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Supplementary Material

Are orthodox Australian rainforest seeds short-lived in storage?

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Supplementary Table S1

Native plant species from New South Wales, Australia, assessed for seed longevity using an artificial aging protocol. Species highlighted in bold were assessed for this study; the remainder were assessed as part of an earlier study published in Merritt *et al.* 2014. 'Accession' is the number assigned to a single wild-sourced seed collection held at The Australian PlantBank; all environmental data provided relate to the original collection location for that accession. 'Endo.' indicates whether seeds are endospermic (E) or non-endospermic (N); 'Dry wgt' is the weight in grams of 100 seeds following drying for 17 h at 103°C (based on the mean weight of ten individual seeds or 3 replicates of 5-100 seeds for species with very small seeds); '*p* 50_{AA}' is the estimated time in days for germination to be reduced to 50% under artificial aging conditions (60% relative humidity, 45°C). 'Collection habitat' is based on a description of habitat at the accession collection site provided by the seed collector. Elevation ('Elev.', m above sea level), latitude and longitude were recorded using a hand-held GPS at the time of collection. Data on mean annual precipitation ('Prec.'), diurnal temperature range ('DNRG'), average, maximum and minimum temperatures ('Tavg', 'Tmax' and 'Tmin', respectively), evaporation ('Evap'), vapour pressure ('Vapp') and number of days per month with precipitation > 0.2mm ('Pwet') at each location were derived from the ANUClimate 1.0 collection, a national dataset based on 30 years of recorded climate data interpolated to a geographic scale of 0.01 degrees (Hutchinson *et al.* 2015).

Family	Species	Accession	Endo.	Dry wgt (g/100)	<i>p</i> 50 _{AA} (days)	Collection habitat	Elev. (m)	Latitude	Longitude	Prec. (mm)	DNRG (°C)	Tavg (°C)	Tmax (°C)	Tmin (°C)	Evap (mm)	Vapp (kPa)	Pwet
Species occurring in rainforest habitats only																	
Rousse.	<i>Abrophyllum ornans</i>	2013-1012	N	0.010	3.7	Complex rainforest	200	-28.27411	153.27558	1617	11.57	18.9	24.9	13.2	126.1	16.9	0.3
Cunoni.	<i>Ackama paniculosa</i>	2012-0178	E	0.010	3.7	Rainforest understory	55	-30.45714	152.93500	1583	12.13	19.0	25.1	13.0	126.8	16.3	0.3
Argophyll.	<i>Argophyllum nullumense</i>	2013-1009	E	0.005	10.9	Remnant rainforest	35	-28.30939	153.29486	1610	12.19	19.7	25.6	13.5	132.2	17.2	0.3
Urtic.	<i>Boehmeria macrophylla</i>	2013-0251	N	0.010	12.1	Rainforest	240	-28.52106	152.74817	1170	13.00	17.9	24.7	11.5	121.4	15.4	0.3
Rousse.	<i>Cuttsia viburnea</i>	2012-0463	E	0.004	4.8	Rainforest	1040	-28.40603	153.12772	1956	7.65	14.9	19.0	11.2	106.4	14.4	0.3
Mor.	<i>Ficus fraseri</i>	2016-0118	E	0.050	27.8	Subtropical rainforest	576	-28.75611	152.74947	1244	11.50	16.9	22.5	11.1	123.1	14.7	0.3
Mor.	<i>Ficus henneana</i>	2015-0860	E	0.060	45.0	Remnant, rainforest spp.	20	-28.43933	153.48994	1872	10.42	19.4	24.6	14.2	131.1	17.7	0.3
Gesneri.	<i>Fieldia australis</i>	2015-0521	N	0.004	11.9	Cool temperate rainfrst	1130	-28.45900	153.13094	1992	7.94	15.2	18.3	11.0	104.2	14.1	0.4
Phylidr.	<i>Helmholtzia glaberrima</i>	2012-0194	E	0.010	19.8	Rainforest understory	390	-28.57689	153.38908	2232	9.23	17.6	22.5	13.1	117.2	16.5	0.4
Arali.	<i>Hydrocotyle pedicellosa</i>	2015-0877	E	0.020	0.7	Complex rainforest	1136	-28.45900	153.13233	1992	7.94	15.2	18.3	11.0	104.2	14.1	0.4
Cunoni.	<i>Karrabina benthamiana</i>	2014-1386	N	0.060	17.9	Rainforest	900	-31.19619	152.39656	1790	10.09	14.4	18.4	8.9	84.9	12.8	0.3
Myrt.	<i>Lenwebbia prominens</i>	2015-0529	N	1.720	-1.2	Regenerating rainforest	125	-28.44197	153.22247	1561	11.96	19.1	25.2	13.2	126.5	16.9	0.3
Apocyn.	<i>Parsonsia fulva</i>	2014-0091	E	1.000	2.8	Complex rainforest	710	-28.57397	153.33428	2290	9.53	17.6	20.8	12.3	114.3	15.7	0.4
Apocyn.	<i>Parsonsia induplicata</i>	2015-0504	E	0.380	1.5	Rainforest	796	-30.36664	152.72764	1941	10.70	14.7	19.9	9.3	92.3	13.8	0.3
Pittospor.	<i>Pittosporum lancifolium</i>	2015-0505	E	0.840	14.0	Rainforest understory	380	-28.90539	152.74656	1115	12.85	17.6	23.8	11.2	130.4	15.2	0.3
Lami.	<i>Plectranthus nitidus</i>	2015-0423	N	0.020	66.5	Gallery rainforest	70	-31.50650	152.64592	1413	10.96	17.6	23.7	12.4	114.8	15.8	0.3
Rubi.	<i>Psychotria loniceroides</i>	2012-0465	E	0.640	15.2	Rainforest	85	-28.71386	153.61253	1907	6.92	19.9	23.5	16.2	131.1	18.0	0.4
Paracryphi.	<i>Quintinia verdonii</i>	2011-1164	N	0.003	2.9	Rainforest	540	-28.58039	153.37467	2180	9.33	17.7	21.7	12.8	117.6	16.2	0.4
Cunoni.	<i>Vesselowskyia venusta</i>	2014-0496	N	0.010	24.9	Tall rainforest	895	-32.12742	151.67947	1360	10.33	15.0	18.5	9.1	95.1	12.2	0.3

Family	Species	Accession	Endo.	Dry wgt (g/100)	p 50 _{AA} (days)	Collection habitat	Elev. (m)	Latitude	Longitude	Prec. (mm)	DNRG (°C)	Tavg (°C)	Tmax (°C)	Tmin (°C)	Evap (mm)	Vapp (kPa)	Pwet
Species occurring in both rainforest and non-rainforest habitats																	
Malv.	<i>Abutilon oxycarpum</i>	2011-1168	E	0.120	41.5	Open forest	580	-28.80869	152.74428	1158	11.64	16.9	22.3	11.0	125.0	14.6	0.3
Apocyn.	<i>Alstonia constricta</i>	2015-0330	E	0.100	43.3	Dry rainforest	395	-28.90103	152.74183	1115	12.85	17.6	23.8	11.2	130.4	15.2	0.3
Linderni.	<i>Artanema fimbriatum</i>	2013-0641	E	0.010	55.4	Open forest	5	-30.60750	152.98219	1481	10.83	19.1	24.5	13.6	124.4	16.8	0.3
Cunoni.	<i>Ceratopetalum gummiferum</i>	2007-0050	E	2.050	9.7	Open forest	170	-33.69944	151.16611	1194	9.97	17.3	22.5	12.4	118.8	14.2	0.3
Malv.	<i>Corchorus cunninghamii</i>	2015-0421	E	0.140	55.4	Cultivated	Cultivated from wild-sourced plants, precise origin not known										
Po.	<i>Entolasia marginata</i>	2011-1224	E	0.110	37.1	Rainforest	540	-28.58039	153.37467	2180	9.33	17.7	21.7	12.8	117.6	16.2	0.4
Prote.	<i>Grevillea robusta</i>	2004-1498	N	1.504	14.7	Wet sclerophyll forest	40	-28.64278	153.21917	1483	12.11	19.4	25.4	13.4	128.5	16.9	0.3
Malv.	<i>Hibiscus splendens</i>	2005-1520	E	1.372	84.9	Open forest	50	-31.27167	152.81278	1347	11.42	18.3	24.0	12.6	117.0	16.1	0.3
Junc.	<i>Juncus usitatus</i>	2004-0147	E	0.001	79.0	Sedgeland	140	-34.38389	150.83861	1559	9.08	15.0	19.1	10.2	113.9	13.2	0.3
Prote.	<i>Lomatia arborescens</i>	2013-0997	N	1.280	6.4	Open forest	1165	-32.12458	151.42875	1148	10.51	14.7	18.4	8.7	100.0	11.8	0.3
Onagr.	<i>Ludwigia octovalvis</i>	2012-0455	N	0.010	125.6	Swamp	10	-28.52872	153.53275	1760	9.32	19.9	24.1	15.1	133.5	18.0	0.3
Myrt.	<i>Melaleuca styphelioides</i>	2010-1082	N	0.003	159.7	Gully	118	-34.07650	150.76247	763	11.82	17.1	22.7	11.0	123.4	13.4	0.3
Solan.	<i>Nicotiana forsteri</i>	2013-0069	N	0.010	22.0	Subtropical rainforest	280	-28.89478	152.69800	1063	13.78	18.2	24.9	11.3	132.9	15.4	0.3
Bignoni.	<i>Pandorea pandorana</i>	2003-0886	N	0.376	7.4	Regrowth, rainforest spp.	280	-31.79333	151.78306	996	12.50	17.0	23.6	10.9	105.0	14.1	0.3
Po.	<i>Panicum bisulcatum</i>	2012-0448	E	0.057	52.3	Disturbed riparian zone	20	-30.44733	152.89628	1566	12.49	19.0	25.3	12.8	127.3	16.2	0.3
Lami.	<i>Plectranthus parviflorus</i>	2004-0587	N	0.027	37.0	Open woodland	105	-34.06639	150.76889	764	11.63	16.9	22.8	11.1	123.3	13.5	0.3
Solan.	<i>Solanum vicinum</i>	2015-0522	E	0.070	19.0	Cool temperate rainfrst	1115	-28.46056	153.12664	1959	8.88	16.0	18.5	11.0	103.7	14.2	0.4
Menisperm.	<i>Stephania japonica</i> var. <i>discolor</i>	2013-0064	E	1.290	0.8	Remnant, rainforest spp.	745	-29.09742	151.71069	755	13.64	15.8	22.3	8.9	131.3	12.4	0.2
Species occurring in non-rainforest habitats only																	
Fab.	<i>Acacia blakei</i> subsp. <i>diphylla</i>	2005-0079	N	0.647	121.4	Open forest	970	-30.54250	151.89444	781	13.13	14.6	20.6	7.8	97.5	12.2	0.3
Fab.	<i>Acacia decurrens</i>	2004-1373	N	1.443	94.4	Open forest	610	-34.33000	150.48083	912	10.92	14.1	19.5	8.6	106.6	12.0	0.3
Fab.	<i>Acacia falcata</i>	2004-1358	N	1.417	94.1	Open forest	90	-29.76417	152.93278	1052	12.33	18.9	25.1	12.8	132.5	16.0	0.3
Fab.	<i>Acacia filicifolia</i>	2004-1362	N	1.569	73.8	Open forest	490	-32.96583	150.10611	641	13.20	15.2	21.7	8.6	116.3	12.1	0.2
Fab.	<i>Acacia pendula</i>	2005-0086	N	2.145	73.5	Open forest	120	-35.37806	145.79861	410	13.97	16.4	23.4	9.4	141.9	11.4	0.2
Api.	<i>Actinotus helianthi</i>	2008-0059	E	0.264	21.8	Open forest	327	-32.96917	150.68472	740	12.33	16.3	22.5	10.2	116.3	13.0	0.2
Casuarin.	<i>Allocasuarina distyla</i>	2005-0491	N	0.191	295.3	Heath	140	-33.71111	151.17639	1198	9.68	17.2	22.0	12.3	119.3	14.1	0.3
Casuarin.	<i>Allocasuarina paludosa</i>	2005-0851	N	0.094	41.6	Heath	630	-34.65917	150.22139	903	11.41	13.5	19.3	7.9	105.0	11.5	0.3

Family	Species	Accession	Endo.	Dry wgt (g/100)	p 50 _{AA} (days)	Collection habitat	Elev. (m)	Latitude	Longitude	Prec. (mm)	DNRG (°C)	Tavg (°C)	Tmax (°C)	Tmin (°C)	Evap (mm)	Vapp (kPa)	Pwet
Aster.	<i>Ammobium alatum</i>	2004-0097	N	0.035	43.8	Grassland	870	-31.51139	151.69694	1061	10.87	13.3	19.4	8.2	91.7	12.1	0.3
Myrt.	<i>Angophora costata</i> subsp. <i>eurphylla</i>	2005-0100	N	1.502	34.3	Open forest	200	-33.46861	150.98417	979	11.19	17.1	22.6	11.4	117.4	13.8	0.3
Myrt.	<i>Angophora floribunda</i>	2005-0099	N	0.709	64.2	Riparian	290	-33.09750	150.23028	644	13.52	16.2	22.2	9.1	114.9	12.4	0.2
Blandfordi.	<i>Blandfordia grandiflora</i>	2004-0570	E	0.198	12.5	Sedgeland	960	-29.53694	152.31056	1129	11.48	13.6	19.5	8.0	98.3	12.5	0.3
Aster.	<i>Brachyscome rigidula</i>	2005-0093	N	0.016	18.7	Open forest	910	-36.38556	149.32750	625	12.95	10.9	17.4	4.4	81.3	9.6	0.2
Aster.	<i>Brachyscome staceae</i>	2004-0389	N	0.056	30.9	Open forest	1630	-36.37111	148.47972	1492	9.49	5.5	10.2	0.7	57.9	7.4	0.4
Cupress.	<i>Callitris oblonga</i> subsp. <i>corangensis</i>	2004-0711	E	0.372	80.6	Riparian	570	-35.20417	150.05139	802	12.09	13.3	19.4	7.3	104.3	11.5	0.3
Cyper.	<i>Carex fascicularis</i>	2006-0030	E	0.109	41.4	Riparian	10	-33.93056	151.12389	1080	9.57	17.8	22.7	12.9	127.1	14.0	0.3
Aster.	<i>Cassinia leptocephala</i> subsp. <i>everettiae</i>	2006-0013	N	0.015	69.1	Open forest	930	-31.28056	149.07111	1021	12.47	14.1	20.8	8.1	127.7	10.7	0.2
Casuarin.	<i>Casuarina glauca</i>	2004-0418	N	0.066	135.8	Floodplain	10	-29.44194	153.23806	1335	11.14	19.3	24.9	13.7	134.1	17.0	0.3
Po.	<i>Chloris truncata</i>	2006-0005	E	0.030	42.6	Woodland	96	-34.09556	150.73167	743	12.13	17.2	23.3	11.2	124.8	13.6	0.3
Po.	<i>Chloris ventricosa</i>	2004-0830	E	0.063	43.9	Woodland	114	-34.06778	150.76556	764	11.63	16.9	22.8	11.1	123.3	13.5	0.3
Aster.	<i>Chrysocephalum apiculatum</i>	2003-0971	N	0.006	32.9	Remnant forest	380	-33.13417	150.14778	614	13.30	15.5	22.4	9.0	119.0	12.4	0.2
Myrt.	<i>Corymbia eximia</i>	2005-0855	N	1.026	34.0	Open forest	270	-33.72639	150.62778	955	11.74	16.8	23.0	11.0	119.2	13.3	0.3
Fab.	<i>Dillwynia sieberi</i>	2004-1506	N	0.376	146.4	Woodland	90	-33.93639	150.71333	774	12.17	17.1	23.4	11.1	123.4	13.5	0.3
Sapind.	<i>Dodonaea falcata</i>	2004-1353	N	0.280	37.5	Open forest	290	-30.63528	149.56639	659	14.52	18.5	25.8	11.3	161.8	12.4	0.2
Sapind.	<i>Dodonaea heteromorpha</i>	2005-1406	N	0.284	376.0	Open forest	270	-30.59806	149.41750	644	14.55	18.6	26.0	11.4	163.2	12.4	0.2
Sapind.	<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>	2004-1104	N	0.348	294.3	Woodland	60	-33.85917	150.69667	806	12.31	17.3	23.4	11.1	123.0	13.5	0.3
Eric.	<i>Dracophyllum secundum</i>	2006-1149	E	0.003	47.7	Open forest	375	-34.30361	150.90472	1385	8.49	16.6	19.4	11.5	116.9	13.9	0.3
Onagr.	<i>Epilobium gunnianum</i>	2004-0388	N	0.340	42.5	Open woodland	1620	-36.37083	148.47833	1492	9.49	5.5	10.2	0.7	57.9	7.4	0.4
Cyper.	<i>Ficinia nodosa</i>	2004-0586	E	0.013	36.6	Coastal headland	20	-34.65333	150.86306	1283	7.17	17.4	21.4	13.8	130.5	14.8	0.3
Ros.	<i>Geum urbanum</i>	2007-0069	N	0.132	53.3	Open forest	860	-35.88667	148.37361	1053	12.87	10.8	17.3	4.4	86.8	9.4	0.3
Fab.	<i>Jacksonia chappilliae</i>	2004-1391	N	0.312	16.8	Tall forest	560	-28.36000	152.52972	1072	11.36	16.5	22.6	10.9	118.1	14.1	0.3
Junc.	<i>Juncus planifolius</i>	2004-0464	E	0.002	35.9	Sandstone plateau	140	-34.38389	150.83861	1559	9.08	15.0	19.1	10.2	113.9	13.2	0.3
Prote.	<i>Lomatia myricoides</i>	2004-0756	N	0.677	8.6	Riparian	1085	-34.05833	149.85833	876	10.57	10.7	15.5	5.2	89.4	9.7	0.3
Lami.	<i>Lycopus australis</i>	2006-0355	N	0.043	19.0	Swamp	20	-33.72889	150.92194	906	11.37	17.6	23.3	11.9	121.5	13.7	0.3
Fab.	<i>Mirbelia rubiifolia</i>	2005-1522	N	0.226	143.8	Heath	880	-33.74056	150.38528	1316	10.25	13.4	18.1	8.1	102.5	11.2	0.3

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Aster.	<i>Ozothamnus diosmifolius</i>	2003-0964	N	0.007	14.5	Open forest	580	-32.96694	150.05528	664	12.94	14.8	21.1	8.3	114.8	11.8	0.2
Irid.	<i>Patersonia sericea</i>	2005-1557	E	0.133	44.8	Shrubland	599	-34.31972	150.46056	878	10.92	13.9	19.5	8.5	107.1	11.9	0.3
Po.	<i>Poa hiemata</i>	2004-0394	E	0.033	11.8	Alpine herbfield	1950	-36.48972	148.28417	1954	7.31	3.9	7.6	0.3	48.4	6.5	0.4
Aster.	<i>Podolepis neglecta</i>	2005-1421	N	0.099	15.6	Open forest	530	-31.27250	149.23361	796	14.53	16.0	23.3	8.8	142.6	11.7	0.2
Aster.	<i>Podolepis robusta</i>	2007-0066	N	0.069	8.9	Alpine woodland	1380	-35.91361	148.57278	1308	11.33	7.6	13.2	1.9	71.3	8.2	0.3
Fab.	<i>Pultenaea villosa</i>	2004-1463	N	0.157	129.7	Open forest	30	-32.13000	152.40250	1125	11.46	18.0	23.8	12.3	121.2	16.0	0.3
Aster.	<i>Pycnosorus globosus</i>	2003-0894	N	0.023	36.1	Open forest (cleared)	640	-30.30611	150.59583	734	15.05	16.3	23.6	8.7	142.5	11.9	0.2
Solan.	<i>Solanum cinereum</i>	2003-0917	E	0.172	84.9	Open forest	420	-29.54250	150.66750	698	15.64	17.5	25.3	9.7	151.4	12.4	0.2
Aster.	<i>Solenogyne bellioides</i>	2004-0829	N	0.012	56.7	Grassland	40	-33.75278	150.72500	817	12.43	17.6	23.8	11.4	124.1	13.6	0.3
Stylidi.	<i>Stylidium graminifolium</i>	2003-1045	E	0.012	22.8	Woodland	36	-33.64056	150.69167	783	12.66	17.7	24.0	11.3	126.3	13.6	0.3
Prote.	<i>Telopea speciosissima</i>	2005-1631	N	1.327	5.8	Riparian	143	-34.14731	151.00556	1152	9.16	16.8	21.1	12.0	121.0	13.9	0.3
Api.	<i>Trachymene incisa</i>	2004-0210	E	0.098	39.8	Sclerophyll forest	32	-33.63333	150.68333	784	12.71	17.7	24.1	11.3	126.2	13.6	0.2
Myrt.	<i>Tristania nerifolia</i>	2005-0029	N	0.005	21.4	Riparian	360	-33.68750	150.54167	1144	11.13	16.0	21.7	10.5	112.2	12.9	0.3
Aster.	<i>Vittadinia cuneata</i> var. <i>cuneata</i>	2005-0771	N	0.058	21.2	Woodland	53	-33.59778	150.90472	863	11.83	17.6	23.6	11.7	123.4	13.8	0.3
Colchic.	<i>Wurmbea biglandulosa</i> subsp. <i>biglandulosa</i>	2003-1001	E	0.069	53.5	Woodland	84	-33.79778	150.66806	815	12.67	17.6	23.9	11.2	124.2	13.6	0.3
Aster.	<i>Xerochrysum bracteatum</i>	2005-0080	N	0.040	21.1	Open forest	790	-31.61917	151.77083	1032	11.35	14.7	19.9	8.8	95.8	12.5	0.3
Aster.	<i>Xerochrysum subundulatum</i>	2004-0406	N	0.039	21.4	Alpine, open forest	1310	-36.05361	148.24806	1454	11.33	8.3	14.0	2.6	74.4	8.4	0.3

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