

不同氮素形态比例条件下接种AMF对玉米氮同化关键酶的影响

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Effects of AMF on key enzymes of nitrogen assimilation in maize under different ammonium to nitrate ratios

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摘要 以珍珠岩为基质, 通过供应3种不同的 $\text{NH}_4^+:\text{NO}_3^-$ 比例营养液, 研究了接种丛枝菌根真菌对玉米氮同化关键酶活性的影响。结果看出, 与不接种的玉米植株相比, 接种*Glomus intraradices*和*Glomus mosseae*分别在 $\text{NH}_4^+:\text{NO}_3^-=3:1$ 和 $\text{NH}_4^+:\text{NO}_3^-=1:3$ 形态下提高了植物叶片的硝酸还原酶活性; 接种AMF对叶片谷氨酰胺合成酶活性(GS)影响不大, 但在 $\text{NH}_4^+:\text{NO}_3^-=3:1$ 形态下接种3种AMF处理均显著提高了根系GS活性, 相对提高了铵态氮在地下部的同化比例。在铵态氮比例较高时, 接种AMF的促生效应较好, 且AMF提高根系GS活性作用较大。表明丛枝菌根真菌在促进宿主植物对铵态氮的利用作用较大。

关键词: 丛枝菌根真菌 铵态氮 硝态氮 谷氨酰胺合成酶 丛枝菌根真菌 铵态氮 硝态氮 谷氨酰胺合成酶

Abstract:

The effect of three arbuscular mycorrhizal fungus (AMF) on growth and key enzyme activities of nitrogen assimilation was measured in maize under three different ratios of $\text{NH}_4^+:\text{NO}_3^-$ using perlite as the substance. The results showed that, nitrate reductase activity on maize leave was enhanced by *Glomus intraradices* and *Glomus mosseae* inoculation when the ratios of $\text{NH}_4^+:\text{NO}_3^-$ were 3:1 and 1:3, respectively. The activity of glutamine synthetase (GS) of maize leaf was not affected significantly by AMF, but all the three AMF inoculation enhanced GS activity of roots and the ratio of ammonium assimilated in roots at $\text{NH}_4^+:\text{NO}_3^-=3:1$. Under the conditions of high ammonium content, AMF had a significant impact upon plant growth promotion, and root GS activity enhancement, as the result, AMF play an more important role in ammonium utilization of host plants.

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