

## **Predominant Effects of Polypodium**

Predominant effects of *Polypodium leucotomos* on membrane integrity, lipid peroxidation, and expression of elastin and matrix metalloproteinase-1 in ultraviolet radiation exposed fibroblasts, and keratinocytes.

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**BACKGROUND:** *Polypodium leucotomos* has been reported to have antioxidant, anti-inflammatory and photoprotective properties. Exposure of skin to ultraviolet (UV) radiation can lead to deposition of excessive elastotic material, reduction in collagen, and increased expression of matrix metalloproteinases (MMPs). **OBJECTIVE:** The goal of this research was to determine the effects of *P. leucotomos* in the absence or presence of UVA or UVB radiation on membrane damage, lipid peroxidation, and expression of elastin and MMP-1 in fibroblasts and keratinocytes, respectively. **METHODS:** Fibroblasts and keratinocytes, respectively, were irradiated by a single exposure to UVA (0.6, 1.8 or 3.6 J) or UVB radiation (0.75, 2.5 or 7.5 mJ), and then incubated with, or without, *P. leucotomos* (0.01, 0.1 and 1%) and examined for membrane damage, lipid peroxidation, expression of elastin (protein levels) and MMP-1 (protein levels or MMP-1 promoter activity). **RESULTS:** UV radiation did not significantly alter membrane integrity, lipid peroxidation or MMP-1 expression, but increased elastin expression. *P. leucotomos* significantly improved membrane integrity, inhibited lipid peroxidation, increased elastin expression, and inhibited MMP-1 expression in both fibroblasts, and keratinocytes. The effects of *P. leucotomos* predominated in the presence of UVA or UVB in both fibroblasts and keratinocytes, respectively, with the exception of inhibition of MMP-1 protein levels in fibroblasts only in combination with UV radiation. **CONCLUSION:** Lower concentration of *P. leucotomos* (lower than 0.1%), may be beneficial in preventing photoaging by improving membrane integrity and inhibiting MMP-1, without increasing elastin expression. Higher concentration (greater than 0.1%) of *P. leucotomos* may reverse the loss of normal elastic fibers associated with intrinsic aging.

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