

研究论文

外源一氧化氮对NaCl胁迫下黄瓜幼苗生长、活性氧代谢和光合特性的影响

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摘要 采用营养液水培的方法, 研究了外源一氧化氮 (Nitric oxide, NO) 对50mmol·L⁻¹NaCl胁迫下黄瓜幼苗生长、活性氧代谢和光合特性的影响。结果表明: 10~400μmol·L⁻¹ NO供体硝普钠 (Sodium nitroprusside, SNP) 能显著缓解NaCl胁迫对黄瓜植株造成的伤害, 100μmol·L⁻¹ SNP缓解效果最好, 可提高幼苗的生长量, 增强幼苗叶片超氧化物歧化酶 (SOD)、过氧化物酶 (POD)、过氧化氢酶 (CAT)、抗坏血酸过氧化物酶 (APX) 活性, 提高了叶片叶绿素和脯氨酸 (Pro) 含量、净光合速率 (Pn)、蒸腾速率 (Tr) 及气孔导度 (Gs); 降低了叶片丙二醛 (MDA) 和过氧化氢 (H₂O₂) 的含量、超氧阴离子 (O⁻²) 的产生速率、质膜透性和胞间二氧化碳浓度 (Ci)。

关键词 [一氧化氮](#); [NaCl胁迫](#); [黄瓜幼苗](#); [活性氧](#); [光合作用](#)

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The effects of exogenous nitric oxide on growth, active oxygen metabolism and photosynthetic characteristics in cucumber seedling under NaCl stress

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Abstract The study was conducted in nutrient solution to investigate the effects of exogenous nitric oxide (NO) on growth of cucumber seedlings, active oxygen metabolism and photosynthetic characteristics in cucumber leaves under 50mmol·L⁻¹ NaCl stress. The results showed that 10-400 μmol·L⁻¹ exogenous sodium nitroprusside (SNP), a nitric oxide donor, especially 100 μmol·L⁻¹ SNP, significantly alleviated the injury to seedlings and increased seedling growth, activity of SOD, POD, CAT, APX, the content of photosynthetic pigment and proline under 50mmol·L⁻¹ NaCl stress. Similarly, net photosynthetic rate (Pn), stomatal conductance (Gs) and transpiration rate (Tr) were also increased significantly. However, exogenous nitric oxide markedly decreased membrane permeability, rate of O⁻² production, the content of MDA and H₂O₂, intercellular CO₂ concentration (Ci) under 50mmol·L⁻¹ NaCl stress.

Key words [nitric oxide](#) _ [NaCl stress](#) _ [cucumber seedling](#) _ [active oxygen](#) _ [photosynthesis](#)

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