

研究报告

UV-B辐射增强和CO₂浓度倍增的复合作用对番茄生长和果实品质的影响

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摘要

以番茄 (*Lycopersicon esculentum*) 为研究对象,在人工模拟8.40 kJ·m⁻² 的UV-B辐射和700 μmol·mol⁻¹的CO₂浓度复合处理下,研究了番茄的生长和果实品质变化.结果表明,UV-B辐射使番茄的株高、鲜重、干重、总叶绿素、叶绿素a、叶绿素b、光合速率、水分利用效率、可溶性蛋白、维生素c及番茄红素等降低,导致果实品质恶化;而CO₂浓度倍增作用相反.在UV-B辐射增强和CO₂浓度倍增复合作用下,番茄的上述指标与对照相比差异不明显.分析认为,CO₂倍增与UV-B辐射增强复合处理下,CO₂的正效应作用可以减轻甚至抵消UV-B辐射的负效应.

关键词 [UV-B辐射](#) [CO₂倍增](#) [番茄](#) [复合作用](#) [果实品质](#)

分类号

Combined effects of enhanced UV-B radiation and doubled CO₂ on tomato growth and its fruit quality

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Abstract

The study on the effects of 8.40 kJ·m⁻² UV-B radiation,700 μmol·mol⁻¹ CO₂ concentration,and their combination on tomato (*Lycopersicon esculentum*) growth and its fruit quality showed that under enhanced UV-B radiation,the plant height,fresh weight,dry weight,photosynthesis rate,water use efficiency,and contents of total chlorophyll,chlorophyll a,chlorophyll b,soluble protein,ascorbate acid (Vitamin C) and lycopene were decreased,which resulted in the deterioration of tomato fruit quality.Doubled CO₂ concentration alone accelerated tomato growth,and accordingly,ameliorated its fruit quality.Under the combined effects of enhanced UV-B radiation and doubled CO₂ concentration,tomato growth and its fruit quality were not significantly different from the control.It was suggested that the positive effects of doubled CO₂ could lighten and counteract the negative effects of UV-B radiation under combined treatment of enhanced UV-B radiation and doubled CO₂ concentration.

Key words [UV-B radiation](#) [Doubled CO₂](#) [Tomato](#) [Combined effects](#) [Fruit quality](#)

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