

Table 1 Characteristics of tobacco anther development

Stage	Bud length (mm)	Morphological characteristics	Major events
1	8	Anthers and stigmas are green and fully differentiated	Microspores, split differentiation
2	11	The calyx opens slightly at the top of the bud	Microspore isolation
3	16	The calyx opens completely at the top of the bud	The tapetum layer shrinks and degenerates, and pollen grains formation
4	22	Corolla tube protrudes from the top of the calyx	Microspore nuclear separation
5	28	Corolla tube higher than calyx, petals closed	Degenerate connective tissue appear in the crack
6	39	Corolla elongated, petals green	Interrupted connective tissue evolved the pollen sac
7	43	The corolla tube swells and the top of the petals starts to turn pink	Connective tissue continues to degenerate, pollen evolved duonucleus
8	47	The corolla tube is half open, you can see the stigma and anthers	The pollen sac of the double ovary is full of mature pollen grains