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Palaeoenvironments of the Middle Stone Age at Sibudu Cave, KwaZulu-Natal, South Africa: An analysis of archaeological charcoal

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	A	B	C	D	E	F	G	H	I	J
1	**TYPE**	Poss Id?	V.Solitary	Short Radials	Radials >4	Rad/Obliq. Or	Clusters	Perf plates	V. Spirals	Pits <3um
3	**C**	Erica sp.								
4	**D**		Some	Y	Occ	N	Y	Simple	N	Mostly
5	**E**		Occ	Y	Y	Y	N	Simple	N	N
6	**F**		Y	Y	Occ	N	N	Simple	N	Y
7	**G**		Y	Y	Occ	N	N	Simple	Y	Y Mostly
8	**H**		N	Y	Y	N	N	Simple	N	N
9	**I**		Y	Y	N	Tang	Occ	Simple	N	Y
10	**J**		Y	N	N	Tang	N	Simple	N	Y
11	**K**		N	Y	Occ	Y	Occ	Simple	Y	N
12	**L**		Y	Y	Occ	N	Some	Simple	Faint	Y Mostly
13	**M**		Y	Y	N	N	N	Simple	N	Y Mostly
14	**N**		Y	Y	N	N	N	Simple	N	Y
15	**O**		N	Occ	Y	Y	Y	Simple	Y	Y
16	**P**		Y	Y	Y	N	N	Simple	Y	N
17	**Q**		Occ	Y	Y	Obliq	Y	Simple	N	N
18	**R**		Y	Y	N	N	Y	Simple	N	N
19	**S**		Y	Y	N	N	N	Simple	Some	Y
20	**T**		Y	Y	N	N	N	Multi	N	Y
21	**U**		Y	Y	Some	Tang	Y	Simple	Faint	Mostly
22	**V**		Y	Occ	N	N	N	Multi	N	Y
23	**W**		Y	N	N	N	N	Simple	N	Y
24	**X**		Y	Y	N	N	N	Simple	N	Y
25	**Y**		Y	Y	Occ	N	N	Simple	N	Y
26	**Z**		Some	Y	Y	Obliq	Some	Simple	N	N
27	**AA**		N	N	Y	Y	Y	Simple	Y	not all
28	**BB**		Y	Occ	Occ	N	N	Simple	N (faint)	Y
29	**CC**		Some	Y	Y	N	Y	Simple	N	Y
30	**DD**		Y	Y	N	Tang	Y	Simple	N	N
31	**EE**		Y	Y	Occ	Tang	Y	Simple	Y	Y
32	**FF**		Y	Occ	N	N	N	Multi	N	Y
33	**GG**		Y	N	N	N	N	Multi	N	Y

Appendix D: Type identification database

	M	N	O	P	Q	R	S	T	U	V
1	Tyloses?	V/mm2	V.Size	V. El. Length	F. Septate	Thick walled?	Pits bordered	F Tracheids	Spirals?	F. Length
3										
4	Some	>40/mm2	<150um	A	Some?	N	N	N	N	<1mm
5	N	>40/mm2	<50um	A	Some	Y	Too sm to see	?	N	<1mm
6	N	>40/mm2	<50um	B	Some	N	N	N	N	<1mm
7	N	>40/mm2	<50um	A	N	Med.	N	N	N	<1mm
8	Y	>40/mm2	<100um	A	N	N	NS	?	NS	NS
9	Some	>40/mm2	<50um	A	N	N	Y minutely	?	N	<1mm
10	Some	>40/mm2	<50um	A	N	N	Y	Y	N	<1mm
11	Y	<40/mm2	<100um	A	N	Y	N	N	N	<1mm
12	Some	>40/mm2	<100um	A/B	Y	N	NS	?	N	<1mm
13	N	>40/mm2	<50um	A	Some	N	N	N	N	<1mm
14	N	>40/mm2	<50um	B	Y	N	Too sm to see	N?	N	<1mm
15	N	>40/mm2	<50um	A	Some	N	N	N	N	<1mm
16	N	>40/mm2	<50um	A	N	N	N	N	N	<1mm
17	N	>40/mm2	<50um	A	Some	N	Y minutely	Y?	N	<1mm
18	Y	>40/mm2	<100um	A	N	N	N	N	N	<1mm
19	Y	>40/mm2	c50um	B	?	Some	Y	Y	N	<1mm
20	Some	>40/mm2	c50um	B	Some	N	Y minutely	Y?	N	<1mm
21	Some	>40/mm2	<100um	A	Y	N	N	N	N	<1mm
22	N	>40/mm2	<50um	A	N	N	Y	Y	N	<1mm
23	N	>40/mm2	<50um	A	N	Some	Y minutely	Y?	N	<1mm
24	N	>40/mm2	<50um	A/B	N	Y	N	N	N	<1mm
25	N	>40/mm2	<50um	A	Y	N	N	N	N	<1mm
26	N	>40/mm2	c50um	A	Y	N	N	N	N	<1mm
27	N	>40/mm2	<50um	A	N	N	Y minutely	Y?	Y	<1mm
28	Y	>40/mm2	<50um	B	N	N	N	N	N	<1mm
29	Y	>40/mm2	c50um	B	N	N	?	N?	N	<1mm
30	N	>40/mm2	c50um +,<50	A	Some	N	N	N	N	<1mm
31	Some	>40/mm2	c100um + <1	A	Y	N	N	N	N	<1mm
32	N	>40/mm2	<50um	A	N	N	Y	Y	N	<1mm
33	N	>40/mm2	<50um	A	N	Y (Many)	Y?	Y	N	<1mm

	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
1	Real Ray widt	Agg Rays?	2 Widths?	Homocellular	Heterocellular	Bi/Tri ser narr	Storied?	Rays/mm	V-R Pits	P.Rare/absen
3										
4	3-+10-ser	N	?	N	Sq + Up (occ	N	Almost	<4/mm	Normal	Y?
5	1-2-ser	N	N	Y pro	(occ up)	N	N?	<12/mm	Poss more B'	N
6	1-3-ser	N	N	N	Y Pro + c4 up	N	N	<12/mm	More Numero	Y
7	1-3/4-ser	N	N	N	Y Pro + Up	N	N	<12/mm	Some opp	Y
8	1-5-ser	Some	N	N	Y Pro + 1-2up	N	N	c11/mm	Some opp + s	N
9	1-4-ser	Fused	N	N	Y Pro + >4 up	N	N	<12/mm	Normal	?
10	1-ser (occ2)	Fused?	N	N	Y Pro/Sq + Up	Y	N	>12/mm	Poss more B'	Y
11	1-7/8-ser	Fused	Y	N	Y	Y (not all)	N	>12/mm	Some larger	N
12	1-3-ser	N	N	N	Y Pro + Up	CHECK THIS	N	<12/mm	Dist. Borders	Y
13	2-3/4-ser	N?	N	Y sq + Up	Occ Sq + Pro	N	N	>12/mm	Normal	N
14	1-2-ser(occ3)	N	N	N	Y Pro + Up	Occ	Some	>12/mm	Normal	N
15	1-ser	N	N	Y Pro	N	NA	N	>12/mm	Normal	Y
16	1-4-ser	N	N	Y Up	N	N	N	<12/mm	Larger + som	Y
17	1-ser (occ2)	N	N	Y Up	N	NA	N	c12/mm	Some opp	N
18	1-3-ser	N	N	Y pro	Occ up@end	N	N	>12/mm	Slight;y larger	N
19	1-3/4-ser	Fused	N	N	Y Pro + Up	Some	N	>12/mm	Normal	N
20	1-2 (occ3)	Fused	N	N	Y Sq/Pro + >1	Y Mostly	N	<12/mm	Normal	Y?
21	2-6-ser	N	N	Y pro	N	N	Some Almost	<12/mm	Normal	Y
22	1-2-ser	N	N	Y pro	N (occ up)	N	N	>12/mm	Normal	Y
23	1-ser	N	N	Y Up	N	NA	N	>12/mm	Normal	N
24	1-2/3-ser	Fused?	N	N	Y Pro + Up	Y Often	N	>12/mm	Normal	N
25	2-5-ser	N	N	Y	Y Pro + Up >4	N	N	c11-12/mm	Normal	N
26	2-6-ser	N	N	Y Pro	Occ up@end	N	Almost	<12/mm	Normal	N
27	1(occ2)-ser	N	N	Sq-Pro	N	Some	N	>12/mm	Normal	N
28	1-2-ser	Fused?	N	N	Y Up (occ Sq	Some	N	>12/mm	Slightly Large	Y
29	1-3/4-ser	N (Fused?)	N	N	Y Pro + Up	Some	N	>12/mm	Normal	Y
30	1-5-ser	N	N	N	Y Pro + Up	Some	N	c12/mm	Opp/Scal	N
31	2-4/5-ser	N	Some 1-ser	Almost Pro	Y Pro + Sq/Up	N	Almost	<12/mm	Normal	?
32	1-2-ser	N	N	N	Y Pro + Sq/Up	Some	N	>12/mm	More Bordere	N
33	1-ser	N	N	N ???	Y Pro ???	NA	Some	>12/mm	Normal	Y

Appendix D: Type identification database

	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1	P. Paratrach	Vasicentric	Alif or Conf.	Banded?	1-ser or >4	>6/mm	Storied?	Fusiform	Marginal?	G.R.Absent
3										
4	N	N	N	N	N	N	NA	NA	NA	Y
5	N	N	N	Y	<4-ser	N	N	N	?	?
6	N	N	N	N	N	N	N	N	N	Y
7	N	N	N	N	N	N	N	N	N	N
8	N	N	N	N	N	N	N	N	N	NS
9	N	N	N	N	N	N	NS	NS	NS	?
10	N	N	N	N	N	N	NA	NA	NA	N
11	N	Some	N	Y	1-ser	Y	Some	N Long Strand	Y	N
12	?	Some	N	N	N	N	NS	NS	N	Y?
13	Y	Y Scanty	N	N	N	N	Y	N	Some	N
14	N	N	N	N	N	N	NS	NS	Y	N
15	?	Some	N	N	N	N	NS	NS	N	N
16	N	N	N	N	N	N	N	N	N	N
17	Y	Scanty	N	N	N	N	NS	NS	N	N
18	Y	Y	Some Ali	N	N	N	N	N	N	Y
19	N	N	N	N	N	N	Almost	N	Y?	N
20	N	N	N	N	N	N	NS	NS	?	N
21	N	N	N	N	N	N	N	N	?	N
22	Y	Scanty	N	N	N	N	NS	NS	N	N
23	N	N	N	Y	c4-ser	Y?	Y	N	Y?	N
24	N	N	N	N	N	N	N	N (c5+ cells)	N	?
25	?	Some	N	N	N	N	N	N	Y?	N
26	Y	Y	N	N	N	N	N	N 4 cells	N	?
27	N	?	N	N	N	N	NS	NS	?	N
28	N	N	N	N	N	N	N	N	N	N
29	N	N	N	N	N	N	NA	NA	NA	N
30	Y	Y	Some	Some Marg	<4-ser	>6/mm	Some	N	Y	N
31	Some	Some	N	N	N	N	N	N	Y?	N
32	Y	Scanty	N	N	N	N	N	N	N	N
33	N	N	N	N	N	N	N	N	N	Y

Appendix D: Type identification database

	AW	AX	AY	AZ	BA
1	Semi-R porou	Crystals?	Resin canals	Sheath Cells?	Tile Cells?
3					
4	N	N	N	Y V clear	N
5	N	Y in P + R	N	N	N
6	N	N	N	N	N
7	N	N	N	Some	N
8	N	Y in R	N	N	N
9	N	N	N	N	N
10	Y	N	N	N	N
11	N	Y in R	N	Some	Y
12	N	N	N	Some	Some
13	Y	N	N	N	N
14	Y	N	N	N	N
15	N	N	N	N	N
16	N	N	N	N	N
17	Almost	N	N	N	N
18	N	poss in Rays	N	N	N
19	Y	N	N	N	N
20	N	N	N	N	N
21	Y	N	N	N	N
22	N	N	N	N	N
23	N	N	N	N	N
24	N	N	N	N	Some
25	N	Y in R	N	N	N
26	Poss	N	N	N	N
27	N	N	N	N	N
28	Y	N	N	N	Some
29	Slightly	N	N	N	Some
30	N	N	N	Y	Y
31	Y	N	N	N	N
32	Y	N	N	N occ	N
33	N	N	N	N	N

	A	B	C	D	E	F	G	H	I	J
1	**TYPE**	Poss Id?	V.Solitary	Short Radials	Radials >4	Rad/Obliq. Or	Clusters	Perf plates	V. Spirals	Pits <3um
34	**HH**		Y	Y	Occ	N	N	Simple	N	Y
35	**II**		Y	Y	N	N	N	Multi	Faint	Y
36	**JJ**		Y	Y	Y	Y?	Some	Simple	N	N Slit-like
37	**KK**		Occ	Y	Y	Y	N	Simple	Faint	Y
38	**LL**		Occ	Y	Y	Y	Y	Simple	Faint	Y
39	**MM**		Y	Y	Occ	N	Y	Simple	N	Y
40	**NN**		Some	Y	Some	Y	N	Simple	N	Y
41	**OO**		N	Y	Y	Y	N	Simple	Faint	Y
42	**PP**		Y	Occ	N	N	N	Simple	N	N
43	**QQ**		Y	Y	Occ	N	Occ	Simple	N	N
44	**RR**		N	Y	Y	Y Rad + Oblic	Y	Simple	Y	Y Slit-like
45	**SS**		N	Y	Y	Y	N	Simple	N	Y Slit-like
46	**TT**		Occ	Y	Y	Y	N	Simple	N	Some + Slit-li
47	**UU**		N	Y	Y	Y	N	Simple	N	Y
48	**VV**		Y	Occ	N	Tang	N	Simple	N	Borderline
49	**WW**		Occ	Y	Occ	N	Occ	Simple	N	Some
50	**XX**		N	Occ	Occ	Y?	Y	Simple	N	Y
51	**YY**		N	Occ	N	Tang	Y	Simple	Faint	Some
52	**ZZ**		Occ	Occ	Y	Y	N	Simple	N	Y
53	**53**		Y	Y	N	N	Y	Simple	N	Y
54	**55**		Y	Y	Y	N	Some	Simple	N	Y Slit-like
55	**56**		Occ	Y	Y	Y	Occ	Simple	Y	Y
56	**57**		Y	Y	N	N	Y	Simple	N	N
57	**58**		N	N	Y	Y	N	Simple	N	Y
58	**59**		Y	Y	N	N	N	Simple	Faint	Y
59	**60**		Y	Y	N	N	Occ	Simple	N	Y
60	**61**		Occ	Y	Y	Y	N	Simple	Faint	N
61	**62**		Y	Y	N	Tang	Y	Simple	Y	Y
62	**63**		Y	Y	Y	Rad	Y	Simple	N	Y
63	**64**		Occ	Y	Y	Rad	N	Simple	Y	Y
64	**65**		N	Y	Y	Rad	N	Simple	Y	Not all

Appendix D: Type identification database

	M	N	O	P	Q	R	S	T	U	V
1	Tyloses?	V/mm2	V.Size	V. El. Length	F. Septate	Thick walled?	Pits bordered	F Tracheids	Spirals?	F. Length
34	N	Just >40/mm2	<50um	A	Some	N	N	N	N	<1mm
35	Some	>40/mm2	c50um	A/B	Y	N	N?	N	N	<1mm
36	N	>40/mm2	c50um	A	Y	N	N	N	Y	>1mm some
37	Y	>40/mm2	<100um	B	Y	N	N	N	N	>1mm some
38	Y	>40/mm2	<100um	A/B	Y	N	N	N	N	>1mm some
39	N	>20,<40/mm2	<100um	A	Some	Y	Y	Y	N	<1mm
40	Y	>40/mm2	<100um	A	N	N	N	N	Y	<1mm
41	N	>40/mm2	<50um	B	Y	N	N	N	N	<1mm
42	N	>40/mm2	<50um	B	N	N	Too sm to see	N?	N	<1mm
43	Y	>20,<40/mm2	<100um	Just B	Some	N	Y minutely	Y	N	<1mm
44	N	>40/mm2	<50um	A	Some	Y (mostly)	N	N	N	<1mm
45	N	>20,<40/mm2	c50um +,<50u	A	N	Some	N	N	N	<1mm
46	Some	>20,<40/mm2	<100um	A/B	N	Some	Y?	Y	N	<1mm
47	N	>40/mm2	<50um	B	N	N	Y	Y	N	<1mm
48	N	>40/mm2	<100um	B	N	Some	Y	Y	N	<1mm
49	Some	>40/mm2	<100um	A/B	N	N	N	N	N	<1mm
50	N	>40/mm2	<100um	A	N	N	N	N	N	<1mm
51	N	>40/mm2	<100um	A	Y	N	N	N	N	<1mm
52	N	>40/mm2	c50um	A	N	N	NS	NS	NS	NS
53	N	>20,<40/mm2	<100um	A	Y	N	N	N	N	<1mm
54	Y	>40/mm2	c50 + <50um	A	Y	Mostly	Y	Y	Y	<1mm
55	N	>40/mm2	c50 + <50um	A	Some	N	N	N	N	<1mm
56	N	<20/mm2	<150um	A	N	Some	N?	N	N	<1mm
57	N	>40/mm2	<100um	A/B	N	N	N	N	N	<1mm
58	Some	>40/mm2	c50 + <50um	A	Y	N	N	N	N	<1mm
59	N	c40/mm2	c50um	A	Y	N	N	N	N	<1mm
60	N	>40/mm2	c50 + <50um	B	Y	N	N	N	N	?<1mm
61	N	>40/mm2	<50um	B	Y	N	N	N	N	<1mm
62	N	>40/mm2	<100um (c50)	A/B	Y	N	N	N	N	<1mm
63	N	>40/mm2	c50 + <50um	A	N	N	N	N	N	<1mm
64	Some	>40/mm2	c50 + <50um	B	Y	N	NS	NS	N	<1mm

	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
1	Real Ray widt	Agg Rays?	2 Widths?	Homocellular	Heterocellular	Bi/Tri ser narr	Storied?	Rays/mm	V-R Pits	P.Rare/absen
34	>4-ser	N	N	Y Up	N	N	N	<4/mm	NS	Y
35	1-2-ser	Poss Fused	N	N	Y Pro + Up	Some	N	c12/mm	Normal	Y (not V Clea
36	3-6-ser	N	N	N	Y Sq + Up	N	N	c4/mm	?	Y
37	1-5-ser	Some Fused	N	N	Y Sq + Up	N	N	<12/mm	Lg + Opp/Sca	Y
38	1-6/7-ser	N	N	N	Y Pro + Up	N	N	<12/mm	Larger + som	?
39	1-2-ser	N	N	N	Y Pro + Up	Y	Y	>12/mm	Some larger	N
40	1/2-6-ser	Y	N	N	Y Pro/Sq + U	N	N	>12/mm	Normal	Y?
41	1-5-ser	N	N	N	Y Pro/Sq + U	N	N	c4/mm	Normal	N
42	1-3/4-ser	Fused?	N	N	Mostly Up sor	N	N	>12/mm	Enlarged	N
43	1-2-ser	N	N	N	Y Pro + Up	N	N	>12/mm	Normal	Y
44	1-2-ser	N	N	NS	NS	NA	N	Not Clear	NS	N
45	1-3/4-ser	N	N	N	Y Pro + Up 1c	N	N	c11/12/mm	Less Slit-Like	N
46	1(occ2)-ser	Some	N	N	Y Pro + Up	NA	N	>12/mm	Large	N
47	1-2(occ 3)-se	N	N	N	Y Pro + 1-4up	N	Some	>4,<12/mm	Normal	Y
48	1-5/6-ser	N?	Some 1-ser	N	Y Pro + Up (>	N	N	>12/mm	Dist. Borders	N
49	1-ser	N	N	Y pro	N	NA	N	>12/mm	Normal	N
50	1-ser + up to	N	Y?	N	Y Pro/Sq + U	N	N	<12/mm	Normal	N
51	1-ser + 1-5/6-	N	?	N	Y Pro/Sq + U	N	Almost	<12/mm	Normal	N
52	1-2-ser	N	N	Y Up	N	Y	N	>12/mm	Normal	Y?
53	1-ser	N	N	N	Y Sq + Up	NA	N	>12/mm	Opp + Scal	?
54	1-ser	N	N	N	Y Pro + Up	NA	N	>12/mm	Some Opp	N
55	up to 5/6-ser	N	N	Y Pro	Y Pro + Up	N	N	<12/mm	Normal	Y
56	Occ 3-ser	N	N	Y Pro	(Occ Sq too)	N	Some	c12/mm	Normal	N
57	1-5-ser	N	N	N	Sq/Pro + long	N	N	<12/mm	Normal	Y
58	1-4-ser	N	N	N	Pro + 1-2-up	N	N	c12/mm	Normal	Y
59	1-5-ser	N	N	N	Pro + 1-2-up	N	N	<12/mm	Normal	Y
60	1-3/4-ser	N	N	N	Y Sq + Up (sc	N	N	>12/mm	Opp + Scal	?
61	1-5-ser	N	N	Almost	Pro + 1-2-up	N	Almost	<12/mm	Normal	Y
62	2-6/7-ser (occ	N	Y (1-2-ser too	N	Y Pro + Sq (o	N	N	<12/mm	Normal	Y
63	1-3-ser	N	N	Y Pro	N	N	Y	c12 + <12/mm	Normal	N
64	1-5-ser	some fused	N	N	Sq + Up	N	Y	<12/mm	Enlarged + Sc	Y

Appendix D: Type identification database

	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1	P. Paratrach	Vasicentric	Alif or Conf.	Banded?	1-ser or >4	>6/mm	Storied?	Fusiform	Marginal?	G.R.Absent
34	N	N	N	N	N	N	N	N	N	Y
35	N	N	N	N	N	N	N	N	N	?
36	N	N	N	N	N	N	N	N	N	N
37	N	N	N	N	N	N	NA	NA	NA	N
38	N	N	N	N	N	N	N	N Long Strand	?	N
39	N	N	N	Y	Variable (<4-s	Y	N	N 4 cells	Y	N
40	?	Scanty	N	N	N	N	N	N	N	N
41	N	N	N	N	N	N	N	N Chambered	?	N
42	N	N	N	Almost	1-2-ser	N	NS	N	N	N
43	N	N	N	N	N	N	N	N	N	N
44	Y?	Y?	N	N	N	N	N	N	N	N
45	Y	Y	Some	N?	N	N	N	N	N?	?
46	N	N	N	Y	1-3-ser	Y?	N	N	Y	N
47	N	N	N	N	N	N	NA	NA	NA	N
48	N	N	N	Y	>4-ser	N	Not Clear	?	Y	N
49	Y	Y	Some Ali	Y	c4-ser	N	N	N 4-6-cells	Y	N
50	Y	Y	N	N	NA	NA	N	N	N	N
51	Y	Y	N	N	NA	NA	N	N	N	N
52	Not Clear	Not Clear	Not Clear	Not Clear	Not Clear	Not Clear	Not Clear	Not Clear	Not Clear	Y
53	Y	Scanty	N	N	N	N	?	?	N	N
54	N	N	N	Y?	1-2-ser	>6/mm	N	N	Some	N
55	N	N	N	N	N	N	N	N	N	N
56	Y	Y	Some	N	N	N	Not Clear	Not Clear	?	?
57	N	N	N	N	N	N	NA	NA	NA	?
58	N	Scanty	N	N	N	N	N	N	N	N
59	N	N	N	N	N	N	N	N	N	N
60	N	N	N	N	N	N	?	?	N	N?
61	N?	Scanty	N	N	N	N	N	N	N	?
62	?	Scanty	N	N	N	N	N	N	?	N
63	Y	Y	N	N	N	N	Y	Occ (Mostly 2	N	N
64	N	N	N	N	N	N	NA	NA	NA	Not Clear

Appendix D: Type identification database

	AW	AX	AY	AZ	BA
1	Semi-R porou	Crystals?	Resin canals	Sheath Cells?	Tile Cells?
34	N	N	N	N	N
35	N	N	N	Some	N
36	N	N	N	Some	N
37	N	N	N	N	N
38	N	N	N	Some	N
39	N	N	N	N	N
40	N	N	N	Y some in Ag	N
41	N	N	N	Y	Y
42	N	N	N	N	N
43	N	N	N	N	N
44	N	N	N	N	N
45	N	N	N	N	N
46	N	N	N	N	N
47	Y	N	N	N	N
48	?	N	N	Y	N
49	N	N	N	N	N
50	N	N	N	Y	N
51	Y?	N	N	Y some	N
52	N	N	N	N	N
53	N	Some In R	N	N	N
54	N	N	N	N	N
55	N	N	N	Some	N
56	?	Some In R	N	N	N
57	N	N	N	Y	N
58	Y	N	N	N	N
59	N	N	N	Some	N
60	N	N	N	N	N
61	?	N	N	N	N
62	N	N	N	N	N
63	N?	N	N	N	N
64	?	N	N	N	N

	A	B	C	D	E	F	G	H	I	J
1	**TYPE**	Poss Id?	V.Solitary	Short Radials	Radials >4	Rad/Obliq. Or	Clusters	Perf plates	V. Spirals	Pits <3um
65	**66**		Y	Y	Some	N	N	Simple	N	Y
66	**67**		N	Y	Y	Y	N	Simple	N	Mostly
67	**68**		Y	Y	N	N	N	Simple	N	Y
68	**69**		Occ	Y	Y	Y	N	Simple	Faint	Y
69	**70**		Y	N	N	N	N	Simple	N	N
70	**71**		Y	N	N	N	N	Simple	N	Y
71	**72**		Occ	Y	Some	Y?	Y	Simple	N	Mostly
72	**73**		Y	Y	Occ	Y	N	Simple	N	Not all
73	**74**		Y	Occ	N	N	N	Multi	N	Y
74	**75**		Y	Y	N	N	N	Simple	N	Y
75	**76**	Buxus?	Y	Occ	N	N	N	Multi	N	Y
76	**77**		N	Y	Y	Rad/Obliq.	Y	Simple	N	Borderline
77	**78**		Occ	Y	N	Tamg	Y	Simple	Some	Some
78	**79**		Y	Y	N	N	N	Simple	Y	Y
79	**81**		Y	Occ	N	N	N	Multi	N	Mostly
80	**83**		Y	Occ	N	N	N	Simple	N	N
81	**84**		Y	Y	N	N	N	Simple	N	Y
82	**85**		Y	Y	N	N	Occ	Simple	N	Y
83	**86**		N	Occ	Y	Y	Occ	Simple	N	Borderline
84	**87**		Occ	Y	Y	Y	N	Simple	N	Y
85	**88**	Buxus?	Y	N	N	N	N	Multi	N	Y
86	**89**		Y	N	N	N	N	Multi	N	Y
87	**90**		Y	Occ	N	N	N	Simple	Some	Y
88	**91**		Y	Y	Occ	N	N	Simple	N	Y
89	**92**	Same As Types 69 + 79								
90	**93**		Y	Y	N	N	N	Simple	N	Y
91	**95**		Y	Occ	N	N	N	Simple	N	N
92	**96**		Occ	Y	Occ	Y	N	Simple	N	Mostly
93	**97**		Y	N	N	N	N	Simple	N	Y
94	**101**		Y	N	N	Tang	N	Multi	N	Y
95	**102**		Y	Y	N	N	Y	Simple	Y	Borderline

Appendix D: Type identification database

	M	N	O	P	Q	R	S	T	U	V
1	Tyloses?	V/mm2	V.Size	V. El. Length	F. Septate	Thick walled?	Pits bordered	F Tracheids	Spirals?	F. Length
65	Some	>20,<40/mm2	<100um	A	N	N	N	N	N	<1mm
66	Some	>40/mm2	<100um	A	Some	N	N	N	N	<1mm
67	N	>40/mm2	<50um	B (occ)	Y	N	N	N	N	<1mm
68	Some	>40/mm2	<50um	B	Y	N	N	N	N	<1mm
69	Some	<20/mm2	<250um	A	N?	Y	NS	N	N	<1mm
70	N	<20/mm2	<100um	?	Can't see	Y	NS	NS	NS	<1mm
71	N	c40/mm2	<100um	A	N	N	Too sm to see	N?	N	<1mm
72	N	>40/mm2	c50 +<50um	A	Y	N	N	N?	N	<1mm
73	Some	>40/mm2	<50um	A/B	N	N	N	N?	N	<1mm
74	N	>40/mm2	<50um	A	N	N	Y Minutely	Y?	N	<1mm
75	N	>40/mm2	<50um	A	N	Y some	Minutely	?	N	<1mm
76	Some	>40/mm2	<50um	A	N	N	Can't See	?	N	<1mm
77	Y	>40/mm2	<100um	A	N	N	N	N	N	<1mm
78	Some	>40/mm2	<50um	B	Y	Occ	N	N	N	<1mm
79	Some	>40/mm2	<50um	B	N	N	Y	Y	N	<1mm
80	N	c40/mm2 + le	Var. <150um	A	N	N	NS	N	N	<1mm
81	N	>40/mm2	<50um	A	N?	Y	Minutely	?	N	<1mm
82	Y	>20,<40/mm	<100um	A	Y	N	N	N	N	<1mm
83	N	>40/mm2	<50um	A Just	N?	Y	Too sm to see	?	N	<1mm
84	N	>40/mm2	<50um	B	N	N	N	N	N	<1mm
85	N	>40/mm2	<50um	A	N	N	N	N	N	<1mm
86	N	>40/mm2	<50um	B	N	Y	N	N	N	<1mm
87	N	>40/mm2	<50um	B Just	N	Y	Minutely	Y?	N	<1mm
88	N	>40/mm2	<50um	B	Y?	N	N	N	N	Not comp.
89										
90	N	>40/mm2	<50um	A	N	Y some	Y?	Y?	N	<1mm
91	N	<20/mm2	<150um	A	Too Think to s	Y	NS	NS	NS	NS
92	N	>40/mm2	<100um	B?	Y	N	N	N	N	<1mm
93	N	c40/mm2	c50um	B	NS	Y	N	N	N	<1mm
94	N	>20,<40/mm2	<100um	B (almost C)	N	N	Minutely	Y?	N	<1mm
95	N	c40/mm2	c50 + <50um	A (high)	Some	N	N	N	N	<1mm

Appendix D: Type identification database

	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
1	Real Ray widt	Agg Rays?	2 Widths?	Homocellular	Heterocellular	Bi/Tri ser narr	Storied?	Rays/mm	V-R Pits	P.Rare/absen
65	1-4/5-ser	N	N	N	Pro + Up@en	Occ (sm. Ray	Y?	<12/mm	Normal	Y
66	1-3/4-ser	N	N	Almost	Occ Up	N	N	c12/mm	Normal	N
67	1-2-ser	N	N	N	Y Pro with Sq	Some	N	<12/mm	Normal	Y
68	1-2 (occ3)-ser	N	N	N	Y Pro + 1-2 U	Some	N	11,12/mm2	Normal	Y?
69	1-ser (occ 2)	N	N	N	Pro + up	N	N	>12/mm2	Normal	N
70	>4 - >10-ser	Y	N	Y Pro	N	N	Some	4-6/mm2	NS	N
71	1-ser	N	N	Y Up	N	NA	N	>12/mm	Normal	Y
72	1-3/4-ser	N	N	N	Pro + Up	Y	N	>12/mm	Opp/Scal + lg	Y
73	1-2-ser (occ 3	N	N	N	Sq/Pro + Up	Y Many	N	>12/mm	Normal	N
74	1-5-ser	Fused	N	N	Pro + >4 Up	Y Some	N	>12/mm	Normal	N
75	1-2-ser (occ3)	N	N	N	Y Pro + Up/Sc	N	Some?	c12/mm2	Normal	N
76	1-ser (occ2)	Fused?	N	N	Sq/Pro + Up	When Presen	N	>12/mm2	Enlarged + O	N
77	2-5-ser	N	N	N	Pro + 1-2 Up	N	Some (not all)	<12/mm2	Normal	N
78	1-2-ser (occ 3	N	N	N	Y Pro + Up to	N (some?)	Some	<12/mm2	Normal	Y
79	1-2/3-ser mos	N	N	N	Y Pro + Up	Some	N	>12/mm2	Enlarged	Y
80	1-5-ser	Fused?	N	N	Sq/Pro + Up	N	N	<12/mm	Normal	N
81	1-3/4-ser	N	N	N	Pro + 1-2 Up	Occ	Some	c12/mm	Normal	N
82	1-3-ser (occ w	N	N	N	Pro + 1-2 Up	N	N	<12/mm	Normal	N
83	1-ser (occ 2)	Fused?	N	N	Sq, Pro + Up	When Presen	N	>12/mm	Not Clear	N
84	1-ser (occ 2)	N	N	Almost	Pro (1 Sq occ	NA	N	<12/mm	Slightly Large	Y
85	1-ser (occ 2)	N	N	Y Pro	N	N	N	<12/mm	Normal	Y
86	1-ser (occ 2)	Fused?	N	N Almost	Y Up + Occ P	NA	N	>12/mm	Lg + Opp/Sca	N
87	1-ser (occ 2)	N	N	Y Pro	N (occ enlarg	N	N	>12/mm	Normal	Y?
88	1-ser parts +	N	N	N	Y Up + Pro	Mostly	N	>12/mm	Normal	Y
89										
90	up to 5/6-ser	Y	N	N	Y Pro/Sq + U	N	N	>12/mm	Normal	N
91	1-2 + Up to 5-	N	Y?	Y pro	N	N	Y	c12/mm	Normal	N
92	2-3/4-ser	N	N	N	Y Pro + Up (>	N	N	<12/mm	Normal	N
93	1-2-ser	N	N	N	Y Pro + Up (>	Y	N	>12/mm	More Numero	N
94	1-2-ser (occ3/	N	N	Y pro	N Occ Sq	N	N	>12/mm	Slightly Large	N
95	1-5-ser (also	N	N	N	Sq Pro + Up	N	N	<12/mm	Occ Scal	Y

Appendix D: Type identification database

	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1	P. Paratrach	Vasicentric	Alif or Conf.	Banded?	1-ser or >4	>6/mm	Storied?	Fusiform	Marginal?	G.R.Absent
65	N	N	N	N	N	N	NA	NA	NA	N
66	N	N	N	Y	Up to 4	<6/mm	N	N	Y	N
67	N	N	N	N	N	N	NA	NA	NA	Y
68	N	N	N	N	N	N	N	NA	N	Y
69	Y	Y	Y	N	N	N	N	Occ + 2 cells	Y	N
70	N	N	N	Y	<4-ser	>6/mm	N	N	N	Y
71	N	Scanty if at al	N	N	N	N	N	N	N	Y
72	N	N	N	n	N	N	N	N	N	Y?
73	Y	Scanty	N	N	N	N	N	N	N	N
74	N	N	N	N	N	N	N	N	Poss Some	N
75	Y	Scanty	N	N	N	N	N	N	N	N
76	Y	N	N	Y	<4-ser	>6/mm	N	N	N	N
77	Y	N	Some Ali.	N	N	N	N	Some	N	N
78	N	N	N	N	N	N	NA	NA	NA	Rare
79	N	N	N	N	N	N	N	N	N	N
80	Y	Y	Y	Almost	>4-ser	N	N	N	Y	N
81	N	N	N	N	N	N	N	N (Ch Strands	Y	N
82	Y?	Scanty ?	N	N	N	N	N	N	N	Y
83	N	N	N	Y	c3-ser	>6/mm	N	N (c7 cell stra	Y (P more foc	N
84	N	N	N	N	N	N	N	N	N	Y
85	N	N	N	N	N	N	N	N	N	N
86	N	N	N	Y	1-ser	N	N	N 6+ cells	Y?	N
87	N	N	N	N	N	N	N	N	N	N
88	N	N	N	N	N	N	N	N	N	N
89										
90	N	N	N	Almost	1-ser	Y (if bands)	N	N >4 cells	N	N
91	N	N	N	Y	1-ser, up to 4-	>6/mm	Y	N 2 cells	NS	NS (Y)
92	N	N	N	Y	1-3-ser	c6/mm	N	N Ch strands	N	Y
93	Y	Y Some	Some	Y	>4-ser	>6/mm	N	N (long strand	?	Y
94	Y	Y	Some	N	N	N	N	Long Strands	With Vs	N
95	N	Scanty	N	N	N	N	N	N	N	Y

Appendix D: Type identification database

	AW	AX	AY	AZ	BA
1	Semi-R porou	Crystals?	Resin canals	Sheath Cells?	Tile Cells?
65	N	N	N	N	Almost in Sm
66	N	N	N	N	N
67	N	N	N	N	N
68	N	N	N	N	N
69	N	Y in Ax P	N	N	N
70	N	Y in Ax P	Y	N	N
71	N	N	N	N	N
72	N	N	N	N	N
73	N	Y in Ch Ax P	N	N	N
74	Y	N	N	Y Some	N
75	Y?	N	N	N	N
76	N	N	N	N	N
77	Y	N	N	Some	N
78	N	N	N	N	N
79	N	N	N	N	N
80	Y	N	N	Y	?
81	Y	N	N	N	N
82	N	N	N	Some	N
83	N	N	N	N	N
84	N	N	N	N	N
85	N	N	N	N	N
86	Y	N	N	N	N
87	N	N	N	N	N
88	N	N	N	N	N
89					
90	N	N	Y In rays	Y some	N
91	N	N	N	N	N
92	N	N	N	N	N
93	N	N	N	N	N
94	N	N	Y Some	N	N
95	N	N	N	Y Some	N

	A	B	C	D	E	F	G	H	I	J
1	**TYPE**	Poss Id?	V.Solitary	Short Radials	Radials >4	Rad/Obliq. Or	Clusters	Perf plates	V. Spirals	Pits <3um
96	**103**		N	Y	Y	Y	Y	Simple	N	N
97	**104**		N	Y	Y	Obliq	Y	Multi	Y	Y
98	**105**		Y	Occ	N	N	N	Multi	N	Y
99	**106**		Y	Y	N	N	N	Multi	N	Y
100	**107**		Occ	Y	Y	Y	N	Simple	N	Y
101	**108**		N	Y	Y	Y	N	Simple	Some	Y
102	**109**		N	N	Y	Y	Y	Simple	Y	Y

	M	N	O	P	Q	R	S	T	U	V
1	Tyloses?	V/mm2	V.Size	V. El. Length	F. Septate	Thick walled?	Pits bordered	F Tracheids	Spirals?	F. Length
96	N	c40/mm2	<100um	A	N	N	N	N	N	<1mm
97	N	>40/mm2	<50um	A	N	N	N	N	N	<1mm
98	N	>40/mm2	<50 (c10um)	Not Comp A?	N	Y	Minutely	?	N	<1mm
99	N	>40/mm2	<50um	A	N	Some	Y?	Y?	N	<1mm
100	N	>40/mm2	<50um	A	N	Med.	N	N	N	<1mm
101	Some	>40/mm2	c50 + <50um	A/B	Y	N	N	N	N	<1mm
102	N	>40/mm2	<50um	A	Some	N	N	N	Some	<1mm

	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
1	Real Ray widt	Agg Rays?	2 Widths?	Homocellular	Heterocellular	Bi/Tri ser narr	Storied?	Rays/mm	V-R Pits	P.Rare/absen
96	4-10-ser (occ	Y some	Y? some 1-se	N	Y Pro + Up	N	N	>12/mm	Normal	N
97	1-ser	N	N	N	Y Pro Up/Sq	NA	N	>12/mm	Normal	Y
98	2-3-ser w/ 1-s	Fused?	N	N	Y Pro + Up	N	N	>12/mm	Normal	N
99	2-3-ser (occ 4	Fused	N		N	Some	N	>12/mm	Opp + Lgr	Y?
100	1-ser (+ V. Sh	N	N	Y Up	N	NA	N	>12/mm	NS	N
101	1-3-ser	Fused	N	N	Y Up + Sq	N	N	<12/mm	Opp/Scal + Lg	N
102	1-ser (occ 2)	N	N	N	Y Up + Sq/Pr	N	N	c 12/mm	Normal	N

	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1	P. Paratrach	Vasicentric	Alif or Conf.	Banded?	1-ser or >4	>6/mm	Storied?	Fusiform	Marginal?	G.R.Absent
96	Y	Y	Some	N	N	N	N	Some (+2 cel	N	N
97	N	N	N	N	N	N	N	N	N	?
98	N	N	N	Y	>4-ser	N	NS	NS	Y	N
99	N	N	N	N	N	N	N	N	N	N
100	Y	Scanty	N	N	N	N	N	N	N	Y
101	N	N	N	N	N	N	NS	NS	NS	N
102	Y	Y	N	Y	1-ser	>6/mm	N	1-2cells	N	Y?

	AW	AX	AY	AZ	BA
1	Semi-R porou	Crystals?	Resin canals	Sheath Cells?	Tile Cells?
96	Y	N	N	Y	N
97	N	N	N	N	N
98	N	N	N	N	N
99	Y?	Some in Rs	N	N	N
100	N	N	N	N	N
101	N	N	N	N	N
102	N	N	N	N	N