

玉米花粉体外萌发方法改进及其对花粉介导转基因的作用

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The Improvement of Maize Pollen *In Vitro* Germination Method and Its Role in Pollen-mediated Plant Genetic Transformation

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摘要

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摘要 超声波处理花粉介导植物基因转化方法由山西省农业科学院生物技术研究中心发明, 已被国家知识产权局授予发明专利(专利号 ZL 99121152.9)。在该专利的基础上, 针对玉米(*Zea mays*)花粉取样、保存和处理条件等因素对其体外萌发的影响进行深入研究, 提出了改进玉米花粉体外萌发实验的方法。研究表明, 在不同时期对开花的玉米进行花粉培养时所需蔗糖溶液的浓度不同; 确定了玉米花粉的保存时间、条件及其对超声波处理后花粉萌发率的影响, 以提高该转化方法中花粉的活力, 并进一步验证了该转基因方法的可靠性; 讨论了玉米花粉体外萌发的操作技巧和各因子的参数, 对提高花粉介导植物基因转化效率有一定的参考价值。

关键词: 转基因 体外萌发 花粉 玉米 超声波

Abstract: The technique of pollen-mediated plant genetic transformation assisted by ultrasonication was patented by the Biotechnology Research Center of the Shanxi Academy of Agricultural Sciences. Here, we further investigated the conditions for sampling, storage and treatment of maize (*Zea mays* L.) pollen and effects on *in vitro* germination of pollen with the method. The optimal sucrose concentration for pollen suspension solution differed for maize pollen collected from plants with different flowering time. We determined the storage time and condition of pollen and their effects on pollen germination after ultrasonication. These results would be useful for improving pollen vitality in genetic transformation and verifying the feasibility of this plant transformation technique. We discuss some key steps for conducting *in vitro* germination of maize pollen and related parameters to increase transformation efficiency of pollen-mediated plant genetic transformation.

Keywords: genetic transformation *in vitro* germination pollen maize ultrasonication

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