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培养基、胚龄和激素配比对棉花胚珠离体培养纤维生长发育的影响

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Effect of Medium, Ovule Age, and Hormone Combinations on the Fiber Growth and Development of Cotton Ovule Culture *in vitro*

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摘要

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摘要 为建立适合棉花胚珠离体培养纤维生长发育的实验体系,以中棉所49为材料,比较研究了培养基类型、激素种类和配比、胚龄等因素对棉花胚珠培养纤维生长发育的影响,以及棉花胚珠离体培养的基因型差异。结果表明:BT基本培养基较适合于棉花胚珠离体培养;液体培养和固体培养均能诱导棉花离体胚珠产生纤维,但液体培养效果优于固体培养;开花前后的胚珠均能诱导离体纤维的生长,但以开花当天的胚珠为外植体的效果最好。外源激素对于棉花胚珠离体培养纤维生长是必不可少的,GA₃、IAA、NAA、Ethylene和BR均促进离体培养胚珠纤维的生长,且GA₃效果最好;2种激素配合使用效果优于单一激素处理,其中5.0 μmol·L⁻¹ IAA+5.0 μmol·L⁻¹ GA₃激素配比效果最佳。棉花胚珠离体培养的纤维生长发育存在显著的基因型差异,不同棉花基因型的最适激素种类及配比具有一定的差异。

关键词: 棉花 纤维生长 胚珠培养 激素

Abstract: In order to establish a suitable system for fiber growth and development during cotton ovule culture *in vitro*, effects of medium types, hormones and hormone combinations, ovule age etc. were studied, using CCRI 49 as material. As well, based on the established experiment system for ovule culture *in vitro*, the genotype effect in ovule culture was studied. The results showed that BT basic medium is the best medium for cotton ovule culture *in vitro*. Liquid culture was better than solid one although both of them could induce the fiber growth and development during the ovule culture. All the ovules sampled before flowering and after flowering can be used as explants in ovule culture, but the best one for fiber growth and development was the ovules sampled at flowering day. Hormone was necessary for fiber growth and development during ovule culture *in vitro*, all the hormones used in the experiment such as GA₃, IAA, NAA, Ethylene, and BR could induce the fiber growth and development, and GA₃ was best one. The effects of hormone combinations on fiber growth during the ovule culture *in vitro* were better than that with single hormone individually, and 5.0 μmol·L⁻¹ IAA+5.0 μmol·L⁻¹ GA₃ was the best one among the hormone combinations used in the experiment. The fiber growth and development during the cotton ovule culture *in vitro* was different significantly among the genotypes used in the experiment, and the best hormone or hormone combination might be different for the different genotypes.

Keywords: cotton fiber growth ovule culture hormone

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