

研究论文

# 光敏胞质不育小麦花药发育过程中ATP酶的定位研究

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收稿日期 1999-10-14 修回日期 2000-3-9 网络版发布日期 接受日期

**摘要** 采用磷酸铅沉淀法(酶解育离子为Mg<sup>2+</sup>)研究了不同日照条件下光敏胞质不育小麦花药发育过程中ATPase分布的变化。结果表明:短日照条件下花粉可育,单核早期ATPase主要分布在花粉表面和细胞核中,花粉外壁、质膜及细胞质中有少量的ATPase分布;随着花粉的发育,其表面、外壁、内壁、质膜及细胞质内ATPase进一步增多;花粉即将成熟时,花粉表面、外壁内、营养核、精子细胞质及核内有大量ATPase分布,但花粉细胞质仅观察到线粒体中有少量ATPase分布。药壁细胞及细胞间隙内均有ATPase的分布,其分布位置和数量随花粉的发育而变化。药隔细胞内ATPase随花粉的发育数量逐渐增多,分布位置发生变化。长日照条件下花粉败育发生在单核之前或花粉即将成熟时,其ATPase的分布与可育花药相比存在一定的差异。根据ATPase的分布特点认为早期花粉败育与物质和能量代谢有关;后期花粉败育与物质和能量代谢无直接的关系。

**关键词** [光敏胞质不育](#) [小麦](#) [花药发育](#) [光周期](#) [ATPase](#) [细胞化学](#)

分类号

## Ultrastructural Localization of ATPase Activity in Anther of Photoperiod-sensitive Cytoplasmic Male-sterile Wheat

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**Abstract** Lead phosphate was used to locate ATPase in fertile and sterile anthers of photoperiod-sensitive cytoplasmic male-sterile wheat (*Triticum aestivum* L.). The quantity and distribution of ATPase in pollen changed during the pollen development and were different between fertile and sterile anthers under different daylight exposure. The anthers were fertile under short daylight exposure. ATPase mainly distributed on the surface and nucleus of preinucleate pollen while little ATPase appeared in exine, cytoplasm and on plasmalemma at the same stage. ATPase distributed on the surface of pollen, plasmalemma, in exine and cytoplasm gradually increased with the pollen development. When the pollen was about to mature, there was little ATPase distribution on the cytoplasm of trinucleate pollen in which abundant starch grains accumulated, but abundant ATPase located on the surface of pollen, in exine, vegetative nucleus and sperm cells. The quantity and distribution of ATPase in the cells of anther including anther wall and connective tissue changed, which correlated with the pollen development. The anthers were sterile under long daylight exposure. The ATPase distributed in sterile anthers was different in comparison with the fertile anthers, showing that the lack of substance and energy resulted in the early pollen abortion but was not the direct reason for the late abortive pollen.

**Key words** [Photoperiod-sensitive cytoplasmic male-sterility](#); [Triticum aestivum L.](#); [Anther development](#) [Photoperiod](#) [ATPase](#) [Cytology](#)

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