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论文

玉米与摩擦禾、薏苡的杂交不亲和性

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摘要:

采用荧光显微技术,对摩擦禾、薏苡花粉在玉米柱头上的萌发和生长过程进行了观察。摩擦禾花粉粒在玉米柱头上均能萌发,花粉管在柱头中伸长并到达花柱基部,且可将雄配子送入胚囊内,玉米果穗顶端有受精结实痕迹,说明摩擦禾与玉米的杂交障碍不是杂交不亲和,而是胚囊不亲和或杂种衰亡。薏苡花粉粒在玉米柱头也能萌发,花粉管能伸入花柱,但玉米与薏苡杂交生殖隔离较摩擦禾严格,杂交极其困难,杂交障碍为胚囊不亲和或花柱不亲和。玉米与薏苡杂交时,薏苡花粉管能到达玉米花柱基部,而川谷花粉管却在花柱中停止生长,杂交障碍与薏苡种类有关。玉米与薏苡杂交的花粉管异常率高于玉米与摩擦禾杂交花粉管异常率,反映了玉米与摩擦禾的亲缘关系较与薏苡近。

关键词: 花粉管 远缘杂交 杂交障碍 玉米 摩擦禾 薏苡 荧光显微技术

Sexual Incompatibility between Maize and Its Wild Relatives *Tripsacum* L. and *Coix* L.

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Abstract:

Pollens of *Tripsacum* L. could germinate on the stigmas of maize (*Zea mays* L.). After extending in maize style, the pollen tubes reached the top of ovary and released androgamete into embryo sac. But the normal hybrids of maize × *Tripsacum* L. were not obtained because of embryo sac incompatibility or hybrids abortion. Pollens of *Coix* L. could also germinate on the stigmas of maize, and the pollen tubes of *C. lacryma-jobi* L. var. *frumentacea* could reach the base of maize style, but the pollen tubes of *Coix lacryma-jobi* L. stopped growing at maize pistil. This indicated that there was a strict reproductive isolation between maize and *Coix* L. and style or embryo sac incompatibility was the crossing barrier between maize and *Coix* L. The ratio of the abnormal pollen tubes in the cross between maize and *Coix* L. was higher than that between maize and *Tripsacum* L., suggesting that maize has a closer relationship to *Tripsacum* L. than to *Coix* L.

Keywords: Pollen tube Distant crossing Sexual barrier Maize *Tripsacum* L. *Coix* L. Fluorescence microscopy

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