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水稻短根毛突变体*Ossrh2*的表型分析与基因定位丁沃娜^{1*}, 童艳丽², 宁永强¹, 朱世华^{1*}¹宁波大学植物分子生物学研究室, 宁波 315211;²浙江大学植物生理学与生物化学国家重点实验室, 杭州 310058Phenotypic Analysis and Gene Mapping of a Short Root Hair Mutant *Ossrh2* in Rice (*Oryza sativa*)Wona Ding^{1*}, Yanli Tong², Yongqiang Ning¹, Shihua Zhu^{1*}¹Laboratory of Plant Molecular Biology, Ningbo University, Ningbo 315211, China;²State Key Laboratory of Plant Physiology and Biochemistry, Zhejiang University, Hangzhou 310058, China

摘要

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摘要 在粳稻品种中花11为遗传背景的T-DNA突变体库中筛选获得一个遗传稳定的水稻(*Oryza sativa*)短根毛突变体*Ossrh2*(*Oryza sativa short root hair 2*)。突变体在苗期表现为根毛数量减少, 为野生型的61.4%, 根毛长度明显变短, 只有野生型的22.8%, 同时根毛增粗, 根毛形态也发生了变异, 局部扭曲膨胀和分叉, 除此之外突变体的地上部和根部生长情况与野生型相比没有显著差异。遗传分析表明, 该突变性状受1对隐性单基因控制。通过对突变体 T_2 和 F_2 代的分子检测发现, 该突变体表型非T-DNA插入引起。利用*Ossrh2*纯合体和籼稻品种Kasalath杂交构建的 F_2 群体对*OsSRH2*进行基因定位, 发现其与第10号染色体短臂上的SSR(simple sequence repeat)标记RM6370和RM474连锁, 遗传距离分别为1.1 cM和3.0 cM。通过在两标记间发展3个新的STS(sequence-tagged site)标记, 将*OsSRH2*基因定位于标记S1227和S1531之间, 物理距离约为304 kb, 为进一步克隆*OsSRH2*打下了基础。

关键词: 基因定位 遗传分析 水稻 短根毛突变体

Abstract: A rice (*Oryza sativa*) mutant with short root hairs (*Ossrh2*) was isolated from a T-DNA insertion mutant library of rice in the Zhonghua11 background. Except for root hairs, *Ossrh2* did not differ from the wild type. The number and length of root hairs of *Ossrh2* were only 61.4% and 22.8%, respectively, that of the wild type, and hairs were thicker. The root hairs of *Ossrh2* were also morphologically abnormal and showed distortion, swelling and branching. Genetic analysis revealed that the mutant phenotype was controlled by a single recessive nuclear gene. PCR analysis of T_2 and F_2 mutants showed that the phenotype was not caused by T-DNA insertion. To map the *OsSRH2* gene, we generated an F_2 population by crossing the mutant *Ossrh2* with the Kasalath wild type. *OsSRH2* was first mapped between the microsatellite markers RM6370 and RM474 on the short arm of chromosome 10 with genetic distance of 1.1 and 3.0 cM, respectively. Then, 3 new polymorphic sequence-tagged site markers were developed in the region. *OsSRH2* was finally mapped between markers S1227 and S1531 with a physical distance of 304 kb, which would help in its cloning.

Keywords: gene mapping genetic analysis *Oryza sativa* short root hair mutant

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