



EFFECTS OF SUPPLEMENTAL ULTRAVIOLET-B RADIATION ON GROWTH AND PHYSIOLOGY OF *ACORUS CALAMUS* L. (SWEET FLAG)

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Increased UV-B radiation due to depletion of stratospheric ozone has potentially harmful effects on plant growth and development. The present study uses a field experiment to examine the effect of long-term supplemental UV-B radiation at two intensities (+1.8 and +3.6 kJ m⁻² d⁻¹ above ambient) on the growth and physiology of the medicinal plant *Acorus calamus* L. (sweet flag). Plant height and leaf area were inhibited in a dose-dependent manner, with greater inhibition at the higher dose. At the lower dose the net photosynthetic rate increased, with an increase in stomatal conductance and water use efficiency. Stimulation of physiological functions in plants under the lower dose resulted in increased biomass production. At the higher dose, total chlorophyll content showed no marked variation, whereas carotenoids and UV-B-screening pigment flavonoids increased significantly after treatment. Increased flavonoid content under lower exposure correlates well with higher activity of phenylalanine ammonia lyase, a key enzyme of flavonoid biosynthesis. This study clearly showed that the lower dose of supplemental UV-B promoted rhizome growth in *A. calamus*, perhaps due to improved photosynthesis. Plant defense was stronger under the lower dose.

Key words: Ultraviolet-B, *Acorus calamus* L., biomass, growth, pigments, phenylalanine ammonia lyase.

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