

研究论文

玉米抗穗粒腐病QTL定位

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摘要 用已构建的包括88个AFLP标记和151个SSR标记的遗传图谱和230个F2植株用于抗病QTL定位研究, 在四川雅安、绵阳对F2株系进行抗病性鉴定, 采用复合区间定位法进行抗病QTL检测。在雅安检测到位于第2、3、4、6和9染色体上的抗病QTL 6个, 解释表型变异的8.3%~25.7%; 在绵阳检测到位于第1、6、7和9染色体上的抗病QTL 4个, 解释表型变异的11.3%~26.4%。在10个抗病QTL中, 位于第6和第9染色体上的2个同时在两点被检测到, 贡献率均超过15%, 表明玉米穗粒腐病确实存在遗传抗病性。利用2个环境抗病指数的平均值进行抗性QTL检测, 共检测到位于第1、6和7连锁群上的3个抗性QTL, 单个QTL的贡献率在8.9%~17.2%之间。结果有助于了解玉米穗粒腐病的抗性机制, 并为分子标记辅助选择提供理论支撑。

关键词 [穗粒腐病](#) [SSR](#) [AFLP](#) [QTL定位](#) [玉米](#)

分类号

Molecular Mapping of QTL for Resistance to Maize Ear Rot Caused by *Fusarium moniliforme*

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Abstract Maize ear rot, mainly caused by *Fusarium moniliforme*, is one of the most destructive diseases of maize in the world. Infected maize is lower yielding and contains toxins that are dangerous to livestock and human. The aims of this study were to identify quantitative trait loci (QTL) associated with genetic resistance to *F. moniliforme*, their positions and effects in the maize genome; investigate the consistency of QTL across two environments and their utilization in a marker-assisted selection programme. A previous genetic map containing 88 AFLP and 151 microsatellite markers and 230 F2 plants were used for QTL mapping in Maize. QTL analysis was performed using joint composite interval mapping. In Ya'an, six QTL conferring *Fusarium moniliforme* ear rot resistance on chromosomes 2, 3, 4, 6, and 9 were detected and explained 8.3% - 25.7% of the phenotypic variance; while in Mianyang, four QTL were identified on chromosomes 1, 6, 7, and 9 that accounted for 11.3% - 26.4% of the total phenotypic variance. Two QTLs on chromosomes 6 and 9 were identified consistently in both environments, which revealed that resistance to *F. moniliforme* was determined by genetic factors. Three QTLs on chromosomes 1, 6 and 7 that accounted for 8.9% - 17.2% of the total phenotypic variance were detected using the mean resistant disease index of two locations. QTL mapping results will be helpful to further understand genetic basis of ear rot resistance in maize and lay a basis for marker-assisted selection for the resistance species.

Key words [Maize \(*Zea mays* L.\)](#) [Ear rot](#) [SSR](#) [AFLP](#) [QTL mapping](#)

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