

Article

Analytical Pyrolysis of *Pinus radiata* and *Eucalyptus globulus*: Effects of Microwave Pretreatment on Pyrolytic Vapours Composition

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Table S1. Microwave pretreatment parameters for PR and EG.

Sample	Microwave	1 min			2 min			3 min			5 min		
		T _{avg}	T _{max}	W _{loss}	T _{avg}	T _{max}	W _{loss}	T _{avg}	T _{max}	W _{loss}	T _{avg}	T _{max}	W _{loss}
		°C	°C	%	°C	°C	%	°C	°C	%	°C	°C	%
PR	259	54,68 ± 1.25	64,41 ± 1.36	1,44 ± 0.13	63,02 ± 1.69	66,12 ± 2.15	4,01 ± 0.18	65,45 ± 1.76	69,61 ± 3.02	6,24 ± 0.35	73,35 ± 2.38	78,11 ± 1.89	7,61 ± 0.14
	462	78,33 ± 2.16	86,02 ± 0.95	3,76 ± 0.15	80,02 ± 2.41	86,29 ± 3.15	5,38 ± 0.09	88,57 ± 1.23	96,79 ± 2.15	7,86 ± 0.26	94,63 ± 3.01	106,79 ± 0.87	8,26 ± 0.16
	595	77,73 ± 1.87	84,79 ± 1.23	4,23 ± 0.24	84,57 ± 0.67	92,01 ± 2.89	6,25 ± 0.14	95,32 ± 0.157	104,21 ± 2.54	8,97 ± 0.19	102,85 ± 2.68	115,72 ± 1.24	10,15 ± 0.17
	700	80,62 ± 1.93	93,50 ± 1.78	5,48 ± 0.23	87,45 ± 1.26	103,61 ± 2.46	7,31 ± 0.12	103,47 ± 2.47	120,32 ± 2.01	10,04 ± 0.82	115,17 ± 3.04	147,69 ± 1.56	11,06 ± 0.08
EG	259	42,78 ± 1.24	46,12 ± 0.49	0,69 ± 0.11	50,40 ± 1.47	57,70 ± 1.32	1,51 ± 0.04	50,98 ± 2.10	57,01 ± 1.23	2,63 ± 0.12	54,72 ± 0.16	59,71 ± 2.06	3,12 ± 0.41
	462	57,78 ± 1.47	65,69 ± 3.26	1,11 ± 0.05	68,68 ± 1.98	75,91 ± 1.52	2,14 ± 0.26	78,93 ± 1.56	85,98 ± 1.27	3,23 ± 0.15	90,31 ± 2.87	106,61 ± 1.78	3,72 ± 0.16
	595	72,63 ± 1.52	80,02 ± 1.89	1,33 ± 0.10	78,43 ± 2.01	84,89 ± 1.87	3,01 ± 0.13	83,67 ± 1.89	97,89 ± 1.96	4,12 ± 0.16	97,53 ± 2.16	109,10 ± 3.14	4,71 ± 0.32
	700	72,37 ± 1.71	79,21 ± 2.11	1,79 ± 0.15	94,82 ± 2.45	106,62 ± 1.59	3,47 ± 0.17	99,82 ± 2.03	118,02 ± 1.90	4,58 ± 0.14	101,98 ± 1.07	130,71 ± 2.79	5,17 ± 0.40

Table S2. Kinetic parameters and the characteristic temperatures of the thermogravimetric tests.

Bio-mass	α °C/min	Pretreatment W-min	T _{initial} °C	T _{onset} °C	T _{shoulder} °C	T _{peak} °C	T _{offset} °C	Y _{shoulder} %	Y _{peak} %	Y _{offset} %	%Res	dY/dT _{shoulder} 10 ⁻³ s ⁻¹	dY/dT _{peak} 10 ⁻³ s ⁻¹
PR	5	WOT	28.84	231.42	309.25	345.61	367.09	61.84	89.01	22.54	13.53	-0.70	-1.06
		259 - 5	39.12	239.54	319.51	356.01	380.71	61.01	84.75	21.03	13.55	-0.70	-1.01
		700 - 5	36.24	251.64	326.00	358.07	386.93	62.04	68.02	25.01	15.05	-0.71	-0.82
	10	WOT	33.72	229.64	310.05	344.26	365.17	66.84	93.14	22.82	12.40	-0.73	-1.12
		259 - 5	38.88	244.71	319.03	355.84	377.86	67.25	81.45	25.19	16.89	-0.73	-0.97
		700 - 5	36.57	254.76	330.58	366.41	401.93	65.01	71.46	20.85	15.36	-0.73	-0.85
	20	WOT	33.81	228.56	309.85	343.86	365.76	66.87	91.85	24.17	8.26	-0.74	-1.08
		259 - 5	36.68	237.54	319.56	354.71	384.01	67.18	82.84	24.65	11.82	-0.74	-0.99
		700 - 5	39.21	249.16	327.17	366.85	399.61	68.23	69.13	21.83	13.89	-0.74	-0.83
EG	5	WOT	32.02	229.41	279.59	336.80	357.23	12.98	76.92	37.58	20.61	-0.48	-1.25
		259 - 5	50.88	233.76	297.32	349.17	369.33	15.05	77.58	40.21	22.53	-0.48	-1.15
		700 - 5	44.88	240.83	337.27	361.52	391.34	12.14	74.82	41.40	20.34	-0.46	-0.91
	10	WOT	33.48	225.39	278.34	338.17	355.14	12.42	77.42	37.33	19.12	-0.48	-1.27
		259 - 5	39.06	234.28	293.25	349.26	368.29	13.73	75.46	37.34	21.34	-0.48	-1.13
		700 - 5	50.41	240.36	339.13	360.27	396.32	9.88	73.18	25.98	18.30	-0.49	-0.94
	20	WOT	34.97	225.31	280.31	338.21	353.32	13.55	77.63	37.15	21.30	-0.47	-1.29
		259 - 5	48.01	234.76	291.46	348.40	369.37	11.59	77.78	37.19	19.48	-0.49	-1.20
		700 - 5	41.90	240.91	309.24	362.38	393.47	16.11	74.97	41.31	22.03	-0.44	-1.19

Table S3. Pyrolysis compounds of PR and EG (WOT, 259 - 700 W) (WE) and (WOE).

Family	Chemical compounds	PR %Area WE			PR %Area WOE			EG %Area WE			EG %Area WOE		
		WOT	259	700	WOT	259	700	WOT	259	700	WOT	259	700
Phenol	Creosol	7.10	6.68	5.79	6.45	6.00	5.81	3.01	2.66	3.01	2.23	2.22	2.58
Acid	Acetic acid	6.72	4.97	4.77	6.43	6.29	5.59	10.85	9.95	9.49	10.75	9.30	8.48
Phenol	2-Methoxy-4-vinylphenol	6.49	6.03	6.06	5.24	5.02	4.97	2.44	2.18	1.81	1.85	2.11	2.31
Phenol	Phenol, 2-methoxy-	5.84	5.20	4.85	4.20	3.71	3.97	1.69	1.70	1.70	0.94	1.12	1.25
Phenol	Phenol, 2-methoxy-4-(1-propenyl)-	5.32	5.13	4.27	0.73	4.80	5.73	0.61	0.55	0.58	0.31	0.21	0.21
Acid	Acetic acid, (acetyloxy)-	4.52	3.74	3.53	4.22	4.18	4.01	5.12	4.88	4.64	5.03	4.51	3.68
Alcohol	Acetol	4.00	5.72	6.83	4.87	5.56	5.72	4.35	4.98	5.93	3.53	4.43	4.61
Acid	Propanoic acid, 2-oxo-, methyl ester	3.61	2.72	1.32	3.02	2.92	1.26	2.69	2.40	2.30	2.78	2.85	1.64
Alcohol	2(5H)-Furanone	3.37	2.97	3.08	2.49	3.10	3.00	1.30	1.30	0.88	0.66	0.85	0.88
Ketone	2-Cyclopenten-1-one, 2-hydroxy-	3.09	3.50	3.67	3.21	3.95	4.10	2.93	3.06	3.56	3.14	3.57	4.00
Ketone	1,2-Cyclopentanedione, 3-methyl-	2.65	2.50	2.42	2.53	2.62	2.82	2.37	2.33	2.30	1.91	2.11	2.44
Alcohol	1,3-propanediol	2.63	2.63	2.63	2.43	2.66	2.70	0.70	0.75	0.78	0.53	0.74	0.67
Aldehyde	Succindialdehyde	2.51	2.28	2.10	2.12	2.37	3.14	2.14	2.15	2.27	1.28	1.70	2.32
Acid	Oxalic acid	2.33	2.33	2.15	2.28	1.57	1.51	5.48	5.29	4.60	4.69	4.41	3.48
Phenol	Phenol, 4-ethyl-2-methoxy-	2.28	1.99	1.63	2.89	2.32	2.14	0.69	0.71	0.69	1.42	0.57	0.75
Acid	Acetic acid ethenyl ester	2.07	1.85	1.67	2.20	2.16	1.87	1.86	1.98	2.12	1.40	1.78	2.35
Aldehyde	Furfural	1.75	1.99	2.21	2.06	2.18	2.30	2.64	2.74	2.81	2.06	2.25	3.00
Aldehyde	Methyl glyoxal	ND	2.14	2.71	3.64	4.25	4.18	3.12	3.47	3.65	2.77	3.80	4.25
Aldehyde	Benzaldehyde, 2,4-dihydroxy-6-methyl-	0.70	0.71	1.37	1.15	1.11	1.59	3.40	3.21	2.93	3.07	3.20	3.10
Phenol	Phenol, 2,6-dimethoxy-	ND	ND	ND	ND	ND	ND	5.13	4.91	4.54	5.12	4.74	4.60
Aldehyde	Hydroxyacetaldehyde	ND	ND	ND	ND	ND	ND	2.08	2.36	2.88	1.32	1.83	1.85

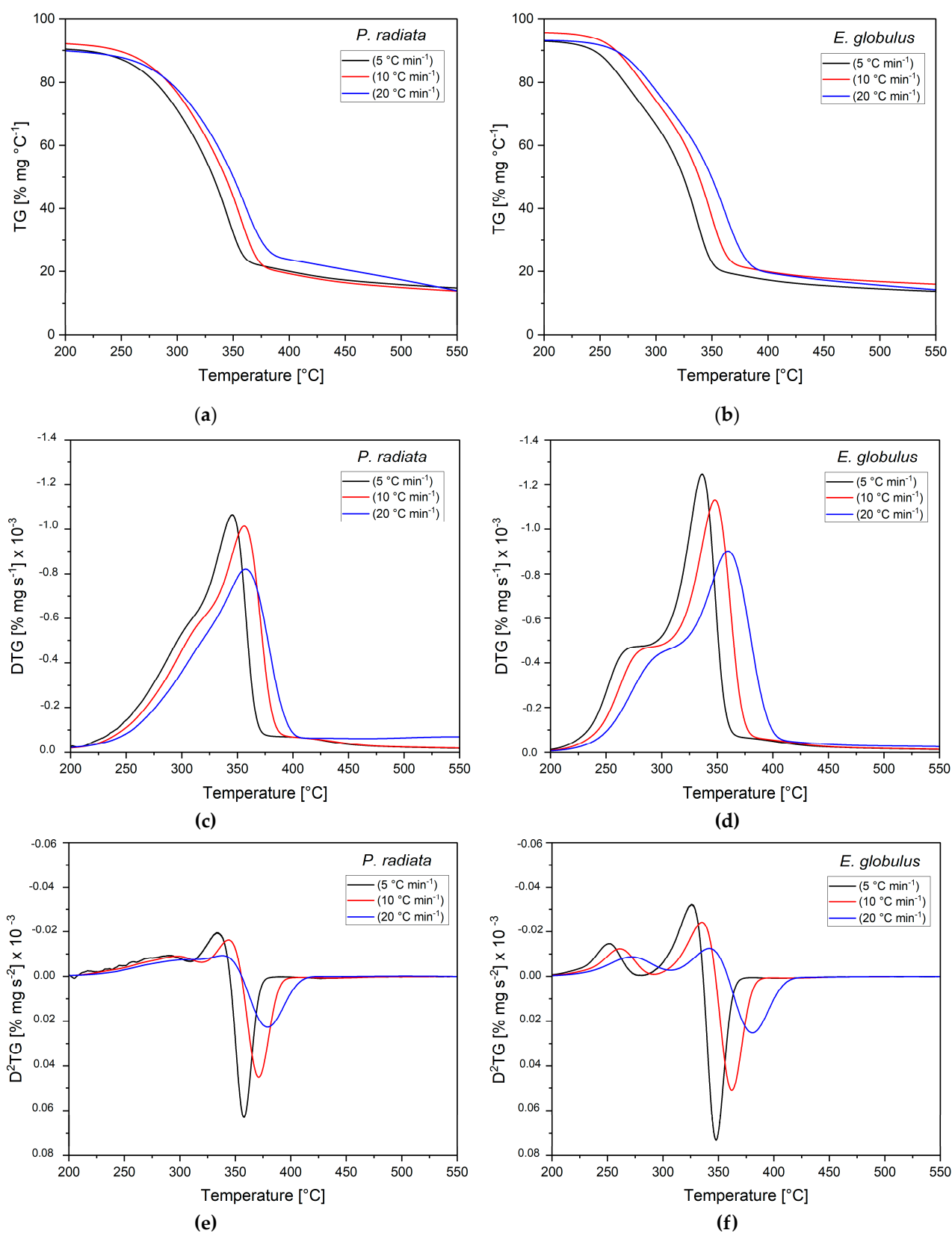


Figure S1. TG for a) *Pinus radiata* b) *Eucalyptus globulus*, DTG for c) *Pinus radiata* d) *Eucalyptus globulus* and D²TG for e) *Pinus radiata* f) *Eucalyptus globulus* at 5, 10 and 20 °C min⁻¹.