

## Supplementary materials

**Table S1.** Museum registration numbers, voucher status and GenBank accession numbers of samples included in the molecular phylogenetic analyses.

Taxon	Museum registration number	Type status	GenBank accession numbers	
			COI	16S
<i>Kimberleytrachia achernaria</i> Köhler, 2011	WAM S37640		KM191231	KM191172
	FMNH 219093		-	KM191170-71
<i>Kimberleytrachia aequum</i> Köhler, 2011	WAM S29303		KM191232	KM191173
<i>Kimberleytrachia alphacentauri</i> Köhler, 2011	WAM S36742		KM191233	KM191174
	WAM S37682		KM191234	KM191175
	WAM S58465		KM191235	HQ245577
<i>Kimberleytrachia amplirhagadoides</i> Köhler, 2011	WAM S37075		-	HQ245573
	WAM S37639		KM191236	KM191176
<i>Kimberleytrachia canopi</i> Köhler, 2011	WAM S49630		KM191237-40	KM191177-80
	WAM S49645		KM191241-42	KM191181-82
<i>Kimberleytrachia chartacea</i> Köhler, 2011	WAM S37066		KM191243	HQ245600
	WAM S37068		KM191244	HQ245601
	WAM S37070		KM191245	HQ245602
	WAM S37071		KM191246	HQ245601
	WAM S37642		KM191247	KM359707
	WAM S37696		KM191248	KM191183
<i>Kimberleytrachia crawfordi</i> Solem, 1979	WAM S49263		KM191249	KM191184
	WAM S49624		KM191250-51	KM191185-86
<i>Kimberleytrachia crucis</i> Köhler, 2011	WAM S37073		KM191252	HQ245608
<i>Kimberleytrachia jacksonensis</i> n. sp.	WAM S66548	Ht	-	KM191187
	FMNH 219086	Pt	-	KM191188
	FMNH 219088		KM191253	KM191189
	WAM S66551		KM191254	KM191190
<i>Kimberleytrachia leopardus</i> n. sp.	WAM S66543		KM191261	KM191198
	WAM S49619		KM191255-57	KM191191-93
	WAM S49620		KM191258-59	KM191194-95
	WAM S49622		KM191260	KM191196
	WAM S49628		KM191262	KM191197
	WAM S49641		KM191263-64	KM191199 KM191200
	WAM S49648		KM191265	KM191201

	WAM S49662		KM191266	KM191202
	WAM S49666		KM191267	KM191203
<i>Kimberleytrachia nelsonensis</i> n. sp.	WAM S66547	Ht	-	KM191204
<i>Kimberleytrachia serrata</i> n. sp.	WAM S66553	Ht	KM191268	KM191205
	WAM S49616	Pt	KM191269	KM191206
<i>Kimberleytrachia setosa</i> n. sp.	WAM S66544	Ht	KM191272	KM191209
	WAM S49617	Pt	KM191270-71	KM191207-08
	WAM S49625		KM191273	KM191210
<i>Kimberleytrachia silvaepluvialis</i> n. sp.	WAM S66545	Ht	KM191274	KM191211
	WAM S49631	Pt	KM191275	KM191212
<i>Kimberleytrachia somniator</i> Köhler, 2011	WAM S36867		-	HQ245607
<i>Kimberleytrachia umbonis</i> Solem, 1979	WAM S49623		KM359708-09	KM191215
	WAM S49626		KM359710-11	KM191217-18
	WAM S49627		KM359712-13	KM191219-20
	WAM S49634		KM359714	KM191221
	WAM S49637		KM359715	KM191222-23
	WAM S49650		KM359716	KM191224
	WAM S49656		KM359717-18	KM191225-26
	WAM S49660		KM359719-20	KM191227-28
<i>Kimberleytrachia</i> (unidentified)	WAM S49629		KM191276	KM191214
<i>Baudinella baudinensis</i> (Smith, 1893)	FMNH 219763		KF734841	KF734796
<i>Baudinella boongareensis</i> Köhler, 2011	WAM S36743		KF734844	KF734798
<i>Baudinella magna</i> Criscione & Köhler, 2014	WAM S83094		KF734846	KF734800
<i>Baudinella margaritata</i> Criscione & Köhler, 2014	WAM S66361	Ht	KF734858	KF734807
<i>Baudinella occidentalis</i> Köhler, 2011	WAM S37079		KF226182	HQ245452
<i>Baudinella thielei</i> Köhler, 2011	WAM S36398		KF226185	HQ245451
<i>Baudinella tuberculata</i> Köhler, 2011	WAM S37061		KF226187	HQ245448
<i>Cardiotrachia bastionensis</i> Criscione & Köhler, 2014	WAM S66304	Ht	KC703179	KC703173
<i>Cristilabrum</i> sp.	WAM S49206		KC614752	KC614705
	WAM S49207		KC614753	KC614706
<i>Exiligada brabyi</i> Criscione et al., 2012	WAM S83168		JX393741	JX393654
<i>Exiligada floraevallis</i> Criscione et al., 2012	AM C.475765		JX393750	JX393661
<i>Exiligada gregoriana</i> Criscione et al., 2012	AM C.475766		JX393761	JX393672
<i>Exiligada monochroma</i> Criscione et al., 2012	AM C.475768		JX393769	JX393680
<i>Exiligada montejinini</i> Criscione et al., 2012	AM C.475769		JX393766	JX393677
<i>Exiligada pallida</i> Criscione et al., 2012	WAM S83174		JX393795	JX393702
<i>Kymatobaudinia carrboydensis</i> Criscione & Köhler, 2013	WAM S84162		KF226189	KF226147

<i>Mesodontrachia fitzroyana</i> Solem, 1985	AM C.462802		KC614780	KC614722
<i>Molema stankowskii</i> Köhler, 2011	WAM S37773		KF226190	HQ245462
<i>Molema tenuicostata</i> Criscione & Köhler, 2014	WAM S66363	Ht	KF734863	KF734813
<i>Mouldingia occidentalis</i> Solem, 1984	AM C.463556		KC614798	HQ245502
<i>Nanotrachia coronata</i> Köhler & Criscione, 2013	WAM S66301		KC679385	KC679331
<i>Nanotrachia costulata</i> Köhler & Criscione, 2013	WAM S66302		KC679367	KC679316
<i>Nanotrachia intermedia</i> (Solem, 1984)	WAM S49195		KC679376	KC679323
<i>Nanotrachia levis</i> Köhler & Criscione, 2013	WAM S66303		KC679355	KC703174
<i>Nanotrachia orientalis</i> (Solem, 1984)	WAM S49196		KC679347	KC679305
<i>Ningbingia australis</i> Solem, 1981	WAM S49180		KC614799	KC614741
<i>Ningbingia octava</i> Solem, 1981	WAM S49212		KC614800	KC614742
<i>Nodulabium solidum</i> Criscione & Köhler, 2013	NTM P48937	Ht	KC614767	HQ245497
<i>Ordtrachia australis</i> Solem, 1984	AM C.462736		KC614801	KC679359
<i>Ordtrachia elegans</i> Solem, 1988	AM C.460981		KC679360	KC614802
<i>Ordtrachia grandis</i> Solem, 1984	WAM S49091		KC679359	KC679313
<i>Ototrachia compressa</i> Criscione & Köhler, 2013	WAM S49226		KC614795	KC614738
<i>Prototrachia sedula</i> Solem, 1984	AM C.437638		KC614803	KC614744
<i>Rachita carltonensis</i> Criscione & Köhler, 2014	WAM S66305	Ht	KC703180	KC703178
<i>Retroterra costa</i> Solem, 1985	WAM S49636		KF734867	KF734814
<i>Retroterra dichroma</i> Criscione & Köhler, 2014	WAM S66365	Ht	KF734873	KF734821
<i>Retroterra nana</i> Criscione & Köhler, 2014	WAM S66364	Ht	KF734878	KF734825
<i>Retroterra solituda</i> Solem, 1985	WAM S49570		KF734879	KF734832
<i>Rhagada bulgana</i> Solem, 1997	AM C.463552		KC703113	HQ245541
<i>Rhagada cygna</i> Solem, 1997	AM C.463537		KC703122	KC703067
<i>Rhagada harti</i> Solem, 1985	WAM S49576		KC703143	HQ245532
<i>Setobaudinia anatispretia</i> Solem, 1985	AM C.437624		KF226193	GQ443619
<i>Setobaudinia angustilabiata</i> Criscione & Köhler, 2014	WAM S83068		KF226195	KF226150
<i>Setobaudinia capillacea</i> Köhler, 2011	WAM S36751		KF226197	HQ245568
<i>Setobaudinia colmani</i> Criscione & Köhler, 2014	WAM S49562	Ht	KF226198	KF226152
<i>Setobaudinia karczewski</i> Köhler, 2011	WAM S37784		KC679405	KC679340
<i>Setobaudinia garlinju</i> Köhler, 2011	WAM S37050		KC679401	HQ245563
<i>Setobaudinia gumalamala</i> Köhler, 2011	WAM S37031		KF226200	GQ443617
<i>Setobaudinia herculea</i> Köhler, 2011	WAM S49353		KC679402	KC679343
<i>Setobaudinia incisa</i> Criscione & Köhler, 2014	WAM S84169		KF226201	KF226154
<i>Setobaudinia joycei</i> Köhler, 2011	WAM S37779		KF226202	HQ245570
<i>Setobaudinia kalumburuana</i> Köhler, 2011	AM C.150786		KF226205	HQ245457
<i>Setobaudinia karczewski</i> Köhler, 2011	WAM S37784		KC679405	KC679340
<i>Setobaudinia kessneri</i> Criscione & Köhler, 2014	WAM S83066		KF226208	KF226159

<i>Setobaudinia latilabiata</i> Criscione & Köhler, 2014	WAM S83081		KF226210	KF226161
<i>Setobaudinia longiflagellata</i> Criscione & Köhler, 2014	WAM S83070		KF226211-12	KF226162-63
<i>Setobaudinia malbyana</i> Criscione & Köhler, 2014	FMNH 219333		KF226215	KF234651
<i>Setobaudinia minima</i> Criscione & Köhler, 2014	WAM S84167	Ht	KF226217	KF226177
<i>Setobaudinia ngurraali</i> Köhler, 2011	WAM S36366		KF226218	HQ245558
<i>Setobaudinia plana</i> Criscione & Köhler, 2014	WAM S84170	Ht	KF226224	KF226171
<i>Setobaudinia quinta</i> Köhler, 2011	WAM S37729		KF226225	KF226172
<i>Setobaudinia rectilabrum</i> (Smith, 1894)	WAM S49361		KF226228	KF226175
<i>Setobaudinia spina</i> (Solem, 1985)	AM C.150538		KF226230	HQ245459
<i>Setobaudinia umbadayi</i> Köhler, 2011	WAM S36704		KF226232	KF226178
<i>Setobaudinia wujurru</i> Köhler, 2011	WAM S36352		KF226237	HQ245566
<i>Succochlea maretensis</i> n. gen n. sp.	WAM S66554	Ht	KM191277	KM191229
	WAM S83042	Pt	KM191278	KM191230
<i>Torresitrachia aquilonia</i> Köhler, 2011	WAM S36632		KC118665	HQ245591
<i>Torresitrachia cuttacutta</i> Willan et al., 2009	AM C.462999		KC118721	KC118638
<i>Torresitrachia darwini</i> Willan et al., 2009	AM C.462300		KC118727	KC118642
<i>Torresitrachia flindersi</i> Köhler, 2011	WAM S37022		KC118728	HQ245575
<i>Trachiopsis victoriana</i> (Solem, 1985)	AM C.463536		KF226239	HQ245572
<i>Turgenitubulus aslini</i> Solem, 1981	WAM S49177		KC614806	KC614746
<i>Turgenitubulus christenseni</i> Solem, 1981	WAM S49201		KC614808	KC614748
<i>Turgenitubulus pagodula</i> Solem, 1981	WAM S49187		KC614809	KC614749
<i>Vincentrachia desmonda</i> (Solem, 1985)	AM C.475931		KC614789	KC614732
<i>Vincentrachia gregoriana</i> Criscione & Köhler, 2013	NTM P48936	Ht	KC614769	HQ245488
<i>Westraltrachia alterna</i> Iredale, 1939	AM C.463539		KC614811	HQ245619

Abbreviations: AM, Australian Museum (Sydney); Ht, Holotype; NTM, Museum and Art Gallery of Northern Territory (Darwin); Pt, Paratype(s); WAM, Western Australia Museum (Perth).