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普通小麦(Triticum aestivum)和毛穗赖草(Leymus paboanus)的杂交,杂种细胞无性系的建立及植株再生

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摘要 以3个普通小麦品种富可(Fuhuko)、中国春(Chinese Spring)及小偃759和毛穗赖草杂交,发现三个品种都可与毛穗赖草杂交,其中Fuhuko×L.paboanus平均结实率高达17.6%,杂种只有发育不全的幼胚而无胚乳。对杂种幼胚在N_6+1—2mg/11BA+0.5mgGA_3或MS(其中NH_4NO_3含量降低一半)附加1mg/1IBA的培养基上进行保姆培养,部分幼胚发育成完整的小植株,大部分幼胚死亡,并且在MS(1/2NH_4NO_3)培养基上,两个胚(Fuhuko×L.psboanus)形成质量很差的小愈伤组织,对其进行改良培养,建立了两个杂种胚性无性细胞系(一个生长很快,另一个相对较慢)。杂种愈伤组织在附加1mg/1IBA的MS或N_6培养基以及附加(0.5mg NAA+0.5mgKT)/1的MS(1/2NH_4NO_3)分化培养基上均可高频率产生再生植株。同时发现:1.将MS培养基中硝酸铵的含量降低一半,可显著提高植株再生频率;2.降低分化培养基中生长素(如IBA,NAA)的含量,加入少量的细胞激动素(如0.5 mg/1KT)可促使大量胚状体萌发,产生正常植株,使绿苗中90.0%以上的植株来自胚状体发生途径。细胞学观察表明:幼胚直接成苗的杂种植株体细胞染色体数很稳定,2n=63+1B,和预期结果相符;而杂种愈伤组组再生植株染色体数极不稳定,不同株间染色体数不同,即使同一根尖中不同的细胞染色体数也有很大差异,造成这种变异的原因还不清楚。

关键词 小麦,毛穗赖草,杂种,愈伤组织,植株再生

分类号

Hybridization of Triticum aestivum with Leymus paboanus the Establishment of Somatic Callus Clones of the Hybrid Embryos and Plant Regeneration

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Abstract Three bread wheat varieties, Fuhuko, Chinese Spring and Xiaoyan 759, were,crossed with L. paboanus. The results indicated that all of the 3 wheat varieties werecrossible with L. paboanus, with Fuhuko/L. paboanus having the highest seed set-ting percentage, 17.6%. The seed, however, had only underdeveloped embryos andno endospermum. The immature hybrid embryos were put under nursing culture onN6 medium+ 1mg /l IBA+0.5 mg /l GA, or MS mediurn with the amount ofNH_4NO_3 reduced to one half of the original. Most of the immature embryos died,but some of them developed into plantlets directly. And 2 immature embryos of thecross Fuhuko/L. paboanus on the second medium produced poorly developed calli.These were than subcultured on modified media, and finally, 2 different somaticembryogenic callus clones, one grew rapidly while the other relatively slowly wereestablished. The calli of both clones could produced high percentage of regeneratedplantlets on differentiation media MS or N_6 enriched with 1 mg /l IBA as well

Key words Triticum aestivum Leymus paboanus Hybrid Calli Plant regenetation

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