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研究论文

小麦与无融合生殖披碱草(Elymus rectisetus)属间杂种F1的形态学和细胞遗传学研究

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摘要 Elymus rectisetus(Nees in Lehm) A.Lüve et Connor 是目前小麦族(Triticeae)中发现的唯一的无融合生殖种。本研究以普通小麦(Triticum aestivum L.； 2n＝6x＝42， AABBDD)为母本， 以E.rectisetus(2n＝6x＝42， SSYYWW)为父本进行杂交， 经过幼胚拯救获得了属间杂种F1。 杂种F1分蘖力强， 具有多年生习性， 其形态特征偏向于父本。 杂种F1高度雄性不育， 自交不结实。 对杂种根尖体细胞的细胞学观察发现， 杂种F1体细胞染色体数2n＝9x＝63(SSYYWWABD)， 其中21条来自普通小麦， 42条来自E. rectisetus。 花粉母细胞染色体配对频率为： 22.69 Ⅰ＋16.15rod Ⅱ＋3.01ring Ⅱ＋0.83Ⅲ＋0.01Ⅳ。 小麦白粉病抗性鉴定结果表明， 杂种F1及父本E. rectisetus表现免疫， 而母本Fukuhokomugi高度感染白粉病。 上述杂种的获得为将E. rectisetus无融合生殖基因及抗白粉病基因向小麦中转育奠定了基础。

关键词 无融合生殖 Elymus rectisetus 普通小麦 属间杂交

分类号

Morphology and Cytogenetics of the Intergeneric Hybrid between Triticum aestivum and Apomictic Elymus rectisetus

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Abstract Elymus rectisetus((Nees in Lehm) A Lüve et Connor) is the only apomictic species found in the Triticeae. The intergeneric hybrid between T.aestivum cv. Fukuhokomugi (AABBDD, 2n＝42) and apomictic E.rectisetus accession 1050 was obtained through sexual hybridization followed by embryo rescue technique. The F1 hybrid is vigorous and perennial in growth habit, but completely male sterile. The characters of the F1 hydrid was morphologically intermediate between their parents, but generally resembled the male parent E.rectisetus accession 1050. The F1 hybrid have 63 chromosomes among which 21 come from T.aestivum cv. Fukuhokomugi and 42 from unreduced pollen of E.rectisetus accession 1050. Examination of pollen mother cells at metaphase Ⅰ revealed an average chromosome pairing pattern of 22.69 Ⅰ＋16.15rod Ⅱ＋3.01ring Ⅱ＋0.83Ⅲ＋0.01Ⅳ. It was also found that the F1 hybrid and its male parent E.rectisetus accession 1050 were highly resistant to powdery mildew. Production of the intergeneric hybrid between Triticum aestivum and apomictic Elymus rectisetus will be useful for transfering gene(s) of apomixis and resistance to powdery mildew from E.rectisetus into wheat.

Key words Apomixis Elymus rectisetus Wheat Intergeneric hybrid

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