

Summary of supplementary documents

Supplementary document 1. Individual photos of gel results following the amplification of various genomic regions in *A. dauci* FRA001 and transformed strains.

Supplementary document 2. Mycelial micrographs of *A. dauci* FRA001 and transformed strains.

Supplementary document 3. UV profiles of aldaulactone isolated from the FRA001 and Δ NC strains, alongside that of an aldaulactone standard.

Supplementary document 4. *In planta* pathogenicity test results for FRA001 and the transformed strains on H1-susceptible and I2-partially resistant carrot genotypes.

Supplementary document 5. Conidial micrographs of *A. dauci* FRA001 and transformed strains, attached on the infected carrot leaves.

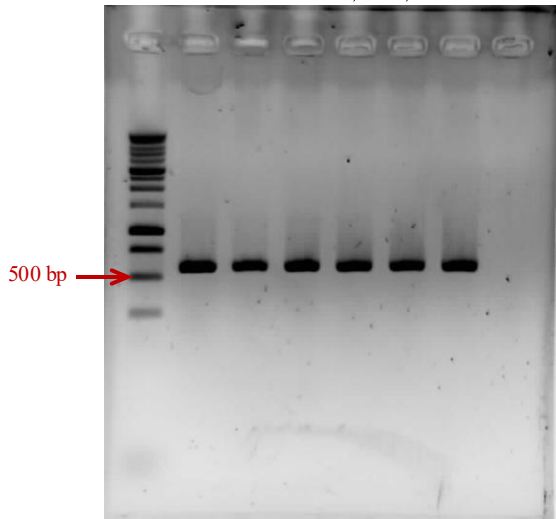
Supplementary document 6. List of primers used in this study to amplify *A. dauci* gDNA.

Supplementary document 7. Detailed PCR programs used in this study.

Supplementary document 1

ITS

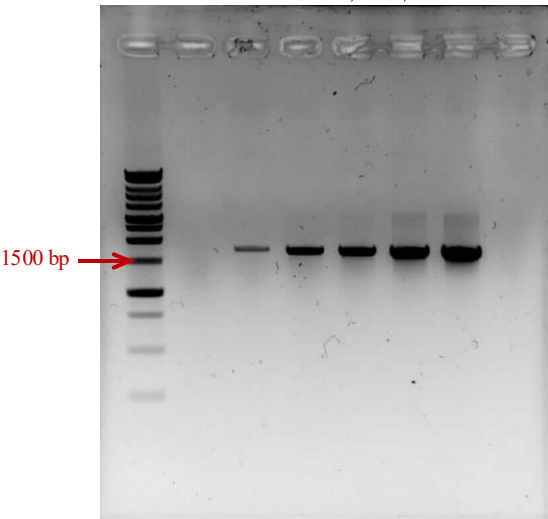
FRA001
AdPKS7 Δ AT
AdPKS7 Δ KS
AdPKS8 Δ AT
AdPKS8 Δ KS
 Δ NC (-)



Amplicon size: 537 bp

Hph

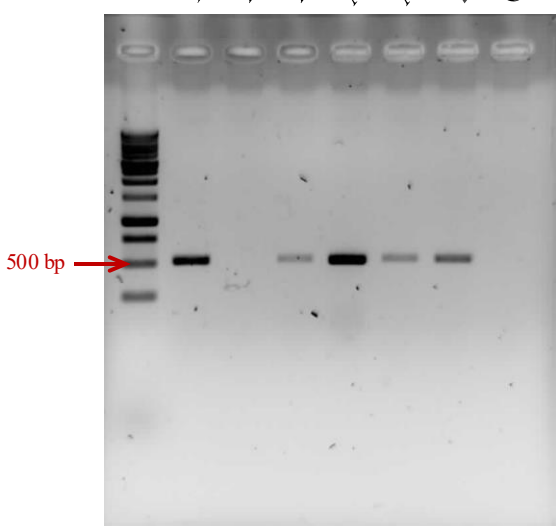
FRA001
AdPKS7 Δ AT
AdPKS7 Δ KS
AdPKS8 Δ AT
AdPKS8 Δ KS
 Δ NC (-)



Amplicon size: 1699 bp

AT domain of *AdPKS7*

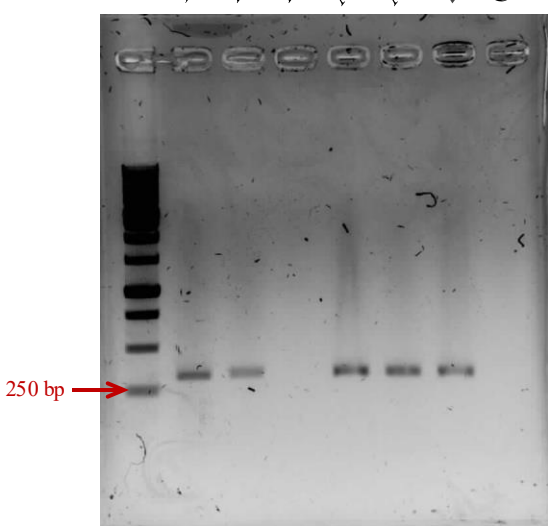
FRA001
AdPKS7 Δ AT
AdPKS7 Δ KS
AdPKS8 Δ AT
AdPKS8 Δ KS
 Δ NC (-)



Amplicon size: 505 bp

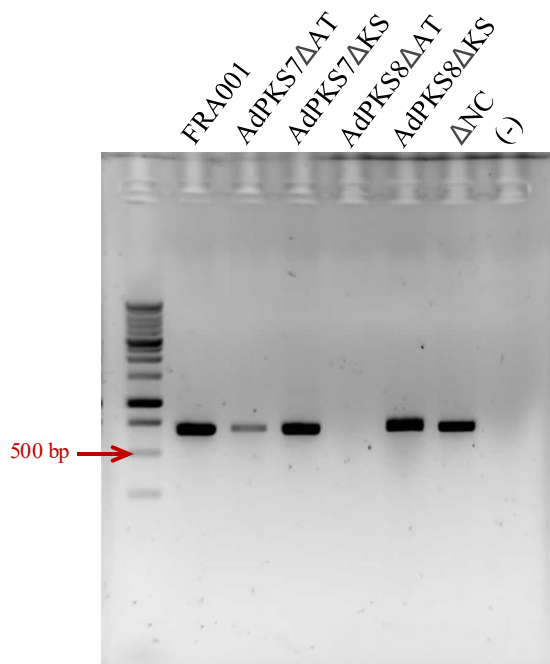
KS domain of *AdPKS7*

FRA001
AdPKS7 Δ AT
AdPKS7 Δ KS
AdPKS8 Δ AT
AdPKS8 Δ KS
 Δ NC (-)



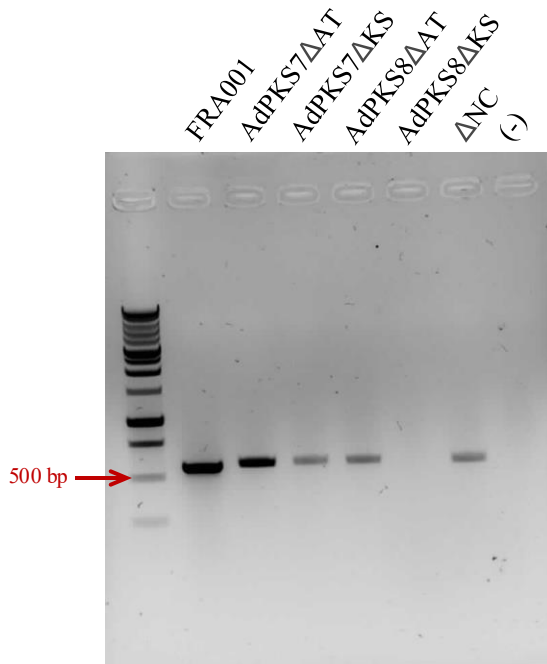
Amplicon size: 318 bp

AT domain of *AdPKS8*



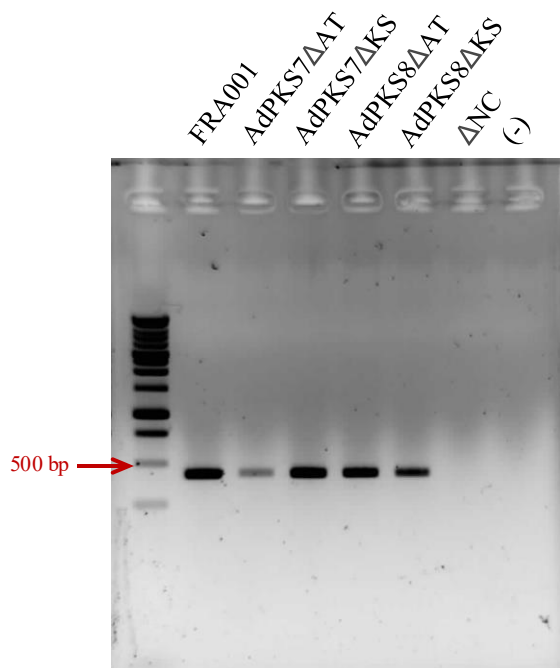
Amplicon size: 685 bp

KS domain of *AdPKS8*



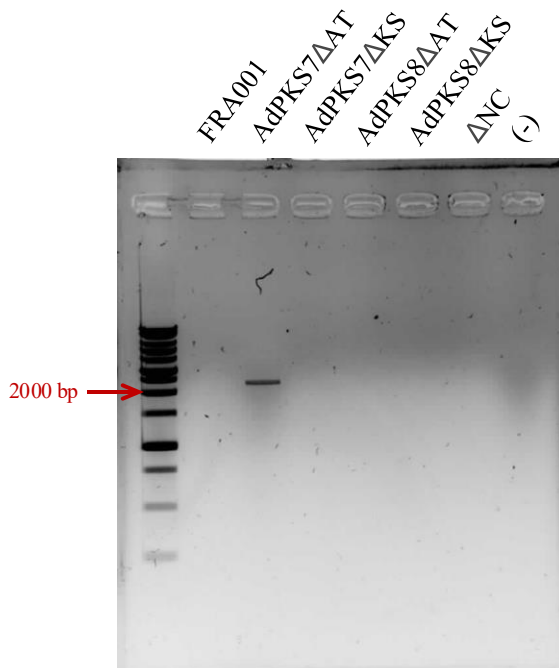
Amplicon size: 553 bp

NC region



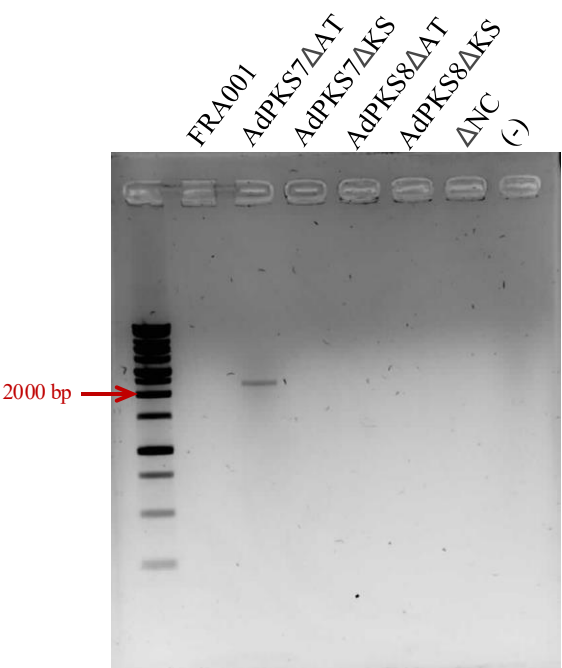
Amplicon size: 419 bp

5' AT of *AdPKS7* and internal of *Hph*



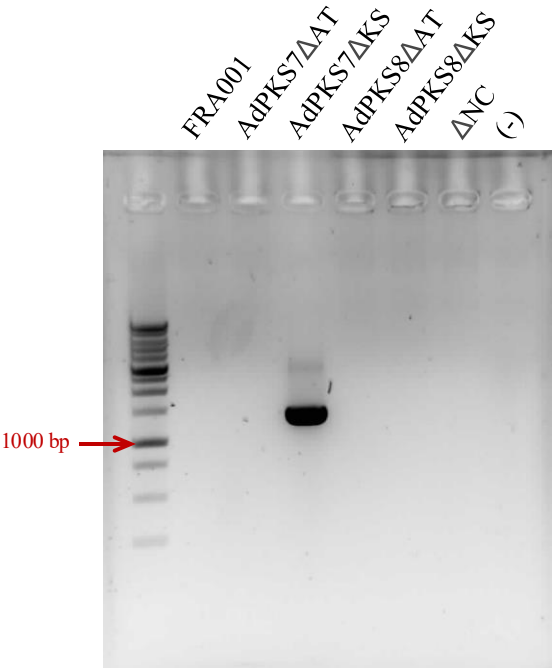
Amplicon size: 2389 bp

3' AT of *AdPKS7* and internal of *Hph*



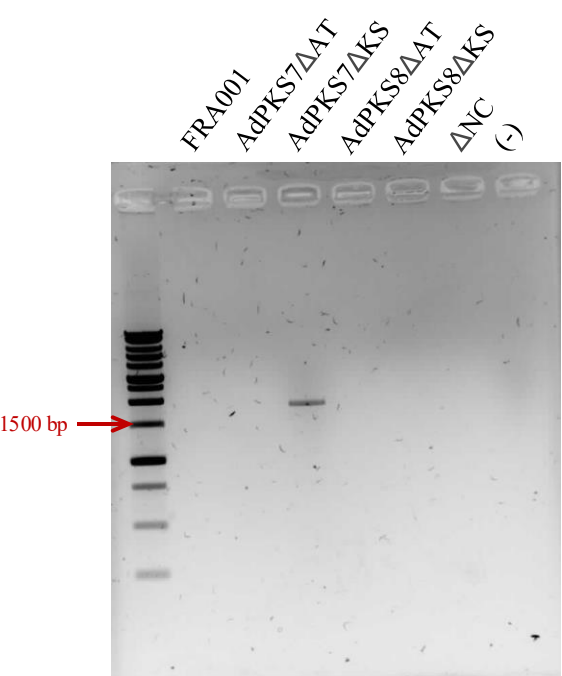
Amplicon size: 2683 bp

5' KS of *AdPKS7* and internal of *Hph*



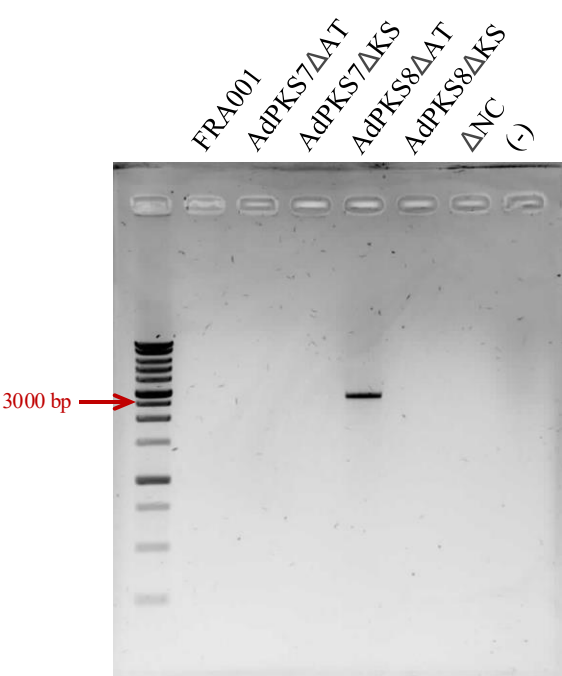
Amplicon size: 1339 bp

3' KS of *AdPKS7* and internal of *Hph*



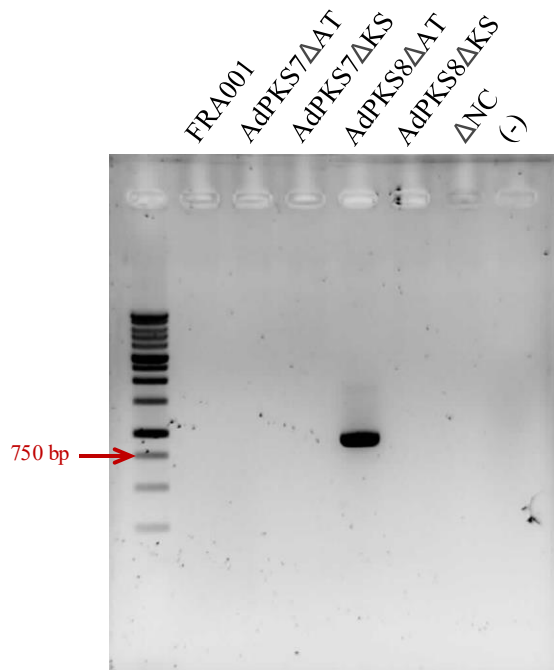
Amplicon size: 1719 bp

5' AT of *AdPKS8* and internal of *Hph*



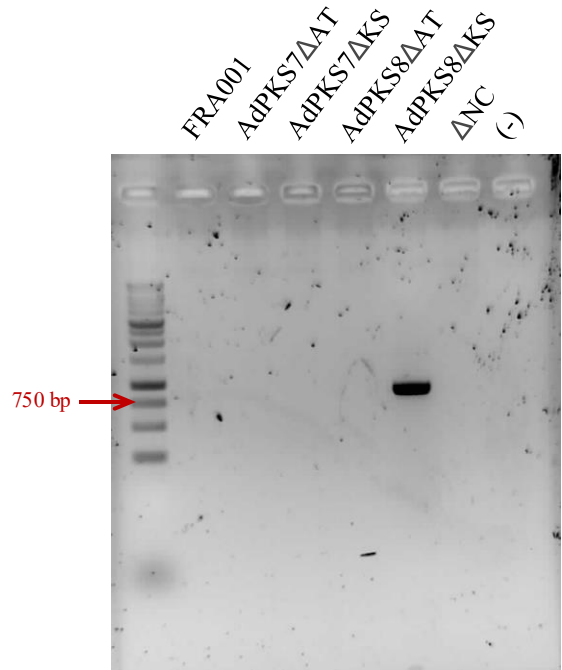
Amplicon size: 3035 bp

3' AT of *AdPKS8* and internal of *Hph*



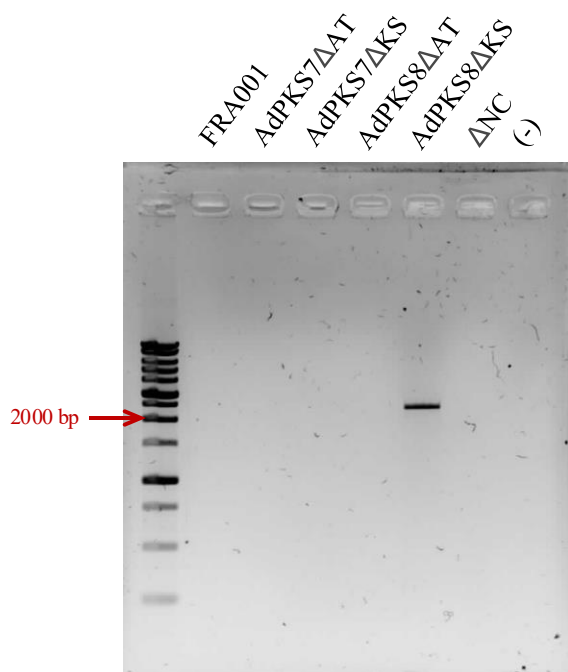
Amplicon size: 854 bp

5' KS of *AdPKS8* and internal of *Hph*



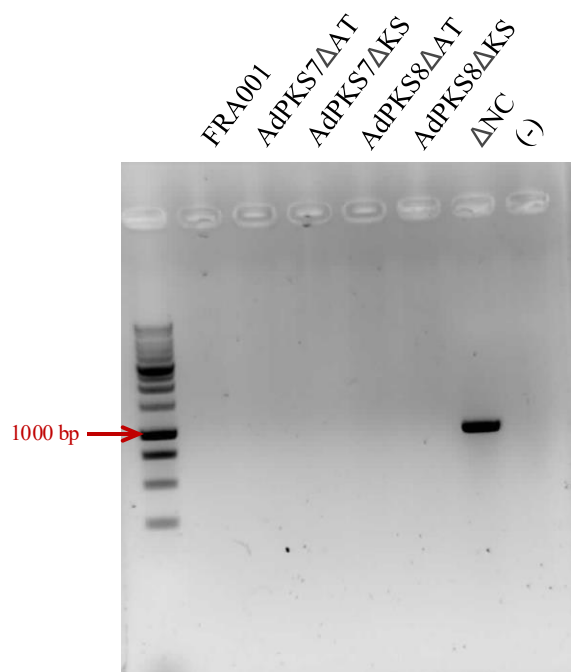
Amplicon size: 823 bp

3' KS of *AdPKS8* and internal of *Hph*



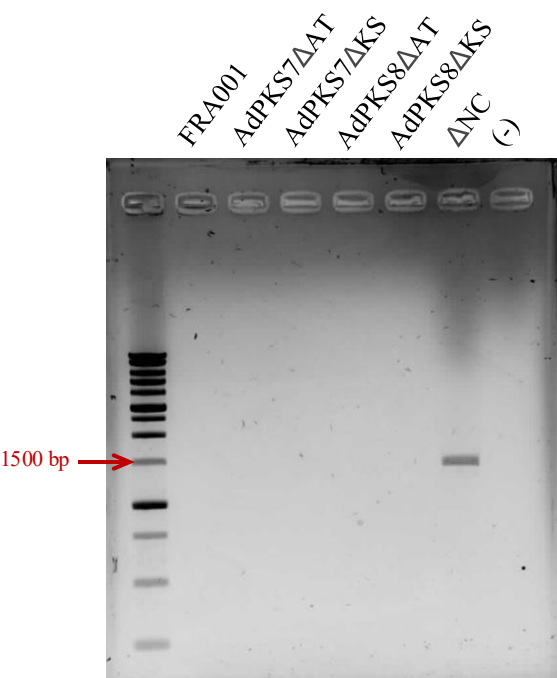
Amplicon size: 2255 bp

5' NC region and internal of *Hph*



Amplicon size: 885 bp

3' NC region and internal of *Hph*

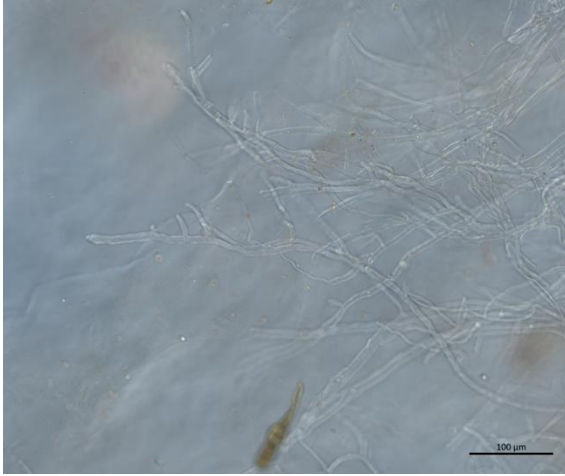


Amplicon size: 1363 bp

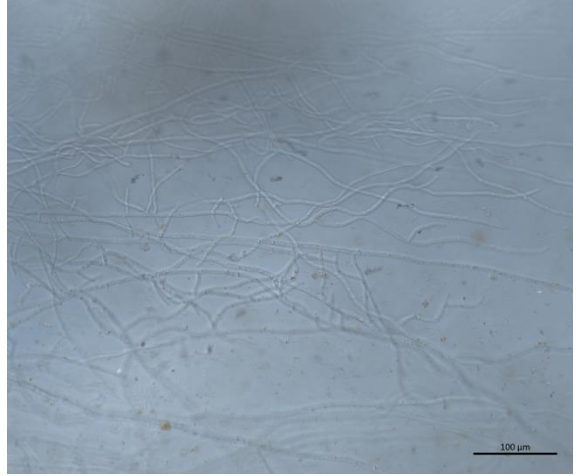
Supplementary document 2

Differential interference contrast (DIC) micrographs of mycelia from the different *A. dauci* strains, captured using a ZEISS Axio Imager microscope. Samples were taken at the edge of the V8 agar cultures. Scale bar = 100 μm .

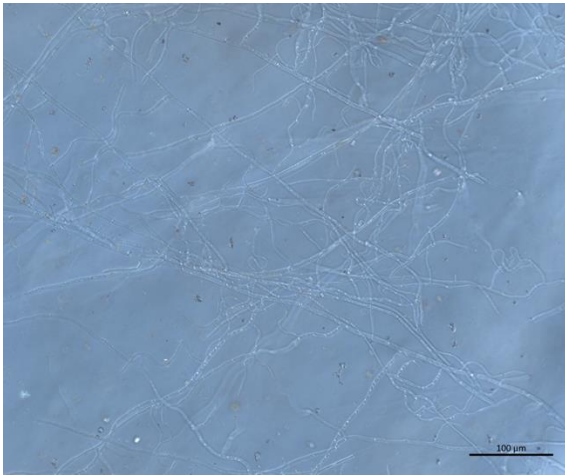
FRA001



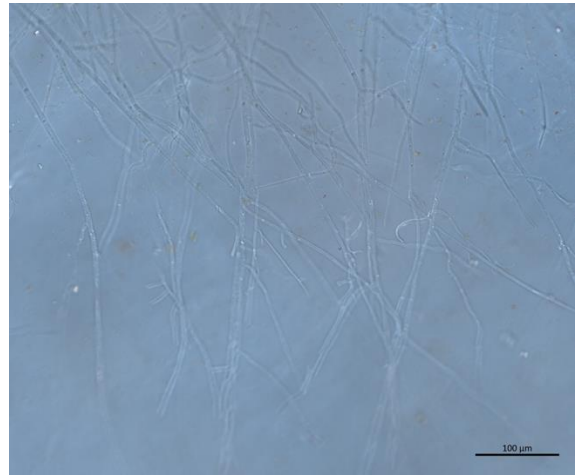
AdPKS7 Δ AT



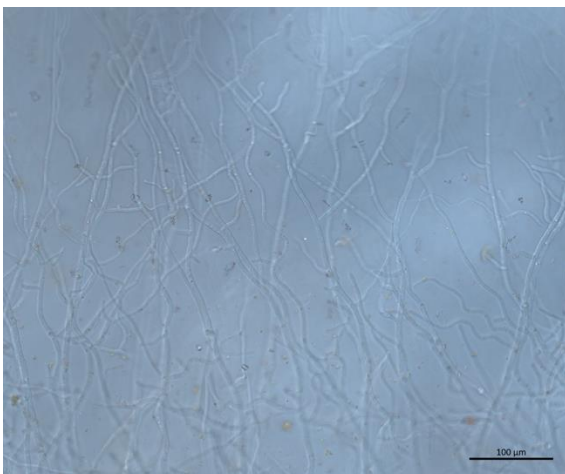
AdPKS7 Δ KS



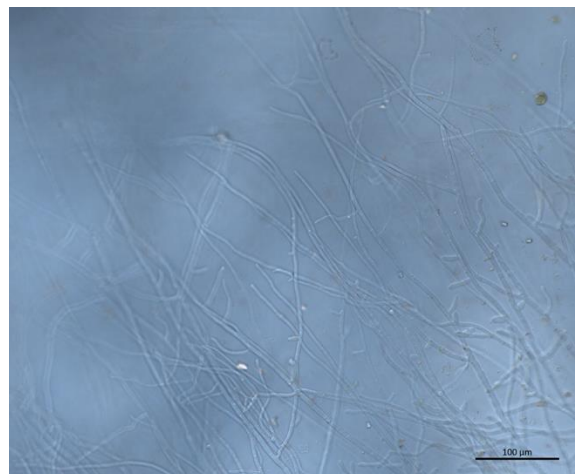
AdPKS8 Δ AT



AdPKS8 Δ KS



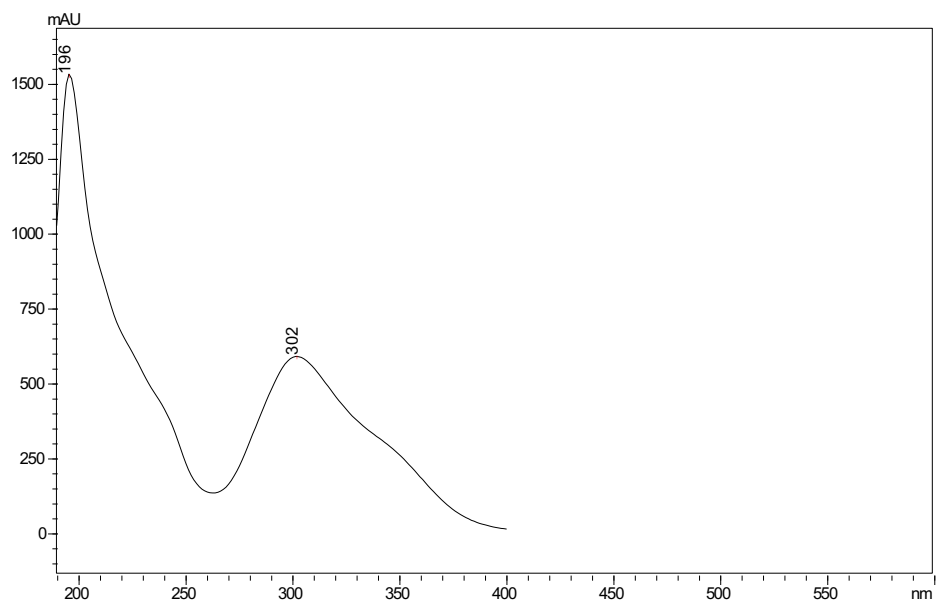
Δ NC



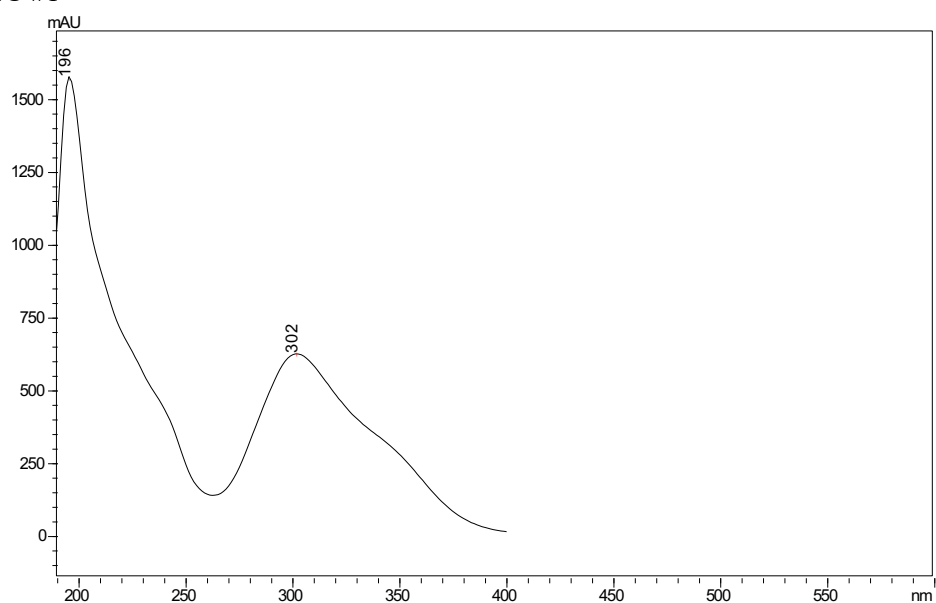
Supplementary document 3

UV profiles of aldaulactone isolated from the peak with the retention time of 18.441 min (for the wild-type FRA001 and Δ NC strains), alongside the UV profile of an aldaulactone standard

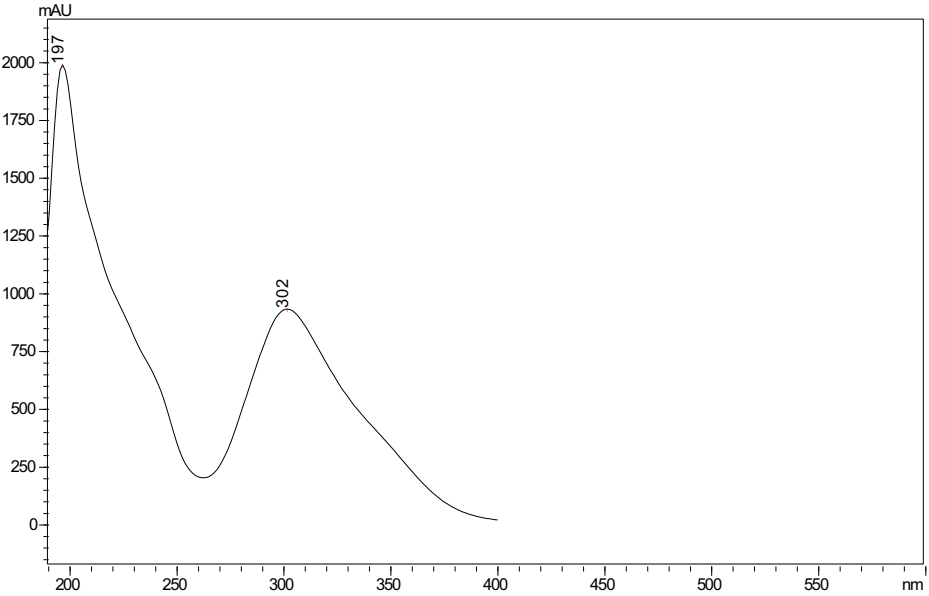
1. FRA001 #1



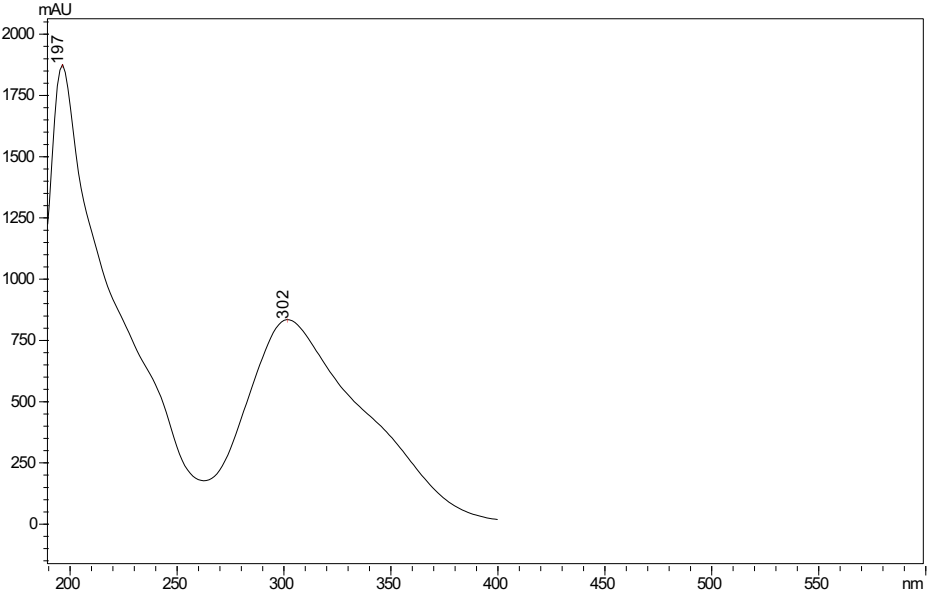
2. Δ NC #1



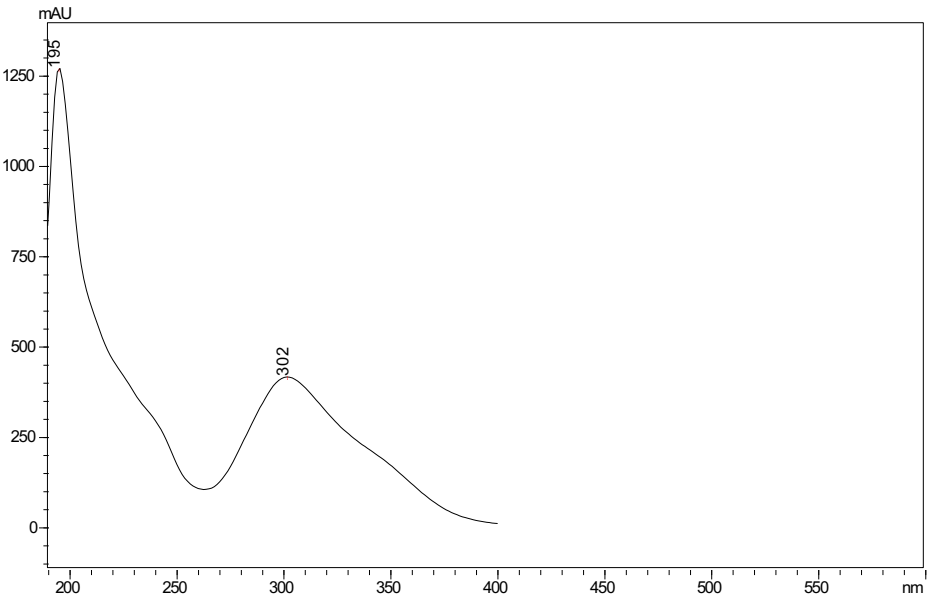
3. FRA001 #2



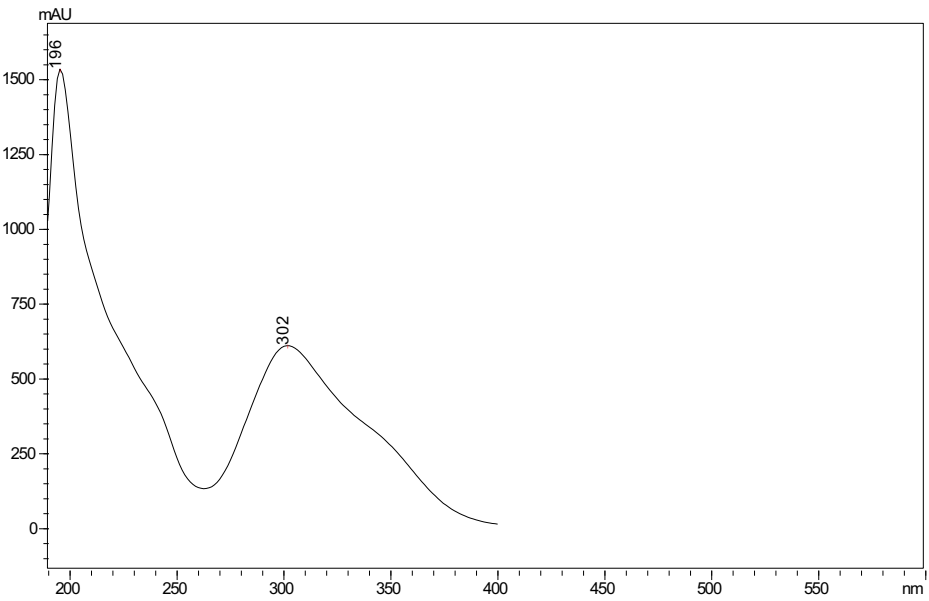
4. ΔNC #2



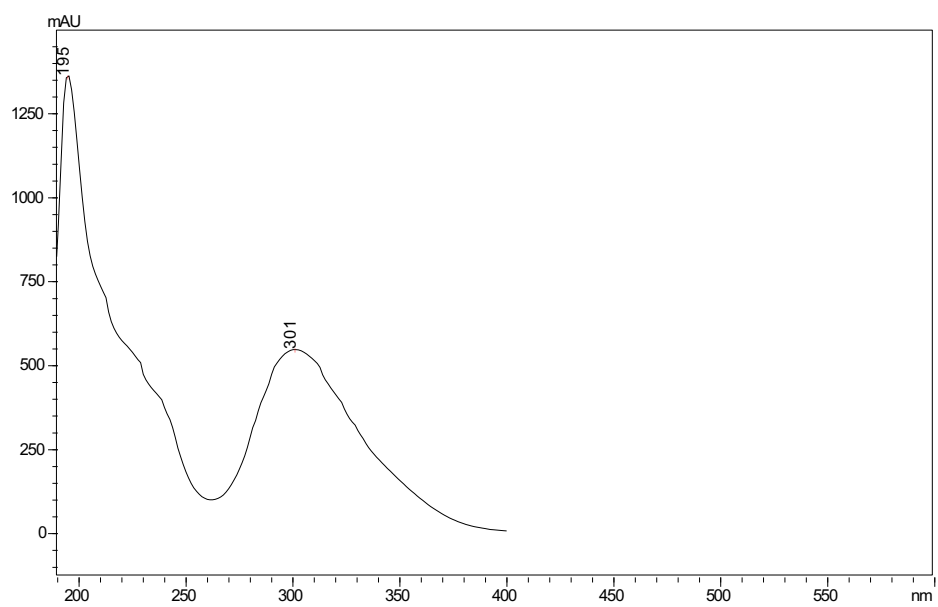
5. FRA001 #3



6. ΔNC #3



7. Aldaulactone standard



Supplementary document 4

In planta pathogenicity test results for FRA001 and the transformed strains on H1-susceptible and I2-partially resistant carrot genotypes.

BiolRep	TRep	Geno	Strain	Nc	d7-Ns	d7-Ns-100c	d11-Ns	d11-Ns-100c	d13-Ns	d13-Ns-100c	AUDPC	LogAUDPC
1	1	H1	FRA001	34	209	615	542	1594	363	1068	7079	3,850
1	2	H1	FRA001	34	351	1032	278	818	489	1438	5956	3,775
1	3	H1	FRA001	34	257	756	500	1471	313	921	6844	3,835
1	1	H1	7DelAT	30	0	0	44	147	60	200	640	2,806
1	2	H1	7DelAT	30	32	107	44	147	24	80	733	2,865
1	3	H1	7DelAT	30	0	0	66	220	108	360	1020	3,009
1	1	H1	7DelKS	30	0	0	38	127	76	253	633	2,802
1	2	H1	7DelKS	30	0	0	22	73	36	120	340	2,531
1	3	H1	7DelKS	30	0	0	44	147	36	120	560	2,748
1	1	H1	8DelAT	28	0	0	NA	NA	NA	NA	NA	NA
1	2	H1	8DelAT	28	17	61	90	321	140	500	1586	3,200
1	3	H1	8DelAT	28	0	0	114	407	74	264	1486	3,172
1	1	H1	8DelKS	20	34	170	32	160	104	520	1340	3,127
1	2	H1	8DelKS	20	32	160	16	80	88	440	1000	3,000
1	3	H1	8DelKS	20	1	5	38	190	77	385	965	2,985
1	1	H1	DelNC	30	340	1133	360	1200	462	1540	7407	3,870
1	2	H1	DelNC	30	608	2027	408	1360	460	1533	9667	3,985
1	3	H1	DelNC	30	426	1420	380	1267	434	1447	8087	3,908
1	1	H1	Mock	0	0	NA	0	NA	0	NA	NA	NA
1	2	H1	Mock	0	0	NA	0	NA	0	NA	NA	NA
1	3	H1	Mock	0	0	NA	0	NA	0	NA	NA	NA
1	1	I2	FRA001	34	161	474	288	847	329	968	4456	3,649
1	2	I2	FRA001	34	226	665	314	924	294	865	4965	3,696
1	3	I2	FRA001	34	128	376	330	971	242	712	4376	3,641
1	1	I2	7DelAT	30	0	0	48	160	63	210	690	2,839
1	2	I2	7DelAT	30	16	53	52	173	62	207	833	2,921
1	3	I2	7DelAT	30	32	107	96	320	75	250	1423	3,153
1	1	I2	7DelKS	30	0	0	22	73	48	160	380	2,580
1	2	I2	7DelKS	30	0	0	66	220	36	120	780	2,892
1	3	I2	7DelKS	30	NA	NA	NA	NA	NA	NA	NA	NA
1	1	I2	8DelAT	28	0	0	48	171	37	132	646	2,811
1	2	I2	8DelAT	28	32	114	4	14	13	46	318	2,502
1	3	I2	8DelAT	28	0	0	4	14	37	132	175	2,243
1	1	I2	8DelKS	20	0	0	22	110	49	245	575	2,760
1	2	I2	8DelKS	20	64	320	176	880	96	480	3760	3,575
1	3	I2	8DelKS	20	80	400	100	500	111	555	2855	3,456
1	1	I2	DelNC	30	394	1313	352	1173	458	1527	7673	3,885
1	2	I2	DelNC	30	264	880	304	1013	354	1180	5980	3,777
1	3	I2	DelNC	30	352	1173	616	2053	342	1140	9647	3,984
1	1	I2	Mock	0	0	NA	0	NA	0	NA	NA	NA
1	2	I2	Mock	0	0	NA	0	NA	0	NA	NA	NA
1	3	I2	Mock	0	0	NA	0	NA	0	NA	NA	NA
2	1	H1	FRA001	34	448	1318	756	2224	442	1300	10606	4,026
2	2	H1	FRA001	34	480	1412	420	1235	354	1041	7571	3,879
2	3	H1	FRA001	34	416	1224	340	1000	378	1112	6559	3,817
2	1	H1	7DelAT	36	112	311	168	467	268	744	2767	3,442
2	2	H1	7DelAT	36	64	178	132	367	108	300	1756	3,244
2	3	H1	7DelAT	36	32	89	88	244	60	167	1078	3,033
2	1	H1	7DelKS	10	0	0	8	80	52	520	760	2,881

BiolRep	TRep	Geno	Strain	Nc	d7-Ns	d7-Ns-100c	d11-Ns	d11-Ns-100c	d13-Ns	d13-Ns-100c	AUDPC	LogAUDPC
2	3	H1	7DelKS	10	16	160	22	220	49	490	1470	3,167
2	1	H1	8DelAT	40	49	123	166	415	185	463	1953	3,291
2	2	H1	8DelAT	40	64	160	228	570	208	520	2550	3,407
2	3	H1	8DelAT	40	32	80	308	770	207	518	2988	3,475
2	1	H1	8DelKS	36	16	44	118	328	123	342	1414	3,150
2	2	H1	8DelKS	36	32	89	198	550	133	369	2197	3,342
2	3	H1	8DelKS	36	64	178	132	367	146	406	1861	3,270
2	1	H1	DelNC	40	152	380	184	460	201	503	2643	3,422
2	2	H1	DelNC	40	112	280	180	450	147	368	2278	3,357
2	3	H1	DelNC	40	241	603	274	685	248	620	3880	3,589
2	1	H1	Mock	0	0	NA	0	NA	0	NA	NA	NA
2	2	H1	Mock	0	0	NA	0	NA	0	NA	NA	NA
2	3	H1	Mock	0	0	NA	0	NA	0	NA	NA	NA
2	1	I2	FRA001	34	352	1035	668	1965	416	1224	9188	3,963
2	2	I2	FRA001	34	196	576	310	912	376	1106	4994	3,698
2	3	I2	FRA001	34	128	376	352	1035	384	1129	4988	3,698
2	1	I2	7DelAT	36	112	311	220	611	0	0	2456	3,390
2	2	I2	7DelAT	36	64	178	118	328	87	242	1581	3,199
2	3	I2	7DelAT	36	32	89	180	500	207	575	2253	3,353
2	1	I2	7DelKS	30	0	0	140	467	98	327	1727	3,237
2	2	I2	7DelKS	30	0	0	24	80	126	420	660	2,820
2	3	I2	7DelKS	30	64	213	48	160	102	340	1247	3,096
2	1	I2	8DelAT	40	32	80	88	220	74	185	1005	3,002
2	2	I2	8DelAT	40	115	288	192	480	256	640	2655	3,424
2	3	I2	8DelAT	40	64	160	52	130	146	365	1075	3,031
2	1	I2	8DelKS	36	48	133	30	83	51	142	658	2,818
2	2	I2	8DelKS	36	32	89	132	367	169	469	1747	3,242
2	3	I2	8DelKS	36	80	222	286	794	205	569	3397	3,531
2	1	I2	DelNC	40	128	320	308	770	168	420	3370	3,528
2	2	I2	DelNC	40	32	80	88	220	60	150	970	2,987
2	3	I2	DelNC	40	16	40	88	220	72	180	920	2,964
2	1	I2	Mock	0	0	NA	0	NA	0	NA	NA	NA
2	2	I2	Mock	0	0	NA	0	NA	0	NA	NA	NA
2	3	I2	Mock	0	0	NA	0	NA	0	NA	NA	NA
3	1	H1	FRA001	14	48	343	66	471	36	257	2357	3,372
3	2	H1	FRA001	14	32	229	88	629	48	343	2686	3,429
3	3	H1	FRA001	14	128	914	198	1414	60	429	6500	3,813
3	1	H1	7DelAT	22	32	145	154	700	122	555	2945	3,469
3	2	H1	7DelAT	22	96	436	162	736	158	718	3800	3,580
3	3	H1	7DelAT	28	66	236	298	1064	345	1232	4896	3,690
3	1	H1	7DelKS	32	65	203	306	956	305	953	4228	3,626
3	2	H1	7DelKS	32	80	250	242	756	228	713	3481	3,542
3	3	H1	7DelKS	32	160	500	280	875	212	663	4288	3,632
3	1	H1	8DelAT	34	176	518	210	618	210	618	3506	3,545
3	2	H1	8DelAT	34	128	376	232	682	198	582	3382	3,529
3	3	H1	8DelAT	34	0	0	110	324	204	600	1571	3,196
3	1	H1	8DelKS	32	96	300	184	575	111	347	2672	3,427
3	2	H1	8DelKS	32	96	300	184	575	174	544	2869	3,458
3	3	H1	8DelKS	32	48	150	250	781	174	544	3188	3,503
3	1	H1	DelNC	38	227	597	548	1442	324	853	6374	3,804
3	2	H1	DelNC	38	224	589	306	805	210	553	4147	3,618
3	3	H1	DelNC	38	80	211	206	542	197	518	2566	3,409
3	1	H1	Mock	0	0	NA	0	NA	0	NA	NA	NA
3	2	H1	Mock	0	0	NA	0	NA	0	NA	NA	NA
3	3	H1	Mock	0	0	NA	0	NA	0	NA	NA	NA

BiolRep	TRep	Geno	Strain	Nc	d7-Ns	d7-Ns-100c	d11-Ns	d11-Ns-100c	d13-Ns	d13-Ns-100c	AUDPC	LogAUDPC
3	2	I2	FRA001	14	0	0	22	157	24	171	643	2,808
3	3	I2	FRA001	14	16	114	22	157	24	171	871	2,940
3	1	I2	7DelAT	22	96	436	96	436	87	395	2577	3,411
3	2	I2	7DelAT	22	48	218	70	318	97	441	1832	3,263
3	3	I2	7DelAT	22	48	218	132	600	180	818	3055	3,485
3	1	I2	7DelKS	12	16	133	66	550	84	700	2617	3,418
3	2	I2	7DelKS	12	177	1475	248	2067	334	2783	11933	4,077
3	3	I2	7DelKS	12	16	133	44	367	36	300	1667	3,222
3	1	I2	8DelAT	34	0	0	70	206	86	253	871	2,940
3	2	I2	8DelAT	34	226	665	192	565	161	474	3497	3,544
3	3	I2	8DelAT	34	128	376	396	1165	218	641	4888	3,689
3	1	I2	8DelKS	16	16	100	22	138	36	225	838	2,923
3	2	I2	8DelKS	16	32	200	48	300	61	381	1681	3,226
3	3	I2	8DelKS	16	32	200	110	688	97	606	3069	3,487
3	1	I2	DelNC	38	145	382	514	1353	223	587	5408	3,733
3	2	I2	DelNC	38	336	884	510	1342	243	639	6434	3,808
3	3	I2	DelNC	38	161	424	378	995	317	834	4666	3,669
3	1	I2	Mock	0	0	NA	0	NA	0	NA	NA	NA
3	2	I2	Mock	0	0	NA	0	NA	0	NA	NA	NA
3	3	I2	Mock	0	0	NA	0	NA	0	NA	NA	NA
4	1	H1	FRA001	34	291	856	462	1359	402	1182	6971	3,843
4	2	H1	FRA001	34	292	859	432	1271	337	991	6521	3,814
4	3	H1	FRA001	34	401	1179	508	1494	370	1088	7929	3,899
4	1	H1	7DelAT	34	82	241	250	735	174	512	3200	3,505
4	2	H1	7DelAT	34	48	141	154	453	96	282	1924	3,284
4	3	H1	7DelAT	34	16	47	92	271	109	321	1226	3,089
4	1	H1	7DelKS	40	49	123	86	215	175	438	1328	3,123
4	2	H1	7DelKS	40	168	420	184	460	258	645	2865	3,457
4	3	H1	7DelKS	40	128	320	236	590	200	500	2910	3,464
4	1	H1	8DelAT	12	16	133	110	917	133	1108	4125	3,615
4	2	H1	8DelAT	12	49	408	166	1383	165	1375	6342	3,802
4	3	H1	8DelAT	12	33	275	52	433	125	1042	2892	3,461
4	1	H1	8DelKS	26	67	258	240	923	198	762	4046	3,607
4	2	H1	8DelKS	26	145	558	368	1415	295	1135	6496	3,813
4	3	H1	8DelKS	26	48	185	74	285	87	335	1558	3,192
4	1	H1	DelNC	30	246	820	314	1047	359	1197	5977	3,776
4	2	H1	DelNC	30	263	877	248	827	343	1143	5377	3,731
4	3	H1	DelNC	30	122	407	148	493	485	1617	3910	3,592
4	1	H1	Mock	0	0	NA	0	NA	0	NA	NA	NA
4	2	H1	Mock	0	0	NA	0	NA	0	NA	NA	NA
4	3	H1	Mock	0	0	NA	0	NA	0	NA	NA	NA
4	1	I2	FRA001	34	353	1038	536	1576	353	1038	7844	3,895
4	2	I2	FRA001	34	226	665	238	700	244	718	4147	3,618
4	3	I2	FRA001	34	112	329	352	1035	194	571	4335	3,637
4	1	I2	7DelAT	34	48	141	110	324	85	250	1503	3,177
4	2	I2	7DelAT	34	272	800	426	1253	272	800	6159	3,789
4	3	I2	7DelAT	34	128	376	374	1100	121	356	4409	3,644
4	1	I2	7DelKS	40	116	290	256	640	301	753	3253	3,512
4	2	I2	7DelKS	40	131	328	278	695	333	833	3573	3,553
4	3	I2	7DelKS	40	151	378	106	265	337	843	2393	3,379
4	1	I2	8DelAT	12	48	400	176	1467	120	1000	6200	3,792
4	2	I2	8DelAT	12	83	692	50	417	153	1275	3908	3,592
4	3	I2	8DelAT	12	160	1333	250	2083	138	1150	10067	4,003
4	1	I2	8DelKS	26	448	1723	668	2569	404	1554	12708	4,104
4	2	I2	8DelKS	26	226	869	264	1015	344	1323	6108	3,786

BiolRep	TRep	Geno	Strain	Nc	d7-Ns	d7-Ns-100c	d11-Ns	d11-Ns-100c	d13-Ns	d13-Ns-100c	AUDPC	LogAUDPC
4	1	I2	DelNC	30	226	753	518	1727	340	1133	7820	3,893
4	2	I2	DelNC	30	184	613	210	700	335	1117	4443	3,648
4	3	I2	DelNC	30	105	350	210	700	269	897	3697	3,568
4	1	I2	Mock	0	0	NA	0	NA	0	NA	NA	NA
4	2	I2	Mock	0	0	NA	0	NA	0	NA	NA	NA
4	3	I2	Mock	0	0	NA	0	NA	0	NA	NA	NA

Legend:

BiolRep: Biological replicate number. The whole experiment was repeated 4 times.

TRep: Technical replicate

Geno: Plant genotype

Strain: Fungal strain

7delAT: AdPKS7ΔAT strain

7delKS: AdPKS7ΔKS strain

8delAT: AdPKS8ΔAT strain

8delKS: AdPKS8ΔKS strain

DelNC: ΔNC strain

FRA001: FRA001 WT strain

Mock: Mock inoculation

Nc: Conidia number on the leaf

d7-Ns: Symptom number seven days after inoculation

d7-Ns-100c: Symptom number per one hundred conidia seven days after inoculation

d11-Ns: Symptom number eleven days after inoculation

d11-Ns-100c: Symptom number per one hundred conidia eleven days after inoculation

d13-Ns: Symptom number thirteen days after inoculation

d13-Ns-100c: Symptom number per one hundred conidia thirteen days after inoculation

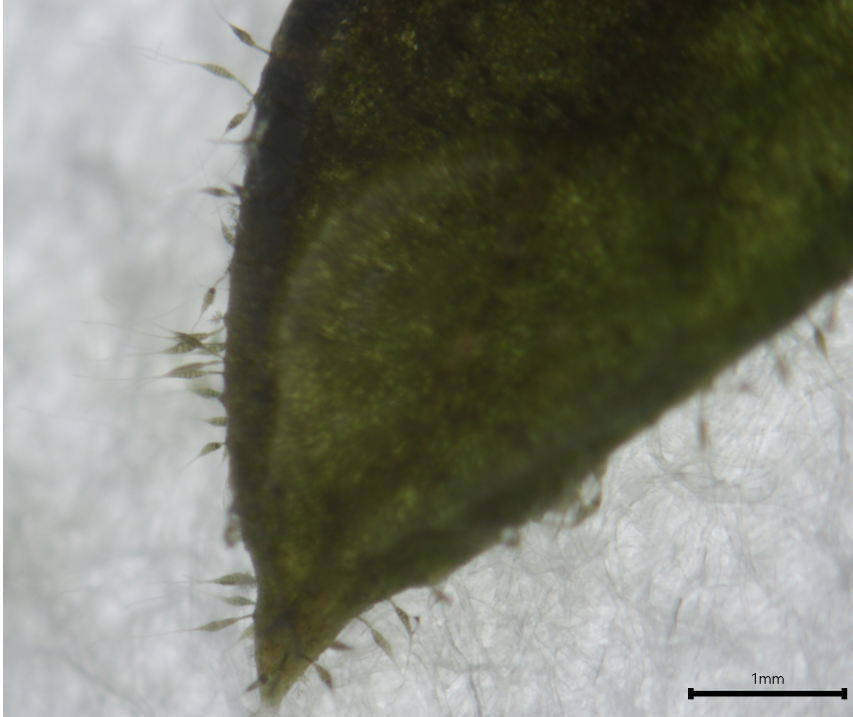
AUDPC: Area under the disease progression curve, where disease is evaluated as the number of symptoms per 100 conidia. The formula used was $\sum_{i=1}^n [(X_{i+1} - X_i)/2](t_{i+1} - t_i)$, with $n = 3$, $t_1 = 7$ d, $t_2 = 11$ d, $t_3 = 13$ d, $X_1 = \text{d7-Ns-100c}$, $X_2 = \text{d11-Ns-100c}$, $X_3 = \text{d13-Ns-100c}$. AUDPC unit is symptoms·day per 100 conidia.

LogAUDPC : Decimal logarithm of AUDPC. LogAUDPC has no unit.

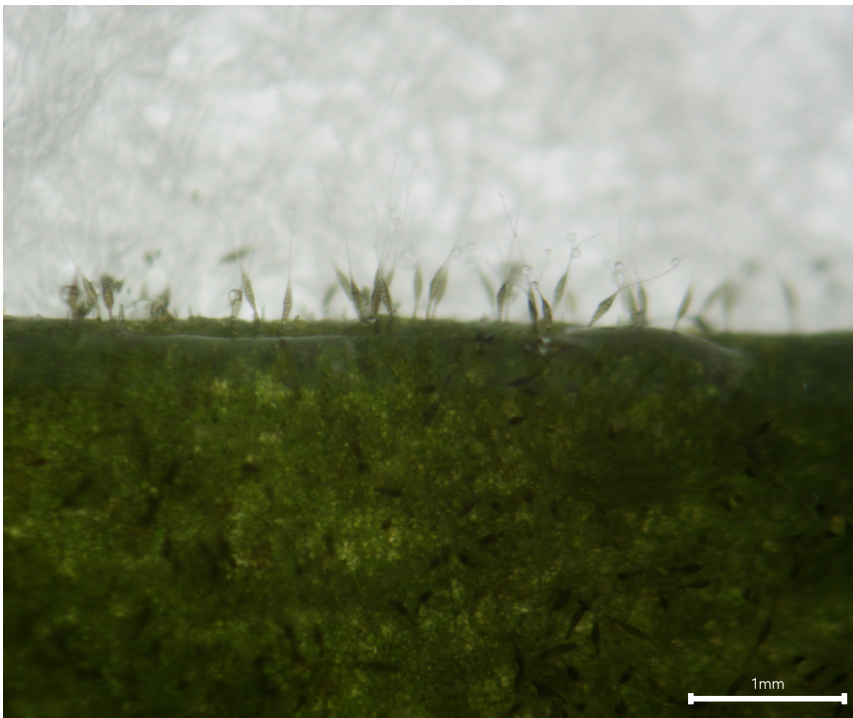
Supplementary document 5

Conidial micrographs of *A. dauci* FRA001 and transformed strains, attached on infected carrot leaves

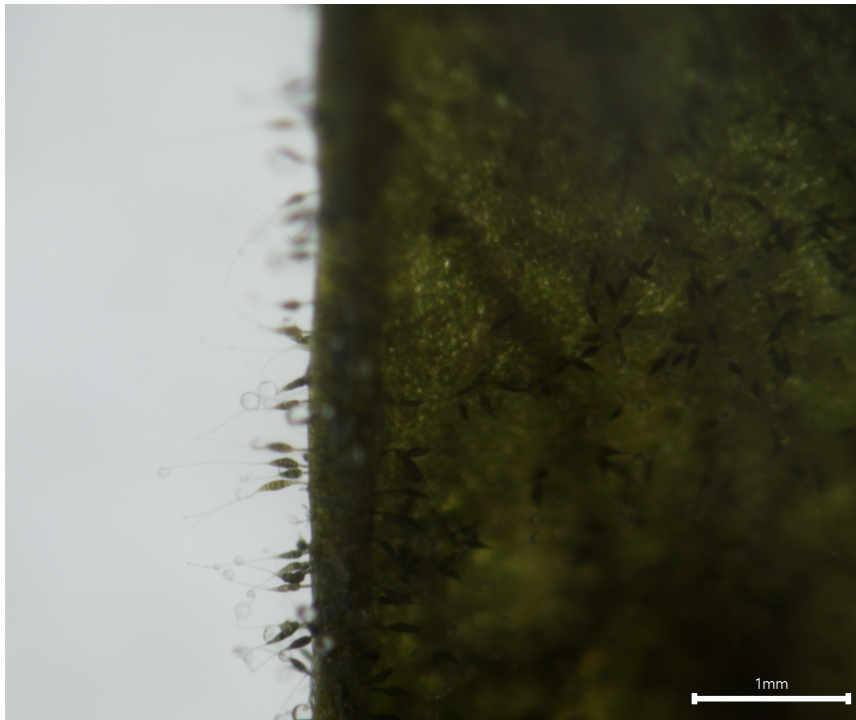
1. FRA001 conidia



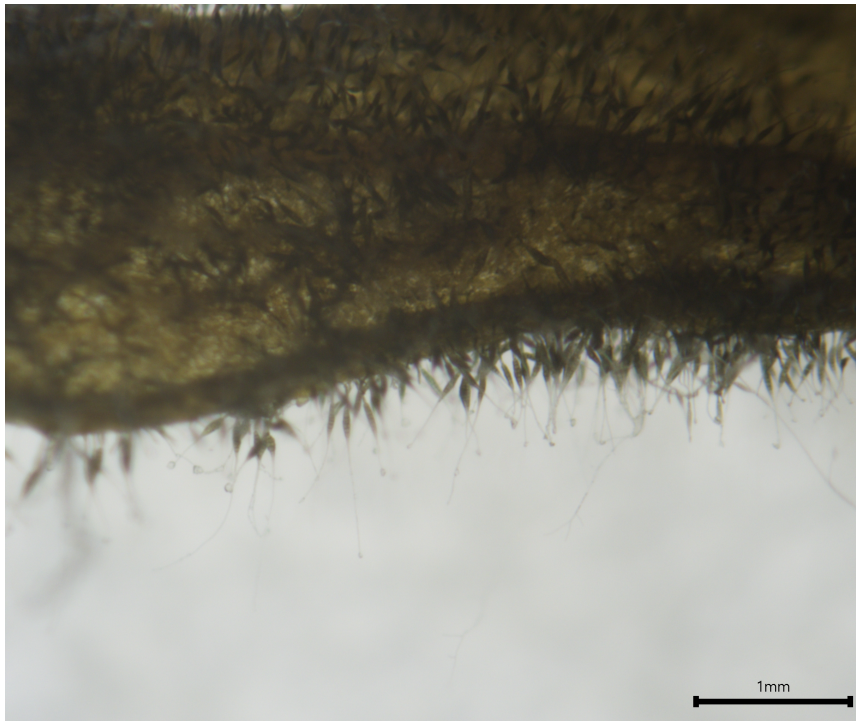
2. AdPKS7 Δ AT conidia



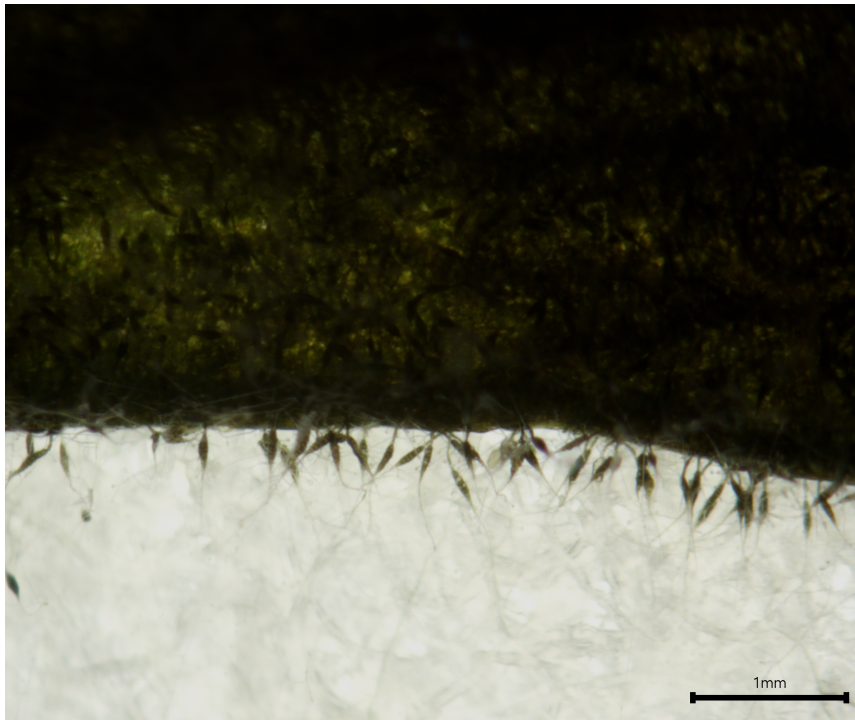
3. AdPKS7 Δ KS conidia



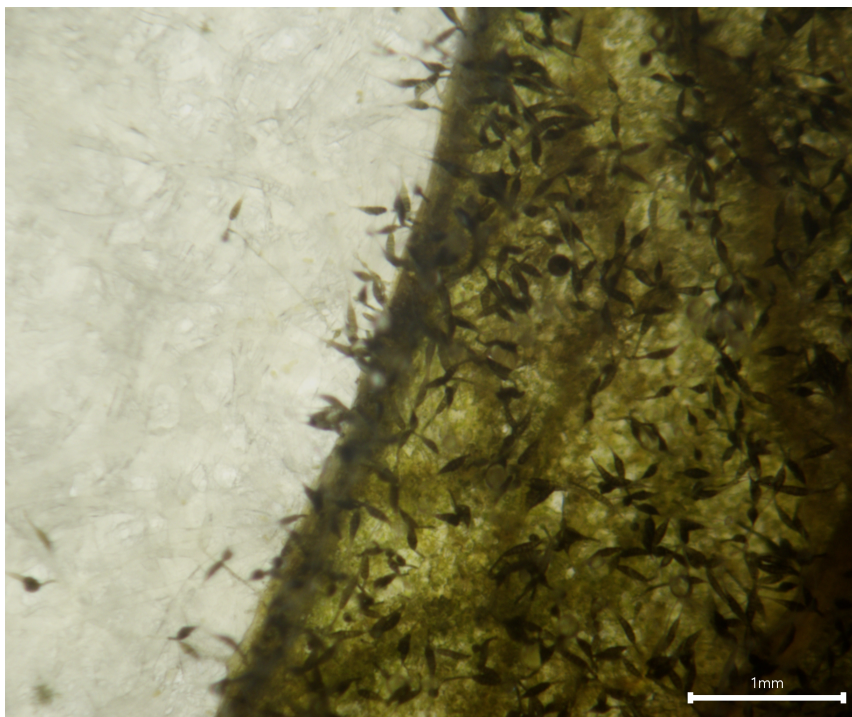
4. AdPKS8 Δ AT conidia



5. AdPKS8 Δ KS conidia



6. Δ NC conidia



DNA region amplified	Primer name	No. in the local database	Primer sequence	T _m (°C)	Note
ITS (Internal transcribed spacer)	ITS1	3338	TCCGTAGGTGAACCTGCGG	61.6	Used in the molecular characterization of all fungal strains
	ITS4	3059	TCCTCCGCTTATTGATATGC	55.1	Used in the molecular characterization of all fungal strains
<i>Hph</i> (Hygromycin B phosphatase)	M13F	1606	CGCCAGGGTTTTCCAGTCACGAC	67.9	Used in the molecular characterization and transformation of fungal strains
	M13R	1607	AGCGGATAACAATTCACACAGGA	60.8	Used in the molecular characterization and transformation of fungal strains
AT domain of <i>AdPKS7</i>	AdPKS7delATIntF	3244	TGAAAGAGCTGGGCTGTAGC	60	Used in the molecular characterization of the relevant strain
	AdPKS7delATIntR	3245	TGCATGTGGGGCGAATGATA	59.8	Used in the molecular characterization of the relevant strain
KS domain of <i>AdPKS7</i>	AdPKS7delDHIntF	3352	ACGAAAGAGAGCGTGTCTGG	60	Used in the molecular characterization of the relevant strain
	AdPKS7delDHIntR	3353	GATGACTTGCGCCACGATTC	60	Used in the molecular characterization of the relevant strain
AT domain of <i>AdPKS8</i>	AdPKS19g8F	3216	CCAATTCATGCTCTATGCTTTC	55.8	Used in the molecular characterization of the relevant strain
	AdPKS19g8R	3217	ACCCAGTAGTTCTTTGTATCCC	57.2	Used in the molecular characterization of the relevant strain
KS domain of <i>AdPKS8</i>	AdPKS19delKSIntF	3230	ATCATGGACAAACGCGACCT	60	Used in the molecular characterization of the relevant strain
	AdPKS19delKSIntR	3231	GCCAGCTCAAAATGTTCGCA	60	Used in the molecular characterization of the relevant strain
Noncoding region (946 bp downstream the AdPKS7)	AddelNCIntF	3360	ATCAATACGTTGCCCAGGTC	58	Used in the molecular characterization of the relevant strain
	AddelNCIntR	3361	TGATTGTGGAAGAGGTGGAGT	58.7	Used in the molecular characterization of the relevant strain

5' AT domain of AdPKS7 and internal region of <i>Hph</i>	M13R	1607	AGCGGATAACAATTTACACAGGA	60.8	Used in the molecular characterization of the relevant strain
	AdPKS7delAT5F	3240	AGCTCTTCATGGGCAGTGTC	60	Used in the molecular characterization of the relevant strain
3' AT domain of AdPKS7 and internal region of <i>Hph</i>	M13F	1606	CGCCAGGGTTTTCCAGTCACGAC	67.9	Used in the molecular characterization of the relevant strain
	AdPKS7delAT3R	3243	GCAGCTTCAACAAGTGCCTC	60	Used in the molecular characterization of the relevant strain
5' KS domain of AdPKS7 and internal region of <i>Hph</i>	AdPKS7KS_5VerF	3624	GGGATGAGTGGGTTGCAGA	60	Used in the molecular characterization of the relevant strain
	AdPKS7KS_5VerR	3625	TGCTGCTCCATACAAGCCAA	60	Used in the molecular characterization of the relevant strain
3' KS domain of AdPKS7 and internal region of <i>Hph</i>	NCL38F	3337	CGTTGCAAGACCTGCCTGAA	61.2	Used in the molecular characterization of the relevant strain
	AdPKS7delKS3R2	3363	ACCCAAGGACACTGGAGATG	59	Used in the molecular characterization of the relevant strain
5' AT domain of AdPKS8 and internal region of <i>Hph</i>	M13R	1607	AGCGGATAACAATTTACACAGGA	60.8	Used in the molecular characterization of the relevant strain
	AdPKS19delAT5F	3234	TGCGAACATTTTGAGCTGGC	60	Used in the molecular characterization of the relevant strain
3' AT domain of AdPKS8 and internal region of <i>Hph</i>	AdPKS8AT_3VerF	3626	TTGGCTTGTATGGAGCAGCA	60	Used in the molecular characterization of the relevant strain
	AdPKS8AT_3VerF	3627	AGGTGGCAGTAGTGTGAAGC	60	Used in the molecular characterization of the relevant strain
5' KS domain of AdPKS8 and internal region of <i>Hph</i>	AdPKS8_5VerF2	3632	ACAGGAGCCGGAAGTATTG	60	Used in the molecular characterization of the relevant strain
	AdPKS8_5VerR2	3633	GCTGATCTGACCAGTTGCCT	60	Used in the molecular characterization of the relevant strain
3' KS domain of AdPKS8 and internal region of <i>Hph</i>	M13F	1606	CGCCAGGGTTTTCCAGTCACGAC	67.9	Used in the molecular characterization of the relevant strain
	AdPKS19delKS3R	3229	GAGCCCCGACAAGATACAGG	59.9	Used in the molecular characterization of the relevant strain

5' noncoding region and internal region of <i>Hph</i>	AdNC_5VerF	3630	AGCGTATTGAGGTTGTGCGA	60	Used in the molecular characterization of the relevant strain
	AdNC_5VerR	3631	TCGCTGAACTCCCCAATGTC	60	Used in the molecular characterization of the relevant strain
3' noncoding region and internal region of <i>Hph</i>	NCL38F	3337	CGTTGCAAGACCTGCCTGAA	61.2	Used in the molecular characterization of the relevant strain
	AddelNC3R2	3365	GGAGAATTCGTAATAAAAGGATGC	58.3	Used in the molecular characterization of the relevant strain
5' end of the AT domain of <i>AdPKS7</i>	AdPKS7delAT-5F	3240	AGCTCTTCATGGGCAGTGTC	60	Used in the first round of PCR for fungal transformation
	AdPKS7delAT-5R	3241	GTCGTGACTGGGAAAACCCTGGCGGGCCACATTGTCCGCATAAC	72.9	Used in the first round of PCR for fungal transformation
3' end of the AT domain of <i>AdPKS7</i>	AdPKS7delAT-3F	3242	TCCTGTGTGAAATTGTTATCCGCTTCCCTCGTACCCCTGGAAT	68.2	Used in the first round of PCR for fungal transformation
	AdPKS7delAT-3R	3243	GCAGCTTCAACAAGTGCCTC	60	Used in the first round of PCR for fungal transformation
Resistance cassette for <i>AdPKS7ΔAT</i>	AdPKS7delAT-NF	3246	CAACATTGGCCACCTGGAAG	59.4	Used for the third round of PCR for fungal transformation
	AdPKS7delAT-NR	3247	AACGACTTTCAGCAAACCGC	60	Used for the third round of PCR for fungal transformation
5' end of the KS domain of <i>AdPKS7</i>	AdPKS7delKS-5F	3346	GGTTACCTTTCGGTGCTTCA	58.1	Used in the first round of PCR for fungal transformation
	AdPKS7delKS-5R	3347	GTCGTGACTGGGAAAACCCTGGCGATATTGAAGAACGCCGCATC	70.7	Used in the first round of PCR for fungal transformation
3' end of the KS domain of <i>AdPKS7</i>	AdPKS7delKS-3F	3362	TCCTGTGTGAAATTGTTATCCGCTATCATCGTGTATGCGGACA	66.5	Used in the first round of PCR for fungal transformation
	AdPKS7delKS-3R	3363	ACCCAAGGACACTGGAGATG	59	Used in the first round of PCR for fungal transformation
Resistance cassette for <i>AdPKS7ΔKS</i>	AdPKS7delKS-NF	3350	TATTGTGGATGTTCCACGA	56.5	Used for the third round of PCR for fungal transformation
	AdPKS7delKS-NR	3351	GGCGAATGATAAGCCACATC	57	Used for the third round of PCR for fungal transformation
5' end of the AT domain of <i>AdPKS8</i>	AdPKS19delAT-5F	3234	TGCGAACATTTTGAGCTGGC	60	Used in the first round of PCR for fungal transformation
	AdPKS19delAT-5R	3235	GTCGTGACTGGGAAAACCCTGGCGTGGTGCATTCTCCTTGCTGT	72.4	Used in the first round of PCR for fungal transformation
3' end of the AT domain of <i>AdPKS8</i>	AdPKS19delAT-3F	3236	TCCTGTGTGAAATTGTTATCCGCTACAGAGGAAATGTGCCCCG AG	67.7	Used in the first round of PCR for fungal transformation
	AdPKS19delAT-3R	3237	GTCCGTGATCCTTGCTTCCA	60	Used in the first round of PCR for fungal transformation
Resistance cassette for <i>AdPKS8ΔAT</i>	AdPKS19delAT-NF	3238	CTGAGGTCACGGCCATCG	60.2	Used for the third round of PCR for fungal transformation

	AdPKS19delAT-NR	3239	AGGACACACGATTCCACTCG	59.8	Used for the third round of PCR for fungal transformation
5' end of the KS domain of <i>AdPKS8</i>	AdPKS19delKS-5F	3226	GGGTTGGTCTTTTCAGGAGGG	60	Used in the first round of PCR for fungal transformation
	AdPKS19delKS-5R	3227	GTCGTGACTGGGAAAACCCTGGCGTGCAGATCTCGTGACCATC	72.3	Used in the first round of PCR for fungal transformation
3' end of the KS domain of <i>AdPKS8</i>	AdPKS19delKS-3F	3228	TCCTGTGTGAAATTGTTATCCGCTCTTCTGCGGAACAAAAG CT	68.4	Used in the first round of PCR for fungal transformation
	AdPKS19delKS-3R	3229	GAGCCCCGACAAGATACAGG	59.9	Used in the first round of PCR for fungal transformation
Resistance cassette for <i>AdPKS8ΔKS</i>	AdPKS19delKS-NF	3232	TACTCAGTGTTTCGGCCCTC	59.4	Used for the third round of PCR for fungal transformation
	AdPKS19delKS-NR	3233	GTCAGCCAGCGACAGTACAC	61	Used for the third round of PCR for fungal transformation
5' end of the NC region	AddelNC-5F	3354	GGTGGAAGGGTTCGAAGATT	57.5	Used in the first round of PCR for fungal transformation
	AddelNC-5R	3355	GTCGTGACTGGGAAAACCCTGGCGGGGATGGAGGTTTGATCCTT	71.8	Used in the first round of PCR for fungal transformation
3' end of the NC region	AddelNC-3F	3364	TCCTGTGTGAAATTGTTATCCGCTAGGCAATCGAGTAGCTCCAA	67.2	Used in the first round of PCR for fungal transformation
	AddelNC-3R	3365	GGAGAATTCGTAACATAAAAGGATGC	58.3	Used in the first round of PCR for fungal transformation
Resistance cassette for Δ NC	AddelNC-NF	3358	GAACGATTCAACGCTCGTAT	58.2	Used for the third round of PCR for fungal transformation
	AddelNC-NR	3359	CGATTTC AACGCCGTAAC TT	57.1	Used for the third round of PCR for fungal transformation

Supplementary document 7

PCR programs used in the study

Double-joint PCR programs used for fungal transformation

	First-round PCR			Second-round PCR			Third-round PCR		
	Temperature	Duration		Temperature	Duration		Temperature	Duration	
Denaturation	98°C	30 s	} 30x	94°C	2 min	} 15x	98°C	30 s	} 35x
	98°C	10 s		94°C	30 s		98°C	10 s	
Hybridization	Tm of primers	30 s		58°C	10 min		Tm of primers	30 s	
Elongation	72°C	30 s / 1000 bp		72°C	5 min		72°C	30 s / 1000 bp	
	72°C	5 min		72°C	10 min		72°C	5 min	
Cooling	15°C	∞		15°C	∞		15°C	∞	

PCR program used for the molecular characterization of fungal strains

	Temperature	Duration	
Denaturation	95°C	3 min	} 35x
	95°C	30 sec	
Hybridization	55°C	1 min	
Elongation	72°C	30 s / 1000 bp	
	72°C	5 min	
Cooling	15°C	∞	