Biodeterioration of pre-treated polypropylene by *Aspergillus terreus* and *Engyodontium album*

Amira Farzana Samat [ac], Dee Carter [b] & Ali Abbas [a*]

[a] School of Chemical and Biomolecular Engineering, The University of Sydney, NSW 2006, Australia
[b] School of Life and Environmental Sciences, The University of Sydney, NSW, 2006, Australia
[c] Faculty of Chemical Engineering and Technology, Universiti Malaysia Perlis, 02100 Padang Besar, Perlis, Malaysia

*Corresponding author: ali.abbas@sydney.edu.au (Ali Abbas).

Supplementary Information

Supplementary Table 1: P-value of gravimetric weight loss of PP samples incubated in *A. terreus* and *E. album* (P-value = 0.05)

Fungi		*A. terreus*			*E. album*		
Samples							
Pre-treatment	Incu-bation Days	GPP	FPP	MFPP	GPP	FPP	MFPP
UV	30	0.8097/ 0.8378	0.7984/ 0.8635	0.0057**/ 0.0164*	0.9232/ 0.9519	0.9224/ 0.9890	0.5610/ 0.8425
	60	0.5523/ 0.6002	0.6846/ 0.7662	0.0034**/ 0.0003***	0.8599/ 0.9154	0.7001/ 0.7822	0.4417/ 0.1357
	90	0.2193/ 0.2328	0.5829/ 0.6055	<0.0001**** / <0.0001****	0.8581/ 0.8862	0.5381/ 0.5599	0.0247*/ 0.0248*
Heat	30	0.6423/ 0.7135	0.0552/ 0.1766	<0.0001**** / 0.0011**	0.1833/ 0.2171	0.0055**/ 0.0259*	<0.0001**** / <0.0001****
	60	0.5041/ 0.5529	0.0319*/ 0.2252	<0.0001**** / 0.0004***	0.1650/ 0.1886	0.0024**/ 0.0332*	0.0001***/ 0.0024**
	90	0.1876/ 0.2335	0.0331*/ 0.2087	<0.0001**** / 0.0008***	0.0156*/ 0.0216*	0.0011**/ 0.0158*	<0.0001**** / <0.0001****
FR	30	0.9196/ 0.9759	0.9374/ 0.9374	0.3891/ 0.2755	0.7680/ 0.8195	0.9421/ 0.9421	0.6272/ 0.4742
	60	0.9135/ 0.9697	0.9173/ 0.9321	0.3103/ 0.1612	0.7781/ 0.8327	0.5869/ 0.7230	0.0618/ 0.0247*
	90	0.5585/ 0.6471	0.3793/ 0.4620	0.4075/ 0.2672	0.4795/ 0.5243	0.2689/ 0.3358	0.0032**/ 0.0013**

*Two-way ANOVA was performed to determine the p-value between biomass production of *A. terreus* and *E. album* for each pre-treatment conducted with its respective treated and untreated (untreated/treated) controls.

Supplementary Table 2: Mass reduction efficiency of *A. terreus* and *E. album* in GPP, FPP and MFPP-infused mineral salt media after 90 days of incubation. Asterisks indicate significant difference while 'ns' indicates not significant between WPC Control (first) and its treated controls (second).

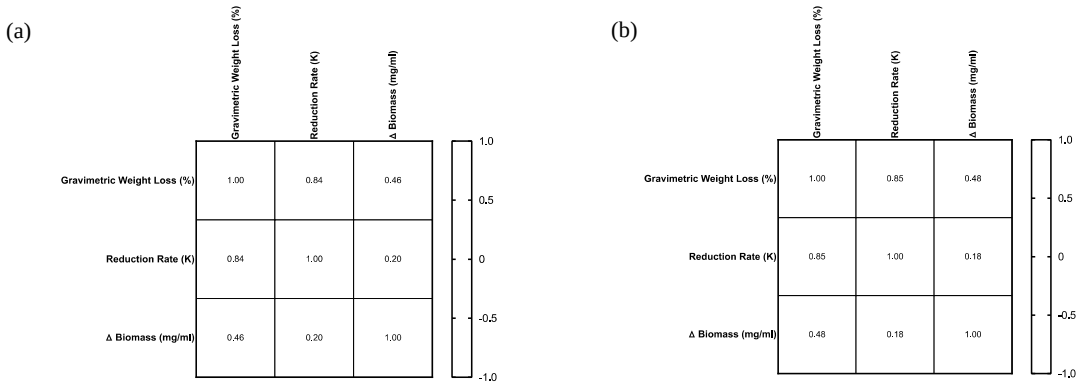
Controls / Fungi	PP samples	Pre-treatment	Initial weight (g)	Final weight (g)	Removal constant (K) day^{-1}	Half-life (days)
WPC Control	GPP	-	0.0715	0.0715	0.0000	∞
	FPP		0.0567	0.0566	0.0000	35340.10
	MFPP		0.0085	0.0081	0.0005	1294.20
UV-treated Control	GPP	UV	0.0713	0.0712	0.0000	44448.06
	FPP		0.0656	0.0654	0.0000	20430.50
	MFPP		0.0191	0.0182	0.0005	1292.47
Heat-treated Control	GPP	Heat	0.0798	0.0794	0.0001	12414.24
	FPP		0.0814	0.0784	0.0004	1661.28
	MFPP		0.0082	0.0075	0.0010	699.12
Fenton-treated Control	GPP	Fenton	0.0588	0.0582	0.0001	6082.31
	FPP		0.0600	0.0595	0.0001	7454.75
	MFPP		0.0166	0.0159	0.0005	1447.96
A. terreus	GPP	UV	0.0298	0.0283	0.0005	1264.09
	FPP		0.0115	0.0112	0.0003	2658.96
	MFPP		0.0036	0.0027	0.0032	214.52*/*
	GPP	Heat	0.0712	0.0675	0.0006	1169.55
	FPP		0.0902	0.0829	0.0009	738.90
	MFPP		0.0394	0.0306	0.0028	245.74
	GPP	Fenton	0.0747	0.0730	0.0003	2657.16
	FPP		0.0602	0.0580	0.0004	1676.59
	MFPP		0.0099	0.0091	0.0009	771.23
E. album	GPP	UV	0.0744	0.0739	0.0001	8675.13
	FPP		0.0585	0.0570	0.0003	2400.23
	MFPP		0.0101	0.0087	0.0016	429.08
	GPP	Heat	0.0713	0.0644	0.0011	616.04
	FPP		0.0566	0.0490	0.0016	434.70
	MFPP		0.0097	0.0071	0.0035	196.96*/ns
	GPP	Fenton	0.0713	0.0693	0.0003	2193.66
	FPP		0.0600	0.0573	0.0005	1337.95
	MFPP		0.0109	0.0091	0.0020	345.64

Supplementary Table 3: P-value of *A. terreus* and *E. album* biomass production in treated PP samples-infused MSM media (P-value = 0.05)

Fungi	*A. terreus*			*E. album*		
Samples	GPP	FPP	MFPP	GPP	FPP	MFPP

Pre-treatment	Incubation Days						
UV	30	<0.0001****	<0.0001****	<0.0001****	0.4934	0.5837	0.5133
	60	<0.0001****	<0.0001****	<0.0001****	0.0528	0.9265	<0.0001****
	90	0.0006***	<0.0001****	<0.0001****	0.2529	0.1894	<0.0001****
Heat	30	0.7099	0.1793	0.0111*	0.6137	0.6635	0.1866
	60	0.2623	0.1141	0.0170*	0.9121	0.4747	0.0673
	90	<0.0001****	<0.0001****	<0.0001****	0.9279	0.2603	0.0040**
FR	30	0.5489	0.2826	0.0736	0.2457	0.2799	0.5080
	60	0.0698	0.0035**	<0.0001****	0.2840	0.4873	0.0149*
	90	0.2595	0.0019**	<0.0001****	0.9704	0.1793	<0.0001****

*Two-way ANOVA was performed to determine the p-value between biomass production of *A. terreus* and *E. album* for each pre-treatment conducted with its respective controls.



Supplementary Figure 1: Correlation coefficient (Pearson r) of *A. terreus* (a) and *E. album* (b)