Biological control and cross infections of the *Neofusicoccum* spp. causing mango postharvest rots in Spain.

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Table S1. Information obtained from fungal isolated ITS and beta-tubulin sequence comparison in NCBI database and was considered for fungal isolated identification.

Nº	Isolated code	Query cover	E-value	%. Identity	Subject Fungal Specie	Accession number
ITS sequences						
1	UMAF M1301	98	0.0	99.63	*Stemphylium vesicarium*	MF401513
2	UMAF M1302	99	0.0	99.95	*Neofusicoccum parvum*	MN654323
3	UMAF M1303	98	0.0	99.63	*Stemphylium botryosum*	MK226299
4	UMAF M1304	99	0.0	99.63	*Stemphylium botryosum*	MK226299
5	UMAF M1305	98	0.0	100	*Stemphylium sp.*	MN153952
6	UMAF M1306	98	0.0	99.63	*Alternaria alternata*	MT447475
7	UMAF M1307	98	0.0	98.33	*Stemphylium vesicarium*	MN519408
8	UMAF M1308	98	0.0	100	*Stemphylium vesicarium*	MH628104
9	UMAF M1309	100	0.0	99.58	*Stemphylium vesicarium*	MF401574.1
10	UMAF M1310	99	1e-171	99.41	*Alternaria alternata*	KX179485
11	UMAF M1911	99	1e-79	94.39	*Aureobasidium pullulans*	MN398509
12	UMAF M1912	99	0.0	99.45	*Aureobasidium pullulans*	KR704881
13	UMAF M1913	100	4e-120	97.30	*Alternaria tenuissima*	MN853399
14	UMAF M1914	98	0.0	100	*Aureobasidium pullulans*	MN371874
15	UMAF M1915	100	0.0	99.35	*Alternaria carthami*	MK102650
16	UMAF M1916	99	0.0	99.44	*Alternaria brassicicola*	MF462314
17	UMAF M1917	99	0.0	99.45	*Stemphylium vesicarium*	MN328386
18	UMAF M1918	100	9e-158	98.75	*Alternaria pobletensis*	NR166226
19	UMAF M1919	100	0.0	98.96	*Stemphylium vesicarium*	MN534849
20	UMAF M1920	99	0.0	100	*Botryosphaeria dothidea*	MF398854
21	UMAF M1921	83	4e-133	98.90	*Neofusicoccum mediterraneum*	KU721871
22	UMAF M1922	79	0.0	97.44	*Aureobasidium pullulans*	FJ150904

23	UMAF M1923	100	4e-140	91.83	*Aureobasidium pullulans*	AM076662
24	UMAF M1924	100	0.0	100	*Nigrospora oryzae*	MN648321
25	UMAF M1925	91	9e-101	98.15	*Colletotrichum gloeosporioides*	MN473209
26	UMAF M1926	90	2e-87	97.44	*Colletotrichum gloeosporioides*	MN473209
27	UMAF M1927	99	0.0	100	*Neofusicoccum luteum*	MG547970
28	UMAF M1928	100	0.0	99.82	*Neofusicoccum parvum*	MK932726
29	UMAF M1929	100	0.0	99.82	*Neofusicoccum parvum*	MK932726
30	UMAF M1930	98	1e-147	94.35	*Stemphylium versicarium*	MT629829
31	UMAF M1931	90	0.0	100	*Alternaria tenuissima*	KR912298
32	UMAF M1932	98	3e-147	98.36	*Alternaria tenuissima*	MN752163
33	UMAF M1933	100	0.0	99.47	*Alternaria tenuissima*	MF574271
34	UMAF M1934	99	0.0	99.81	*Alternaria alternata*	KX783399
35	UMAF M1935	100	0.0	99.80	*Alternaria alternata*	MT644140
36	UMAF M1936	99	0.0	99.81	*Alternaria tenuissima*	MH345863
37	UMAF M1937	98	0.0	99.10	*Neofusicoccum parvum*	MK932726
38	UMAF M1938	100	0.0	99.63	*Neofusicoccum mediterraneum*	MT252673
39	UMAF M1939	99	0.0	100	*Alternaria tenuissima*	KR912298
40	UMAF M1940	99	0.0	99.81	*Alternaria alternata*	KX783399
41	UMAF M1941	99	0.0	99.45	*Alternaria tenuissima*	MV907695
42	UMAF M1942	100	0.0	99.08	*Alternaria tenuissima*	MN206864
43	UMAF M1943	100	0.0	99.63	*Alternaria tenuissima*	MN907695
44	UMAF M1944	99	0.0	99.81	*Alternaria tenuissima*	HQ647307
45	UMAF M1945	99	0.0	99.43	*Neofusicoccum mediterraneum*	KX505909
46	UMAF M1946	98	0.0	100	*Alternaria tenuissima*	KX065045
47	UMAF M1947	100	3e-136	96.37	*Neofusicoccum australe*	MK932744

48	UMAF M1948	99	0.0	100	*Alternaria alternata*	KF293964
49	UMAF M1949	99	0.0	99.64	*Neofusicoccum luteum*	MG547970
50	UMAF M1950	99	0.0	99.81	*Alternaria tenuissima*	MH345863
51	UMAF M1951	99	0.0	99.45	*Alternaria alternata*	MH879772
52	UMAF M1952	99	0.0	99.80	*Nigrospora lacticolonia*	MT043787
53	UMAF M1953	100	0.0	99.63	*Alternaria tenuissima*	MN206864
54	UMAF M1954	99	0.0	99.75	*Rosellinia convexa*	MN707567
55	UMAF M1955	83	0.0	99.36	*Xylaria sp.*	KU295384
56	UMAF M1956	99	0.0	99.65	*Trichoderma atroviride*	MN516446
57	UMAF M1957	99	0.0	99.63	*Alternaria tenuissima*	MG975636
58	UMAF M1958	98	0.0	99.81	*Colletotrichum gloeosporioides*	KM203586
59	UMAF M1959	98	0.0	99.81	*Colletotrichum gloeosporioides*	KM203586
60	UMAF M1960	99	0.0	99.60	*Neofusicoccum mediterraneum*	MN166003
61	UMAF M1961	99	0.0	99.82	*Neofusicoccum australe*	KF702388
62	UMAF M1962	99	0.0	99.81	*Alternaria tenuissima*	JK867218
63	UMAF M1963	100	0.0	99.82	*Neofusicoccum parvum*	MK932726
64	UMAF M1964	99	0.0	99.82	*Neofusicoccum parvum*	MK932726
65	UMAF M1965	100	0.0	99.81	*Alternaria tenuissima*	MT487771
66	UMAF M1966	98	0.0	99.82	*Neofusicoccum parvum*	MN893926
67	UMAF M1967	100	0.0	99.61	*Lasiodiplodia theobromae*	MK530072
68	UMAF M1968	98	0.0	98.92	*Fusarium oxysporum*	KT876557
69	UMAF M1969	89	0.0	99.00	*Alternaria tenuissima*	MN853397
70	UMAF M1970	82	3e-168	98.54	*Fusarium verticillioides*	MN737769
71	UMAF M1971	99	0.0	99.82	*Pestalotiopsis trachicarpicola*	MN427963
72	UMAF M1972	95	1e-157	96.00	*Lasiodiplodia citricola*	MN634040

73	UMAF M1973	99	0.0	99.81	*Alternaria alternata*	MN173832
74	UMAF M1974	100	0.0	99.82	*Trichoderma gamsii*	KX343104
75	UMAF M1975	99	0.0	98.04	*Alternaria alternata*	MT134992
Beta-tubulin sequences						
1	UMAF M1302	100	1e-170	100	*Neofusicoccum parvum*	OQ361698.1
2	UMAF M1928	100	9e-148	94.99	*Neofusicoccum parvum*	KP183115.1
3	UMAF M1937	100	1e-120	98.08	*Neofusicoccum parvum*	KP183108.1
4	UMAF M1938	100	2e-95	98.57	*Neofusicoccum mediterraneum*	KX505926.1
5	UMAF M1945	100	2e-130	99.26	*Neofusicoccum mediterraneum*	MN318104.1
6	UMAF M1961	97	9e-102	95.42	*Neofusicoccum cryptoaustrale*	KY000212.1

Figure S1. Mangos fruits with rot symptoms. The symptoms were developed during factory storage and analyzed for causal agents in the current study.

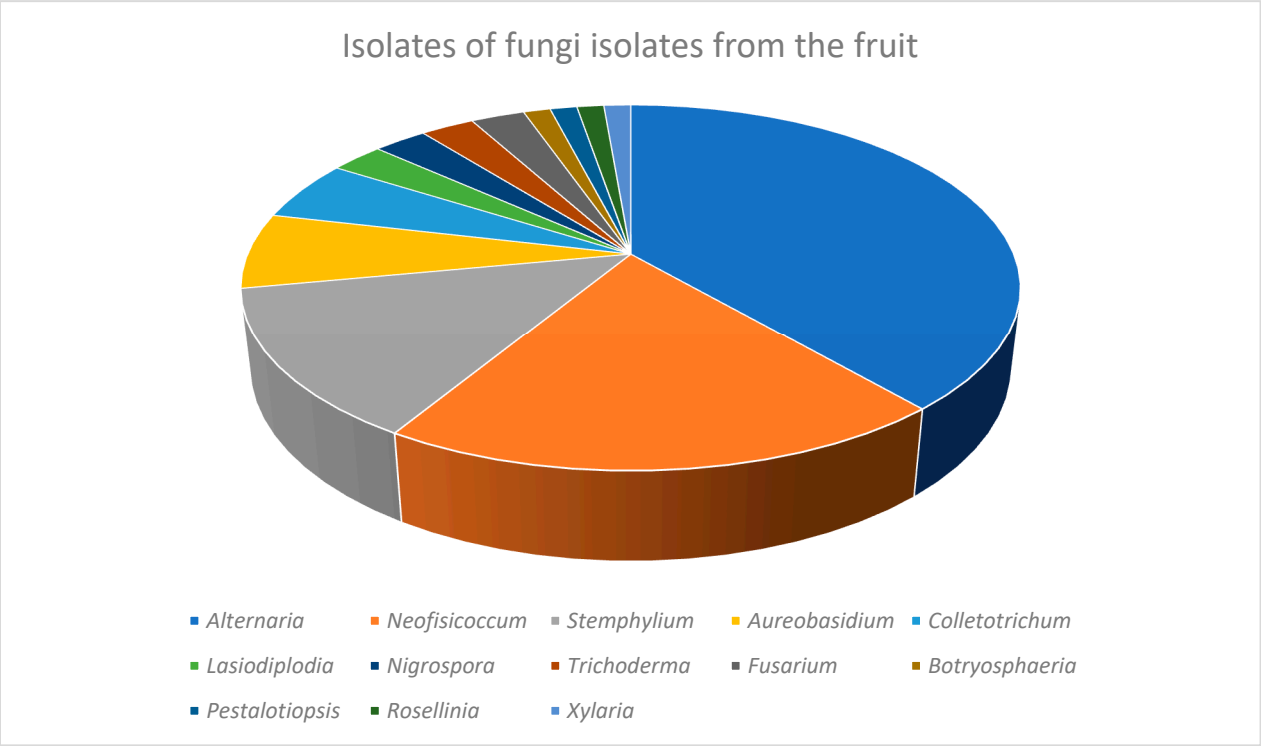

Figure S2: Graph of the numbers of isolated obtained from the rotten mangoes and their genera identification.

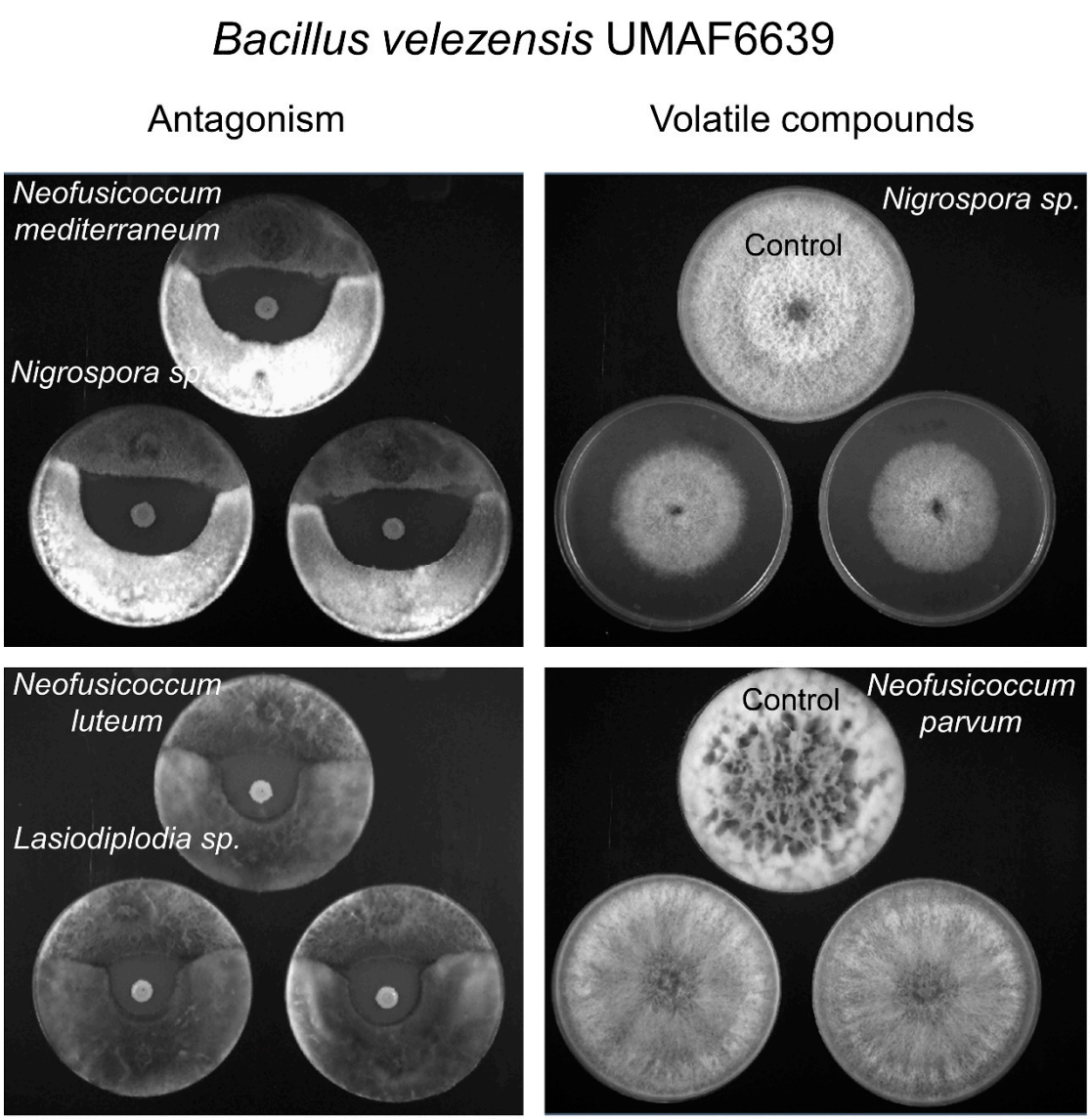

Figure S3. Photograph illustrating the growth inhibition of fungal isolates caused by fermented *Bacillus velezensis* UMAF6639. Growth inhibition by antagonism in the dual test and by organic volatile compounds.

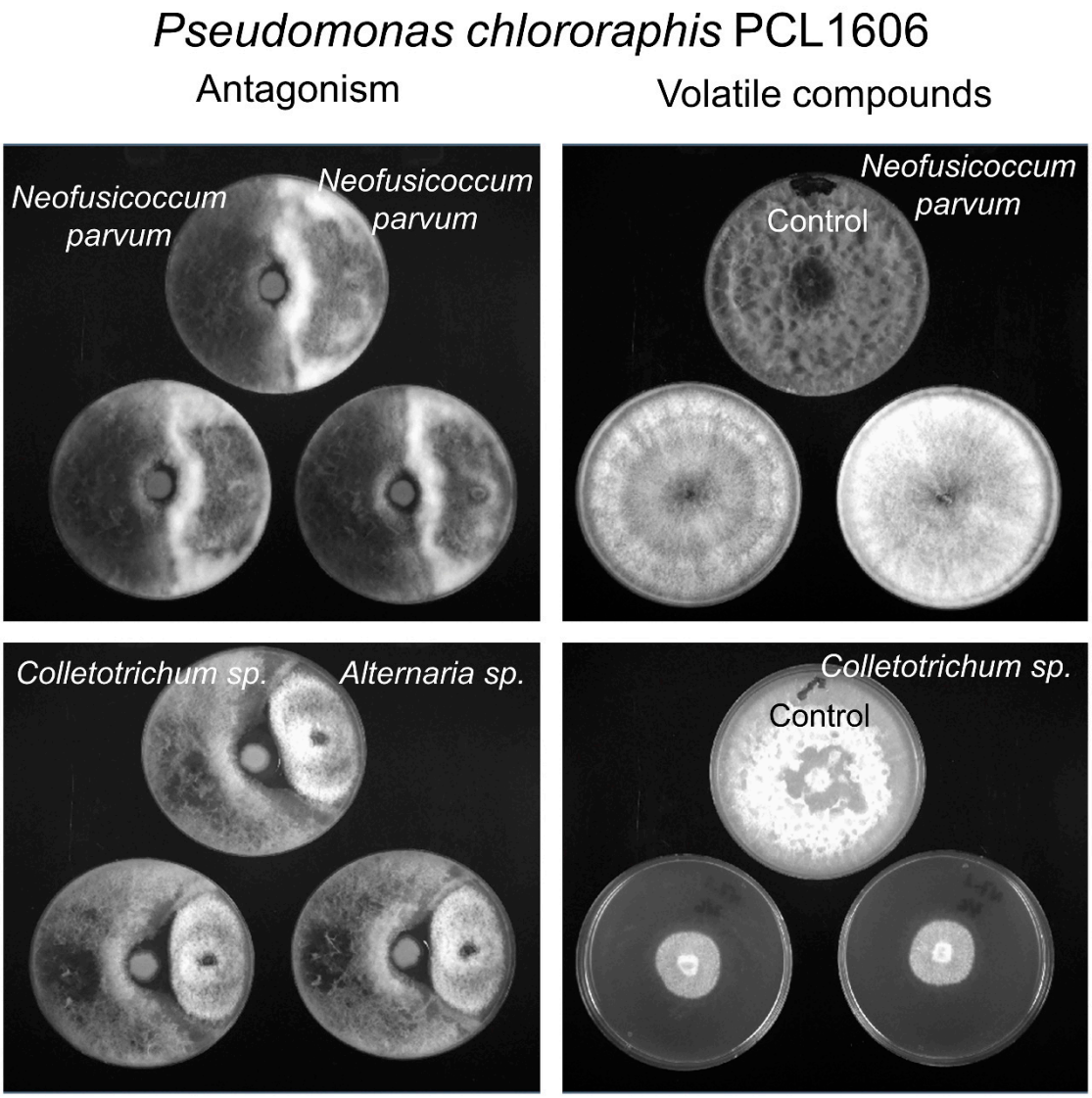

Figure S4. Photograph illustrating the growth inhibition of fungal isolates caused by *Pseudomonas chlororaphis* PCL1606. Growth inhibition by antagonism in the dual test and by organic volatile compounds.

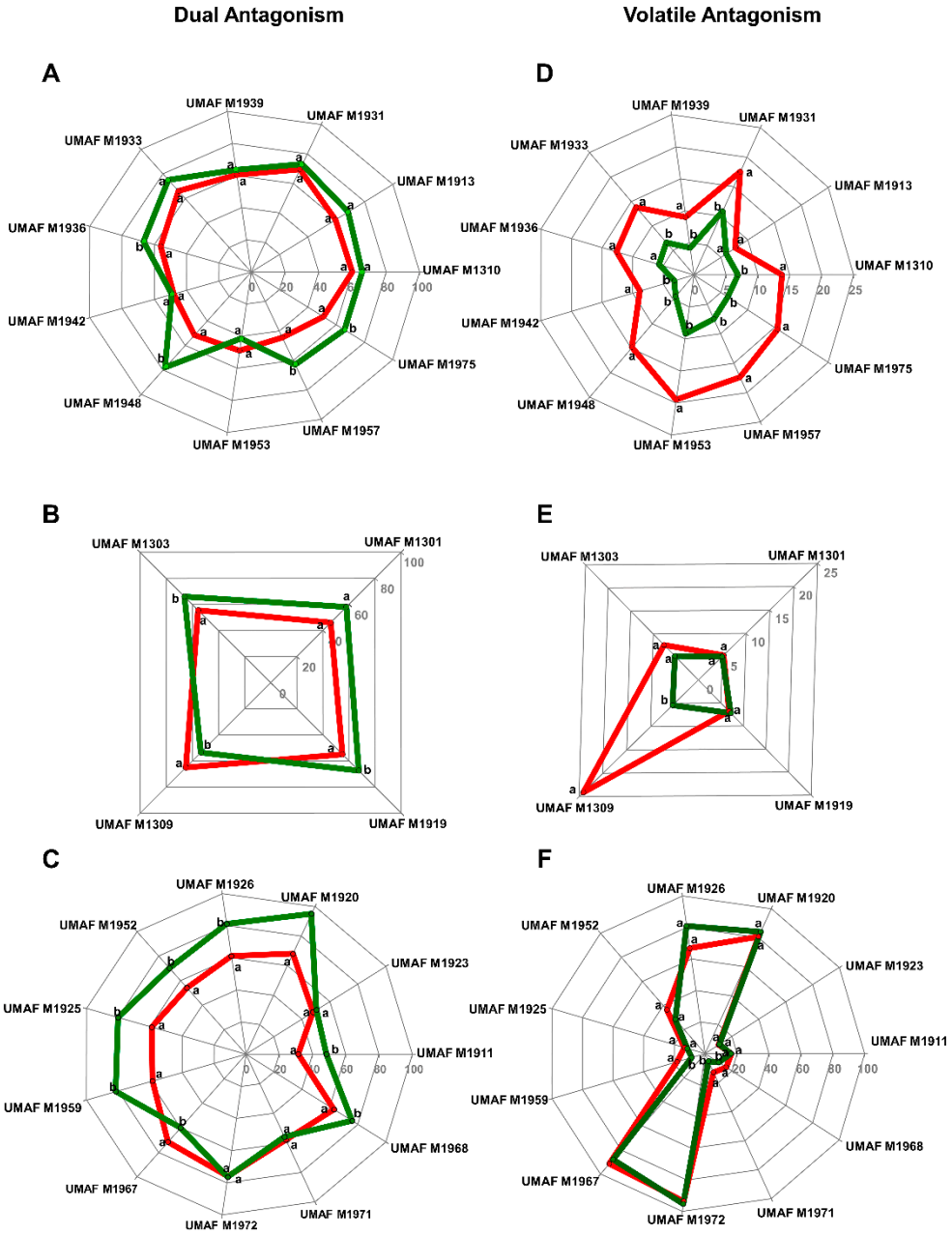

Figure S5. Radar representation of the percentage of growth of fungi isolated in the current study against antagonist bacteria, fermented *Bacillus velezensis* UMAF6639 (in red) and *Pseudomonas chlororaphis* PCL1606 (in green). Values with letters show statistical significance compared to the control without bacteria. Values with different letters show significant differences between bacterial levels of action. A, B and C) Percentage of growth of isolates by dual technique for antagonism test: A) isolates identified as *Alternaria* spp., B) isolates identified as *Stemphylium* spp., C) other fungal isolates obtained (Table 1). D, E and F) Percentage of growth of isolates incubated in front of antagonist bacteria for volatile organic compound analysis: D) isolates identified as *Alternaria* spp. axis scale up to 25%, E) isolates identified as *Stemphylium* spp. axis scale up to 25%, F) other fungal isolates obtained (Table 1). Statistical analysis was conducted by one-way ANOVA using SPSS software.

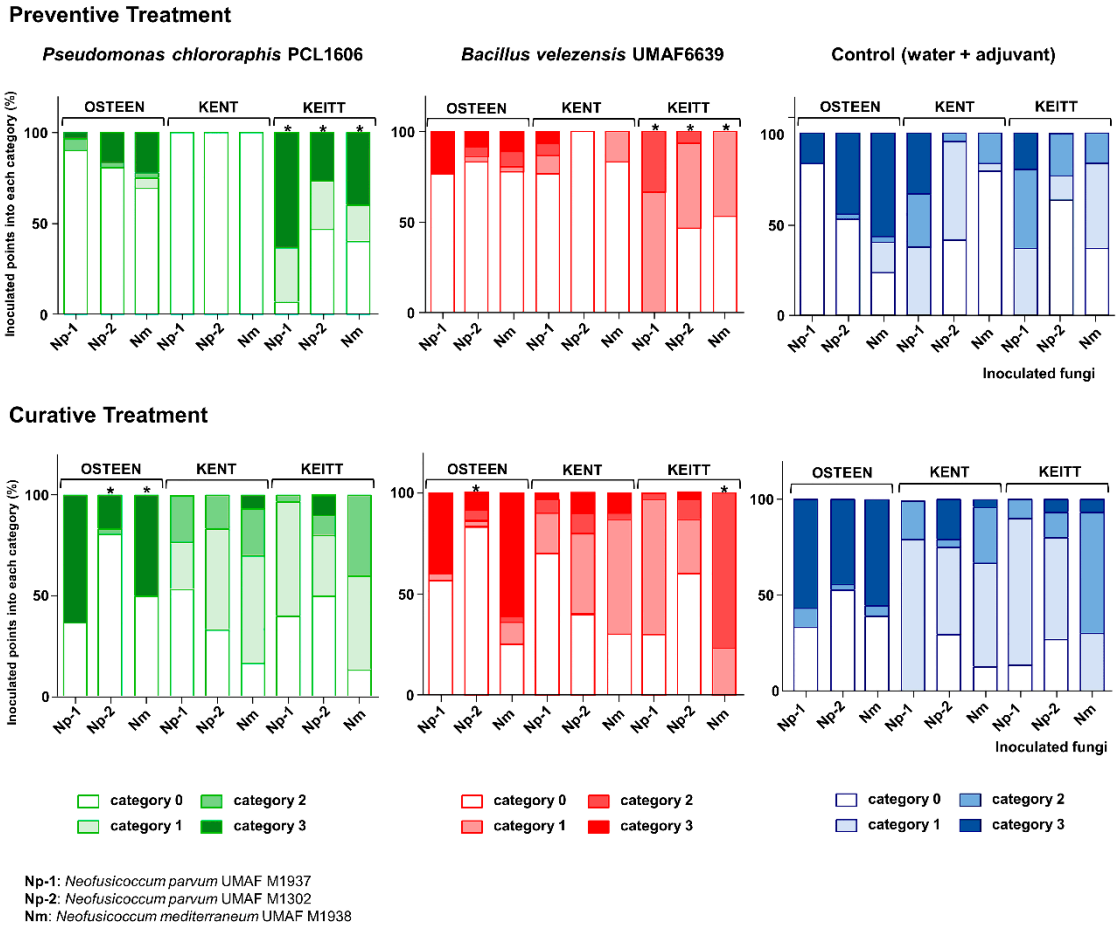

Figure S6. Percentage of inoculated points with rot symptoms belonging to each category of severity obtained on the fifth day postinoculation of the three mango varieties: Osteen, Kent and Keitt. The mangos fruits were inoculated with three fungal isolates, two *Neofusicoccum parvum* (UMAF M1937 and UMAF M1302) and one *N. mediterraneum* (UMAF M1938). The fruits were subjected to preventive and curative treatment with antagonist bacteria, *Pseudomonas chlororaphis* PCL1606 (green) and fermented *Bacillus velezensis* UMAF6639 (red), and sterile water with adjuvant was used as control (blue). Statistical analysis was conducted by Student's T-test using SPSS software, and significant differences are marked with asterisks.