SUPPLEMENTARY DATA

Fig S1. Mean monthly rainfall for each of the sample sites used in this study. Data for Mount Field, Kuringgai, Princess Hills, Yengo, Round Hill and Fowler's Gap are long-term climate averages sourced from nearby (< 10 km) weather stations (Australian Bureau of Meteorology; http://www.bom.gov.au); data for Yanachaga (Peru) are based on 7 years of within-site measurements (2003–2009; D. Catchpole, unpublished).

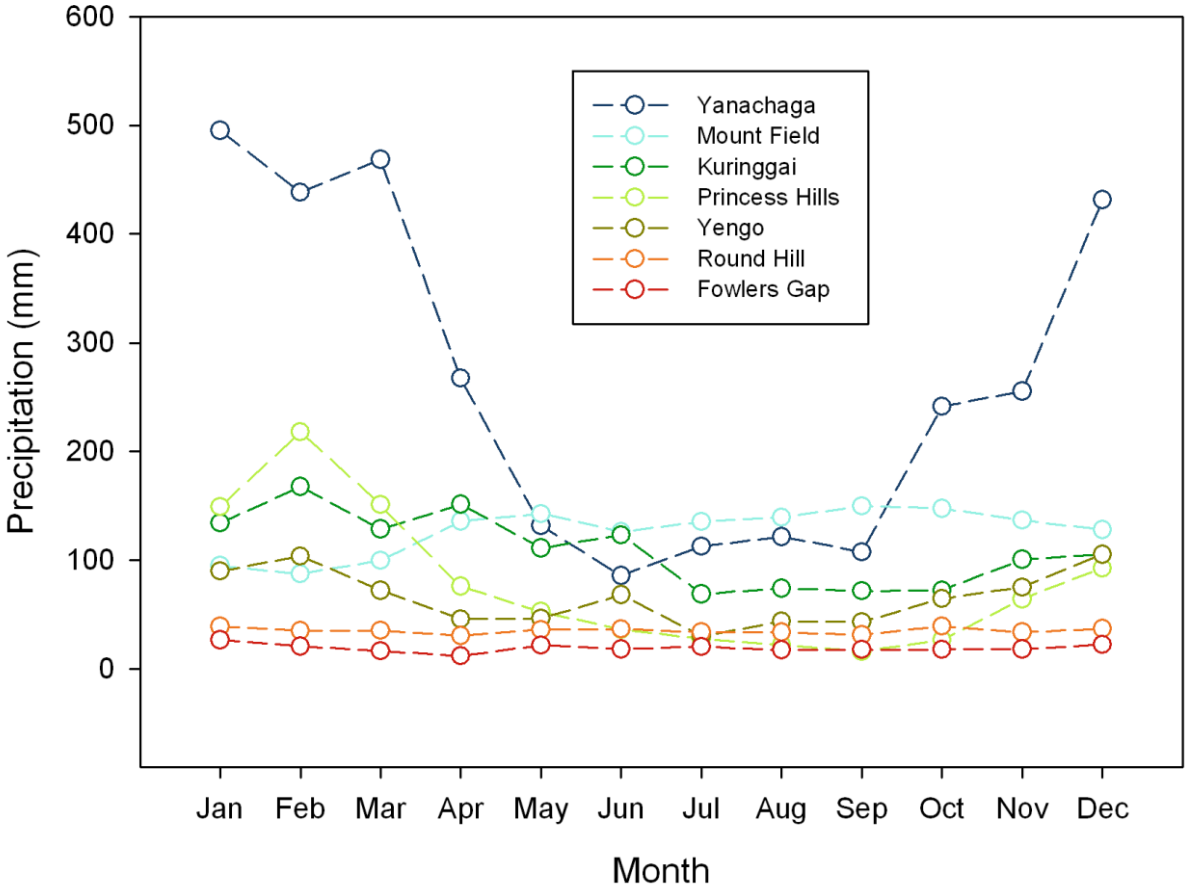
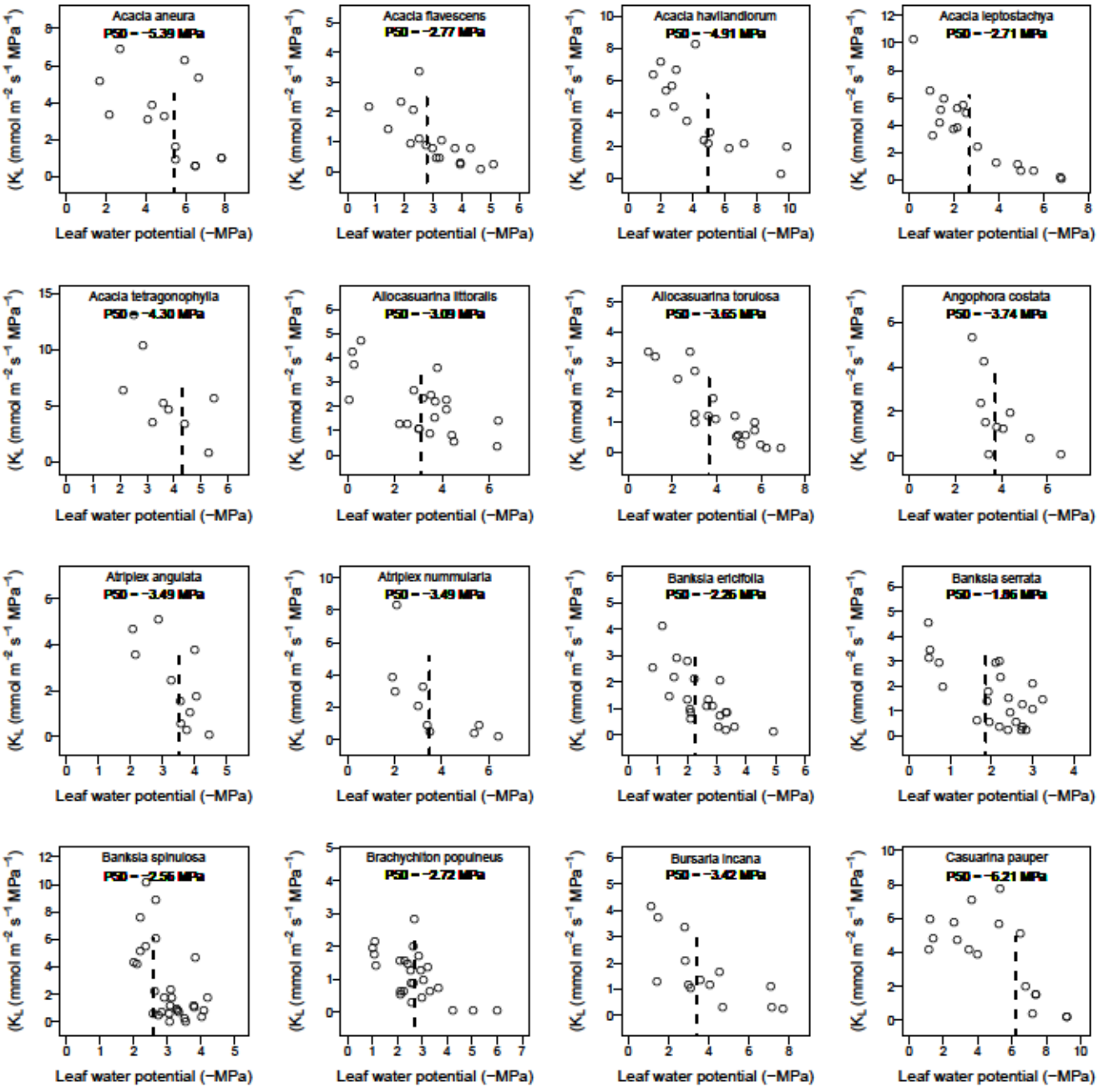
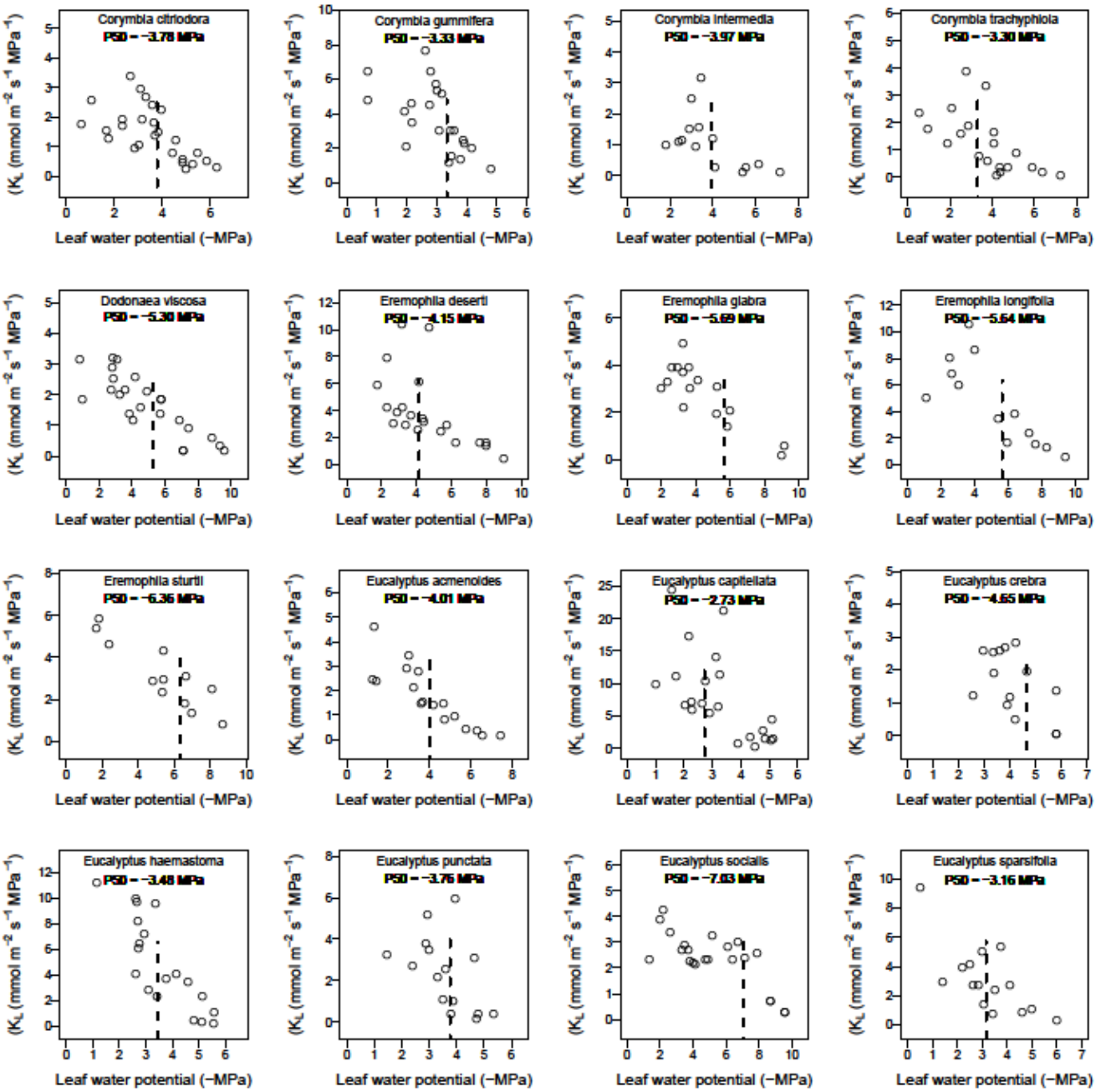
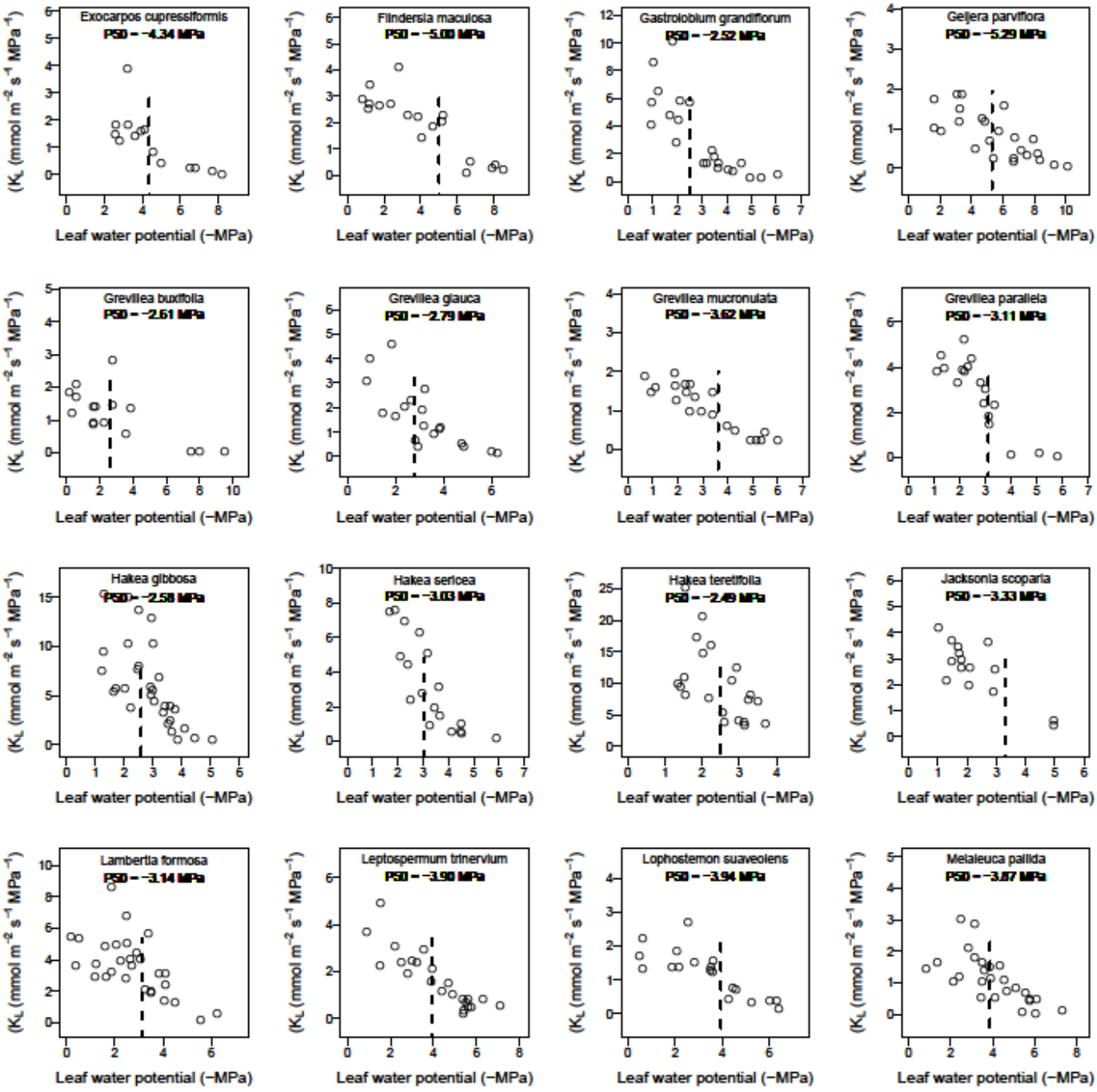
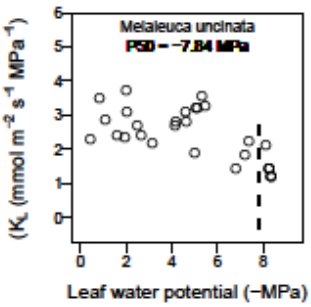


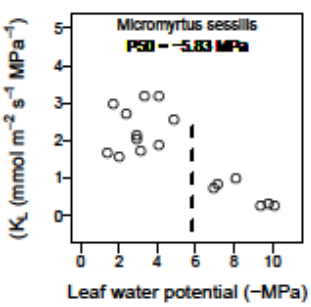
Fig S2. Leaf hydraulic vulnerability curves for species measured in the present study. Species plots are arranged by alphabetical order. Vertical dashed lines in each plot indicate the water potential at which point 50% of hydraulic conductance had declined ($P50_{leaf}$).

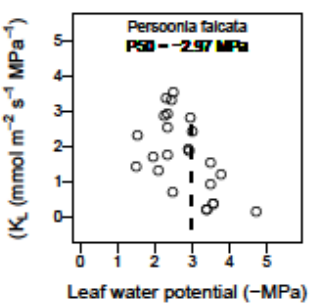


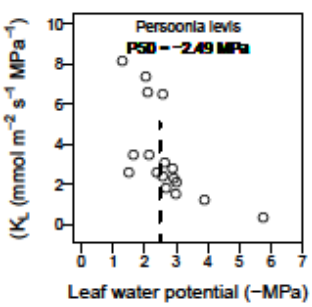

Corymbia citriodora
PSD = −3.78 MPa
Corymbia gummifera
PSD = −3.33 MPa
Corymbia intermedia
PSD = −3.97 MPa
Corymbia trachyphloia
PSD = −3.30 MPa
Dodonaea viscosa
PSD = −5.30 MPa
Eremophila deserti
PSD = −4.15 MPa
Eremophila glabra
PSD = −5.69 MPa
Eremophila longifolia
PSD = −5.64 MPa
Eremophila sturtii
PSD = −6.36 MPa
Eucalyptus acmenoides
PSD = −4.01 MPa
Eucalyptus capitellata
PSD = −2.73 MPa
Eucalyptus crebra
PSD = −4.65 MPa
Eucalyptus haemastoma
PSD = −3.48 MPa
Eucalyptus punctata
PSD = −3.76 MPa
Eucalyptus socialis
PSD = −7.03 MPa
Eucalyptus sparsifolia
PSD = −3.16 MPa
(K_L (mmol m^-2 s^-1 MPa^-1)
Leaf water potential (−MPa)

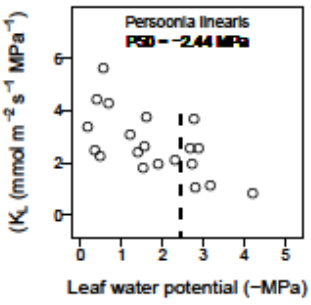

Exocarpos cupressiformis
P50 = −4.34 MPa
Flindersia maculosa
P50 = −5.00 MPa
Gastrolobium grandiflorum
P50 = −2.52 MPa
Geijera parviflora
P50 = −5.29 MPa
Grevillea buxifolia
P50 = −2.61 MPa
Grevillea glauca
P50 = −2.79 MPa
Grevillea mucronulata
P50 = −3.62 MPa
Grevillea parallela
P50 = −3.11 MPa
Hakea gibbosa
P50 = −2.58 MPa
Hakea sericea
P50 = −3.03 MPa
Hakea teretifolia
P50 = −2.49 MPa
Jacksonia scoparia
P50 = −3.33 MPa
Lambertia formosa
P50 = −3.14 MPa
Leptospermum trinervium
P50 = −3.90 MPa
Lophostemon suaveolens
P50 = −3.94 MPa
Melaleuca pallida
P50 = −3.87 MPa
(K_L (mmol m^-2 s^-1 MPa^-1)
Leaf water potential (−MPa)

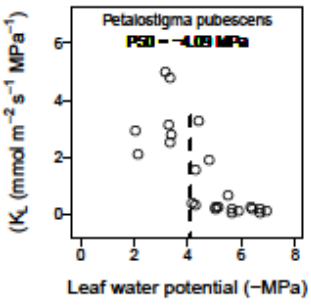

Melaleuca uncinata
P50 = −7.84 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)

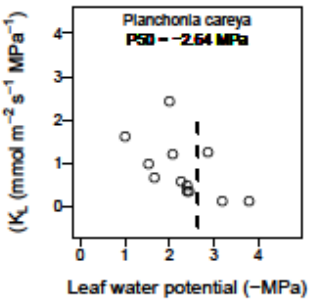

Micromyrtus sessilis
P50 = −5.83 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)

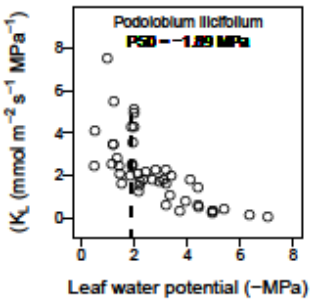

Persoonia falcata
P50 = −2.97 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)

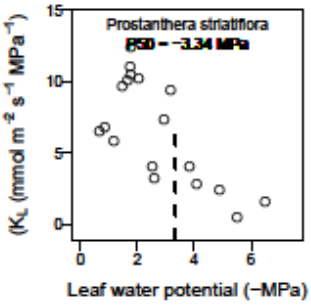

Persoonia levis
P50 = −2.49 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)

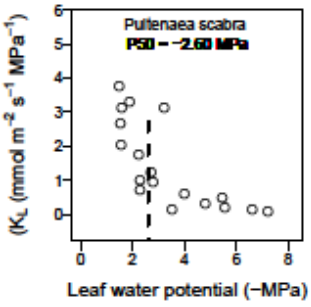

Persoonia linearis
P50 = −2.44 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)

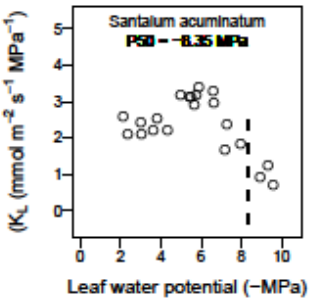

Petalostigma pubescens
P50 = −4.09 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)

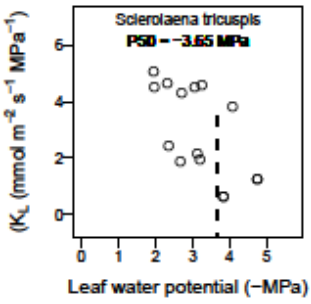

Planchonia careya
P50 = −2.64 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)

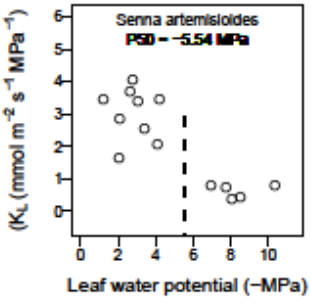

Podolobium ilicifolium
P50 = −1.89 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)

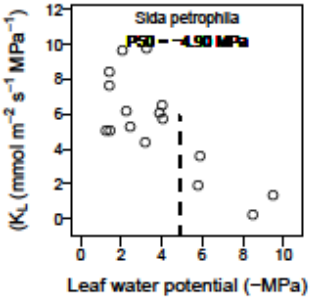

Prostanthera striatiflora
P50 = −3.34 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)

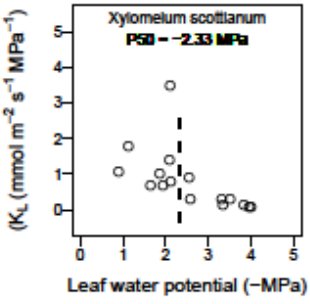

Pultenaea scabra
P50 = −2.60 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)


Santalum acuminatum
P50 = −8.35 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)


Sclerolaena tricuspis
P50 = −3.65 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)


Senna artemisioides
P50 = −5.54 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)


Sida petrophila
P50 = −4.90 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)


Xylomelum scottianum
P50 = −2.33 MPa
(K_L (mmol m⁻² s⁻¹ MPa⁻¹)
Leaf water potential (−MPa)

SUPPLEMENTARY DATA

Table S1 Taxonomic details and trait data for each species grouped by sample site. Trait data include leaf area (LA), leaf mass per unit area (LMA), and leaf hydraulic vulnerability to drought-induced dysfunction ($P50_{leaf}$). Data for species from Mount Field and Yanachaga were sourced from Blackman *et al*. (2010) and Blackman *et al*. (2012), respectively.

Site	Species	Family	LA (cm^2)	LMA ($g\ m^2$)	$P50_{leaf}$ (MPa)
Fowlers Gap	*Acacia aneura* F.Muell. ex Benth.	Mimosaceae	2.00	402.65	-5.39
	Acacia tetragonophylla F.Muell.	Fabaceae	1.34	373.80	-4.30
	Atriplex angulata Benth.	Amaranthaceae	0.62	43.64	-3.49
	Atriplex nummularia Lindl.	Amaranthaceae	0.15	136.80	-3.49
	Casuarina pauper F.Muell. ex L.A.S.Johnson	Casuarinaceae	1.00	589.28	-6.21
	Eremophila longifolia (R.Br.) F.Muell.	Scrophulariaceae	1.46	248.46	-5.64
	Eremophila sturtii R.Br.	Scrophulariaceae	1.41	239.22	-6.36
	Flindersia maculosa (Lindl.) Benth.	Rutaceae	1.23	160.38	-5.00
	Prostanthera striatiflora F.Muell.	Lamiaceae	1.16	150.91	-3.34
	Sclerolaena tricuspis (F.Muell.) R.H.Anderson	Amaranthaceae	0.56	112.11	-3.65
	Sida petrophila F.Muell.	Malvaceae	0.89	193.71	-4.90
Ku-ring-gai	*Allocasuarina littoralis* (Salisb.) L.A.S.Johnson	Casuarinaceae	0.72	241.98	-3.09
	Banksia ericifolia L.f.	Proteaceae	0.19	202.59	-2.26
	Banksia serrata L.f.	Proteaceae	26.29	262.09	-1.86
	Banksia spinulosa Sm.	Proteaceae	1.87	231.93	-2.56
	Corymbia gummifera (Gaertn.) K.D.Hill & L.A.S.Johnson	Myrtaceae	20.81	228.07	-3.33
	Eucalyptus capitellata Sm.	Myrtaceae	13.64	287.66	-2.73
	Eucalyptus haemastoma Sm.	Myrtaceae	19.35	265.28	-3.48
	Grevillea buxifolia (Sm.) R.Br.	Proteaceae	0.57	125.13	-2.61
	Hakea gibbosa (Sm.) Cav.	Proteaceae	0.74	405.00	-2.58
	Hakea sericea Schrad. & J.C.Wendl.	Proteaceae	0.36	297.90	-3.03
	Hakea teretifolia (Salisb.) Britten	Proteaceae	0.90	446.97	-2.49
	Lambertia formosa Sm.	Proteaceae	1.85	233.52	-3.14
	Leptospermum trinervium (Sm.) Joy Thomps.	Myrtaceae	0.27	131.55	-3.90
	Persoonia levis (Cav.) Domin	Proteaceae	21.54	202.72	-2.49

Princess Hills	*Acacia flavescens* A.Cunn. ex Benth.	Mimosaceae	45.94	182.73	-2.77
	Acacia leptostachya Benth.	Mimosaceae	7.06	179.98	-2.71
	Allocasuarina torulosa (Aiton) L.A.S.Johnson	Casuarinaceae		264.44	-3.65
	Bursaria incana Lindl.	Pittosporaceae			-3.42
	Corymbia citriodora (Hook.) K.D.Hill & L.A.S.Johnson	Myrtaceae	18.76	116.45	-3.78
	Corymbia intermedia (R.T.Baker) K.D.Hill & L.A.S.Johnson	Myrtaceae	24.62	135.34	-3.97
	Corymbia trachyphloia (F.Muell.) K.D.Hill & L.A.S.Johnson	Myrtaceae	13.94	145.29	-3.30
	Eucalyptus acmenoides Schauer	Myrtaceae	23.54	206.17	-4.01
	Gastrolobium grandiflorum F.Muell.	Fabaceae	15.28	148.33	-2.52
	Grevillea glauca Banks & Sol. ex Knight	Proteaceae	27.64	151.63	-2.79
	Grevillea parallela Knight	Proteaceae	7.82	212.09	-3.11
	Lophostemon suaveolens (Sol. ex Gaertn.) Peter G.Wilson & J.T.Waterh.	Myrtaceae	26.14	136.87	-3.94
	Persoonia falcata R.Br.	Proteaceae	16.02	193.60	-2.97
	Petalostigma pubescens Domin	Picrodendraceae	5.86	140.90	-4.09
	Planchonia careya (F.Muell.) R.Knuth	Lecythidaceae	27.58	96.47	-2.64
	Xylomelum scottianum (F.Muell.) F.Muell.	Proteaceae	22.06	135.66	-2.33
Round Hill	*Acacia havilandiorum* Maiden	Mimosaceae	0.43	430.29	-4.91
	Brachychiton populneus (Schott & Endl.) R.Br.	Sterculiaceae	11.46	102.12	-2.72
	Dodonaea viscosa subsp. cuneata (Sm.) J.G.West	Sapindaceae	0.36	109.27	-5.30
	Eremophila deserti (A.Cunn. ex Benth.) Chinnock	Myoporaceae	0.76	201.90	-4.15
	Eremophila glabra (R.Br.) Ostenf.	Myoporaceae	0.72	159.52	-5.69
	Eucalyptus socialis F.Muell. ex Miq.	Myrtaceae	8.91	307.12	-7.03
	Geijera parviflora Lindl.	Rutaceae	3.83	151.02	-5.29
	Melaleuca uncinata R.Br.	Myrtaceae	0.18	364.78	-7.84
	Micromyrtus sessilis J.W.Green	Myrtaceae	0.012	115.13	-5.83
	Santalum acuminatum (R.Br.) A.DC.	Santalaceae	5.04	203.82	-8.35
	Senna artemisioides (Gaudich. ex DC.) Randell	Caesalpiniaceae	0.44	387.25	-5.54
Yengo	*Angophora costata* (Gaertn.) Britten	Myrtaceae	24.56	179.13	-3.74
	Eucalyptus crebra F.Muell.	Myrtaceae	7.72	149.48	-4.65
	Eucalyptus punctata DC.	Myrtaceae	32.11	216.55	-3.76
	Eucalyptus sparsifolia Blakely	Myrtaceae	14.20	250.09	-3.16
	Exocarpos cupressiformis Labill.	Santalaceae	0.35	206.34	-4.34
	Grevillea mucronulata R.Br.	Proteaceae	0.65	75.22	-3.62
	Jacksonia scoparia R.Br. ex Sm.	Fabaceae	0.27	227.77	-3.33

	Melaleuca pallida (Bonpl.) Craven	Myrtaceae	1.25	151.44	-3.87
	Persoonia linearis Andrews	Proteaceae	0.90	130.27	-2.44
	Podolobium ilicifolium (Andrews) Crisp & P.H.Weston	Fabaceae	1.33	121.53	-1.89
	Pultenaea scabra R.Br.	Fabaceae	0.087	92.99	-2.60
Mount Field	*Atherosperma moschatum* Labill.	Atherospermataceae	4.20	137.19	-1.48
	Coprosma nitida Hook.f.	Rubiaceae	0.22	174.68	-1.95
	Cyathodes straminea R.Br.	Ericaceae	0.39	199.49	-2.00
	Eucalyptus coccifera Hook.f.	Myrtaceae	7.65	253.44	-2.65
	Gaultheria hispida R.Br.	Ericaceae	2.35	172.27	-1.32
	Hakea lissosperma R.Br.	Proteaceae	1.38	772.43	-2.85
	Lomatia polymorpha R.Br.	Proteaceae	1.05	292.76	-1.57
	Nothofagus cunninghamii (Hook.) Oerst.	Nothofagaceae	0.39	186.72	-1.70
	Nothofagus gunnii (Hook.f.) Oerst.	Nothofagaceae	1.63	102.00	-1.53
	Olearia pinifolia (Hook.f.) Benth.	Asteraceae	0.46	314.16	-1.71
	Orites diversifolius R.Br.	Proteaceae	1.93	380.85	-1.25
	Pittosporum bicolor Hook.	Pittosporaceae	1.38	251.52	-1.87
	Richea scoparia Hook.f.	Ericaceae	2.05	201.24	-1.41
	Tasmannia lanceolata (Poir.) A.C.Sm.	Winteraceae	1.11	211.97	-1.56
	Telopea truncata (Labill.) R.Br.	Proteaceae	5.55	243.32	-1.58
Yanachaga	*Cedrela montana* Moritz ex Turez	Meliaceae	53.96	108.42	-1.36
	Clusia ducuoides Engl.	Clusiaceae	26.09	187.68	-1.25
	Clusia elliptica Kunth	Clusiaceae	37.54	194.52	-1.19
	Eugenia pubescens (Kunth) DC.	Myrtaceae	25.54	161.92	-1.55
	Freziera uncinata A.L. Weitzman	Pentaphylaceae	5.68	153.68	-1.20
	Hedyosmum anisodorum Todzia	Chloranthaceae	69.26	93.89	-1.14
	Hedyosmum lechleri Solms	Chloranthaceae	27.22	116.45	-1.09
	Licaria subsessilis Werff	Lauraceae	21.77	162.38	-1.52
	Miconia adinantha Wurdack	Melastomataceae	104.49	156.90	-1.91
	Miconia aprica Gleason	Melastomataceae	33.44	107.04	-1.55
	Miconia barbeyana Cogn	Melastomataceae	49.44	102.41	-1.68
	Myrsine pellucida (Ruiz & Pav) Spreng.	Myrsinaceae	71.51	138.48	-1.48
	Weinmannia lechleriana Engl.	Cunoniaceae	39.61	129.99	-1.31
	Weinmannia microphylla Kunth	Cunoniaceae	6.34	100.81	-1.03

Table S2. Correlation coefficients (*r*) of least-square regressions between leaf hydraulic vulnerability to drought-induced dysfunction ($P50_{leaf}$) and climate parameters related to water availability across species' distributions, analysed by site. Climate parameters are: mean annual precipitation (MAP); 5^{th} percentile of mean annual precipitation; 95^{th} percentile of aridity index (AI). Significance levels of regressions are indicated (ns = $P > 0.05$; ** $P < 0.001$; *** $P < 0.0001$).

Site	MAP	5^{th} percentile MAP	95^{th} percentile AI
Mount Field	0.75***	0.73**	0.71**
Kur-ing-gai	0.34^{ns}	0.28^{ns}	0.43^{ns}
Princess Hills	-0.08^{ns}	-0.07^{ns}	-0.28^{ns}
Yengo	0.32^{ns}	0.38^{ns}	0.29^{ns}
Round Hill	0.50^{ns}	0.43^{ns}	0.36^{ns}
Fowler's Gap	0.56^{ns}	0.39^{ns}	0.37^{ns}