Sensitivity and Photosynthetic Response of Indoor Plant Species to **Ozone Exposure Duration**¹

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ABSTRACT

This study was conducted to determine the effect of ozone in eight species of indoor foliage plants (Cissus rhombifolia Vahl, Hedera helix L., Spathiphyllum wallisii Regel, Syngonium podophyllum Schott 'Albo-Virens', Dieffenbachia 'Marrianne', Ficus benjamina L. 'Hawaii', Pachira aquatica Aubl., and Scindapsus aureus Engler) in relation to their sensitivity and physiological responses. The indoor plants grown under controlled environment chambers were exposed to 120 ppb ozone which is typically found in indoor conditions for 2, 4, or 8 hr/d for 25 d. Of the eight foliage plants, only *Cissus rhombifolia* displayed distinct foliar injuries within a few days after initial exposure. The severeness of the symptoms such as leaf necrosis and distortion of mesophyll cells was positively correlated with ozone treatment period. No significant differences were observed in the chlorophyll content and chlorophyll fluorescence (Fv/Fm) between control plants and ozone treated plants. Ozone treatment resulted in significant decreases in photosynthetic rate in Cissus rhombifolia, Dieffenbachia, Pachira aquatica, and Scindapsus aureus. There were significant differences in carbon fixation among the indoor plants used in this study, Dieffenbachia, and Pachira aquatica had ozone tolerant carbon fixation systems that did not exhibit changes in photosynthetic rate with increasing CO₂ concentration. Cissus rhombifolia was considered the most sensitive species to ozone among the eight foliage plants due to severe visual injury Dieffenbachia, Pachira aquatica, and Scindapsus aureus were classified as ozone sensitive species due to their inhibition of photosynthesis by ozone. The remaining species (Spathiphyllum wallisii, Ficus benjamina and Hedera helix) were more tolerant to ozone and thereby potentially better suited for indoor air phytoremediation.

Keywords : Apparent quantum yield, Chlorophyll content, Chlorophyll fluorescence, CO₂ fixation efficiency

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