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研究论文

ABA对水稻愈伤组织、不定胚发育及其植株再生的影响

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摘要 以长期培养的水稻愈伤组织为材料，用不同浓度的ABA对其进行了预处理，从愈伤组织的结构变化、植株再分化率、不定胚和器官分化的形成进行了研究。结果表明：经10 mg/L ABA预处理的愈伤组织外缘部分表现出禾本科类不定胚形成前期的形态结构，10 mg/L ABA预处理不仅能使分化时间缩短一周，而且使植株再生率明显提高，说明ABA对细胞再分化进程有明显的促进作用。

关键词 水稻 ABA 愈伤 再生 不定胚

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Effect of ABA on the Rice Callus and Development of the Somatic Embryo and Plant Regeneration

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Abstract It has been reported that ABA can promote the development of somatic embryo and increase the ratio of regenerated plantlet in rice callus. But, little was reported about the mechanism of ABA on improving the ratio re-differentiation of rice callus so far, and especially about middle-process from re-differentiation cells to regenerate plantlet. Present study indicated that ABA can affect the structure of rice callus and make it compact, color yellow and the granule obvious, but it has not relation to the ratio of callus formation. That the ratio of plantlet re-differentiation declined dramatically has been a general knowledge for the long-time cultured rice callus, and this is one of the main problems for some researchers. Improving the ratio of rice callus to plantlet not only brought along the research of transgenic rice plant, but also had positive roles on related research. In this research, we treated the long-time subcultured rice callus with different concentration of ABA, and observed the structure of callus, the differentiation of somatic embryo and rice organs and investigated the ratio of plantlet regeneration. The result indicated that after the long-time subcultured callus were treated with 10 mg/L ABA, the exterior structure of the callus showed some characters that just similar to that the development prophase of the somatic embryogenesis in graminaceae (Fig.1). And not only the plant regeneration period was shortened about 1 week, but also the percentage of plant regeneration from callus-mass was increased, indicating that ABA can promote differentiation process of cells (Table 1). Also, the ratio of regenerated plants developing from somatic embryo was increased by ABA pretreatment (Table 2). These results suggested that ABA might stimulate the processes of callus differentiation, promote the plant regeneration and the development of somatic embryo, and reduced the shoot organ formation from the callus differentiation.

Key words Rice；ABA；Callus；Regeneration Somatic embryo

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