

研究论文

## 低氧胁迫对黄瓜幼苗根系无氧呼吸酶和抗氧化酶活性的影响

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**摘要** 对两个抗低氧胁迫能力不同的黄瓜品种进行营养液水培,研究了低氧胁迫下植株根系中无氧呼吸酶和抗氧化酶活性的变化.结果表明,低氧胁迫下,黄瓜植株生长受到抑制,鲜重和干重显著降低,根系中蛋白质含量降低,而根系中乳酸脱氢酶(LDH)、丙酮酸脱羧酶(PDC)、乙醇脱氢酶(ADH)、超氧化物歧化酶(SOD)、过氧化物酶(POD)和过氧化氢酶(CAT)活性在低氧胁迫下显著提高,且提高的幅度与品种抗低氧胁迫能力的强弱有关,与“中农8号”相比,抗低氧性胁迫能力较强的“绿霸春四号”根系内LDH活性增幅较小,而ADH、PDC、SOD、POD和CAT活性增幅较大.说明较高的ADH、PDC、SOD、POD、CAT活性和较低的LDH活性有利于增强幼苗植株抗低氧胁迫的能力.

**关键词** [根际低氧胁迫](#) [黄瓜](#) [无氧呼吸酶](#) [抗氧化酶](#)

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## Effects of Hypoxia Stress on Anaerobic Respiratory Enzyme and Antioxidant Enzyme Activities in Roots of Cucumber

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**Abstract** Exposure to hypoxia is stress commonly encountered by plants. To survive prolonged periods of oxygen deficiency, all organisms have had to evolve mechanisms for sensing oxygen shortage and to adjust their cellular metabolism accordingly. In this experiment, the effects of hypoxia stress on anaerobic respiratory enzyme activities and antioxidant enzyme activities in two cucumber cultivars (*Cucumis sativus* L. cv. Zhongnong No.8 and cv. Lübachun No.4) seedlings with different resistance ability were studied. The results showed that under hypoxia treatment, fresh weight, dry weight and content of protein decreased, while the activities of lactate dehydrogenase (LDH), pyruvate (PDC), alcohol dehydrogenase (ADH), superoxide dismutase (SOD), peroxidase (POD) and catalase (CAT) in roots of two cucumber cultivars seedlings increased significantly, which bear on the resistance of seedlings. The activity of LDH increased significantly in the early period of hypoxia stress treatment, while that of ADH and PDC increase lightly, which reduced the tolerance to hypoxia stress in ‘Zhongnong No.8’ seedlings which is hypoxia-sensitive to hypoxia stress cultivar. The activity of LDH increased tardness, the activities of PDC and ADH of ‘Lübachun No.4’ increased much more than that of ‘Zhongnong No.8’, which could increase the resistance of ‘Lübachun No.4’ under hypoxia.

**Key words** [Hypoxia stress](#); [Cucumber seedlings](#); [Anaerobic respiratory enzymes](#); [Antioxidant enzyme](#)

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