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硝普钠、24-表油菜素内酯\水杨酸浸种对盐胁迫下玉米种子萌发及幼苗生长的影响

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摘要:

采用营养液水培,以玉米品种天泰16(TT16)、豫玉18(YT18)为材料,探讨外源硝普钠(NO的外源供体 SNP)+2,4-表油菜素内酯(EBR)/水杨酸(SA)浸种对盐胁迫下玉米种子萌发及幼苗生长的影响。结果显示,2种外源物组合浸种后,促进了盐胁迫(150mmol/L NaCl溶液)下玉米种子的萌发,以500mg/L 24-表油菜素内酯+硝普钠复合浸种和200mg/L水杨酸+硝普钠复合浸种效果最佳,其发芽率TT16分别比对照增加15%和13%,YT18增加16%和13%;发芽势TT16分别比对照增加24%和22%,YT18增加43%和44%,主根长、芽长及生物量也较对照增加。经外源物质浸种后,盐胁迫下的玉米幼苗长势较好,SOD、POD酶活性相比对照增加显著,MDA含量较少,可溶性糖在200mg/L水杨酸+硝普钠浸种的幼苗中积累最多,分别为对照的4.35倍(TT16)和4.03倍(YT18)。与对照相比,500mg/L EBR+100mmol/L SNP复合浸种和200mg/L SA+100mmol/L SNP复合浸种,玉米种子及幼苗耐盐性增强。

关键词: 硝普钠 油菜素内酯 水杨酸 浸种 盐胁迫 抗氧化酶

EFFECTS OF PRIMING WITH SODIUM NITROPRUSSIDE AND 24-EPIBRASSINOLIDE OR SALYLIC ACID ON SEED GERMINATION AND GROWTH OF MAIZE UNDER SALT STRESS

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Abstract:

The aim of this study was to study effects of exogenous sodium nitroprusside (SNP)+2,4-epibrassinolide(EBR) or salicylic acid (SA) on the germination of seeds, activities of antioxidative enzymes,MDA and soluble sugar in the leaves of maize (*Zea mays* L. cv. Tiantai No.16 and Yuyu No.18) seedlings under salt stress. After the seeds were soaked in one or two exogenous substances, especially in SNP +500mg/L EBR or SNP+200mg/L SA solution, their germination vigots were improved by 24%/22% (TT16) and 43%/40% (YT18) respectively, and germination percentage were increased by 15%/13%(TT16) and 16%/13% (YT18), respectively with higher activities of antioxidative enzymes and 109%/435%(TT16) and 119%/403%(YT18) higher soluble sugar in leaves under salt stress, while the accumulation of malondialdehyde (MDA) decreased by 70% /66%(TT16) and 66%/68% (YT18) as compared to control. It was suggested that SNP +EBR or SNP+SA could promote the seed germination and seedlings growth of maize exposed to salt stress through increasing seedlings' scavenging ability of reactive oxgen species and accumulating soluble sugar.

Keywords: sodium nitroprusside 24-epibrassinolide salicylic acid soaking seeds salt stress antioxidative enzymes

收稿日期 2011-03-18 修回日期 2011-06-28 网络版发布日期

DOI:

基金项目:

山东省自然科学基金项目(Y2008D36)

通讯作者:

扩展功能

本文信息

Supporting info

PDF(1196KB)

[HTML全文]

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