Table S1. Experimental charring data gathered by Scott and Glasspool (2005). Specimens were charred at durations ranging from 0.5 to 24 hrs and temperatures from 200 to 900 °C, from which the resulting mean random reflectance (R_o %) for each charring run was determined.

Duration of charring (hrs)	Experimental charring temp. (°C)	Mean Random Reflectance (Ro %)
0.5	200	0.00
1	200	0.00
2	200	0.00
4	200	0.00
24	200	0.00
1	275	0.10
24	275	0.40
0.5	300	0.10
1	300	0.27
4	300	0.34
2	300	0.35
24	300	0.42
1	325	0.55
1	350	1.00
0.5	400	1.11
2	400	1.19
1	400	1.22
4	400	1.27
24	400	1.51
1	450	1.45
0.5	500	2.14
2	500	2.25
1	500	2.27
4	500	2.75
24	500	3.17
1	550	2.78
1	600	3.87
4	600	3.95
24	600	4.73
24	900	6.52

Table S2. Experimental charring data gathered by Scott and Glasspool (2007). Specimens of the bracket fungus (*Ganoderma*) were charred for 1 hour at temperatures between 300 and 600 °C and the resulting mean random reflectance (R_o %) for each charring run determined.

Experimental charring temp. (°C)	**Mean Random Reflectance (Ro %)**
300	0.00
350	0.45
400	0.85
450	1.45
500	1.97
550	2.32
600	2.93

Table S3. Hudspith et al. (2014) 1 hr hold-duration experimental charring calibration data. *N.B. Hudspith et al. (2014) only presented the raw data in chart format. However, the calibration equation as presented could not be used to calculate temperature of formation from mean random reflectance. To permit these data to be used for the calculation of temperature, Glasspool precisely measured the points and replotted them in Excel (herein shown as measured).*

Hudspith et al. (2014) Experimental charring temps. (°C)	**Reflectance, as measured by Glasspool from Hudspith et al. (2014, Fig. 1) (Ro %)**
800	4.800
700	4.450
600	2.710
500	1.820
400	0.726
300	0.162

Table S4. Application of calibration equations to nominal reflectance values (Ro = 0.25-6.5%) to permit an assessment of their impact on temperature estimates. *Within the column headers, Max = the maximum experimental charring temperature used for each run, and Ro % the maximum mean random reflectance measured. Data in **bold** correspond to values beyond the calibration ranges.*

Nominal assigned reflectance value	Scott & Glasspool (2005) Composite **Equation 1**	Scott & Glasspool (2007) *Ganoderma* **Equation 2**	Scott & Glasspool (2005) 1 hr **Equation 3**	Scott & Glasspool (2005) 24 hr **Equation 4**	Hudspith et al. (2014) 1 hr **Equation 7**
Ro %	Max 900°C/Ro 6.52%	Max 600°C/Ro 2.93%	Max 600°C/Ro 3.87%	Max 900°C/Ro 6.52%	Max 800°C/Ro 4.80%
	Calculated Temperatures (°C) from the application of **Equations 1-4 & 7**				
0.25	269	329	274	254	316
0.50	312	357	309	294	363
0.75	349	383	342	329	402
1.00	382	409	373	359	436
1.50	435	460	430	406	491
2.00	475	509	479	442	531
2.50	505	559	521	469	564
3.00	530	**609**	557	491	594
3.50	554	**662**	585	515	629
4.00	580	**719**	**607**	542	674
4.50	613	**780**	**623**	578	735
5.00	657	**847**	**633**	628	**817**
5.50	715	**921**	**637**	694	**928**
6.00	792	**1003**	**636**	782	**1073**
6.50	891	**1094**	**629**	895	**1257**

Table S5. List of Rumney, Winnica, Ludford Lane & North Brown Clee Hill specimen morphotypes, their associated mean random reflectance (R_o%), recorded as an average of 100 data points (measured as pixels). Where less than 100 points were sampled, the number measured (n =) is given next to the Id#. (Temp. °C w) is the fire temperature calculated from the R_o% using **Equation 1** based upon modern woods. (Temp. °C g) is the fire temperature calculated from the R_o% using **Equation 2** based upon the modern bracket fungus *Ganoderma*. Mean, min and max Temp. °C data are summarized in Table S6.

RUMNEY DATA

Vitrinite			Inertinite			Temp °C	Temp °C
Id #	**Morphology**	**Ro%**	**Id #**	**Morphology**	**Ro%**	**w**	**g**
R.314.316.3m.Strew-1	UP	0.98	R.316.3-317.39m.SEM2-26	UP	1.27	410	440
R.314.316.3m.Strew-3	UP	1.02	R.316.3-317.39m.SEM2-17	UP	1.28	410	440
R.316.3-317.39m.Strew-13	UP	1.02	R.316.3-317.39m.Strew-16	UP	1.29	410	440
R.316.3-317.39m.Strew-2a	UP	1.03	R.316.3-317.39m.Insitu-3	UP	1.36	420	450
R.316.3-317.39m.SEM2-16c	UP	1.03	R.316.3-317.39m.SEM2-1	Nematophyte	1.36	420	450
R.316.3-317.39m.Strew-7	UP	1.06	R.316.3-317.39m.SEM1-6	*Pachytheca*	1.44	430	450
R.316.3-317.39m.SEM2-13	UP	1.06	R.316.3-317.39m.SEM2-3	Prototaxodioid	1.49	430	460
R.316.3-317.39m.Strew-6	UP	1.06	R.316.3-317.39m.SEM2-14	UP	1.52	440	460
R.314.316.3m.Strew-2	UP	1.07	R.316.3-317.39m.SEM2-18	Coprolite	1.54	440	460
R.316.3-317.39m.Strew-12	UP	1.08	R.316.3-317.39m.SEM1-7	*Pachytheca*	1.54	440	460
R.314.316.3m.Strew-5	UP	1.08	R.316.3-317.39m.SEM1-4	Prototaxodioid	1.6	440	470
R.316.3-317.39m.Strew-5	UP	1.09	R.316.3-317.39m.Strew-14	Prototaxodioid	1.61	440	470
R.316.3-317.39m.Insitu-2	UP	1.11	R.316.3-317.39m.Strew-15	UP	1.67	450	480
R.314.316.3m.Strew-4	UP	1.11	R.316.3-317.39m.SEM2-12	Nematophyte	1.67	450	480
R.316.3-317.39m.Strew-18	UP	1.11	R.316.3-317.39m.Strew-19	*Pachytheca*	1.67	450	480
R.314.316.3m.Strew-8	UP	1.13	R.316.3-317.39m.SEM2-25	Nematophyte	1.69	450	480
R.316.3-317.39m.Strew-9	UP	1.14	R.316.3-317.39m.SEM2-24	UP	1.7	450	480
R.314.316.3m.Strew-7	UP	1.14	R.316.3-317.39m.SEM1-3	Prototaxodioid	1.71	450	480
R.314.316.3m.Strew-6	UP	1.15	R.316.3-317.39m.SEM2-21	Prototaxodioid	1.74	460	480
R.316.3-317.39m.SEM2-7	UP	1.16	R.316.3-317.39m.SEM2-19	*Pachytheca*	1.77	460	490
R.316.3-317.39m.Strew-21	UP	1.17	R.316.3-317.39m.SEM2-20	Prototaxodioid	1.77	460	490
R.316.3-317.39m.Strew-10	UP	1.18	R.316.3-317.39m.SEM2-16b	UP	1.8	460	490

R.316.3-317.39m.Strew-4	UP	1.22	R.316.3-317.39m.SEM2-4	Nematophyte	1.82	460	490
			R.316.3-317.39m.Strew-17	Prototaxodioid	1.82	460	490
			R.316.3-317.39m.SEM2-8	UP	1.84	460	490
			R.316.3-317.39m.Strew-3	Nematophyte	1.85	460	490
			R.316.3-317.39m.Strew-8	Nematophyte	1.89	470	500
			R.316.3-317.39m.SEM2-22	Nematophyte	2.01	480	510
			R.316.3-317.39m.SEM2-2	Prototaxodioid	2.02	480	510
			R.316.3-317.39m.SEM2-16a	UP	2.05	480	510
			R.316.3-317.39m.SEM2-9	Prototaxodioid	2.14	480	520
			R.316.3-317.39m.SEM2-11	Prototaxodioid	2.16	490	530
			R.316.3-317.39m.SEM1-12	UP	2.17	490	530
			R.316.3-317.39m.Strew-22	Nematophyte	2.32	490	540
			R.316.3-317.39m.SEM1-11	Prototaxodioid	2.33	500	540
			R.316.3-317.39m.Strew-11	Nematophyte	2.37	500	550
			R.316.3-317.39m.Strew-1	Nematophyte	2.41	500	550
			R.316.3-317.39m.SEM2-15	Prototaxodioid	2.57	510	570
			R.316-317m.Insitu. 1 Inert	Prototaxodioid	2.82	520	590
			R.316.3-317.39m.SEM2-23	*Pachytheca*	3.36	550	650
			R.316.3-317.39m.SEM2-10	*Pachytheca*	3.68	560	680
			R.316.3-317.39m.SEM1-8	Prototaxodioid	4	580	720
			R.316.3-317.39m.SEM2-3a	UP	4.98	650	840
			R.316.3-317.39m.Strew-2	UP	5.13	670	870
			R.316.3-317.39m.Strew-3a	UP	5.36	700	900
			R.316.3-317.39m.SEM2-5	Prototaxodioid	5.57	720	930
			R.316.3-317.39m.Strew-20	UP	5.61	730	940

WINNICA

Vitrinite			Inertinite			Temp °C	
Id #	**Morphology**	**R_o %**	**Id #**	**Morphology**	**R_o %**	**w**	**g**
W.Strew-8	UP	0.89	W.SEM-6	Nematothalloid	1.15	400	420
W.Strew-23	UP	0.92	W.SEM-1	Coprolite	1.17	400	430
W.Strew-71	UP	0.96	W.Strew-10	UP	1.19	400	430
W.Strew-22	UP	0.97	W.Strew-14 (n=77)	Nematophyte	1.28	410	440
			W.Strew-42	UP	1.29	410	440

Id #	Samples not studied in Reflected Light	W.SEM-14	Nematophyte	1.37	420	450
W.SEM-17	Coprolite	W.Strew-38	UP	1.38	420	450
W.SEM-18	Coprolite	W.Strew-46 (n=82)	UP	1.38	420	450
W.SEM-19	Cryptophyte	W.Strew-58 (n=59)	UP	1.38	420	450
W.SEM-20	Nematophyte	W.Strew-47	Nematothalloid?	1.39	420	450
W.SEM-21	Nematophyte	W.Strew-50	UP	1.4	430	450
W.SEM-22	Nematophyte	W.Strew-51	UP	1.41	430	450
W.SEM-23	Nematophyte	W.Strew-52	UP	1.41	430	450
W.SEM-24	Nematophyte	W.Strew-69	UP	1.42	430	450
W.SEM-25	Missing	W.Strew-19	Nematophyte	1.44	430	450
W.SEM-26	Nematophyte	W.Strew-43	UP	1.44	430	450
W.SEM-27	Nematophyte	W.Strew-53	Nematothalloid	1.44	430	450
W.SEM-28	Arthropod	W.Strew-7	Nematophyte	1.44	430	450
W.SEM-29	Nematophyte	W.Strew-60 (n=67)	Nematophyte	1.45	430	450
W.SEM-30	Coprolite	W.Strew-16	UP	1.46	430	460
W.SEM-31	UP	W.Strew-68	UP	1.46	430	460
W.SEM-32	UP	W.Strew-70 (n= 66)	UP	1.46	430	460
W.SEM-33	UP	W.Strew-67 (n= 67)	Nematophyte	1.47	430	460
W.SEM-34	Arthropod	W.Strew-12 (n=65)	Nematophyte	1.48	430	460
W.SEM-35	UP	W.Strew-48 (n=87)	Prototaxodioid?	1.48	430	460
W.SEM-36	UP	W.Strew-49	UP	1.5	430	460
W.SEM-37	Nematophyte	W.Strew-5	UP	1.53	440	460
W.SEM-38	Nematophyte	W.Strew-62 (n= 62)	UP	1.53	440	460
W.SEM-39	UP	W.Strew-17	Prototaxodioid?	1.54	440	460
W.SEM-40	Nematophyte	W.Strew-23	Nematothalloid	1.54	440	460
W.SEM-41	Nematophyte	W.Strew-21	UP	1.55	440	460
W.SEM-42	Nematophyte	W.Strew-1 (n=88)	Nematophyte	1.6	440	470
W.SEM-43	UP	W.Strew-63 (n=51)	UP	1.6	440	470
W.SEM-44	Nematophyte	W.Strew-27	UP	1.61	440	470
W.SEM-45	Nematophyte	W.Strew-64	UP	1.61	440	470
W.SEM-46	Char	W.Strew-31 (n= 74)	Prototaxodioid?	1.63	450	470
W.SEM-47	Nematophyte	W.Strew-36	Nematophyte	1.65	450	470

	W.Strew-39	UP	1.65	450	470
	W.Strew-33	UP	1.66	450	480
	W.Strew-57	Nematophyte	1.66	450	480
	W.Strew-35	UP	1.68	450	480
	W.Strew-65	UP	1.7	450	480
	W.Strew-45	Nemtothalloid	1.74	460	480
	W.Strew-44	UP	1.76	460	490
	W.Strew-22	Nematothalloid	1.79	460	490
	W.SEM-2	Embryophyte?	1.8	460	490
	W.Strew-40	UP	1.81	460	490
	W.Strew-13	Prototaxodioid	1.86	460	500
	W.SEM-16	Prototaxodioid	1.89	470	500
	W.Strew-26	Prototaxodioid?	1.91	470	500
	W.Strew-28	UP	2	470	510
	W.Strew-55	Prototaxodioid	2.04	480	510
	W.Strew-18	UP	2.07	480	520
	W.Strew-4	UP	2.07	480	520
	W.Strew-9	Nematophyte	2.07	480	520
	W.SEM-4	Prototaxodioid	2.1	480	520
	W.Strew-24	UP	2.3	490	540
	W.SEM-8	Char	2.39	500	550
	W.Strew-25	UP	2.39	500	550
	W.Strew-3 (n= 58)	UP	2.43	500	550
	W.Strew-32	Prototaxodioid?	2.43	500	550
	W.Strew-61	UP	2.48	500	560
	W.Strew-30	UP	2.56	510	560
	W.Strew-20	Prototaxodioid	2.63	510	570
	W.SEM-5	Embryophyte?	2.64	510	570
	W.Strew-37	Nematophyte	2.75	520	580
	W.SEM-15	Char	2.76	520	580
	W.SEM-10	Nematothalloid	2.79	520	590
	W.SEM-9	Prototaxodioid	3.01	530	610
	W.Strew-66 (n= 91)	UP	3.02	530	610

		W.Strew-11	Prototaxodioid?	3.06	530	620
		W.Strew-29	UP	3.06	530	620
		W.Strew-2	Prototaxodioid?	3.07	530	620
		W.Strew-34	Nematophyte	3.13	540	620
		W.Strew-15	Prototaxodioid?	3.17	540	630
		W.SEM-7	Prototaxodioid	3.25	540	640
		W.Strew-59	Prototaxodioid	3.65	560	680
		W.Strew-56	Prototaxodioid	3.71	560	690
		W.Strew-41	UP (detrital)	3.94	580	710
		W.SEM-12	Prototaxodioid	3.95	580	710
		W.Strew-54	UP (detrital)	4.74	630	810
		W.SEM-11	Nematophyte (tube)	4.78	640	820
LUDFORD LANE (Data used in Glasspool et al., 2004)						
Vitrinite			**Inertinite**		**Temp °C**	
Id #	**Morphology**	**R_o %**	**Id #**	**Morphology**	**R_o %**	**w**	**g**
	UP	0.29		Rhyniophytoid	1.03	390	410
	UP	0.4		Prototaxodioid	1.05	390	410
	UP	0.46		Rhyniophytoid	1.06	390	420
				Rhyniophytoid	1.06	390	420
				Rhyniophytoid	1.15	400	420
				Rhyniophytoid	1.19	400	430
				Rhyniophytoid	1.21	410	430
				Rhyniophytoid	1.22	410	430
				Rhyniophytoid	1.22	410	430
				Rhyniophytoid	1.30	420	440
				Rhyniophytoid	1.30	420	440
				Rhyniophytoid	1.32	420	440
				Rhyniophytoid	1.36	420	450
				Rhyniophytoid	1.37	420	450
				Rhyniophytoid	1.38	420	450
				Rhyniophytoid	1.38	420	450
				Rhyniophytoid	1.39	420	450

			Rhyniophytoid	1.39	420	450
			Rhyniophytoid	1.39	420	450
			Rhyniophytoid	1.40	430	450
			Rhyniophytoid	1.45	430	450
			Rhyniophytoid	1.47	430	460
			Rhyniophytoid	1.47	430	460
			Rhyniophytoid	1.48	430	460
			Rhyniophytoid	1.48	430	460
			Rhyniophytoid	1.50	430	460
			Rhyniophytoid	1.54	440	460
			Rhyniophytoid	1.60	440	470
			Rhyniophytoid	1.70	450	480
			Rhyniophytoid	1.71	450	480
			Rhyniophytoid	1.72	450	480
			Rhyniophytoid	1.72	450	480
			Rhyniophytoid	1.76	460	490
			Rhyniophytoid	1.79	460	490
			Rhyniophytoid	1.80	460	490
			Rhyniophytoid	1.84	460	490
			Rhyniophytoid	1.87	470	500
			Rhyniophytoid	1.87	470	500
			Rhyniophytoid	1.88	470	500
			Rhyniophytoid	1.94	470	500
			Rhyniophytoid	1.94	470	500
			Rhyniophytoid	1.99	470	510
			Rhyniophytoid	2.01	480	510
			Prototaxodioid	2.11	480	520
			Rhyniophytoid	2.15	480	520
			Rhyniophytoid	2.16	490	530
			Rhyniophytoid	2.21	490	530
			Rhyniophytoid	2.22	490	530
			Prototaxodioid	2.23	490	530
			Rhyniophytoid	2.23	490	530

			Rhyniophytoid	2.34	500	540
			Rhyniophytoid	2.41	500	550
			Rhyniophytoid	2.71	520	580
			Rhyniophytoid	2.74	520	580

NORTH BROWN CLEE HILL (Data used in Glasspool et al., 2006) + Prototaxodioid-2022 a new specimen (Prototaxodioid-2022 data in Table S7)

Vitrinite			Inertinite			Temp °C	
Id #	**Morphology**	**R_o %**	**Id #**	**Morphology**	**R_o %**	**w**	**g**
	UP	0.30		Axis	0.67	340	370
	UP	0.40		Pachytheca	0.68	340	380
	UP	0.44		Axis	0.72	340	380
	UP	0.52		Axis	0.74	350	380
				Unknown	0.75	350	380
				Axis	0.77	350	390
				Axis	0.80	360	390
				Axis	0.82	360	390
				Axis	0.82	360	390
				Axis	0.84	360	390
				Axis	0.89	370	400
				Axis	0.90	370	400
				Axis	0.95	380	400
				Prototaxodioid	0.95	380	400
				Axis	0.95	380	400
				Axis	0.97	380	410
				Axis	0.98	380	410
				Axis	0.99	380	410
				Axis	1.00	380	410
				Axis	1.02	380	410
				Axis	1.02	380	410
				Axis	1.04	390	410
				Prototaxodioid	1.04	390	410

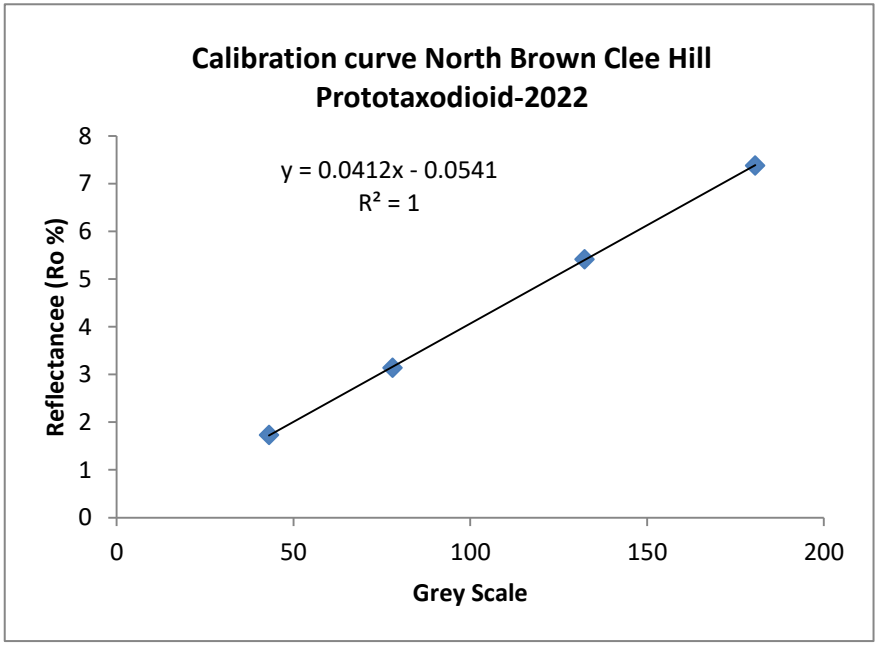
			Unknown	1.04	390	410
			Prototaxodioid	1.04	390	410
			Prototaxodioid	1.05	390	410
			Axis	1.05	390	410
			Axis	1.06	390	420
			Axis	1.06	390	420
			Pachytheca	1.07	390	420
			Axis	1.07	390	420
			Axis	1.10	390	420
			Axis	1.12	400	420
			Axis	1.12	400	420
			Axis	1.15	400	420
			Axis	1.15	400	420
			Axis	1.16	400	430
			Axis	1.16	400	430
			Prototaxodioid	1.16	400	430
			Axis	1.17	400	430
			Axis	1.17	400	430
			Axis	1.18	400	430
			Axis	1.19	400	430
			Axis	1.22	410	430
			Axis	1.23	410	430
			Axis	1.24	410	430
			Axis	1.24	410	430
			Unknown	1.27	410	440
			Axis	1.29	410	440
			Axis	1.30	420	440
			Axis	1.31	420	440
			Axis	1.32	420	440
			Axis	1.38	420	450
			Axis	1.40	430	450
			Axis	1.41	430	450
			Pachytheca	1.46	430	460

			Unknown	1.52	440	460
			Axis	1.55	440	460
			Axis	1.63	450	470
			Axis	1.96	470	510
			Axis	2.04	480	510
			Prototaxodioid	2.04	480	510
			Unknown	2.12	480	520
			Axis	2.17	490	530
			Pachytheca	2.32	490	540
			Pachytheca	2.47	500	560
			Prototaxodioid	2.51	510	560
			Unknown	2.61	510	570
			Pachytheca	3.07	530	620
			Prototaxodioid	3.45	550	660
			Pachytheca	4.14	590	740
			Pachytheca	4.40	610	770
			Pachytheca	4.41	610	770
			Pachytheca	4.43	610	770
			Prototaxodioid	4.54	620	790
			Prototaxodioid	4.61	620	790
			Prototaxodioid-2022	5.82	760	970

Table S6. Summary of the mean, minimum, and maximum charring temperatures (°C) calculated from the Winnica and Rumney Borehole data in Table S5. The two sets of summary data (w and g) represent the application of **Equation 1** based upon modern woods and **Equation 2** based upon the modern bracket fungus *Ganoderma*.		**Rumney Borehole ~430 Ma**			**Winnica ~424 Ma**			**Ludford Lane ~423 Ma**			**North Brown Clee Hill ~419 Ma**		
Reflectance Ro % (Calc. from Table S5)		Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
		2.31	1.27	5.61	2.06	1.15	4.78	1.67	1.03	2.74	1.60	0.67	5.82
Charring Calibration Equation (y =)		Temp. (°C)			Temp. (°C)			Temp. (°C)			Temp. (°C)		
		Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Equation 1 (combined)	(5.3103*(x3))-(50.454*(x2))+(206.87*x)+220.17	w-490	w-410	w-730	w-480	w-400	w-640	w-450	w-390	w-520	w-440	w-340	w-760
Equation 2 (*Ganoderma)*	(1.5242*(x3))-(9.0073*(x2))+(116.22*x)+300.66	g-540	g-440	g-940	g-520	g-420	g-820	g-480	g-410	g-580	g-470	g-370	g-970

Table S7. Reflectance (Ro %) data measured in 2022 from an additional prototaxodioid specimen from North Brown Clee Hill. The calibration curve for conversion from raw grey scale values to Ro % is given.

Calibration data for North Brown Clee Hill Prototaxodioid-2022			
	Ro %	Value	Ro %
SiC	7.380	180.61	7.38
STit	5.410	132.3	5.41
CZ	3.140	78.01	3.14
GGG	1.728	43.05	1.728



North Brown Clee Hill Prototaxodioid-2022 (1 Specimen)	Grey Scale	Ro %
Mean		5.82
Min		5.02
Max		6.77
Image 1 Loc 1	147.37	6.02
Image 1 Loc 2	157.33	6.43
Image 1 Loc 3	138.04	5.63
Image 1 Loc 4	142.37	5.81
Image 1 Loc 5	133.25	5.44
Image 2 Loc 1	146.20	5.97
Image 2 Loc 2	141.36	5.77
Image 2 Loc 3	147.08	6.01
Image 2 Loc 4	138.04	5.63
Image 2 Loc 5	147.44	6.02
Image 3 Loc 1	142.98	5.84
Image 3 Loc 2	141.29	5.77
Image 3 Loc 3	130.98	5.34
Image 3 Loc 4	141.61	5.78
Image 3 Loc 5	139.56	5.70
Image 4 Loc 1	143.34	5.85
Image 4 Loc 2	147.76	6.03
Image 4 Loc 3	144.21	5.89
Image 4 Loc 4	158.35	6.47
Image 4 Loc 5	158.84	6.49
Image 5 Loc 1	158.76	6.49

Image 5 Loc 2	141.27	5.77
Image 5 Loc 3	145.81	5.95
Image 5 Loc 4	151.25	6.18
Image 5 Loc 5	163.41	6.68
Image 6 Loc 1	154.18	6.30
Image 6 Loc 2	140.80	5.75
Image 6 Loc 3	151.85	6.20
Image 6 Loc 4	140.06	5.72
Image 6 Loc 5	149.00	6.08
Image 7 Loc 1	147.34	6.02
Image 7 Loc 2	141.45	5.77
Image 7 Loc 3	138.04	5.63
Image 7 Loc 4	141.82	5.79
Image 7 Loc 5	153.32	6.26
Image 8 Loc 1	146.00	5.96
Image 8 Loc 2	149.97	6.12
Image 8 Loc 3	146.51	5.98
Image 8 Loc 4	148.72	6.07
Image 8 Loc 5	151.34	6.18
Image 9 Loc 1	140.76	5.75
Image 9 Loc 2	138.52	5.65
Image 9 Loc 3	137.32	5.60
Image 9 Loc 4	147.49	6.02
Image 9 Loc 5	158.83	6.49
Image 10 Loc 1	147.95	6.04
Image 10 Loc 2	153.88	6.29
Image 10 Loc 3	143.77	5.87
Image 10 Loc 4	165.60	6.77
Image 10 Loc 5	152.45	6.23
Image 11 Loc 1	133.05	5.43
Image 11 Loc 2	142.17	5.80

Image 11 Loc 3	139.51	5.69
Image 11 Loc 4	139.26	5.68
Image 11 Loc 5	146.14	5.97
Image 12 Loc 1	139.76	5.70
Image 12 Loc 2	140.55	5.74
Image 12 Loc 3	134.85	5.50
Image 12 Loc 4	133.29	5.44
Image 12 Loc 5	132.83	5.42
Image 13 Loc 1	127.52	5.20
Image 13 Loc 2	128.53	5.24
Image 13 Loc 3	143.32	5.85
Image 13 Loc 4	140.50	5.73
Image 13 Loc 5	152.60	6.23
Image 14 Loc 1	133.00	5.43
Image 14 Loc 2	143.38	5.85
Image 14 Loc 3	136.30	5.56
Image 14 Loc 4	136.87	5.58
Image 14 Loc 5	139.54	5.69
Image 15 Loc 1	140.77	5.75
Image 15 Loc 2	137.38	5.61
Image 15 Loc 3	143.89	5.87
Image 15 Loc 4	142.02	5.80
Image 15 Loc 5	123.10	5.02
Image 16 Loc 1	134.88	5.50
Image 16 Loc 2	131.86	5.38
Image 16 Loc 3	129.39	5.28
Image 16 Loc 4	139.24	5.68
Image 16 Loc 5	141.72	5.78
Image 17 Loc 1	139.91	5.71
Image 17 Loc 2	136.52	5.57
Image 17 Loc 3	135.76	5.54

Image 17 Loc 4	128.13	5.22
Image 17 Loc 5	138.06	5.63
Image 18 Loc 1	133.76	5.46
Image 18 Loc 2	150.89	6.16
Image 18 Loc 3	128.54	5.24
Image 18 Loc 4	128.57	5.24
Image 18 Loc 5	140.49	5.73
Image 19 Loc 1	142.45	5.81
Image 19 Loc 2	140.62	5.74
Image 19 Loc 3	136.00	5.55
Image 19 Loc 4	140.94	5.75
Image 19 Loc 5	128.06	5.22
Image 20 Loc 1	154.62	6.32
Image 20 Loc 2	152.48	6.23
Image 20 Loc 3	146.98	6.00
Image 20 Loc 4	145.25	5.93
Image 20 Loc 5	139.24	5.68

Table S8. Regional rank maturation data from Bullock et al., (2019).

Colliery/Coalfield	**Reflectance (R_o %)**	**Proximity to Rumney**
Wylie	1.14	~16 km north-west
Llanilid	1.07	~24 km west
Midsomer Norton	1.06	~52 km south-east
Cattybrook	0.87	~38 km east.
Cynheidre coalfield	3.29	~78 km north-west