

A. Sequence datasets and fossils used in phylogeny construction and calibration. F, Node age fixed to minimum age of fossil; L, Lower bound for node age set to minimum age of fossil. Redundant calibration points provide extra support for the calibration points in use. *Calibration point is redundant because a nested node can be dated at the same or older date. **Calibration point is redundant because the node is the same as the one used above, and the fossil is the same age or younger than the fossil above.

putative relict	dataset	gene regions	calibration no.	taxon to which fossil associated, with taxon identification in parentheses if different from the former	fossil type	fossil date and minimum age (Myr before present)	reference(s)	supported node taxon 1	calibrated taxon 2	constraint on node age
<i>Brabejum stellatifolium</i> Proteaceae	Hoot & Douglas (1998) ^a	atpB	1	Proteaceae (<i>Triorites africaensis</i>)	Pollen	Cenomanian 93.5	Herngreen (1973), Ward & Doyle (1994)	<i>Brabejum</i>	<i>Platanus</i>	F
			2	<i>Adenanthos</i>	Pollen	Campanian 70.6	Dettmann (1994), Dettmann & Jarzen (1991)	<i>Adenanthos</i>	<i>Protea</i>	L
			3	<i>Stirlingia</i>	Pollen	Campanian 70.6	Dettmann (1994), Dettmann & Jarzen (1991)	<i>Stirlingia</i>	<i>Cenarrhenes</i>	L
			4	<i>Telopea</i>	Pollen	Campanian 70.6	Dettmann (1994), Dettmann & Jarzen (1991)	<i>Telopea</i>	<i>Alloxylon</i>	L
			5	<i>Grevillea</i>	Pollen	Maastrichtian 65.5	Dettmann (1994), Dettmann & Jarzen (1991)	<i>Grevillea</i>	<i>Buckinghamia</i>	L
			6	<i>Beauprea</i>	Pollen	Campanian 70.6	Dettmann (1994), Dettmann & Jarzen (1991)	<i>Beauprea</i>	<i>Cenarrhenes</i>	*
			7	<i>Camarvonnia</i>	Pollen	Campanian 70.6	Dettmann (1994), Dettmann & Jarzen (1991)	<i>Camarvonnia</i>	<i>Bellendena</i>	*
			8	<i>Knightia</i>	Pollen	Campanian 70.6	Dettmann (1994), Dettmann & Jarzen (1991)	<i>Knightia</i>	<i>Bellendena</i>	*
<i>Cunonia capensis</i> Cunoniaceae	Bradford & Barnes (2001)	trnL-trnF	1	Cunoniaceae	Flowers	Campanian 70.6	Schönenberger <i>et al.</i> (2001), Crepet <i>et al.</i> (2004)	<i>Brunellia</i>	<i>Cunonia</i>	F
			2	<i>Eucryphia</i>	Compound leaves	Paleocene 55.8	Barnes & Jordan (2000)	<i>Eucryphia</i>	<i>Ackama</i>	L
			3	<i>Callicoma</i>	Leaves	Oligocene 23.03	Barnes & Hill (1999)	<i>Callicoma</i>	<i>Cunonia</i>	L
			4	<i>Codia</i>	Leaves	Oligocene 23.03	Barnes & Hill (1999)	<i>Codia</i>	<i>Cunonia</i>	**
<i>Curtisia dentata</i> Cornaceae	Fan & Xiang (2003)	26S	1	<i>Nyssa-Mastixia</i> group	3D Fruits & perianth	Early Coniacian 89	Takahashi <i>et al.</i> (2002), Bremer <i>et al.</i> (2004)	<i>Curtisia</i>	<i>Petalonyx</i>	F
<i>Gunnera perpensa</i> Gunneraceae	Wanntorp <i>et al.</i> (2002) ^o	ITS, rbcL, & rps16	1	<i>Gunnera</i> (<i>Tricolpites reticulatus</i>)	Pollen	Albian 99.6	Brenner (1968), Jarzen (1980)	<i>Gunnera</i>	<i>Myrothamnus</i>	F
<i>Ilex mitis</i> Aquifoliaceae	Manen <i>et al.</i> (2002) ^c	atpB-rbcL, trnL-trnF & rbcL	1	<i>Ilex</i>	Pollen	Cenomanian 93.5	Bolchovitina (1953), Martin (1977)	<i>Ilex</i>	<i>Phyllonoma</i>	F
<i>Lachnostylis bilocularis</i> Euphorbiaceae	Davis & Chase (2004)	PHYC, ndhF & rbcL	1	Clusiaceae	Flower	Turonian 89.3	Crepet & Nixon (1998), Crepet <i>et al.</i> (2004)	<i>Clusia</i>	<i>Hypericum</i>	F
<i>Metrosideros angustifolia</i> Myrtaceae	Wright <i>et al.</i> (2000, 2003) ^d	ITS	1	<i>Metrosideros</i>	Leaf	Otaian (Early Miocene) 21	Pole (1993), D.C. Mildenhall pers. comm.	<i>Metrosideros</i>	<i>Cloezia</i>	F
<i>Ocotea bullata</i> Lauraceae	Chanderbali <i>et al.</i> (2001)	ITS	1	<i>Persea</i> group & Cinnamomeae	Flowers	Eocene 33.9	Taylor (1988), Chanderbali <i>et al.</i> (2001)	<i>Ocotea</i>	<i>Persea</i>	F

<i>Platylophus trifoliatus</i> Cunoniaceae	Bradford & Barnes (2001)	trnL-trnF	1	Cunoniaceae	Flowers	Campanian 70.6	Schönenberger <i>et al.</i> (2001), Crepet <i>et al.</i> (2004)	<i>Brunellia</i>	<i>Cunonia</i>	F
			2	<i>Eucryphia</i>	Compound leaves	Paleocene 55.8	Barnes & Jordan (2000)	<i>Eucryphia</i>	<i>Ackama</i>	L
			3	<i>Callicoma</i>	Leaves	Oligocene 23.03	Barnes & Hill (1999)	<i>Callicoma</i>	<i>Cunonia</i>	L
			4	<i>Codia</i>	Leaves	Oligocene 23.03	Barnes & Hill (1999)	<i>Codia</i>	<i>Cunonia</i>	**
<i>Podocarpus latifolius</i> Podocarpaceae	Conran <i>et al.</i> (2000) ^e	rbcL	1	<i>Dacrydium</i>	Pollen	Turonian 89.3	Dettmann <i>et al.</i> (1992)	<i>Dacrydium</i>	<i>Falcatifolium</i>	F
			2	<i>Nageia</i>	Leafy branches, leaves & seeds	Barremian 125.0	Kimura <i>et al.</i> (1988)	<i>Nageia</i>	<i>Retrophyllum</i>	F
			3	<i>Lagarostrobos</i>	Pollen	Turonian 89.3	Dettmann <i>et al.</i> (1992)	<i>Lagarostrobos</i>	<i>Manoao</i>	F
			4	<i>Dacrycarpus</i>	Pollen	Santonian 83.5	Dettmann <i>et al.</i> (1992)	<i>Dacrycarpus</i>	<i>Dacrydium</i>	*
<i>Prionium serratum</i> Prioniaceae	Bremer (2002)	rbcL	1	<i>Typha</i>	Fruit	Maastrichtian 65.5	Knobloch & Mai (1986), Bremer (2002)	<i>Typha</i>	<i>Sparganium</i>	F
			2	Cyperaceae	Fruit	Paleocene 55.8	Mai (1987), Bremer (2002)	<i>Luzula</i>	<i>Chorizandra</i>	F
			3	Poaceae (<i>Monoporites</i>)	Pollen	Maastrichtian 65.5	van der Hammen (1954), Linder (1987), Bremer (2002)	<i>Joinvillea</i>	<i>Georgeantha</i>	F
			4	BEP & PACCAD Poaceae clades	Spikelets & inflorescence fragments	Paleocene 55.8	Crepet & Feldman (1991), GPWG (2001), Bremer (2002)	<i>Puelia</i>	<i>Oryza</i>	L
			5	Restionaceae (<i>Milfordia</i>)	Pollen	Maastrichtian 65.5	van der Hammen (1954), Elisik (1968), Bremer (2002)	<i>Restio</i>	<i>Anarthria</i>	*
<i>Roridula gorgonias</i> Actinidiaceae	Anderberg <i>et al.</i> (2002) ^f	atp1, atpB, ndhF matR & rbcL	1	<i>Saurauia</i>	Seeds	Turonian 89.3	Knobloch & Mai (1986), Bremer <i>et al.</i> (2004)	<i>Roridula</i>	<i>Actinidia</i>	F
<i>Smelophyllum capense</i> Sapindaceae	Harrington <i>et al.</i> (2005)	matK	1	<i>Acer</i>	Leaf	Early Eocene 53.3	Wolfe & Tanai (1987), Triplehorn <i>et al.</i> (1984)	<i>Acer</i>	<i>Dipteronia</i>	F
<i>Widdringtonia</i> Cupressaceae s.l.	Gadek <i>et al.</i> (2000)	matK	1	Cupressaceae s. <i>lat.</i>	Seed cones	Anisian 237.0	Yao <i>et al.</i> (1997), Stockey <i>et al.</i> (2005)	<i>Amentotaxis</i>	<i>Cunninghamia</i>	F
			2	<i>Fitzroya</i>	Leafy twigs	Mid-Lutetian 47.46	Berry (1938), Wilf <i>et al.</i> (2005)	<i>Fitzroya</i>	<i>Diselma</i>	L

^a*Nelumbo lutea* added as outgroup (AF093387).

^b*Paeonia* added as outgroup (AY328313, AJ430201 and AJ402982). The ITS region was unavailable for *Myrothamnus*, and multidivtime requires that each gene must be sampled for at least one taxon from each of the two lineages that emanate from the ingroup root. We therefore dated the basal *Gunnera* divergence between *G. herteri* and the rest of the genus based on the Bayesian three-gene topology and branch lengths from rbcL and rps16, using the Albian fossil to calibrate the *Gunnera-Myrothamnus* divergence. Maximum and minimum credibility intervals for the basal *Gunnera* divergence were then used to calibrate a Bayesian ITS tree.

^c*Sambucus* added as outgroup (AF446988, AF446928 and AF366929).

^d*Anetholea anisata* added as outgroup (AY187225).

^eSampling follows Conran *et al.* (2000) except that *Cephalotaxus* was represented by AF227461, and *Taxodium distichum* by AF127427.

^fA Bayesian tree based on Anderberg *et al.*'s (2002) five-gene dataset with wide sampling supports a sister relationship between *Roridula gorgonias* and *Actinidia* (100% Bayesian branch support). A Bayesian tree based on the following rbcL sequences supports the monophyly of the Actinidiaceae (*Actinidia*, *Saurauia* and *Clematocletha*, 100% Bayesian branch support) sister to *Roridula*. *Actinidia*: L01882, AJ549049, AJ549070, AJ549042, AJ549071 and AJ549064. *Clematocletha*: Z80172. *Saurauia*: Z83147, AJ549074 and AF088852. *Roridula gorgonias*: L01950. Outgroups: L01952 and L02433.

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