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大豆抗胞囊线虫4号生理小种新品系SSR标记分析

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1 国家农作物基因资源与遗传改良重大科学工程 / 中国农业科学院作物科学研究所 / 农业部作物种质资源与生物 技术重点开放实验室, 北京100081; 2 河南省农业科学院棉花油料作物研究所, 河南郑州450002 摘要:

培育抗病品种是大豆胞囊线虫(Soybean Cyst Nematode, SCN)病经济、有效的防治方法。利用130个SSR标记对 26份抗SCN 4号生理小种(SCN 4)新品系和15份感病品系进行基因型分析,旨在明确抗病品系与SCN 4抗性相关联 的SSR标记, 提出抗性基因分子标记鉴定方法, 以提高抗病品系在育种中的利用效率。研究表明, Hartwig与晋品系 亲本具有不同的SCN 4抗病基因, 其遗传相似系数为0.362。与抗性显著关联的22个SSR位点分布在11个连锁群 (LG), 推测LG D1b上分布的SSR标记附近存在1个新的SCN 4抗病基因; 而Satt684、Sat 230、Sat 222、 Satt615和Satt231位点,来自亲本Hartwig等位基因与抗病相关联,而来自晋品系的等位基因与感病相关联,在 Sat_400、Satt329和Satt557等其他17个SSR位点,来自Hartwig等位基因与感病相关联,来自晋品系亲本的等位 基因与抗病相关联。利用非连锁不平衡SSR标记Satt684和Sat_400可对供试品系进行有效的抗性辅助选择。 关键词: 大豆 品系 胞囊线虫 抗性 SSR

SSR Analysis of New Developed Soybean Lines Resistant to Soybean Cyst Nematode (Heterodera glycines Ichinohe) Race 4

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Abstract:

Soybean cyst nematode (SCN, Heterodera glycines) is a seriously destructive pest in soybean production worldwide and causes great yield loss every year. Planting resistant variety is an effective and economical method to decrease its damage. At present we obtained 41 elite soybean lines from the crosses of Hartwig × Jin 1261, Hartwig × Jin 1265 and Hartwig × Jin 1267, and genotyped them with 130 SSR markers from 20 linkage groups of soybean, in order to provide new soybean germplasm as well as molecular markers used in soybean breeding for resistance to SCN. The results suggested that Hartwig and Jin 1261, Jin 1265 or Jin 1267 had different resistance genes to SCN 4, with genetic similarity of 0.362. Twenty-two SSR markers from 11 linkage groups were associated with resistance to SCN 4, and at Satt684, Sat_230, Sat_222, Satt615 and Satt231 loci, the allele from Hartwig was resistant type, while the allele from Jin 1261, Jin 1265 and Jin 1267 was susceptible one, on the contrary at the other 17 SSR loci, the allele from Hartwig was susceptible type, while the allele from Jin 1261, Jin 1265 and Jin 1267 was resistant one. We supposed that Jin strains had at least a new resistance gene on linkage group D1b. We could effectively identify the resistance of these soybean lines to SCN 4 with Satt684 and Sat_400.

Keywords: Soybean Soybean lines Soybean cyst nematode Resistance SSR

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