become an important anti-aging ingredient.9

Researchers investigated the effect of the fern extract, which is rich in polyphenols, on human dermal fibroblasts. The scientists studied the impact of Polypodium leucotomos on UV radiated fibroblasts and those that were non-irradiated in vitro. The researchers were particularly interested in the expression of enzymes and transforming growth factor-beta (TGF-beta) that are known to affect the extracellular matrix proteins such as elastin and collagen, responsible for keeping the skin supple and firm.

In the study, they looked at how Polypodium leucotomos affects matrix metalloproteinases (MMPs)—enzymes that break down collagen and that are stimulated by exposure to UV light.

The study found that Polypodium leucotomos may play a role in preventing skin aging by directly inhibiting MMP expression. At the same time, the fern extract demonstrated its protective effects by stimulating certain types of collagen. Interestingly, Polypodium leucotomos stimulated collagen production and it also decreased its degradation by the MMPs.

WHY FERN EXTRACT IS EFFECTIVE

Over the years, researchers have studied whether antioxidants such as oral tocopherol (vitamin E), ascorbate (vitamin C), and carotenoids are effective in protecting against the sun’s ultraviolet rays.10,11 Studies have showed varying results, some more promising than others. However, when any photo-protective effect was observed, it usually was after prolonged administration of the antioxidants.12 So why is Polypodium leucotomos more effective than other antioxidants?

In an article published this April,3 Dr. Salvador Gonzalez, a renowned physician-researcher in dermatology and photo-medicine at Memorial Sloan-Kettering Cancer Center, reviewed several proposed mechanisms by which the natural ingredient appears to work:

- Polypodium leucotomos extract contains a high percentage of phenolics such as caffeic acid and ferulic acid, antioxidants which protect the skin against erythema. The fern extract inhibits the formation of free radicals and the oxidative damage that results from UV radiation.3
- It protects cells and prevents damage to DNA. A recent study of 10 healthy volunteers found that Polypodium leucotomos showed a trend toward preventing the increase in levels of the common deletion (a photoaging marker), as UVA radiation was increased.13
- Fern extracts exhibit powerful anti-inflammatory effects in skin tissue.3
- It also prevents UV rays from suppressing immune function, which is important in preventing harmful cellular changes that could lead to the development of skin cancer.1

Polypodium leucotomos not only has short-term effects such as inhibiting reactive oxygen species (free radicals) production and DNA damage, but the short-term effects “translate into long-term prevention of photoaging and photocarcinogenesis,” Dr. Gonzalez said.3

He noted that since Polypodium leucotomos can be administered orally it could decrease the incidence of phototoxicity in individuals with difficult-to-treat skin disorders such as psoriasis and vitiligo (loss of pigment in patches of the skin) who are undergoing UV treatments.3

HOW THE SUN’S RAYS AFFECT YOU

The Earth’s ozone layer filters out most of the sun’s harmful rays, but those ultraviolet rays—UVA and UVB—that do manage to penetrate the ozone both tan and damage the skin. Blocking these rays helps prevent an array of problems including
NEW COMBINATIONS OFFER MORE PROTECTION

Interestingly, combinations of various antioxidants have been found to have synergistic effects, yielding formulations that are more beneficial than any of the individual compounds used alone. Studies have shown that when several antioxidants are combined in one skin care product, the benefits to skin may be greater, and the photoprotective effect increases. For instance, it’s well known that sun exposure is not the only cause of accelerated skin aging. Stress can also damage our skin, the body’s largest organ, as well as various other body parts. Reducing stress may therefore be significant in improving overall skin condition.

In a double-blind, randomized, placebo-controlled, in vitro study, a proprietary preparation containing Indian gooseberry (Phyllanthus emblica) and ashwagandha extracts demonstrated a 54% inhibition of enzymes that break down collagen, and an 86% inhibition of those that break down hyaluronic acid, the skin’s natural moisturizer.

While ashwagandha helps protect the skin against the effects of stress, it also helps to benefit stress-related health conditions. In a randomized, double-blind, placebo-controlled trial, 98 chronically stressed adults were assigned to receive a patented standardized extract of ashwagandha for 60 days. They received either 125 mg once or twice a day, 250 mg twice a day, or a placebo. Their stress levels were measured throughout the study and blood pressure was taken at the beginning and at the end of the study.

The researchers found that all three groups taking the ashwagandha reduced their stress and anxiety and lowered their blood pressure levels. The group receiving the lowest dose of 125 mg once a day had a 62% reduction in anxiety compared to those with the placebo, with anxiety scores declining even further in the other two groups. In addition, the group receiving the daily dose of 125 mg showed a 14.5% reduction in cortisol levels and a 13.2% increase in DHEA, with the other two groups reporting significantly greater benefits. In addition, all three groups taking ashwagandha saw a definite drop in their levels of C-reactive protein, which is a measure of inflammation within the body.

The researchers concluded that the “daily use of Withania somnifera (also known as ashwagandha) would benefit people suffering from the effects of stress and anxiety without any adverse effects.”

In response, Polypodium leucotomos has recently been combined with a patented form of Phyllanthus emblica (from the Indian gooseberry) and ashwagandha—a medicinal herb that has been used for thousands of years by Ayurvedic practitioners. Rich in flavonoids and steroidal lactones called withanolides, ashwagandha works as an adaptogen to relieve the damage that emotional stress can inflict on skin.

SUMMARY

Most of us fail to recognize the age-accelerating effects of everyday sun ray exposure to the skin. Just ten minutes a day of normal sun exposure is the equivalent of intentionally bathing in the sun for over an hour every week.
Sun self-defense is crucial to prevent skin cancer, skin aging, and immune system suppression. Even when using a sunscreen, many of us are less-than-perfect, inconsistent applicers of topical protection.

*Polypodium leucotomos* is a tropical fern plant with potent antioxidant and anti-inflammatory properties that scavenges free radicals, protects DNA, and provides significant protection against other UV dangers. *Polypodium leucotomos*, when taken orally, works as a skin protector at a deep cellular level.

This fern extract, along with Indian gooseberry and ashwagandha, however, is not meant to substitute for topical sunscreens and should not give anyone a false sense of security about their sun exposure.

*If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.*

### WHAT YOU NEED TO KNOW: UNLEASH YOUR SKIN’S INTERNAL DEFENSES

- *Polypodium leucotomos* is a fern plant that grows in the Honduran jungles and rain forests.
- Ferns have been used for a variety of medicinal purposes, possibly beginning with **Dioscorides**, a Greek physician and botanist back in the first century. The ancient Mayans used it as a tea in their daily diet to purify the blood.
- Indigenous people of Central and South America have used *Polypodium leucotomos* extract for centuries for the treatment of skin ailments such as psoriasis, **atopic dermatitis**, and sunburn.
- Research supports the use of Polypodium leucotomos as an “internal sunscreen.”
- **Ashwagandha** is an Ayurvedic tonic best known for helping individuals deal with stress. It is also known as **Indian ginseng**.
- Ashwagandha relieves the damage that emotional stress can inflict on the skin, and *Phyllanthus emblica* (Indian gooseberry) provides potent antioxidant protection against skin-damaging free radicals.
- Together these three ingredients protect against the harmful effects of the sun and work to keep skin looking smooth, beautiful, and healthy.

### References


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