

**Near-tropical early Eocene terrestrial temperatures at the Australo-Antarctic margin, western Tasmania****FULL LIST OF FOSSIL TAXA FROM LOWANA RD WITH NEAREST LIVING RELATIVES (NLRs)**

Fossil plant taxa with bioclimatically informative NLRs shown in Figure 4 are marked by asterisks (\*). These taxa are mostly represented by well-preserved macrofossils, which were usually assigned to extant genera. The NLRs of three groups of fossil taxa are not shown in the coexistence approach analysis in Fig. 4. One group (†) is represented by fossil taxa that have less informative NLRs, these being highly relictual or typically occupying very wide thermal ranges. Fossil taxa in the second group (*Nothofagidites* spp. and most podocarp conifers) were excluded from the analysis because their pollen was assumed to have been derived from remote sources only. This assumption is important, because potentially very different and much cooler climates may have occurred inland of Lowana Rd, especially on Tasmanian mountains (Carpenter et al., 1994; Macphail et al., 1994). These taxa had very low pollen incidences in the samples with respect to expected output and dispersability, and were never observed as macrofossils. The remaining taxa were excluded from the analysis because they have no close NLRs, or unknown or very uncertain NLRs, or NLRs at the family level only with extremely broad (more-or-less global or hemispheric) distributions.

For microfossils, relative abundance values are expressed as a percentage of the total identifiable pollen and spore count (excluding dinoflagellates) averaged from five samples. ‘p’ represents taxon presence either at lower than 1% in the counts, or recorded outside the count.

<b>Taxon</b>	<b>Proposed NLR</b>
<b>Macrofossils</b>	
<b>Cryptogams</b>	
* <i>Lygodium</i> sp.	<i>Lygodium</i> (Schizaeaceae)
<b>Gymnosperms</b>	
<i>Araucarioides linearis</i> Bigwood & R.S.Hill	Araucariaceae (no close NLR)
* <i>Araucaria</i> sp. section <i>Eutacta</i>	<i>Araucaria</i> section <i>Eutacta</i> (Araucariaceae)
* <i>Bowenia</i> sp.	<i>Bowenia</i> (Zamiaceae)
<i>Komlopteris cenozoicus</i> McLoughlin, R.J.Carp., G.J.Jord. & R.S.Hill	extinct ?Corytospermaceae (no close NLR)
* <i>Libocedrus microformis</i> Paull & R.S.Hill	callitroid Cupressaceae
* <i>Podocarpus</i> sp.	<i>Podocarpus</i> (Podocarpaceae)
*? <i>Retrophyllum</i> sp.	<i>Retrophyllum</i> (Podocarpaceae)
<b>Angiosperms</b>	
<i>Bandulskia estuaria</i> R.J.Carp., G.J.Jord & R.S.Hill	Lauraceae (no close NLR)
* <i>Gymnostoma</i> sp.	<i>Gymnostoma</i> (Casuarinaceae)
Myrtaceae sp.	?Leptospermeae
* <i>Nypa</i> sp.	<i>Nypa</i> (Arecaceae)
*other Lauraceae (3 spp. + 5 spp. dispersed cuticle)	Lauraceae Cryptocaryae (+ other taxa)
Proteaceae sp. (+2 spp. dispersed cuticle)	indeterminate Proteaceae
* <i>Ripogonum tasmanicum</i> Conran, R.J.Carp. & G.J.Jord.	<i>Ripogonum</i> (Ripogonaceae)
* <i>Ceriops</i> sp.	<i>Ceriops</i> (Rhizophoraceae)
unassigned (includes 10 leaf taxa with cuticle + ~18 other dispersed cuticle taxa)	unknown angiosperms
<b>Microfossils</b>	
<b>Marine</b>	
cf <i>Apteodinium</i>	p Dinophyceae
<i>Apectodinium homomorphum</i> Deflandre & Cookson	p Dinophyceae
<i>Apectodinium longispinosum</i> (R.L.Wilson) J.P.Bujak & R.J.Davey	p Dinophyceae
<i>Homotryblium tasmaniense</i> Cookson & Eisenack	4 Dinophyceae
<i>Muratodinium fimbriatum</i> (Cookson & Eisenack) Drugg	p Dinophyceae
<i>Operculodinium</i>	p Dinophyceae

<i>Spiniferites</i> spp.				Dinophyceae
<i>Systematophora variabilis</i> Cookson & Eisenack	1			Dinophyceae
<i>Turbiosphaera filosa</i> (G.J.Wilson) S.Archang.	p			Dinophyceae
unassigned dinoflagellates	4			Dinophyceae
foram trichospiral liners	1			planktonic Foraminifera
Total marine	12			
<b>Cryptogams</b>				
<i>Baculatisporites cf comaumensis</i> (Cookson) R.Potonié	p			?Marchantiophyta (liverwort)
† <i>Baculatisporites disconformis</i> Stover	p			Hymenophyllaceae
† <i>Cyathidites australis</i> Couper/minor Couper	4			includes <i>Cyathea</i> (Cyatheaceae)
† <i>Cyathidites splendens</i> W.K.Harris	p			<i>Acrostichum</i> (Pteridaceae)/ <i>Lygodium</i> (Schizaeaceae)
† <i>Dictyophyllidites arcuatus</i> Pocknall & Mildenh.	p			cf <i>Dicranopteris</i> (Gleicheniaceae)
† <i>Gleicheniidites</i> spp.	p			Gleicheniaceae
<i>Ischyosporites gremius</i> Stover	p			?Dicksoniaceae
<i>Ischyosporites irregularis</i> ms	p			?Dicksoniaceae
† <i>Kraeuselisporites</i> sp.	p			Marsileaceae
† <i>Kuylisporites waterbolkii</i> R.Potonié	p			<i>Cnemidaria</i> (Cyatheaceae)
<i>Laevigatosporites ovatus</i> R.L.Wilson & R.M.Webster/ <i>major</i> (R.L.Wilson) Krutzsch	p			includes Blechnaceae
<i>Latrobosporites amplus</i> (E.A.Stanley) Stover	p			Lycopodiaceae
† <i>Latrobosporites marginis</i> Mildenh. & Pocknall	p			<i>Lycopodium laterale</i> R.Br. (Lycopodiaceae)
† <i>Polypodiaceoisporites varus</i> ms	p			<i>Pteris</i> (Pteridaceae)
<i>Polypodiisporites</i> spp.	p			Polypodiaceae
† <i>Rugulatisporites mallatus</i> Stover	p			<i>Calochlaena/Culcita</i> ('Dicksoniaceae')
<i>Stereisporites australis</i> Cookson	p			<i>Sphagnum</i> (Sphagnaceae)
<i>Stereisporites maastrichtiensis</i> Krutzsch	p			Sphagnaceae
† <i>Triletes tuberculiformis</i> Cookson	p			Dicksoniaceae
<i>Verrucosisporites kopukuensis</i> (Couper) Stover	p			? <i>Lygodium</i> (Schizaeaceae)
Total cryptogams	7			
<b>Gymnosperms</b>				
* <i>Araucariacites australis</i> Cookson	4			Araucariaceae ( <i>Araucaria</i> section <i>Eutacta</i> analysed)
<i>Dacrycarpites australiensis</i> Cookson & K.M.Pike	p			<i>Dacrycarpus</i> (Podocarpaceae)

<i>†Dilwynites granulatus</i> W.K.Harris	p	<i>Agathis/Wollemia</i> (Araucariaceae)
<i>†Dilwynites tuberculatus</i> W.K.Harris	8	<i>Agathis/Wollemia</i> (Araucariaceae)
<i>Ephedripites notensis</i> Cookson	p	<i>Ephedra</i> (Ephedraceae)
<i>Lygistepollenites florinii</i> (Cookson & K.M.Pike) Stover & P.R.Evans	p	<i>Dacrydium</i> (Podocarpaceae)
<i>Microalatidites palaeogenicus</i> (Cookson & K.M.Pike) Mildenh. & Pocknall	p	<i>Phyllocladus</i> (Podocarpaceae)
<i>Microcachryidites antarcticus</i> Cookson	p	<i>Microcachrys</i> (Podocarpaceae)
<i>Phyllocladidites mawsonii</i> Cookson ex Couper	1	<i>Lagarostrobus</i> (Podocarpaceae)
* <i>Podocarpidites</i> spp.	8	<i>Podocarpus/Prumnopitys</i> ( <i>Podocarpus</i> analysed)
<i>Podosporites cf erugatus</i> Mildenh.	p	<i>Microstrobos?</i> (Podocarpaceae)
<i>Podosporites microsaccatus</i> (Couper) M.E.Dettmann	2	<i>Microcachrys?</i> (Podocarpaceae)
cf <i>Vitreisporites pallidus</i> (Reissinger) T.Nilsson	p	extinct ?pteridosperm (no close NLR)
Total gymnosperms	27	
<b>Angiosperms</b>		
<i>†Ailanthispites paenestriatus</i> (Stover) L.A.Milne	p	Anacardiaceae
* <i>Anacolosidites</i> spp.	p	<i>Anacolosa</i> spp. (Olacaceae)
<i>†Arecipites</i> sp.	p	Arecaceae
* <i>Banksieeidites arcuatus</i> Stover	p	Musgraveinae (Proteaceae)
<i>†Beaupreaidites elegansiformis</i> Cookson	p	<i>Beauprea</i> (Proteaceae)
<i>†Bluffopollis scabrus</i> (Couper) Pocknall & Mildenh.	p	Strasburgeriaceae
<i>Bysmapollis emaciatus</i> Partridge	p	Unknown
<i>Clavatipollenites glarius</i> Stover & Partridge	p	Chloranthaceae lineage
<i>Compositoipollenites</i> sp.	p	Unknown
<i>†Cunoniaceae</i>	p	Cunoniaceae
<i>†Cupanieidites orthoteichus</i> Cookson & K.M.Pike	p	Cupanieae (Sapindaceae)
<i>Dicotetradites meridianus</i> (W.K.Harris) Crosbie & C.D.Cloues	p	Unknown
<i>†Gothanipollis cf bassensis</i> Stover	p	Loranthaceae
<i>Graminidites</i> sp.	p	Poaceae
<i>†Haloragacidites harrisii</i> (Couper) W.F.Harris	8	Casuarinaceae
<i>†Ilexpollenites anguloclavatus</i> D.J.McIntyre	p	<i>Ilex</i> (Aquifoliaceae) (?Australasian lineage)
<i>Intratriporopollenites notabilis</i> (W.K.Harris) Stover	p	? <i>Brownlowia</i> (Malvaceae)
<i>†Liliacidites cf bainii</i> Stover	p	Liliaceae s.l.

<i>†Liliacidites lanceolatus</i> Stover	p	Liliaceae s.l.
<i>†Liliacidites</i> spp.	1	Liliaceae s.l.
<i>†Malvacipollis diversus</i> W.K.Harris	p	<i>Austrobuxus</i> (Picrideridaceae)
<i>Malvacipollis</i> cf <i>gracilis</i>	p	?Euphorbiaceae
<i>†Malvacipollis subtilis</i> Stover	p	<i>Austrobuxus</i> (Picrideridaceae)
<i>†Myrtaceidites</i> cf <i>eugeniioides</i> Cookson & K.M.Pike	p	<i>Eugenia/Syzygium</i> (Myrtaceae)
<i>†Myrtaceidites eucalyptoides</i> Cookson & K.M.Pike	p	<i>Eucalyptus</i> s.l. (Myrtaceae)
<i>Myrtaceidites parvus</i> Cookson & K.M.Pike	2	non-eucalypt Myrtaceae
<i>Myrtaceopollenites australis</i> W.K.Harris	p	extinct cf Normapolles complex (Fagales)
<i>Nothofagidites asperus</i> (Cookson) E.J.Romero	p	<i>Nothofagus</i> subgenus <i>Lophozonia</i> (Nothofagaceae)
<i>Nothofagidites brachyspinulosus</i> (Cookson) W.K.Harris	1	<i>Nothofagus</i> subgenus <i>Fuscospora</i> (Nothofagaceae)
<i>Nothofagidites</i> cf <i>deminutus</i> (Cookson) Stover & P.R.Evans	p	<i>Nothofagus</i> subgenus <i>Brassospora</i> (Nothofagaceae)
<i>Nothofagidites emarcidus</i> (Cookson) W.K.Harris/ <i>heterus</i> (Cookson) Stover & P.R.Evans	2	<i>Nothofagus</i> subgenus <i>Brassospora</i> (Nothofagaceae)
<i>Nothofagidites flemingii</i> (Couper) R.Potonié	p	<i>Nothofagus</i> subgenus <i>Brassospora</i> (Nothofagaceae)
<i>Nothofagidites goniatus</i> (Cookson) Stover & P.R.Evans	p	<i>Nothofagus</i> subgenus <i>Lophozonia</i> (Nothofagaceae)
<i>Nothofagidites</i> cf <i>vansteenisii</i> (Cookson) Stover & P.R.Evans	p	<i>Nothofagus</i> subgenus <i>Brassospora</i> (Nothofagaceae)
<i>Periporopollenites demarcatus</i> Stover	p	Trimeniaceae?
<i>†Periporopollenites polyoratus</i> (Couper) Stover	p	Caryophyllaceae
<i>Polycolporopollenites esobalteus</i> (D.K.McIntyre) Pocknall & Mildenh.	p	Polygalaceae
<i>Propylipollis annularis</i> (Cookson) A.R.H.Martin & W.K.Harris	p	Proteaceae
<i>Propylipollis biporus</i> Dudgeon	p	Proteaceae
<i>Proteacidites adenanthoides</i> Cookson	p	Proteaceae
<i>Proteacidites differentipollis</i> Dudgeon	p	Proteaceae
<i>Proteacidites dilwynensis</i> W.K.Harris/ <i>grandis</i> Cookson	p	Proteaceae
<i>Proteacidites latrobensis</i> W.K.Harris	p	cf <i>Megahertzia</i> (Proteaceae)
<i>Proteacidites nasus</i> Truswell & J.A.Owen	p	Proteaceae
<i>Proteacidites reticuloscabratus</i> W.K.Harris	p	Proteaceae
<i>Proteacidites</i> aff. <i>rugulatus</i> Stover & Partridge	p	Proteaceae
<i>Proteacidites</i> spp.	3	Proteaceae
<i>†Schizocolpus rarus</i> ms	p	<i>Alchornea</i> (Euphorbiaceae)
* <i>Spinozonocolpites prominatus</i> (D.J.McIntyre) Stover & P.R.Evans	8	<i>Nypa</i> (Arecaceae)

<i>†Striatocolporites gammeroi</i> S.Archang.	p	Anacardiaceae
<i>Tricolpites cf phillipsii</i> Stover	p	unknown
<i>†Tricolpites reticulatus</i> Cookson	p	<i>Gunnera</i> (Gunneraceae)
<i>Tricolpites cf trioblatus</i> Mildenh. & Pocknall	p	cf <i>Wilsonia</i> (Convolvulaceae)
indet. <i>Tricolpites</i> spp.	2	unknown
<i>Tricolporites moultonii</i> ms	p	unknown
<i>†Tricolporites valvatus</i> W.K.Harris	p	<i>Diospyros</i> (Ebenaceae)
indet. <i>Phoipites/Tricolporites</i> spp.	31	unknown
<i>†Triporopollenites ambiguus</i> Stover	p	Embothriaceae (Proteaceae)
unassigned angiosperms	4	
Total angiosperms	66	

---

## REFERENCES CITED

- Carpenter, R.J., Hill, R.S., and Jordan, G.J., 1994, Cenozoic vegetation in Tasmania: macrofossil evidence, in Hill, R.S., ed., History of the Australian vegetation: Cretaceous to Recent: Cambridge, Cambridge University Press, p. 276–298.
- Macphail, M.K., Alley, N.F., Truswell, E.M., and Sluiter, I.R.K., 1994, Early Tertiary vegetation: evidence from spores and pollen, in Hill, R.S., ed., History of the Australian vegetation: Cretaceous to Recent: Cambridge, Cambridge University Press, p. 189–261.