

水稻苗期耐高Cu²⁺胁迫的QTL定位和上位性分析沈圣泉¹;庄杰云²;舒庆尧¹;夏英武¹

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Main and epistasis analysis of QTLs for tolerant to high Cu²⁺ stress at seedling stage of rice(Oryza Sativa L.)SHEN Sheng-quan¹; ZHUANG Jie-yun²; SHU Qing-yao¹; XIA Ying-wu^{1*}

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摘要

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摘要 用珍汕97B/密阳46构建RIL群体及其遗传图谱,对其种子采用沙培法育苗和培养,试验设置2个高浓度(100.mg/L和200.mg/L)Cu²⁺胁迫处理,以处理20.d后的幼苗相对根长(%)和相对苗高(%)作为苗期耐Cu²⁺胁迫指标,并用于QTL定位分析。结果表明,试验共检测到苗期耐Cu²⁺胁迫的主效应QTL.4个,以相对根长为指标,检测到*qRCC(r)6*(100.mg/L)和*qRCC(r)9*(200.mg/L),以相对苗高为指标,也检测到*qRCC(s)1-2*(100.mg/L和200mg/L)和*qRCC(r)6-1*(200.mg/L),有效基因分散于双亲中。试验还检测到苗期耐Cu²⁺胁迫的上位性互作8对,以相对根长为指标时,检测到2对互作;以相对苗高为指标时,检测到6对上位性互作。表明水稻苗期耐高浓度Cu²⁺胁迫,其上位性互作也起到较为重要作用。

关键词: 水稻 RIL群体 QTL定位 上位性效应 耐Cu²⁺胁迫 水稻 RIL群体 QTL定位 上位性效应 耐Cu²⁺胁迫

Abstract: The recombinant inbred line(RIL) populations derived from Zhenshan 97B/Miyang 46(ZS97B/MY46) and their genetic linkage maps were employed to map QTLs controlling tolerant to high Cu²⁺ stress at the seedling stage by culturing the seedling in two concentration of Cu²⁺(100 mg/L and 200 mg/L) on the sand medium.After 20 days of treatment,the relative root length(%) and relative seedling height(%) was measured as index for tolerant to high Cu²⁺ stress.The results indicated that a total of four main effect QTLs were detected under high Cu²⁺ stress.Two were significant for the relative root length,*qRCC(r)6*(100 mg/L) and *qRCC(r)9*(200 mg/L),the other two were significant for relative seedling height,*qRCC(s)1-2*(100 mg/L and 200 mg/L) and *qRCC(r)6-1*(200mg/L).The positive allele were distributed in both the parents.A total of eight pairs of epistasis were detected for tolerant to high Cu²⁺ stress.Two were for relative root length;the other six for relative seedling height,indicating that epistasis were important genetic basis for the tolerant to high Cu²⁺ stress at the seedling stage.

Keywords:

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