

研究论文

棉花 (*Gossypium hirsutum* L.) 花粉壁的发育

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摘要 用光镜和透射电镜观察研究了棉花花粉壁的发育过程。棉花花粉壁的发生始于四分孢子时期, 四分体形成后, 在小孢子的质膜与胼胝质壁之间逐渐形成多糖性质的原外壁。游离小孢子时期, 在一定间隔的原外壁中小孢子质膜表面积累外壁物质并形成基粒棒, 之后在基粒棒的下部和上部分别横向延展并接合形成基足层和覆盖层。花粉内壁发生时期较晚, 大约在大液泡形成之前。但内层和外层花粉壁均在小孢子有丝分裂之前同时建成。构建花粉壁的特质主要来自绒毡层的周原质团和小孢子原生质体的代谢分泌。小孢子胞质中在四分体时期形成的巨型内质网复合体是较为特殊的细胞结构, 在游离小孢子时期, 巨型内质网不断产生大量的内含微粒物的运输小泡, 这种小囊泡表现出向质膜趋向运动并进一步与质膜融合。推测由内质网复合体产生的这些小囊泡是小孢子原生质体向质膜外运输花粉壁构建物质的主要形式。

关键词 [棉花](#), [小孢子](#), [花粉壁](#), [内质网](#)

分类号

Pollen Wall Development in *Gossypium hirsutum* L.

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Abstract The characteristics of the pollen wall development in cotton (*Gossypium hirsutum*) are examined with light and electron microscopy. The result revealed that the construction of pollen wall was initiated in the microspore tetrad stage. By the time of late microspore tetrad stage, a thin, nearly uniform, primexine formed around each microspore beneath the intact callose special wall. The primexine consisted of a tenuous matrix component identified tentatively as polysaccharide. On release from the tetrad, the primexine walls around each free microspores were gradually traversed by radially directed rods, the bacula. The distribution of the bacula and the interconnections they formed above and below the loose matrix material, the primexine, became the basis of the final exine pattern. The polysaccharide matrix of the primexine was dispersed or/and probably partly digested during the early development stages of microspore. The exine layers grew in thickness and complexity from the materials of both the tapetum and the microspore during microspore development. The initiation of intine was much later than that of exine, except at the aperture region, its formation was finished during the late period of microspore development before the microspore mitosis, almost simultaneously with the formation of exine. The large stacked RER complex formed in the microspore is a novel structure. The preferential location and active vesicle formation of the RER complex might indicate that the special structure play a important role in supplying raw materials for the building of both the exine and intine of pollen.

Key words [Gossypium hirsutum L.](#) [Microspore](#) [Pollen wall](#) [Endoplasmic reticulum](#)

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