

研究论文

苗龄及pH值对不同基因型甜菜根际磷酸酶活性的影响

周建朝, 韩晓日

黑龙江大学农学院, 黑龙江哈尔滨 150080

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摘要 采用无菌液培法在甜菜生长的幼苗期进行了根系内源和分泌到根际的磷酸酶的影响因子研究。结果表明, 甜菜内源和分泌到根际的磷酸酶可同时存在酸性、中性和碱性3种形态。随着苗龄的变化, 不同品种的内源和根际的3种磷酸酶活性变化各异, 但在20 d后均明显下降。生长介质中的酸碱反应对甜菜根系各种内源磷酸酶的分泌具有明显的调控作用, 其中酸性和中性磷酸酶对pH的敏感程度显著高于碱性磷酸酶。甜菜3种磷酸酶分泌的最佳酸碱范围在pH 6~7之间; 不同基因型甜菜内源和根际的3种磷酸酶活性对环境pH变化的反应表现出明显的生物学多样性。

关键词 [甜菜](#) [根际](#) [磷酸酶](#) [苗龄](#) [pH值](#)

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The Effects of Seedling Age and pH on Phosphatase Activity of Rhizosphere in Different Sugar Beet Genotypes

ZHOU Jian-Chao, HAN Xiao-Ri

Agricultural College, Heilongjiang University, Harbin 150080, Heilongjiang

Abstract Soil organic phosphorus has to be hydrolyzed before it can be used by plants, rhizosphere is the most active part for this kind of transformation. Phosphatase can be produced by plant roots and play an important role in the availability of organic phosphorus. To explore the possibility of using bio-diversity in the plant P nutrition, the factors that affect root endogenous phosphatase and its exudation in the rhizosphere of sugar beet (*Beta vulgaris* L.) were studied under sterile condition by liquid culture. The acid, neutral and alkaline phosphatase could present simultaneously in the roots and rhizosphere. With the increase of seedling age from 10 d to 20 d, the changes in activities of all kinds of phosphatases in roots or in the rhizosphere for three cultivars showed a great difference, then decreased significantly after the seedling age of 20 d. The pH of growing substrate could regulate the exudation of all kinds of phosphatases in the young sugar beet roots, as compared with alkaline phosphatase, the acid and neutral phosphatase were more sensitive to pH. The optimum pH for the exudation of all the three kinds of phosphatase was at the range of pH 6—7. The reaction of all kinds of endogenous phosphatase or that in the rhizosphere showed a significant bio-diversity to the pH condition.

Key words [Sugar beet](#); [Rhizosphere](#); [Phosphatase](#); [pH](#)

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通讯作者 周建朝

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