## Supplementary Materials

**Table S1.** Sampling details of *Alternaria alternata* isolates recovered from pecans grown in major production locations in South Africa

| *Alternaria alternata* isolates | Location (Town, Province) | Coordinates | Plant tissue |
|---|---|---|---|
| CGJM3136 | Cullinan, Gauteng | S 25°35'13.6" E 028°33'31.6" | Symptomatic shoots |
| CGJM3097 | Cullinan, Gauteng | S 25°35'13.6" E 028°33'31.6" | Symptomatic leaves |
| CGJM3102 | Modemolle, Limpopo | S 24°40'40.5" E 028°29'55.6" | Symptomatic shoots |
| CGJM2972 | Mookgophong, Limpopo | S 24°25'42.1" E 028°35'41.0" | Symptomatic leaves |
| CGJM3080 | Mookgophong, Limpopo | S 24°25'42.1" E 028°35'41.0" | Non-symptomatic leaves |
| CGJM3006 | Mbombela, Mpumalanga | S 25 26'14.2" E 030 56'01.5" | Symptomatic leaves |
| CGJM3032 | Weenen, KwaZulu-Natal | S 28 51'01.7" E 030 06'01.5" | Symptomatic nuts |
| CGJM3142 | Weenen, KwaZulu-Natal | S 28 51'29.4" E 030 05'21.3" | Symptomatic nuts |
| CGJM3056 | Muden, Kwa-Zulu Natal | S 28 59'27.4" E 030 22'32.4" | Symptomatic nuts |
| CGJM3095 | Pongola, KwaZulu-Natal | S 27 36'25.8" E 031 27'21.3" | Symptomatic shoots |
| CGJM3078 | Cradock, Eastern Cape | S 32 01'42.4" E 025 32'52.7" | Symptomatic shoots |
| CGJM3089 | Cradock, Eastern Cape | S 32 01'42.4" E 025 32'52.7" | Symptomatic nuts |
| CGJM3121 | Cradock, Eastern Cape | S 32 01'42.4" E 025 32'52.7" | Non-symptomatic leaves |
| CGJM3122 | Cradock, Eastern Cape | S 32 01'42.4" E 025 32'52.7" | Non-symptomatic leaves |
| CGJM3090 | Cradock, Eastern Cape | S 32 01'42.4" E 025 32'52.7" | Symptomatic leaves |
| CGJM2997 | Aliwal North, Eastern Cape | S 30 39'49.6" E 026 49'36.7" | Symptomatic nuts |
| CGJM2966 | Aliwal North, Eastern Cape | S 30 39'49.6" E 026 49'36.7" | Symptomatic nuts |
| CGJM3087 | Aliwal North, Eastern Cape | S 30 39'49.6" E 026 49'36.7" | Symptomatic leaves |
| CGJM3103 | Skeerpoort, North West | S 25 47'24.5" E 027 45'53.1" | Non-symptomatic leaves |
| CGJM3036 | Koedoeskop, North West | S 25 13'19.1" E 027 32'02.5" | Symptomatic leaves |
| CGJM3072 | Brits, North West | S 25 32'40.7" E 027 48'56.5" | Symptomatic leaves |
| CGJM3066 | Makwassie, North West | S 27 14'27.4" E 026 09'39.3" | Symptomatic shoots |
| CGJM2987 | Makwassie, North West | S 27 14'27.4" E 026 09'39.3" | Non-symptomatic leaves |
| CGJM3137 | Makwassie, North West | S 27 14'27.4" E 026 09'39.3" | Symptomatic leaves |
| CGJM2957 | Makwassie, North West | S 27 14'27.4" E 026 09'39.3" | Symptomatic leaves |
| CGJM2991 | Coligny, North West | S 26 24'01.0" E 026 12' 32.6" | Symptomatic leaves |
| CGJM2988 | Coligny, North West | S 26 35'05.1" E 026 33'18.8" | Symptomatic leaves |
| CGJM2969 | Coligny, North West | S 26 35'05.1" E 026 33'18.8" | Non-symptomatic leaves |
| CGJM3060 | Syferkuil, North West | S 26 47'35.1" E 026 14'37.9" | Symptomatic leaves |
| CGJM2981 | Skeerpoort, North West | S 25 46'56.9" E 027 45'00.5" | Symptomatic leaves |

**Table S2.** Three-way ANOVA summary table of the detached nut assay of pecan showing their interaction effects of *Alternaria alternata* isolate, treatment (wounded and unwounded), and cultivar (Wichita and Ukulinga) data sets.

| Variables[a] | D.f. | Sum Sq. | Mean Sq. | F value | *P*-value |
|---|---|---|---|---|---|
| Iso | 6 | 232.7 | 38.8 | 7756.0 | <0.001 *** |
| TrT | 1 | 430.2 | 430.2 | 86042.9 | <0.001 *** |
| WN-UH | 1 | 216.0 | 216.0 | 43200.2 | <0.001 *** |
| Iso:TrT | 6 | 80.7 | 13.5 | 2690.2 | <0.001 *** |
| Iso:WN-UN | 6 | 53.6 | 8.9 | 1785.8 | <0.001 *** |
| TrT:WN-UN | 1 | 81.0 | 81.0 | 16205.4 | <0.001 *** |
| Iso:TrT:WN-UN | 6 | 14.6 | 2.4 | 485.5 | <0.001 *** |
| Residuals | 56 | 0.3 | 0.0 | | |

Significant codes: 0, '***' 0.001 (< 2e-16), '**' 0.01, '*' 0.05, '.' 0.1, ' ' 1.

[a] = Iso (*Alternaria alternata* isolate), TrT (Treatment: wounded and unwounded), WN-UN (Cultivar: Wichita nut and Ukulinga nut).

**Table S3.** Three-way ANOVA summary table of the detached leaf assay of pecan showing their interaction effects of *Alternaria alternata* isolate and treatment (wounded and unwounded) of Wichita cultivar data set.

| Variables[a] | D.f. | Sum Sq. | Mean Sq. | F value | *P*-value |
|---|---|---|---|---|---|
| Iso | 6 | 74.59 | 12.43 | 10442 | <0.001 *** |
| TrT | 1 | 145.60 | 145.60 | 122305 | <0.001 *** |
| Iso:TrT | 6 | 46.60 | 7.77 | 6524 | <0.001 *** |
| Residuals | 28 | 0.03 | 0.00 | | |

Significant codes: 0, '***' 0.001 (< 2e-16), '**' 0.01, '*' 0.05, '.' 0.1, ' ' 1.

[a] = Iso (*Alternaria alternata* isolate), TrT (Treatment: wounded and unwounded).

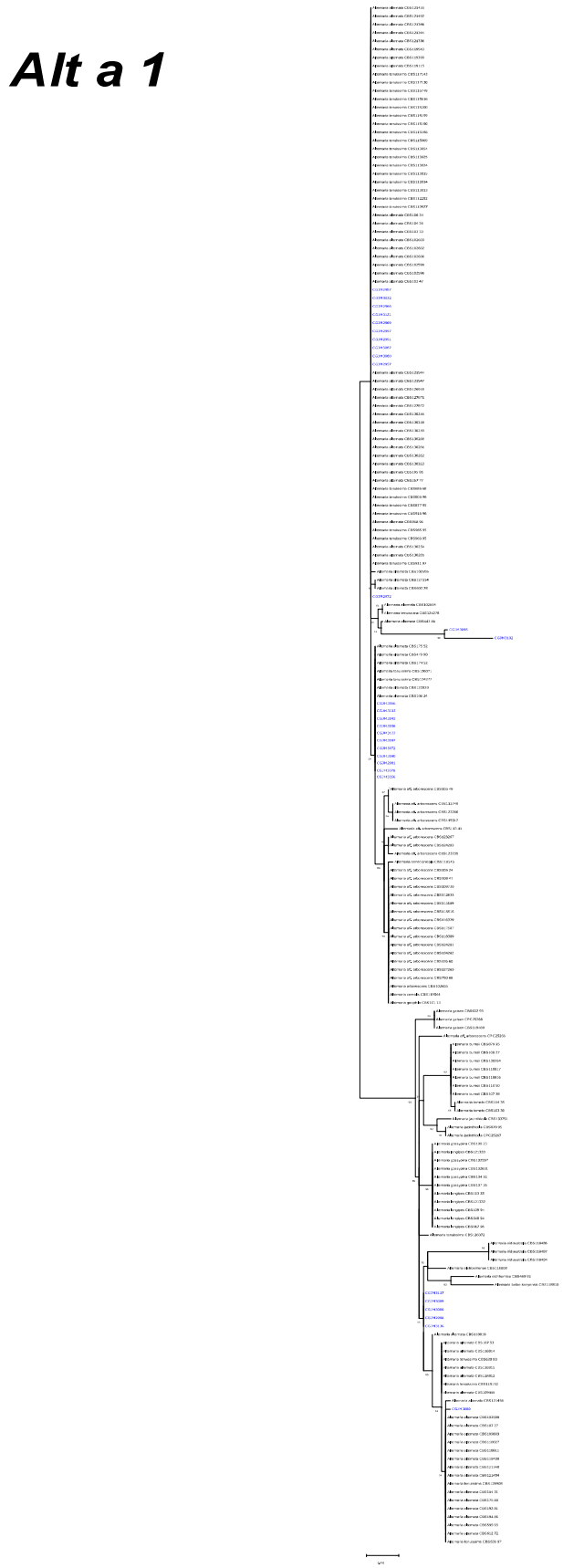



**Figure S1A:** Maximum likelihood tree of *Alternaria* section *Alternaria* based on *Alt a* 1 gene DNA sequences. Bootstrap support values are indicated on the branch nodes. The identified *A. alternata* isolates (highlighted in blue) clustered within the *A. alternata* species complex. No geographical locality and symptom classification amongst the *A. alternata* isolates.

***Gapdh***

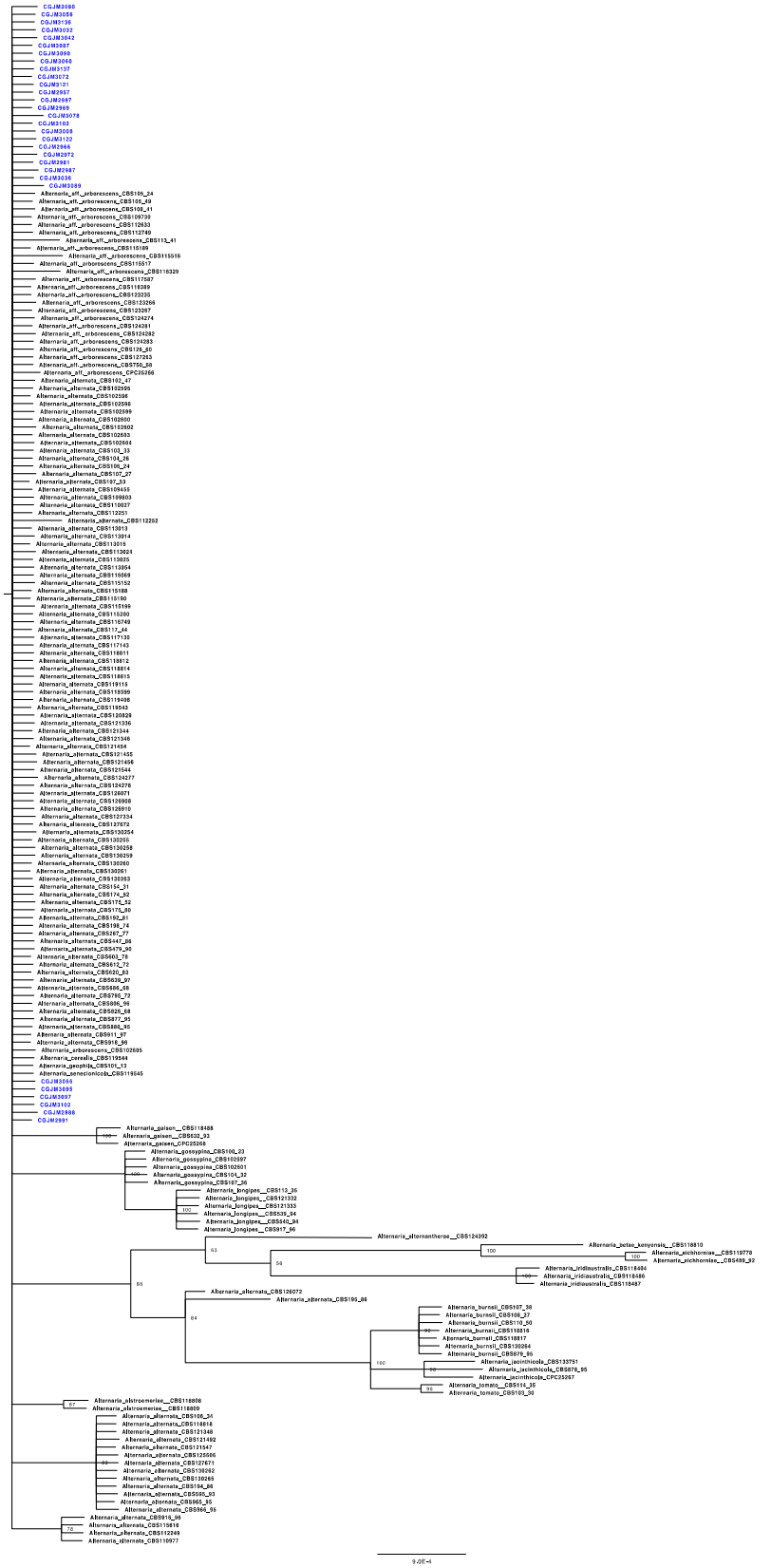


**Figure S1B:** Maximum likelihood tree of *Alternaria* section *Alternaria* based on *Gapdh* gene DNA sequences. Bootstrap support values are indicated on the branch nodes. The identified *A. alternata* isolates (highlighted in blue) clustered within the *A. alternata* species complex. No geographical locality and symptom classification amongst the *A. alternata* isolates.

# *Rpb2*

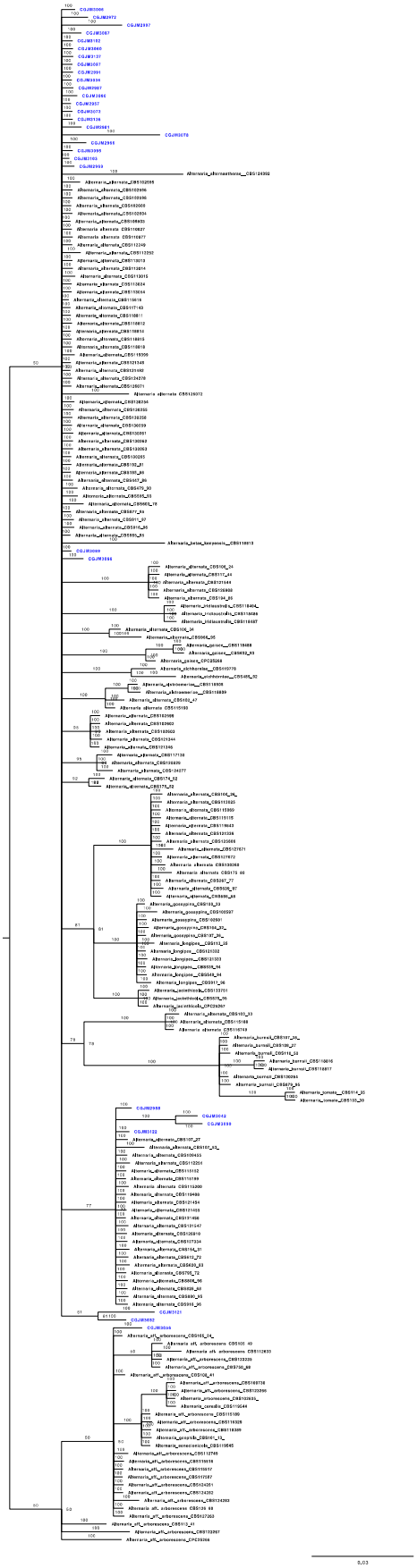


**Figure S1C:** Maximum likelihood tree of *Alternaria* section *Alternaria* based on *Rpb2* gene DNA sequences. Bootstrap support values are indicated on the branch nodes. The identified *A. alternata* isolates (highlighted in blue) clustered within the *A. alternata* species complex. No geographical locality and symptom classification amongst the *A. alternata* isolates.

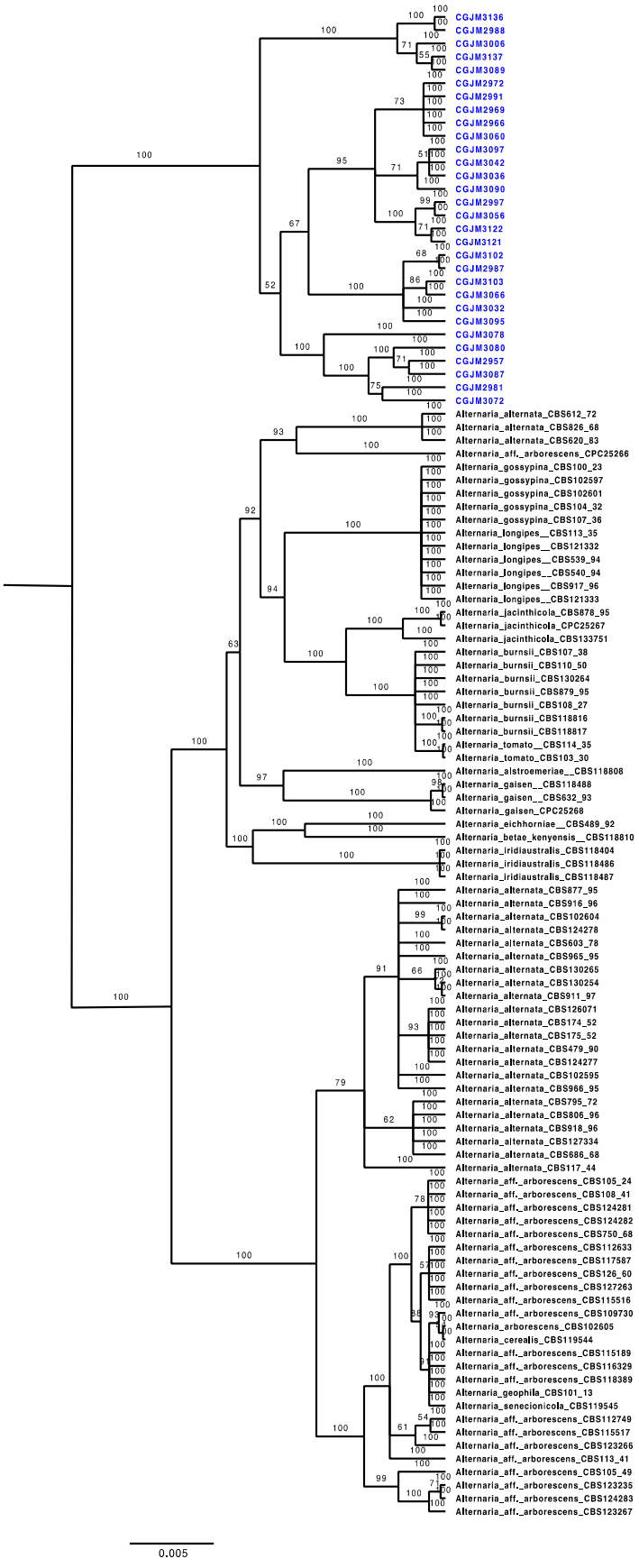



**Figure S1D:** Maximum likelihood tree of *Alternaria* section *Alternaria* based on *Tef*1 gene DNA sequences. Bootstrap support values are indicated on the branch nodes. The identified *A. alternata* isolates (highlighted in blue) clustered within the *A. alternata* species complex. No geographical locality and symptom classification amongst the *A. alternata* isolates.

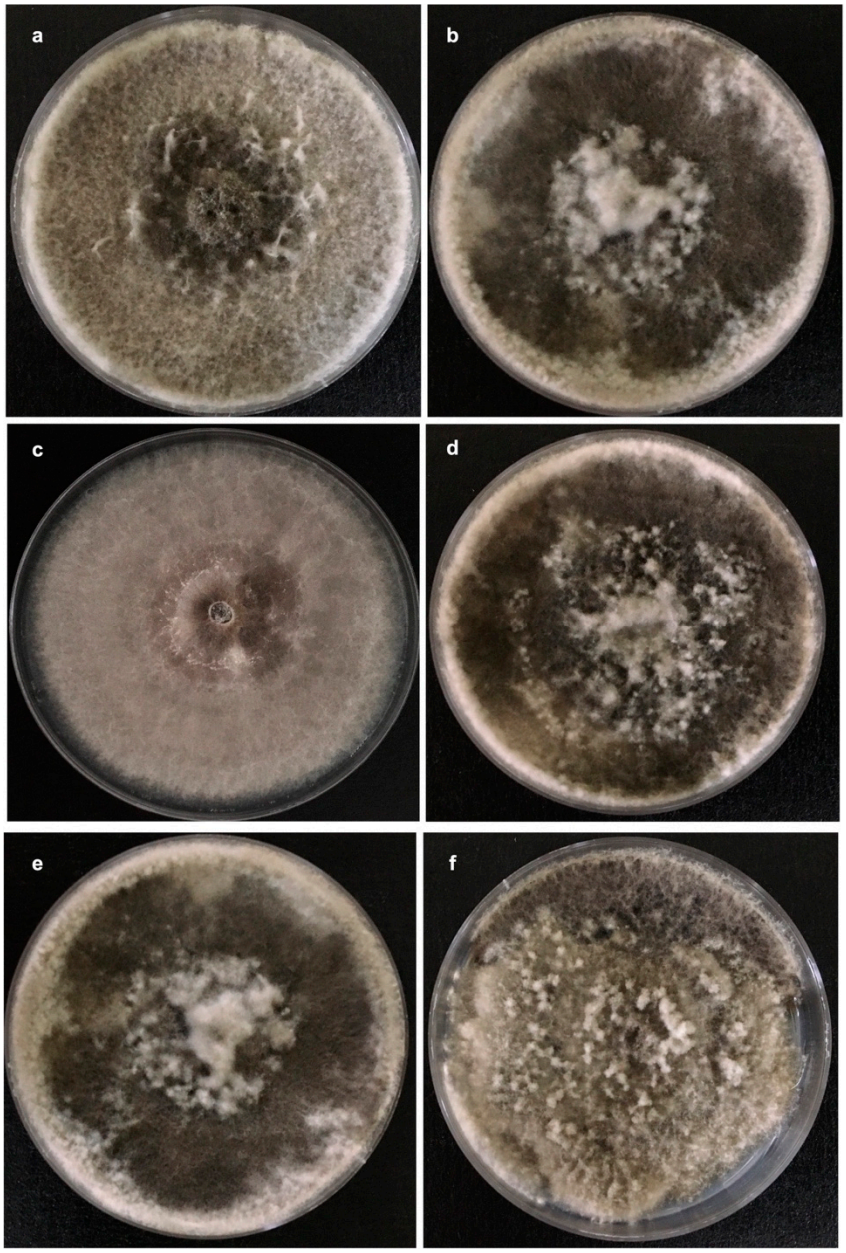



**Figure S2**. *Alternaria alternata* cultures recovered from treated roots of seedling wilt: **(a)** CGJM3006, **(b)** CGJM3013, **(c)** CGJM3078, **(d)** CGJM3136, **(e)** CGJM3137, and **(f)** CGJM3142.