

**CHAPTER 5:**  
**A null mutation in the first enzyme of flavonoid biosynthesis does not affect male fertility in Arabidopsis\***

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**ABSTRACT:**

Flavonoids are a major class of secondary metabolites that serve a multitude of functions in higher plants, including a recently discovered role in male fertility. Surprisingly, Arabidopsis plants deficient in flavonoid biosynthesis appear to be fully fertile. Using RNA gel blot analysis and polymerase chain reaction-based assays, we have been able to show that a mutation at the 3' splice acceptor site in the Arabidopsis chalcone synthase gene completely disrupts synthesis of the active form of the enzyme. We also confirmed that this enzyme, which catalyzes the first step of flavonoid biosynthesis, is encoded by a single-copy gene. HPLC analysis of whole flowers and stamens was used to show that plants homozygous for the splice site mutation are completely devoid of flavonoids. This work provides compelling evidence that despite the high levels of these compounds in the pollen of most plant species, flavonoids are not universally required for fertility. The role of flavonoids in plant reproduction may therefore offer an example of convergent functional evolution in secondary metabolism.