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Supplement of

A new quantitative approach to identify reworking in Eocene to Miocene pollen records from offshore Antarctica using red fluorescence and digital imaging

Stephanie L. Strother et al.

Correspondence to: Stephanie L. Strother (slstrother2@gmail.com)
and Ulrich Salzmann (ulrich.salzmann@northumbria.ac.uk)

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Table S1: Subjective assessment (optical appearance) and digital measurement (intensity, red, green, blue, saturation and brightness) of sporomorph fluorescence

Total depth (mbsf)	Age (Ma)	Taxa	Optical appearance	Area	Intensity	Red	Green	Blue	Saturation	Brightness
106.62	12.72	<i>Cyathidites minor</i>	46	7877	96.99	37.67	100.54	152.77	154.55	38.04
106.62	12.72	<i>Nothofagidites flemingii</i>	46	9003	110.51	39.92	113.78	177.82	163.81	43.34
106.62	12.72	<i>Nothofagidites flemingii</i>	43	10233	118.16	37.61	121.04	195.83	173.84	46.34
106.62	12.72	<i>Nothofagidites flemingii</i>	43	5188	75.52	28.07	77.16	121.33	160.08	29.61
106.62	12.72	<i>Nothofagidites lachlaniae</i>	43	6943	102.53	38.03	103.23	166.33	160.42	40.21
106.62	12.72	<i>Nothofagidites lachlaniae</i>	46	8278	96.22	34.84	101.25	152.57	164.04	37.73
106.62	12.72	<i>Podocarpidites ellipticus</i>	43	14794	111.11	28.3	108.58	196.45	190.21	43.57
141.02	13.39	<i>Cyathidites minor</i>	43	9030	113.67	41.6	116.12	183.3	162.36	44.58
141.02	13.39	<i>Myricipites harrisii</i>	44	6023	158.66	59.27	173.59	243.13	160.32	62.22
141.02	13.39	<i>Myricipites harrisii</i>	43	16814	125.09	34.18	126.53	214.56	185.46	49.06
141.02	13.39	<i>Nothofagidites flemingii</i>	44	7482	92.66	33.01	93.99	150.99	165.03	36.34
141.02	13.39	<i>Nothofagidites flemingii</i>	43	5622	96.5	25.48	92.82	171.2	187.65	37.84
141.02	13.39	<i>Nothofagidites lachlaniae</i>	43	6351	131.31	29.31	131.45	233.15	198.11	51.49
141.02	13.39	<i>Nothofagidites flemingii</i>	42	9955	120.74	40.35	124.91	196.95	170.15	47.35
141.02	13.39	<i>Podocarpidites ellipticus</i>	43	20580	131.69	48.64	141.36	205.07	162.45	51.64
156.22	13.42	<i>Nothofagidites flemingii</i>	43	8067	86.5	23.44	83.68	152.39	185.84	33.92
156.22	13.42	<i>Nothofagidites lachlaniae</i>	46	5899	76.27	34.48	79.49	114.85	140.12	29.91
156.22	13.42	<i>Nothofagidites lachlaniae</i>	43	6311	76.78	37.72	82.56	110.07	130.65	30.11
156.22	13.42	<i>Podocarpidites ellipticus</i>	43	20434	109.9	40.35	108.56	180.79	161.12	43.1
156.22	13.42	<i>Nothofagidites flemingii</i>	43	7065	76.03	19.19	73.47	135.42	190.69	29.81
202.62	14.06	<i>Cyathidites minor</i>	46	4994	65.58	30.34	69.93	96.48	137.97	25.72
202.62	14.06	<i>Myricipites harissii</i>	43	6403	100.64	58.03	111.35	132.55	110.42	39.47
202.62	14.06	<i>Nothofagidites flemingii</i>	43	7220	64.26	23.4	65.44	103.94	163.62	25.2
202.62	14.06	<i>Nothofagidites lachlaniae</i>	43	6975	147.14	44.78	156.84	239.8	177.49	57.7
202.62	14.06	<i>Podocarpidites ellipticus</i>	43	19754	112.6	30.19	110.88	196.73	187.53	44.16
202.62	14.06	<i>Podocarpidites ellipticus</i>	43	15224	113.65	37.6	115.58	187.78	171.38	44.57
327.22	15.79	<i>Nothofagidites flemingii</i>	45	27164	118.28	53.39	128.16	173.28	141.58	46.38
327.22	15.79	<i>Nothofagidites flemingii</i>	43	6527	111.22	26.3	107.52	199.83	194.83	43.62
327.22	15.79	<i>Podocarpidites ellipticus</i>	45	7882	131.31	32.69	130.29	230.95	191.61	51.49
416.25	19.25	<i>Podocarpidites ellipticus</i>	46	21756	138.15	32.99	138.43	243.04	194.29	54.18

443.25	23.22	<i>Nothofagidites flemingii</i>	43	8945	147.79	34.77	154.86	253.74	195.16	57.96
443.25	23.22	<i>Podocarpidites ellipticus</i>	46	12045	91.38	31.11	91.01	152.03	168.18	35.84
443.25	23.22	<i>Podocarpidites ellipticus</i>	46	7116	106.92	31.45	108.05	181.27	179.46	41.93
443.25	23.22	<i>Cyathidites minor</i>	46	7071	91.73	22.82	87.62	164.76	190.17	35.97
443.25	23.22	<i>Cyathidites minor</i>	46	13339	103.49	19.77	96.99	193.69	206.07	40.58
469.3	24.44	<i>Cyathidites minor</i>	46	9800	129.55	31.26	128.65	228.76	193.49	50.81
469.3	24.44	<i>Cyathidites minor</i>	46	7341	153.21	39.7	165.69	254.23	188.96	60.08
469.3	24.44	<i>Nothofagidites lachlaniae</i>	46	6162	129.66	30.59	129.3	229.08	194.89	50.85
469.3	24.44	<i>Podocarpidites ellipticus</i>	46	20406	129.7	32.88	132.03	224.21	190.45	50.86
469.3	24.44	<i>Podocarpidites ellipticus</i>	46	17096	87.32	33.96	92.64	135.36	157.03	34.24
469.3	24.44	<i>Podocarpidites ellipticus</i>	46	6693	127.38	32.86	127.27	222.01	189.35	49.95
469.3	24.44	<i>Podocarpidites ellipticus</i>	47	15534	158.1	36.89	182.41	255	195.55	62
507.62	24.90	<i>Cyathidites minor</i>	46	9234	81.97	26.25	80.23	139.44	172.98	32.15
507.62	24.90	<i>Nothofagidites lachlaniae</i>	43	8068	110.02	31.87	109.96	188.23	180.55	43.15
507.62	24.90	<i>Podocarpidites ellipticus</i>	43	19584	98.68	34.65	97.98	163.4	165.05	38.7
507.62	24.90	<i>Podocarpidites ellipticus</i>	46	13950	125.1	35.52	125.68	214.09	183.01	49.06
507.62	24.90	<i>Myricipites harrisii</i>	46	7894	119.81	33.59	120.68	205.15	183.13	46.98
507.62	24.90	<i>Nothofagidites flemingii</i>	47	2738	94.96	22.05	90.29	172.53	195.33	37.24
537.31	24.90	<i>Podocarpidites ellipticus</i>	43	7932	81.5	23.54	77.79	143.19	180.39	31.96
537.31	24.90	<i>Podocarpidites ellipticus</i>	43	18196	109.69	27.35	106.7	195.01	191.26	43.01
555.19	24.90	<i>Cyathidites minor</i>	43	17482	147.8	32.34	157.36	253.68	199.33	57.96
555.19	24.90	<i>Cyathidites minor</i>	46	10771	110.37	25.09	101.86	204.15	196.99	43.28
555.19	24.90	<i>Myricipites harrisii</i>	46	6970	162.75	56.45	184.86	246.94	166.6	63.82
555.19	24.90	<i>Myricipites harrisii</i>	46	8273	132.46	46.57	139.74	211.08	163.91	51.95
555.19	24.90	<i>Myricipites harrisii</i>	46	6999	125.91	51.31	130.48	195.94	151.49	49.38
555.19	24.90	<i>Nothofagidites flemingii</i>	43	9744	122.03	21.72	119.17	225.18	209.64	47.85
555.19	24.90	<i>Nothofagidites flemingii</i>	43	6229	153.06	40.02	166.34	252.8	188.33	60.02
555.19	24.90	<i>Podocarpidites ellipticus</i>	43	9248	161.73	44.81	185.41	254.99	184.5	63.43
555.19	24.90	<i>Podocarpidites ellipticus</i>	46	14789	118.43	35.5	119.2	200.58	178.76	46.44
555.19	24.90	<i>Podocarpidites ellipticus</i>	46	9504	126.46	38.57	127.72	213.09	177.47	49.59
795.58	30.63	<i>Cyathidites minor</i>	46	13474	80.1	17.21	71.87	151.23	200.38	31.41
795.58	30.63	<i>Myricipites harrisii</i>	46	7473	112.97	42.89	115.8	180.22	158.5	44.3
795.58	30.63	<i>Nothofagidites lachlaniae</i>	46	6996	79.27	19.34	72.9	145.57	192.98	31.09
795.58	30.63	<i>Cyathidites minor</i>	47	9225	106.89	15.35	93.18	212.12	218.39	41.92
799.44	30.76	<i>Myricipites harrisii</i>	46	7364	96.98	39.85	96.05	155.05	150.69	38.03

799.44	30.76	<i>Podocarpidites ellipticus</i>	46	8792	143.78	39	152.73	239.62	185.4	56.39
799.44	30.76	<i>Podocarpidites ellipticus</i>	46	9551	49.36	19.62	48.27	80.2	155.84	19.36
803.62	30.89	<i>Podocarpidites ellipticus</i>	44	17516	180.78	52.07	235.27	255	181.54	70.89
803.62	30.89	<i>Podocarpidites ellipticus</i>	46	13103	149.14	37.85	164.48	245.09	189.73	58.49
806.58	30.98	<i>Myricipites harrisii</i>	43	7633	119.74	34.52	118.99	205.72	181.15	46.96
806.58	30.98	<i>Podocarpidites ellipticus</i>	46	12014	164.63	47.4	191.68	254.82	181.64	64.56
806.58	30.98	<i>Podocarpidites ellipticus</i>	46	18413	145.82	32.24	155.7	249.53	198.75	57.19
807.23	31.00	<i>Podocarpidites ellipticus</i>	46	9903	67.28	19.23	62.35	120.25	182.06	26.38
807.23	31.00	<i>Nothofagidites lachlaniae</i>	46	6641	123.78	25.16	115.43	230.75	203.25	48.54
808.53	31.05	<i>Myricipites harrisii</i>	46	6038	97.66	26.91	90.69	175.38	184.41	38.3
808.53	31.05	<i>Nothofagidites lachlaniae</i>	46	5663	108.64	24.36	99.33	202.21	197.74	42.6
808.53	31.05	<i>Podocarpidites ellipticus</i>	46	17865	124.61	18.53	112.52	242.77	217.1	48.87
809.74	31.09	<i>Podocarpidites ellipticus</i>	46	22686	67.85	14.1	58.87	130.58	202.01	26.61
809.74	31.09	<i>Nothofagidites lachlaniae</i>	46	6242	79.1	13.6	65.87	157.84	211.26	31.02
809.74	31.09	<i>Nothofagidites lachlaniae</i>	46	7866	136.75	23	132.5	254.75	212.14	53.63
830.02	31.74	<i>Nothofagidites flemingii</i>	46	7290	155.29	34.17	176.7	255	198.94	60.9
830.02	31.74	<i>Nothofagidites lachlaniae</i>	46	6493	130.47	32.23	130.56	228.6	192.04	51.16
883.75	33.35	<i>Myricipites harrisii</i>	47	9374	77.92	21.46	75.28	137.01	184.27	30.56
883.75	33.35	<i>Nothofagidites lachlaniae</i>	47	7520	70.99	15.18	67.43	130.35	199.52	27.84
885.59	33.37	<i>Podocarpidites ellipticus</i>	47	14919	134.9	27.32	136.09	241.28	203.22	52.9
885.59	33.37	<i>Cyathidites minor</i>	46	14170	107.71	19.56	99.6	203.96	208.62	42.24
885.59	33.37	<i>Podocarpidites ellipticus</i>	47	12407	123.67	24.57	118.57	227.86	204.21	48.5
885.71	33.38	<i>Nothofagidites lachlaniae</i>	45	8958	138.62	29.05	136.78	250.01	201.61	54.36
885.71	33.38	<i>Podocarpidites ellipticus</i>	46	12284	68.39	24.54	67.99	112.64	161.17	26.82
885.71	33.38	<i>Podocarpidites ellipticus</i>	46	34203	61.23	21.61	59.21	102.86	163.7	24.01
910.83	47.25	<i>Nothofagidites flemingii</i>	46	10447	88.54	30.25	90.87	144.5	167.74	34.72
910.83	47.25	<i>Nothofagidites flemingii</i>	47	11723	74.74	23.85	75.39	124.98	173.69	29.31
910.83	47.25	<i>Nothofagidites flemingii</i>	46	8043	109.06	22.15	103.78	201.27	203.2	42.77
910.83	47.25	<i>Nothofagidites lachlaniae</i>	47	3972	63.52	22.71	65.45	102.41	164.2	24.91
920.83	48.40	<i>Nothofagidites flemingii</i>	46	6505	54.4	16.92	54.81	91.45	174.98	21.33
931.3	48.57	<i>Nothofagidites flemingii</i>	47	4411	58.33	20.34	59.37	95.26	165.78	22.87
931.3	48.57	<i>Nothofagidites flemingii</i>	47	6166	59.14	18.05	59.48	99.89	176.36	23.19
931.3	48.57	<i>Nothofagidites flemingii</i>	47	7643	65.6	22.79	66.15	107.86	165.94	25.73
931.3	48.57	<i>Nothofagidites flemingii</i>	47	8092	59.72	20.15	60.31	98.7	167.34	23.42
931.3	48.57	<i>Nothofagidites lachlaniae</i>	47	4594	58.62	22.38	60.34	93.15	157.17	22.99

939.37	48.64	<i>Cyathidites minor</i>	47	3856	97.91	22.98	94.25	176.5	195.18	38.39
939.37	48.64	<i>Nothofagidites flemingii</i>	47	10121	62.68	17.05	62.21	108.77	184.72	24.58
939.37	48.64	<i>Nothofagidites flemingii</i>	46	8100	96.11	26.41	95.12	166.79	184.93	37.69
939.37	48.64	<i>Nothofagidites lachlaniae</i>	46	4715	66.51	26.66	69.47	103.42	153.49	26.08
939.37	48.64	<i>Podocarpidites ellipticus</i>	46	16160	61.81	20.52	61.62	103.29	169.58	24.24
951.31	52.31	<i>Nothofagidites flemingii</i>	46	7448	135.22	39.71	140.28	225.69	180.69	53.03
951.31	52.31	<i>Nothofagidites flemingii</i>	44	8938	94.35	36.27	98.58	148.19	156.17	37
951.31	52.31	<i>Podocarpidites ellipticus</i>	47	20506	96.09	35.56	95.93	156.77	159.74	37.68
951.51	52.32	<i>Nothofagidites flemingii</i>	46	5335	83.14	19.59	81.31	148.5	194.86	32.6
951.51	52.32	<i>Nothofagidites flemingii</i>	46	8979	121.41	26.21	119.72	218.31	199.87	47.61
951.51	52.32	<i>Podocarpidites ellipticus</i>	47	18507	87.07	19.92	82.75	158.53	196.06	34.14
951.51	52.32	<i>Podocarpidites ellipticus</i>	48	15808	69.47	15.27	67.01	126.14	198.69	27.24
951.51	52.32	<i>Podocarpidites ellipticus</i>	47	8215	96.06	26.53	94.84	166.8	183.88	37.67
951.51	52.32	<i>Podocarpidites ellipticus</i>	47	17380	75.34	16.58	73	136.44	197.94	29.55
994.88	53.61	<i>Cyathidites minor</i>	47	13611	61.16	12.46	59.09	111.94	202.69	23.98
994.88	53.61	<i>Nothofagidites flemingii</i>	46	7309	143.11	28.94	149.84	250.56	203.47	56.12
994.88	53.61	<i>Podocarpidites ellipticus</i>	46	13111	109.96	24.47	108.58	196.84	197.84	43.12
998.99	54.39	<i>Myricipites harrisii</i>	46	8065	108.29	37.28	107.35	180.24	167.41	42.47
998.99	54.39	<i>Nothofagidites flemingii</i>	44	8783	66.8	18.29	64.55	117.56	185.33	26.19
998.99	54.39	<i>Podocarpidites ellipticus</i>	47	11092	86.61	21.15	82.89	155.78	191.86	33.96

Table S2. ANISOM results showing the Global R and p-values between the factors: Stage (Eocene, Oligocene and Miocene), Fluorescence colour, Depth and Taxa to understand if these factors had any influence on the similarity of fluorescence values.

Factor	Outside histogram of chance	Global R	p-value
Stage	Yes	0.145	0.001
Fluorescence colour	No	0.085	0.011
Depth	Yes	0.315	0.001
Taxa	No	0.006	0.385