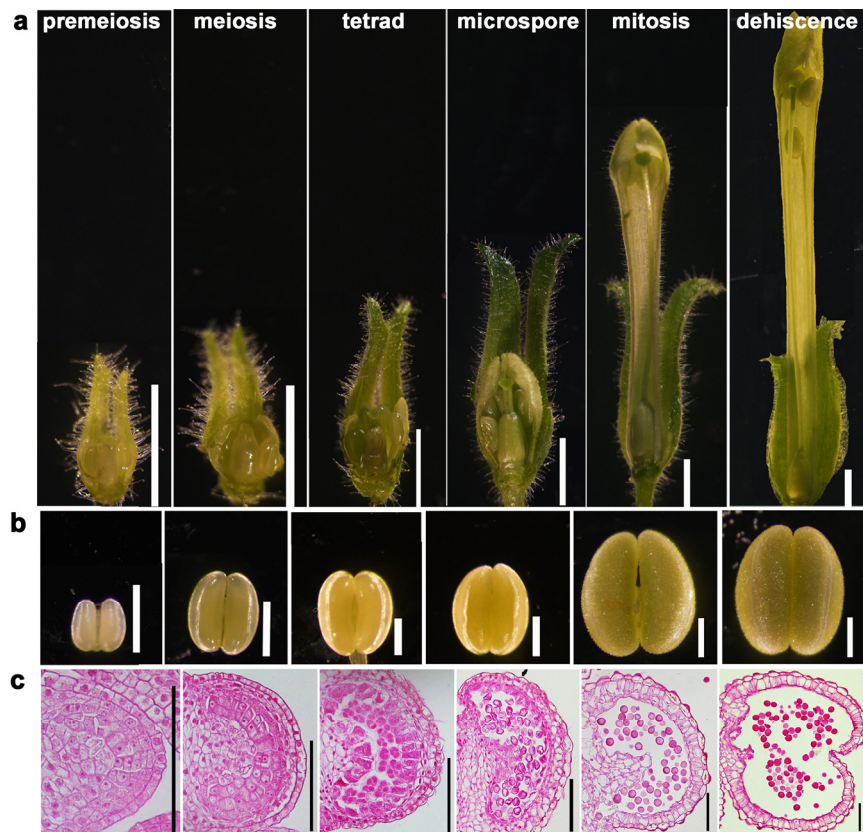
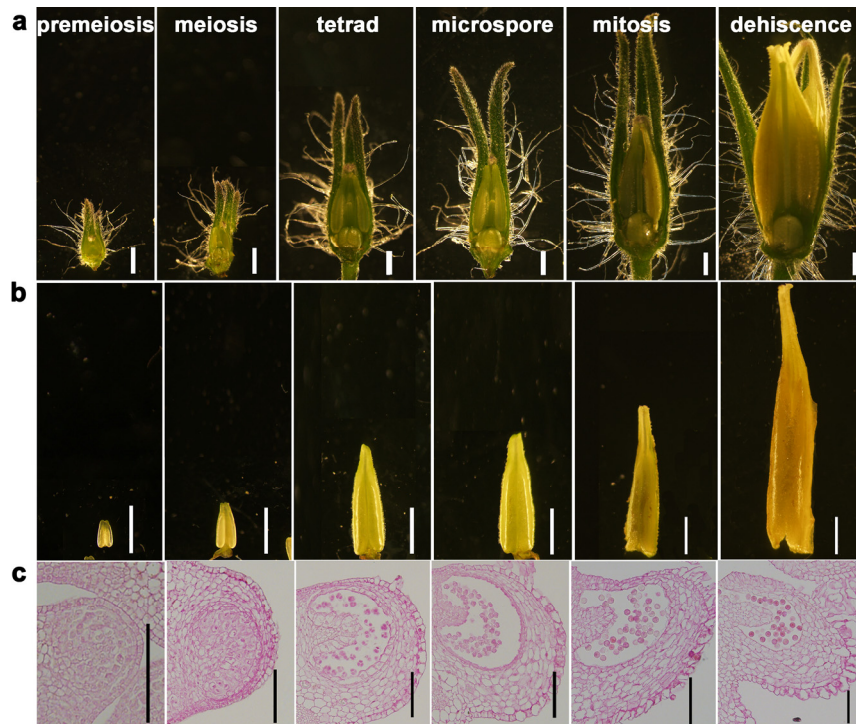




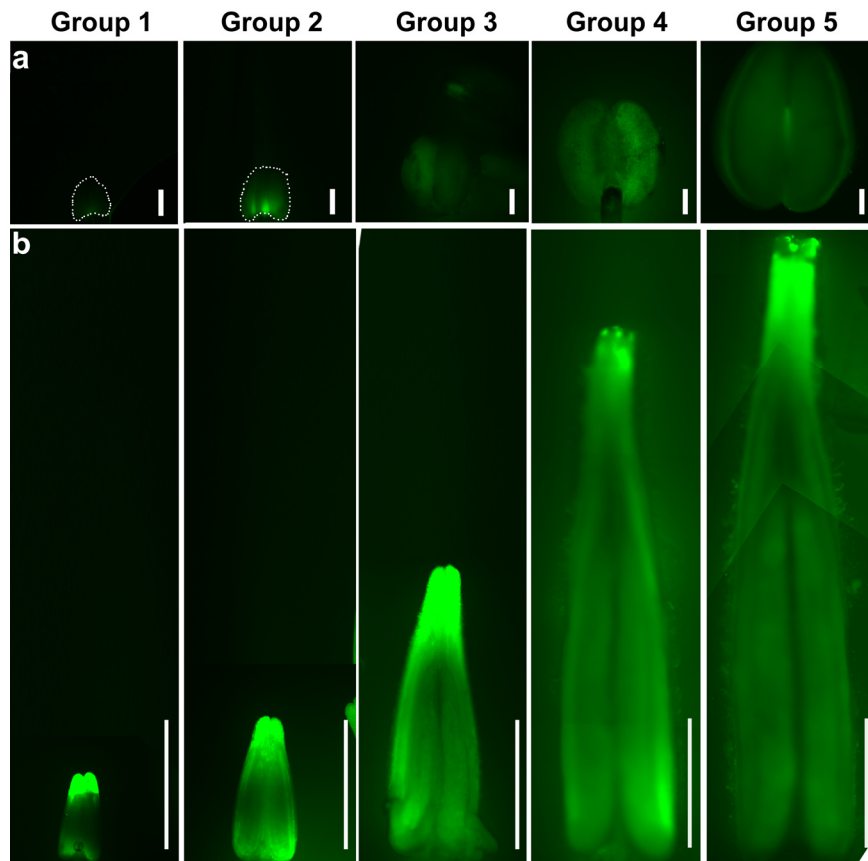
Supplemental Figure 1. Staging of tobacco anther development.

(a) Representative floral buds with exposed inner whorls at various developmental stages. (b) Representative anthers at various developmental stages. (c) Transverse sections of anthers at the stage of premeiosis, meiosis, tetrad, microspore, mitosis, or dehiscence. Bars, 2 mm for (a), 500 μm for (b), and 100 μm for (c).



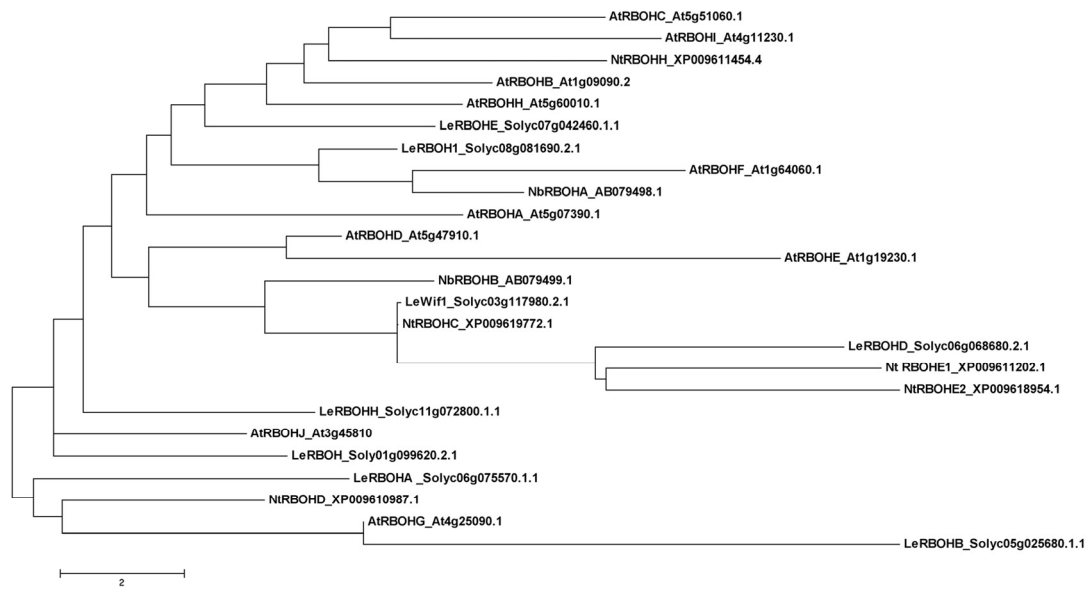
Supplemental Figure 2. Staging of tomato anther development.

(a) Representative floral buds with exposed inner whorls at various developmental stages. (b) Representative anthers at various developmental stages. (c) Transverse sections of anthers at the stage of premeiosis, meiosis, tetrad, microspore, mitosis, or dehiscence. Bars, 1 mm for (a, b), and 100 μ m for (c).



Supplemental Figure 3. Temporal ROS levels during anther development in tobacco and tomato by H₂DCF-DA staining.

(a-b) Representative H₂DCF-DA staining of tobacco (a) or tomato (b) anthers during development. In total 20-25 anthers at each development stage from three independent batches of plants were analyzed and similar results were obtained. Bars, 200 μ m for (a), 1000 μ m for (b).



Supplemental Figure 4. Phylogenetic analysis between Arabidopsis, tobacco and tomato RBOHs. The tobacco, tomato and Arabidopsis protein sequence analysis used MEGA software. Arabidopsis protein sequence number obtained from tair website, tobacco protein sequence obtained from NCBI data, tomato protein sequence obtained from tomato website. Sequence data from this article can be found in the GenBank databases under the following accession numbers: At5g07390 for *AtRBOHA*; At1g09090 for *AtRBOHB*; At5g51060 for *AtRBOHC*; At5g47910 for *AtRBOHD*; At1g19230 for *AtRBOHE*; At1g64060 for *AtRBOHF*; At4g25090 for *AtRBOHG*; At5g60010 for *AtRBOHH*; At4g11230 for *AtRBOHI*; At3g45810 for *AtRBOHJ*; AB079498.1 for *NtRBOHA*; AB079499.1 for *NtRBOHB*; XP009619772.1 for *NtRBOHC*; XP009610987.1 for *NtRBOHD*; XP009611202.1 for *NtRBOHE1*; XP009618954.1 for *NtRBOHE2*; XP009611454.4 for *NtRBOHH*; Solyc06g075570.1.1 for *LeRBOHA*; Solyc05g025680.1.1 for *LeRBOHB*; Solyc06g068680.2.1 for *LeRBOHD*; Solyc07g042460.1.1 for *LeRBOHE*; Solyc11g072800.1.1 for *LeRBOHH*; Solyc08g081690.2.1 for *LeRBOH1*; Solyc01g099620.1 for *LeRBOH*; and Solyc03g117980.2.1 for *LeWif1*.

Supplementary Table 1. Sizing and major events during tobacco or tomato anther development.

Stage	Bud length (mm) ^{a,1}	Anther length (mm) ^{a,1}	Bud length (mm) ^{b,1}	Anther length (mm) ^{b,1}	Event ^c
5	2-2.5	0.25-0.4	2.4-3.5	0.55-1	Premeiosis
6	2.5-5.5	0.4-0.7	3.5-5.5	1.0-2.0	Meiosis
7	5.5-6.5	0.7-0.85	5.5-7	2.0-3.0	Tetrad
8-9	6.5-10	0.85-1.35	7.0-10	3.0-4.5	Microspore
11	10.0-15	1.35-1.5	10.0-11	4.5-5.5	Mitosis
12-13	>15	>1.5	>11	>5.5	Dehiscence

¹ Mean of 20 anthers from five plants.

^a Tobacco

^b Tomato

^c Based on semi-thin transverse anther sections.

Supplementary Table 2. Oligos used in real-time PCRs.

Gene symbol	No. Oligos	Primer sequences (5'-3')
<i>LeACTIN</i>	ZP4402	GGAACCTGAGAAGGAGCCTAAG
	ZP4403	CAACACCAACAGCAACAGTCT
<i>LeRBOHA</i>	ZP4129	CTCCTTCACATTGGCTACAC
	ZP4130	GAGGATGTAGACGAGGACCAG
<i>LeRBOHB</i>	ZP4131	CAGTGCCCAACAATATCCTC
	ZP4132	TCCTGGTGCTGATGTTATAG
<i>LeRBOHD</i>	ZP2948	AAACCAAACAGATAACAACC
	ZP2949	AACAATACAAAACCCAACTA
<i>LeRBOHE</i>	ZP2938	GAGGAATGAATGTACCACTACAC
	ZP2939	GAGATCCCAAAGGACAAATA
<i>LeRBOHH</i>	ZP2944	AAGGTTCAATTTCTTCCCATTTC
	ZP2945	GGTCATGGTATCAGTTTCAACAC
<i>LeRBOH</i>	ZP2946	CACAAGGTCTAGTTGGAGAACT
	ZP2947	CCATAGTAATTGGAGTCAAGCTC
<i>LeRBOH1</i>	ZP2942	GCTAAAGAACTCAGCCAACT
	ZP4135	AGATGTGTGTACCGTTGATGC
<i>LeWIF1</i>	ZP4133	GGCACCGGCACTAACGAA
	ZP4134	CAACTTAGTGTCCGTGGCAG
<i>NbACTIN</i>	ZP3097	ATGGAAACATTGTGCTCAGTG
	ZP2999	GGTGCTGAGAGAAGCCAAG
<i>NbRBOHA</i>	ZP4136	CTTGCTCGTCAACATCGTG
	ZP4137	GGAGAAATCTTGTGAGAGC
<i>NbRBOHB</i>	ZP4138	TAATACAAGGAGGGCATATT
	ZP4139	GCAGAACGAGCATCACCT
<i>NbRBOHC</i>	ZP3075	GTGATGACGTGGAAGATCCC
	ZP4145	CCAGTAGGAATTGGGCGTT
<i>NbRBOHD</i>	ZP3079	CAGCTCATCATGCTCTCAAAG
	ZP4146	ATTCCTTAGATTCCCTATTCAT
<i>NbRBOHE1</i>	ZP3096	TTTGTACTCGGATTAATGATAATAG
	ZP3072	CTTAGCCAAAGCATTGAACC
<i>NbRBOHE2</i>	ZP3098	AATTTGCCGGAATTCCAGT
	ZP3074	TCGAAGCGCGTCTCAACTTT
<i>NbRBOHH</i>	ZP3077	GCTGAAATAGATAGTGATGTTCC
	ZP4144	CCATTCTTGGGACAACTCC