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利用1RS特异标记和染色体原位杂交技术鉴定小麦1BL • 1RS易位系

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Identification of 1BL • 1RS Wheat-Rye Chromosome Translocations *via* 1RS Specific Molecular Markers and Genomic in *situ* Hybridization

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摘要 以小麦-黑麦1BL • 1RS易位系(Kavkaz、山农030-1)、1AL • 1RS易位系(Amigo)、荆州黑麦、八倍体小黑麦劲松49、1R-7R二体异附加系以及普通小麦中国春、辉县红、铭贤169、Chancellor等为材料，对65个黑麦1RS特异标记进行鉴定，从中筛选出8个稳定的标记，即NOR-1、SECA2/SECA3、SCSS30.2、Sec1Gene、Sec1Pro、ω-Sec-P1/P2、ω-Sec-P3/P4和IB-267，可用于检测1AL • 1RS易位系或1BL • 1RS易位系；另外3个特异标记O-SEC5′-A/O-SEC3′-R、IAG95-1和SCM-9可用于区别1RS来源不同的1AL • 1RS和1BL • 1RS易位系。利用这11个标记和染色体原位杂交技术对40份山东省近年育成小麦品种(系)进行检测，发现潍麦8号、鲁麦14、济宁13、山农664、山农优麦3号和烟农25为1BL • 1RS易位系，而且是1RS的整臂易位系，未检测到1AL • 1RS易位系和其他易位类型。

关键词： 1BL • 1RS易位系 特异性分子标记 基因组原位杂交

Abstract: Sixty-five rye-specific molecular markers were validated with two 1BL • 1RS wheat-rye chromosome translocations (Kavkaz and Shannong 030-1), one 1AL • 1RS wheat-rye chromosome translocation (Amigo), Jingzhouheimai, octoploid Triticale Jinsong 49, 1R-7R addition lines, Chinese Spring, Huixianhong, Mingxian 169, and Chancellor. Eleven markers were selected due to stable amplification, clear PCR products in electrophoresis gels, and good repeatability, of which eight markers, i.e., NOR-1, SECA2/SECA3, SCSS30.2, Sec1Gene, Sec1Pro, ω-Sec-P1/P2, ω-Sec-P3/P4, and IB-267 amplified specific bands associated with 1AL • 1RS and 1BL • 1RS translocations. Another three markers, O-SEC5′-A/O-SEC3′-R, IAG95-1, and SCM-9, were able to discriminate wheat–rye translocations involving different sources of 1RS. Both molecular markers and genomic *in situ* hybridization were used to detect the frequency of 1BL • 1RS translocations in forty Shandong varieties (lines) bred in recent years. Among the forty varieties (lines), only 15% (Weimai 8, Lumai 14, Jining 13, Shannong 664, Shannongyoumai 3, and Yannong 25) harbored the 1BL • 1RS translocation with the whole short arm of chromosome 1R of rye, and no 1AL • 1RS or other translocation types were found.

Keywords: 1BL • 1RS translocations Specific molecular marker Genomic in situ hybridization

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