Dataset and age ranges for dating analyses:

FAD LAD
Djarthia\_murgonensis 54.7 54.6
Perameles\_nasuta 0 0
Antechinus\_flavipes 0 0
Badjcinus\_turnbulli 27.8 23.0
Barinya\_wangala 23.03 11.62
Dasycercus\_cristicauda 0 0
Dasyuroides\_achilpatna 2.9 2.5
Dasyurus\_dunmalli 4.2 3.6
Dasyurus\_hallucatus 0 0
Dasyurus\_maculatus 0 0
Muribacinus\_gadiyuli 15.1 12.9
Mutpuracinus\_archibaldi 17.0 12.0
Ngamalacinus\_timmulvaneyi 18.5 16.2
Nimbacinus\_dicksoni 17.0 12.0
Phascogale\_tapoatafa 0 0
Sminthopsis\_floravillensis 2.58 0.1
Sminthopsis\_murina 0 0
Thylacinus\_cynocephalus 0 0
Thylacinus\_macknessi 18.5 16.2
Thylacinus\_megiriani 7.5 4.5
Thylacinus\_potens 8.5 5.5
Thylacinus\_yorkellus 5.3 3.6
Tyarrpecinus\_rothi 8.5 5.5
Wabulacinus\_ridei 18.5 17.0

Newick tree for strap analysis in Fig. S1a:

(Djarthia\_murgonensis,(Perameles\_nasuta,((Mutpuracinus\_archibaldi,Barinya\_wangala,(Sminthopsis\_murina,Dasyuroides\_achilpatna,(Antechinus\_flavipes,Phascogale\_tapoatafa),(Sminthopsis\_floravillensis,Dasyurus\_dunmalli,(Dasycercus\_cristicauda,(Dasyurus\_hallucatus,Dasyurus\_maculatus))))),(Badjcinus\_turnbulli,((Nimbacinus\_dicksoni,(Muribacinus\_gadiyuli,Ngamalacinus\_timmulvaneyi)),(Tyarrpecinus\_rothi,(Wabulacinus\_ridei,(Thylacinus\_macknessi,(Thylacinus\_potens,(Thylacinus\_yorkellus,Thylacinus\_cynocephalus,Thylacinus\_megiriani))))))))));

Newick tree for strap analysis in Fig. S1b:

(Djarthia\_murgonensis,(Perameles\_nasuta,((((((Antechinus\_flavipes,Phascogale\_tapoatafa),(((Dasycercus\_cristicauda,Dasyurus\_dunmalli),(Dasyurus\_hallucatus,Dasyurus\_maculatus)),Sminthopsis\_floravillensis)),(Dasyuroides\_achilpatna,Sminthopsis\_murina)),Mutpuracinus\_archibaldi),Barinya\_wangala),(Badjcinus\_turnbulli,(((Muribacinus\_gadiyuli,Nimbacinus\_dicksoni),Ngamalacinus\_timmulvaneyi),((((Thylacinus\_cynocephalus,Thylacinus\_yorkellus),Thylacinus\_megiriani),Thylacinus\_macknessi),(Thylacinus\_potens,(Tyarrpecinus\_rothi,Wabulacinus\_ridei))))))));

Age ranges and references for fossil taxa.

|  |  |  |  |
| --- | --- | --- | --- |
| Taxon | Locality | Age Range (Ma) | Reference(s) |
| *Djarthia murgonensis* | Tingamarra Local Fauna, Etadunna Formation, South Australia | 54.7-54.6 | Godthelp et al. 1992 |
| *Badjcinus turnbulli* | see text for details | 27.8-23.0 | see text for details |
| *Barinya wangala* | Riversleigh Faunal Zones B & C, Queensland, Australia | 23.03-11.62 | Arena et al. 2015 |
| *Dasyuroides achilpatna* | Fisherman’s Cliff Local Fauna, Moorna Formation, New South Wales, Australia | 2.9-2.5 | Whitelaw, 1991 |
| *Dasyurus dunmalli* | Chinchilla Local Fauna, Queensland, Australia | 4.2-3.6 | Tedford et al., 1992 |
| *Muribacinus gadiyuli* | see text for details | 15.1-12.9 | see text for details |
| *Mutpuracinus archibaldi* | see text for details | 17.0-12.0 | see text for details |
| *Ngamalacinus timmulvaneyi* | see text for details | 18.5-16.2 | see text for details |
| *Nimbacinus dicksoni* | see text for details | 17.0-12.0 | see text for details |
| *Sminthopsis floravillensis* | Site 5C, Floraville Crossing, Queensland, Australia | 2.58-0.1 | Price, 2013 |
| *Thylacinus macknessi* | see text for details | 18.5-16.2 | see text for details |
| *Thylacinus megiriani* | see text for details | 7.5-4.5 | see text for details |
| *Thylacinus potens* | see text for details | 8.5-5.5 | see text for details |
| *Thylacinus yorkellus* | see text for details | 5.3-3.6 | see text for details |
| *Tyarrpecinus rothi* | see text for details | 8.5-5.5 | see text for details |
| *Wabulacinus ridei* | see text for details | 18.5-17.0 | see text for details |

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