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研究报告

甘蓝型油菜雌性不育突变体*FS-M*$_1$乳突细胞的细胞学观察

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Anatomy of Papilla Cells of a Female Sterile Mutant *FS-M*$_1$ in *Brassica napus*

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摘要 雌性不育突变体*FS-M*$_1$是从甘蓝型油菜(*Brassica napus*)品种宁油10号中发现的。为了从细胞学角度研究*FS-M*$_1$的雌性不育机理, 利用荧光显微镜、扫描和透射电子显微镜观察分析了*FS-M*$_1$柱头乳突细胞的授粉行为和超微结构。结果表明: 花粉粒能在*FS-M*$_1$乳突细胞上附着和萌发形成花粉管, 但花粉管无法穿越柱头乳突细胞; 开花后的*FS-M*$_1$乳突细胞迅速衰退而呈干瘪萎蔫状, 在衰退过程中, *FS-M*$_1$柱头乳突细胞的细胞器数量减少, 细胞液泡化明显, 高尔基体、内质网和线粒体等一些细胞器结构被逐渐破坏。因此, 推测*FS-M*$_1$的雌性不育性是由于柱头乳突细胞发育异常造成的。

关键词: 甘蓝型油菜 雌性不育 细胞器 乳突细胞

Abstract: The female sterile mutant *FS-M*$_1$ was isolated from spontaneous mutation of *Brassica napus* 'Ningyou10'. To understand the cellular mechanism of female sterility, we investigated the pollination response and ultrastructure of *FS-M*$_1$ papilla cells by fluorescence microscope, scanning electron and transmission electron microscopy. Pollen grains could adhere to and germinate to produce pollen tubes on *FS-M*$_1$ papilla cells, but the pollen tubes could not penetrate into papilla cells. *FS-M*$_1$ papilla cells became withered and degenerated quickly after flowering. During the degeneration, the number of organelles was significantly decreased; vacuolization was obvious; some organelles such as dictyosome, endoplasmic reticulum, and mitochondria gradually became misshapen and degenerated. Therefore, female sterility in *FS-M*$_1$ may have resulted from defects in papilla cells.

Keywords: *Brassica napus* female sterility organelle papilla cell

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