Tree	No.	Constrained Clade	Calibration Type	Min Age (My)	Max Age (My)	Distribution	Effective Range Constraint	Oldest Fossil	Comments/References for oldest Fossil & Maximum Age Bounds
Marsupials	1	Perorycti nae + Echymiperinae	Primary	4.36	23.03	Normal prior with mean 13, sigma 5.0	Soft; 95% CI = 3.2-22.8	*cf. Peroryctes; Yarala kida*	Turnbull et al. (2003) reported cf. *Peroryctes* from the Hamilton Local Fauna (minimum age = 4.36 Mya). The Kangaroo Well Local Fauna, which includes Yarala kida (Schwartz 2006), is approximately coeval with the Kutjamarpu Local Fauna of the Wipajiri Formation based on biocorrelation (Schwartz 2006; Megirian et al. 2004). Woodburne et al. (1993) suggested that the Kutjamarpu Local Fauna is correlative with Chron 6Cn, and suggested an age of ~23.8 Mya for the Kutjamarpu Local Fauna. Ogg and Smith's (2004) revision of magnetostratigraphic ages indicates that Chron 6Cn ranges from 22.564 to 23.03 Ma.
Marsupials	2	Peramelemorphia (Dasyuridae + Myrmecobiidae)	Primary	14.17	54.65	Normal prior with mean 35, sigma 11	Soft; 95% CI = 13.4-54.6	Cf. *Peroryctes; Murgon "Stem perameloid" (2nd outgroup)*	Turnbull et al. 2003 (see comments above). Godthelp et al. 1992, 1999; Archer et al. 1999
Marsupials	3	Dasyuridae + Myrmecobiidae	Primary	17	54.65	Normal prior with mean 35, sigma 10	Soft; 95% CI = 15.4-54.6	*Barinya wangala; Murgon "Stem perameloid"*	*Barinya* is the oldest dasyurid and is known from Neville's Garden (Riversleigh) (Wroe 1999). This minimum assumes that thylacinids are the sister group to dasyurids + myrmecobiids following Miller et al. (2009). The oldest numbat fossils are from Pleistocene (0.1 Ma) cave deposits (Long et al. 2003). The age of Neville's Garden is Faunal Zone B (~early Miocene) according to Travouillon et al. 2006. Megirian et al. (2010) assigned Neville's Garden to the Wipajirian land mammal age (17-25 Ma). We followed Megirian et al. (2010) and assigned a minimum age of 17 Ma to the common ancestor of Dasyuridae + Myrmecobiidae. Thylacinids are the first outgroup to dasyurids + myrmecobiids (Miller et al. 2009; Wroe 2003). The oldest thylacinid (Badjcinus) is from the White Hunter Site (Muirhead and Wroe 1998). The second outgroup is Peramelemorphia, which includes a "stem perameloid" from Murgon (Godthelp et al. 1992; Archer et al. 1999).
Marsupials	4	Phalangeridae + Burramyidae	Primary	24.6	54.65	Normal prior with mean 39, sigma 8	Soft; 95% CI = 23.3-54.7	*Eocuscus sarastamppi*	*Eocuscus sarastamppi* is known from faunal zone B (Ditjimanka local fauna) of the Edadunna Formation (Case et al. 2009). The age of this fauna is 24.6-24.9 Ma (Megirian et al. 2010).
Marsupials	5	Petauridae to Pseudocheiridae	Primary	24.9	54.65	Normal prior with mean 39, sigma 8	Soft; 95% CI = 23.3-54.7	*Paljara sp. A*	*Paljara* sp. A is known from faunal zone A of the Etadunna Formation (Woodburne et al. 1993). The age of this fauna is 24.9-25.3 Ma (Megirian et al. 2010).
Marsupials	6	Macropodoidea (=Macropodidae + Potoroidae)	Primary	24.1	54.65	Normal prior with mean 39, sigma 8	Soft; 95% CI = 23.3-54.7	*Bulungamaya*	*Bulungamaya* is known from faunal zone D of the Etadunna Formation (Woodburne et al. 1993). The age of this fauna is 24.1-24.6 Ma (Megirian et al. 2010). Kear et al.'s (2007) cladistics analysis recovered *Bulungamaya* as a stem macropodid.
Marsupials	7	Vombatiformes	Primary	24.9	54.65	Normal prior with mean 39, sigma 8	Soft; 95% CI = 23.3-54.7	*Perikoala*	*Perikoala robusta* is known from faunal zone A of the Etadunna Formation (Woodburne et al. 1993). The age of this fauna is 24.9-25.3 Ma (Megirian et al. 2010).
Marsupials	8	Australidelphia + Didelphimorphia	Primary	65.18	84.2	Normal prior with mean 74, sigma 5	Soft; 95% CI = 64.2-83.8	*Peradectes* (Puercan); *Minoperadectes* (Early Wasatchian)	Horovitz et al. 2009
Marsupials	9	*Antechinus + Phascogale*	Primary	4.36	15.97	Normal prior with mean 9, sigma 3	Soft; 95% CI = 3.12-14.9	*Antechinus* sp	*Antechinus* sp. is known from the Hamilton Local Fauna (4.46 +/- 0.1 Ma; Turnbull et al. 2003) and is the oldest described member of the Phascogalini. We used 4.36 Ma as the minimum age for the split between *Antechinus* and *Phascogale* .
Marsupials	10	*Dasyurus* to *Phascolosorex*	Primary	4.36	15.97	Normal prior with mean 10, sigma 2.75	Soft; 95% CI = 4.61-15.4	Cf. *Dasyurus* sp.	Turnbull et al. 2003
Marsupials	11	*Isoodon* to *Perameles*	Primary	3.62	15.97	Normal prior with mean 8, sigma 3	Soft; 95% CI = 2.12-13.9	*Perameles allinghamensis; P. bowensis*	*P. allinghamensis* and *P. bowensis* are known from the early Pliocene Bluff Downs and Bow Local Faunas, respectively (Muirhead et al. 1997; Mackness et al. 2000a). The Bluff Downs Local Fauna is overlain by a basalt flow that has been dated at 3.62 Ma (Mackness et al. 2000b).
Marsupials	12	Australasian marsupials	Primary	54.55	65.8	Normal prior with mean 59, sigma 3	Soft; 95% CI = 53.1-64.9	Murgon "stem perameloid"; Peradectes (Puercan)	Godthelp et al. 1992; Archer et al. 1999; Meredith et al. 2008. Microbiotheres are the first outgroup to Australasian marsupials. The oldest putative microbiothere is Khasia from the early or middle Paleocene (see Beck 2008), although the affinities of this taxon with Microbiotheria have been questioned (Wroe et al. 2000). Djarthia is a putative stem australidelphian (Beck et al. 2008) and is the second outgroup to crown Australasian marsupials. Djarthia is known from Murgon and is younger than Khasia (Beck et al. 2008).
Marsupials	13	Dasyuromorpha	Primary	24.7	54.65	Normal prior with mean 39, sigma 8	Soft; 95% CI = 23.3-54.7	Badjcinus turnbulli	Meredith et al. (2009); Campbell (1976a,b). We also included a 13th calibration for Dasyuromorpha from Meredith et al. (2009). Specifically, we used a minimum age of 24.7 Myr for this clade based on Badjcinus turnbulli, which is the oldest known thylacinid fossil. This minimum age also conforms to the inferred place- ment of Apoktesis cuspis as the most ancient dasyurid (sensu Campbell, 1976a, b). The maximum age was changed to 54.65 Myr rather than the more conserva- tive 65 Myr used previously.
Sphenomorphinae	1	Australian sphenomorphines	Secondary	24	36	Normal prior with mean 30 and s.d. 3.0	Soft, 95% CI 24.12-35.88		Calibration with 95% ci spanning values in Skinner et al. 2013, Pyron & Burbrink 2014, Zheng Wiens 2016
Sphenomorphinae	2	Australian sphenomorphines	Primary	20	NA	Uniform, 20 to 200 (effectively unbounded upper limit)	Hard minimum of 20		~20Ma based on faunal/stratigraphic analysis of a range of Riversleigh sites, Hutchinson 1992. This calibration has little effect due to the above calibration for the same clade also being used.
Pygopodoidea	1	Pygopodoidea (all)	Secondary	48	77	Normal prior with mean 62.65 and s.d. 7.12	Soft, 95% CI 48.7-76.6		Calibration with 95% ci spanning the 3 estimates in Mulcahey et al. 2012 Appendix E and the (generally older) estimates in Zheng & Wiens 2016 Fig. S3
Pygopodoidea	2	Pygopodidae	Secondary	20	39	Normal prior with mean 29.805 and s.d. 4.595	Soft, 95% CI 20.8-38.81		Calibration with 95% ci spanning the 3 estimates in Mulcahey et al. 2012 Appendix E and the (generally older) estimates in Zheng & Wiens 2016 Fig. S3
Pygopodoidea	3	Diplodactylidae	Secondary	30	62	Normal prior with mean 45.965 and s.d. 7.94	Soft, 95% CI 30.4-61.53		Calibration with 95% ci spanning the 3 estimates in Mulcahey et al. 2012 Appendix E and the (generally older) estimates in Zheng & Wiens 2016 Fig. S3
Pygopodoidea	4	Core Diplodtylids, stem	Primary	16	NA	Uniform, 16 to 200 (effectively unbounded upper limit)	Hard minimum of 16		Based on faunal/stratigraphic analysis of St Bathans, Lee et al. 2009
Pygopodoidea	5	*Pygopus,* stem	Primary	18	NA	Uniform, 18 to 200 (effectively unbounded upper limit)	Hard minimum of 18		18Ma based on radiometric dating of Nevilles Garden, Riversleigh.
Agamidae	1	Australian agamids	Secondary			Normal prior with mean 30.22 and s.d. 3.938			Calibration with 95% ci spanning estimates in Townsend et al. 2011, Hugall et al. 2008, Zheng & Wiens 2016 Fig. S3.
Agamidae	2	*Intellagama,* stem	Primary	18	NA	Uniform, 18 to 200 (effectively unbounded upper limit)	Hard minimum of 18		Based on radiometric dating of Nevilles Garden, Riversleigh by Woodhead et al. 2016
Meliphagoid	1	Acanthizidae	Primary	16.24	NA	Uniform, 16.24 to 51	Hard; min. of 16.24		Crown acanthizid from early Miocene deposit from the Riversleigh World Heritage Area, Australia, (Nguyen, in prep.), dated by Woodhead et al. 2016
Meliphagoid	2	Meliphagidae	Primary	14.17	NA	Uniform 16.24 to 51	Hard; min of 14.17		Crown meliphagid from middle Miocene deposit at Riversleigh World heritage Area, Australia, (Boles, 2005), dated by Woodhead et al. 2016
Meliphagoid	3	Meliphagidae	Secondary	37	65	Normal prior with mean 53, s.d. 5	Soft; 95% CI = 37-65		Secondary calibration from Prum et al. (2015) to estimate the divergence between *Acanthasitta* and all other passerines.

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