作物学报 2004 30 (9): 855-860 ISSN: 0496-3490 CN: 11-1809/S

研究论文

小麦（Triticum aestivum L.）品种的组培特性和转基因受体选择

吉前华,任正隆

广东肇庆学院生物系, 广东肇庆526061

收稿日期 2004-2-7 修回日期 2004-5-30 网络版发布日期 接受日期

摘要 本研究分析了西南地区地方品种资源的几个组培特性的变异及优良转基因受体小麦品系选育的可能性。研究指出，小麦幼穗的脱分化能力和愈伤组织再分化能力具有基因型间的广泛变异，农家品种和育成品种中的变异趋势一致。在不同的品种中，半愈期和成愈率分别分布在6～28 d以上和15.85%～100%，半愈期呈现了连续的分布，并在12 d和21 d处形成两个分布高峰。94.81%的品种（系）的愈伤组织能形成根，成根愈率存在基因型间的广泛变异，分布在0～74.29%之间。绝大多数品种（系）的成根愈率分布在10%左右，但个别品系如R1395的成根愈率达70%以上。仅有26.67%的供试品种（系）的愈伤组织能成芽，而且成芽愈率很低。但有的品种（系），如西藏地方品种多花白的成芽愈率达20%以上，是宝贵的基因资源。半愈期和成愈率显示了高度的相关性，相关系数为－0.7229**。半愈期、成根愈率、成芽愈率之间没有检测到显著的相关性，指出它们可能受不同的遗传基础控制。使用组织培养中脱分化能力和再生能力均较好的资源多花白（西藏地方品种）和R1395（育成品系）为杂交亲本，发现其F5株系中，半愈期、成愈率、成根愈率和成芽愈率等性状的变异趋势和地方品种及育成品种一致，但具有优良组织培养特性的株系的频率显著较高，组织培养特性和农艺性状存在一定的正相关。文中讨论了小麦转基因受体的选育策略问题。

关键词 组织培养 转基因植物 小麦育种 资源

分类号 S512

Tissue Culture Response and Selection of Transgenic Receptors in Wheat （Triticum aestivum L.） Cultivars

JI Qiang-Hua1,REN Zheng-Long

Department of Biology, Zhaoqing College, Zhaoqing 526000,Guangdong

Abstract In the study on transferring alien genes into wheat using a transgenic system, the receptor plant is very important for its capability in callus induction and plant regeneration. The present study was conducted to find the good germplasm in wheat breeding for transgenic receptors which should exhibit excellence in tissue culture response and good agronomic characteristics. 75 local genotypes, 83 modern genotypes and 127 F5 families of Duohuabai/R1395 in wheat were analyzed for the days of callusing at 50% (DCH), the rate of callusing in 4 weeks (RCW) in callus induction; and rate of calli of root formation (in %, RCRF) and the rate of calli of shoot formation (in %, RCSF) in differentiation culture. An extensive variation was found in DCH, NCW, RCRF, and RCSF among different wheat genotypes (Table 1). The same trend of variation of these characters was observed in all the genotypes (Fig.1,2,3,4). A high correlation between DCH and RCW was found with the correlation coefficients of —0.7229**, indicating there was same genetic background for DCH and RCW (Table 2). No significant correlation was observed among DCH, RCRF, and RCSF, suggesting that DCH, RCRF and RCSF were controlled by different genetic foundation (Table 2). A moderate correlation was observed between DCH and RCW with some agronomic characteristics, indicating the possibility to develop wheat transgenic receptors with excellent agronomic characteristics (Table 2). Several excellent parents of wheat with high ability in tissue culture response, such as Duohuabai from Tibet, R1395 from advanced lines, were screened from genotypes. A higher frequency of lines with excellent ability in tissue culture response was observed in the F5 family populations of the crosses between Duohuabai and R1395 as well as other wheat parents with excellent agronomic traits (Fig.1,2,3,4). The method of wheat breeding for transgenic receptors was discussed.

Key words Tissue culture Transgenic plants Wheat Genetic resource

DOI:

通讯作者 任正隆 rzhllab@sicau.edu.cn