

	A	B	C	D	E	F	G	H	I	J	K	L
	Plate	Figure	Taxon	Size (µm)	Scale	Paly. Number	C- Number	Stage X	Stage Y	England Finder	Image Number (n.tif)	Comments
1												
2					a							
3	1	1	<i>Desmidiospora</i> sp.	26/20	a	P4364-22	C-400716	90	6.1	E49/3	0144	See Kalgutkar and Jansonius (2000).
4	1	2	<i>Diporisporites pisciculatus</i> Norris 1997	34/24	a	P4364-90	C-400765	94	7.6	G44/2	0189	The probable <i>Diporisporites pisciculatus</i> is like Norris' illustration (1997, Plate 2, fig. 1-8) but these specimens do not have noteable pores.
5	1	3	Mallik 2L-38 unknown 13	29	a	P4364-1	C-400654	96.3	10	K42/2	0128	This fungal palynomorph has subquadrangular cells, each about 4µm in diameter, arranged to yield a structure which is concave - triangular and di- or triprojectate. Each projection is made up of two rows of cells, terminating in a blunt apex. One broken projection suggests attachment to another body.
6	1	4	Mallik 2L-38 unknown 26	52/36	a	P4364-89	C-400764	94	14.5	O45/3	0188	This is probably a fungal palynomorph, ovoid shaped with a prominent ?fold, and an irregular vermiculate surface pattern.
7	1	5	Mallik2L-38 unknown 2	34/21	a	P4364-38	C-400584	90	8	G49/3	0084	An elongated, probable fungal spore perofated by fine, evenly distributed foveolae. There appears to be an attachment mark near one pole
8	1	6	<i>Striadiporites inflexus</i> (Ke and Shi) Norris 1986	34/20	a	P4364-88	C-400763	80.1	19.8	U59/1	0183	<i>Striadiporites inflexus</i> (Ke et Shi ex Sung et al) Norris 1986, p. 21, Pl. 1, fig. 30, 31, 35
9	1	7	<i>Striadiporites inflexus</i> (Ke and Shi) Norris 1987	36/19	a	P4364-89	C-400764	74.2	9.7	J65	0184	<i>Striadiporites inflexus</i> (Ke et Shi ex Sung et al) Norris 1986, p. 21, Pl. 1, fig. 30, 31, 35
10	1	8	<i>Stereisporites microgranulus</i> Krutzsch 1963	26	a	P4364-65	C-400648	78	18.5	S61	0123	Krutzsch, 1963. Compare with Norris, 1986, Pl.7, figs 5-7.
11	1	9	<i>Baculatisporites comaumensis</i> (Cookon) Potonié 1956	34	a	P4364-84	C-400759	86.1	20.9	V53/1	0178	(Cookson) Potonié 1956; see Norris, 1986, p. 32, Pl. 7, fig. 15
12	1	10	<i>Baculatisporites primarius primarius</i> Krutzsch 1967	44	a	P4364-27	C-400730	82	5.6	E57	0153	<i>B. primarius primarius</i> spores are trilete with quite robust, sparse, irregular baculate-verrucate ornament (Krutzsch, 1967, p. 54, Pl. 9). <i>Osmunda</i> spp. are similar, but as used here, the name applies to trilete spores with an irrular but less robust baculate-verrucate ornament about 2-3 µm high.
13	1	11	<i>Baculatisporites primarius primarius</i> Krutzsch 1967	44	a	P4364-79	C-400752	90	7.8	G49	0171	<i>B. primarius primarius</i> spores are trilete with quite robust, sparse, irregular baculate-verrucate ornament (Krutzsch, 1967, p. 54, Pl. 9). <i>Osmunda</i> spp. are similar, but as used here, the name applies to trilete spores with an irrular but less robust baculate-verrucate ornament about 2-3 µm high.
14	1	12	<i>Baculatisporites primarius crassiprimarius</i> Krutzsch 1967	56	a	P4364-58	C-400641	80.1	23.2	X59	0104	Note raised laesurae,and ornament of imbricated, irregularly margined ridges . This is close to Krutzsch's (1967, p. 58) specimen, but not a perfect match as his ornament is more verrucate and irregularly distributed. See Image 150.tif
15	1	13a,b	<i>Baculatisporites primarius crassiprimarius</i> Krutzsch 1967	58	a	P4364-60	C-400643	87	4.2	D61/2	0108a,b	Note raised laesurae,and ornament of imbricated, irregularly margined ridges . This is close to Krutzsch's (1967, p. 58) specimen, in verrucate and irregularly distributed. See also Image 104. A is trilete mark, B is amb. See Image 150.tif
16	1	14	<i>Baculatisporites primarius crassiprimarius</i> Krutzsch 1967	64	a	P4364-26	C-400726	80.1	20.3	U59/3	0150	Note ornament of imbricated, irregularly margined ridges . This is close to Krutzsch's (1967, p. 58) specimen, in verrucate and irregularly distributed. See also Image 104. A is trilete mark, B is amb.
17	1	15	<i>Baculatisporites quintus</i> (Thompson and Pflug) Krutzsch 1967	48	a	P4364-61	C-400644	86.1	16.5	Q53/3	0118	(Thompson and Pflug) Krutzsch, 1967, p. 48; see also Norris (1986, p. 32, Pl. 7, fig. 23,24). The exine of this spore is thick, about 2 µm below the ornament. The verrucae are subangular in plan view.
18	1	16	<i>Baculatisporites quintus</i> (Thompson and Pflug) Krutzsch 1967	54	a	P4364-79	C-400752	74	7	F65/4	0169	<i>Baculatisporites quintus</i> (Thompson and Pflug) Krutzsch, as used by Norris (1986, p. 32, Pl. 7, figs. 23,24). This is a round spore with a dense baculate-gemmate ornament.
19	1	17	<i>Cicatricosisporites paradorogensis</i> Krutzsch 1959	46	a	P4364-83	C-400758	81.1	5	D58	0174	<i>Cicatricosisporites paradorogensis</i> Krutzsch 1959b, according to Krutzsch (1967, p. 80, Pl 22, no 7-12), is of Middle Eocene age in its stratotype, but occurs in Middle Oligocene, brackish marine in Europe
20	1	18a,b	<i>Concavisporites</i> sp.	32	a	P4364-83	C-400758	81.1	7.8	G58/3	0175a,b	This thick-walled trilete spore has low broad verrucate ornament, reduced near the laesurae, with the apices turned up towards the proximal pole.
21		19	<i>Osmunda irregulites</i> ?	46	a	P4364-32	C-400743	100.1	14.2	O38/2	0163	This grain is crushed. The central proximal area is relatively unornamented with a faint raised trilete mark. Dense and irregular baculate-clavate ornment, about 3 µm high, covers the distal and equatorial areas, and equatorial area of the proximal pole. In type of ornament, it is similar <i>Osmunda</i> irregulites of Martin and Rouse, 1966, figs. 29,30.
22	1	20	Mallik 2L-28 unknown 18	48/38	a	P4364-22	C-400716	80	22.9	X59	0143	May be monolete to inaperturate or with erose area, surface psilate with irregular granules to pits, exine about 1 µm thick,
23	1	21	Mallik 2L-38 unknown 14	38	a	P4364-2	C-400660	81	17.2	R58	0131	A trilete spore with distinct laesurae, with irregularly distributed verrucate, baculate to gemmate ornament, distally , and on the margins of the laesurae.
24	1	22	Mallik 2L-38 unknown 17	70	a	P4364-20	C-400709	100.1		R38/2	0140	This it a trilete spore with a proximal, eroded vermiculate pattern and a distal verrucate-gemmate pattern
25	1	23	Mallik 2L-38 unknown 8	20	a	P4364-60	C-400643	98.2	8.7	H40	0112	A small trilete spore with raised laesurae, baculate to rounded echinate ornament proximally and distally.
26	1	24	Mallik2L-38 unknown 1	24	a	P4364-38	C-400584	92	11.8	L47/3	0083	A subtriangular area indicates a possibly trilete mark , ornamented by distinct gemmae/clavae on the proximal face, which are not visible on amb or distal face
27	1	25	<i>Osmunda regalis</i>	42	a	P4364-60	C-400643	72	15.1	P67/2	0110	Note the spaced baculate to denticulate ornament. See McAndrews et al. (1973, fig. 19b,c).
28												
29	2	1	<i>Osmundacidites wellmanii</i> Couper 1953	76	a	P4364-62	C-400645	74	17.3	R65/4	0119	This has the discrete verrucate/baculate/subgemmate ornament of <i>Osmunda</i> sp. (eg., McAndrews et al, 1973, fig. 19). It compares with Norris' (1986, Pl. 7, fig 11, p. 31) illustration of <i>Osmundacidites wellmanii</i> Couper 1953.
30	2	2	Polypodiaceae-Dennstaedtiaceae	38	a	P4364-60	C-400643	94	14.5	O44	0111	This monolete spore is similar to Polypodiaceae-Dennstaedtiaceae Form 1 of Martin and Rouse, 1966, Pl. III, fig. 19,20
31	2	3	Retitriletes sp.	38	a	P4364-65	C-400648	82.1	11.4	L57	0122	This trilete spore has a coarse distal reticulum with muri running dominantly towards the equator.
32	2	4a,b	<i>Retitriletes</i> sp. cf. <i>R. novomexicanus</i> of Norris (1986)	45	a	P4364-80	C-400753	74.1	13.7	N65/4	0172a,b	<i>Retitriletes</i> sp. cf. <i>R. novomexicanus</i> has been used following Norris' nomenclature for <i>Lycopodium</i> spores where the reticulum is distally elongated and discontinuous (Norris (1986, Pl. 8, figs. 3, 4, p. 33). The reticulum may be reduced or absent proximally. However, Anderson's description and illustration (1960, p. 14, Pl. 1, fig. 2; Pl. 8, fig. 1) of <i>Lycopodium novomexicanum</i> does not show the same discontinuous reticulum.
33	2	5	<i>Verrucatosporites favus</i> (Potonié) Thompson and Pflug 1953	38/30	a	P4364-61	C-400644	100.2	19.7	T38/4	0113	Spores with a patellate ornament compare favourably with <i>Verrucatosporites favus</i> (Potonié) Thompson and Pflug 1953 as illustrated by Norris (1986, p. 34 , Pl. 8, fig. 11, 12). These spores occur sporadically in the middle of the Richards Formation (Norris, 1986, p. 34).
34	2	6	<i>Verrucatosporites favus</i> (Potonié) Thompson and Pflug 1953	36/26	a	P4364-90	C-400765	100	5.9	E38/4	0192	Spores with a patellate ornament compare favourably with <i>Verrucatosporites favus</i> (Potonié) Thompson and Pflug 1953 as illustrated by Norris (1986, p. 34 , Pl. 8, fig. 11, 12). These spores occur sporadically in the middle of the Richards Formation (Norris, 1986, p. 34).
35	2	7	<i>Ephedra</i> sp.	42/20	a	P4364-28	C-400734	98.2	16.8	Q40/4	0155	This pollen is similar to the polyplicate <i>Ephedra</i> pollen illustrated by Moore and Webb (1978, Pl. 30f).
36	2	8	<i>Podocarpus</i> -type	54/40	a	P4364-17	C-400698	100.1	8.3	H38/2	0139	This specimen has a small capa and the large bladders with the reticular ridges radiating from the colpal region, as shown by Erdtman (1957, fig. 61a).
37	2	9	<i>Sciadopitys</i> sp.	36	a	P4364-69	C-400652	92	8.9	H47/3	0125	The collumellae are visible in the vellum of this pollen, as shown by Shimakura (1973, Pl. 7, figs. 35, 36).
38	2	10	Taxodiaceae-Cupressaceae-Taxaceae	30	a	P4364-38	C-400584	97.9	18.5	S40/4	0082	See discussion in White and Ager (1994, Pl. 2, fig. 5).
39	2	11	Mallik 2L-38 unknown 23	33	a	P4364-32	C-400743	92.5	20.4	U46	0164	This palynomorph is mono- or disulcate, shaped like a <i>Tsuga</i> grain, and has possible minor projections at the?equator,and a linear, foveolate exine.
40	2	12	<i>Tsuga</i> sp.	42	a	P4364-55	C-400638	102.2	14	L36/2	0100	Pollen grains recorded as <i>Tsuga</i> sp. include this morphotype, a compact grain about 40 µm in diameter.
41	2	13	<i>Pinus koraiensis</i> -type	60/44	a	P4364-61	C-400644	75.9	17.8	S63/1	0115	Note the <i>Picea</i> -like shape and verrucae between bladders, as described by White and Ager (1984, Plate 2, figs. 14,16).
42	2	14	Cyperaceae	30/30	b	P4364-38	C-400584	99.9	21.7	W38/2	0081	These subtriangular grains with thin exines and erose pseudo-pores are typical of the Cyperaceae (Kapp et al., 2000).
43	2	15	<i>Momipites wyomingensis</i> ?	31	b	P4364-59	C-400642	72	11.2	L67/2	0106	This triporate grain has an erose endopore and polar elongation of the pore, although the protrusion of the pore is not similar to the illustration of Nichols and Ott (1978, Plate 1, figs 1-4).
44	2	16	Labrapollis sp.	22	b	P4364-29	C-400737	102	16	Q36/2	0159	This taxon is triporate and has polar plicae with the folds oriented between the pores. See Krutzsch (1968).
45	2	17	<i>Sparganium</i> sp.	30/18	b	P4364-58	C-400641	85.8	19.6	T53/4	0105	Note the pore on the amb and the fine reticulation, as illustrated by Kapp et al. (2000).
46	2	18	<i>Annutriporites</i> sp. A of Norris (1986)	20	b	P4364-89	C-400764	92	20.5	U46/4	0186	This triporate specimen has the annular thickenings around the pores of <i>Annutriporites</i> sp. A. of Norris (1986, Pl. 10, figs 20-23, p. 39).
47	2	19	<i>Boisduvalia clavatites</i> Piel 1971	52	b	P4364-27	C-400730	86	13.9	N53/3	0151	This tetrad has clavate ornamented, as illustrated by Piel (1971, Pl. XV, fig. 141).
48												
49	3	1	<i>Diervilla</i> of McIntyre 1991	50	a	P4364-29	C-400737	81.5	7.1	G58/1	0158	This is a large triporate grain with baculate ornament, similar to that illustrated by McIntyre (1991, Pl. 4, figs 1,2) as <i>Diervilla</i> . In ornament, it is very similar to Triporate B of Piel, 1971 (p.1914, fig 150), but the pores differ from Triporate B. The protruding, thickened and colpoid pore morphology of this specimen is exhibited by <i>Ludwigia</i> , of the Onagraceae (Praglowski et al, 1963, Pl. 10, 11), and it seems that this pollen more likely belongs in the Onagraceae than the Caprifoliaceae, as indicated by the name <i>Diervilla</i> . However, " <i>Diervilla</i> of McIntyre (1991)" is used to compare this specimen to his specimen.
50	3	2	<i>Polyvestibulopollenites trinus</i> (Stanley) Norris 1986	24	b	P4364-89	C-400764	96	9.1	J43/1	0185	This specimen compares well with <i>Polyvestibulopollenites trinus</i> (Stanley) Norris 1986, Pl. 10, fig. 46, p. 41.

	A	B	C	D	E	F	G	H	I	J	K	L
51	3	3	<i>Ostrya/Carpinus</i>	34	b	P4364-55	C-400638	76.1	8.4	H63/2	0099	This specimen is tetraporate, without endexinal separation at the pores. Lieux (1980b, p. 211,212) discusses the occurrence of tetraporate grains in these genera. Likely many more triporate grains of these genera occur but were not separately identified.
52	3	4	<i>Diervilla</i> of McIntyre 1991	54	b	P4364-97	C-400772	89.2	5.2	E50/1	0203	This is a large triporate grain with baculate ornament, similar to that illustrated by McIntyre (1991, Pl. 4, figs 1,2) as <i>Diervilla</i> . In ornament, it is very similar to Triporate B of Piel, 1971 (p.1914, fig 150), but the pores differ from Triporate B. The protruding, thickened and colpoid pore morphology of this specimen is exhibited by <i>Ludwigia</i> , of the Onagraceae (Pragowski et al, 1963, Pl. 10, 11), and it seems that this pollen more likely belongs in the Onagraceae than the Caprifoliaceae, as indicated by the name <i>Diervilla</i> . However, " <i>Diervilla</i> of McIntyre (1991)" is used to compare this specimen to his specimen.
53	3	5	<i>cf. Planera</i> sp.	22/18	b	P4364-44	C-400611	96.3	8.8	H42/4	0091	The pores of this grain are slightly annulate with apparent arcoid streaks between the pores, suggesting <i>Planera</i> (Kapp et al., 2000; Erdtmann, 1966).
54	3	6	Caryophyllaceae	28	b	P4364-44	C-400611	100	20.3	U38/4	0089	See Kapp et al. (2000).
55	3	7	Chenopodiineae	18	b	P4364-44	C-400611	69	19.8	U70	0090	See Kapp et al. (2000).
56	3	8	<i>Paraalnipollenites alterniporus</i> (Simpson) Srivastava 1975	28	b	P4364-2	C-400660	84.1	8.8	H55/3	0130	(Simpson) Srivastava 1975
57	3	9	<i>Ulmus</i> -type	28	b	P4364-52	C-400635	80.4	14.3	O59	0096	This is a tetraporate grain with a rugulate ornament (see White and Ager, 1994).
58	3	10	<i>Juglans</i> sp.	42	b	P4364-84	C-400759	96	10.8	K42/4	0179	This a porate, heteropolar grain, as illustrated by Bassett et al. (1978, p. 202-204).
59												
60	4	1	<i>Liquidambar</i> sp.	31 µm	b	P4364-65	C-400648	88.1	17.1	R51/1	0121	Compares well with <i>Liquidambar stryraciflua</i> , illustrated by Lieux (1980b, Pl. XXV, figs. 1-6), in having a microreticulate/perforate exine and granulae in the pores.
61	4	2	? <i>Liquidambar</i> sp.	24	b	P4364-98	C-400773	84	12.1	M55	0206	Compared with <i>L. stryraciflua</i> (Lieux, 1980b, Pl. XXV, figs. 1-6) the pores are not as distinctly developed, and the pore granulae are not clear in this specimen. However, this morphology falls in the range of <i>Liquidambar</i> spp., as illustrated by Kuprianova (1959, Pl. 1).
62	4	3a,b	Brassicaceae (Cruciferae)	?/28	b	P4364-51	C-400634	102.1	14.5	O37/1	0094a,b	This very robust tricolpate grain has coarse rugu-reticulate, intectate surface ornament formed by fusion of the heads of clavae. The exine is about 2 µm thick and intine about 2 µm thick (see Erdtmann, 1966; Kapp et al., 2000).
63	4	4	<i>Ribes</i> sp.	15	b	P4364-37	C-400580	88.2	8.5	H51/1	0080	Compare with Adams and Morton (1974, Pl. 22).
64	4	5	<i>Fagus</i> sp.	28		P4364-90	C-400765	94	13.8	N44/4	0190	This is a tricolporate grain, with semi-tectate ornament (see Lieux, 1980b, Pl. XXXVIII; White and Ager, 1994, Pl. 5, fig. 9).
65	4	6	Caprifoliaceae	42	a	P4364-97	C-400772	90.2	15.6	P49/3	0204	This is a crushed grain which appears to have 3 colps. It is tectate with spares spinulose ornament 1 µm high or less high, with the columellae giving the exine a verrucate appearance below the spinulae. It most likely belongs in the Caprifoliaceae.
66	4	7	<i>Fagus</i> sp.	32/30	b	P4364-27	C-400730	85.9	23.5	X53/3	0152	This is a tricolporate grain, with semitectate ornament (see Lieux, 1980b, Pl. XXXVIII; White and Ager, 1994, Pl. 5, fig. 9).
67	4	8	<i>Diervilla echinata</i> Piel 1971	52	a	P4364-56	C-400639	94.1	13.5	N45	0101	See Piel, 1971, Plate XVI, fig 144, 145, p. 1916.
68	4	9	<i>Jussiaea/Ludwigia</i>	35	b	P4364-61	C-400644	83.8	15.3	P55	0116	See Piel, 1971, Pl. XVII, fig. 152, 153.
69	4	10	<i>Lonicerapollis gallwitzii</i> Krutzsch 1962	40	b	P4364-7	C-400672	96	8.8	H43/3	0133	Krutzsch, 1962. This grain is compressed in the polar axis, but compares with Norris's illustration (1997, Pl. 6, fig. 30).
70	4	11	Mallik2L-38 unknown 3	23/18	b	P4364-39	C-400588	93.1	8.2	G46/3	0085	This tricolpate grain has a 4 µm thick, nearly tectate exine, having a very fine reticulum with luminae less than 1 µm. Scabrae are apparently present on the tectum.
71	4	12	<i>Lonicerapollis gallwitzii</i> Krutzsch 1962	32/32	b	P4364-94	C-400769	98.2	10.3	K40/2	0194a	Krutzsch, 1962. This grain is similar in exine structure and ornament to Norris' illustration (1997, Pl. 6 fig. 30-32).
72												
73	5	1	Mallik2L-38 unknown 4	14/12	b	P4364-41	C-400596	92.2	18.9	T46/2	0088	This is a small tricolpate grain with gaping furrows about half the length of the grain, and is ornamented with clavae.
74	5	2	Mallik 2L-38 unknown 15	26	b	P4364-11	C-400682	84.2	9.8	J55/3	0134	This is a tricol(?por)ate grain with colps almost reaching the poles. The colps have a margo, apparently torn at equator, possible indicating a pore. The exine is one µm thick exine on intercolps, with scabrate ornament and faintly visible columellae.
75	5	3	Mallik 2L-38 unknown 11	16/12	b	P4364-66	C-400649	78	23.2	X61	0126	This is a small tricolpate pollen grain, tectate and with a microreticulum of even-sized lumina.
76	5	4	Mallik 2L-38 unknown 19	26/20	b	P4364-23	C-400719	95.7	22.1	W43	0147	This tricolporate specimen has a geniculus in the colpus, suggesting the presence of an eruped pore, and a polar-oriented, partly anastomosing, coarse striate ornament. It may have rosaceous affinities.
77	5	5	Mallik 2L-38 unknown 24	23	b	P4364-33	C-400745	100	15.2	P38/2	0166	This appears to be an oblate, tricolpate grain with scabrate ornament and with a tectum composed of clavae.
78	5	6	Mallik 2L-38 unknown 28	32	b	P4364-95	C-400770	100	7.5	G38	0196	This tricolpate grain in known only from one polar presentation. The exine is thin and apparently semi-tectate, with pilae less than 0.5 µm high, fusing to give a psilate or microfoveolate exine. The tectum appears to be reduced towards the colps, an appearance enhanced by oblique compression of the grain. The colps have irregular-margins. It is similar to <i>Cranwellia</i> sp. , illustrated by Nichols and Sweet (1993, Pl. II, fig. 3) in morphology, but not in striate sculpture. It may be reworked from Campanian or Maastrichtian rocks.
79	5	7	Mallik 2L-38 unknown 22	26	b	P4364-30	C-400739	101.8	5.5	E36/2	0162	This is apparently an oblate grain with two pores visible at 10 and 1 o'clock and it may be stephanoporate. It has a thick, undifferentiated exine (1.5 µm) and a discontinuous, faint reticulum.
80	5	8	<i>Pistillipollenites macgregorii</i> Rouse 1962	24	b	P4364-83	C-400758	91.5	4.9	D47	0177	See Rouse (1962, Pl. 1, figs 8-12).
81	5	9	<i>Pistillipollenites macgregorii</i> Rouse 1962	24	bx2	P4364-83	C-400758	75.1	19.6	T64/3	0176	See Rouse (1962, Pl. 1, figs 8-12).
82	5	10	<i>Fraxinus</i> sp.	23	b	P4364-4	C-400666	92.1	15.1	P46/2	0209	This grain is small, tricolpate, intectate and finely reticulate, similar to <i>Fraxinus nigra</i> (Bassett et al., 1978, p. 213-214).
83	5	11a,b	Mallik 2L-38 unknown 30	42/26	b	P4364-97	C-400772	92	9	H47/3	0202a,b	This is a tricolpate grain with a distinct 3 µm thick exine, half of which is foot layer, half strongly columellate ectexine, with a thick tectum. The tectum is apparently psilate, but the intercolpal areas show a slightly linear, strong verrucate pattern, which must be produced by the thick columellae.
84												
85	6	1	<i>Tilia</i> -type	38	b	P4364-35	C-400750	97.9	18.8	S41/3	0167	<i>Tilia</i> -type, as discussed in White and Ager (1994, p. 72, Pl. 5, fig. 25).
86	6	2	<i>Psilastephanocolpites cf. marginatus</i> of Norris 1997	22	b	P4364-97	C-400772	90.1	12.7	M49/3	0201	This specimen is tetracolporate, virtually the same size, and has the faint, equatorially-elongated, biconvex pore, seen on reexamination of the reference slide of Norris' specimen (1997, p. 39, Pl. 6, no. 34), called <i>Psilastephanocolpites cf. marginatus</i> Gonzales Guzman 1967. This grain is the same as with Tetracolporate B of Piel (1971, Pl. XII, figs 93,94). It appears that all colps do not project the same distance towards the pole, as in Norris' and Piel's illustrations, but some oblique compression may contribute to this appearance.
87	6	3	<i>Psilastephanocolpites cf. marginatus</i> of Norris 1997	23/20	b	P4364-97	C-400772	86.2	19.8	U53/1	0205	This specimen is tetracolporate, virtually the same size, and has the faint, equatorially-elongated, biconvex pore, seen on reexamination of the reference slide of Norris' specimen (1997, p. 39, Pl. 6, no. 34), called <i>Psilastephanocolpites cf. marginatus</i> Gonzales Guzman 1967. This grain is the same as with Tetracolporate B of Piel (1971, Pl. XII, figs 93,94). It appears that all colps do not project the same distance towards the pole, as in Norris' and Piel's illustrations, but some oblique compression may contribute to this appearance.
88	6	4	<i>Castanea</i> -type	16/8	b	P4364-61	C-400644	101.8	17	R36/2	0117	See White and Ager (1994, Pl. 5, fig. 7, p. 72).
89	6	5	<i>Psilastephanocolpites cf. marginatus</i> of Norris 1997	26/24	b	P4364-89	C-400764	72	11.9	M67/2	0187	This specimen is tetracolporate, virtually the same size, and has the faint, equatorially-elongated, biconvex pore, seen on reexamination of the reference slide of Norris' specimen (1997, p. 39, Pl. 6, no. 34), called <i>Psilastephanocolpites cf. marginatus</i> Gonzales Guzman 1967. This grain is the same as with Tetracolporate B of Piel (1971, Pl. XII, figs 93,94). It appears that all colps do not project the same distance towards the pole, as in Norris' and Piel's illustrations, but some oblique compression may contribute to this appearance.
90	6	6	<i>Acer</i> sp.	33/32	b	P4364-21	C-400711	88	5	D51/3	0141	This is apparently a tricolate grain, although a pore is suggested by an inflection in the colpus. A faint striate ornament runs in a general polar direction. It is similar to <i>Acer spicatum</i> (Adams and Morton, 1976, Plate 41).
91	6	7	<i>Aceripollenites tener</i> (Samoilovitch) Norris 1997	26	b	P4364-28	C-400734	102	5.1	D36/4	0154	(Samoilovitch) Norris 1997. This is an intectate, apparently oblate grain with deep colps and a meridional striate pattern from pole to equator, and size similar to that shown by Norris (1997, p. 38 Pl 5, fig. 22, 23).
92	6	8	Apiaceae (Umbelliferae)	22/12	b	P4364-55	C-400638	70.2	7.1	G70/1	0097	This tricolporate grain has equatorially elongated pores and a thick tectate exine typical of the Apiaceae (Kapp et al., 2000). The exine is thickest at the poles, about 1.5 µm thick, and the tectum appears to be microreticulate.
93	6	9	<i>Castanea</i> -type	14/9	b	P4364-33	C-400745	92	11.5	L47/3	0165	This broken specimen appears to <i>Castanea</i> -type, as discussed in White and Ager (1994, p. 72), although it does not have sharply defined pores.
94	6	10	<i>Cornus</i> sp.	42/28	b	P4364-2	C-400660	79.9	21	V61	0129	This large tricolporate grain has the strongly erupted pores and subangular shape of <i>Cornus</i> sp. (McAndrews et al., 1973, fig. 14a-c), but no pronounced verrucate pattern.
95	6	11	<i>Cornus</i> sp.	42./24	b	P4364-9	C-400677	98.9	6.8	F40/3	0132	This specimen of <i>Cornus</i> sp. shows subangular shape and the verrucate ornament of <i>Cornus</i> spp. (McAndrews et al., 1973, fig. 14a-c).

	A	B	C	D	E	F	G	H	I	J	K	L
96	6	12	//ex -type	20	b	P4364-60	C-400643	70.2	5.3	unavail	0109	See discussion in White and Ager (1994, p. 73, Pl. 5, fig. 14).
97	6	13	Mallik 2L-38 unknown 5	24/16	b	P4364-51	C-400634	102	21.3	V36/4	0095	The pores in this tricolporate grain appear to be equatorially elongated. The exine is tectate and scabrate and thickest (about 3 µm) at the pores.
98	6	14	Mallik 2L-38 unknown 6	19/11	b	P4364-56	C-400639	74	13	N66/1	0102	This specimen is tricolporate with apparent equatorial elongation of pores, and is tectate with scabrate/verrucate ornament.
99	6	15	Mallik 2L-38 unknown 9	19/14	b	P4364-61	C-400644	86	23.2	X53/3	0114	This grain is tricolporate with a robust exine. It is tectate with clearly visible collumellae and an exine up to 2 µm thick at poles, but thinner at equator. The ornament is scabrate.
100	6	16	Mallik 2L-38 unknown 10	24	b	P4364-65	C-400648	80	6	E59/4	0120	This is grain is apparently oblate, with distinct colps reaching 3/4 way to the pole, distinct pores, and a tectate, microreticulate exine.
101	6	17	Mallik 2L-38 unknown 12	22/16	b	P4364-70	C-400653	92.1	9.6	J47	0127	This is a tricolporate pollen grain with sharply erupted pores, scabrate ornament, and a very robust exine about 1.5 to 2 µm thick. It is similar to Mallik 2L-38 unknown 12 image 0148.tif, (Pl. 7, fig. 1), excepting in the eruption of the pores which in this speciemnt is pronounced, but may be a result of the crushing of the grain.
102	6	18	Mallik 2L-38 unknown 12	24/22	b	P4364-12	C-400684	102	9.3	J36/2	0135	This specimen of Mallik 2L-38 unknown 12 shows more verrucate ornament and a distinct, slit-like, psilate colpus. Other specimens measured in this slide range in size, i.e., 32/22, 28/20, 29/18, and 24/22 µm. This range of sizes might indicate that this is a complex of pollen species.
103												
104	7	1	Mallik 2L-38 unknown 12	20/16	b	P4364-24	C-400720	98	21.5	V40	0148	This specimen shows Mallik 2L-38 unknown 12 undeformed, but with pores but not strongly erupted.
105	7	2	Mallik 2L-38 unknown 21	24/18	b	P4364-28	C-400734	102	10	K36/2	0157	This is a tricolpate, tectate grain, apparently reticulate between the colps and equatorially regulate near the colps, with a 3 µm thick exine thick.
106	7	3	Mallik 2L-38 unknown 25	24/14	b	P4364-34	C-400748	94.1	10.7	K44/4	0168	This is a tricolporate grain with an indistinct pore, a subquadrangular shape, a thick exine, about 1.5 µm, and is psilate. It is similar to Mallik 2L-38 unknown 12, except for its more subquadrangular shape lack of an ornamented exine.
107	7	4	Mallik 2L-38 unknown 27	24/20	b	P4364-91	C-400766	90	9	H49/3	0193	This is a tricolporate grain with small pores and colps extending about 3/4 of the way towards the poles. The colps are marked by dark exine . The exine is consitently about 1 - 1.5 µm thick with faintly visible columellae. The exine is tectate and apparently psilate, but may also be micro-foveolate in the intercolpal region.
108	7	5	Mallik 2L-38 unknown 31	28/21	b	P4364-98	C-400773	72	9.8	J68/3	0207	This tricolporate grain exhibits pore eruption, although this is probably exaggerated by some crushing in the polar axis. The exine is thick, about 2 µm, with a thick foot layer, a thin columellate layer and a thin, psilate tectum.
109	7	6	Nyssa sp.	22/22	b	P4364-55	C-400638	84.1	14.9	P55/1	0098	This specimen is comparable in morphology to <i>Nyssa aquatica</i> and <i>N. sylvatica</i> , as illustrated by Lieux, (1983, p. 326, Pl. XCV, XCVI) but is considerably smaller than even the smaller <i>N.sylvatica</i> (about 30-37/30-35 µm). Another, unillustrated specimen of <i>Nyssa</i> sp. from Mallik 2L-38 is larger, 28/24 µm.
110	7	7	cf. Nyssa sp.	30	b	P4364-86	C-400761	86.1	14.2	O53	0180	This oblique polar presentation shows the thickened to annulate pores, suggesting <i>Nyssa</i> (see Lieux, 1983, p. 326, Pl. XCV, XCVI). It has a thin collumellate exine, is semitectate and microfoveolate.
111	7	8	Quercus sp.	22/16	b	P4364-40	C-400592	100	18.6	S39/3	0086	This specimen has the irregular verrucate ornament of Quercus, and has an equatorial inflection which suggests the presence of a pore (see Adams and Morton, 1972; Bassett et al., 1978).
112	7	9	Quercus? sp.	30/24	b	P4364-13	C-400687	87.2	8.5	H52	0136	This specimen tricolpate specimen seems similar to Quercus in being semitectate with visible columellae and having irregular verrucate ornament, are as shown by Lieux (1980b, Plates XXXIX -XLVI).
113	7	10	<i>Rhoipites</i> sp., cf. <i>R. microreticulatus</i>	26/20	b	P4364-79	C-400752	88.1	7.8	F51	0170	<i>Rhoipites</i> sp., cf. <i>R. microreticulatus</i> (Pflug and Thompson in Thompson and Pflug) Takahashi and Jux,1986 as illustrated by Norris (1997, p. 41, Pl. 5, figs. 26-28). The lumina of this reticulate, tricolporate specimen are ca. 1 µm, grading to microreticulate sizes at the colpus. The pore is equatorially elongated.
114	7	11	<i>Rhoipites</i> sp.	34/24	b	P4364-98	C-400773	99.6	16.9	Q39/3	0208	This grain is tricolporate, with an exine 3 µm thick and a reticulum composed of fused clavae. The reticulum becomes finer towards the colps. The colpal exine is psilate adjacent to the pore, and the pore is rectangular and equatorially elongated. An exinal thickening appears to run in the colpus from the pore to about 2/3 of the way to the pole.
115	7	12	Quercus sp.	28/20	b	P4364-87	C-400762	71.8	20	U67	0181	See Adams and Morton (1972, Bassett et al. (1978).
116	7	13	Rosaceae	24/18	b	P4364-66	C-400649	92.1	21.4	V47/3	0124	The protruding pores and faint striate ornament of this grain suggests the Rosaceae (Adams and Morton,1974).
117	7	14	Rosaceae	24/18	b	P4364-26	C-400726	87.8	21	V51	0149	The protruding pores and faint striate ornament of this grain suggests the Rosaceae (Adams and Morton,1974).
118	7	15	<i>Shepherdia canadensis</i>	24/12	b	P4364-40	C-400592	78	23.3	X61	0087	This tricolporate grain has the low verrucate ornament, distinct colpus and annulated pore of <i>Shepherdia canadensi</i> s (Adams and Morton, 1976; McAndrews et al., 1973; Bassett et al, 1978).
119	7	16	<i>Shepherdia canadensis</i>	34/16	b	P4364-87	C-400762	84.2	12.8	M54/4	0182	This tricolporate grain has the low verrucate ornament, distinct colpus and annulated pore of <i>Shepherdia canadensis</i> (Adams and Morton, 1976; McAndrews et al., 1973; Bassett et al, 1978).
120	7	17a,b	<i>Boehlensipollis hohli</i> Krutzsch 1972	20	b	P4364-95	C-400770	92.2	14.1	O46/2	0195a,b	This grain shows the features of <i>Boehlensipollis hohli</i> Krutzsch 1962 (p. 272, Pl. III, fig. 18-30), i.e.; a deep concave-shaped amb, thin closed trilete mark extending to the equator where it merges to an atriate pore, and a psilate exine.
121												
122	8	1a,b	<i>Integricorpus</i> sp. A of Norris 1986	33/12	b	P4364-30	C-400739	98	16.5	Q40/4	0161a,b	This is a triprojecate grain with an angular microreticulum, becoming distally very fine to scabrate on projections. Norris' specimens were distally scabate (Norris, 1986, p. 36, Pl. 9, fig. 12-14). The size 34 µm long, 12 µm wide, with 10 µm projections, is within Norris' size range. The projections can not be accuratley measured. See the discussion herein.
123	8	2a,b	<i>Integricorpus</i> sp. A of Norris 1986	30	b	P4364-23	C-400719	103	15.2	P35	0145a,b	This is a triprojecate grain with an angular microreticulum, becoming distally very fine to scabrate on projections. Norris' specimens were distally scabate (Norris, 1986, p. 36, Pl. 9, fig. 12-14). The polar axis is within Norris' size range. The projections can not be accuratley measured. See the discusion herein.
124	8	3a,b	cf. <i>Parviprojectus</i> sp. A of Rouse 1977	27/14	b	P4364-23	C-400719	101.8	14.1	O36/2	0146a,b	This specimen is referred to <i>Parviprojectus</i> sp. A of Rouse 1977 (Rouse, 1977, Pl. 2, fig. 31). Rouse's specimen is 28/15 µm with arms about 3 µm long, vs. 27/14 µm with projections about 3µm long for this Mallik specimen. The Mallik specimen is crushed and eroded, but has faint, polar-oriented striations as in Rouse's specimen. See discussion herein.
125	8	4	<i>Striatocorpus sweetii</i> n. sp.	18/22	b	P4364-82	C-400755	80.1	13.1	N59	0173	<i>Striatocorpus sweetii</i> n. sp. Crushing obscures the distal pole. See Appendix 2, herein.
126	8	5	<i>Striatocorpus sweetii</i> n. sp. (holotype)	20/22	b	P4364-96	C-400771	100.1	18.3	S39/3	0197	<i>Striatocorpus sweetii</i> , n. sp., holotype. This specimen has a striate pattern normal or slightly oblique to the projections surface, more pronounced at the proximal pole and reducing towards the distal pole, and apparently more pronounced on the spines of the projections than towards the body. This specimen is about 20/22 µm, and may have a slight distal dome, although the distal pole is obscured by a projection. In White (1999) it was called Mancicorpus sp.of Ridgway et al. 1995. See Appendix 2, herein.
127	8	6	<i>Striatocorpus sweetii</i> n. sp. (holotype - digitally enhanced)	20/22	b	P4364-96	C-400771	100.1	18.3	S39/3	0197	This is image 0197.tif, with the straite ornament emphasized by processing the image with an unsharp mask filter.
128	8	7	cf. <i>Striatocorpus sweetii</i> n. sp.	18/22	b	P4364-97	C-400772	93.9	21.2	V45	0199	Cf. <i>Striatocorpus sweetii</i> . This specimen may represent variation in <i>S. sweetii</i> . It is almost isopolar, and nearly rhombic in shape, but the striate ornament is very similar to the holotype and it occurs stratigraphically just 10 m below the holotype.
129	8	8	<i>Gothanipollis</i> ? sp.	20	b	P4364-90	C-400765	88.1	13.8	N51/3	0191	This specimen is stongly inter-radially convex, has a distinct trilete mark and appears to have a germinal apparatus comparable to <i>Gothanipollis</i> spp. (Krutzsch 1959, p. 232-239, Pl. XLVI, XLVII).
130	8	9	Mallik 2L-38 unknown 29	20	b	P4364-96	C-400771	91.9	14.9	P47/2	0198	This specimen appears to be a tetrad, with one slightly protruding colpus visible on each grain. Each colpus appears to have some marginal thickening. The exine is psilate.
131	8	10	<i>Magnolia</i> sp.	46/20	b	P4364-50	C-400633	102.2	8.5	H36/2	0093	This pollen has the naviculate shape with a sulcus extending to the poles of the grain, and a double wall, but a more reduced ornament compared to that illustrated by Lieux (1980a, Plates IX to XIII).
132	8	11	<i>Magnolia</i> sp.	84/54	b/2	P4364-28	C-400734	94	7.6	G44/4	0156	The monocolpate structure compares with <i>Magnolia</i> spp., as illustrated by Lieux (1980a, Pl. IX-XIII). Modern <i>Magnolia</i> pollen ranges from 42 - 98 µm in longitudinal equatorial axis (Lieux, 1980a).
133	8	12	Mallik 2L-38 unknown 16	26	b	P4364-14	C-400689	84.1	19	T55/1	0137	This is a subtriangular grain with clavae forming a striate ornament.The apertures are difficult to interpret.
134	8	13	Pollen tetrad (scabrate)	34	b	P4364-15	C-400692	95.9	16.5	Q43/3	0138	This pollen is a planar tetrad with a thin exine and scabrate ornament. It may belong to the Ericales.

	A	B	C	D	E	F	G	H	I	J	K	L
135	8	14	<i>Trudopollis</i> sp., <i>T. ?barensii</i>	28		P4364-97	C-400772	76.1	11	L63/2	0200	This specimen of <i>Trudopollis</i> has a slightly convex amb, has short colps, and distinctly thickened, psilate exine at the apices. The rest of the grain has scabrate-verrucate exine. It is similar to <i>T. barensii</i> of Spitsbergen (Manum 1962, p. 49-50, Pl XII, figs 24-27), in size and subtriangular outline. However, it has a less coarse ornament, slit-like colps and no evidence of an inner exinal layer forming a vestibulum. This morphology is similar to <i>Haloragis</i> spp. , a modern pollen illustrated by Simpson (1960, Pl XIV, figs 12-15) and Praglowski (1970, Pl. 7) which is a humid, terrestrial genus mainly represented in the southern hemisphere.