

土壤肥料·生理生化·农业生态

土壤干旱下云锦杜鹃光合作用的限制形式^{*}

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摘要 以盆栽五年生云锦杜鹃为材料, 研究了土壤干旱胁迫下光合作用的限制形式。结果表明: 轻度干旱胁迫下光合速率的下降主要由气孔限制引起, 中度和重度胁迫下主要由非气孔限制引起, 此时表观量子效率、最大光化学效率和羧化效率明显降低。云锦杜鹃光合日进程中出现了明显的光合“午休”。“午休”主要由非气孔限制引起, 表观量子效率和光化学效率下降表明光抑制是午间非气孔限制形成和发展的深层原因。干旱胁迫加重了午间光合作用的光抑制。

关键词 [干旱胁迫](#); [光合特性](#); [气孔限制](#); [非气孔限制](#); [云锦杜鹃](#)

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The Limited Types of Photosynthesis of *Rhododendron fortunei* under Soil Drought Stress

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Abstract

The limited types of Photosynthesis of *Rhododendron fortunei* under drought stress were studied using 5-year-old potted seedlings as the experimental materials. The results showed that the depression of photosynthesis under mild stress might be due to stomatal limitation, while that might be due to non-stomatal limitation under moderate stress and severe stress. The maximal efficiency of photochemistry in PS II (F_v/F_m) exhibited an obvious decline under moderate stress and severe stress, in additions, the decreases of apparent quantum yield (AQY) and carboxylation efficiency (CE) occurred. There existed an obvious decline of the net photosynthetic rate (P_n) at noon in the diurnal variation under natural condition in summer. The mid-depress of P_n was principally caused by non-stomatal limitation. The decreases of AQY and photochemical efficiency at noon showed that there existed photoinhibition of photosynthesis, which was the intrinsic reason why non-stomatal limitation could form and develop. Drought stress aggravated the photoinhibition of photosynthesis at noon.

Key words [drought stress](#) [photosynthetic characteristics](#) [stomatal limitation](#) [non-stomatal limitation](#) [Rhododendron fortunei](#)

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