

## Supplementary Material

### Applied Sciences

#### Chemical characterisation, antioxidant and antibacterial activities of *Pinus pinaster* Ait. and *Pinus pinea* L. bark polar extracts: prospecting forestry by-products as renewable sources of bioactive compounds

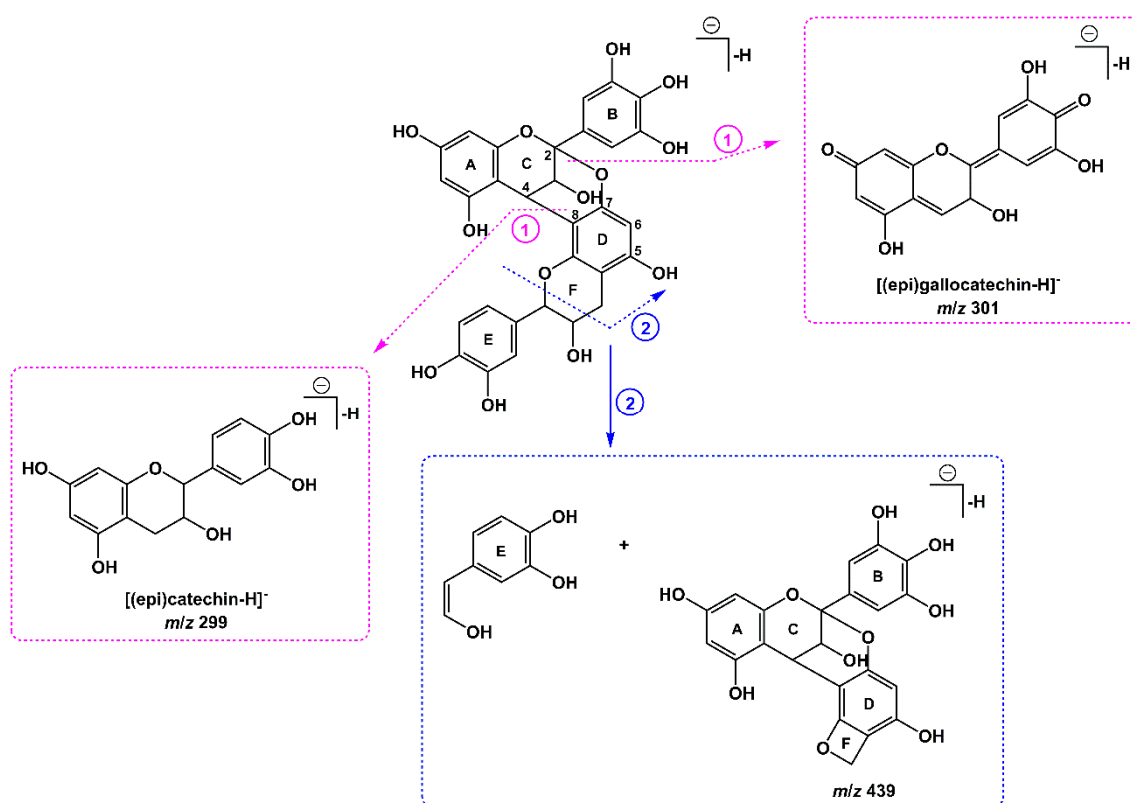
Patrícia A. B. Ramos<sup>1,2</sup>, Carla Pereira<sup>3</sup>, Ana Peixoto Gomes<sup>3</sup>, Rodrigo T. Neto<sup>1</sup>, Adelaide Almeida<sup>3</sup>, Sónia A. O. Santos<sup>1,\*</sup>, Artur M. S. Silva<sup>2</sup>, and Armando J. D. Silvestre<sup>1</sup>

<sup>1</sup> CICECO—Aveiro Institute of Materials, Department of Chemistry, University of Aveiro, 3810-193 Aveiro, Portugal; patriciaaramos@ua.pt (P.A.B.R.); rtneto@ua.pt (R.T.N.); armsil@ua.pt (A.J.D.S.)

<sup>2</sup> LAQV-REQUIMTE, Department of Chemistry, University of Aveiro, 3810-193 Aveiro, Portugal; artur.silva@ua.pt

<sup>3</sup> CESAM—Centre for Environmental and Marine Studies, Department of Biology, University of Aveiro, 3810-193 Aveiro, Portugal; csgp@ua.pt (C.P.); ana.peixoto@ua.pt (A.P.G.); aalmeida@ua.pt (A.A.)

\* Correspondence: santos.sonia@ua.pt; Tel.: + 351-234-370-711



**Figure S1.** Mass fragmentation of (epi)gallocatechin-(2→O7, 4→8)-(epi)catechin in the negative ionisation mode.

**Table S1.** *S. aureus* counts after application of *Pinus pinaster* Ait. and *Pinus pinea* L. bark polar extracts. (a) *S. aureus* control: The bacterial control was only inoculated with *E. coli*; (b) Solvent control: The solvent control represents the bacterial growth under 12.5% (v/v) ethanol; (c) *Pinus pinaster* Ait. extract: The results represent the effect of *P. pinaster* Ait. bark polar extract against the growth of *S. aureus* and (d) *Pinus pinea* L. extract: The results represent the effect of *P. pinea* L. bark polar extract against the growth of *S. aureus*. *Pinus* spp. bark polar extracts were prepared in triplicate (samples 1-3). Each sample was evaluated three times (assay 1- 2) in different periods to secure independent replication. with three replicates (R1-R3) for each concentration. The results represent the mean of the three independent experiments in the three samples studied and their standard deviations.

**(a) *S. aureus* control**

	Number of colonies									Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )	Average log (CFU mL <sup>-1</sup> )	Standard derivation
	Sample 1			Sample 2			Sample 3									
<i>S. aureus</i> control	R1	R2	R3	R1	R2	R3	R1	R2	R3							
Assay 1	4	5	8	30	20	32	36	47	39	24.56	100000	100	2.46E+08	8.39	8.43831	0.04184
Assay 2	24	24	13	11	15	18	51	54	53	29.22	100000	100	2.92E+08	8.47		
Assay 3	10	9	13	22	26	24	49	55	51	28.78	100000	100	2.88E+08	8.46		

**(b) Solvent control**

	Number of colonies									Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )	Average log (CFU mL <sup>-1</sup> )	Standard derivation
	Sample 1			Sample 2			Sample 3									
Solvent 12.5 % (v/v)	R1	R2	R3	R1	R2	R3	R1	R2	R3							
Assay 1	3	2	5	17	15	14	27	29	31	15.89	100000	100	1.59E+08	8.20	8.34239	0.13813
Assay 2	5	6	5	12	9	12	54	52	46	22.33	100000	100	2.23E+08	8.35		
Assav 3	29	33	25	16	12	13	47	44	51	30.00	100000	100	3.00E+08	8.48		

(c) *Pinus pinaster* Ait. extract

Sample 1 (mg mL <sup>-1</sup> )	Number of colonies (assay 1)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	0	0	0	0	1	100	0	0
6.25	4	3	1	2.67	1	100	2.67E+02	2.43
3.13	9	12	11	10.67	10	100	1.07E+04	4.03
1.56	32	27	31	30.00	10	100	3.00E+04	4.48
0.78	21	24	25	23.33	100	100	2.33E+05	5.37
0.39	11	9	5	8.33	100000	100	8.33E+07	7.92

Sample 1 (mg mL <sup>-1</sup> )	Number of colonies (assay 2)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	1	0	0	0.33	1	100	3.33E+01	1.52
6.25	38	41	34	37.67	1	100	3.77E+03	3.58
3.13	13	9	16	12.67	100	100	1.27E+05	5.10
1.56	7	9	11	9.00	1000	100	9.00E+05	5.95
0.78	45	46	46	45.67	10000	100	4.57E+07	7.66
0.39	31	28	34	31.00	100000	100	3.10E+08	8.49

Sample 1 (mg mL <sup>-1</sup> )	Number of colonies (assay 3)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	1	0	0	0.33	1	100	3.33E+01	1.52
6.25	52	44	50	48.67	1	100	4.87E+03	3.69
3.13	28	19	13	20.00	100	100	2.00E+05	5.30
1.56	11	9	11	10.33	1000	100	1.03E+06	6.01
0.78	21	22	18	20.33	10000	100	2.03E+07	7.31
0.39	7	8	10	8.33	100000	100	8.33E+07	7.92

	Number of colonies (assay 1)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 2 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	0	0	0	0	1	100	0	0
6.25	11	7	8	8.67	10	100	8.67E+03	3.94
3.13	9	8	9	8.67	10000	100	8.67E+06	6.94
1.56	23	15	20	19.33	10000	100	1.93E+07	7.29
0.78	34	35	25	31.33	10000	100	3.13E+07	7.50
0.39	9	9	7	8.33	100000	100	8.33E+07	7.92

	Number of colonies (assay 2)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 2 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	0	0	0	0	1	100	0	0
6.25	34	23	27	28.00	10	100	2.80E+04	4.45
3.13	63	50	58	57.00	1000	100	5.70E+06	6.76
1.56	11	9	12	10.67	10000	100	1.07E+07	7.03
0.78	31	30	34	31.67	10000	100	3.17E+07	7.50
0.39	13	12	10	11.67	100000	100	1.17E+08	8.07

	Number of colonies (assay 3)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 2 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	0	0	0	0	1	100	0	0
6.25	27	35	32	31.33	10	100	3.13E+04	4.50
3.13	54	49	48	50.33	1000	100	5.03E+06	6.70
1.56	12	16	20	16.00	10000	100	1.60E+07	7.20
0.78	35	40	33	36.00	10000	100	3.60E+07	7.56
0.39	20	31	27	26.00	100000	100	2.60E+08	8.41

	Number of colonies (assay 1)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 3 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	24	28	31	27.67	10	100	2.77E+04	4.44
6.25	16	21	24	20.33	100	100	2.03E+05	5.31
3.13	45	37	40	40.67	1000	100	4.07E+06	6.61
1.56	11	15	19	15.00	10000	100	1.50E+07	7.18
0.78	25	31	24	26.67	10000	100	2.67E+07	7.43
0.39	17	19	20	18.67	10000	100	1.87E+07	7.27

	Number of colonies (assay 2)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 3 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	53	40	38	43.67	10	100	4.37E+04	4.64
6.25	15	10	10	11.67	100	100	1.17E+05	5.07
3.13	46	45	45	45.33	1000	100	4.53E+06	6.66
1.56	5	11	9	8.33	10000	100	8.33E+06	6.92
0.78	23	24	21	22.67	10000	100	2.27E+07	7.36
0.39	30	22	28	26.67	10000	100	2.67E+07	7.43

	Number of colonies (assay 3)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 3 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	47	47	46	46.67	10	100	4.67E+04	4.67
6.25	10	9	12	10.33	100	100	1.03E+05	5.01
3.13	39	35	36	36.67	1000	100	3.67E+06	6.56
1.56	5	10	9	8.00	10000	100	8.00E+06	6.90
0.78	19	15	10	14.67	10000	100	1.47E+07	7.17
0.39	33	31	25	29.67	10000	100	2.97E+07	7.47

	Sample 1			Sample 2			Sample 3			Average (CFU mL <sup>-1</sup> )	Standard derivation
<i>P. pinaster</i> Ait. extract (mg mL <sup>-1</sup> )	Assay 1	Assay 2	Assay 3	Assay 1	Assay 2	Assay 3	Assay 1	Assay 2	Assay 3		
25	0	0	0	0	0	0	0	0	0	0	0
12.5	0	1.52288	1.52288	0	0	0	4.44196	4.64015	4.66901	1.86632	2.13165
6.25	2.42597	3.57596	3.68723	3.93785	4.44716	4.49601	5.30821	5.06695	5.01424	4.21773	0.91220
3.13	4.02803	5.10266	5.30103	6.93785	6.75587	6.70186	6.60924	6.65642	6.56427	6.07303	1.01233
1.56	4.47712	5.95424	6.01424	7.28631	7.02803	7.20412	7.17609	6.92082	6.90309	6.55156	0.92138
0.78	5.36798	7.65960	7.30821	7.49601	7.50060	7.55630	7.42597	7.35539	7.16633	7.20404	0.70360
0.39	7.92082	8.49136	7.92082	7.92082	8.06695	8.41497	7.27107	7.42597	7.47227	7.87834	0.42472

This table represents the mean of the three independent experiments in the three samples studied and their standard deviations.

(d) *Pinus pinea* L. extract

Sample 1 (mg mL <sup>-1</sup> )	Number of colonies (assay 1)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	8	5	6	6.33	1	100	6.33E+02	2.80
6.25	10	15	16	13.67	1	100	1.37E+03	3.14
3.13	18	12	21	17.00	10	100	1.70E+04	4.23
1.56	27	29	24	26.67	10	100	2.67E+04	4.43
0.78	3	7	4	4.67	100000	100	4.67E+07	7.67
0.39	10	15	17	14.00	100000	100	1.40E+08	8.15

Sample 1 (mg mL <sup>-1</sup> )	Number of colonies (assay 2)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	15	6	15	12.00	1	100	1.20E+03	3.08
6.25	16	23	24	21.00	1	100	2.10E+03	3.32
3.13	37	39	40	38.67	10	100	3.87E+04	4.59
1.56	33	35	38	35.33	100	100	3.53E+05	5.55
0.78	2	1	8	3.67	10000	100	3.67E+06	6.56
0.39	10	11	16	12.33	100000	100	1.23E+08	8.09

Sample 1 (mg mL <sup>-1</sup> )	Number of colonies (assay 3)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	4	5	3	4.00	1	100	4.00E+02	2.60
6.25	7	8	9	8.00	10	100	8.00E+03	3.90
3.13	39	42	45	42.00	10	100	4.20E+04	4.62
1.56	43	45	9	32.33	100	100	3.23E+05	5.51
0.78	17	25	25	22.33	10000	100	2.23E+07	7.35

0.39	6	8	6	6.67	100000	100	6.67E+07	7.82
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Sample 2 (mg mL <sup>-1</sup> )	Number of colonies (assay 1)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	0	0	0	0	1	100	0	0
6.25	6	7	11	8.00	1	100	8.00E+02	2.90
3.13	45	36	35	38.67	100	100	3.87E+05	5.59
1.56	17	18	21	18.67	10000	100	1.87E+07	7.27
0.78	39	37	37	37.67	10000	100	3.77E+07	7.58
0.39	9	11	16	12.00	100000	100	1.20E+08	8.08

Sample 2 (mg mL <sup>-1</sup> )	Number of colonies (assay 2)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	0	0	0	0	1	100	0	0
6.25	6	3	5	4.67	1	100	4.67E+02	2.67
3.13	35	27	25	29.00	100	100	2.90E+05	5.46
1.56	15	19	17	17.00	10000	100	1.70E+07	7.23
0.78	38	36	26	33.33	10000	100	3.33E+07	7.52
0.39	9	10	8	9.00	100000	100	9.00E+07	7.95

Sample 2 (mg mL <sup>-1</sup> )	Number of colonies (assay 3)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	0	0	0	0	1	100	0	0
6.25	17	20	15	17.33	1	100	1.73E+03	3.24
3.13	36	39	29	34.67	100	100	3.47E+05	5.54
1.56	29	30	24	27.67	10000	100	2.77E+07	7.44
0.78	49	57	46	50.67	10000	100	5.07E+07	7.70
0.39	25	26	23	24.67	100000	100	2.47E+08	8.39



	Number of colonies (assay 1)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 3 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	3	7	2	4.00	10	100	4.00E+03	3.60
6.25	17	11	16	14.67	10	100	1.47E+04	4.17
3.13	20	27	26	24.33	100	100	2.43E+05	5.39
1.56	45	37	33	38.33	10000	100	3.83E+07	7.58
0.78	11	2	9	7.33	10000	100	7.33E+06	6.87
0.39	9	5	7	7.00	100000	100	7.00E+07	7.85

	Number of colonies (assay 2)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 3 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	5	17	4	8.67	10	100	8.67E+03	3.94
6.25	57	58	41	52.00	10	100	5.20E+04	4.72
3.13	16	14	12	14.00	100	100	1.40E+05	5.15
1.56	5	10	10	8.33	10000	100	8.33E+06	6.92
0.78	25	24	23	24.00	10000	100	2.40E+07	7.38
0.39	30	19	28	25.67	10000	100	2.57E+07	7.41

	Number of colonies (assay 3)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 3 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	39	29	43	37.00	10	100	3.70E+04	4.57
6.25	56	61	59	58.67	10	100	5.87E+04	4.77
3.13	21	24	27	24.00	100	100	2.40E+05	5.38
1.56	13	13	6	10.67	10000	100	1.07E+07	7.03
0.78	19	18	20	19.00	10000	100	1.90E+07	7.28
0.39	13	24	23	20.00	10000	100	2.00E+07	7.30

	Sample 1			Sample 2			Sample 3			Average (CFU mL <sup>-1</sup> )	Standard derivation
<i>P. pinea</i> L. extract (mg mL <sup>-1</sup> )	Assay 1	Assay 2	Assay 3	Assay 1	Assay 2	Assay 3	Assay 1	Assay 2	Assay 3		
25	0	0	0	0	0	0	0	0	0	0	0
12.5	2.80163	3.07918	2.60206	0	0	0	3.60206	3.93785	4.56820	2.28789	1.81457
6.25	3.13566	3.32222	3.90309	2.90309	2.66901	3.23888	4.16633	4.71600	4.76839	3.64696	0.77290
3.13	4.23045	4.58734	4.62325	5.58734	5.46240	5.53991	5.38620	5.14613	5.38021	5.10480	0.49635
1.56	4.42597	5.54818	5.50965	7.27107	7.23045	7.44196	7.58358	6.92082	7.02803	6.55108	1.10738
0.78	7.66901	6.56427	7.34895	7.57596	7.52288	7.70472	6.86530	7.38021	7.27875	7.32334	0.38086
0.39	8.14613	8.09108	7.82391	8.07918	7.95424	8.39211	7.84510	7.40937	7.30103	7.89357	0.35040

This table represents the mean of the three independent experiments in the three samples studied and their standard deviations.

**Table S2.** *E. coli* counts after application of *Pinus pinaster* Ait. and *Pinus pinea* L. bark polar extracts. (a) *E. coli* control: The bacterial control was only inoculated with *E. coli*; (b) Solvent control: The solvent control represents the bacterial growth under 12.5% (v/v) ethanol; (c) *Pinus pinaster* Ait. extract: The results represent the effect of *P. pinaster* Ait. bark polar extract against the growth of *E. coli* and (d) *Pinus pinea* L. extract: The results represent the effect of *P. pinea* L. bark polar extract against the growth of *E. coli*. *Pinus* spp. bark polar extracts were prepared in triplicate (samples 1-3). Each sample was evaluated three times (assay 1- 2) in different periods to secure independent replication. with three replicates (R1-R3) for each concentration. The results represent the mean of the three independent experiments in the three samples studied and their standard deviations.

**(a) *E. coli* control**

	Number of colonies									Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )	Average log (CFU mL <sup>-1</sup> )	Standard derivation
	Sample 1			Sample 2			Sample 3									
<i>E. coli</i> control	R1	R2	R3	R1	R2	R3	R1	R2	R3							
Assay 1	4	5	7	60	52	55	35	50	44	34.67	100000	100	3.47E+08	8.54	8.54314	0.00288
Assay 2	39	41	35	16	13	15	54	48	54	35.00	100000	100	3.50E+08	8.54		
Assay 3	37	42	39	23	25	27	42	39	42	35.11	100000	100	3.51E+08	8.55		

**(b) Solvent control**

	Number of colonies									Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )	Average log (CFU mL <sup>-1</sup> )	Standard derivation
	Sample 1			Sample 2			Sample 3									
Solvent 12.5 % (v/v)	R1	R2	R3	R1	R2	R3	R1	R2	R3							
Assay 1	4	1	2	37	40	42	38	37	41	26.89	100000	100	2.69E+08	8.42957	8.37132	0.06083
Assay 2	26	21	25	5	9	12	37	39	40	23.78	100000	100	2.38E+08	8.37617		
Assay 3	6	8	6	19	21	20	36	35	32	20.33	100000	100	2.03E+08	8.30821		

(c) *Pinus pinaster* Ait. extract

Sample 1 (mg mL <sup>-1</sup> )	Number of colonies (assay 1)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	9	9	5	7.67	100000	100	7.67E+07	7.88
6.25	31	29	33	31.00	100000	100	3.10E+08	8.49
3.13	32	34	36	34.00	100000	100	3.40E+08	8.53
1.56	32	27	31	30.00	100000	100	3.00E+08	8.48
0.78	31	34	37	34.00	100000	100	3.40E+08	8.53
0.39	39	31	35	35.00	100000	100	3.50E+08	8.54

Sample 1 (mg mL <sup>-1</sup> )	Number of colonies (assay 2)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	16	16	9	13.67	100000	100	1.37E+08	8.14
6.25	34	37	41	37.33	100000	100	3.73E+08	8.57
3.13	35	43	31	36.33	100000	100	3.63E+08	8.56
1.56	33	38	42	37.67	100000	100	3.77E+08	8.58
0.78	44	37	34	38.33	100000	100	3.83E+08	8.58
0.39	38	31	45	38.00	100000	100	3.80E+08	8.58

Sample 1 (mg mL <sup>-1</sup> )	Number of colonies (assay 3)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0.00
12.5	10	12	12	11.33	100000	100	1.13E+08	8.05
6.25	33	27	32	30.67	100000	100	3.07E+08	8.49
3.13	45	38	41	41.33	100000	100	4.13E+08	8.62
1.56	43	37	41	40.33	100000	100	4.03E+08	8.61
0.78	38	41	39	39.33	100000	100	3.93E+08	8.59
0.39	42	41	45	42.67	100000	100	4.27E+08	8.63

	Number of colonies (assay 1)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 2 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	31	33	35	33.00	100000	100	3.30E+08	8.52
6.25	51	49	50	50.00	100000	100	5.00E+08	8.70
3.13	51	53	49	51.00	100000	100	5.10E+08	8.71
1.56	51	57	55	54.33	100000	100	5.43E+08	8.74
0.78	53	57	51	53.67	100000	100	5.37E+08	8.73
0.39	55	52	54	53.67	100000	100	5.37E+08	8.73

	Number of colonies (assay 2)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 2 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	10	9	8	9.00	100000	100	9.00E+07	7.95
6.25	49	51	52	50.67	100000	100	5.07E+08	8.70
3.13	53	54	50	52.33	100000	100	5.23E+08	8.72
1.56	48	55	50	51.00	100000	100	5.10E+08	8.71
0.78	51	53	50	51.33	100000	100	5.13E+08	8.71
0.39	54	47	56	52.33	100000	100	5.23E+08	8.72

	Number of colonies (assay 3)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 2 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	19	12	15	15.33	100000	100	1.53E+08	8.19
6.25	34	38	32	34.67	100000	100	3.47E+08	8.54
3.13	33	34	40	35.67	100000	100	3.57E+08	8.55
1.56	35	38	37	36.67	100000	100	3.67E+08	8.56
0.78	41	35	37	37.67	100000	100	3.77E+08	8.58
0.39	34	37	36	35.67	100000	100	3.57E+08	8.55

Sample 3 (mg mL <sup>-1</sup> )	Number of colonies (assay 1)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0.00
12.5	31	34	39	34.67	100000	100	3.47E+08	8.54
6.25	51	45	54	50.00	100000	100	5.00E+08	8.70
3.13	52	56	50	52.67	100000	100	5.27E+08	8.72
1.56	49	51	57	52.33	100000	100	5.23E+08	8.72
0.78	53	54	51	52.67	100000	100	5.27E+08	8.72
0.39	52	51	53	52.00	100000	100	5.20E+08	8.72

Sample 3 (mg mL <sup>-1</sup> )	Number of colonies (assay 2)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	12	15	12	13.00	100000	100	1.30E+08	8.11
6.25	19	22	20	20.33	100000	100	2.03E+08	8.31
3.13	24	22	20	22.00	100000	100	2.20E+08	8.34
1.56	18	23	25	22.00	100000	100	2.20E+08	8.34
0.78	24	21	23	22.67	100000	100	2.27E+08	8.36
0.39	17	23	26	22.00	100000	100	2.20E+08	8.34

Sample 3 (mg mL <sup>-1</sup> )	Number of colonies (assay 3)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	21	25	26	24.00	100000	100	2.40E+08	8.38
6.25	19	22	24	21.67	100000	100	2.17E+08	8.34
3.13	25	21	23	23.00	100000	100	2.30E+08	8.36
1.56	25	19	23	22.33	100000	100	2.23E+08	8.35
0.78	22	26	21	23.00	100000	100	2.30E+08	8.36
0.39	20	24	23	22.33	100000	100	2.23E+08	8.35

	Sample 1			Sample 2			Sample 3			Average (CFU mL <sup>-1</sup> )	Standard derivation
<i>P. pinaster</i> Ait. extract (mg mL <sup>-1</sup> )	Assay 1	Assay 2	Assay 3	Assay 1	Assay 2	Assay 3	Assay 1	Assay 2	Assay 3		
25	0	0	0	0	0	0	0	0	0	0	0
12.5	7.88461	8.13566	8.05436	8.51851	7.95424	8.18564	8.53991	8.11394	8.38021	8.19634	0.23510
6.25	8.49136	8.57210	8.48667	8.69897	8.70472	8.53991	8.69897	8.30821	8.33579	8.53741	0.14970
3.13	8.53148	8.56031	8.61630	8.70757	8.71878	8.55226	8.72154	8.34242	8.36173	8.56804	0.14283
1.56	8.47712	8.57596	8.60566	8.73507	8.70757	8.56427	8.71878	8.34242	8.34895	8.56398	0.14942
0.78	8.53148	8.58358	8.59476	8.72970	8.71040	8.57596	8.72154	8.35539	8.36173	8.57384	0.14133
0.39	8.54407	8.57978	8.63009	8.72970	8.71878	8.55226	8.71600	8.34242	8.34895	8.57356	0.14756

This table represents the mean of the three independent experiments in the three samples studied and their standard deviations.

(d) *Pinus pinea* L. extract

Sample 1 (mg mL <sup>-1</sup> )	Number of colonies (assay 1)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	9	9	8	8.67	100000	100	8.67E+07	7.94
6.25	30	35	36	33.67	100000	100	3.37E+08	8.53
3.13	38	32	31	33.67	100000	100	3.37E+08	8.53
1.56	37	29	34	33.33	100000	100	3.33E+08	8.52
0.78	33	37	34	34.67	100000	100	3.47E+08	8.54
0.39	30	35	37	34.00	100000	100	3.40E+08	8.53

Sample 1 (mg mL <sup>-1</sup> )	Number of colonies (assay 2)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	3	5	9	5.67	100000	100	5.67E+07	7.75
6.25	22	28	26	25.33	100000	100	2.53E+08	8.40
3.13	37	41	46	41.33	100000	100	4.13E+08	8.62
1.56	40	43	49	44.00	100000	100	4.40E+08	8.64
0.78	42	45	48	45.00	100000	100	4.50E+08	8.65
0.39	38	42	44	41.33	100000	100	4.13E+08	8.62

Sample 1 (mg mL <sup>-1</sup> )	Number of colonies (assay 3)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	7	2	3	4.00	100000	100	4.00E+07	7.60
6.25	31	35	34	33.33	100000	100	3.33E+08	8.52
3.13	41	44	37	40.67	100000	100	4.07E+08	8.61
1.56	42	39	42	41.00	100000	100	4.10E+08	8.61
0.78	40	44	37	40.33	100000	100	4.03E+08	8.61
0.39	39	41	43	41.00	100000	100	4.10E+08	8.61



	Number of colonies (assay 1)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 2 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	17	21	19	19.00	100000	100	1.90E+08	8.28
6.25	44	45	49	46.00	100000	100	4.60E+08	8.66
3.13	42	42	41	41.67	100000	100	4.17E+08	8.62
1.56	43	38	41	40.67	100000	100	4.07E+08	8.61
0.78	51	50	44	48.33	100000	100	4.83E+08	8.68
0.39	53	51	50	51.33	100000	100	5.13E+08	8.71

	Number of colonies (assay 2)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 2 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	31	32	32	31.67	100000	100	3.17E+08	8.50
6.25	49	51	53	51.00	100000	100	5.10E+08	8.71
3.13	52	54	50	52.00	100000	100	5.20E+08	8.72
1.56	49	53	51	51.00	100000	100	5.10E+08	8.71
0.78	55	48	52	51.67	100000	100	5.17E+08	8.71
0.39	53	51	49	51.00	100000	100	5.10E+08	8.71

	Number of colonies (assay 3)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 2 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	21	19	22	20.67	100000	100	2.07E+08	8.32
6.25	41	38	36	38.33	100000	100	3.83E+08	8.58
3.13	37	34	40	37.00	100000	100	3.70E+08	8.57
1.56	39	35	37	37.00	100000	100	3.70E+08	8.57
0.78	35	38	34	35.67	100000	100	3.57E+08	8.55
0.39	37	41	39	39.00	100000	100	3.90E+08	8.59

	Number of colonies (assay 1)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 3 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	24	28	28	26.67	100000	100	2.67E+08	8.43
6.25	45	40	39	41.33	100000	100	4.13E+08	8.62
3.13	58	59	53	56.67	100000	100	5.67E+08	8.75
1.56	57	56	61	58.00	100000	100	5.80E+08	8.76
0.78	45	50	52	49.00	100000	100	4.90E+08	8.69
0.39	47	53	50	50.00	100000	100	5.00E+08	8.70

	Number of colonies (assay 2)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 3 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	12	18	19	16.33	100000	100	1.63E+08	8.21
6.25	17	22	24	21.00	100000	100	2.10E+08	8.32
3.13	22	20	23	21.67	100000	100	2.17E+08	8.34
1.56	23	25	21	23.00	100000	100	2.30E+08	8.36
0.78	20	24	22	22.00	100000	100	2.20E+08	8.34
0.39	23	25	20	22.67	100000	100	2.27E+08	8.36

	Number of colonies (assay 3)			Average	Dilution	Dilution factor	CFU mL <sup>-1</sup>	log (CFU mL <sup>-1</sup> )
Sample 3 (mg mL <sup>-1</sup> )	R1	R2	R3					
25	0	0	0	0	1	100	0	0
12.5	21	25	23	23.00	100000	100	2.30E+08	8.36
6.25	19	24	26	23.00	100000	100	2.30E+08	8.36
3.13	20	23	26	23.00	100000	100	2.30E+08	8.36
1.56	22	24	21	22.33	100000	100	2.23E+08	8.35
0.78	18	25	23	22.00	100000	100	2.20E+08	8.34
0.39	21	25	23	23.00	100000	100	2.30E+08	8.36

	Sample 1			Sample 2			Sample 3			Average (CFU mL <sup>-1</sup> )	Standard derivation
<i>P. pinea</i> L. extract (mg mL <sup>-1</sup> )	Assay 1	Assay 2	Assay 3	Assay 1	Assay 2	Assay 3	Assay 1	Assay 2	Assay 3		
25	0	0	0	0	0	0	0	0	0	0	0
12.5	7.93785	7.75333	7.60206	8.27875	8.50060	8.31527	8.42597	8.21307	8.36173	8.15429	0.31508
6.25	8.52720	8.40369	8.52288	8.66276	8.70757	8.58358	8.61630	8.32222	8.36173	8.52310	0.13535
3.13	8.52720	8.61630	8.60924	8.61979	8.71600	8.56820	8.75333	8.33579	8.36173	8.56751	0.14191
1.56	8.52288	8.64345	8.61278	8.60924	8.70757	8.56820	8.76343	8.36173	8.34895	8.57092	0.14123
0.78	8.53991	8.65321	8.60566	8.68425	8.71321	8.55226	8.69020	8.34242	8.34242	8.56928	0.14186
0.39	8.53148	8.61630	8.61278	8.71040	8.70757	8.59106	8.69897	8.35539	8.36173	8.57619	0.13705

This table represents the mean of the three independent experiments in the three samples studied and their standard deviations.