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An annotated checklist of Australian Mesozoic tetrapods

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ABSTRACT

In 2020, the Australasian palaeontological association *Australasian Palaeontologists* (AAP) joined the Australian government-supported *Australian National Species List* (auNSL) initiative to compile the first *Australian Fossil National Species List* (auFNSL) for the region. The goal is to assemble comprehensive systematic data on all vertebrate, invertebrate and plant fossil taxa described to date, and to present the information both within a continuously updated open-access online framework, and as a series of primary reference articles in AAP's flagship journal *Alcheringa*. This paper spearheads these auFNSL *Alcheringa* publications with an annotated checklist of Australian Mesozoic tetrapods. Complete synonymy, type material, source locality, geological age and bibliographical information are provided for 111 species formally named as of 2022. In addition, chronostratigraphically arranged inventories of all documented Australian Mesozoic tetrapod fossil occurrences are presented with illustrations of significant, exceptionally preserved and/or diagnostic specimens. The most diverse order-level clades include temnospondyl amphibians (34 species), saurischian (13 species) and ornithischian (12 species) dinosaurs (excluding ichnotaxa), and plesiosaurian marine reptiles (11 species). However, numerous other groups collectively span the earliest Triassic (earliest Induan) to Late Cretaceous (late Maastrichtian) and incorporate antecedents of modern Australian lineages, such as chelonioid and chelid turtles and monotreme mammals. Although scarce in comparison to records from other continents, Australia's Mesozoic tetrapod assemblages are globally important because they constitute higher-palaeolatitude faunas that evince terrestrial and marine ecosystem evolution near the ancient South Pole. The pace of research on these assemblages has also accelerated substantially over the last 20 years, and serves to promote fossil geoheritage as an asset for scientific, cultural and economic development. The auFNSL augments the accessibility and utility of these palaeontological resources and provides a foundation for ongoing exploration into Australia's unique natural history.

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THE *AUSTRALIAN NATIONAL SPECIES LIST* (auNSL) is a joint taxonomic resource project (https://biodiversity.org.au/nsl/) involving the *Australian Biological Resources Study* (ABRS) of the Australian Government Department of Climate Change, Energy, the Environment and Water (https://www.dcceew.gov.au/science-research/abrs), in partnership with the CSIRO (https://www.csiro.au) and various Australian museums, herbaria, and universities. The auNSL aims to produce publicly accessible databases for all formally designated taxa represented in the Australian biota and, thereby, provide an authoritative tool for research, education and government policy. *Australasian Palaeontologists* (AAP) joined the auNSL to integrate the perspective of past biodiversity, which has otherwise been previously catalogued through disparate external portals, such as the *New and Old Worlds* (NOW) *Database of Fossil Mammals* (https://nowdatabase.org/). The resulting *Australian Fossil National Species List* (auFNSL) is, thus, a resource dedicated to documenting the unique fossil record of the region.

The auFNSL (https://www.australasianpalaeontologists.org/databases) currently hosts taxonomic checklists for multiple invertebrate and vertebrate groups, including species of fossil mammals from Australia and New Guinea (Travouillon *et al.* 2021), Australian fossil birds (Worthy *et al.* 2021), and Australian fossil reptiles and amphibians (Thorn *et al.* 2021). Worthy & Nguyen (2020) independently published an annotated list of Australian fossil bird species that established both a catalyst and formatting blueprint for special feature articles now being published in AAP's flagship journal *Alcheringa*. Here, we present the inaugural contribution to this series with an annotated checklist of

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Australian Mesozoic tetrapods; this expands on data from Thorn *et al.* (2021) and showcases one of the most high-profile areas of palaeontological research in Australasia. Note that although fragmentary Mesozoic tetrapod fossils are known from Timor and New Caledonia, which were connected to Australia during the early Mesozoic (see Kear *et al.* 2018), these will be summarized in a separate auFNSL annotated list. This survey also excludes fossils from the Australian Antarctic Territories. New Zealand otherwise maintains its own national palaeontological collection (https://www.gns.cri.nz/data-and-resources/national-paleontological-collection/) and locality documentation (https://fred.org.nz/) initiatives.

Collectively, the Australian Mesozoic tetrapod fossil record is among the least prolific of any continent (e.g., Molnar 1980a, 1982, 1991, Warren 1972, 1982, 1991, Long 1990, 1993, 1998, Rich & Vickers-Rich 2003a, Scanlon 2006, Kear & Hamilton-Bruce 2011). Yet, knowledge of these fossils likely extends back many thousands of years amongst First Nations peoples. For instance, in the Saltwater Culture of the West Kimberley in northwestern Western Australia, three-toed footprints exposed along the Dampier Peninsula coastline form part of a song cycle or 'dreaming' that traces the journey of a creation being known as Marala or 'Emu Man' (Salisbury *et al.* 2017). Western science has come to interpret these tracks as traces of non-avian theropod dinosaurs, and named them *Megalosauropus broomensis* Colbert & Merrilees, 1967. Since the late 1980s, numerous other fossilized tracks have been recorded and described from these rocks, and the region now boasts the most diverse dinosaur ichnocoenoses in the world (Salisbury *et al.* 2017).

The earliest written description of an Australian Mesozoic tetrapod fossil was published in 1859 by the eminent British anatomist Thomas Henry Huxley, who reported a skull and mandible of the temnospondyl amphibian *Bothriceps australis* Huxley, 1859 (Huxley 1859). The source locality of this specimen (NHMUK PV R23110) was 'said to be from Australia', which left its geographical origin in doubt (Warren & Marsicano 1998). The mystery was finally resolved by the discovery of new material in the upper Parmeener Group of Tasmania, which stratigraphically spans the uppermost Permian to lowermost Triassic transition (Warren *et al.* 2011).

A similarly quirky history follows the recovery of Australia's 'first' dinosaur fossils, which were allegedly collected in 1844 on Cape York Peninsula by crew of the British navy warship H.M.S. *Fly* (Vickers-Rich *et al.* 1999). These bones were duly sent back to England and eventually named *Agrosaurus macgillivrayi* Seeley, 1891 by the famous English palaeontologist Harry Govier Seeley (Seeley 1891). Galton (1990) and Molnar (1991) later identified the remains as being from a 'prosauropod' (non-sauropod sauropodomorph); however, re-exploration of the supposed type locality (thought to be somewhere on Cape Grenville near the tip of the Cape York Peninsula in northernmost Queensland) in 1995 led Vickers-Rich *et al.* (1999) to demonstrate that these fossils were not derived from Australia at all. Rather, they were from the UK and had likely been mislabelled. *Agrosaurus macgillivrayi* was thus formally designated a junior synonym of *Thecodontosaurus antiquus* Morris, 1843, a basally divergent sauropodomorph from the Upper Triassic (Rhaetian) of southwestern England.

At most recent count in 2022, there are 100 genera and 111 species (including 10 *nomina dubia*) of Mesozoic tetrapods formally named from body or trace fossils found in Australia, with almost 35% having been published in the last ~20 years (Table 1). The majority of these taxa are based on material from Triassic (17 occurrences) and Lower and Upper Cretaceous (29 occurrences) lithostratigraphic units, with only a few (four occurrences) reported from Jurassic rocks (Appendix Tables A1–A6).

Temnospondyl amphibians are by far the most diverse order-level clade, with 31 species and 27 genera named from 12 uppermost Permian to Lower Triassic and Middle Triassic formations (see Kear & Hamilton-Bruce 2011). An additional three named monospecific genera are recognized from Lower Jurassic (upper Toarcian: Todd *et al.* 2019, Sobczak *et al.* 2022) and Lower Cretaceous (uppermost Barremian to lowermost Aptian: Wagstaff *et al.* 2020) deposits, encompassing the last-surviving member of the clade *Koolasuchus cleelandi* Warren, Rich & Vickers-Rich, 1997 (Warren & Hutchinson 1983, Warren *et al.* 1991, Warren *et al.* 1997).

Australian Triassic amniotes include fragmentary dicynodont and cynodont synapsid remains (Thulborn 1990, Rozefelds *et al.* 2011), together with a procolophonid, basal neodiapsid, and various archosauromorphs representing five monospecific genera based on body fossils from two formations of Induan to Olenekian age (Ezcurra 2014, Hamley *et al.* 2021). Jurassic reptiles incorporate the theropod *Ozraptor subotaii* Long & Molnar, 1998 and an indeterminate sauropod dinosaur (Long 1992b, Long & Molnar 1998), along with plesiosauroid and 'rhomaleosaurid-like' plesiosaurians from two lower Bajocian formations in Western Australia (see Mory *et al.* 2005, Kear 2012). The famous gravisaurian sauropod *Rhoetosaurus brownei* Longman, 1926 (Nair & Salisbury 2012) was also named from the Oxfordian of Queensland (Todd *et al.* 2019). In addition, indeterminate plesiosaurians (including the geologically oldest identifiable freshwater pliosaurs: Kear 2012), and a cryptic diversity of thyreophorans, ornithopods, and small-to-large non-avian theropod dinosaurs have been identified from footprint traces in three formations ranging from the Hettangian to lower Tithonian in Queensland (Romilio 2021a, 2021b, Romilio *et al.* 2021a, Romilio *et al.* 2021c).

Australian Cretaceous sedimentary rock units are geographically much more extensive than their Triassic or Jurassic counterparts, and have yielded a far greater number of described taxa. Saurischian (12 non-avian monospecific genera) and ornithischian (12 monospecific genera) dinosaurs and plesiosaurian marine reptiles (six unique genera and 11 species) are especially prolific in mid-Valanginian to upper Aptian (Kear 2003, Kear *et al.* 2018, Salisbury *et al.* 2017, Wagstaff *et al.* 2020) and upper Albian to mid-Cenomanian (Kear 2003, Kear *et al.* 2018, Bell *et al.* 2019b) successions.

Table 1. Classification summary of uppermost Permian and Mesozoic tetrapods from the Australian Fossil National Species List.

Classification	Taxon	Holotype	Reference
Tetrapoda			
Temnospondyli	Temnospondyli *incertae sedis* (‘*Lepidostrobus*’ *muelleri*)	TMAG Z1376	Rozefelds & Warren (2011)
Stereospondyli	*Capulomala arcadiaensis*	QM F39706	Warren et al. (2009)
Lydekkerinidae	*Lydekkerina huxleyi*	NHMUK PV R507	Warren et al. (2006)
	Chomatobatrachus halei	UTGD 80738	Cosgriff (1974)
	Lapillopsis nana	QM F12284	Warren & Hutchinson (1990a)
	Rotaurisaurus contundo	UTGD 87795	Yates (1999)
Capitosauria	*Bulgosuchus gargantua*	AM F80190	Damiani (1999)
	Watsonisuchus sp. indet. (‘*Parotosaurus*’ *wadei*)	AM F55341	Cosgriff (1972
	Watsonisuchus rewanensis	QM F6571	Warren (1980)
	Watsonisuchus gunganj	QM F10114	Warren (1980)
	Warrenisuchus aliciae	QM F12281	Warren & Hutchinson (1988)
Mastodonsauridae	*Paracyclotosaurus davidi*	NHMUK PV R6000	Watson (1958)
	Subcyclotosaurus brookvalensis	AM F47499	Watson (1958)
Trematosauria			
Trematosauroidea			
Trematosauridae	*Tirraturhinus smisseni*	QM F44093	Nield et al. (2006)
Lonchorhynchinae	*Erythrobatrachus noonkanbahensis*	WAM 62.1.46	Cosgriff & Garbutt (1972)
Trematosaurinae	*Microposaurus averyi*	AM F135895	Warren (2012)
Rhytidosteidae	*Trucheosaurus major*	NSWGS F12967	Watson (1956)
	Deltasaurus kimberleyensis	WAM 62.1.44	Cosgriff (1974)
	Deltasaurus pustulatus	BMR F21775	Cosgriff (1965)
	Rewana quadricuneata	QM F6471	Howie (1972b)
	Derwentia warreni	UTGD 87784	Cosgriff (1974)
	Arcadia myriadens	QM F10121	Warren & Black (1985)
	Acerastea wadeae	QM F12277	Warren & Hutchinson (1987)
	Nanolania anatopretia	QM F12293	Yates (2000)
Plagiosauridae	*Plagiobatrachus australis*	QM F12667	Warren (1985a)
Brachyopoidea	*Austropelor wadleyi*	QM F2628	Longman (1941)
Brachyopidae	*Bothriceps australis*	NHMUK PV R23110	Huxley (1859)
	Batrachosuchus henwoodi	WAM 62.1.42	Cosgriff (1969)
	Platycepsion wilkinsoni	NSWGS F12572	Stephens (1887c)
	Notobrachyops picketti	NSWGS F8258	Cosgriff (1967)
	Xenobrachyops allos	QM F6572	Howie (1972a)
	Banksiops townrowi	UTGD 87785	Cosgriff (1974)
Chigutisauridae	*Keratobrachyops australis*	QM F10115	Warren (1981a)
	Siderops kehli	QM F7882	Warren & Hutchinson (1983)
	Koolasuchus cleelandi	NMV P186213	Warren et al. (1997)
Reptilia			
Parareptilia			
Procolophonoidea			
Procolophonidae	*Eomurunna yurrgensis*	QM F18335	Hamley et al. (2021)
Eureptilia			
Diapsida			
Neodiapsida	*Kudnu mackinlayi*	QM F9181	Bartholomai (1979)
Ichthyosauromorpha			
Ichthyosauriformes			
Ichthyopterygia			
Ichthyosauria			
Ophthalmosauria			
Brachypterygidae	*Platypterygius australis*	NMV P12989	M’Coy (1867), Zammit (2010)
Sauropterygia			

(*continued*)

Table 1. Continued.

Classification	Taxon	Holotype	Reference
Pistosauroidea			
Plesiosauria			
Pliosauridae			
Brachaucheninae	*Kronosaurus queenslandicus*	QM F1609, QM F18827	Longman (1924), McHenry (2009)
	Eiectus longmani	MCZ 1285	Noè & Goméz-Pérez (2022)
Plesiosauroidea			
Cryptocleididae	*Opallionectes andamookaensis*	SAMA P24560	Kear (2006c)
Leptocleidia	*Leptocleidus clemai*	WAM 92.8.1	Cruickshank & Long (1997)
	Umoonasaurus demoscyllus	AM F99374	Kear et al. (2006)
Polycotylidae	Polycotylidae *incertae sedis* (*'Cimoliosaurus' leucoscopelus*)	AM F6266–AM F6298	Etheridge (1897), Kear (2005b)
Elasmosauridae	Elasmosauridae *incertae sedis* (*'Plesiosaurus' macrospondylus*)	NMV P22548	M'Coy (1867), Kear (2003)
	Elasmosauridae *incertae sedis* (*'Plesiosaurus' sutherlandi*)	NMV P22572	M'Coy (1867), Kear (2003)
	Elasmosauridae *incertae sedis* (*'Cimoliosaurus' maccoyi*)	AM F9630–AM F9928	Etheridge (1904), Kear (2002a)
	Elasmosauridae *incertae sedis* (*Woolungasaurus glendowerensis*)	QM F6890	Persson (1960), Kear (2007b)
	Eromangasaurus australis	QM F11050	Kear (2005c, 2007b)
Testudinata	Testudinata *incertae sedis* (*Chelycarapookus arcuatus*)	NMV P13160	Warren (1969), Joyce (2017)
Mesochelydia	*Spoochelys ormondea*	AM F121643, AM F121646, AM F121579, AM F121580, AM F121581, AM F121686, AM F121687, AM F121641, AM F121587, AM F121621, AM F121613	Smith & Kear (2013)
Meiolaniformes	*Otwayemys cunicularius*	NMV P186116	Gaffney et al. (1998)
Testudines			
Pan-Chelonioidea			
Protostegidae	*Notochelone costata*	AM F67326	Owen (1882), Kear (2003)
	Cratochelone berneyi	QM F14550	Longman (1915)
	Bouliachelys suteri	QM F31669	Kear & Lee (2006)
Archosauromorpha			
Crocopoda	*Tasmaniosaurus triassicus*	UTGD 54655	Camp & Banks (1978)
Prolacertidae	*Kadimakara australiensis*	QM F6710	Bartholomai (1979)
Archosauriformes	*Kalisuchus rewanensis*	QM F8998	Thulborn (1979)
Archosauria			
Crocodylomorpha			
Neosuchia	*Confractosuchus sauroktonos*	AODF 0890	White et al. (2022)
Suisuchidae	*Isisfordia selaslophensis*	AM F15818	Etheridge (1917), Hart (2020)
	Isisfordia duncani	QM F36211	Salisbury et al. (2006)
	Isisfordia molnari	AM F125553	Hart et al. (2019), Hart (2020)
Ornithodira			
Pterosauria			
Pterodactyloidea			
Ornithocheiroidea			
Pteranodontoidea			
Lanceodontia			
Ornithocheirae			
Targaryendraconia	*Aussiedraco molnari*	QM F10613	Kellner et al. (2011)
Anhangueria	*Mythunga camara*	QM F18896	Molnar & Thulborn (2007)
	Ferrodraco lentoni	AODF 0876	Pentland et al. (2019)
	Thapunngaka shawi	KK F494	Richards et al. (2021)
Dinosauria			

(*continued*)

Table 1. Continued.

Classification	Taxon	Holotype	Reference
Saurischia			
Sauropodomorpha			
Sauropoda			
Gravisauria	*Rhoetosaurus brownei*	QM F1659	Longman (1926), Nair & Salisbury (2012)
Eusauropoda			
Neosauropoda			
Macronaria			
Titanosauriformes			
Somphospondyli	*Austrosaurus mckillopi*	QM F2316	Longman (1933), Poropat et al. (2017)
	Wintonotitan wattsi	QM F7292	Hocknull et al. (2009)
Titanosauria			
Diamantinasauria	*Diamantinasaurus matildae*	AODF 0603	Hocknull et al. (2009)
	Savannasaurus elliottorum	AODF 0660	Poropat et al. (2016)
	Australotitan cooperensis	EMF 102	Hocknull et al. (2021)
Theropoda	Theropoda *incertae sedis* (*Walgettosuchus woodwardi*)	NHMUK R3717	von Huene (1932), Agnolin et al. (2010)
	Kakuru kujani	SAMA P17926	Molnar & Pledge (1980)
	Ozraptor subotaii	UWA 82469	Long & Molnar (1998)
Coelurosauria			
Megaraptoridae	*Rapator ornitholestoides*	NHMUK PV R3718	von Huene (1932), White et al. (2013a)
	Australovenator wintonensis	AODF 0604	Hocknull et al. (2009)
Tyrannosauroidea	*Timimus hermani*	NMV P186303	Rich & Vickers-Rich (1994)
Avialae			
Enantiornithes	*Nanantius eos*	QM F12992	Molnar (1986)
Ornithischia	Ornithischia *incertae sedis* (*Serendipaceratops arthurcclarkei*)	NMV P186385	Rich & Vickers-Rich (1994)
Thyreophora			
Eurypoda			
Ankylosauria	*Minmi paravertebra*	QM F10329	Molnar (1980b)
	Kunbarrasaurus ieversi	QM F18101	Leahey et al. (2015)
Neornithischia			
Cerapoda			
Ornithopoda	Ornithopoda *incertae sedis* (*Fulgurotherium australe*)	NHMUK R3719	Von Huene (1932), Agnolin et al. (2010)
	Weewarrasaurus pobeni	LRF 3076	Bell et al. (2018b)
Elasmaria	*Leaellynasaura amicagraphica*	NMV P185991	Rich & Rich (1989)
	Atlascopcosaurus loadsi	NMV P166409	Rich & Rich (1989)
	Qantassaurus intrepidus	NMV P199075	Rich & Vickers-Rich (1999)
	Diluvicursor pickeringi	NMV P221080	Herne et al. (2018)
	Galleonosaurus dorisae	NMV P229196	Herne et al. (2019)
Iguanodontia	*Muttaburrasaurus langdoni*	QM F6140	Bartholomai & Molnar (1981)
	Fostoria dhimbangunmal	LRF 3050.A	Bell et al. (2019a)
Synapsida			
Therapsida			
Theriodontia			
Cynodontia			
Mammalia			
Australosphenida			
Ausktribosphenidae	*Ausktribosphenos nyktos*	NMV P208090	Rich et al. (1997)
	Kryoparvus gerriti	NMV P210087	Rich et al. (2020c)
Bishopidae	*Bishops whitmorei*	NMV P210075	(Rich et al. 2001b)
Prototheria			
Monotremata	*Kryoryctes cadburyi*	NMV P208094	Pridmore et al. (2005)
	Stirtodon elizabethae	AM F118621	Rich et al. (2020a)
Teinolophidae	*Teinolophos trusleri*	NMV P208231	Rich et al. (1999)

(*continued*)

Table 1. Continued.

Classification	Taxon	Holotype	Reference
Steropodontidae	*Steropodon galmani*	AM F66763	Archer et al. (1985)
Kollikodontidae	*Kollikodon ritchiei*	AM F96602	Flannery et al. (1995)
	Sundrius ziegleri	NMV P252052	Rich et al. (2020b)
Theriiformes			
Allotheria			
Multituberculata			
Cimolodonta			
Corriebaataridae	*Corriebaatar marywaltersae*	NMV P216655	Rich et al. (2009b)
Sauropod tracks	*Oobardjidama foulkesi*	WAM 12.1.6	Salisbury et al. (2017)
Theropod tracks	*Megalosauropus broomensis*	WAM 66.2.51	Colbert & Merrilees (1967)
	Skartopus australis	QM F10330	Thulborn & Wade (1984)
	Yangtzepus clarkei	WAM 12.1.1	Salisbury et al. (2017)
	Kayentapus isp. indet. (*Changpeipus bartholomaii*)	–	Romilio et al. (2021a)
Thyreophoran tracks	*Garbina roeorum*	WAM 12.1.19, WAM 12.1.20	Salisbury et al. (2017)
	Luluichnus mueckei	WAM 15.12.701	Salisbury et al. (2017)
Ornithopod tracks	*Wintonopus latomorum*	QM F10319	Thulborn & Wade (1984)
	Wintonopus middletonae	WAM 12.1.15	Salisbury et al. (2017)
	Walmadanyichnus hunteri	WAM 12.1.16	Salisbury et al. (2017)
Dicynodont tracks	*Dicynodontipus bellambiensis*	NSWGS F13639	Retallack (1996)
?Cynodont burrows	*Reniformichnus australis*	NRM X9101	McLoughlin et al. (2020)

Finally, the late Albian enantionithine bird *Nanantius eos* Molnar, 1986, along with 10 mammalian monospecific genera variously identified as ausktribosphenids, bishopids, monotremes and multituberculates have been excavated from uppermost Barremian to lower Albian (Rich & Vickers-Rich 2004, Poropat *et al.* 2018, Rich et al. 2022a, 2022b, Flannery *et al.* 2022a, Flannery *et al.* 2022b), and lower–mid-Cenomanian successions (Bell *et al.* 2019b, Rich *et al.* 2020a).

Exploration for new Mesozoic tetrapod fossil-bearing strata is ongoing, and while historically driven by Australian state museums and universities in collaboration with various international partners, there is now increasing synergy with government accredited regional museums that have led to a wave of new discoveries and raised the profile of regional centres for fossil geotourism and geoconservation (Meakin 2011, Sookias *et al.* 2013, Cayla 2020). The resulting upsurge in interest, investment and infrastructure is today revolutionizing Australian vertebrate palaeontology, and will no doubt sustain scientific and community benefits for many decades to come.

Institutional abbreviations

AM, Australian Museum, Sydney, Australia. AAOD, Australian Age of Dinosaurs Museum of Natural History, Winton, Australia. BMR, Bureau of Mineral Resources, Geology and Geophysics, Canberra, Australia. KK, Kronosaurus Korner (Richmond Marine Fossil Museum), Richmond, Australia. LR, Australian Opal Centre, Lightning Ridge, Australia. MCZ, Museum of Comparative Zoology, Cambridge, USA. NHMUK, The Natural History Museum, London, UK. NMV, Melbourne Museum, Museums Victoria, Melbourne, Australia. NRM, Swedish Museum of Natural History (Naturhistoriska riksmuseet), Stockholm, Sweden. NSWGS, New South Wales Geological Survey, Sydney, Australia. QM, Queensland Museum, Brisbane, Australia. SAMA, South Australian Museum, Adelaide, Australia. TMAG, Tasmanian Museum and Art Gallery, Hobart, Australia. UCMP, University of California Museum of Paleontology, Berkeley, USA. UQ, University of Queensland, Brisbane, Australia. UTGD, University of Tasmania, Department of Geology, Hobart, Australia. UWA, University of Western Australia, Perth, Australia. WAM, Western Australian Museum, Perth, Australia.

Systematic palaeontology

TETRAPODA Hatschek & Cori, 1896
TEMNOSPONDYLI Zittel, 1888 *in* Zittel, 1887–1890

Temnospondyli *incertae sedis*

1885, *Lepidostrobus muelleri* Johnston, p. 225.
2011, cf. Rhinesuchidae or Rhytidosteidae Rozefelds & Warren, p. 459.

Remarks

We designate *Lepidostrobus muelleri* a *nomen dubium* following Rozefelds & Warren (2011).

STEREOSPONDYLI Zittel, 1887–1890

Capulomala Warren, Damiani & Sengupta, 2009

Type species

Capulomala arcadiaensis Warren, Damiani & Sengupta, 2009.

Capulomala arcadiaensis Warren, Damiani & Sengupta, 2009

2009, *Capulomala arcadiaensis* Warren *et al.*, p. 166.

Holotype

QM F39706, incomplete right mandibular ramus.

Type locality, unit and age

'Tank locality' (QM L1111) on the northeastern scarp of the Carnarvon Range, at the southern end of Arcadia Valley in the Central Highlands region of Queensland, Australia. Warren *et al.* (2009) considered the host deposit to be part of the Arcadia Formation in the Rewan Group (Bowen Basin), which Metcalfe *et al.* (2015) correlated with the upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones. These span the lower to middle Olenekian (Lower Triassic) based on the recalibrated palynostratigraphy of Mays *et al.* (2020).

Remarks

Capulomala was erected to accommodate both *Capulomala arcadiaensis* and a second species, '*Labyrinthodon*' *panchetensis* Tripathi, 1969, from the Panchet Formation of India (Warren *et al.* 2009). Two partial left mandibular rami (QM F12269, QM F12270) previously referred to *Plagiobatrachus australis* Warren, 1985a from 'The Crater' locality (QM L78) near Rolleston in central Queensland, together with multiple specimens from Duckworth Creek (QM L1215) near Bluff in east-central Queensland, have now also been assigned to this taxon (Warren *et al.* 2009).

LYDEKKERINIDAE Watson, 1919

Lydekkerina Broom, 1915

Type species

Lydekkerina huxleyi (see Lydekker 1889a, Broom 1915).

Lydekkerina huxleyi (Lydekker, 1889a) Broom, 1915

1889a, *Bothriceps huxleyi* Lydekker, p. 476.
1915, *Lydekkerina huxleyi* Broom, p. 366.
2006, *Lydekkerina huxleyi* Warren *et al.*, p. 878.

Holotype

NHMUK PV R507, an associated skull with articulated left and partial right mandibular ramus, together with cervical and anterior dorsal vertebrae.

Type locality, unit and age

Unspecified site within the Karoo Basin of the Free State Province in South Africa. Botha & Smith (2020) listed *Lydekkerina huxleyi* as a diagnostic taxon for the *Lystrosaurus* Assemblage Zone in the Beaufort Group (Karoo Basin), which spans the Induan to lower Olenekian (Lower Triassic).

Remarks

Warren *et al.* (2006) attributed a skull with both mandibular rami (QM F39705) to *Lydekkerina huxleyi* from upper Induan to lower Olenekian strata (see Mays *et al.* 2020) of the Rewan Formation (Galilee Basin) on Alpha Station (QM L1434) near Alpha, in southeastern Queensland. *Lydekkerina huxleyi* is otherwise geographically restricted to Lower Triassic deposits in South Africa (Pawley & Warren 2005, Jeannot *et al.* 2006).

Chomatobatrachus Cosgriff, 1974

Type species

Chomatobatrachus halei Cosgriff, 1974.

Chomatobatrachus halei Cosgriff, 1974

1974, *Chomatobatrachus halei* Cosgriff, p. 44.

Holotype

UTGD 80738, an isolated intact skull.

Type locality, unit and age

Meadowbank Dam northwest of Hobart in Tasmania, Australia. Ezcurra (2014) correlated *Chomatobatrachus halei* with coeval vertebrate assemblages from the Knocklofty Formation (Tasmanian Basin), which is predominantly Induan to lower Olenekian (Lower Triassic) but has a maximum depositional age of 253 ± 4 mega-annum (Ma).

Remarks

Chomatobatrachus halei is represented by multiple specimens from several localities in southeast Tasmania (Cosgriff 1974). The taxon is consistently placed with *Lydekkerina huxleyi* (Lydekker, 1889a) in Lydekkerinidae (Warren *et al.* 2006, Schoch 2013, Gee 2022, Gee *et al.* 2022).

Lapillopsis Warren & Hutchinson, 1990b

Type species

Lapillopsis nana Warren & Hutchinson, 1990b.

Lapillopsis nana Warren & Hutchinson, 1990b

1990a, Dissorophoidea: Micropholidae Warren & Hutchinson, p. 105.
1990b, *Lapillopsis nana* Warren & Hutchinson, p. 149.
1999, *Lapillopsis nana* Yates, p. 303.

Holotype

QM F12284, an associated skull (Fig. 1F), mandible, interclavicle, right scapulocoracoid, right humerus, and femur.

Type locality, unit and age
'The Crater' locality (QM L78) near Rolleston in central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks
Originally identified as a dissorophoid and classified within Micropholidae (Warren & Hutchinson 1990a, 1990b), *Lapillopsis nana* has since been referred to Lapillopsidae (Yates 1999) or Lydekkerinidae (Eltink *et al.* 2019, Gee 2022).

Rotaurisaurus Yates, 1999

Type species
Rotaurisaurus contundo Yates, 1999.

Rotaurisaurus contundo Yates, 1999

1974, *Chomatobatrachus halei* Cosgriff, p. 44 [*partim*]
1999, *Lapillopsis nana* Yates, p. 311.

Holotype
UTGD 87795, an isolated crushed skull with associated left mandibular ramus.

Type locality, unit and age
'Lower Red Bed' layer within the Crisp and Gunn's Brick Pit, western end of Arthur Street in suburban Hobart, Tasmania, Australia; Knocklofty Formation (Tasmania Basin) correlated with Induan to lower Olenekian (Lower Triassic) vertebrate assemblages by Ezcurra (2014).

Remarks
UTGD 87795 was initially referred to *Chomatobatrachus halei* by Cosgriff (1974), but subsequently established as *Rotaurisaurus contundo* by Yates (1999). *Rotaurisaurus contundo* is placed within Lydekkerinidae following the phylogeny-based classifications of Eltink *et al.* (2019) and Gee (2022).

CAPITOSAURIA Schoch & Milner, 2000

Bulgosuchus Damiani, 1999

Type species
Bulgosuchus gargantua Damiani, 1999.

Bulgosuchus gargantua Damiani, 1999

1999, *Bulgosuchus gargantua* Damiani, p. 91.

Holotype
AM F80190, the posterior glenoid section of a left mandibular ramus (Fig. 1D).

Type locality, unit and age
Coastal rock platform at Long Reef in the northern beaches suburbs of Sydney, New South Wales, Australia. The vertebrate fossil-bearing layer at Long Reef occurs within the Bulgo Sandstone (Damiani 1999, Kear 2009, Niedźwiedzki *et al.* 2016) of the Clifton Subgroup in the Narrabeen Group (Sydney Basin). Mays *et al.* (2020) directly correlated this level with the mid-Olenekian (Lower Triassic) upper *Protohaploxypinus samoilovichii* Zone. Metcalfe *et al.* (2015) also delimited the unit as being older than 248.23 ± 0.13 Ma based on U-Pb zircon dating from the up-sequence Garie Formation.

Remarks
At the time of discovery, *Bulgosuchus gargantua* was distinguished as the largest-bodied Early Triassic temnospondyl known worldwide (Damiani 1999, 2001).

Watsonisuchus Ochev, 1966

Type species
Watsonisuchus magnus (Watson, 1962) Ochev, 1966.

Watsonisuchus sp. indet.

1972, *Parotosaurus wadei* Cosgriff, p. 546.
1980, *Parotosuchus wadei* (Cosgriff) Warren, p. 25.
1997, *Parotosuchus wadei* (Cosgriff) Damiani & Warren, p. 282.
2001, *Watsonisuchus* sp. indet. Damiani, p. 429.

Holotype
AM F55341, an external impression of the skull roof.

Type locality, unit and age
The Railway Ballast Quarry near Gosford in northeastern New South Wales, Australia. These deposits are correlated with the Terrigal Formation of the Narrabeen Group (Sydney Basin). Helby (1973) and Morante (1996) placed this unit within the mid-Olenekian to lower Anisian (Lower to Middle Triassic) *Aratrisporites tenuispinosus* Palynomorph Zone. Mays & McLoughlin (2022) also listed a specific age estimate of ~248 Ma.

Remarks
AM F55341 was excavated in 1886 (Stephens 1888) and variously attributed to *Parotosaurus* Jaekel, 1922 (Cosgriff 1972), *Parotosuchus* (Warren 1980), or treated as a *nomen dubium* (Damiani & Warren 1997), before being transferred to an indeterminate species of *Watsonisuchus* by Damiani (2001).

Watsonisuchus rewanensis (Warren, 1980) Damiani, 2001

1980, *Parotosuchus rewanensis* Warren, p. 26.
2000, *Rewanobatrachus gunganj* (Warren) Schoch & Milner, p. 135.
2001, *Watsonisuchus rewanensis* (Warren) Damiani, p. 429.

Holotype
QM F6571, an isolated intact skull.

Type locality, unit and age
'The Crater' locality (QM L78) near Rolleston in central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks
Watsonisuchus rewanensis was initially assigned to *Parotosuchus* (Warren 1980) but has also been treated as a junior synonym of *Rewanobatrachus gunganj* (Schoch & Milner 2000). Maganuco *et al.* (2009) demonstrated close affinity with *Watsonisuchus magnus*, thus confirming the generic placement of Damiani (2001).

Watsonisuchus gunganj (Warren, 1980) Damiani, 2001

1980, *Parotosuchus gunganj* Warren, p. 29.
2000, *Rewanobatrachus gunganj* (Warren) Schoch & Milner, p. 135.
2001, *Watsonisuchus gunganj* (Warren) Damiani, p. 427.

Holotype
QM F10114, an isolated fragmented skull with incomplete mandible (Fig. 1A).

Type locality, unit and age
'The Crater' locality (QM L78) near Rolleston in central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks
See remarks for *Watsonisuchus wadei* and *Watsonisuchus rewanensis*. We follow the generic assignments of Damiani (2001) and Maganuco *et al.* (2009).

Warrenisuchus Maganuco, Steyer, Pasini, Boulay, Lorrain, Bénéteau & Auditore, 2009

Type species
Warrenisuchus aliciae (Warren & Hutchinson, 1988) as revised by Maganuco *et al.* (2009).

Warrenisuchus aliciae (Warren & Hutchinson, 1988)

1988, *Parotosuchus aliciae* Warren & Hutchinson, p. 860.
2000, *Rewanobatrachus aliciae* (Warren & Hutchinson) Schoch & Milner, p. 135.
2001, *Watsonisuchus aliciae* (Warren & Hutchinson) Damiani, p. 425.
2009, *Warrenisuchus aliciae* (Warren & Hutchinson) Maganuco *et al.*, p. 37.

Holotype
QM F12281, an associated intact skull (Fig. 1I) and mandible with vertebrae, ribs, the right ilium, and right hind limb.

Type locality, unit and age
Duckworth Creek (QM L215) near Bluff in east-central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks
Warrenisuchus aliciae has been variously assigned to *Parotosuchus* Ochev & Shishkin *in* Kalandadze, 1968 (Warren & Hutchinson 1988), *Rewanobatrachus* Schoch & Milner, 2000 (Schoch & Milner 2000), and *Watsonisuchus* (Damiani 2001). However, Maganuco *et al.* (2009) demonstrated sufficient differentiation from these taxa to establish the monotypic genus, *Warrenisuchus*. Although occurring commonly in the Arcadia Formation (Warren & Hutchinson 1988, Warren & Schroeder 1995), other potentially attributable remains (= *Parotosuchus* sp. indeterminate: Warren 1980) have been identified from the Lower Triassic Blina Shale in the Canning Basin, Western Australia (Damiani 2000).

MASTODONSAURIDAE Lydekker, 1885 (*sensu* Moser & Schoch 2007)

Paracyclotosaurus Watson, 1958

Type species
Paracyclotosaurus davidi Watson, 1958.

Paracyclotosaurus davidi Watson, 1958

1958, *Paracyclotosaurus davidi* Watson, p. 237.

Holotype
NHMUK PV R6000, natural impressions of an articulated skull (Fig. 2D: AM F151922 cast), mandible and a virtually complete postcranial skeleton with associated skin and scale traces preserved in counterpart ironstone concretions that have been prepared out and cast (Watson 1958).

Type locality, unit and age
St Peters Brick Pit at St Peters in metropolitan Sydney, New South Wales, Australia. This locality exposes deposits of the Rouse Hill Siltstone Member of the Ashfield Shale, which is the basalmost unit within the Wianamatta Group (Sydney Basin). Herbert (1983, 1997) indicated a probable mid-Anisian (Middle Triassic) age for this unit. Helby (1973) provided a specific correlation with the *Aratrisporites parvispinosus* Palynomorph Zone (see also Helby *et al.* 1987, Metcalfe *et al.* 2015).

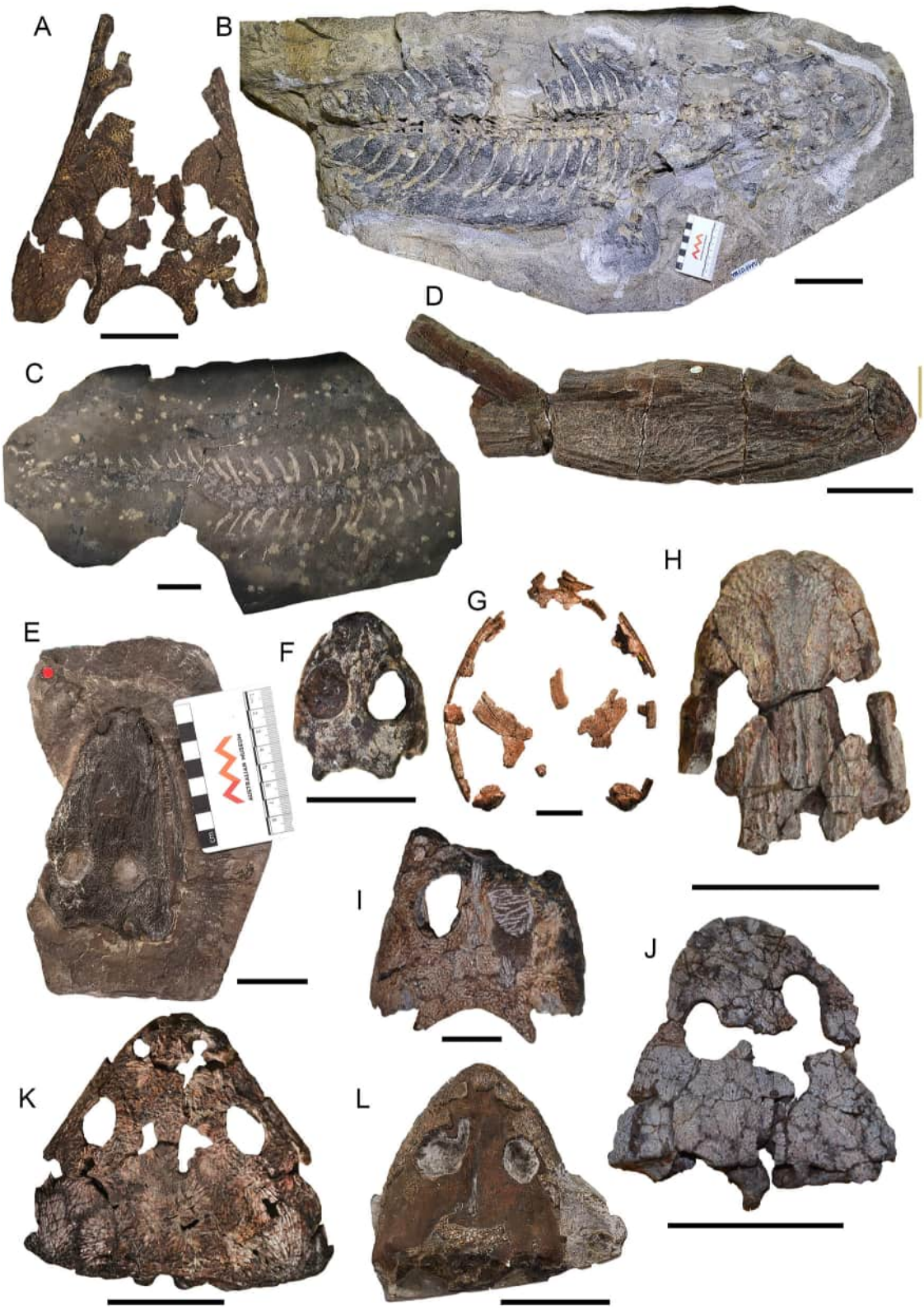

Fig. 1. Australian uppermost Permian and Mesozoic temnospondyls. **A**, *Watsonisuchus gunganj* (QM F10114; holotype) skull in dorsal view. Scale = 5 cm. **B**, Chigutisauridae nov. (AM F125866) skull and partial skeleton. Scale = 10 cm. **C**, *Trucheosaurus major* (AM F50977; holotype) partial postcranial skeleton. Scale = 5 cm. **D**, *Bulgosuchus gargantua* (AM F80190; holotype) left mandible in lateral view. Scale = 10 cm. **E**, *Subcyclotosaurus brookvalensis* (AM F47499) skull in dorsal view. Scale = 5 cm. **F**, *Lapillopsis nana* (QM F12284; holotype) skull in dorsal view. Scale = 1 cm. **G**, *Rewana quadricuneata* (QM F6471; holotype) partial skull in dorsal view. Scale = 5 cm. **H**, *Tirraturhinus smisseni* (QM F44093; holotype) rostral portion of skull in dorsal view. Scale = 5 cm. **I**, *Warrenisuchus aliciae* (QM F12281; holotype) partial skull in dorsal view. Scale = 1 cm. **J**, *Keratobrachyops australis* (QM F10115; holotype) skull in dorsal view. **K**, *Xenobrachyops allos* (QM F6572; holotype) skull in dorsal view. Scale = 5 cm. **L**, *Bothriceps australis* (AM F4316; cast of holotype [NHMUK PV R23110]) skull in dorsal view. Scale = 5 cm.

Remarks

NHMUK PV R6000 was discovered before 1910 (possibly as early as 1892) and sold to the British Museum (Natural History) in 1927 (Rix 2023), where it was reconstructed for exhibition over several decades (Watson 1958). Early reports described the find as a temnospondyl similar to *Cyclotosaurus* Fraas, 1889 (e.g., Watson 1918, 1919, Howchin 1925–1930, David 1932, Longman 1941, Romer 1947, Hills 1958). The genus and species, *Paracyclotosaurus davidi*, was eventually established 48 years later by Watson (1958). Since then, other species of *Paracyclotosaurus* have been named, including *Paracyclotosaurus crookshanki* Damiani, 2001 from the ?Anisian Denwa Formation of India (Mukherjee & Sengupta 1998, Damiani 2001), and *Paracyclotosaurus morganorum* Damiani & Hancox, 2003 from upper Anisian strata of the *Cynognathus* Assemblage Zone in the Beaufort Group (Karoo Basin) of South Africa (Hancox *et al.* 2000, Damiani & Hancox 2003).

Subcyclotosaurus Watson, 1958

Type species

Subcyclotosaurus brookvalensis Watson, 1958.

Subcyclotosaurus brookvalensis Watson, 1958

1958, *Subcyclotosaurus brookvalensis* Watson, p. 258.
1965, *Parotosaurus brookvalensis* Welles & Cosgriff, p. 80.
1968, *Parotosuchus brookvalensis* Ochev & Shishkin *in* Kalandadze, p. 77.
2000, *Stanocephalosaurus* sp. Schoch & Milner, p. 147.
2001, Mastodonsauridae *incertae sedis* Damiani, p. 436.

Holotype

AM F47499, an isolated impression of the external skull roof and left mandibular ramus (Fig. 1E).

Type locality, unit and age

The Beacon Hill Quarry at Brookvale in suburban Sydney, New South Wales, Australia. Herbert (1997) recognized that the Beacon Hill Quarry exposed part of the extensive Hawkesbury Sandstone of the Sydney Basin. Helby (1973), Herbert (1983) and Helby *et al.* (1987) included this unit within the probable lower Anisian (Middle Triassic) section of the *Aratrisporites parvispinosus* Palynomorph Zone (see also Metcalfe *et al.* 2015).

Remarks

Subcyclotosaurus brookvalensis was classified as Mastodonsauridae *incertae sedis* by Damiani (2001), but is retained here pending re-evaluation.

TREMATOSAURIA Yates & Warren, 2000
TREMATOSAUROIDEA Watson, 1919
TREMATOSAURIDAE Watson, 1919

Tirraturhinus Nield, Damiani & Warren, 2006

Type species

Tirraturhinus smisseni Nield, Damiani & Warren, 2006.

Tirraturhinus smisseni Nield, Damiani & Warren, 2006

2006, *Tirraturhinus smisseni* Nield *et al.*, p. 264.

Holotype

QM F44093, an isolated prenarial section of the skull showing the skull roof and palate (Fig. 1H).

Type locality, unit and age

Duckworth Creek (QM L215) near Bluff in east-central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks

Although classified within Trematosauridae (Schoch 2019), the fragmentary condition of QM F44093 prevents an unambiguous placement within the clade (Novikov 2012).

LONCHORHYNCHINAE Säve-Söderbergh, 1935

Erythrobatrachus Cosgriff & Garbutt, 1972

Type species

Erythrobatrachus noonkanbahensis Cosgriff & Garbutt, 1972.

Erythrobatrachus noonkanbahensis Cosgriff & Garbutt, 1972

1972, *Erythrobatrachus noonkanbahensis* Cosgriff & Garbutt, p. 7.

Holotype

WAM 62.1.46, an internal impression of the nasofrontal region of the skull and opposing palate.

Type locality, unit and age

UCMP locality V6044 on Blina Station in the Erskine Ranges of the West Kimberley District, Western Australia. McKenzie (1961) summarized the vertebrate fossil localities from the Blina Shale (Canning Basin), indicating a Lower Triassic succession. Haig *et al.* (2015) specified an upper Induan–Olenekian range corresponding with the upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (see also Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks

Cosgriff (1965) suggested that *Erythrobatrachus noonkanbahensis* might be congeneric with *Tertrema* Wiman, 1914 (see Slodownik *et al.* 2021). *Erythrobatrachus noonkanbahensis* has otherwise been classified as a distinct taxon within Lonchorhynchinae (Hammer 1987, Welles 1993, Fortuny *et al.* 2018).

TREMATOSAURINAE Watson, 1919

Microposaurus Haughton, 1925

Type species

Microposaurus casei Haughton, 1925.

Microposaurus averyi Warren, 2012

2012, *Microposaurus averyi* Warren, p. 538.

Holotype
AM F135895, an isolated anterior section of the skull with articulated mandible (Fig. 2C).

Type locality, unit and age
Unspecified locality ~7 km southeast of Picton, southwest of Sydney in New South Wales, Australia; Rouse Hill Siltstone Member of the Ashfield Shale in the Wianamatta Group (Sydney Basin), mid-Anisian (Middle Triassic) *Aratrisporites parvispinosus* Palynomorph Zone (Herbert 1983, 1997, Helby *et al.* 1987, Metcalfe *et al.* 2015).

Remarks
Microposaurus has been recorded elsewhere from the *Cynognathus* Assemblage Zone (upper Olenekian: Hancox *et al.* 2020) of the Beaufort Group in South Africa (Haughton 1925, Damiani 2004).

RHYTIDOSTEIDAE von Huene, 1920

Trucheosaurus Watson, 1956

Type species
Trucheosaurus major (Smith Woodward, 1909) as revised by Watson (1956).

Trucheosaurus major (Smith Woodward, 1909)
1909, *Bothriceps major* Smith Woodward, p. 319.
1911, *Bothriceps woodwardi* Moodie, p. 375.
1956, *Trucheosaurus major* (Smith Woodward) Watson, p. 327.

Holotype
The holotype material has been accessioned into three separate collection repositories: NSWGS F12967, part component showing the intact skull roof; AM F50977, part component of the incomplete vertebral column and right forelimb with some right hind limb elements (Fig. 1C); NHMUK PV R3728, counterpart component of the skull roof, incomplete vertebral column and limb elements.

Type locality, unit and age
Commonwealth Oil Corporation oil shale mine at Airly in central-eastern New South Wales, Australia. Marsicano & Warren (1998) listed the source unit as the Glen Davis Formation within the Charbon Subgroup in the Illawarra

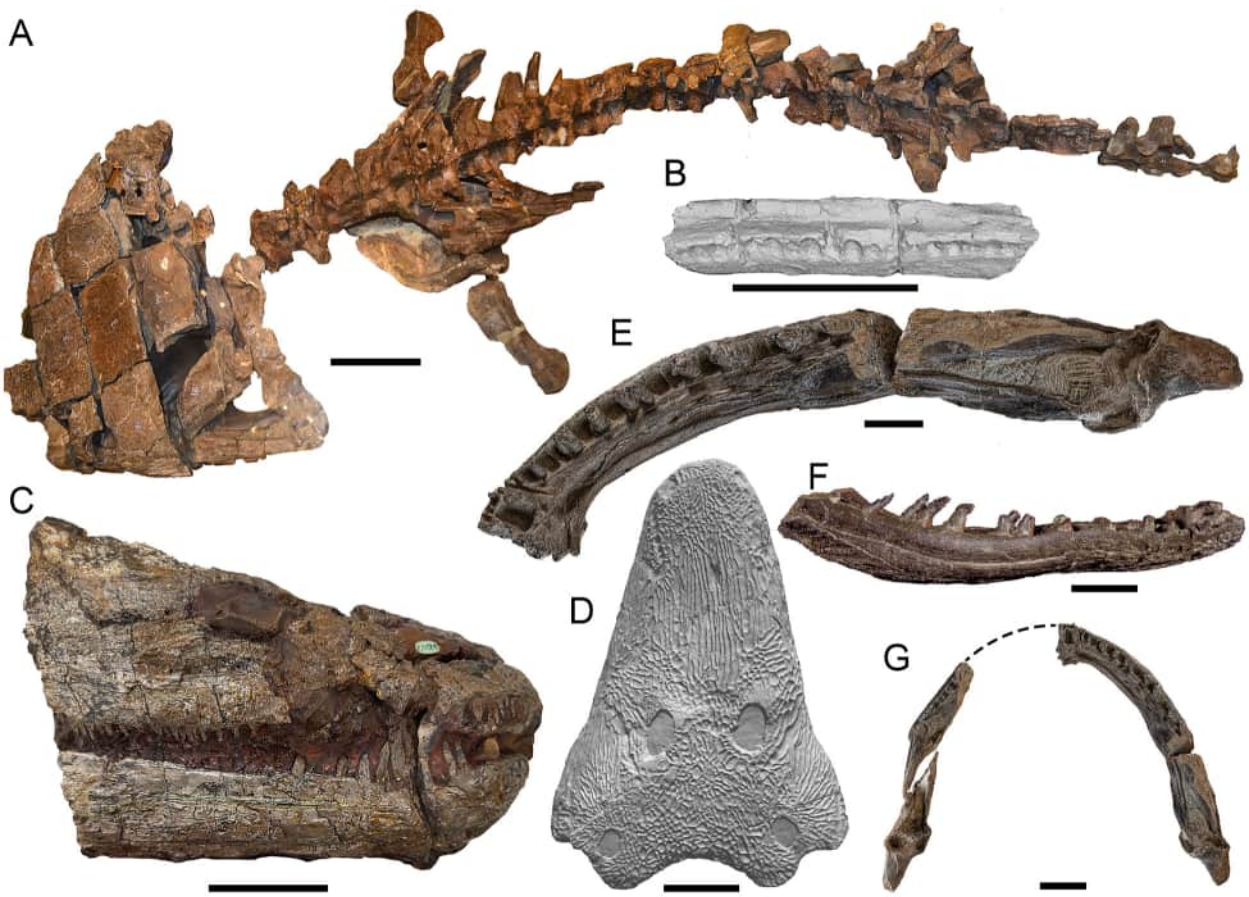

Fig. 2. Australian Mesozoic temnospondyls. **A**, *Siderops kehli* (QM F7882; holotype) skull and partial skeleton. Scale = 20 cm. **B**, *Austropelor wadleyi* (QM F2628; holotype) 3D digital rendering of partial dentary in dorsal (occlusal) view. Scale = 5 cm. **C**, *Microposaurus averyi* (AM F135895; holotype) rostral portion of skull in right lateral view. Scale = 5 cm. **D**, *Paracyclotosaurus davidi* (3D digital rendering of AM F151922; reconstruction based on NHMUK PV R6000) skull in dorsal view. Scale = 10 cm. *Koolasuchus cleelandi* (NMV P186213; holotype [part]) right mandible in **E**, dorsal (occlusal) and **F**, lateral views. Scale = 5 cm. **G**, *Koolasuchus cleelandi* (NMV P186213; holotype) left and right mandibles in dorsal (occlusal) view. Dashed line represents reconstructed contour of lower jaw. Scale = 10 cm.

Coal Measures (Sydney Basin). McMinn (1985) correlated the Glen Davis Formation with the upper Tomago Coal Measures in the northern Sydney Basin, which are mid-Lopingian (upper Permian) based on Percival *et al.* (2012).

Remarks

Although of Palaeozoic age, we include *Trucheosaurus major* as a rare late Permian tetrapod taxon named from the otherwise predominantly Early–Middle Triassic tetrapod assemblage succession of the Sydney Basin. *Trucheosaurus major* was originally described as a brachyopid (Watson 1956), but has more recently been interpreted as the geologically oldest member of Rhytidosteidae (Warren 1997, Marsicano & Warren 1998).

Deltasaurus Cosgriff, 1965

Type species

Deltasaurus kimberleyensis Cosgriff, 1965.

Deltasaurus kimberleyensis Cosgriff, 1965

1965, *Deltasaurus kimberleyensis* Cosgriff, p. 68.

Holotype

WAM 62.1.44, an isolated incomplete skull preserving the left lateral skull roof and corresponding palate.

Type locality, unit and age

UCMP locality V6040 on Blina Station in the Erskine Ranges of the West Kimberley District, Western Australia; Blina Shale (Canning Basin), upper Induan to lower Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Haig *et al.* 2015).

Remarks

Deltasaurus kimberleyensis is one of the most common vertebrate fossil taxa encountered in the Blina Shale (Cosgriff 1965). The species has also been identified from the Cluan and Knocklofty formations of Tasmania (Cosgriff 1974). Schoch & Milner (2000) proposed a subfamilial placement within Peltosteginae.

Deltasaurus pustulatus Cosgriff, 1965

1965, *Deltasaurus pustulatus* Cosgriff, p. 80.

Holotype

BMR F21775, a skull roof fragment preserving the right orbital region and corresponding palate.

Type locality, unit and age

Beagle Ridge Bore (BMR 10) north of Geraldton in south-western Western Australia. Cosgriff (1965) listed the source unit as the Kockatea Shale (Perth Basin), which Thomas *et al.* (2004) recognized as spanning the Permian/Triassic boundary. Haig *et al.* (2015) alternatively correlated strata along the onshore basin margins with the lower Olenekian (Lower Triassic) *Krauselisporites saeptatus* and *Protohaploxypinus samoilovichii* palynomorph zones.

Remarks

Dickins *et al.* (1961) reported that BMR F21775 was encountered at a bore depth of ~1 km. Haig *et al.* (2015) have since also described possible temnospondyl remains from surface exposures of the Kockatea Shale.

Rewana Howie, 1972b

Type species

Rewana quadricuneata Howie, 1972b.

Rewana quadricuneata Howie, 1972b

1972, *Rewana quadricuneata* Howie, p. 52.

Holotype

QM F6471, an incomplete palate with components of the skull roof (Fig. 1G) and an associated largely intact postcranial skeleton.

Type locality, unit and age

'The Crater' locality (QM L78) near Rolleston in central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks

Rewana quadricuneata has been taxonomically problematic (Howie 1972b), with various referrals to Indobrachyopidae (Cosgriff & Zawiskie 1979), Derwentiidae (Schoch & Milner 2000) or Rhytidosteidae (Warren & Black 1985). We follow the phylogeny-based classification of Dias-Da-Silva & Marsicano (2011), who placed *R. quadricuneata* in Rhytidosteidae.

Derwentia Cosgriff, 1974

Type species

Derwentia warreni Cosgriff, 1974

Derwentia warreni Cosgriff, 1974

1974, *Derwentia warreni* Cosgriff, p. 75.

Holotype

UTGD 87784, an isolated intact skull.

Type locality, unit and age

'Old Beach' locality on the eastern shore of the Derwent River north of Hobart in Tasmania, Australia; Knocklofty Formation (Tasmanian Basin) correlated with Induan to lower Olenekian (Lower Triassic) vertebrate assemblages by Ezcurra (2014).

Remarks

Derwentia warreni has been variously assigned to Rhytidosteidae (Cosgriff 1974), Indobrachyopidae (Cosgriff & Zawiskie 1979), and Derwentiidae (Schoch & Milner 2000). We follow the phylogeny-based classification of Dias-Da-Silva & Marsicano (2011) with assignment of *D. warreni* to Rhytidosteidae.

Arcadia Warren & Black, 1985

Type species

Arcadia myriadens Warren & Black, 1985.

Arcadia myriadens Warren & Black, 1985

1985, *Arcadia myriadens* Warren & Black, p. 314.
2000, *Rewana myriadens* (Warren & Black) Schoch & Milner, p. 85.

Holotype

QM F10121, a fragmented skull roof with palatal components, incomplete mandibular rami and associated vertebrae, rib fragments and hind limb elements.

Type locality, unit and age

Duckworth Creek (QM L215) near Bluff in east-central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks

Arcadia myriadens has been classified as either a rhytidosteid (Warren & Black 1985) or derwentiid (Schoch & Milner 2000). Schoch & Milner (2000) also used the alternative generic designation *Rewana myriadens*. We follow the phylogeny-based classification of Dias-Da-Silva & Marsicano (2011) with assignment of *A. myriadens* to Rhytidosteidae.

Acerastea Warren & Hutchinson, 1987

Type species

Acerastea wadeae Warren & Hutchinson, 1987.

Acerastea wadeae Warren & Hutchinson, 1987

1987, *Acerastea wadeae* Warren & Hutchinson, p. 292.

Holotype

QM F12277, a fragmentary skull with mandibular rami, vertebrae, ribs pectoral girdle, forelimb and pelvic girdle elements, together with associated gastroliths.

Type locality, unit and age

'The Crater' locality (QM L78) near Rolleston in central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks

Schoch & Milner (2000) placed *Acerastea wadeae* within Derwentiidae, although we follow Dias-Da-Silva & Marsicano (2011) in their phylogeny-based referral to Rhytidosteidae. Warren & Hutchinson (1987) also remarked on the unusual presence of associated gastroliths.

Nanolania Yates, 2000

Type species

Nanolania anatopretia Yates, 2000.

Nanolania anatopretia Yates, 2000

1990a, *Arcadia myriadens* (Warren & Black) Warren & Hutchinson, p. 104.
2000, *Nanolania anatopretia* Yates, p. 485.

Holotype

QM F12293, the postorbital region of a skull and parts of both mandibular rami.

Type locality, unit and age

Duckworth Creek (QM L215) near Bluff in east-central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks

Warren & Hutchinson (1990a) initially identified QM F12293 as an osteologically immature specimen of *Arcadia myriadens*. Yates (2000) subsequently established *Nanolania anatopretia* as a distinct species within Rhytidosteidae.

PLAGIOSAURIDAE Jaekel, 1914

Plagiobatrachus Warren, 1985a

Type species

Plagiobatrachus australis Warren 1985a.

Plagiobatrachus australis Warren 1985a

1985, *Plagiobatrachus australis* Warren, p. 237.

Holotype

QM F12667, a vertebral centrum.

Type locality, unit and age

'The Crater' locality (QM L78) near Rolleston in central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks

Doubts have been raised about the validity of *Plagiobatrachus australis* (Warren *et al.* 2009, Gee & Sidor 2022), with several specimens (see Warren 1985a) reassigned to *Capulomala arcadiaensis* (Warren *et al.* 2009).

BRACHYOPOIDEA Lydekker, 1885

Austropelor Longman, 1941

Type species

Austropelor wadleyi Longman, 1941.

Austropelor wadleyi Longman, 1941

1941 *Austropelor wadleyi* Longman, p. 29.

Holotype

QM F2628, a mandibular ramus fragment (Fig. 2B).

Type locality, unit and age

Collected from the bed of the Brisbane River, ~1.6 km south-east of Lowood west of Brisbane in southeastern Queensland, Australia. Warren & Hutchinson (1983) recognized the source unit as the lower Marburg Sandstone (Clarence-Morton Basin), which has since been elevated to sub-group level (Wells & O'Brien 1994). The exposures at Lowood have thus been correlated with the Ma Ma Creek Member of the Koukandowie Formation (O'Brien & Wells 1994), which is likely Toarcian in age based on Pliensbachian–Toarcian plant fossils found in the underlying Gatton Sandstone (Jansson *et al.* 2008). The lower Marburg Subgroup was also considered a lateral equivalent of the Evergreen Formation (Surat Basin) by Exon (1976) and Day *et al.* (1983), which incorporates Pliensbachian to Aalenian (Lower to Middle Jurassic) deposits across the Surat Basin (La Croix *et al.* 2022).

Remarks

Austropelor wadleyi was initially interpreted as a capitosaurid (Longman 1941), but later classified as a stereospondyl (Colbert 1967) and has since been assigned to Brachyopoidea *incertae sedis* (Warren & Marsicano 2000b) or Stereospondyli *incertae sedis* (Schoch & Milner 2000).

BRACHYOPIDAE Lydekker, 1885

Bothriceps Huxley, 1859

Type species

Bothriceps australis Huxley, 1859.

Bothriceps australis Huxley, 1859

1859, *Bothriceps australis* Huxley, p. 649.

Holotype

NHMUK PV R23110, impressions of an isolated skull roof (Fig. 1L: AM F4316 cast), partial palate and occipital region with articulated mandible.

Type locality, unit and age

Unspecified locality, possibly Eli Point near Koonya on the Tasman Peninsula in southeastern Tasmania, Australia (Warren *et al.* 2011). Warren *et al.* (2011) suggested that the source unit was probably within the upper Parmeener Supergroup (Tasmania Basin), which spans the uppermost Permian to lowermost Triassic interval.

Remarks

Huxley (1859) provided ambiguous source information for NHMUK PV R23110, although the type locality was assumed to be the Middle Triassic (Anisian) Hawkesbury Sandstone in New South Wales (Lydekker 1890, Moodie 1911). Watson (1919, p. 44) emphasized that 'the exact locality and of course the horizon are unknown' and, subsequently, added that the 'type—and only known specimen—was bought by the British Museum in 1848 from a person of whom nothing is known' (Watson 1956, p. 422). Cosgriff (1969, p. 80) otherwise stated that NHMUK PV R23110 'is believed to come from a locality in the Upper Permian Lithgow Coal Measures of the Sydney Basin in New South Wales'. Warren (1997, p. 26) further explained that a 'label associated with the specimen says it is from the "Hawkesbury Beds (Permian)". This was probably an educated guess but could well be correct except that the Hawkesbury Sandstone of the Sydney Basin is now early Middle Triassic'. Conversely, the discovery of multiple new specimens of *Bothriceps australis* from Eli Point near Koonya in Tasmania suggests that this locality might have been the original source for NHMUK PV R23110 (Warren *et al.* 2011). Accordingly, Warren *et al.* (2011, p. 740) reported that the 'holotype was bought … from a Mrs. Musworthy', at a time when, '… Koonya (then known as Cascades) was an outstation for the penal colony established at Port Arthur, some 15 km to the southeast. It seems likely that NHMUK 23110 was found on the rock platform at Koonya by someone associated with the colony, and sent to England without documentation of the precise locality of the find' (Warren *et al.* 2011, pp. 746–749). *Bothriceps australis* was referred to Brachyopidae by Broom (1915). This classification has since been followed by most studies (e.g., Welles & Estes 1969, Warren & Marsicano 1998, Warren *et al.* 2011), but Warren & Marsicano (2000b) alternatively placed *B. australis* outside of Brachyopidae and within the more inclusive clade Brachyomorpha.

Batrachosuchus Broom, 1903a

Type species

Batrachosuchus henwoodi (Cosgriff, 1969) Warren & Marsicano, 1998.

Batrachosuchus henwoodi (Cosgriff, 1969) Warren & Marsicano, 1998

1969, *Blinasaurus henwoodi* Cosgriff, p. 68.
1998, *Batarachosuchus henwoodi* (Cosgriff) Warren & Marsicano, p 336.

Holotype
WAM 62.1.42, impressions of an isolated skull incorporating the internal skull roof and palatal surfaces.

Type locality, unit and age
UCMP locality V6041 on Blina Station in the Erskine Ranges of the West Kimberley District, Western Australia; Blina Shale (Canning Basin), upper Induan to lower Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Haig *et al.* 2015).

Remarks
Initially referred to *Blinasaurus* by Cosgriff (1969) but transferred to *Batrachosuchus* by Warren & Marsicano (1998).

Platycepsion Kuhn, 1961

Type species
Platycepsion wilkinsoni (Stephens, 1887c) Kuhn, 1961.

Platycepsion wilkinsoni (Stephens, 1887c) Kuhn, 1961.

1887, *Platyceps wilkinsonii* Stephens, p. 1181.
1890, *Bothriceps wilkinsonii* (Stephens) Lydekker, p. 172.
1961, *Platycepsion wilkinsonii* (Stephens) Kuhn, p. 79.
1969, *Blinasaurus wilkinsoni* (Stephens) Cosgriff, p. 68.
1969, *Bothriceps wilkinsoni* (Stephens) Welles & Estes, p. 21.
1998, *Platycepsion wilkinsoni* (Stephens) Warren & Marsicano, p. 333.

Holotype
NSWGS F12572, articulated incomplete skeleton incorporating the skull roof with branchial bars, neural arches and ribs, the pectoral girdle and elements of the pelvic girdle and right hind limb.

Type locality, unit and age
The Railway Ballast Quarry near Gosford in northeastern New South Wales, Australia; Terrigal Formation of the Narrabeen Group (Sydney Basin), mid-Olenekian to lower Anisian (Lower to Middle Triassic) *Aratrisporites tenuispinosus* Palynomorph Zone (*sensu* Helby 1973, Morante 1996).

Remarks
Lydekker (1890) reported that *Platyceps*, as established by Stephens (1887c), was preoccupied, and suggested that *Platyceps wilkinsoni* was likely a 'juvenile' individual of *Bothriceps* (see also Welles & Estes 1969). Nonetheless, the name *Platyceps wilkinsoni* continued to be used in many subsequent studies (e.g., Feistmantel 1890, Moodie 1911, Chapman 1914, Watson 1919, Howchin 1925–1930, Longman 1941). Romer (1947) alternatively listed the species as '*Platyceps*' *wilkinsoni* (see also Watson 1956, Hills 1958), with Kuhn (1961) finally proposing the replacement name *Platycepsion*. Cosgriff (1969) otherwise designated *P. wilkinsoni* the type species of *Blinasaurus*, a generic epithet that persisted (except in Shishkin 1973) until Warren & Marsicano (1998) revived *Platycepsion* as the senior synonym. Witzmann & Schoch (2022) recently demonstrated that NSWGS F12572 represents a larval brachyopid, as initially interpreted by Stephens (1887c), thus we restrict *P. wilkinsoni* to distinguish the holotype only.

Notobrachyops Cosgriff, 1967

Type species
Notobrachyops picketti Cosgriff, 1967.

Notobrachyops picketti Cosgriff, 1967

1967, *Notobrachyops picketti* Cosgriff, p. K4–K5.
1973, *Notobrachyops picketti* (Cosgriff) Cosgriff, p. 1096.

Holotype
NSWGS F8258, an impression of the skull roof with parts of the occipital region.

Type locality, unit and age
Hurstville Brick Company quarry at Mortdale in metropolitan Sydney, New South Wales, Australia; Rouse Hill Siltstone Member of the Ashfield Shale in the Wianamatta Group (Sydney Basin), mid-Anisian (Middle Triassic) *Aratrisporites parvispinosus* Palynomorph Zone (Herbert 1983, 1997, Helby *et al.* 1987, Metcalfe *et al.* 2015).

Remarks
Cosgriff (1967) initially named *Notobrachyops picketti* in an abstract, but later described the taxon in more detail (Cosgriff 1973). Warren & Marsicano (1998) advocated placement of *N. picketti* within Brachyopidae, although its relationships remain uncertain (Warren & Marsicano 2000b).

Xenobrachyops Warren & Hutchinson, 1983

Type species
Xenobrachyops allos (Howie, 1972a) Warren & Hutchinson, 1983.

Xenobrachyops allos

1972a, *Brachyops allos* Howie, p. 270.
1983, *Xenobrachyops allos* (Howie) Warren & Hutchinson, p. 59.

Holotype
QM F6572, an isolated intact skull and palate (Fig. 1K).

Type locality, unit and age
Duckworth Creek (QM L215) near Bluff in east-central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks

Xenobrachyops allos was initially referred to *Brachyops* Owen, 1855 by Howie (1972a). Several mandibular (Warren 1981a, Warren 1981b, Jupp & Warren 1986) and pectoral girdle elements (Warren & Marsicano 2000b) have also been assigned to this taxon.

Banksiops Warren & Marsicano, 2000a

Type species

Banksiops townrowi (Cosgriff, 1974) Warren & Marsicano, 2000a.

Banksiops townrowi (Cosgriff, 1974) Warren & Marsicano, 2000a

1974, *Blinasaurus townrowi* Cosgriff, p. 7.
1998, *Banksia townrowi* (Cosgriff) Warren & Marsicano, p. 338.
2000, *Banksiops townrowi* (Cosgriff) Warren & Marsicano, p. 186.

Holotype

UTGD 87785, an isolated skull including the cranial roof and palate.

Type locality, unit and age

'Old Beach' locality on the eastern shore of the Derwent River north of Hobart in Tasmania, Australia; Knocklofty Formation (Tasmanian Basin) correlated with Induan to lower Olenekian (Lower Triassic) vertebrate assemblages by Ezcurra (2014).

Remarks

Cosgriff (1969, 1974) initially assigned *Banksiops townrowi* to *Blinasaurus*, with the preoccupied genus name *Banksia* Warren & Marsicano, 1998 replaced with *Banksiops* by Warren & Marsicano (2000a).

CHIGUTISAURIDAE Rusconi, 1948

Keratobrachyops Warren, 1981a

Type species

Keratobrachyops australis Warren, 1981a.

Keratobrachyops australis Warren, 1981a

1981, *Keratobrachyops australis* Warren, p. 274.

Holotype

QM F10115, a fragmented skull with articulated mandibular rami (Fig. 1J).

Type locality, unit and age

Duckworth Creek (QM L215) near Bluff in east-central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks

Keratobrachyops australis has been unambiguously classified within Chigutisauridae by Warren (1981a), Sengupta (1995), Damiani & Warren (1996), Schoch & Milner (2000), Warren & Marsicano (2000b), and Dias-Da-Silva *et al.* (2012).

Siderops Warren & Hutchinson, 1983

Type species

Siderops kehli Warren & Hutchinson, 1983.

Siderops kehli Warren & Hutchinson, 1983

1977, Jurassic labyrinthodont, Warren, p. 436.
1983, *Siderops kehli* Warren & Hutchinson, p. 5.

Holotype

QM F7882, an articulated skull, mandible, and largely intact postcranial skeleton incorporating vertebral column, ribs, limb girdles and both fore- and hind limbs (Fig. 2A).

Type locality, unit and age

Locality west of Kennedy Peak on Kolane Station, ~60 km north of Wandoan in southeastern Queensland, Australia; Westgrove Ironstone Member of the Evergreen Formation (Surat Basin); this site was constrained to a late Toarcian (Early Jurassic) maximum depositional age of 176.6 ± 2.0 Ma by Todd *et al.* (2019). The Westgrove Ironstone Member is more broadly correlated with Pliensbachian to Aalenian (Lower to Middle Jurassic) strata across the Surat Basin (La Croix *et al.* 2022).

Remarks

Warren (1977) published an initial short report on the discovery of QM F7882 and its novel stratigraphical occurrence as an unambiguous Jurassic temnospondyl. However, *Siderops kehli* was later formally named with an exhaustive description by Warren & Hutchinson (1983). *Siderops kehli* is consistently resolved amongst brachyopoids (e.g., Warren & Marsicano 2000b, Ruta *et al.* 2007, Schoch 2013, Gee 2022), and classified within Chigutisauridae (Marsicano 1999). Other records of Jurassic temnospondyl fossils have since been reported from southern Africa (Kitching & Raath 1984, Steyer & Damiani 2005), Kyrgyzstan (Nessov 1988, Averianov *et al.* 2008), Mongolia (Shishkin 1991), China (Dong 1985, Maisch *et al.* 2004, Maisch & Matzke 2005), and Thailand (Buffetaut *et al.* 1994a, 1994b, Nonsrirach *et al.* 2021).

Koolasuchus Warren, Rich & Vickers-Rich, 1997

Type species

Koolasuchus cleelandi Warren, Rich & Vickers-Rich, 1997.

Koolasuchus cleelandi Warren, Rich & Vickers-Rich, 1997

1997, *Koolasuchus cleelandi* Warren, Rich & Vickers-Rich, p. 5.

Holotype
NMV P186213, associated right and left mandibular rami (Fig. 2E–G).

Type locality, unit and age
West end of Rowells Beach, east of Potters Hill Road in Kilcunda on the Bass Coast of southern Victoria, Australia. Wagstaff *et al.* (2020) correlated this locality with the 'Wonthaggi Formation' succession of the upper Strzelecki Group (Gippsland Basin); uppermost Barremian (Lower Cretaceous) *Pilosisporites notensis* Spore-pollen Zone 'Group 1' site category.

Remarks
The first specimen of *Koolasuchus cleelandi* was found in 1979, but comprised only an edentulous mandible fragment (NMV P156988) whose identifications 'ranged from a crocodile to an ornithischian dinosaur or even a labyrinthodont amphibian' (Flannery & Rich 1981, p. 197). Jupp & Warren (1986, p. 120) stated that the 'main obstacle to accepting NMV P156988 as a labyrinthodont amphibian is its Early Cretaceous age.' However, subsequent discoveries have unambiguously confirmed the status of *K. cleelandi* as the geologically youngest temnospondyl (Warren *et al.* 1991, Warren *et al.* 1997) and member of the Gondwanan clade Chigutisauridae (Warren *et al.* 1997, Marsicano 1999). The recent recovery and forthcoming description of several partial skulls (e.g., Poropat *et al.* 2018, Warren & Marsicano 2000b) will undoubtedly yield new insights into the palaeobiology and relationships of *K. cleelandi*, which became the Victorian State Fossil Emblem in 2022.

REPTILIA Linnaeus, 1758
PARAREPTILIA Olson, 1947 (*sensu* Laurin & Reisz, 1995)
PROCOLOPHONOIDEA Romer, 1956
PROCOLOPHONIDAE Lydekker *in* Nicholson & Lydekker, 1889

Eomurruna Hamley, Cisneros & Damiani, 2021

Type species
Eomurruna yurrgensis Hamley, Cisneros & Damiani, 2021.

Eomurruna yurrgensis Hamley, Cisneros & Damiani, 2021

1970, ?Paliguanid, Bartholomai & Howie, p. 1063.
1971, *Procolophon*, Romer, p. 114.
2006, Arcadia procolophonid, Cisneros Martínez, p. 76.
2021, *Eomurruna yurrgensis* Hamley, Cisneros & Damiani, p. 560.

Holotype
QM F18335, an articulated skull and mandible with accompanying postcranial skeleton incorporating vertebral column and ribs with the pectoral and pelvic girdle and right fore- and hind limb elements (Fig. 3A).

Type locality, unit and age
Duckworth Creek (QM L215) near Bluff in east-central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks
Eomurruna yurrgensis is the only procolophonid currently documented from Australia (Hamley *et al.* 2021). Abundant remains have been referred to this taxon from the 'The Crater' locality (QM L78) of the Arcadia Formation (Fig. 3B), including an articulated skull and mandible (QM F6704) that Bartholomai & Howie (1970) identified as a possible paliguanid. Romer (1971) latter attributed this specimen to Procolophonidae, thereby establishing the classification recognized by all subsequent studies (Warren 1972, Colbert & Kitching 1975, Molnar 1982, 1991, Hamley *et al.* 2021).

EUREPTILIA Olson, 1947
DIAPSIDA Osborn, 1903
NEODIAPSIDA Benton, 1985

Kudnu Bartholomai, 1979

Type species
Kudnu mackinlayi Bartholomai, 1979.

Kudnu mackinlayi Bartholomai, 1979

1979, *Kudnu mackinlayi* Bartholomai, p. 231.

Holotype
QM F9181, the anterior section of a cranium with articulated dentary rami (Fig. 3C).

Type locality, unit and age
'The Crater' locality (QM L78) near Rolleston in central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks
Kudnu mackinlayi (Fig. 3D) was initially identified as a lepidosaur and assigned to Paliguanidae by Bartholomai (1979). Subsequent interpretations have ranged from an indeterminate lepidosauromorph (Benton 1985, Conrad 2008), osteologically immature prolacertiform (Evans 2003), a possible procolophonid (Evans & Jones 2010), or a neodiapsid or saurian of uncertain affinity (Ezcurra *et al.* 2022).

ICHTHYOSAUROMORPHA Motani, Jiang, Chen, Tintori, Rieppel, Ji & Huang, 2015
ICHTHYOSAURIFORMES Motani, Jiang, Chen, Tintori, Rieppel, Ji & Huang, 2015
ICHTHYOPTERYGIA Owen, 1840
ICHTHYOSAURIA de Blainville, 1835

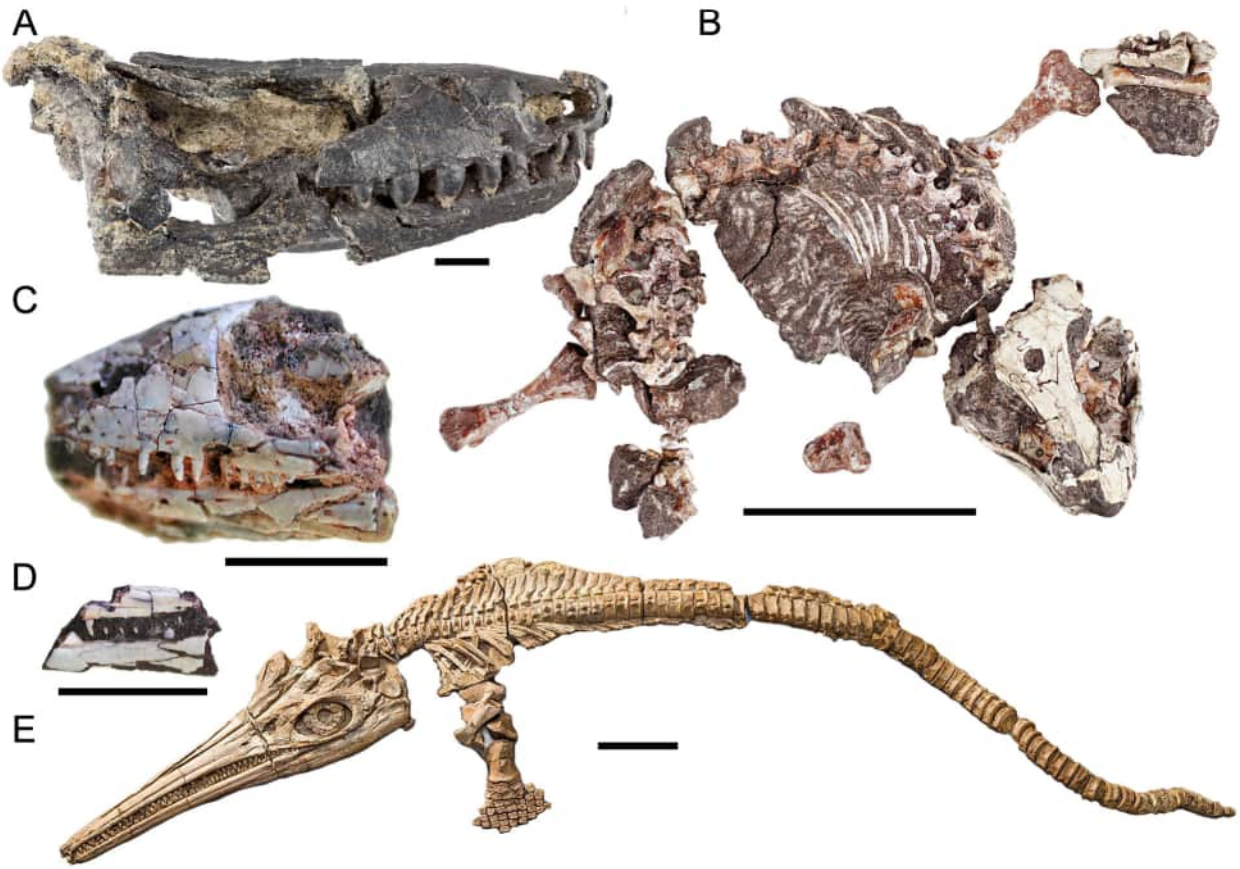

Fig. 3. Australian Mesozoic procolophonids, basal neodiapsids, and ichthyosaurians. **A**, *Eomurunna yurrgensis* (QM F49510; referred specimen) skull and mandible in right lateral view. Scale = 3 mm. **B**, *Eomurunna yurrgensis* (QM F18335; holotype) skull and postcranial skeleton. Scale = 5 cm. **C**, *Kudnu mackinlayi* (QM F9181; holotype) partial skull in left lateral view. Scale = 5 mm. **D**, *Kudnu mackinlayi* (QM F9182; referred specimen) partial skull in left lateral view. Scale = 5 mm. **E**, *Platypterygius australis* (QM F2453; referred specimen), skull and partial skeleton. Scale = 30 cm.

OPHTHALMOSAURIA Motani, 1999
BRACHYPTERYGIIDAE Cortés, Maxwell & Larsson, 2021

Platypterygius von Huene, 1922

Type species

Platypterygius platydactylus (Broili, 1907) von Huene, 1922.

Platypterygius australis (M'Coy, 1867) McGowan, 1972 *sensu* Zammit, 2010

1867, *Ichthyosaurus australis* M'Coy, p. 356.
1888, *Ichthyosaurus marathonensis* Etheridge, p. 408.
1922, *Myopterygius marathonensis* (Etheridge) von Huene, p. 96, 98.
1944, *Myopterygius australis* (M'Coy) Teichert & Matheson, p. 169.
1972, *Platypterygius australis* (M'Coy) McGowan, p. 16.
1990, *Platypterygius longmani* Wade, p. 120.
2003, *Platypterygius longmani* Kear, p. 284.
2005a, *Platypterygius longmani* Kear, p. 584.

Neotype

NMV P12989, incomplete cranium comprising nasal and orbital regions with an articulated basioccipital and atlas-axis complex. The type material also includes associated vertebral centra NMV P12992, NMV P22653, NMV P22654, and NMV P22656–NMV P22661 (see Zammit 2010).

Type locality, unit and age

Reportedly collected at 'Lat. 21° 13′S and Long. 143° 25′E (M'Coy 1865), north Queensland' (Hell 2001, p. 294). These coordinates pinpoint a locality between the O'Connell and Walker creeks (or 'Walker and O'Connell Creeks left bank of the river': Hell 2001, p. 294), south of the Flinders River and southwest of Hughenden in central-northern Queensland, Australia. Zammit (2010) listed the source unit as the Allaru Mudstone in the Wilgunya Subgroup of the Rolling Downs Group (Eromanga Basin); correlated with the upper Albian (Lower Cretaceous) *Endoceratium ludbrookae* Dinocyst Zone (*sensu* Partridge 2006) by Foley *et al.* (2022).

Remarks

McGowan (1972) established the generic reassignment of *Platypterygius australis* (Fig. 3E), which was later updated by McGowan & Motani (2003). Zammit (2010) proposed the neotype cranium, NMV P12989, to replace the historically unidentified holotype that was anecdotally attributed to non-diagnostic vertebral centra (see Wade 1984, Hell 2001, Zammit 2010). Arkhangelsky (1998, p. 612) additionally created the

subgenus *P.* (*Longirostria*) *australis* to accommodate '*Platypterygius longmani*' and *Platypterygius* (*Longirostria*) *hauthali* von Huene, 1927. However, McGowan & Motani (2003) synonymized *Longirostria* with *Platypterygius*, a genus that is also now conceptually restricted to the type species, *Platypterygius platydactylus* (e.g., Cortés *et al.* 2021). Accordingly, Fischer (2016) concluded that *P. australis* could be a potential type species for the genus *Myopterygius* von Huene, 1922, which was initially erected to accommodate the species group incorporating '*Ichthyosaurus*' *marathonensis* (Huene 1922). The intended type species of *Myopterygius* was probably '*Ichthyosaurus*' *campylodon* (Carter 1846), although this was never formally designated (Fischer 2016). Consequently, Fischer (2016) transferred '*I.*' *campylodon* to *Pervushovisaurus* Arkhangelsky, 1998—another subgeneric synonym of *Platypterygius* (see McGowan & Motani 2003) elevated to genus-level by Fischer *et al.* (2014). This decision has rendered the formal generic assignment of *P. australis* uncertain. Furthermore, the priority of *Myopterygius* versus *Longirostria* remains unresolved since neither epithet is diagnostically consistent with *P. australis*. We, therefore, provisionally retain the referral of *P. australis* to *Platypterygius* pending a more detailed taxonomic assessment.

SAUROPTERYGIA Owen, 1860b
PISTOSAUROIDEA Baur, 1887 *in* Zittel, 1887–1890
PLESIOSAURIA de Blainville, 1835
PLIOSAURIDAE Seeley, 1874
BRACHAUCHENINAE Williston, 1925 (*sensu* Benson & Druckenmiller 2014)

Kronosaurus Longman, 1924

Type species

Kronosaurus queenslandicus Longman, 1924, as revised by McHenry (2009).

Kronosaurus queenslandicus Longman, 1924

1924, *Kronosaurus queenslandicus* Longman, p. 26.
1991, *Kronosaurus queenslandicus*? Molnar, p. 613.
2022, *Eiectus longmani* Noè & Goméz-Pérez, p. 6.

Type material

QM F1609 (holotype), weathered paired jaw bone fragments containing remnants of six teeth. QM F18827 (proposed neotype), articulated skull and mandible (Fig. 4B) with associated cervical and pectoral vertebrae, components of the pectoral girdle and proximal end of the humerus (see McHenry 2009, pp. 180–185).

Type locality, unit and age

QM F1609 was derived from an unspecified locality in the Hughenden region of central-northern Queensland, Australia (Longman 1924). Longman (1930, p. 1) also attributed two incomplete propodials (QM F2137) and some weathered bone fragments (apparently occurring together with a caudal vertebral series: Romer & Lewis 1959) from a locality 'two miles [~3.2 km] south of Hughenden'. QM F18827 was recovered 'from the airstrip on Lucerne Station, [~9 km] north of Richmond' (McHenry 2009, p. 180). McHenry (2009) identified the type unit as the Toolebuc Formation in the Wilgunya Subgroup of the Rolling Downs Group (Eromanga Basin); correlated with the upper Albian (Lower Cretaceous) *Canningopsis denticulata* and lower *Endoceratium ludbrookae* dinocyst zones (*sensu* Partridge 2006) by Foley *et al.* (2022).

Remarks

Despite early reports of 'comprehensive undescribed material' being available for study at the QM (Persson 1960, p. 4), Welles (1962, p. 48) designated *Kronosaurus queenslandicus* a *nomen vanum* (= name designated on fragmentary type remains: Mones 1989), and recommended establishment of a neotype based on the 'material at Harvard University' (presumably referring to the incomplete skull and skeleton MCZ 1285: White 1935, Anonymous 1959, Fletcher 1959, Romer & Lewis 1959). Persson (1960, p. 4) likewise refrained from documenting the QM specimens 'before a description of the Harvard skeleton has been published'. Nevertheless, White (1935) and Romer & Lewis (1959) had already described MCZ 1285 and a second premaxillary rostrum with associated symphyseal section of the mandible (MCZ 1284: see White 1935) in some detail.

Clearly, these initial first-hand examinations (e.g., Longman 1924, 1930, White 1935, Romer & Lewis 1959) and subsequent reviews (e.g., Persson 1960, Welles 1962) assumed a conspecific assignment of the then accessioned QM and MCZ fossils. However, Molnar (1982, 1991, p. 633) reiterated that '*K. queenslandicus* is based on very incomplete material' (QM F1609), and although '[more] complete specimens of probable *K. queenslandicus*' had been collected by the QM, 'no attempt at adequate comparison with the type material [had] yet been carried out'. Moreover, Molnar (1982, p. 186, 1991, p. 633) noted that the 'Harvard kronosaur' (MCZ 1285) was excavated from an upper Aptian deposit of the Doncaster Member in the Wallumbilla Formation (Wilgunya Subgroup) north of Richmond, whereas QM F1609 and a 'second partial skull (QM F24446 [*sic* QM F2446])' were both derived from the upper Albian Toolebuc Formation near Hughenden. QM F2446 was reportedly 'very broad, low, and flat (at least 87 cm across by only 13 cm high), with large upwardly directed orbits' (see Molnar 1991, p. 632, fig. 15), whereas the 'Harvard skull (MCZ 1285) seems deeper' (Molnar 1982, p. 186, Molnar 1991, p. 633). As acknowledged by Molnar (1991, p. 633), though, '[t]he Harvard skeleton is less complete than appears from the mount'. Indeed, White (1935, p. 220) explicitly stated that the extensively restored skull of MCZ 1285 included only 'the brain case with left quadrate attached and the posterior end of the lower jaw, a section of the face containing the anterior border of the left orbit and left external naris, a portion of the rostrum showing the maxillary-premaxillary suture, and a portion of the mandibular symphysis showing the division of the two rami'. Its original cranial proportions are, therefore, uncertain. Furthermore, the long-awaited comprehensive inspection of *K. queenslandicus* remains from QM and MCZ by McHenry

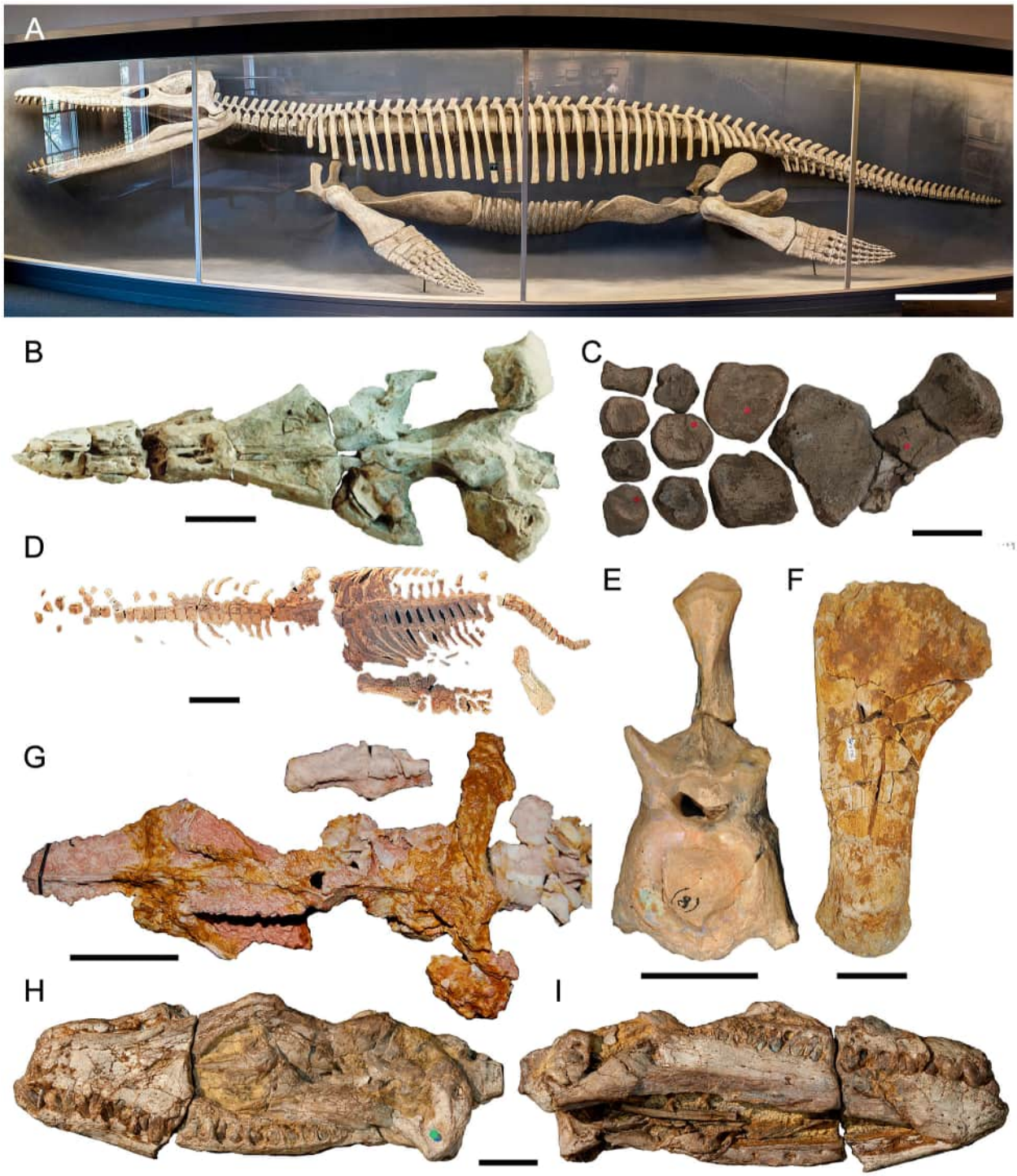

Fig. 4. Australian Mesozoic sauropterygians. **A**, *Eiectus longmani* (MCZ 1285; holotype) in left lateral view (Wikimedia Commons). Scale = 1 m. **B**, *Kronosaurus queenslandicus* (QM F18827; proposed neotype [part]) skull in dorsal view (modified from McHenry 2009). Scale = 30 cm. **C**, Elasmosauridae incertae sedis (QM F3567; holotype [part] of *Woolungasaurus glendowerensis*) partial forelimb. Scale = 5 cm. **D**, *Opallionectes andamookaensis* (SAMA P24560; holotype) partial postcranial skeleton in dorsal view. Scale = 30 cm. **E**, Polycotylidae incertae sedis (AM F6268; holotype [part] of *Cimoliasaurus leucoscopelus*) cervical vertebra in anterior view. Scale = 3 cm. **F**, *Leptocleidus clemai* (WAM 92.8.1; holotype [part]) humerus of assigned specimen in dorsal view. Scale = 3 cm. **G**, *Umoonasaurus demoscyllus* (AM F99374; holotype [part]) partial skull in dorsal view. Scale = 5 cm. *Eromangasaurus australis* (QM F11050; holotype [part]) skull in **H**, left lateral and **I**, right oblique ventral views. Scale = 5 cm.

(2009, p. 427) found 'no evidence that more than one taxon of large pliosaur is present in the Toolebuc fauna …, and that [all of] this material can be confidently assigned to *Kronosaurus queenslandicus* Longman'. McHenry (2009, p. 429) continued with 'the Doncaster material [MCZ 1284, MCZ 1285] is referrable to *Kronosaurus*' because the 'premaxillae bear four teeth', which McHenry (2009) considered diagnostic. The differences in cranial proportions mentioned by Molnar (1991) were also 'undoubtedly a result of taphonomy' (McHenry 2009, p. 430). Finally, 'assignment of the Doncaster [Member] *Kronosaurus* specimens to *Kronosaurus queenslandicus* [was] maintained, pending the

results of future examination, as this taxonomy reflects the most parsimonious interpretation of the available data' (McHenry 2009, p. 431). We concur with these findings, which have since been reinforced by studies attributing other morphologically consistent specimens from stratigraphically proximal Rolling Downs Group strata of the upper Aptian Bulldog Shale (Marree Subgroup), upper Aptian Doncaster Member of the Wallumbilla Formation in New South Wales, and the upper Albian Allaru Mudstone (e.g., Kear 2005b, 2006a, Holland 2018).

Regardless, Noè & Goméz-Pérez (2022, p. 6) examined a painted plaster cast of QM F1609 (MCZ 2445) and posited that '[in] the absence of diagnostic features of the holotype, the genus *Kronosaurus* and the type species *Kronosaurus queenslandicus* cannot be satisfactorily diagnosed or compared to other pliosaurid material. To date, as no diagnostic neotype has been formally designated (as proposed by Welles 1962; Molnar [1982]; McHenry 2009), the taxonomic name (genus, and nominotypical and only species), *Kronosaurus queenslandicus*, must be restricted to the holotype specimen QM F1609, which should be considered Pliosauridae (?Brauchauchiniinae [*sic* Brachaucheninae]) indet.' This patently ignored McHenry's (2009, p. 257) unambiguous recognition that 'there is no indication of more than one taxon of large pliosaur from the Toolebuc Formation, [therefore] the holotype can be assumed to represent the same species as the more complete specimens … [in] particular, QM F18827 preserves all of the features—premaxillary tooth count, mandibular symphysis, tooth shape and ornamentation, anisodonty of the tooth row, vertebral centra morphology—that can separate the Toolebuc Formation large pliosaur taxon from all other currently described species of pliosaur'. A second specimen of *K. queenslandicus* from the Toolebuc Formation comprising an articulated postcranial skeleton (QM F10113) was also nominated to distinguish *K. queenslandicus* from the apparently closely related taxon *Monquirasaurus boyacensis* (Hampe, 2002), which was referred to *Kronosaurus* by Hampe (1992). Consequently, we again support McHenry's (2009, p. 257) conclusion that '[either] of these two specimens may be appropriate candidates for the name-bearing specimen for *Kronosaurus queenslandicus*. Under the International Committee of Zoological Nomenclature (ICZN) rules, reallocation of the type specimen for a species, on the grounds that the holotype has not been lost or destroyed, but is non-diagnostic, requires a petition to the ICZN committee. It is recommended that this action be taken in order to retain *Kronosaurus queenslandicus* Longman 1924 as a valid species'. Accordingly, we reject the suggestion of Noè & Gómez-Pérez (2022, p. 6) that because 'only a single genus (and possibly species) of giant sized pliosaurid [is evident in the] Australian Aptian–Albian deposits (McHenry 2009) … all material previously assigned to *Kronosaurus* or *Kronosaurus queenslandicus* [should be provisionally assigned to a] new genus'. In our opinion, this creates unwarranted taxonomic instability via merger of *Kronosaurus* and potentially *K. queenslandicus* with obvious junior synonyms. Moreover, Noè & Gómez-Pérez (2022) listed (but did not redescribe) MCZ 1285 as a replacement holotype, which is inadequate since it comprises a notoriously inaccurate plaster reconstruction (McHenry 2009) incorporating severely weathered and incomplete embedded fossil components (see Romer & Lewis 1959). The extent of restoration has even instigated a popular nickname, 'Plasterosaurus', and calls for disassembly and CT scanning of MCZ 1285 to detect any taxonomically informative original bone material (see Tembe & Siddiqui 2014, p. 55). In the interim, we adhere to the diagnoses of McHenry (2009) and others (e.g., Holland 2018), which justifiably classified the stratigraphically conformable upper Albian Toolebuc Formation and Allaru Mudstone brachauchenine fossils as *K. queenslandicus*, with QM F18827 representing the most feasible neotype pending a detailed redescription and formal nomenclatural ruling by the ICZN.

Eiectus Noè & Goméz-Pérez, 2022

Type species

Eiectus longmani Noè & Goméz-Pérez, 2022.

Eiectus longmani Noè & Goméz-Pérez, 2022

1991, *Kronosaurus* sp. Molnar, p. 613.
1993, ?*Kronosaurus* sp. Thulborn & Turner, p. 491.
2022, *Eiectus longmani* Noè & Goméz-Pérez, p. 6.

Holotype

MCZ 1285, an incomplete skull, mandible and postcranial skeleton embedded within a reconstructed plaster exhibition mount (Fig. 4A).

Type locality, unit and age

MCZ 1285 was reportedly excavated in the vicinity of Army Downs bore 'five miles [~8 km] further north' of another referred specimen, MCZ 1284, which was recovered '30 miles [~48 km] to the north of Richmond' in central-northern Queensland, Australia (Romer & Lewis 1959, p. 1). Based on this locality information, the source unit has been interpreted as the Doncaster Member of the Wallumbilla Formation in the Wilgunya Subgroup of the Rolling Downs Group (Eromanga Basin); correlated with the upper Aptian (Lower Cretaceous) *Muderongia australis* and lower *Odontochitina operculata* dinocyst zones (*sensu* Partridge 2006) by Foley *et al.* (2022).

Remarks

Noè & Goméz-Pérez (2022, p. 6) erected *Eiectus longmani* to accommodate 'all material previously assigned to *Kronosaurus* or *Kronosaurus queenslandicus*'. However, because this prioritizes a junior synonym based on a reconstructed display mount manifesting unconfirmable diagnostic character states, we restrict *E. longmani* to define only MCZ 1285 and MCZ 1284 until a more rigorous evaluation is carried out. This acknowledges the unresolved possibility of taxonomic distinction from the upper Albian Toolebuc Formation/Allaru Mudstone *K. queenslandicus* as diagnosed by McHenry (2009) using the holotype QM F1609, proposed

neotype QM F18827, and referred specimen QM F10113 (see also Holland [2018] for a differential diagnosis).

PLESIOSAUROIDEA Welles, 1943 (*sensu* Ketchum & Benson, 2010)

CRYPTOCLEIDIDAE Williston, 1925

Opallionectes Kear, 2006a

Type species

Opallionectes andamookaensis Kear, 2006a.

Opallionectes andamookaensis Kear, 2006a

2006, *Opallionectes andamookaensis* Kear, p. 840.

Holotype

SAMA P24560, incomplete articulated skeleton comprising teeth, vertebrae and ribs, pectoral girdle, and limb elements (Fig. 4D).

Type locality, unit and age

Lunatic Hill opal field near Andamooka, west of Lake Torrens in northeastern South Australia, Australia. The opal-bearing strata at Andamooka form part of the Bulldog Shale in the Marree Subgroup of the Rolling Downs Group (Eromanga Basin). An upper Aptian (Lower Cretaceous) range has been determined for the Andamooka opal-bearing deposits based mainly on bivalves and ammonites (Ludbrook 1966, Day 1969), together with the age-diagnostic belemnite *Peratobelus* Whitehouse, 1924 (Henderson *et al.* 2000, Williamson 2006). This correlates with the *Muderongia australis* and lower *Odontochitina operculata* dinocyst zones (*sensu* Partridge 2006) as recognized by Krieg & Rogers (1995) and Alexander & Sansome (1996), and recalibrated by Foley *et al.* (2022).

Remarks

Although Kear (2006a) treated the family-level assignment of *Opallionectes andamookaensis* as indeterminate within Plesiosauroidea, we follow Kear (2016) and Kear *et al.* (2018) in formally referring the taxon to Cryptocleididae.

LEPTOCLEIDIA Ketchum & Benson, 2010

Leptocleidus Andrews, 1922

Type species

Leptocleidus superstes Andrews, 1922.

Leptocleidus clemai Cruickshank & Long, 1997

1997 *Leptocleidus clemai* Cruickshank & Long, p. 268.

Holotype

WAM 92.8.1, associated vertebral centra, neural arches and ribs, limb girdle components (Fig. 4F), at least three propodials, and other bone fragments.

Type locality, unit and age

Cruickshank & Long (1997) withheld the type locality information for security, although Mory *et al.* (2005) reported that the plesiosaurian remains described by Cruickshank & Long (1997) derived from 'Stone Wall' on the southern side of Pillawarra Plateau, on Murchison House Station northeast of Kalbarri in southwestern Western Australia. Cruickshank & Long (1997) further identified the source unit as the Birdrong Sandstone; however, Kear *et al.* (2018) re-attributed these fossils to the Windalia Sandstone Member of the Muderong Shale (see Mory *et al.* 2005), which spans the upper Barremian–lower Aptian (Lower Cretaceous) *Muderongia testudinaria–Muderongia australis* dinocyst zones (*sensu* Partridge 2006) as recalibrated by Foley *et al.* (2022).

Remarks

Leptocleidus clemai has been variously compared with pliosaurids (Cruickshank & Long 1997), leptocleidids (e.g., Kear 2016), and polycotylids (e.g., Smith & Dyke 2008). The genus-level attribution, and even species-level validity (Druckenmiller & Russell 2008) of this taxon are also doubtful (Kear & Barrett 2011). Nevertheless, both WAM 92.8.1 and the other referred specimens, WAM 94.1.6 and WAM 95.5.2, can be morphologically distinguished amongst leptocleidians (see Kear 2016). Consequently, we follow recent classifications that retain *L. clemai* as valid taxon within Leptocleidia (Kear *et al.* 2018).

Umoonasaurus Kear, Schroeder & Lee, 2006

Type species

Umoonasaurus demoscyllus Kear, Schroeder & Lee, 2006.

Umoonasaurus demoscyllus Kear, Schroeder & Lee, 2006

1999, *Leptocleidus* sp. Cruickshank, Fordyce & Long, p. 204.
2003, *Leptocleidus* sp. Kear, p. 294.
2006a, *Leptocleidus* sp. Kear, p. 848.
2006b, *Umoonasaurus demoscyllus* Kear, Schroeder & Lee, p. 615.
2007a, cf. *Leptocleidus* sp. Kear, p. 155.

Holotype

AM F99374, skull with fragmentary mandible and dentition (Fig. 4G), and an articulated posterior cervical to caudal axial skeleton, partial limb girdles, propodials and some distal limb elements.

Type locality, unit and age

Zorba Extension opal field west of Coober Pedy in central-northern South Australia, Australia. These strata form part of the Bulldog Shale in the Marree Subgroup of the Rolling Downs Group (Eromanga Basin). An upper Aptian (Lower Cretaceous) range has been determined for the opal-bearing deposits of Coober Pedy and surrounding areas based on bivalves, ammonites (Ludbrook 1966, Day 1969), and the age-diagnostic belemnite *Peratobelus* (Henderson *et al.* 2000, Williamson 2006). This correlates with the *Muderongia australis* and lower *Odontochitina operculata* dinocyst zones (*sensu* Partridge 2006) as recognized by Krieg & Rogers

(1995) and Alexander & Sansome (1996), and recalibrated by Foley *et al.* (2022).

Remarks

Although initially assigned to Rhomaleosauridae (Kear *et al.* 2006), *Umoonasaurus demoscyllus* has been alternately referred to Leptocleididae (Benson *et al.* 2013a) or Polycotylidae (Druckenmiller & Russell 2008). We, therefore, conservatively classify this taxon within the more inclusive clade Leptocleidia.

POLYCOTYLIDAE Williston, 1908

Polycotylidae *incertae sedis*

1897, *Cimoliosaurus leucoscopelus* Etheridge, p. 24.
1960, *Dolichorhynchops*? sp. Persson, p. 4.
1962, *Dolichorhynchops* sp. Welles, p. 46.
1982, *Dolichorhynchops*? *leucoscopelus* Molnar, p. 186.
1991, '?*Trinacromeron*' *leucoscopelus* Molnar, p. 612.
2003, Polycotylidae gen. et sp. indet. Kear, p. 289.
2005b, Polycotylidae gen. et sp. indet. Kear, p. 775.

Remarks

Etheridge (1904, p. 306) used the incorrect spelling '*Cimoliosaurus*', rather than *Cimoliasaurus* Leidy, 1851, derived from the type species *Cimoliasaurus magnus* Leidy, 1851. We, thus, designate '*Cimoliosaurus*' *leucoscopelus* (= *Cimoliasaurus leucoscopelus*: see Kear 2002b, 2003, 2005b; Fig. 4E) a *nomen dubium* following Kear (2003, 2005b).

ELASMOSAURIDAE Cope, 1870

Elasmosauridae *incertae sedis*

1867, *Plesiosaurus macrospondylus* M'Coy, p. 356.
1914, *Pliosaurus macrospondylus* Chapman, p. 278.
1960, Elasmosauridae gen. et sp. indet. Persson, p. 18.
1962, Elasmosauridae gen. et sp. indet. Welles, p. 49.
2003, Elasmosauridae gen. et sp. indet. Kear, p. 286.

Remarks

We designate *Plesiosaurus macrospondylus* a *nomen dubium* following Kear (2003).

Elasmosauridae *incertae sedis*

1867, *Plesiosaurus sutherlandi* M'Coy, p. 356.
1904, *Cimoliosaurus sutherlandi* Etheridge, p. 312.
1914, *Pliosaurus sutherlandi* Chapman, p. 278.
1960, Cimoliasauridae gen. et sp. indet. Persson, p. 10.
2003, Elasmosauridae gen. et sp. indet. Kear, p. 286.

Remarks

See previous comment on the misspelling of *Cimoliasaurus* by Etheridge (1904). We designate *Plesiosaurus sutherlandi* a *nomen dubium* following Kear (2003).

Elasmosauridae *incertae sedis*

1904, *Cimoliosaurus maccoyi* Etheridge, p. 312.
1962, Plesiosauroidea indet. Welles, p. 47.
2002a, Elasmosauridae gen. et sp. indet. Kear, p. 679.
2003, Elasmosauridae gen. et sp. indet. Kear, p. 286.
2005c, Elasmosauridae gen. et sp. indet. Kear, p. 774.

Remarks

See previous comment on the misspelling of *Cimoliasaurus* by Etheridge (1904). We designate *Cimoliasaurus maccoyi* a *nomen dubium* following Kear (2002b, 2003, 2005c).

Elasmosauridae *incertae sedis*

1960, *Woolungasaurus glendowerensis* Persson, p. 12.
1962, Elasmosauridae indet. Welles, p. 47, 48.
2003, Elasmosauridae gen. et sp. indet. Kear, p. 288.
2004, *Styxosaurus glendowerensis* Sachs, 215.
2005c, Elasmosauridae indet. Kear, p. 801.
2007b, Elasmosauridae indet. Kear, p. 241.

Remarks

We designate *Woolungasaurus glendowerensis* a *nomen dubium* following Kear (2003, 2005c, 2007b). However, the character state context of Elasmosauridae has developed considerably within current plesiosaurian phylogenies (e.g., O'Gorman 2019, Fischer *et al.* 2021, Marx *et al.* 2021, Sachs *et al.* 2021). Thus, *W. glendowerensis* (Fig. 4C) might yet prove diagnosable given a revision of the taxon in the future.

Eromangasaurus Kear, 2005c

Type species

Eromangasaurus australis (Sachs, 2005) Kear, 2007b.

Eromangasaurus australis (Sachs, 2005) Kear, 2007b

1982, *Woolungasaurus* cf. *Woolungasaurus glendowerensis* Persson, p. 647.
1993, ?Elasmosauridae gen. et sp. nov. Thulborn & Turner, p. 491.
2001, Elasmosauridae gen. et sp. indet. Kear, p. 127.
2003, Elasmosauridae gen. et sp. nov. Kear, p. 289.
2004, *Tuarangisaurus* sp. nov. Sachs, p. 215.
2005, *Tuarangisaurus australis* Sachs, p. 426.
2005c, *Eromangasaurus carinognathus* Kear, p. 793.
2007b, *Eromangasaurus australis* (Sachs) Kear, p. 245.

Holotype

QM F11050, cranium with articulated mandible (Fig. 4H, I) and anterior cervical vertebrae.

Type locality, unit and age

Yambore Creek near Maxwelton in central-northern Queensland, Australia. Persson (1982) identified the type unit as the Toolebuc Formation of the Wilgunya Subgroup in the Rolling Downs Group (Eromanga Basin); correlated with the upper Albian (Lower Cretaceous) *Canningopsis denticulata* and lower *Endoceratium ludbrookae* dinocyst zones (*sensu* Partridge 2006) by Foley *et al.* (2022).

Remarks

Eromangasaurus australis is consistently resolved as a basally divergent taxon within Elasmosauridae (e.g., Kubo *et al.* 2012, Otero 2016, Sachs *et al.* 2017, Sachs & Kear 2017,

Serratos *et al.* 2017, Sachs *et al.* 2018, O'Gorman 2019, Fischer *et al.* 2021, Marx *et al.* 2021, Sachs *et al.* 2021).

TESTUDINATA Klein, 1760 (*sensu* Joyce *et al.* 2020a)

Testudinata *incertae sedis*

1919, *Emydura* cf. *macquariae* Chapman, p. 12, 13.
1969, *Chelycarapookus arcuatus* Warren, p. 23, 26.
1981, Testudines indet. Gaffney, p. 34.
1998, Eucryptodira indet. Gaffney, Kool, Brinkman, Rich & Vickers-Rich, p. 6.
2017, Testudinata indet. Joyce, p. 97.

Remarks

Warren (1969) erected the family-level grouping Chelycarapookidae to monotypically accommodate *Chelycarapookus arcuatus* (Fig. 5A, B). We, therefore, designate both *C. arcuatus* and Chelycarapookidae as *nomina dubia* following Joyce (2017).

MESOCHELYDIA Joyce, 2017

Spoochelys Smith & Kear, 2013

Type species

Spoochelys ormondea Smith & Kear, 2013.

Spoochelys ormondea Smith & Kear, 2013

2013, *Spoochelys ormondea* Smith & Kear, p. 123.

Holotype

Associated cranial and postcranial elements including: AM F121643, quadrate; AM F121646, supraoccipital; AM F121579, AM F121580, and AM F121581, anterior peripherals; AM F121686 and AM F121687, anterior costal fragments; AM F121641, caudal vertebra; AM F121587, scapula; AM F121621, ulna; AM F121613, pedal phalanges.

Type locality, unit and age

T-Bone Extension opal field within the Coocoran Opal Fields, west of Lightning Ridge in northwestern New South Wales, Australia. Bell *et al.* (2019b) constrained the fossiliferous opal-bearing lenses to the informally defined 'Finch Clay Facies' of the Wallangulla Sandstone Member of the Griman Creek Formation in the Rolling Downs Group (Surat Basin). The maximum depositional age range has been determined as early to mid-Cenomanian (Late Cretaceous, 100.2–96.6 Ma) using detrital zircon analyses (Bell *et al.* 2019b).

Remarks

Joyce (2017) placed *Spoochelys ormondea* (Fig. 5H) within the crownward testudinatan clade Parachelyida; however, we limit our classification to the more inclusive stemward clade Mesochelyida because *S. ormondea* retains a remnant interpterygoid vacuity (see Smith & Kear 2013).

MEIOLANIFORMES Sterli & de la Fuente, 2013

Otwayemys Gaffney, Kool, Brinkman, Rich & Vickers-Rich, 1998

Type species

Otwayemys cunicularius Gaffney, Kool, Brinkman, Rich & Vickers-Rich, 1998

Otwayemys cunicularius Gaffney, Kool, Brinkman, Rich & Vickers-Rich, 1998

1998, *Otwayemys cunicularius* Gaffney, Kool, Brinkman, Rich & Vickers-Rich, p. 3.

Holotype

NMV P186116, an incomplete carapace and plastron (Fig. 5D, E).

Type locality, unit and age

Dinosaur Cove near Glenaire, west of Cape Otway on the southwestern coast of Victoria, Australia. Wagstaff *et al.* (2020) correlated strata at this locality with the Eumeralla Formation of the Otway Group (Otway Basin); lower Albian (Lower Cretaceous) *Crybelosporites striatus* Spore-pollen Zone.

Remarks

Sterli (2015) summarized the phylogenetic placement of *Otwayemys cunicularius* as the only basally divergent non-meiolaniid meiolaniform currently named from Australia.

TESTUDINES Batsch, 1788 (*sensu* Joyce *et al.* 2020b)
PAN-CHELONIOIDEA Joyce, Parhan & Gauthier, 2004
PROTOSTEGIDAE Cope, 1872

Notochelone Lydekker, 1889b

Type species

Notochelone costata (Owen, 1882) Lydekker, 1889b.

Notochelone costata (Owen, 1882) Lydekker, 1889b

1882, *Notochelys costata* Owen, p. 178.
1889b, *Notochelone costata* (Owen) Lydekker, p. 325.

Holotype

AM F67326, the anterior section of the carapace and plastron (Fig. 5C) with associated pectoral girdle elements.

Type locality, unit and age

Flinders River region of central-northern Queensland, Australia. No exact locality or source bed are known but Gaffney (1981, p. 5) stated that the 'matrix and type of preservation are consistent with the same source as other presumed *Notochelone*; i.e., Toolebuc Limestone [= Toolebuc Formation]'. We concur, yet remains potentially attributable to *Notochelone* are also known from the stratigraphically overlying Allaru Mudstone (Kear 2003, 2016, Kear *et al.* 2018). The distribution of *Notochelone* and potentially also *Notochelone costata*, therefore, spans both these units within the Wilgunya Subgroup of the Rolling Downs Group (Eromanga Basin); correlated with the upper Albian (Lower Cretaceous) *Canningopsis denticulata* and *Endoceratium ludbrookae* dinocyst zones (*sensu* Partridge 2006) by Foley *et al.* (2022).

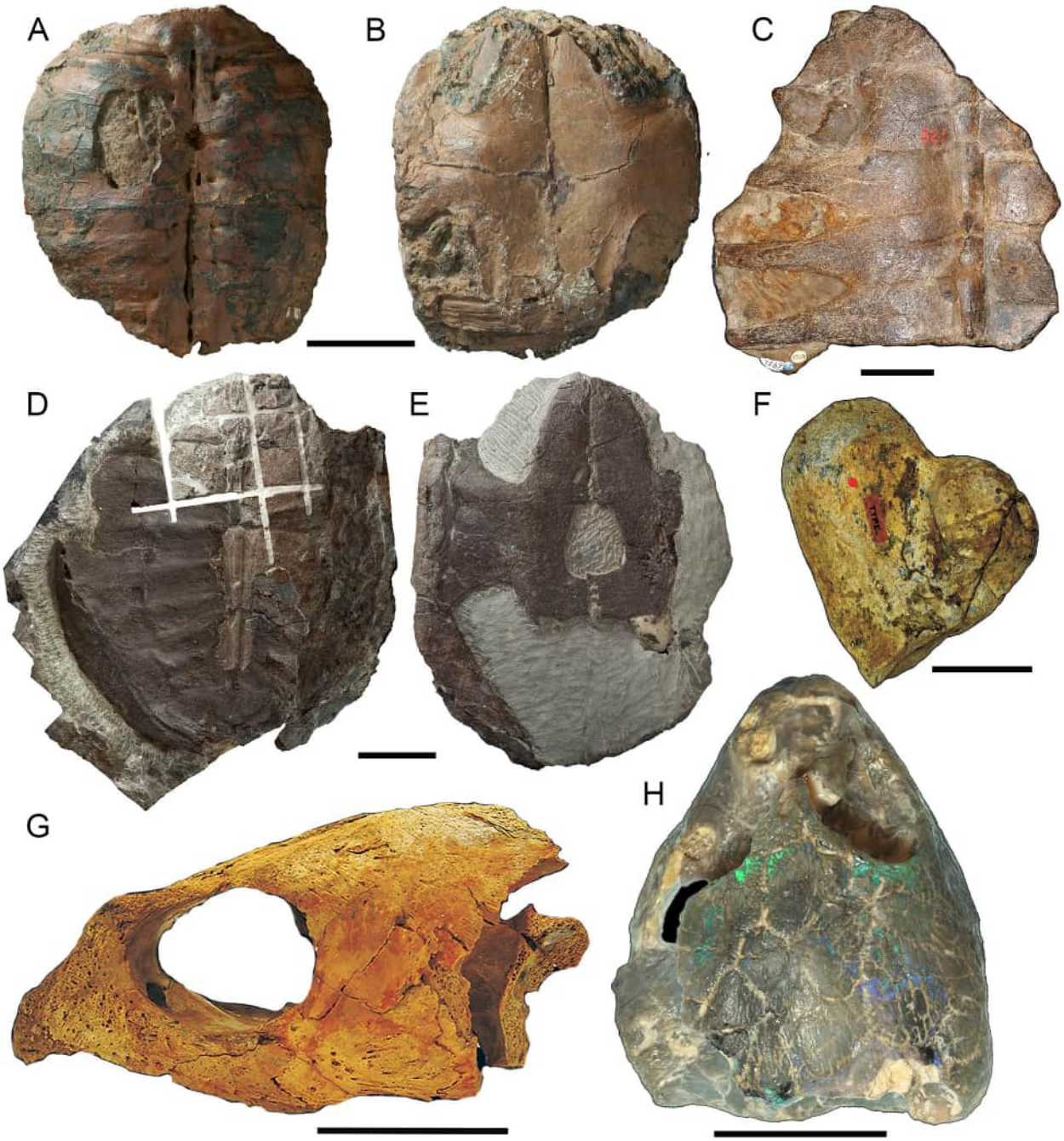

Fig. 5. Australian Mesozoic testudinatans. Testudinata incertae sedis (NMV P13160; holotype of *Chelycarapookus arcuatus*) carapace and plastron in **A**, dorsal and **B**, ventral views. Scale = 5 cm. **C**, *Notochelone costata* (AM F67326; holotype) partial carapace in dorsal view. Scale = 5 cm. *Otwayemys cunicularius* (NMV P186116; holotype) carapace and plastron in **D**, dorsal and **E**, ventral views. Scale = 5 cm. **F**, *Cratochelone berneyi* (QM F14550; holotype [part]); proximal left humerus in dorsal view. Scale = 10 cm. **G**, *Bouliachelys suteri* (SAMA P41106; referred specimen) skull in left lateral view. Scale = 5 cm. **H**, *Spoochelys ormondea* (privately owned original specimen) skull in dorsal view (LRF 450 accessioned cast). Scale = 2 cm.

Remarks

Numerous specimens have been assigned to *Notochelone* (e.g., De Vis 1911, Gaffney 1981, Kear 2006b); however, the likelihood of cryptic taxa has long been recognized (Gaffney 1981, Molnar 1991; although see Myers 2007), with the most recent generic diagnosis representing a character state composite (see Kear 2003). We, therefore, restrict our nominal designation to the holotype (AM F67326) until a comprehensive assessment of all the referred material has been carried out.

Cratochelone Longman, 1915

Type species

Cratochelone berneyi Longman, 1915.

Cratochelone berneyi Longman, 1915

1915, *Cratocehelone berneyi* Longman, p. 25.

Holotype

QM F14550, associated incomplete humerus (Fig. 5F), radius, ulna, pectoral girdle and plastron fragments.

Type locality, unit and age

Unknown locality on Sylvania Station near Hughenden in central-northern Queensland, Australia. Gaffney (1981) listed the type unit as the Toolebuc Formation, although the overlying Allaru Mudstone also crops out in the Sylvania Station area (Vine & Paine 1974). We, therefore, limit the stratigraphical range to the Wilgunya Subgroup of the Rolling Downs Group (Eromanga Basin); correlated with the upper Albian (Lower Cretaceous) *Canningopsis denticulata* and *Endoceratium ludbrookae* dinocyst zones (*sensu* Partridge 2006) by Foley *et al.* (2022).

Remarks

Kear (2006d) provided the most recent character state-based assessment of *Cratochelone berneyi*, which confirmed placement within Protostegidae. The massive body-size ('estimated snout–tail length up to four meters'), highly vascularized limb bone articular surfaces, and prominent lateral wing on the entoplastron are especially consistent with derived protostegids (Kear 2006d, p. 780), and serve to distinguish *C. berneyi* from *Notochelone costata* (see Gaffney 1981) and other coeval taxa (see Kear & Lee 2006).

Bouliachelys Kear & Lee, 2006

Type species

Bouliachelys suteri Kear & Lee, 2006.

Bouliachelys suteri Kear & Lee, 2006

2006, *Bouliachelys suteri* Kear & Lee, p. 116.

Holotype

QM F31669, articulated cranium and mandible.

Type locality, unit and age

Dunraven Station near Hughenden in central-northern Queensland, Australia. Numerous additional specimens (e.g., SAMA P41106; Fig. 5G) have also been recovered from Canary Station in the Boulia region of western Queensland, Australia (Kear & Lee 2006). Both localities host widespread outcrops of the Toolebuc Formation of the Wilgunya Subgroup in the Rolling Downs Group (Eromanga Basin); correlated with the upper Albian (Lower Cretaceous) *Canningopsis denticulata* and lower *Endoceratium ludbrookae* dinocyst zones (*sensu* Partridge 2006) by Foley *et al.* (2022).

Remarks

Although originally established on the basis of cranial remains (see Kear & Lee 2006), several articulated skulls and shells have since been discovered (Kear 2016) and are currently under study by BPK.

ARCHOSAUROMORPHA von Huene, 1946
CROCOPODA Ezcurra, 2016

Tasmaniosaurus Camp & Banks, 1978

Type species

Tasmaniosaurus triassicus Camp & Banks, 1978.

Tasmaniosaurus triassicus Camp & Banks, 1978

1972, *Chasmatosaurus* sp. Warren, p. 281.
1978, *Tasmaniosaurus triassicus* Camp & Banks, p. 151.

Holotype

UTGD 54655, disarticulated skull (Fig. 6A), mandible and teeth, vertebrae, ribs, pectoral girdle and hind limb elements.

Type locality, unit and age

'Upper level' within the Crisp and Gunn's Brick Pit, western end of Arthur Street in suburban Hobart, Tasmania, Australia; Knocklofty Formation (Tasmanian Basin) correlated with Induan to lower Olenekian (Lower Triassic) vertebrate assemblages by Ezcurra (2014).

Remarks

Although initially (Banks 1962, Cosgriff 1969, Warren 1972) considered a close relative or possible congeneric species of *Chasmatosaurus vanhoepeni* Haughton, 1924 (= *Proterosuchus fergusi* Broom, 1903b: Ezcurra & Butler 2015), Camp & Banks (1978) and Thulborn (1986a) both recognized *Tasmaniosaurus triassicus* as a distinct taxon within Proterosuchidae. By contrast, Ezcurra *et al.* (2013) found insufficient evidence to classify *T. triassicus* beyond Archosauromorpha (Ezcurra 2014), with a phylogenetic placement as the sister to Archosauriformes (Ezcurra 2016).
PROLACERTIDAE Parrington, 1935

Kadimakara Bartholomai, 1979

Type species

Kadimakara australiensis Bartholomai, 1979.

Kadimakara australiensis Bartholomai, 1979

1979, *Kadimakara australiensis* Bartholomai, p. 226.

Holotype

QM F6710, a posterior section of the cranium (Fig. 6C) with part of the right mandibular ramus.

Type locality, unit and age

'The Crater' locality (QM L78) near Rolleston in central Queensland, Australia; Arcadia Formation of the Rewan Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks

Kadimakara australiensis (Fig. 6B) was initially described as a prolacertid by Bartholomai (1979), and has even been synonymized with *Prolacerta broomi* Parrington, 1935 (Borsuk-Białynicka & Evans 2009, Evans & Jones 2010). However, recent phylogenetic analyses have reaffirmed the taxonomic distinctness of *K. australiensis* as a close relative of *P. broomi* (Ezcurra 2016, Spiekman 2018), with Prolacertidae constituting the most basal clade within Crocopoda (Spiekman *et al.* 2021).

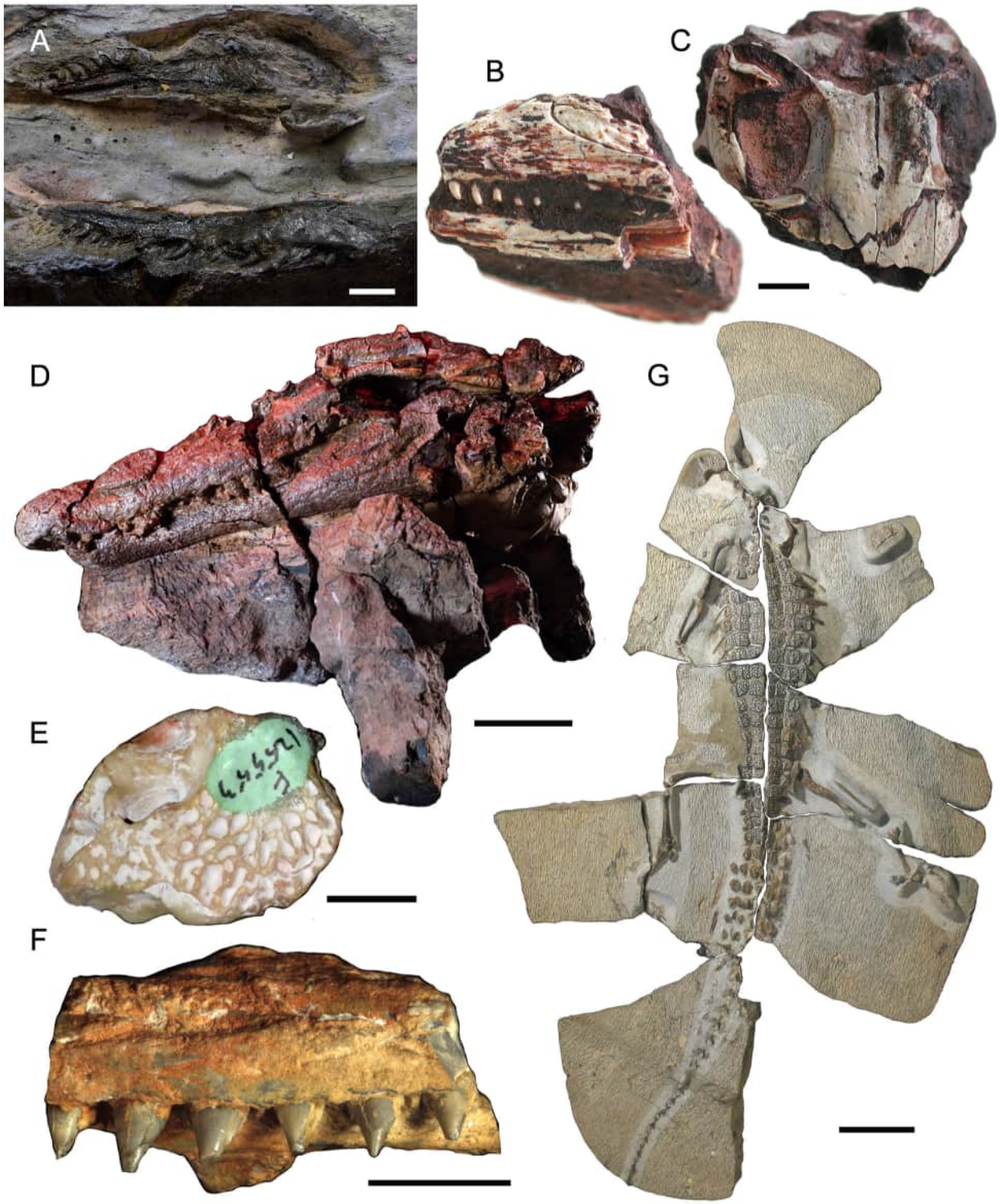

Fig. 6. Australian Mesozoic non-ornithodiran archosauromorphs. **A**, *Tasmaniosaurus triassicus* (UTGD 54655; holotype [part]) left maxilla (below) and natural mould (above). Scale = 1 cm. **B**, *Kadimakara australiensis* (QM F6676; referred specimen) partial skull and mandible in left lateral view. Scale = 2 mm. **C**, *Kadimakara australiensis* (QM F6710; holotype) partial skull in dorsal view (anterior is down). Scale = 2 mm. **D**, *Confractosuchus sauroktonos* (AODF 0890; holotype [part]) skull and mandible (in concretion) in left lateral view. Scale = 5 cm. **E**, *Isisfordia molnari* (AM F125553; holotype) partial braincase in dorsal view (anterior is up). Scale = 1 cm. **F**, *Isisfordia selaslophensis* (AM F15818; holotype) right maxilla in ventrolateral view. Scale = 1 cm. **G**, *Isisfordia duncani* (QM F36211; holotype) articulated skeleton. Scale = 10 cm.

ARCHOSAURIFORMES Gauthier, Kluge & Rowe, 1988

Kalisuchus Thulborn, 1979

Type species

Kalisuchus rewanensis Thulborn, 1979.

Kalisuchus rewanensis Thulborn, 1979

1979 *Kalisuchus rewanensis* Thulborn, p. 332.

Holotype

QM F8998, a left maxilla.

Type locality, unit and age

'The Crater' locality (QM L78) near Rolleston in central Queensland, Australia; Arcadia Formation of the Rewan

Group (Bowen Basin), correlated with the lower to middle Olenekian (Lower Triassic) upper *Lunatisporites pellucidus* and *Protohaploxypinus samoilovichii* palynomorph zones (Metcalfe *et al.* 2015, Mays *et al.* 2020).

Remarks

Although initially attributed to Proterosuchidae based on a hypodigm of referred cranial and postcranial elements (Thulborn 1979), Ezcurra (2016) restricted *Kalisuchus rewanensis* to the holotype maxilla (QM F8998) and placed the taxon outside Proterosuchidae within Archosauriformes.

ARCHOSAURIA Cope, 1870
CROCODYLOMORPHA Walker, 1970 (*sensu* Benton & Clark, 1988)
NEOSUCHIA Benton & Clark, 1988 (*sensu* Sereno, Larsson, Sidor & Gado, 2001)

Confractosuchus White, Bell, Campione, Sansalone, Brougham, Bevitt, Molnar, Cook, Wroe & Elliot, 2022.

Type species

Confractosuchus sauroktonos White, Bell, Campione, Sansalone, Brougham, Bevitt, Molnar, Cook, Wroe & Elliot, 2022.

Confractosuchus sauroktonos White, Bell, Campione, Sansalone, Brougham, Bevitt, Molnar, Cook, Wroe & Elliott, 2022

2022, *Confractosuchus sauroktonos* White, Bell, Campione, Sansalone, Brougham, Bevitt, Molnar, Cook, Wroe & Elliott, p. 284.

Holotype

AODF 0890, a skull and mandible (Fig. 6D) with articulated vertebral column, osteoderms and disarticulated fore- and hind limb elements.

Type locality, unit and age

'Chookie Site' (AODL 0120) on Elderslie Station near Winton in central-western Queensland, Australia; 'upper' Winton Formation of the Manuka Subgroup in the Rolling Downs Group (Eromanga Basin). This correlates approximately (*sensu* Tucker *et al.* 2013) with the mid-Cenomanian–lower Turonian (Upper Cretaceous) *Diconodinum multispinum* Dinocyst Zone (*sensu* Partridge 2006) as recalibrated by Foley *et al.* (2022).

Remarks

White *et al.* (2022) recovered *Confractosuchus sauroktonos* within Eusuchia as the sister to a clade comprising Susisuchidae and Hylaeochampsidae. Ristevski *et al.* (2023) consistently resolved *C. sauroktonos* as sister to Susisuchidae, albeit outside Eusuchia in some analyses. We follow their conservative approach and do not classify *C. sauroktonos* beyond Neosuchia.

SUSISUCHIDAE Salisbury, Frey, Martill & Buchy, 2003

Isisfordia Salisbury, Molnar, Frey & Willis, 2006

Type species

Isisfordia duncani Salisbury, Molnar, Frey & Willis, 2006.

Isisfordia duncani Salisbury, Molnar, Frey & Willis, 2006

2006, *Isisfordia duncani* Salisbury, Molnar, Frey & Willis, p. 2440.

Holotype

QM F36211, an articulated postcranial skeleton lacking only some forelimb elements and the anterior section of the skull and mandible (Fig. 6G).

Type locality, unit and age

UQL-ISIS-1 locality near Isisford in central-western Queensland, Australia. Syme *et al.* (2016) and Syme & Salisbury (2018) reported that the *ex situ* sandstone concretion containing QM F36211 derived from the 'lower' portion of the Winton Formation of the Manuka Subgroup in the Rolling Downs Group (Eromanga Basin). Tucker *et al.* (2013) constrained the maximum depositional age of vertebrate-bearing localities in the Winton Formation at Isisford to the late Albian (Early Cretaceous, 102.2–100.5 Ma) using U-Pb isotope dating of detrital zircons, within the *Phimopollenites pannosus* spore-pollen zone of Helby *et al.* (1987) and the *Dioxya armata* Dinocyst Zone (*sensu* Partridge 2006) as recalibrated by Foley *et al.* (2022).

Remarks

Isisfordia duncani is the most skeletally complete fossil crocodyliform taxon yet known from Australia. The holotype (QM F36211) and paratype specimens, including a second partial skeleton (QM F34642) and skull (QM F44330), collectively elucidate almost all aspects of its osteology. Salisbury *et al.* (2006) identified *Isisfordia duncani* as the earliest-branching member of Eusuchia. Subsequent studies and new material have demonstrated a sister relationship with *Susisuchus anatoceps* Salisbury, Frey, Martill & Buchy, 2003 within Susisuchidae, which is nested either outside (Turner & Pritchard 2015, Montefeltro *et al.* 2019), or within a more inclusive Eusuchia (Leite & Fortier 2018, Martin *et al.* 2020, White *et al.* 2022).

Isisfordia selaslophensis (Etheridge, 1917) Hart, 2020.

1917, *Crocodilus* (?*Botosaurus*) *selaslophensis* Etheridge, p. 133.
1980c, *Crocodylus* (*Bottosaurus*) *selaslophensis* (Etheridge) Molnar, p. 65.
2019, *Isisfordia molnari* Hart, Bell, Smith & Salisbury, p. 4.
2020, *Isisfordia selaslophensis* (Etheridge) Hart, p. 3.

Holotype

AM F15818, a right maxillary fragment with intact dentition (Fig. 6F).

Type locality, unit and age

Unspecified opal field in the Lightning Ridge region of north-western New South Wales, Australia; 'Finch Clay Facies' of the Wallangulla Sandstone Member of the Griman Creek Formation in the Rolling Downs Group (Surat Basin). The

maximum depositional age range is early to mid-Cenomanian (Late Cretaceous, 100.2–96.6 Ma: Bell *et al.* 2019b).

Remarks

Isisfordia selaslophensis represents the earliest recognized Mesozoic crocodyliform documented from Australia (see Etheridge 1917). The holotype AM F15818 was initially identified as a dentary by Etheridge (1917), who bestowed the name '*Crocodilus* (?*Botosaurus*)' *selaslophensis*. Molnar (1980c) corrected this misspelling to '*Crocodylus* (*Bottosaurus*)' *selaslophensis*, and also noted that AM F15818 bore no morphological resemblance to either of these genera. Hart *et al.* (2019) reinterpreted AM F15818 as part of a maxilla and listed the taxon as a *nomen dubium*. However, Hart (2020) subsequently revived the new combination *Isisfordia selaslophensis* with Hart *et al.* (2021) attributing additional cranial and postcranial elements from the Wallangulla Sandstone Member to *Isisfordia* cf. *I. selaslophensis*.

Isisfordia molnari Hart, Bell, Smith & Salisbury, 2019

2019, *Isisfordia molnari* Hart, Bell, Smith & Salisbury, p. 4.

Holotype

AM F125553, a partial cranium incorporating components of the skull roof and braincase (Fig. 6E).

Type locality, unit and age

Coocoran Opal Fields, west of Lightning Ridge in northwestern New South Wales, Australia; 'Finch Clay Facies' of the Wallangulla Sandstone Member of the Griman Creek Formation in the Rolling Downs Group (Surat Basin). The maximum depositional age range is early to mid-Cenomanian (Late Cretaceous, 100.2–96.6 Ma: Bell *et al.* 2019b).

Remarks

Hart (2020) and Hart *et al.* (2021) considered *Isisfordia molnari* to be a probable junior subjective synonym of *Isisfordia selaslophensis*. However, we follow Hart (2020) in retaining *I. molnari* as a distinct species because there are currently no anatomically overlapping specimens with which to test this synonymy.

ORNITHODIRA Gauthier, 1986
PTEROSAURIA Kaup, 1834
PTERODACTYLOIDEA Plieninger, 1901
ORNITHOCHEIROIDEA Seeley, 1870 (*sensu* Bennett, 1994)
PTERANODONTOIDEA Marsh, 1876 (*sensu* Kellner, 2003)
LANCEODONTIA Andres, Clark & Xu, 2014
ORNITHOCHEIRAE Seeley, 1870 (*sensu* Andres, Clark & Xu, 2014)
TARGARYENDRACONIA Pêgas, Holgado and Leal, 2021

Aussiedraco Kellner, Rodrigues & Costa, 2011

Type species

Aussiedraco molnari Kellner, Rodrigues & Costa, 2011.

Aussiedraco molnari Kellner, Rodrigues & Costa, 2011

1980, aff. *Ornithocheirus* Molnar & Thulborn, p. 363.
2000, *Anhanguera*? *cuvieri* Unwin, Lü & Bakhurina, p. 189.
2007, aff. *Lonchodectes* sp. Molnar & Thulborn, p. 469.
2011, *Aussiedraco molnari* Kellner, Rodrigues & Costa, p. 302.

Holotype

QM F10613, the symphyseal section of a mandible (Fig. 7A).

Type locality, unit and age

Hamilton River channel on Warra Station near Boulia in western Queensland, Australia; Toolebuc Formation of the Wilgunya Subgroup in the Rolling Downs Group (Eromanga Basin), correlated with the upper Albian (Lower Cretaceous) *Canningopsis denticulata* and lower *Endoceratium ludbrookae* dinocyst zones (*sensu* Partridge 2006) by Foley *et al.* (2022).

Remarks

QM F10613 was one of the first pterosaur fossils reported from Australia (Molnar & Thulborn 1980). The specimen was initially designated aff. *Ornithocheirus* (Molnar & Thulborn 1980), but subsequently transferred to *Anhanguera*?*cuvieri* (Unwin *et al.* 2000, Barrett *et al.* 2008), considered similar to *Anhanguera* (Kear *et al.* 2010), or reclassified as aff. *Lonchodectes* sp. (Molnar & Thulborn 2007). Kellner *et al.* (2010) alternatively established *Aussiedraco molnari* with possible affinity to Anhangueridae, or Pteranodontoidea (see Kellner *et al.* 2011). Recent phylogenetic analyses have otherwise placed the taxon within Targaryendraconidae (Pêgas *et al.* 2021, Pentland *et al.* 2022b).

ANHANGUERIA Rodrigues & Kellner, 2013
TROPEOGNATHINAE Holgado & Pêgas, 2020

Mythunga Molnar & Thulborn, 2007

Type species

Mythunga camara Molnar & Thulborn, 2007.

Mythunga camara Molnar & Thulborn, 2007

1998, cf. *Anhanguera* Long, p. 155.
2007, *Mythunga camara* Molnar & Thulborn, p. 462.

Holotype

QM F18896, an incomplete section of the maxillary and mandibular rostra (Fig. 7B).

Type locality, unit and age

Unspecified locality on Dunluce Station near Hughenden in central-northern Queensland, Australia; Toolebuc Formation of the Wilgunya Subgroup in the Rolling Downs Group (Eromanga Basin), correlated with the upper Albian (Lower Cretaceous) *Canningopsis denticulata* and lower *Endoceratium ludbrookae* dinocyst zones (*sensu* Partridge 2006) by Foley *et al.* (2022).

Fig. 7. Australian Mesozoic pterosaurs. **A**, *Aussiedraco molnari* (QM F10613; holotype) mandible in dorsal view. Scale = 1 cm. **B**, *Mythunga camara* (QM F18896; holotype) partial skull and mandible in left lateral view. Scale = 5 cm. **C**, *Thapunngaka shawi* (KK F494; holotype) mandible in left lateral view. Scale = 5 cm. **D**, *Ferrodraco lentoni* (AODF 0876; holotype [part]) partial skull and mandible in left lateral view. Scale = 5 cm.

Remarks

Mythunga camara was originally interpreted as a short-snouted archaeopterodactyloid (Molnar & Thulborn 2007); however, subsequent studies recognized that the anterior end of the rostrum was incomplete (Fletcher & Salisbury 2010, Kellner *et al.* 2010), and suggested alternative affinity with Ornithocheiridae or Anhangueridae (Kear *et al.* 2010, Pentland & Poropat 2023). Phylogenetic analyses have placed *M. camara* within Anhangueria (Pentland & Poropat 2019), Ornithocheirinae (Pentland *et al.* 2019), Tropeognathinae (Holgado & Pêgas 2020, Pentland *et al.* 2022b), and Ornithocheiridae or Tropeognathinae as a

monophyletic polytomy of Australian taxa (Richards *et al.* 2021, Xu *et al.* 2022).

Ferrodraco Pentland, Poropat, Tischler, Sloan, Elliott, Elliott, Elliott & Elliott, 2019

Type species

Ferrodraco lentoni Pentland, Poropat, Tischler, Sloan, Elliott, Elliott, Elliott & Elliott, 2019.

Ferrodraco lentoni Pentland, Poropat, Tischler, Sloan, Elliott, Elliott, Elliott & Elliott, 2019

2019, *Ferrodraco lentoni* Pentland, Poropat, Tischler, Sloan, Elliott, Elliott, Elliott & Elliott, p. 2.

Holotype

AODF 0876, rostral section of the skull and dentaries (Fig. 7D) with associated teeth, cervical vertebrae, and incomplete left and right forelimbs.

Type locality, unit and age

'Pterosaur Site' (AODL 245) on Belmont Station northeast of Winton in central-western Queensland, Australia; 'upper' Winton Formation of the Manuka Subgroup in the Rolling Downs Group (Eromanga Basin). This correlates approximately (*sensu* Tucker *et al.* 2013) with the mid-Cenomanian–lower Turonian (Upper Cretaceous) *Diconodinum multispinum* Dinocyst Zone (*sensu* Partridge 2006) as recalibrated by Foley *et al.* (2022).

Remarks

AODF 0876 constitutes the most complete pterosaur skeleton documented from Australia to date (Pentland *et al.* 2019). *Ferrodraco lentoni* was originally classified within Ornithocherinae (*sensu* Andres *et al.* 2014) as the sister to *Mythunga camara* (Pentland *et al.* 2019). However, Holgado & Pêgas (2020) moved these taxa to Tropeognanthinae, with subsequent phylogenies producing comparable placements (Richards *et al.* 2021, Pentland *et al.* 2022b).

Thapunngaka Richards, Stumkat & Salisbury, 2021

Type species

Thapunngaka shawi Richards, Stumkat & Salisbury, 2021.

Thapunngaka shawi Richards, Stumkat & Salisbury, 2021

2021, *Thapunngaka shawi* Richards, Stumkat & Salisbury, p. 4.

Holotype

KK F494, incomplete dentary section of the mandible (Fig. 7C).

Type locality, unit and age

'Free Fossil Hunting Site 1', ~12 km northwest of Richmond in central-northern Queensland, Australia; Toolebuc Formation of the Wilgunya Subgroup in the Rolling Downs Group (Eromanga Basin), correlated with the upper Albian (Lower Cretaceous) *Canningopsis denticulata* and lower *Endoceratium ludbrookae* dinocyst zones (*sensu* Partridge 2006) by Foley *et al.* (2022).

Remarks

Richards *et al.* (2021) placed *Thapunngaka shawi* within Tropeognanthinae to form a monophyletic polytomy with *Mythunga camara* and *Ferrodraco lentoni*.

DINOSAURIA Owen, 1842
SAURISCHIA Seeley, 1887
SAUROPODOMORPHA von Huene, 1932
SAUROPODA Marsh, 1878
GRAVISAURIA Allain & Aquesbi, 2008

Rhoetosaurus Longman, 1926

Type species

Rhoetosaurus brownei Longman, 1926.

Rhoetosaurus brownei Longman, 1926

1926, *Rhoetosaurus brownei* Longman, p. 185.

Holotype

QM F1659, incomplete postcranial skeleton comprising cervical and dorsal vertebrae, dorsal ribs, sacral and caudal vertebrae with haemal arches, a complete pelvic girdle and right hind limb (Fig. 8A).

Type locality, unit and age

Recovered from a shallow gully draining into the south side of Eurombah Creek on Taloona Station (originally part of Durham Downs Station) near Roma in southwestern Queensland, Australia; Walloon Coal Measures of the Injune Creek Group (Surat Basin), constrained with a mid-Oxfordian (Late Jurassic) maximum depositional age of 162.6 ± 1.1 Ma by Todd *et al.* (2019).

Remarks

Longman (1926, 1927a) considered *Rhoetosaurus brownei* to be a close relative of *Cetiosaurus oxoniensis* Phillips, 1871, and the taxon was placed within Cetiosauridae (Huene 1932), or Cetiosaurinae within Camarasauridae (Steel 1970). McIntosh (1990) otherwise re-classified *R. brownei* within the subfamily Shunosaurinae of Cetiosauridae. Although Upchurch (1995) limited his assignment to Neosauropoda, the potential affinity of *R. brownei* with *Shunosaurus lii* Dong, Zhou & Zhang, 1983 (Dong 1988, Dong *et al.* 1989) has even led to speculation that *R. brownei* may have similarly possessed a tail club (Long & Buffetaut 2001). More recent reassessments by Nair & Salisbury (2012) and Jannel *et al.* (2019) documented additional pedal remains discovered at the type locality relocated in the 1970s (Thulborn 1985). Their phylogenetic analyses also resolved *R. brownei* within Gravisauria as the sister to Eusauropoda (Nair & Salisbury 2012, Jannel *et al.* 2019). Given the revised Oxfordian age (Todd *et al.* 2019), this distinguishes *R. brownei* as the latest-surviving non-eusauropodan sauropod.

EUSAUROPODA Upchurch, 1995
NEOSAUROPODA Bonaparte, 1986

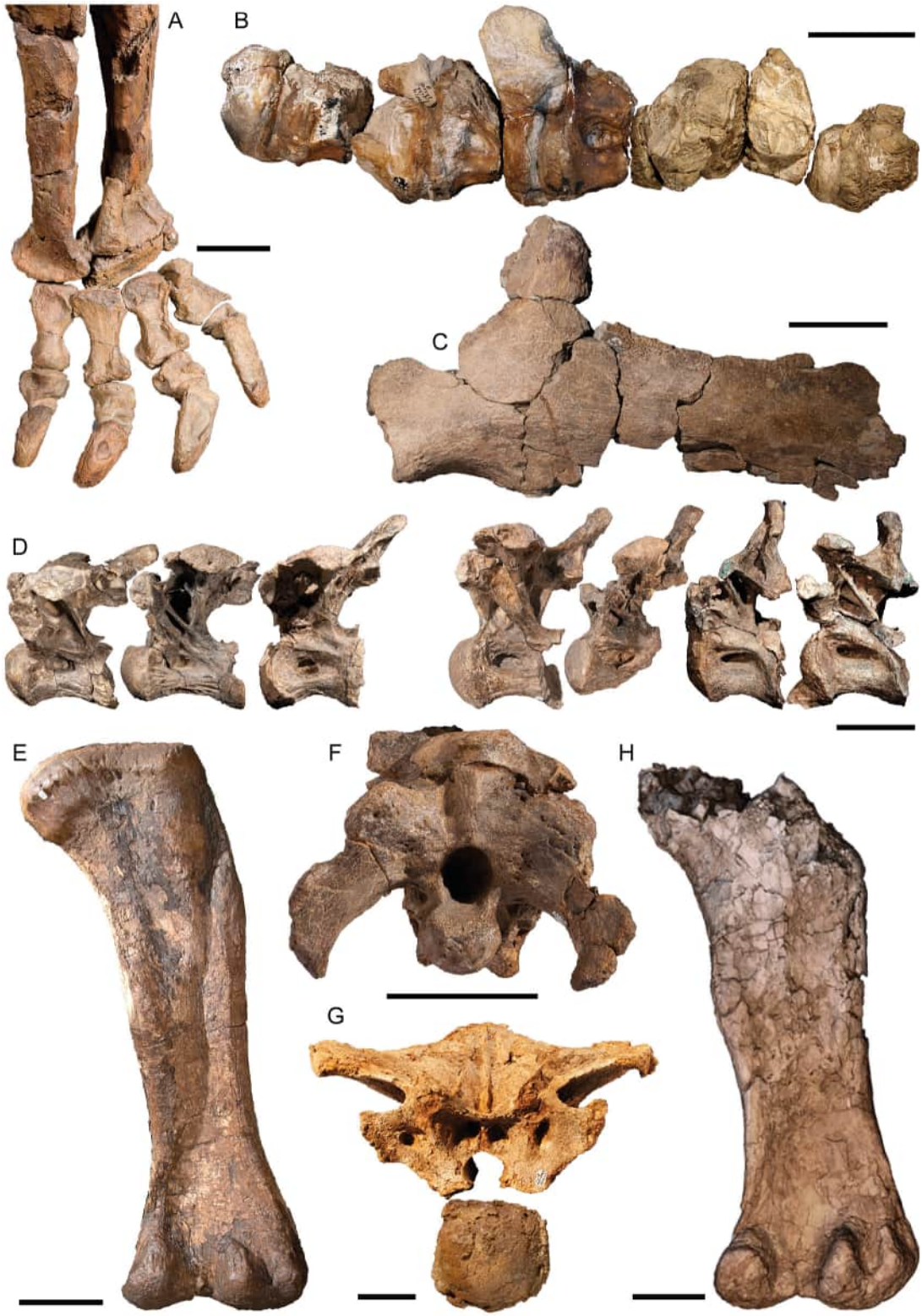

Fig. 8. Australian Mesozoic sauropod dinosaurs. **A**, *Rhoetosaurus brownei* (QM F1659; holotype [part]) right crus and pes in anterodorsal view. Scale = 20 cm. **B**, *Austrosaurus mckillopi* (QM F2316; holotype [part]) presacral vertebral series in left lateral view. Scale = 20 cm. **C**, *Wintonotitan wattsi* (QM F7292; holotype [part]) left scapula in lateral view. Scale = 20 cm. **D**, *Savannasaurus elliottorum* (AODF 0660; holotype [part]) dorsal vertebrae II–V and VII–X in left lateral view (V and IX–X mirrored). Scale bar = 20 cm. **E**, *Diamantinasaurus matildae* (AODF 0603; holotype [part]) right femur in posterior view. Scale = 20 cm. **F**, *Diamantinasaurus matildae* (AODF 0836; referred specimen [part]) braincase in posterior view. Scale = 10 cm. Image: **G**, *Diamantinasaurus matildae* (AODF 0663; referred juvenile specimen [part]) anterior dorsal vertebra in anterior view. Scale = 5 cm. **H**, *Australotitan cooperensis* (3D digital rendering of EMF 102; holotype [part]) right femur in posterior view (modified from Hocknull *et al.* 2021). Scale = 20 cm.

MACRONARIA Wilson & Sereno, 1998
TITANOSAURIFORMES Salgado, Coria & Calvo, 1997
SOMPHOSPONDYLI Wilson & Sereno, 1998

Austrosaurus Longman, 1933

Type species
Austrosaurus mckillopi Longman, 1933

Austrosaurus mckillopi Longman, 1933

1933, *Austrosaurus mckillopi* Longman, p. 132.

Holotype
QM F2316, a posterior cervical and anterior dorsal vertebrae (Fig. 8B); KK F1020, dorsal ribs.

Type locality, unit and age
Southwest corner of Whitewood Paddock on Clutha Station, ~55 km northwest of Maxwelton (~77 km northwest of Richmond) in northwestern Queensland, Australia (see Poropat *et al.* 2017). Poropat *et al.* (2017) identified the type unit based on outcrop area as the Allaru Mudstone of the Wilgunya Subgroup in the Rolling Downs Group (Eromanga Basin); correlated with the upper Albian (Lower Cretaceous) *Endoceratium ludbrookae* Dinocyst Zone (*sensu* Partridge 2006) by Foley *et al.* (2022).

Remarks
Austrosaurus mckillopi was originally assigned to Cetiosauridae, but recognized as being more derived than *Rhoetosaurus brownei* by Longman (1933). Steel (1970) subsequently listed *A. mckillopi* as Sauropoda *incertae sedis*, despite the referral of additional material to *Austrosaurus* sp. (Coombs & Molnar 1981). Molnar (2001b) restricted *A. mckillopi* to the holotype (QM F2316) and assigned the taxon to Titanosauria (see also Molnar & Salisbury 2005). This conclusion was supported by the phylogenetic analyses of Upchurch *et al.* (2004), although their character scores comprised a chimaera of referred specimens (Mannion *et al.* 2013; Poropat *et al.* 2015a). *Austrosaurus mckillopi* has since been regarded as a *nomen dubium* (Hocknull *et al.* 2009, Mannion & Calvo 2011, Mannion *et al.* 2013, Poropat *et al.* 2015a), an indeterminate titanosauriform (Agnolin *et al.* 2010), or even a non-titanosauriform sauropod (Molnar 2011b). However, a reappraisal of the QM F2316 and KK F1020 type material has reasserted the validity of *A. mckillopi* and its placement within Somphospondyli, basal to Titanosauria (Poropat *et al.* 2017).

Wintonotitan Hocknull, White, Tischler, Cook, Calleja, Sloan & Elliott, 2009

Type species
Wintonotitan wattsi Hocknull, White, Tischler, Cook, Calleja, Sloan & Elliott, 2009

Wintonotitan wattsi Hocknull, White, Tischler, Cook, Calleja, Sloan & Elliott, 2009

1981, *Austrosaurus* sp. Coombs & Molnar, p. 351.
2001b, Titanosauriformes indet. Molnar, p. 143.
2005, Titanosauria indet. Molnar & Salisbury, p. 463.
2009, *Wintonotitan wattsi* Hocknull, White, Tischler, Cook, Calleja, Sloan & Elliott, p. 15.

Holotype
QM F7292, fragmentary postcranial skeleton preserving dorsal vertebrae and ribs, caudal vertebrae, haemal arches, the left scapula (Fig. 8C), partial forelimbs, left ilium, and left ischium.

Type locality, unit and age
'Triangle Paddock Site' (QM L313) on Elderslie Station near Winton in central-western Queensland, Australia; Cenomanian (Upper Cretaceous) strata within the Winton Formation of the Manuka Subgroup in the Rolling Downs Group (Eromanga Basin). This broadly correlates with the recalibrated upper *Dioxya armata*, *Xenascus asperus* and lower *Diconodinum multispinum* dinocyst zones (*sensu* Partridge 2006) of Foley *et al.* (2022).

Remarks
Wintonotitan wattsi was originally described as *Austrosaurus* sp. (Coombs & Molnar 1981) and attributed to Cetiosaurinae. The material was later evaluated by Molnar (2001b) and Molnar & Salisbury (2005), who regarded it a titanosaurian based on comparisons of character states from Wilson (2002). This was supported by the phylogeny of Upchurch *et al.* (2004), which placed *W. wattsi* (as '*Austrosaurus*') within Titanosauria. *Wintonotitan wattsi* has since been resolved as a basally divergent somphospondylan (Hocknull *et al.* 2009, Carballido *et al.* 2011, Carballido *et al.* 2012, D'Emic 2012, Carballido & Sander 2014, Poropat *et al.* 2015a, Poropat *et al.* 2016, Poropat *et al.* 2021a, Poropat *et al.* 2023); however, Hocknull *et al.* (2021) alternatively classified *W. wattsi* within Diamantinasauria, implying the possible presence of a single sauropod clade within the Winton Formation assemblages (Poropat *et al.* 2022).

TITANOSAURIA Bonaparte & Coria, 1993
DIAMANTINASAURIA Poropat, Kundrát, Mannion, Upchurch, Tischler & Elliott, 2021a

Diamantinasaurus Hocknull, White, Tischler, Cook, Calleja, Sloan & Elliott, 2009

Type species
Diamantinasaurus matildae Hocknull, White, Tischler, Cook, Calleja, Sloan & Elliott, 2009

Diamantinasaurus matildae Hocknull, White, Tischler, Cook, Calleja, Sloan & Elliott, 2009

2009, *Diamantinasaurus matildae* Hocknull, White, Tischler, Cook, Calleja, Sloan & Elliott, p. 3.

Holotype
AODF 0603, an incomplete skeleton including part of the dentary, a tooth, cervical and dorsal ribs, dorsal vertebrae, the sacrum, partial pectoral girdles, nearly complete right and left forelimbs, the pelvic girdle and right hind limb lacking the pes (Fig. 8E).

Type locality, unit and age

'Matilda Site' (AODL 0085) on Elderslie Station near Winton in central-western Queensland, Australia; 'upper' Winton Formation of the Manuka Subgroup in the Rolling Downs Group (Eromanga Basin). This correlates approximately (*sensu* Tucker *et al.* 2013) with the mid-Cenomanian–lower Turonian (Upper Cretaceous) *Diconodinum multispinum* Dinocyst Zone (*sensu* Partridge 2006) as recalibrated by Foley *et al.* (2022).

Remarks

Hocknull *et al.* (2009), Mannion *et al.* (2013), and Poropat *et al.* (2015b) classified *Diamantinasaurus matildae* as a derived titanosaurian within Lithostrotia. However, subsequent phylogenies have advocated a revised position closer to the base of Titanosauria (Poropat *et al.* 2016). Other studies have also consistently resolved Diamantinasauria (Mannion *et al.* 2017, González Riga *et al.* 2018, Mannion *et al.* 2019, Hocknull *et al.* 2021) as an early diverging titanosaurian lineage (Poropat *et al.* 2021a, Poropat *et al.* 2023). We expect that further preparation of AODF 0603 (Poropat *et al.* 2022) and description of new *D. matildae* specimens (e.g., Poropat *et al.* 2022; Rigby *et al.* 2022; Poropat *et al.* 2023; Fig. 8F, G) by SFP will refine the phylogenetic placement of this taxon.

Savannasaurus Poropat, Mannion, Upchurch, Hocknull, Kear, Kundrát, Sloan, Sinapius, Elliott & Elliott, 2016

Type species

Savannasaurus elliottorum Poropat, Mannion, Upchurch, Hocknull, Kear, Kundrát, Sloan, Sinapius, Elliott & Elliott, 2016

Savannasaurus elliottorum Poropat, Mannion, Upchurch, Hocknull, Kear, Kundrát, Sloan, Sinapius, Elliott & Elliott, 2016

2016, *Savannasaurus elliottorum* Poropat, Mannion, Upchurch, Hocknull, Kear, Kundrát, Sloan, Sinapius, Elliott & Elliott, p. 3.

Holotype

AODF 0660, an incomplete postcranial skeleton comprising presacral (Fig. 8D), sacral and caudal vertebrae, a coracoid, forelimb bones, the pelvic girdle and pedal elements.

Type locality, unit and age

'Ho-Hum Site' (AODL 0082) on Belmont Station, northeast of Winton in central-western Queensland, Australia; 'upper' Winton Formation of the Manuka Subgroup in the Rolling Downs Group (Eromanga Basin). This correlates approximately (*sensu* Tucker *et al.* 2013) with the mid-Cenomanian–lower Turonian (Upper Cretaceous) *Diconodinum multispinum* Dinocyst Zone (*sensu* Partridge 2006) as recalibrated by Foley *et al.* (2022).

Remarks

Poropat *et al.* (2016) placed *Savannasaurus elliottorum* as the sister to *Diamantinasaurus matildae*. Consistent resolution of these taxa (Mannion *et al.* 2017, González Riga *et al.* 2018, Mannion *et al.* 2019, Hocknull *et al.* 2021) with the approximately coeval *Sarmientosaurus musacchioi* Martínez, Lamanna, Novas, Ridgely, Casal, Martínez, Vita & Witmer, 2016 from the Cenomanian–Turonian Bajo Barreal Formation of Argentina has led to the establishment of Diamantinasauria (Poropat *et al.* 2021a); this clade is topologically mobile (Carballido *et al.* 2022), but clearly represents a basally divergent titanosaurian lineage (Poropat *et al.* 2020b, Poropat *et al.* 2021a, Poropat *et al.* 2023).

Australotitan Hocknull, Wilkinson, Lawrence, Konstantinov, Mackenzie & Mackenzie, 2021

Type species

Australotitan cooperensis Hocknull, Wilkinson, Lawrence, Konstantinov, Mackenzie & Mackenzie, 2021.

Australotitan cooperensis Hocknull, Wilkinson, Lawrence, Konstantinov, Mackenzie & Mackenzie, 2021

2021, *Australotitan cooperensis* Hocknull, Wilkinson, Lawrence, Konstantinov, Mackenzie & Mackenzie, p. 38.

Holotype

EMF 102, a fragmentary skeleton including the left scapula, right and left humeri, right ulna, right and left pubes, right and left ischia and right (Fig. 8H) and left femora.

Type locality, unit and age

EML 011(a) locality on Plevna Downs Station, west of Eromanga in southwestern Queensland, Australia; 'upper' Winton Formation of the Manuka Subgroup in the Rolling Downs Group (Eromanga Basin). This correlates approximately (*sensu* Tucker *et al.* 2013) with the mid-Cenomanian–lower Turonian (Upper Cretaceous) *Diconodinum multispinum* Dinocyst Zone (*sensu* Partridge 2006) as recalibrated by Foley *et al.* (2022).

Remarks

Hocknull *et al.* (2021) resolved *Australotitan cooperensis* within Diamantinasauria, together with *Diamantinasaurus matildae*, *Savannasaurus elliottorum* and (in some analyses excluding selected taxa and characters) *Wintonotitan wattsi*. Other phylogenies have not yet evaluated this placement (e.g., Poropat *et al.* 2023), thus we retain the Hocknull *et al.* (2021) classification herein.

THEROPODA Marsh, 1881

Theropoda *incertae sedis*

1932, *Walgettosuchus woodwardi* von Huene, p. 69.

Remarks

von Huene (1932) erected *Walgettosuchus woodwardi* on the basis of an isolated caudal centrum (Smith Woodward 1910). This specimen (NHMUK R3717: Fig. 9A) cannot be diagnosed beyond Theropoda. Consequently, we designate *W. woodwardi* a *nomen dubium* following Agnolin *et al.* (2010).

Kakuru Molnar & Pledge, 1980

Fig. 9. Australian Mesozoic theropod and thyreophoran dinosaurs. **A**, Theropoda incertae sedis (NHMUK PV R3717; holotype of *Walgettosuchus woodwardi*) distal caudal vertebra in left lateral view. Scale = 1 cm. **B**, *Kakuru kujani* (SAMA P17926; holotype) left tibia in anterior view. Scale = 2 cm. **C**, *Ozraptor subotaii* (UWA 82469; holotype) distal left tibia in anterior view. Scale = 2 cm. **D**, *Rapator ornitholestoides* (NHMUK PV R3718; holotype) left metacarpal I in dorsal view. Scale = 1 cm. **E**, *Timimus hermani* (NMV P186303; holotype) left femur in posterior view. Scale = 5 cm. **F**, *Australovenator wintonensis* holotype left manus (AODF 0604; holotype [part], incorporating right carpal elements, right metacarpal II, and right phalanges I-2, II-3, and III-3–4 [not mirrored]) in palmomedial view. Scale = 5 cm. **G**, *Nanantius eos* (QM F12992; holotype) left tibiotarsus in posterior view. Scale = 5 mm. **H**, *Minmi paravertebra* (QM F10329; holotype [part]) left pes in plantar view. Scale = 2 cm. **I**, *Kunbarrasaurus ieversi* (QM F18101; holotype) skeleton in dorsal view. Scale = 20 cm.

Type species
Kakuru kujani Molnar & Pledge, 1980.

Kakuru kujani Molnar & Pledge, 1980

1980, *Kakuru kujani* Molnar & Pledge, p. 281.

Holotype
SAMA P17926, an incomplete left tibia (Fig. 9B).

Type locality, unit and age
Unknown opal field near Andamooka, west of Lake Torrens in northeastern South Australia, Australia. The Andamooka opal-bearing strata form part of the Bulldog Shale in the Marree Subgroup of the Rolling Downs Group (Eromanga Basin); upper Aptian (Lower Cretaceous) based on bivalves (Ludbrook 1966) and the age-diagnostic belemnite *Peratobelus* (Henderson *et al.* 2000, Williamson 2006). This correlates with the *Muderongia australis* and lower *Odontochitina operculata* dinocyst zones (*sensu* Partridge 2006) as recognized by Krieg & Rogers (1995) and Alexander & Sansome (1996), and recalibrated by Foley *et al.* (2022).

Remarks
Kakuru kujani has been interpreted as a coelurosaurian, an abelisauroid, an indeterminate averostran or tetanuran theropod (Rauhut 2005, Agnolin *et al.* 2010, Barrett *et al.* 2010a, Rauhut 2012). We consider the taxon to be valid and most feasibly referrable to Averostra (*sensu* Agnolin *et al.* 2010, Barrett *et al.* 2010a, Brougham *et al.* 2019).

Ozraptor Long & Molnar, 1998

Type species
Ozraptor subotaii Long & Molnar 1998.

Ozraptor subotaii Long & Molnar 1998

1998, *Ozraptor subotaii* Long & Molnar, p. 124.

Holotype
UWA 82469, an incomplete distal left tibia (Fig. 9C).

Type locality, unit and age
Bringo Railway Cutting, ~24 km east of Geraldton in south-central coastal Western Australia. UWA 82469 reportedly derived from the Colalura Sandstone, which represents the stratigraphically basalmost unit within the Champion Bay Group (Long & Molnar 1998). Mory *et al.* (2005) listed the overlying Newmarracarra Limestone as corresponding to the lower Bajocian (Middle Jurassic) *ovalis/laeviscula* ammonite zones (see Hall 1989), although Turner *et al.* (2009) indicated an extension of the lower Champion Bay Group into the Aalenian.

Remarks
Long & Molnar (1998) interpreted *Ozraptor subotaii* as an indeterminate theropod, although Rauhut (2005) suggested attribution to Abelisauroidea (as did Agnolin *et al.* 2010), and later as a valid theropod taxon of uncertain affinity (Rauhut 2012, Brougham *et al.* 2020).

COELUROSAURIA von Huene, 1914
MEGARAPTORIDAE Novas, Agnolin, Ezcurra, Porfiri and Canale, 2013

Rapator von Huene, 1932

Type species
Rapator ornitholestoides von Huene, 1932.

Rapator ornitholestoides von Huene, 1932

1932, *Rapator ornitholestoides* von Huene, p. 70.

Holotype
NHMUK PV R3718, a left metacarpal I (Fig. 9D).

Type locality, unit and age
Unspecified opal field in the Lightning Ridge region of northwestern New South Wales, Australia; 'Finch Clay Facies' of the Wallangulla Sandstone Member of the Griman Creek Formation in the Rolling Downs Group (Surat Basin). The maximum depositional age range is early to mid-Cenomanian (Late Cretaceous, 100.2–96.6 Ma: Bell *et al.* 2019b).

Remarks
Rapator ornitholestoides was interpreted as a possible megaraptoran (Hocknull *et al.* 2009, Agnolin *et al.* 2010, White *et al.* 2013a), but the lack of autapomorphies has left its taxonomic validity in doubt (Agnolin *et al.* 2010, Bell *et al.* 2016).

Australovenator Hocknull, White, Tischler, Cook, Calleja, Sloan & Elliott, 2009

Type species
Australovenator wintonensis Hocknull, White, Tischler, Cook, Calleja, Sloan & Elliott, 2009.

Australovenator wintonensis Hocknull, White, Tischler, Cook, Calleja, Sloan & Elliott, 2009

2009, *Australovenator wintonensis* Hocknull, White, Tischler, Cook, Calleja, Sloan & Elliott, p. 25.

Holotype
AODF 0604, a fragmentary skeleton including both dentaries, ribs, and almost complete fore- (Fig. 9F) and hind limbs.

Type locality, unit and age
'Matilda Site' (AODL 0085) on Elderslie Station near Winton in central-western Queensland, Australia; 'upper' Winton Formation of the Manuka Subgroup in the Rolling Downs Group (Eromanga Basin). This correlates approximately (*sensu* Tucker *et al.* 2013) with the mid-Cenomanian–lower Turonian (Upper Cretaceous) *Diconodinum multispinum* Dinocyst Zone (*sensu* Partridge 2006) as recalibrated by Foley *et al.* (2022).

Remarks
AODF 0604 is the most complete non-avian theropod dinosaur skeleton from Australia (White *et al.* 2012, White *et al.* 2013b, White *et al.* 2015b, White *et al.* 2015a, White *et al.* 2016,

White *et al.* 2020). *Australovenator wintonensis* was initially recovered as the sister to Carcharodontosauridae (Hocknull *et al.* 2009), but Benson *et al.* (2010a) placed the taxon within Megaraptora. Novas *et al.* (2013) later erected Megaraptoridae to include *A. wintonensis* and other Gondwanan megaraptorans. Megaraptora has been nested amongst allosauroids with Carcharodontosauridae, or amongst coelurosaurians either within (see Delcourt & Grillo 2018, Lamanna *et al.* 2020, Naish and Cau 2022), or outside of Tyrannosauroidea (Porfiri *et al.* 2018, Lamanna *et al.* 2020). *Australovenator wintonensis* might indicate an Australian origin for Megaraptoridae (Bell *et al.* 2016, Poropat *et al.* 2019).

TYRANNOSAUROIDEA Walker, 1964
Timimus Rich & Vickers-Rich, 1994

Type species
Timimus hermani Rich & Vickers-Rich, 1994.

Timimus hermani Rich & Vickers-Rich, 1994

1994, *Timimus hermani* Rich & Vickers-Rich, p. 130.

Holotype
NMV P186303, a left femur (Fig. 9E).

Type locality, unit and age
'Dinosaur Cove East' locality at Dinosaur Cove near Glenaire, west of Cape Otway on the southwestern coast of Victoria, Australia. Wagstaff *et al.* (2020) correlated strata at this locality with the Eumeralla Formation of the Otway Group (Otway Basin); lower Albian (Lower Cretaceous) *Crybelosporites striatus* Spore-pollen Zone.

Remarks
Timimus hermani was originally identified as an ornithomimosaurian by Rich & Vickers-Rich (1994). Bonaparte (1999) otherwise suggested a close relationship with Unenlagiinae within Dromaeosauridae, but Agnolin *et al.* (2010) listed the taxon as a *nomen dubium*. Benson *et al.* (2012) attributed *T. hermani* to Tyrannosauroidea, with Delcourt & Grillo (2018) further classifying the taxon as an early diverging member of Pantyrannosauria.

AVIALAE Gauthier, 1986
ENANTIORNITHES Walker, 1981

Nanantius Molnar, 1986

Type species
Nanantius eos Molnar, 1986.

Nanantius eos Molnar, 1986

1986, *Nanantius eos* Molnar, p. 737.

Holotype
QM F12992, a left tibiotarsus (Fig. 9G).

Type locality, unit and age
East bank of the Hamilton River on Warra Station, near the Hamilton Hotel ruins, ~80 km east of Boulia in western Queensland, Australia; Toolebuc Formation of the Wilgunya Subgroup in the Rolling Downs Group (Eromanga Basin), correlated with the upper Albian (Lower Cretaceous) *Canningopsis denticulata* and lower *Endoceratium ludbrookae* dinocyst zones (*sensu* Partridge 2006) by Foley *et al.* (2022).

Remarks
Nanantius eos is the only named Mesozoic avialan taxon from Australia, and is unambiguously grouped within Enantiornithes (Molnar 1986, Kurochkin & Molnar 1997, Worthy & Nguyen 2020). Additional referred material (Kurochkin & Molnar 1997, Kear *et al.* 2003) includes the proximal end of a tibiotarsus (QM F31813) that is morphologically distinct from QM F12992 and has been identified as *Nanantius* sp. (Kurochkin & Molnar 1997).

ORNITHISCHIA Seeley, 1887

Ornithischia *incertae sedis*
2003b, *Serendipaceratops arthurcclarkei* Rich & Vickers-Rich, p. 2.
2010, Genasauria indet. Agnolin *et al.*, p. 262.

Remarks
The holotype of *Serendipaceratops arthurcclarkei*, NMV P186385, is one of the most controversial dinosaur fossils from Australia. Although initially identified as a neoceratopsian by Rich & Vickers-Rich (1994) and Rich & Vickers-Rich (2003b), Agnolin *et al.* (2010) relegated the taxon to Genasauria indet. Rich *et al.* (2014) alternatively argued that *S. arthurcclarkei* was a valid member of Ceratopsia, although Rozadilla *et al.* (2021) cited similarities with Ankylosauria. In light of these uncertainties, and the fragmentary condition of NMV P186385, we treat the taxon as Ornithischia *incertae sedis* until more diagnostic material is recovered.

THYREOPHORA Nopcsa, 1915
EURYPODA Sereno, 1986
ANKYLOSAURIA Osborn, 1923

Minmi Molnar, 1980b

Type species
Minmi paravertebra Molnar, 1980b.

Minmi paravertebra Molnar, 1980b

1980b, *Minmi paravertebra* Molnar, p. 79.

Holotype
QM F10329, a fragmentary postcranial skeleton including dorsal vertebrae, ribs, a partial right pes (Fig. 9H), and associated dermal elements.

Type locality, unit and age
Unnamed locality ~1 km south of Mack Gully north of Roma in southeastern Queensland, Australia; Minmi Member of the Bungil Formation in the Blythesdale Group (Surat Basin). Burger (1980) considered the Minmi Member to be lower Aptian (Lower Cretaceous) based on dinoflagellates and mollusc assemblages, although the base of the

Bungil Formation succession extends into the Hauterivian–Barremian (Cooling *et al.* 2021).

Remarks

Although undoubtedly an ankylosaurian (Molnar 1980b), *Minmi paravertebra* was treated as a *nomen dubium* by Arbour & Currie (2016). Leahey *et al.* (2015) alternatively retained *M. paravertebra* with most subsequent studies likewise considering the taxon valid (e.g., Bell *et al.* 2018a, Murray *et al.* 2019, Frauenfelder *et al.* 2022).

Kunbarrasaurus Leahey, Molnar, Carpenter, Witmer & Salisbury, 2015

Type species

Kunbarrasaurus ieversi Leahey, Molnar, Carpenter, Witmer & Salisbury, 2015.

Kunbarrasaurus ieversi Leahey, Molnar, Carpenter, Witmer & Salisbury, 2015

1996b, *Minmi* sp. Molnar, p. 654.
2015, *Kunbarrasaurus ieversi* Leahey, Molnar, Carpenter, Witmer & Salisbury, p. 7.

Holotype

QM F18101, an articulated skeleton comprising the skull, mandible and intact vertebral column lacking only the distal caudal series, a partial pectoral girdle and left forelimb, the pelvic girdle, proximal hind limbs and intact dermal armour (Fig. 9I).

Type locality, unit and age

Locality on Marathon Station, ~48 km east of Richmond in northwestern Queensland, Australia. Molnar (1996b) identified the type unit as the Allaru Mudstone of the Wilgunya Subgroup in the Rolling Downs Group (Eromanga Basin); correlated with the upper Albian (Lower Cretaceous) *Endoceratium ludbrookae* Dinocyst Zone (*sensu* Partridge 2006) by Foley *et al.* (2022).

Remarks

QM F18101 (= the 'Marathon specimen') is the most complete non-avian dinosaur skeleton ever recovered from Australia (Molnar 1996b). Although initially assigned to *Minmi* sp. (Molnar 1996b), Arbour & Currie (2016) argued for generic distinction from *Minmi paravertebra* (QM F10329), with Leahey *et al.* (2015) erecting *Kunbarrasaurus ieversi* as an early diverging ankylosaurid (Hill *et al.* 2003, Vickaryous *et al.* 2004). *Kunbarrasaurus ieversi* has since been placed at the base of Anklyosauria (Thompson *et al.* 2012, Arbour & Currie 2016, Soto-Acuña *et al.* 2021, Frauenfelder *et al.* 2022, Riguetti *et al.* 2022) within the Gondwanan ankylosaurian clade Parankylosauria; this also includes *Antarctopelta oliveroi* Salgado & Gasparini, 2006 from the upper Campanian Santa Marta Formation of James Ross Island, and *Stegouros elengassen* Soto-Acuña, Vargas, Kaluza, Leppe, Botelho, Palma-Liberona, Gutstein, Fernández, Ortiz, Aravena, Manríquez, Alarcón-Muñoz, Pino, Trevisan, Mansilla, Hinojosa, Muñoz-Walther & Rubilar-Rogers, 2021 from the Cenomanian–Turonian Dorotea Formation of Chile. Nevertheless, *K. ieversi* has been resolved within Ankylosauridae in some recent analyses (Raven *et al.* 2023).

NEORNITHISCHIA Cooper, 1985
CERAPODA Sereno, 1986
ORNITHOPODA Marsh, 1881

Ornithopoda *incertae sedis*

1932, *Fulgurotherium australe* von Huene, p. 69.

Remarks

von Huene (1932) based *Fulgurotherium australe* on a fragmentary distal femur (NHMUK PV R3719; Fig. 10G) that was attributed to a theropod. Molnar (1980a) reassigned the taxon to Ornithopoda, with additional material identified by Molnar & Galton (1986), Rich & Rich (1989), and Rich & Vickers-Rich (1999). Agnolin *et al.* (2010) otherwise designated the taxon a *nomen dubium*. We follow this conclusion in accordance with other recent studies (Bell *et al.* 2018b, 2019a, 2019b, Herne *et al.* 2018, 2019, Poropat *et al.* 2018, Duncan *et al.* 2021).

Weewarrasaurus Bell, Herne, Brougham & Smith, 2018b

Type species

Weewarrasaurus pobeni Bell, Herne, Brougham & Smith, 2018b.

Weewarrasaurus pobeni Bell, Herne, Brougham & Smith, 2018b

2018b, *Weewarrasaurus pobeni* Bell, Herne, Brougham & Smith, p. 7.

Holotype

LRF 3076, an incomplete right dentary with intact dentition (Fig. 10H).

Type locality, unit and age

Locality on 'Wee Warra' Station, close to the Grawin and Glengarry opal fields, ~40 km southwest of Lightning Ridge in northwestern New South Wales, Australia (Bell *et al.* 2018b); Wallangulla Sandstone Member of the Griman Creek Formation in the Rolling Downs Group (Surat Basin). The maximum depositional age range is early to mid-Cenomanian (Late Cretaceous, 100.2–96.6 Ma: Bell *et al.* 2019b).

Remarks

Bell *et al.* (2018b) considered *Weewarrasaurus pobeni* to be a non-iguanodontian ornithopod.

ELASMARIA Calvo, Porfiri and Novas, 2007

Leaellynasaura Rich & Rich, 1989

Type species

Leaellynasaura amicagraphica Rich & Rich, 1989.

Leaellynasaura amicagraphica Rich & Rich, 1989

1989, *Leaellynasaura amicagraphica* Rich & Rich, p. 21.

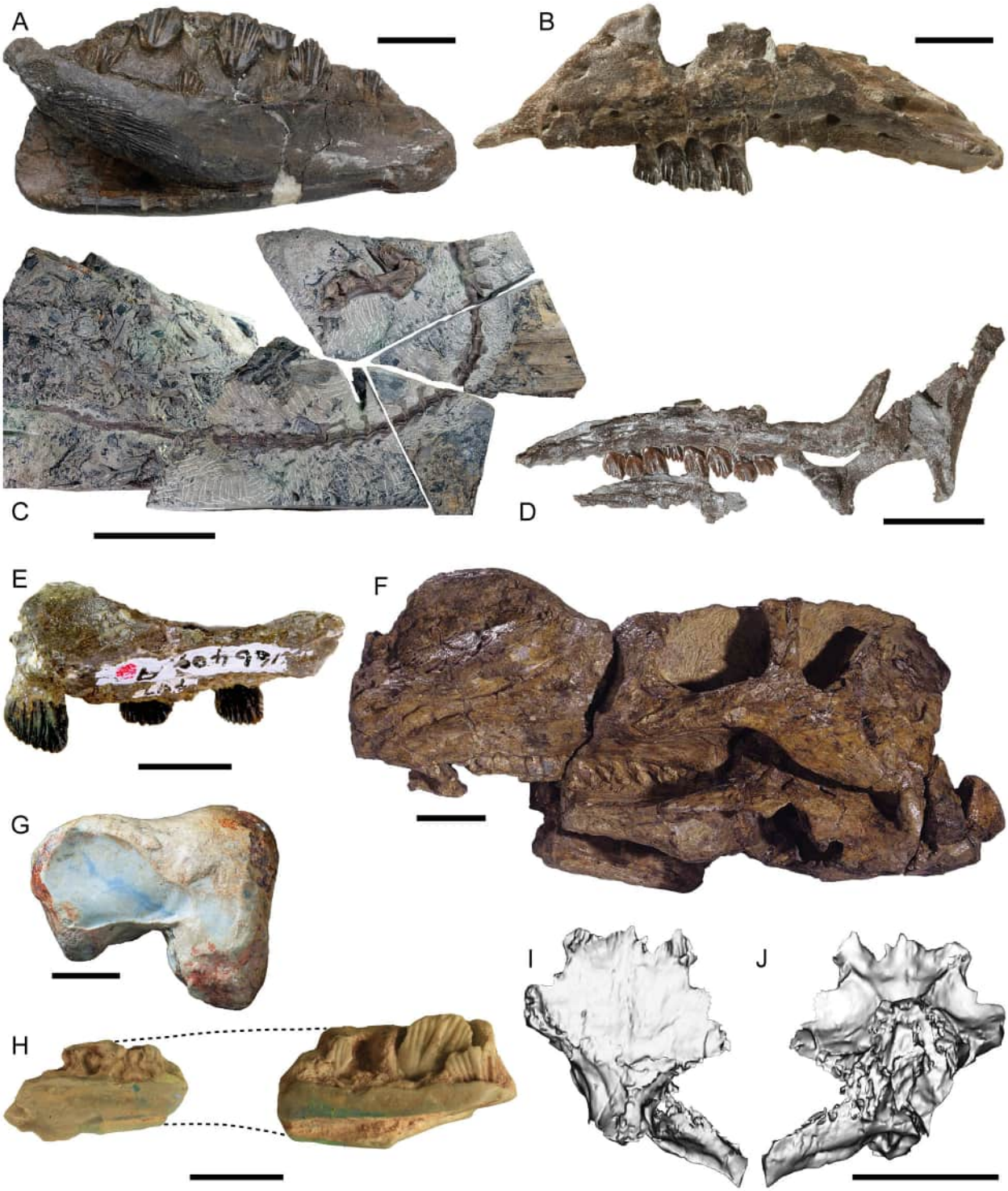

Fig. 10. Australian Mesozoic ornithopod dinosaurs. **A**, *Qantassaurus intrepidus* (NMV P199075; holotype) left dentary in medial view. Scale = 1 cm. **B**, *Galleonosaurus dorisae* (NMV P229196; holotype) left maxilla in lateral view. Scale = 1 cm. **C**, *Diluvicursor pickeringi* (NMV P221080; holotype) partial skeleton. Scale = 10 cm. **D**, *Leaellynasaura amicagraphica* (NMV P185991; holotype) partial skull in left lateral view. Scale = 1 cm. **E**, *Atlascopcosaurus loadsi* (NMV P166409; holotype) left maxilla in lateral view. Scale = 1 cm. **F**, *Muttaburrasaurus langdoni* (QM F6140; holotype) skull and mandible in left lateral view. Scale = 10 cm. **G**, Ornithopoda incertae sedis (NHMUK PV R3719; holotype of *Fulgurotherium australe*) right femur in distal view. Scale = 1 cm. **H**, *Weewarrasaurus pobeni* (LRF 3076; holotype) right dentary in medial view. Scale = 1 cm. *Fostoria dhimbangunmal* (3D digital rendering of LRF 3050; holotype) braincase in **I**, dorsal and **J**, ventral views. Scale bar = 10 cm.

Holotype

NMV P185991 (holotype), an incomplete skull comprising the maxilla, jugal, quadrate, quadratojugal, pterygoid and ectopterygoid (Fig. 10D); recovered in close proximity to NMV P185990, an articulated skull roof (Rich & Rich 1988), NMV P185992 and NMV P185993, an articulated dorsal and caudal vertebral column with hind limb elements interpreted as belonging to a single individual (Rich & Rich 1989).

Type locality, unit and age

'Slippery Rock' locality at Dinosaur Cove near Glenaire, west of Cape Otway on the southwestern coast of Victoria, Australia. Wagstaff *et al.* (2020) correlated strata at this locality with the Eumeralla Formation of the Otway Group (Otway Basin); lower Albian (Lower Cretaceous) *Crybelosporites striatus* Spore-pollen Zone.

Remarks

The association of NMV P185991, NMV P185990, NMV P185992 and NMV P185993 (Rich & Rich 1989) was contested by Herne & Salisbury (2009) and Herne *et al.* (2016), but refuted by Rich *et al.* (2010) and Rich & Vickers-Rich (2020). *Leaellynasaura amicagraphica* has been considered a non-iguanodontian ornithopod (Agnolin *et al.* 2010) or even positioned outside of Ornithopoda (Boyd 2015). Phylogenetic instability of the taxon based on NMV P185991 (Bell *et al.* 2018b, Madzia *et al.* 2018) led to a hypodigm placement of *L. amicagraphica* within the Gondwanan clade Elasmaria (Herne *et al.* 2019), incorporating other Australian mid-Cretaceous small-bodied ornithopods (see Madzia *et al.* 2018, Duncan *et al.* 2021). Alternatively, Poole (2022) proposed classification of *Leaellynasaura* within Hypsilophodontidae; however, this analysis combined character state scores from ambiguously referred specimens (NMV P186047: Gross *et al.* 1993), along with remains pertaining to other taxa (NMV P221080, the holotype of *Diluvicursor pickeringi*; NMV P229196, the holotype of *Galleonosaurus dorisae*: Herne *et al.* 2018, Herne *et al.*, 2019), and is thus rejected herein.

Atlascopcosaurus Rich & Rich, 1989

Type species

Atlascopcosaurus loadsi Rich & Rich, 1989.

Atlascopcosaurus loadsi Rich & Rich, 1989

1989, *Atlascopcosaurus loadsi* Rich & Rich, p. 31.

Holotype

NMV P166409, an isolated left maxilla (Fig. 10E).

Type locality, unit and age

Point Lewis on Cape Otway on the southwestern coast of Victoria, Australia. Wagstaff *et al.* (2020) correlated strata at this locality with the Eumeralla Formation of the Otway Group (Otway Basin); lower Albian (Lower Cretaceous) *Crybelosporites striatus* Spore-pollen Zone.

Remarks

Agnolin *et al.* (2010) considered *Atlascopcosaurus loadsi* a *nomen dubium*; however, the name has remained in use (e.g., Madzia *et al.* 2018, Bell *et al.* 2019a, Herne *et al.* 2019, Duncan *et al.* 2021). *Atlascopcosaurus loadsi* is regarded as a valid genus and species of non-iguanodontian ornithopod (e.g., Norman *et al.* 2004, Agnolin *et al.* 2010, Boyd 2015, Bell *et al.* 2018b) with possible affinity to Elasmaria (Madzia *et al.* 2018). Duncan *et al.* (2021) alternatively placed the taxon within a polytomy of iguanodontian and non-iguanodontian ornithopods.

Qantassaurus Rich & Vickers-Rich, 1999

Type species

Qantassaurus intrepidus Rich & Vickers-Rich, 1999.

Qantassaurus intrepidus Rich & Vickers-Rich, 1999

1999, *Qantassaurus intrepidus* Rich & Vickers-Rich, p. 174.

Holotype

NMV P199075, an isolated left dentary (Fig. 10A).

Type locality, unit and age

Dinosaur Dreaming Fossil Site at Flat Rocks, west of Inverloch on the Bass Coast of southern Victoria, Australia. Wagstaff *et al.* (2020) correlated strata at this locality with the 'Wonthaggi Formation' succession of the upper Strzelecki Group (Gippsland Basin); uppermost Barremian (Lower Cretaceous) *Pilosisporites notensis* Spore-pollen Zone 'Group 1' site category.

Remarks

Norman *et al.* (2004) noted that *Qantassaurus intrepidus* has similarities with the rhabdodontid *Zalmoxes robustus* Weishampel, Csiki-Sava & Norman, 2003, but the taxon is usually considered a non-iguanodontian ornithopod (Agnolin *et al.* 2010, Boyd 2015, Herne *et al.* 2019) within Elasmaria (Madzia *et al.* 2018), or Rhabdodontomorpha (Duncan *et al.* 2021).

Diluvicursor Herne, Tait, Hall, Weisbecker, Nair, Cleeland & Salisbury, 2018

Type species

Diluvicursor pickeringi Herne, Tait, Hall, Weisbecker, Nair, Cleeland & Salisbury, 2018.

Diluvicursor pickeringi Herne, Tait, Hall, Weisbecker, Nair, Cleeland & Salisbury, 2018

2018, *Diluvicursor pickeringi* Herne, Tait, Hall, Weisbecker, Nair, Cleeland & Salisbury, p. 16.

Holotype

NMV P221080, an almost complete caudal vertebral column and lower right hind limb (Fig. 10C).

Type locality, unit and age

'Eric the Red West' locality to the east of Cape Otway on the southwestern coast of Victoria, Australia. Wagstaff *et al.* (2020) correlated strata at this locality with the 'Eric the Red West Sandstone' of the Eumeralla Formation of the Otway Group (Otway Basin); lower Albian (Lower Cretaceous) *Crybelosporites striatus* Spore-pollen Zone.

Remarks

Herne *et al.* (2018) differentiated *Diluvicursor pickeringi* from postcranial remains previously assigned to *Leaellynasaura amicagraphica* but were unable to resolve its placement within Ornithopoda. Duncan *et al.* (2021) alternatively posited that *D. pickeringi* may be a junior synonym of *L. amicagraphica*, *A. loadsi* or another taxon, but this hypothesis cannot be confirmed without further material.

Galleonosaurus Herne, Nair, Evans & Tait, 2019

Type species

Galleonosaurus dorisae Herne, Nair, Evans & Tait, 2019.

Galleonosaurus dorisae Herne, Nair, Evans & Tait, 2019

2019, *Galleonosaurus dorisae* Herne, Nair, Evans & Tait, p. 547.

Holotype

NMV P229196, an isolated left maxilla (Fig. 10B).

Type locality, unit and age

Dinosaur Dreaming Fossil Site at Flat Rocks, west of Inverloch on the Bass Coast of southern Victoria, Australia. Wagstaff *et al.* (2020) correlated strata at this locality with the 'Wonthaggi Formation' succession of the upper Strzelecki Group (Gippsland Basin); uppermost Barremian (Lower Cretaceous) *Pilosisporites notensis* Spore-pollen Zone 'Group 1' site category.

Remarks

Herne *et al.* (2019) placed *Galleonosaurus dorisae* within Elasmaria as a close relative of *Leaellynasaura amicagraphica* and possibly *Diluvicursor pickeringi*. Duncan *et al.* (2021) otherwise determined an uncertain position within Ornithopoda and suggested that *G. dorisae* could be synonymous with *Diluvicursor pickeringi*, but this hypothesis cannot be confirmed without further material.

IGUANODONTIA Baur, 1891 (*sensu* Sereno, 1986)

Muttaburrasaurus Bartholomai & Molnar, 1981

Type species

Muttaburrasaurus langdoni Bartholomai & Molnar, 1981.

Muttaburrasaurus langdoni Bartholomai & Molnar, 1981

1981, *Muttaburrasaurus langdoni* Bartholomai & Molnar, p. 320.

Holotype

QM F6140, an incomplete skeleton comprising the skull and posterior sections of both mandibular rami (Fig. 10F), an almost complete presacral vertebral column, and anterior caudal series, ribs, the pectoral and pelvic girdles, both forelimbs and hind limbs.

Type locality, unit and age

The 'Rock Hole' locality along the banks of the Thomson River on 'Rosebery Downs' Station, ~4.5 km southwest of Muttaburra in central-northern Queensland, Australia (Bartholomai & Molnar 1981); upper Mackunda Formation of the Manuka Subgroup in the Rolling Downs Group (Eromanga Basin). This unit correlates with the uppermost Albian to lowermost Cenomanian (mid-Cretaceous) *Dioxya armata* Dinocyst Zone (*sensu* Partridge 2006) as recalibrated by Foley *et al.* (2022).

Remarks

Muttaburrasaurus langdoni became the Queensland State Fossil Emblem in 2022. Bartholomai & Molnar (1981) classified *M. langdoni* as an 'iguanodontid', with Norman (2004) and Novas *et al.* (2004) referring the taxon to Iguanodontia. McDonald (2012) placed *M. langdoni* within Rhabdodontidae, although Dieudonné *et al.* (2016, 2021) recovered it as a rhabdodontid sister taxon in Rhabdodontomorpha (see Bell *et al.* 2018b, Yang *et al.* 2020). By contrast, Madzia *et al.* (2020) classified *M. langdoni* as a derived iguanodontian within Styracosterna (as had been proposed earlier by Agnolin *et al.* 2010). Molnar (1996a) and Agnolin *et al.* (2010) referred large-bodied ornithopod remains from the upper Albian Allaru Mudstone (Rolling Downs Group) to *Muttaburrasaurus* sp., which might represent a separate species (Matthew Herne [UNE] pers. comm. 2022). Poole (2022), nonetheless, integrated scores from QM F6140 with the Allaru Mudstone specimen QM F14921 to place the genus *Muttaburrasaurus* within Rhabdodontoidea as a potential sister to Rhabdodontidae.

Fostoria Bell, Brougham, Herne, Frauenfelder & Smith, 2019

Type species

Fostoria dhimbangunmal Bell, Brougham, Herne, Frauenfelder & Smith, 2019a.

Fostoria dhimbangunmal Bell, Brougham, Herne, Frauenfelder & Smith, 2019a

2019a, *Fostoria dhimbangunmal* Bell, Brougham, Herne, Frauenfelder & Smith, p. 3.

Holotype

LRF 3050.A, an incomplete skull roof and braincase comprising frontals, parietals, supraoccipital, basisphenoid, the right otoccipital, and laterosphenoids, orbitosphenoids, and prootics (Fig. 10I, J).

Type locality, unit and age

Sheepyard Opal Field in the Grawin Opal Fields, ~70 km west of Lightning Ridge in northwestern New South Wales, Australia; Wallangulla Sandstone Member within the Griman Creek Formation of the Rolling Downs Group (Surat Basin). The maximum depositional age range is early to mid-Cenomanian (Late Cretaceous, 100.2–96.6 Ma: Bell *et al.* 2019b).

Remarks

The holotype (LRF 3050.A) of *Fostoria* was preserved in association with 100 fragmentary bones representing at least four individuals (Bell *et al.* 2019a). Bell *et al.* (2019a) placed *Fostoria dhimbangunmal* with *Muttaburrasaurus langdoni* in Iguanodontia. Dieudonné *et al.* (2021) alternatively nested these taxa within Rhabdodontomorpha.

SYNAPSIDA Osborn, 1903
THERAPSIDA Broom, 1905
THERIODONTIA Owen, 1876
CYNODONTIA Owen, 1861
MAMMALIA Linnaeus, 1758
AUSTRALOSPHENIDA Luo, Cifelli, and Kielan-Jaworowska, 2001
AUSKTRIBOSPHENIDAE Rich, Vickers-Rich, Constantine, Flannery, Kool & Van Klaveren, 1997

Ausktribosphenos Rich, Vickers-Rich, Constantine, Flannery, Kool & Van Klaveren, 1997

Type species

Ausktribosphenos nyktos Rich, Vickers-Rich, Constantine, Flannery, Kool & Van Klaveren, 1997.

Ausktribosphenos nyktos Rich, Vickers-Rich, Constantine, Flannery, Kool & Van Klaveren, 1997

1997, *Ausktribosphenos nyktos* Rich, Vickers-Rich, Constantine, Flannery, Kool & Van Klaveren, p. 1439.

Holotype

NMV P208090, an incomplete right dentary with pm6 and m1–m3 (Fig. 11F).

Type locality, unit and age

Dinosaur Dreaming Fossil Site at Flat Rocks, west of Inverloch on the Bass Coast of southern Victoria, Australia. Wagstaff *et al.* (2020) correlated strata at this locality with the 'Wonthaggi Formation' succession of the upper Strzelecki Group (Gippsland Basin); uppermost Barremian (Lower Cretaceous) *Pilosisporites notensis* Spore-pollen Zone 'Group 1' site category.

Remarks

Ausktribosphenos nyktos has been variously interpreted as a placental (Rich *et al.* 1997, Rich *et al.* 1998), eutherian (Rich *et al.* 2001a, Rich *et al.* 2002, Woodburne 2003, Woodburne *et al.* 2003), or a convergent non-therian (Kielan-Jaworowska *et al.* 1998, Archer *et al.* 1999) related to monotremes (Luo *et al.* 2001, Luo *et al.* 2002, Rauhut *et al.* 2002, Kielan-Jaworowska *et al.* 2004). Flannery *et al.* (2022a) alternatively argued against monotreme affinities, and classified *A. nyktos* as a Gondwanan representative of Tribosphenida (Flannery *et al.* 2022b). Nonetheless, to maintain a phylogenetically justifiable taxonomy (and consistency with the corresponding online auFNSL: Travouillon *et al.* 2021), we retain *A. nyktos* within Australosphenida as defined by Luo *et al.* (2001).

Kryoparvus Rich, Trusler, Kool, Pickering, Evans, Siu, Maksimenko, Kundrat, Gostling, Morton, & Vickers-Rich, 2020c.

Type species

Kryoparvus gerriti Rich, Trusler, Kool, Pickering, Evans, Siu, Maksimenko, Kundrat, Gostling, Morton, & Vickers-Rich, 2020.

Kryoparvus gerriti Rich, Trusler, Kool, Pickering, Evans, Siu, Maksimenko, Kundrat, Gostling, Morton, & Vickers-Rich, 2020

2020, *Kryoparvus gerriti* Rich, Trusler, Kool, Pickering, Evans, Siu, Maksimenko, Kundrat, Gostling, Morton, & Vickers-Rich, p. 68.

Holotype

NMV P210087, an incomplete right dentary with m1–m3 (Fig. 11G).

Type locality, unit and age

Dinosaur Dreaming Fossil Site at Flat Rocks, west of Inverloch on the Bass Coast of southern Victoria, Australia. Wagstaff *et al.* (2020) correlated strata at this locality with the 'Wonthaggi Formation' succession of the upper Strzelecki Group (Gippsland Basin); uppermost Barremian (Lower Cretaceous) *Pilosisporites notensis* Spore-pollen Zone 'Group 1' site category.

Remarks

Kryoparvus gerriti is distinguished as possibly the smallest-bodied Mesozoic mammal on record (Rich *et al.* 2020c). Rich *et al.* (2020c) assigned the taxon to Ausktribosphenidae, which was reiterated by Flannery *et al.* (2022b), who also posited tribosphenidan affinities. We otherwise retain *K. gerriti* with *A. nyktos* in Australophenida (*sensu* Travouillon *et al.* 2021) to follow the most widely accepted phylogenetic taxonomy (see Luo *et al.* 2001, Luo *et al.* 2002, Rauhut *et al.* 2002, Kielan-Jaworowska *et al.* 2004).

BISHOPIDAE Flannery, Rich, Vickers-Rich, Veatch & Helgen, 2022b

Bishops Rich, Flannery, Trusler, Kool, Van Klaveren, & Vickers-Rich, 2001b

Type species

Bishops whitmorei Rich, Flannery, Trusler, Kool, Van Klaveren, & Vickers-Rich, 2001b.

Bishops whitmorei Rich, Flannery, Trusler, Kool, Van Klaveren, & Vickers-Rich, 2001b

2001b, *Bishops whitmorei* Rich, Flannery, Trusler, Kool, Van Klaveren, & Vickers-Rich, p. 2.

Holotype

NMV P210075, a left dentary with pm2–pm6 and m1–m3 (Fig. 11H).

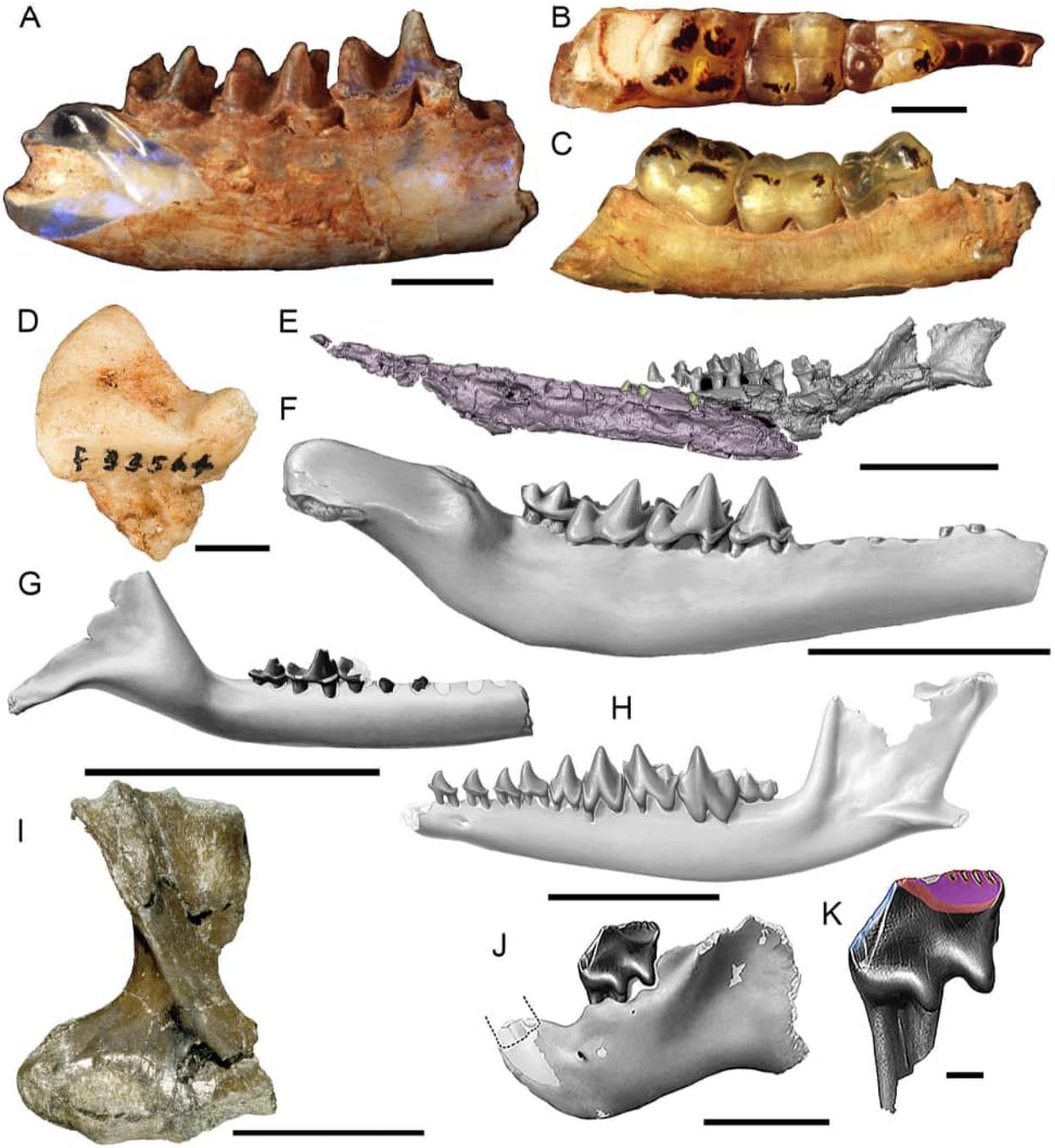

Fig. 11. Australian Mesozoic synapsids. **A**, *Steropodon galmani* (AM F66763; holotype) partial right mandible in lateral view. Scale = 5 mm. *Kollikodon ritchiei* (AM F96602; holotype) partial right mandible in **B**, occlusal and **C**, lateral views. Scale = 5 mm. **D**, *Stirtodon elizabethae* (AM F118621; holotype) right upper premolar in labial view (modified from Rich *et al.* 2020a). Scale = 5 mm. **E**, *Teinolophus trusleri* (3D digital rendering of NMV P229408; referred specimen) left dentary in lateral view (modified from Rich *et al.* 2016). Scale = 5 mm. **F**, *Ausktribosphenos nyktos* (NMV P208090; holotype) right mandible in lateral view. Scale = 5 mm. **G**, *Kryoparvus gerriti* (NMV P210087; holotype) right mandible in lateral view (modified from Rich *et al.* 2020c). Scale = 5 mm. **H**, *Bishops whitmorei* (NMV P210075; holotype) left mandible in lateral view. Scale = 5 mm. **I**, *Kryoryctes cadburyi* (NMV P208094; holotype) right humerus in ventrolateral view. **J**, *Corriebaatar marywaltersae* (NMV P252730; referred specimen) left mandible in lateral view. Scale = 5 mm. **K**, *Corriebaatar marywaltersae* (NMV P252730; referred specimen) detail of left p4. Scale = 1 mm.

Type locality, unit and age

Dinosaur Dreaming Fossil Site at Flat Rocks, west of Inverloch on the Bass Coast of southern Victoria, Australia. Wagstaff *et al.* (2020) correlated rocks at this locality with the 'Wonthaggi Formation' succession of the upper Strzelecki Group (Gippsland Basin); uppermost Barremian (Lower Cretaceous) *Pilosisporites notensis* Spore-pollen Zone 'Group 1' site category.

Remarks

Bishops whitmorei was grouped in Ausktribosphenidae by Luo *et al.* (2001), but elevated to a monotypic family Bishopidae within Tribosphenida by Flannery *et al.* (2022b). Although we retain Bishopidae based on character state distinction (see Flannery *et al.* 2022b), this clade is herein referred to Australosphenida to maintain consistency with the classification schemes of Luo *et al.* (2001) and

Travouillon *et al.* (2021). Other potential bishopids include *Bishops* cf. *B. whitmorei* (Rich *et al.* 2009a) and aff. *Bishops*? (Rich *et al.* 2020b) from the lower Albian Eumeralla Formation of the Otway Group, and aff. ?*Bishops* from the Cenomanian Mata Amarilla Formation in southern Patagonia, Argentina (Martin *et al.* 2022).

PROTOTHERIA Gill, 1872
MONOTREMATA Bonaparte, 1832 *sensu* Bonaparte, 1838

Kryoryctes Pridmore, Rich, Vickers-Rich & Gambaryan, 2005

Type species

Kryoryctes cadburyi Pridmore, Rich, Vickers-Rich & Gambaryan, 2005.

Kryoryctes cadburyi Pridmore, Rich, Vickers-Rich & Gambaryan, 2005.

2005, *Kryoryctes cadburyi* Pridmore, Rich, Vickers-Rich & Gambaryan, p. 361.

Holotype

NMV P208094, an isolated right humerus (Fig. 11I).

Type locality, unit and age

'Slippery Rock Pillar' locality at Dinosaur Cove, west of Cape Otway on the southwestern coast of Victoria, Australia. Wagstaff *et al.* (2020) correlated this locality with the Eumeralla Formation of the Otway Group (Otway Basin); lower Albian (Lower Cretaceous) *Crybelosporites striatus* Spore-pollen Zone.

Remarks

Kryoryctes cadburyi has been regarded as a stem-tachyglossid (Rowe *et al.* 2008, Camens 2010), or a non-monotreme mammal (Musser 2013). The most recent assessment tentatively assigned *K. cadburyi* to Kollikodontidae (Flannery *et al.* 2022a), although we refrain from a definitive classification until additional fossils are discovered.

Stirtodon Rich, Flannery & Vickers-Rich, 2020

Type species

Stirtodon elizabethae Rich, Flannery & Vickers-Rich, 2020.

Stirtodon elizabethae Rich, Flannery & Vickers-Rich, 2020

2020, *Stirtodon elizabethae* Rich, Flannery & Vickers-Rich, p. 529.

Holotype

AM F118621, a right upper premolar (Fig. 11D).

Type locality, unit and age

'Vertical Bill's claim' on the Three-Mile Field in Lightning Ridge, northwestern New South Wales, Australia; 'Finch Clay Facies' of the Wallangulla Sandstone Member of the Griman Creek Formation in the Rolling Downs Group (Surat Basin). The maximum depositional age range is early to mid-Cenomanian (Late Cretaceous, 100.2–96.6 Ma: Bell *et al.* 2019b).

Remarks

Originally classified as a synapsid (Clemens *et al.* 2003), Rich *et al.* (2020a) recognized affinity with Monotremata, and Flannery *et al.* (2022a) suggested possible referral to Teinolophidae. We refrain from a definitive classification until additional fossils are discovered.

TEINOLOPHIDAE Flannery, Rich, Vickers-Rich, Ziegler, Veatch & Helgen, 2022a

Teinolophos Rich, Vickers-Rich, Constantine, Flannery, Kool & Van Klaveren, 1999

Type species

Teinolophos trusleri Rich, Vickers-Rich, Constantine, Flannery, Kool & Van Klaveren, 1999.

Teinolophos trusleri Rich, Vickers-Rich, Constantine, Flannery, Kool & Van Klaveren, 1999

1999, *Teinolophos trusleri* Rich, Vickers-Rich, Constantine, Flannery, Kool & Van Klaveren, p. 19.

Holotype

NMV P208231, an incomplete left dentary with m4.

Type locality, unit and age

Dinosaur Dreaming Fossil Site at Flat Rocks, west of Inverloch on the Bass Coast of southern Victoria, Australia. Wagstaff *et al.* (2020) correlated rocks at this locality with the 'Wonthaggi Formation' succession of the upper Strzelecki Group (Gippsland Basin); uppermost Barremian (Lower Cretaceous) *Pilosisporites notensis* Spore-pollen Zone 'Group 1' site category.

Remarks

Rich *et al.* (1999) classified *Teinolophos trusleri* (Fig. 11E) as a 'eupantothere', but subsequently referred the taxon to Monotremata (Rich *et al.* 2001c, Rich *et al.* 2016) with controversial interpretations (Bever *et al.* 2005, Martin & Luo 2005, Rich *et al.* 2005a, 2005b, Rougier *et al.* 2005). Rowe *et al.* (2008) placed *T. trusleri* within Ornithorhynchidae, although Flannery *et al.* (2022b) alternatively established the monotypic family Teinolophidae as a basally divergent monotreme lineage.

STEROPODONTIDAE Archer, Flannery, Ritchie & Molnar, 1985

Steropodon Archer, Flannery, Ritchie & Molnar, 1985

Type species

Steropodon galmani Archer, Flannery, Ritchie & Molnar, 1985.

Steropodon galmani Archer, Flannery, Ritchie & Molnar, 1985

1985, *Steropodon galmani* Archer, Flannery, Ritchie & Molnar, p. 364.

Holotype
AM F66763, an incomplete right dentary with m1–m3 (Fig. 11A).

Type locality, unit and age
Unspecified opal field in the Lightning Ridge region of northwestern New South Wales, Australia; 'Finch Clay Facies' of the Wallangulla Sandstone Member of the Griman Creek Formation in the Rolling Downs Group (Surat Basin). The maximum depositional age range is early to mid-Cenomanian (Late Cretaceous, 100.2–96.6 Ma: Bell *et al.* 2019b).

Remarks
The first Mesozoic mammal described from Australia (Archer *et al.* 1985), *Steropodon galmani* represents the monotypic family Steropodontidae within Monotremata (Flannery *et al.* 2022a). A possible maxilla fragment (AM 66786) referred to *S. galmani* by Rich *et al.* (1989) has been reidentified as a turtle element (Smith 2009).

KOLLIKODONTIDAE Flannery, Archer, Rich & Jones, 1995

Kollikodon Flannery, Archer, Rich & Jones, 1995

Type species
Kollikodon ritchiei Flannery, Archer, Rich & Jones, 1995.

Kollikodon ritchiei Flannery, Archer, Rich & Jones, 1995

1995, *Kollikodon ritchiei* Flannery, Archer, Rich & Jones, p. 418.

Holotype
AM F96602, an incomplete right dentary with m1–m3 (Fig. 11B, C).

Type locality, unit and age
Claim 30226 in Moonshine locality of the Coocoran Opal Fields, west of Lightning Ridge in northwestern New South Wales, Australia; 'Finch Clay Facies' of the Wallangulla Sandstone Member of the Griman Creek Formation in the Rolling Downs Group (Surat Basin). The maximum depositional age range is early to mid-Cenomanian (Late Cretaceous, 100.2–96.6 Ma: Bell *et al.* 2019b).

Remarks
Kollikodon ritchiei has been resolved as the sister taxon to Monotremata within Australosphenida (Pian *et al.* 2016), or even a mammaliaform outside Mammalia (Musser 2003); however, placement within Monotremata (Flannery *et al.* 1995) was reinforced by the recent assessment of Flannery *et al.* (2022a).

Sundrius Rich, Flannery, Evans, White, Ziegler, Maguire, Poropat, Trusler & Vickers-Rich, 2020b

Type species
Sundrius ziegleri Rich, Flannery, Evans, White, Ziegler, Maguire, Poropat, Trusler & Vickers-Rich, 2020b.

Sundrius ziegleri Rich, Flannery, Evans, White, Ziegler, Maguire, Poropat, Trusler & Vickers-Rich, 2020b

2020b, *Sundrius ziegleri* Rich, Flannery, Evans, White, Ziegler, Maguire, Poropat, Trusler & Vickers-Rich, p. 78.

Holotype
NMV P252052, a broken left upper molar.

Type locality, unit and age
'Eric the Red West' locality to the east of Cape Otway on the southwestern coast of Victoria, Australia. Wagstaff *et al.* (2020) correlated strata at this locality with the 'Eric the Red West Sandstone' of the Eumeralla Formation of the Otway Group (Otway Basin); lower Albian (Lower Cretaceous) *Crybelosporites striatus* Spore-pollen Zone.

Remarks
Although tentatively assigned to Monotremata (Rich *et al.* 2020b), *Sundrius ziegleri* was recently classified within Kollikodontidae and may be synonymous with *Kryoryctes cadburyi* (Flannery *et al.* 2022a).

THERIIFORMES Rowe, 1988
ALLOTHERIA Marsh, 1880
MULTITUBERCULATA Cope, 1884
CIMOLODONTA McKenna, 1975
CORRIEBAATARIDAE Rich, Vickers-Rich, Flannery, Kear, Cantrill, Komarower, Kool, Pickering, Trusler, Morton, Van Klaveren & Fitzgerald, 2009b

Corriebaatar Rich, Vickers-Rich, Flannery, Kear, Cantrill, Komarower, Kool, Pickering, Trusler, Morton, Van Klaveren & Fitzgerald, 2009b

Type species
Corriebaatar marywaltersae Rich, Vickers-Rich, Flannery, Kear, Cantrill, Komarower, Kool, Pickering, Trusler, Morton, Van Klaveren & Fitzgerald, 2009b.

Corriebaatar marywaltersae Rich, Vickers-Rich, Flannery, Kear, Cantrill, Komarower, Kool, Pickering, Trusler, Morton, Van Klaveren & Fitzgerald, 2009b

2009b, *Corriebaatar marywaltersae* Rich, Vickers-Rich, Flannery, Kear, Cantrill, Komarower, Kool, Pickering, Trusler, Morton, Van Klaveren & Fitzgerald, p. 2.

Holotype
NMV P216655, a left dentary fragment with pm4 and the mesial root of m1.

Type locality, unit and age
Dinosaur Dreaming Fossil Site at Flat Rocks, west of Inverloch on the Bass Coast of southern Victoria, Australia. Wagstaff *et al.* (2020) correlated rocks at this locality with the 'Wonthaggi Formation' succession of the upper Strzelecki Group (Gippsland Basin); uppermost Barremian (Lower Cretaceous) *Pilosisporites notensis* Spore-pollen Zone 'Group 1' site category.

Remarks
Corriebaatar marywaltersae is the only multituberculate known from Australia (Rich *et al.* 2009b), with a second specimen (NMV P252730: Fig. 11J, K) confirming placement in Cimolodonta (Rich *et al.* 2022a).

Systematic palaeoichnology

Sauropod tracks

Oobardjidama Salisbury, Romilio, Herne, Tucker & Nair, 2017

Type species
Oobardjidama foulkesi Salisbury, Romilio, Herne, Tucker & Nair, 2017.

Oobardjidama foulkesi Salisbury, Romilio, Herne, Tucker & Nair, 2017

2017, *Oobardjidama foulkesi* Salisbury, Romilio, Herne, Tucker & Nair, p. 43.

Holotype
WAM 12.1.6, a polyurethane resin replica of the natural mould of a right pes (track locality reference UQL-DP45-8[rp2]: Fig. 12A).

Type locality, unit and age
Topotype trackway locality UQL-DP45 in the intertidal zone of the Yanijarri-Lurujarri section of the Dampier Peninsula in the west Kimberly region of Western Australia, Australia (see Salisbury *et al.* 2017); Broome Sandstone depositional cycle within the Canning Basin, correlated with the mid-Valanginian to mid-Barremian (Lower Cretaceous) uppermost *Egmontodinium torynum* to mid-*Muderongia australis* dinocyst zones and upper *Ruffordiaspora australiensis* to upper *Foraminisporis wonthaggiensis* spore-pollen zones (Smith *et al.* 2013).

Remarks
Sauropod tracks and trackways are a common component of the Broome Sandstone dinosaur ichnofossil assemblage (Thulborn *et al.* 1994, Thulborn 2012, Salisbury *et al.* 2017). Although as many as seven types of sauropod tracks have been identified (Salisbury *et al.* 2017; Salisbury & Romilio 2019), most are too poorly defined to warrant formal naming. The only exception, *Oobardjidama foulkesi*, was attributed to either a diplodocoid or a non-lithostrotian titanosauriform trackmaker by Salisbury *et al.* (2017).

Theropod tracks

Megalosauropus Colbert & Merrilees, 1967

Type species
Megalosauropus broomensis Colbert & Merrilees, 1967.

Megalosauropus broomensis Colbert & Merrilees, 1967

1967, *Megalosauropus broomensis* Colbert & Merrilees, p. 22.

Holotype
WAM 66.2.51, epoxy resin, fibreglass and plaster positive from the natural mould of a left pes (Fig. 12B; track locality reference G5-6: Colbert & Merrilees 1967).

Type locality, unit and age
Topotype trackway locality at Minyirr (= Gantheaume Point) ~7.5 km west of Broome on the Dampier Peninsula in the west Kimberly region of Western Australia, Australia (see Salisbury *et al.* 2017); Broome Sandstone depositional cycle within the Canning Basin, correlated with the mid-Valanginian to mid-Barremian (Lower Cretaceous) uppermost *Egmontodinium torynum* to mid-*Muderongia australis* dinocyst zones and upper *Ruffordiaspora australiensis* to upper *Foraminisporis wonthaggiensis* spore-pollen zones (Smith *et al.* 2013).

Remarks
Numerous tridactyl theropod tracks have been referred to the ichnogenus *Megalosauropus* (see Lockley *et al.* 1996, 2000); however, the type ichnospecies *Megalosauropus broomensis* is restricted to the Broome Sandstone (Lockley *et al.* 1996, 2000, Thulborn 2001). Colbert & Merrilees (1967, p. 25) attributed these tracks to 'a large carnosaur … possibly *Megalosaurus* itself'. Salisbury *et al.* (2017) alternatively compared the gracile proportions of the pedal impressions to body fossils of the megaraptorid *Australovenator wintonensis*. Although the G5-6 topotype trackway of *M. broomensis* was lost to erosion in the early 1990s, numerous other examples of *M. broomensis* occur at Minyirr, elsewhere around Broome, and along the Yanijarri-Lurujarri coastline ~50 km further north (Salisbury *et al.* 2017). Romilio & Godfrey (2022) recently assigned multiple theropod tracks to an indeterminate ichnospecies of *Megalosauropus* from the lower Albian Eumeralla Formation at Wattle Bay, west of Cape Otway in Victoria, Australia.

Skartopus Thulborn & Wade, 1984

Type species
Skartopus australis Thulborn & Wade, 1984.

Skartopus australis Thulborn & Wade, 1984.

1979, Coelurosaur tracks Thulborn & Wade, p. 275.
1984, *Skartopus australis* Thulborn & Wade, p. 427.

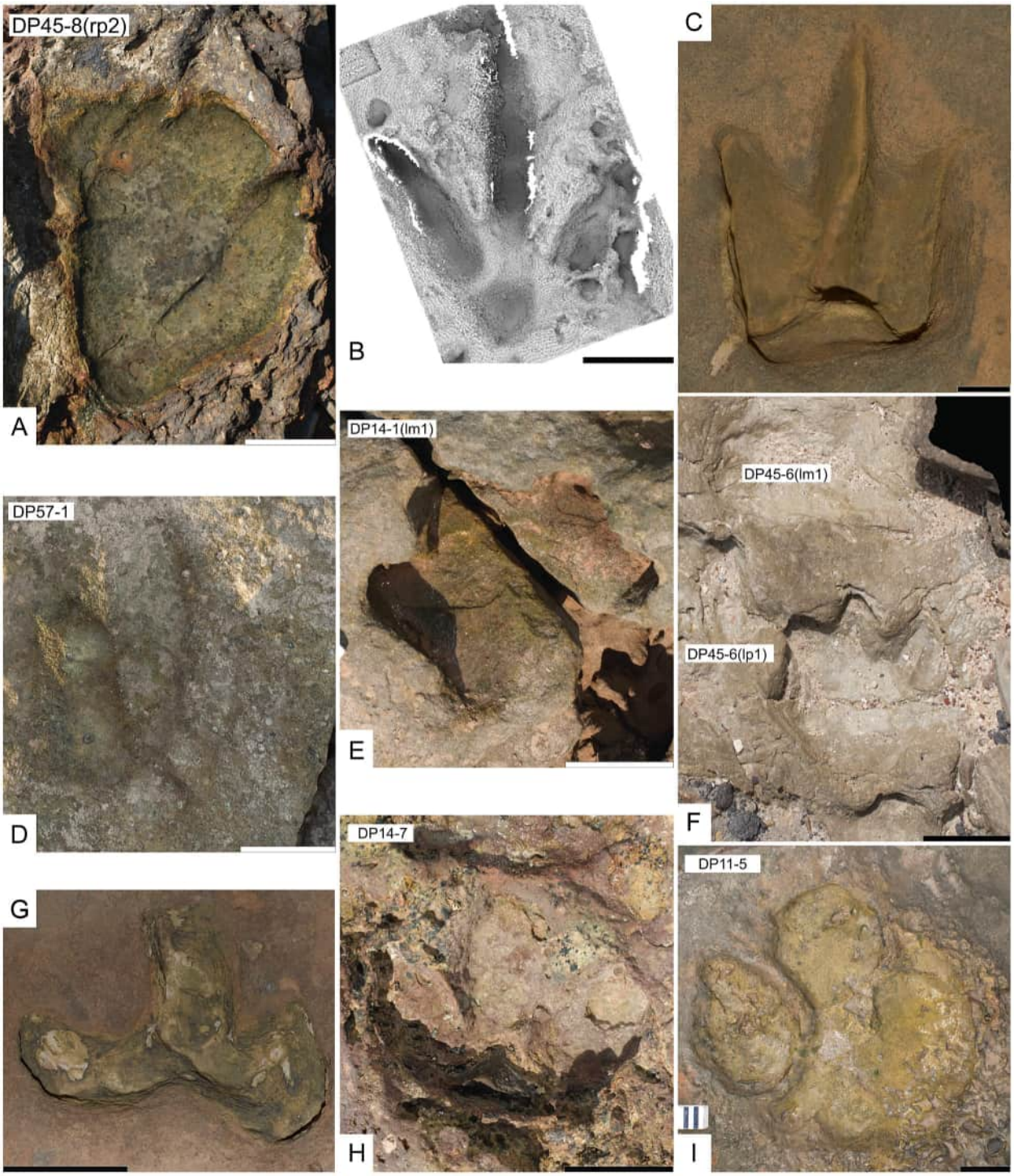

Fig. 12. Australian Mesozoic dinosaur tracks. **A**, *Oobardjidama foulkesi* (UQL-DP45-8[rp2]; topotype) right pedal track. Scale bar = 20 cm. **B**, *Megalosauropus broomensis* (ambient occlusion image of WAM 66.2.51: holotype) left pedal track. Scale bar = 10 cm. **C**, *Skartopus australis* (QM F10330; holotype) right pedal track. Scale bar = 1 cm. **D**, *Yangtzepus clarkei* (UQL-DP57-1; topotype) right pedal track. Scale bar = 10 cm. **E**, *Garbina roeorum* (UQL-DP14-1[lm1]; topotype [part]) left manal track. Scale bar = 10 cm. **F**, *Luluichnus mueckei* (UQL-DP45-6[lp1, lm1]; topotype) coupled left manual and pedal tracks. Scale bar = 10 cm. **G**, *Wintonopus latomorum* (QM F10319; holotype) right pedal track. Scale bar = 5 cm. **H**, *Wintonopus middletonae* (UQL-DP14-7; topotype) ?left pedal track. Scale bar = 10 cm. **I**, *Walmadanyichnus hunteri* (UQL-DP11-5; topotype) right pedal track. Scale bar = 10 cm. A–B, D–F and H–I from Salisbury *et al.* (2017).

2013, *Wintonopus latomorum* (Thulborn & Wade) Romilio, Tucker & Salisbury, p. 114.
2017, *Skartopus australis* (Thulborn & Wade) Thulborn, p. 1.

Holotype

QM F10330, a left pedal impression (Fig. 12C).

Type locality, unit and age

Dinosaur Stampede National Monument at Lark Quarry Conservation Park, ~120 km southwest of Winton in Central West Queensland, Australia; middle Cenomanian–upper Turonian (Upper Cretaceous) strata within the Winton Formation of the Manuka Subgroup in the Rolling Downs Group (Eromanga Basin). Tucker *et al.* (2013)

constrained the maximum depositional age of track-bearing localities in the Winton Formation at Lark Quarry Conservation Park to the middle Cenomanian–early Turonian (Late Cretaceous; 94.5–92 Ma using U-Pb isotope dating of detrital zircons); this correlates with the *Appendicisporites distocarinatus* spore-pollen zone of Helby *et al.* (1987), and the recalibrated upper *Dioxya armata*, *Xenascus asperus* and lower *Diconodinum multispinum* dinocyst zones (*sensu* Partridge 2006) of Foley *et al.* (2022).

Remarks

Thulborn & Wade (1984) assigned 34 trackways from the Dinosaur Stampede National Monument assemblage to *Skartopus australis*. These were characterized by small, symmetrical tridactyl footprints with long, narrow digital impressions attributed to small-bodied non-avian theropods (Thulborn & Wade 1979, 1984). Romilio *et al.* (2013) critiqued that the individual track dimensions and trackway parameters, including pace, stride, and pace angulation listed by Thulborn & Wade (1979, 1984, 1989) are difficult to confirm. Certainly, Thulborn & Wade (1984, p. 511, pl. 14, fig. B) photographed only three tracks in a continuous *S. australis* trackway, whereas Wade (1989, p. 77, fig. 8.5) illustrated '[p]rints 7–12 of 24' from a trackway that Romilio *et al.* (2013, p. 107, fig. 6) identified as 'LQ-2' and attributed to the ornithopod ichnotaxon *Wintonopus latomrorum* Thulborn & Wade, 1984. This was then used as a basis for rendering *S. australis* a junior synonym of *W. latomrorum*, with the recognition that several tracks assigned to *S. australis* by Thulborn & Wade (1984) formed parts of trackways incorporating examples of *W. latomorum* (see Romilio *et al.* 2013, pp. 107–108, figs 6, 7), and that even the holotype of *S. australis* (QM F10330) integrated internal track outlines consistent with *W. latomorum* (Romilio *et al.* 2013, p. 110, fig. 10). Comparable examples of deeply impressed '*Skartopus*-like' trackways incorporating shallower *W. latomorum* tracks have also been described from the mid-Valanginian to mid-Barremian Broome Sandstone of the Walmadany area on the Dampier Pensinsula of Western Australia (e.g., UQL-DP5-1: see Salisbury *et al.* 2017, p. 78, fig. 39). Nonetheless, Thulborn (2017) and Poropat *et al.* (2021b) rejected this synonymization, and instead documented additional examples of *S. australis* (AODF 0904.T1) from the Snake Creek Tracksite in the 'upper' Winton Formation, northwest of Winton in Queensland, Australia (see Poropat *et al.* 2021b, p. 39, fig. 20). In light of these unresolved competing interpretations, we provisionally retain *S. australis* as a valid ichnotaxon until further studies clarify the ambiguous track associations.

Yangtzepus Young, 1960

Type species

Yangtzepus yipingensis Young, 1960.

Yangtzepus clarkei Salisbury, Romilio, Herne, Tucker & Nair, 2017

2017, *Yangtzepus clarkei* Salisbury, Romilio, Herne, Tucker & Nair, p. 34.

Holotype

WAM 12.1.1, a polyurethane resin replica of a right pedal impression (track locality reference UQL-DP57-1: Fig. 12D).

Type locality, unit and age

Topotype trackway locality UQL-DP57-1 in the intertidal zone of the Yanijarri-Lurujarri section of the Dampier Peninsula in the west Kimberly region of Western Australia, Australia (see Salisbury *et al.* 2017); Broome Sandstone depositional cycle within the Canning Basin, correlated with the mid-Valanginian to mid-Barremian (Lower Cretaceous) uppermost *Egmontodinium torynum* to mid-*Muderongia australis* dinocyst zones and upper *Ruffordiaspora australiensis* to upper *Foraminisporis wonthaggiensis* spore-pollen zones (Smith *et al.* 2013).

Remarks

Yangtzepus clarkei tridactyl tracks are longer than wide with distinctive 'inflated' digital impressions (especially that of digit III) that closely resemble the probable theropod ichnotype species *Yangtzepus yipingensis* (see Xing *et al.* 2009b, Salisbury *et al.* 2017).

Kayentapus Welles, 1971

Type species

Kayentapus hopii Welles, 1971.

Kayentapus ichnosp. indet.

1971, *Changpeipus bartholomaii* Haubold, p. 79.
1997, cf. *Eubrontes* Thulborn, p. 42.
2009, cf. *Eubrontes* Turner *et al.* p. 63.
2021, *Kayentapus* ichnosp. Indet. Romilio, Jannel & Salisbury, p. 2138.

Remarks

Haubold (1971) assigned two tridactyl theropod tracks to *Changpeipus bartholomaii* Haubold, 1971 from the mid-Oxfordian Walloon Coal Measures of the Injune Creek Group at Rosewood, ~62 km west of Brisbane in Queensland, Australia. However, Haubold (1971) failed to formally designate a holotype or describe these traces in detail, which renders the ichnotaxon a *nomen nudum* (Xing *et al.* 2009a). Thulborn (1997) and Turner *et al.* (2009) also noted similarities to the ubiquitous theropod ichnotaxon *Eubrontes* Hitchcock, 1845, and Romilio *et al.* (2021a) otherwise assigned all definitive theropod tracks from the Walloon Coal Measures to the ichnogenus *Kayentapus* Welles, 1971.

Thyreophoran tracks

Garbina Salisbury, Romilio, Herne, Tucker & Nair, 2017

Type species

Garbina roeorum Salisbury, Romilio, Herne, Tucker & Nair, 2017.

Garbina roeorum Salisbury, Romilio, Herne, Tucker & Nair, 2017

2017, *Garbina roeorum* Salisbury, Romilio, Herne, Tucker & Nair, p. 88.

Holotype

WAM 12.1.19 and WAM 12.1.20, polyurethane resin replicas from associated natural moulds of a left manus and a left pes, respectively (track locality references UQL-DP14-1[lm1] [Fig. 12E], UQL-DP14-1[lp1]).

Type locality, unit and age

Topotype trackway locality UQL-DP14-1 in the intertidal zone of the Yanijarri-Lurujarri section of the Dampier Peninsula in the west Kimberly region of Western Australia, Australia (see Salisbury *et al.* 2017); Broome Sandstone depositional cycle within the Canning Basin, correlated with the mid-Valanginian to mid-Barremian (Lower Cretaceous) uppermost *Egmontodinium torynum* to mid-*Muderongia australis* dinocyst zones and upper *Ruffordiaspora australiensis* to upper *Foraminisporis wonthaggiensis* spore-pollen zones (Smith *et al.* 2013).

Remarks

The Broome Sandstone has long been famous for producing thyreophoran footprints that might be attributable to stegosaurians (e.g., Long 1992a, Thulborn *et al.* 1994). Salisbury *et al.* (2017) accordingly identified *Garbina roeorum* as a probable stegosaurian ichnotaxon based on the co-occurrence of tetradactyl manual and tridactyl pedal impressions within multiple trackways. Some tracks and trackways from the Yanijarri-Lurujarri section of the Dampier Peninsula indicate that the predominantly quadrupedal *G. roeorum* trackmaker was also capable of bipedal locomotion over short distances (Salisbury *et al.* 2017, p. 93, fig. 49). Romilio *et al.* (2021a) subsequently described a cf. *Garbina* manual track (see Hill et al. 1966) from the mid-Oxfordian Walloon Coal Measures of Rosewood in southeastern Queensland, which now constitutes the stratigraphically oldest evidence of stegosaurians in Australia (Salisbury *et al.* 2017). In the absence of any body fossils, tracks assigned to *Garbina* and similar ichnotaxa are the only evidence of stegosaurian ornithischians in Australia.

Luluichnus Salisbury, Romilio, Herne, Tucker & Nair, 2017

Type species

Luluichnus mueckei Salisbury, Romilio, Herne, Tucker & Nair, 2017.

Luluichnus mueckei Salisbury, Romilio, Herne, Tucker & Nair, 2017

2017, *Luluichnus mueckei* Salisbury, Romilio, Herne, Tucker & Nair, p. 99.

Holotype

WAM 15.12.701, polyurethane resin replicas from associated natural moulds of a left manus and a left pes within a trackway (track locality reference UQL-DP45-6[lp1,lm1]; Fig. 12F); NMV P230370-B, a plaster replica of the left pedal impression (UQL-DP45-6[lp1]).

Type locality, unit and age

Topotype trackway locality UQL-DP45-6 in the intertidal zone of the Yanijarri-Lurujarri section of the Dampier Peninsula in the west Kimberly region of Western Australia, Australia (see Salisbury *et al.* 2017); Broome Sandstone depositional cycle within the Canning Basin, correlated with the mid-Valanginian to mid-Barremian (Lower Cretaceous) uppermost *Egmontodinium torynum* to mid-*Muderongia australis* dinocyst zones and upper *Ruffordiaspora australiensis* to upper *Foraminisporis wonthaggiensis* spore-pollen zones (Smith *et al.* 2013).

Remarks

Luluichnus mueckei tracks were mentioned in popular accounts by Long (1990, 1993, 1998), who noted similarities with stegosaurian footprints. Salisbury *et al.* (2017) concurred with a formal description of *L. muecki*, which differs from *Garbina roeorum* in lacking clear digit impressions on the manual tracks and possessing pointed digit impressions on the pedal tracks. The manual and pedal tracks are also of comparable size, unlike those of *G. roeorum*, in which the pedal tracks are considerably larger than the manual tracks.

Ornithopod tracks

Wintonopus Thulborn & Wade, 1984 *sensu* Salisbury *et al.* 2017

Type species

Wintonopus latomorum Thulborn & Wade, 1984.

Wintonopus latomorum Thulborn & Wade, 1984

1984, *Wintonopus latomorum* Thulborn & Wade, p. 421.

Holotype

QM F10319, a natural mould of the right pes (Fig. 12G).

Type locality, unit and age

Dinosaur Stampede National Monument at Lark Quarry Conservation Park, ~120 km southwest of Winton in Central West Queensland, Australia; middle Cenomanian–upper Turonian (Upper Cretaceous) strata within the Winton Formation of the Manuka Subgroup in the Rolling Downs Group (Eromanga Basin). Tucker *et al.* (2013) constrained the maximum depositional age of track-bearing localities in the Winton Formation at Lark Quarry Conservation Park to the middle Cenomanian–early Turonian (Late Cretaceous, 94.5–92 Ma) using U-Pb isotope dating of detrital zircons, within the *Appendiscisporites distocarinatus* spore-pollen zone of Helby *et al.* (1987) and the recalibrated upper *Dioxya armata*, *Xenascus asperus* and lower *Diconodinum multispinum* dinocyst zones (*sensu* Partridge 2006) of Foley *et al.* (2022).

Remarks

Wintonopus latomorum is typified by tridactyl tracks with short broad digits that suggest attribution to a small-bodied ornithopod trackmaker (Thulborn & Wade 1979, 1984, Romilio *et al.* 2013, Salisbury *et al.* 2017). Romilio *et al.* (2013) considered *Skartopus australis* to be a junior synonym of *Wintonopus*, although this is not universally accepted (see Thulborn 2017, Poropat *et al.* 2021b). Small ornithopod tracks from the lower Albian Eumeralla Formation at Wattle Bay, west of Cape Otway in Victoria, Australia have also been referred to cf. *Wintonopus* by Romilio & Godfrey (2022).

Wintonopus middletonae Salisbury, Romilio, Herne, Tucker & Nair, 2017

2017, *Wintonopus middletonae* Salisbury, Romilio, Herne, Tucker & Nair, p. 80.

Holotype

WAM 12.1.15, polyurethane resin replica from the natural mould of a ?left pes (track locality reference UQL-DP14-7; Fig. 12H).

Type locality, unit and age

Topotype trackway locality UQL-DP14-7 in the intertidal zone of the Yanijarri-Lurujarri section of the Dampier Peninsula in the west Kimberly region of Western Australia, Australia (see Salisbury *et al.* 2017); Broome Sandstone depositional cycle within the Canning Basin, correlated with the mid-Valanginian to mid-Barremian (Lower Cretaceous) uppermost *Egmontodinium torynum* to mid-*Muderongia australis* dinocyst zones and upper *Ruffordiaspora australiensis* to upper *Foraminisporis wonthaggiensis* spore-pollen zones (Smith *et al.* 2013).

Remarks

Salisbury *et al.* (2017) attributed *Wintonopus middletonae* to a medium-sized, bipedal ornithopod trackmaker. Similar to tracks assigned to *Wintonopus latomorum*, those referred to *W. middletonae* lack a metatarsodigital pad impression, suggesting a subunguligrade pedal posture (Salisbury *et al.* 2017). *Wintonopus middletonae* can be distinguished from *W. latomorum* by its proportionately broader digit impressions, typically with rounded distal ends, and a symmetrically bilobed proximal margin on the pedal impression (Salisbury *et al.* 2017). In addition to the Yanijarri-Lurujarri topotype area, examples of *W. middletonae* tracks have also been recorded from Broome Sandstone exposures around Broome (Salisbury & Romilio, 2019).

Walmadanyichnus Salisbury, Romilio, Herne, Tucker & Nair, 2017

Type species

Walmadanyichnus hunteri Salisbury, Romilio, Herne, Tucker & Nair, 2017.

Walmadanyichnus hunteri Salisbury, Romilio, Herne, Tucker & Nair, 2017

2017, *Walmadanyichnus hunter* Salisbury, Romilio, Herne, Tucker & Nair, p. 83.

Holotype

WAM 12.1.16, polyurethane resin replica from the natural mould of a right pes (track locality reference UQL-DP11-5; Fig. 12I).

Type locality, unit and age

Topotype trackway locality DP11-5 in the intertidal zone of the Yanijarri-Lurujarri section of the Dampier Peninsula in the west Kimberly region of Western Australia, Australia (see Salisbury *et al.* 2017); Broome Sandstone depositional cycle within the Canning Basin, correlated with the mid-Valanginian to mid-Barremian (Lower Cretaceous) uppermost *Egmontodinium torynum* to mid-*Muderongia australis* dinocyst zones and upper *Ruffordiaspora australiensis* to upper *Foraminisporis wonthaggiensis* spore-pollen zones (Smith *et al.* 2013).

Remarks

Walmadanyichnus hunteri is known from numerous large (up to ~800 mm in maximum proximodistal length) tridactyl pedal tracks and partial trackways; there are no associated manus tracks, suggesting a bipedal ornithopod of compatible size to large non-hadrosauroid iguanodontians (Salisbury *et al.* 2017). *Walmadanyichnus hunteri* differs from the ichnospecies of *Wintonopus* in displaying: (1) continuous metatarsodigital pad and digit IV impressions; (2) a sub-circular peripheral outline; and (3) sub-equally sized, oval digit impressions (Salisbury *et al.* 2017).

Dicynodont tracks

Dicynodontipus Rühle von Lilienstern, 1944

Type species

Dicynodontipus hildburghausensis Rühle von Lilienstern, 1944.

Dicynodontipus bellambiensis Retallack, 1996

1915, *Ichnium gampsodactylum* Harper, p. 153.
1996, *Dicynodontipus bellambiensis* Retallack, p. 311.

Holotype

NSWGS F13639, a trackway sequence of six alternating manus and pes impressions.

Type locality, unit and age

Roof siltstone/shale unit from above the Bulli coal seam in the Bellambi Colliery workings in the northern suburbs of Wollongong, New South Wales, Australia. Retallack (1996) originally reported that the track horizon occurred within the Coal Cliff Sandstone of the Clifton Subgroup in the Narrabeen Group (Sydney Basin). However, McLoughlin *et al.* (2021) redefined this thin shale-dominated host unit as equivalent to the Frazer Beach Member of the Moon Island Beach Formation (Newcastle Coal Measures). McLoughlin *et al.* (2021) correlated the Bulli seam with the uppermost Changhsingian (Upper Permian) *Dulhuntyispora parvithola* Zone, and the overlying Frazer Beach Member to the palynomorph 'dead zone' of

Vajda *et al.* (2020), which marks the end-Permian mass extinction interval (see also Mays & McLoughlin 2022). McLoughlin *et al.* (2021) also determined a lower U-Pb zircon age bracket of 252.1 ± 0.06 to 251.51 ± 0.14 Ma.

Remarks

Retallack (1996) attributed *Dicynodontipus bellambiensis* to a '*Lystrosaurus*-like' dicynodont trackmaker based on scale impressions, claw marks and the pentadactyl manus/pes.

Reniformichnus Krummeck & Bordy, 2018

Type species

Reniformichnus katikatii Krummeck & Bordy, 2018.

Reniformichnus australis McLoughlin, Mays, Vajda, Bocking, Frank & Fielding, 2020

2020, *Reniformichnus australis* McLoughlin, Mays, Vajda, Bocking, Frank & Fielding, p. 345.

Holotype

NRM X9101a, a burrow infilling; NRM X9101b, a thin-section through the burrow trace structure.

Type locality, unit and age

Coastal rock exposures at Frazer Beach and Wybung Head in the Munmorah State Conservation Area at Wyong north of Sydney Basin, New South Wales, Australia; Frazer Beach Member of the Moon Island Beach Formation (Newcastle Coal Measures), uppermost Changhsingian (Upper Permian) palynomorph 'dead zone' of Vajda *et al.* (2020), representing the end-Permian mass extinction interval (252.1 ± 0.06 to 251.51 ± 0.14 Ma: McLoughlin *et al.* 2021).

Remarks

McLoughlin *et al.* (2020) attributed these burrow traces to cynodonts, indicating the survival of fossorial tetrapods across the end-Permian mass extinction.

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Appendix

Table A1. Chronostratigraphically arranged inventory of Australian Mesozoic temnospondyl occurrences.

Taxon	Rock unit	Age range	Reference
Trucheosaurus major	Glen Davis Formation	uppermost Permian	Watson (1956), Warren (1997), Marsicano & Warren (1998)
Bothriceps australis	upper Parmeener Supergroup	uppermost Permian/lowermost Triassic	Huxley (1859), Warren (1997), Warren & Marsicano (1998), Rozefelds *et al.* (2011), Warren *et al.* (2011)
Temnospondyli *incertae sedis* (*Lepidostrobus muelleri*)	?Knocklofty Formation	Induan–lower Olenekian	Twelvetrees & Petterd (1900), Akerman & Rozefelds (2011), Rozefelds & Warren (2011)
Watsonisuchus sp.	Knocklofty Formation	Induan–lower Olenekian	Cosgriff & DeFauw (1987), Damiani (2001)
Banksiops townrowi	Knocklofty Formation	Induan–lower Olenekian	Cosgriff (1974), Warren & Marsicano (1998, 2000a)
Chomatobatrachus halei	Knocklofty Formation	Induan–lower Olenekian	Cosgriff (1974)
Deltasaurus kimberleyensis	Knocklofty Formation	Induan–lower Olenekian	Cosgriff (1974)
Derwentia warreni	Knocklofty Formation	Induan–lower Olenekian	Cosgriff (1974)
Rotaurisaurus contundo	Knocklofty Formation	Induan–lower Olenekian	Yates (1999)
Deltasaurus kimberleyensis	Cluan Formation	Induan–Olenekian	Cosgriff (1974)
Lydekkerina huxleyi	Rewan Formation	upper Induan–lower Olenekian	Warren *et al.* (2006)
Deltasaurus kimberleyensis	Blina Shale	upper Induan–lower Olenekian	Cosgriff (1965)
Banksiops townrowi	Blina Shale	upper Induan–lower Olenekian	Warren & Marsicano (1998, 2000a)
Warrenisuchus aliciae	Blina Shale	upper Induan–lower Olenekian	Damiani (2000), Maganuco *et al.* (2009)
Batrachosuchus henwoodi	Blina Shale	upper Induan–lower Olenekian	Cosgriff (1969), Warren & Marsicano (1998)
Erythrobatrachus noonkanbahensis	Blina Shale	upper Induan–lower Olenekian	Cosgriff & Garbutt (1972)
Tetrapoda indet.	Kockatea Shale	lower Olenekian	Haig *et al.* (2015)
Deltasaurus pustulatus	Kockatea Shale	lower Olenekian	Cosgriff (1965)
Watsonisuchus rewanensis	Arcadia Formation	lower–mid-Olenekian	Warren (1980), Damiani (2001)
Watsonisuchus gunganj	Arcadia Formation	lower–mid-Olenekian	Warren (1980)
Warrenisuchus aliciae	Arcadia Formation	lower–mid-Olenekian	Warren & Hutchinson (1988), Warren & Schroeder (1995), Maganuco *et al.* (2009)
Tirraturhinus smisseni	Arcadia Formation	lower–mid-Olenekian	Nield *et al.* (2006)
Trematosauridae indet.	Arcadia Formation	lower–mid-Olenekian	Warren (1985b)
Capulomala arcadiaensis	Arcadia Formation	lower–mid-Olenekian	Warren *et al.* (2009)
Plagiobatrachus australis	Arcadia Formation	lower–mid-Olenekian	Warren (1985a)
Keratobrachyops australis	Arcadia Formation	lower–mid-Olenekian	Warren (1981a), Damiani & Warren (1996)
Xenobrachyops allos	Arcadia Formation	lower–mid-Olenekian	Howie (1972a), Warren (1981b), Warren & Hutchinson (1983), Warren & Marsicano (2000b)
Arcadia myriadens	Arcadia Formation	lower–mid-Olenekian	Warren & Black (1985)
Acerastea wadeae	Arcadia Formation	lower–mid-Olenekian	Warren & Hutchinson (1987)
Rewana quadricuneata	Arcadia Formation	lower–mid-Olenekian	Howie (1972b)
Lapillopsis nana	Arcadia Formation	lower–mid-Olenekian	Warren & Hutchinson (1990a, 1990b), Yates (1999)
Nanolania anatopretia	Arcadia Formation	lower–mid-Olenekian	Yates (2000)
Bulgosuchus gargantua	Bulgo Sandstone	mid-Olenekian	Damiani (1999)
cf. Mastodonsauridae indet.	Bulgo Sandstone	mid-Olenekian	Damiani (1999)
Trematosauridae indet.	Glenidal Formation	Olenekian–lower Anisian	Warren (1985b)
Brachyopidae indet.	Glenidal Formation	Olenekian–lower Anisian	Damiani & Warren (1996), Warren & Marsicano (2000b)
Watsonisuchus sp. indet. (‘*Parotosaurus*’ *wadei*)	Terrigal Formation	mid-Olenekian–lower Anisian	Stephens (1888), Cosgriff (1972)
Platycepsion wilkinsoni	Terrigal Formation	mid-Olenekian–lower Anisian	Stephens (1887c), Witzmann & Schoch (2022)
Chigutisauridae sp. nov.	Terrigal Formation	mid-Olenekian–lower Anisian	Hart et al. (in press)
Mastodonsauridae indet.	Hawkesbury Sandstone	lower Anisian	Stephens (1887a, 1887b)
Subcyclotosaurus brookvalensis	Hawkesbury Sandstone	lower Anisian	Watson (1958)
Paracyclotosaurus davidi	Rouse Hill Siltstone	mid-Anisian	Watson (1958), Hart et al. (2022)

(*continued*)

Table A2. Chronostratigraphically arranged inventory of Australian parareptilian and basal neodiapsidan occurrences.

Taxon	Rock unit	Age range	Reference
Eomurunna yurrgensis	Arcadia Formation	lower–mid-Olenekian	Hamley *et al.* (2021)
Kudnu mackinlayi	Arcadia Formation	lower–mid-Olenekian	Bartholomai (1979)

Table A3. Chronostratigraphically arranged inventory of Australian ichthyosauromorphan occurrences.

Taxon	Rock unit	Age range	Reference
?Ichthyosauromorpha indet.	Blina Shale	upper Induan–lower Olenekian	Kear (2004)
Ophthalmosauria indet.	Windalia Sandstone Member (Muderong Shale)	lower Aptian	McLoughlin *et al.* (1995); Kear (2003)
Ophthalmosauria indet.	Doncaster Member (Wallumbilla Formation)	upper Aptian	Kear (2005b)
Ophthalmosauria indet.	Bulldog Shale	upper Aptian	Kear (2006c)
Ophthalmosauria indet.	Darwin Formation	upper Aptian	Murray (1985), Kear (2002a)
Ophthalmosauria indet.	Gearle Siltstone	middle Albian	Kear *et al.* (2018)
Platypterygius australis	Toolebuc Formation	upper Albian	Longman (1935, 1943), Wade (1984, 1990), Kear (2001a, 2005a), Zammit (2010), Kear & Zammit (2014), Vakil *et al.* (2020)
Platypterygius australis	Allaru Mudstone	upper Albian	Zammit (2010), Zammit *et al.* (2010)
cf. *Platypterygius australis*	Mackunda Formation	upper Albian	Kear (2016)
Ophthalmosauria indet.	Alinga Formation	lower Cenomanian	Choo (1999)
Ophthalmosauria indet.	upper Gearle Siltstone	Cenomanian	Kear (2016)
Ophthalmosauria indet.	Molecap Greensand	Cenomanian–Coniacian	Kear (2016)

Table A4. Chronostratigraphically arranged inventory of Australian Mesozoic lepidosaurian occurrences.

Taxon	Rock unit	Age range	Reference
Lepidosauria indet.	upper Strzelecki Group	lower Aptian	Gill (1965); Poropat *et al.* (2018)
Varanoidea indet.	'upper' Winton Formation	Cenomanian–lowermost Turonian	Scanlon & Hocknull (2008), Kear (2016)
Mosasauridae indet.	Molecap Greensand	Cenomanian–Coniacian	Kear *et al.* (2005)
Clidastes sp.	Molecap Greensand	Cenomanian–Coniacian	Lundelius & Warne (1960), Kear (2016)
Mosasauridae indet.	Korojon Calcarenite	lower Maastrichtian	Kear *et al.* (2005)
Mosasauridae indet.	Miria Formation	upper Maastrichtian	Kear *et al.* (2005)

Table A5. Chronostratigraphically arranged inventory of Australian sauropterygian occurrences.

Taxon	Rock unit	Age range	Reference
Plesiosauria indet.	Razorback beds	Sinemurian–lower Pliensbachian	Bartholomai (1966b), Kear (2012)
Plesiosauria indet.	Westgrove Ironstone Member (Evergreen Formation)	lower Toarcian	Thulborn & Warren (1980), Kear (2012)
Plesiosauroidea indet.	Colalura Sandstone	lower Bajocian	Long & Cruickshank (1998), Kear (2012)
Pliosauroidea indet.	Colalura Sandstone	lower Bajocian	Long & Cruickshank (1998), Kear (2012)
Plesiosauria indet.	Newmarracarra Limestone	lower–middle Bajocian	Long & Cruickshank (1998), Kear (2012)
Plesiosauria indet.	Barrow Group	uppermost Tithonian–upper Valanginian	Long & Cruickshank (1998), Kear (2003)
Pliosauroidea indet.	upper Strzelecki Group	upper Barremian–lower Aptian	Kear (2006b), Benson *et al.* (2013b)
Plesiosauria indet.	Bungil Formation	Aptian	Molnar (1991), Kear (2003)
Elasmosauridae indet.	Windalia Sandstone Member (Muderong Shale)	lower Aptian	McLoughlin *et al.* (1995); Kear (2016)
Leptocleidus clemai	Windalia Sandstone Member (Muderong Shale)	lower Aptian	Cruickshank & Long (1997)
Elasmosauridae indet.	Bulldog Shale	upper Aptian	Kear (2006c)
Opallionectes andamookaensis	Bulldog Shale	upper Aptian	Kear (2006c)
Umoonasaurus demoscyllus	Bulldog Shale	upper Aptian	Kear *et al.* (2006), Kear (2007a), White *et al.* (2023)
Polycotylidae indet.	Bulldog Shale	upper Aptian	Kear (2006c)
cf. *Kronosaurus* sp.	Bulldog Shale	upper Aptian	Kear (2006c)
Elasmosauridae indet.	Darwin Formation	upper Aptian	Murray (1987), Kear (2002a)
Leptocleidia indet.	Darwin Formation	upper Aptian	Kear (2016)
Elasmosauridae indet.	Windalia Radiolarite	upper Aptian	Kear (2016)
Elasmosauridae *incertae sedis* ('*Cimoliosaurus*' *maccoyi*)	Doncaster Member (Wallumbilla Formation)	upper Aptian	Kear (2005b)
Elasmosauridae *incertae sedis* (*Woolungasaurus glendowerensis*)	Doncaster Member (Wallumbilla Formation)	upper Aptian	Sachs (2004), Kear (2007b)
Elasmosauridae indet.	Doncaster Member (Wallumbilla Formation)	upper Aptian	McHenry *et al.* (2005)
Polycotylidae *incertae sedis* ('*Cimoliosaurus*' *leucoscopelus*)	Doncaster Member (Wallumbilla Formation)	upper Aptian	Kear (2005b)
Eiectus longmani	Doncaster Member (Wallumbilla Formation)	upper Aptian	White (1935), Romer & Lewis (1959), Noè & Goméz-Pérez (2022)

(*continued*)

Table A5. Continued.

Taxon	Rock unit	Age range	Reference
cf. *Kronosaurus* sp.	Doncaster Member (Wallumbilla Formation)	upper Aptian	Kear (2005b)
Elasmosauridae indet.	Toolebuc Formation	upper Albian	Kear (2001b), Vakil *et al.* (2021)
Eromangasaurus australis	Toolebuc Formation	upper Albian	Kear (2007b)
Polycotylidae nov.	Toolebuc Formation	upper Albian	Kear & Hamilton-Bruce (2011), Kear (2016)
Kronosaurus queenslandicus	Toolebuc Formation	upper Albian	Longman (1924, 1930, 1935), McHenry (2009)
Elasmosauridae indet.	Oodnadatta Formation	upper Albian	Kear (2006c)
Elasmosauridae indet.	Allaru Mudstone	upper Albian	McHenry *et al.* (2005)
Eromangasaurus australis	Allaru Mudstone	upper Albian	Kear (2016)
Elasmosauridae *incertae sedis* (‘*Plesiosaurus*’ *macrospondylus*	?Allaru Mudstone	upper Albian	Kear (2003)
Elasmosauridae *incertae sedis* (‘*Plesiosaurus*’ *sutherlandi*)	?Allaru Mudstone	upper Albian	Kear (2003)
Polycotylidae nov.	Allaru Mudstone	upper Albian	Mobbs (1990), Kear (2016)
Kronosaurus queenslandicus	Allaru Mudstone	upper Albian	Holland (2018)
Polycotylidae indet.	Mackunda Formation	upper Albian	Kear (2016)
Elasmosauridae indet.	Gearle Siltstone	middle Albian–Cenomanian	Kear (2016)
Leptocleidia indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Kear (2006b), Bell *et al.* (2019b)
Elasmosauridae indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Bell *et al.* (2019b)
Polycotylidae indet.	upper Gearle Siltstone	middle Cenomanian	Kear (2016)
Elasmosauridae indet.	Molecap Greensand	Cenomanian–Coniacian	Kear (2003)

Table A6. Chronostratigraphically arranged inventory of Australian Mesozoic testudinatan occurrences.

Taxon	Rock unit	Age range	Reference
Testudinata nov.	upper Strzelecki Group	upper Barremian–lower Aptian	Poropat *et al.* (2018)
Testudinata indet. (*Chelycarapookus arctuatus*)	Eumeralla Formation	lower Albian	Joyce (2017), Poropat *et al.* (2018)
Otwayemys cunicularius	Eumeralla Formation	lower Albian	Gaffney *et al.* (1998), Sterli (2015), Poropat *et al.* (2018)
Notochelone costata	Toolebuc Formation	upper Albian	Kear (2003)
Bouliachelys suteri	Toolebuc Formation	upper Albian	Kear & Lee (2006)
Cratochelone byrnei	Toolebuc Formation	upper Albian	Kear (2006d)
cf. *Notochelone* sp.	Allaru Mudstone	upper Albian	Kear (2003)
Protostegidae indet.	Mackunda Formation	upper Albian	Kear (2016)
Testudinata nov.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Smith (2009), Bell *et al.* (2019b)
Spoochelys ormondea	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Smith & Kear (2013)
Chelidae indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Smith (2010), Bell *et al.* (2019b)
Protostegidae indet.	upper Gearle Siltstone	middle Cenomanian	Kear (2016)
?Chelonioidea indet.	‘upper’ Winton Formation	Cenomanian–lowermost Turonian	Kear (2016)
Chelidae indet.	‘upper’ Winton Formation	Cenomanian–lowermost Turonian	Hocknull *et al.* (2009)
Protostegidae indet.	Haycock Marl	uppermost Cenomanian–lowermost Turonian	Kear *et al.* (2018)
Chelonioidea indet.	Miria Formation	upper Maastrichtian	Kear & Siverson (2010)

Table A7. Chronostratigraphically arranged inventory of Australian Mesozoic non-archosaurian archosauromorph occurrences.

Taxon	Rock unit	Age range	Reference
Tasmaniosaurus triassicus	Knocklofty Formation	Induan–lower Olenekian	Camp & Banks (1978), Thulborn (1986a), Ezcurra (2014)
Kadimakara australiensis	Arcadia Formation	lower–mid-Olenekian	Bartholomai (1979)
Kalisuchus rewanensis	Arcadia Formation	lower–mid-Olenekian	Thulborn (1979)
Erythrosuchidae indet.	Bulgo Sandstone	mid-Olenekian	Kear (2009), Ezcurra (2016)

Table A8. Chronostratigraphically arranged inventory of Australian Mesozoic crocodylomorph occurrences.

Taxon	Rock unit	Age range	Reference
Crocodyliformes indet.	Eumeralla Formation	lower Albian	Poropat *et al.* (2018)
Isisfordia duncani	‘lower’ Winton Formation	upper Albian–lower Cenomanian	Salisbury *et al.* (2006), Syme & Salisbury (2018)
Isisfordia molnari	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Hart *et al.* (2019, 2020)
Isisfordia selaslophensis	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Molnar (1980c), Molnar & Willis (2001), Hart *et al.* (2019, 2021)
Confractosuchus sauroktonos	‘upper’ Winton Formation	Cenomanian–lowermost Turonian	White *et al.* (2022)

Table A9. Chronostratigraphically arranged inventory of Australian Mesozoic pterosaur occurrences.

Taxon	Rock unit	Age range	Reference
Pterosauria indet.	Eumeralla Formation	lower Albian	Poropat *et al.* (2018), Pentland *et al.* (2023),
Aussiedraco molnari	Toolebuc Formation	upper Albian	Kellner *et al.* (2011)
Pterodactyloidea indet.	Toolebuc Formation	upper Albian	Pentland & Poropat (2023)
Ornithocheiridae indet.	Toolebuc Formation	upper Albian	Molnar & Thulborn (1980), Molnar (1987), Fletcher & Salisbury (2010), Kellner *et al.* (2010), Pentland *et al.* (2022a, 2022b), Pentland & Poropat (2023)
Mythunga camara	Toolebuc Formation	upper Albian	Molnar & Thulborn (2007), Pentland & Poropat (2019)
Thapunngaka shawi	Toolebuc Formation	upper Albian	Richards *et al.* (2021)
Ctenochasmatoidea indet.	Mackunda Formation	upper Albian	Fletcher & Salisbury (2010)
Ornithocheiridae indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Brougham et al. (2017), Pentland & Poropat (2023)
Anhangueria indet.	'upper' Winton Formation	Cenomanian	Pentland *et al.* (2022a)
Ferrodraco lentoni	'upper' Winton Formation	Cenomanian	Pentland *et al.* (2019, 2022b)
Ornithocheiridae indet.	Molecap Greensand	Cenomanian–Coniacian	Kear *et al.* (2010)
Azhdarchidae indet.	Miria Formation	upper Maastrichtian	Bennett & Long (1991)

Table A10. Chronostratigraphically arranged inventory of Australian Mesozoic dinosaur occurrences (including Avialae).

Taxon	Rock unit	Age range	Reference
Ozraptor subotaii	Colalura Sandstone	lower Bajocian	Long & Molnar (1998)
Sauropoda indet.	Colalura Sandstone	lower Bajocian	Long (1992b)
Rhoetosaurus brownei	Walloon Coal Measures	Oxfordian	Longman (1926, 1927b, 1927a), Thulborn (1985), Nair & Salisbury (2012)
Theropoda indet.	upper Strzelecki Group	upper Barremian–lower Aptian	Smith Woodward (1906), Benson *et al.* (2012)
Noasauridae indet.	upper Strzelecki Group	upper Barremian–lower Aptian	Fitzgerald *et al.* (2012), Brougham *et al.* (2020)
Tetanurae indet.	upper Strzelecki Group	upper Barremian–lower Aptian	Benson *et al.* (2012), Novas *et al.* (2013)
Avetheropoda indet.	upper Strzelecki Group	upper Barremian–lower Aptian	Benson *et al.* (2012)
Megaraptora indet.	upper Strzelecki Group	upper Barremian–lower Aptian	Molnar *et al.* (1981, 1985), Welles (1983), Agnolin *et al.* (2010), Benson *et al.* (2012), Novas *et al.* (2013)
Maniraptora indet.	upper Strzelecki Group	upper Barremian–lower Aptian	Benson *et al.* (2012)
Paraves indet.	upper Strzelecki Group	upper Barremian–lower Aptian	Kundrát *et al.* (2020)
Avialae indet.	upper Strzelecki Group	upper Barremian–lower Aptian	Talent *et al.* (1966), Waldman (1970), Kundrát *et al.* (2020)
Enantiornithes indet.	upper Strzelecki Group	upper Barremian–lower Aptian	Close *et al.* (2009)
Ankylosauria indet.	upper Strzelecki Group	upper Barremian–lower Aptian	Barrett *et al.* (2010b)
Ornithopoda indet.	upper Strzelecki Group	upper Barremian–lower Aptian	Woodward *et al.* (2011, 2018), Kitchener *et al.* (2019)
Qantassaurus intrepidus	upper Strzelecki Group	upper Barremian–lower Aptian	Rich & Vickers-Rich (1999), Herne *et al.* (2019)
Galleonosaurus dorisae	upper Strzelecki Group	upper Barremian–lower Aptian	Herne *et al.* (2019)
cf. *Atlascopcosaurus loadsi*	upper Strzelecki Group	upper Barremian–lower Aptian	Herne *et al.* (2019)
Ornithischia *incertae sedis* (*Serendipaceratops arthurcclarkei*)	upper Strzelecki Group	upper Barremian–lower Aptian	Rich & Vickers-Rich (1994, 2003b), Agnolin *et al.* (2010), Rich *et al.* (2014)
Minmi paravertebra	Bungil Formation	Aptian	Molnar (1980b), Molnar & Frey (1987)
Dinosauria indet.	Bulldog Shale	upper Aptian	Long (1998), Barrett *et al.* (2010a)
Kakuru kujani	Bulldog Shale	upper Aptian	Molnar & Pledge (1980), Barrett *et al.* (2010a)
?Theropoda indet.	Doncaster Member (Wallumbilla Formation)	upper Aptian	Bell *et al.* (2019b)
Theropoda indet.	Eumeralla Formation	lower Albian	Benson *et al.* (2012)
Elaphrosaurinae indet.	Eumeralla Formation	lower Albian	Poropat *et al.* (2020a)
Tetanurae indet.	Eumeralla Formation	lower Albian	Benson *et al.* (2012), Poropat *et al.* (2019)
Megaraptoridae indet.	Eumeralla Formation	lower Albian	Smith *et al.* (2008), Barrett *et al.* (2011), Benson *et al.* (2012), Poropat *et al.* (2019)
Coelurosauria indet.	Eumeralla Formation	lower Albian	Benson *et al.* (2012)
Tyrannosauroidea indet.	Eumeralla Formation	lower Albian	Benson *et al.* (2010b), Benson *et al.* (2010c), Herne *et al.* (2010)
Timimus hermani	Eumeralla Formation	lower Albian	Rich & Vickers-Rich (1994), Agnolin *et al.* (2010), Delcourt & Grillo (2018)
Maniraptora indet.	Eumeralla Formation	lower Albian	Currie *et al.* (1996), Benson *et al.* (2012)
Unenlagiinae indet.	Eumeralla Formation	lower Albian	Benson *et al.* (2012)
Ankylosauria indet.	Eumeralla Formation	lower Albian	Barrett *et al.* (2010b)
Ornithopoda indet.	Eumeralla Formation	lower Albian	Gross *et al.* (1993), Woodward *et al.* (2011, 2018), Kitchener *et al.* (2019)
Leaellynasaura amicagraphica	Eumeralla Formation	lower Albian	Rich & Rich (1988), Rich & Rich (1989), Rich *et al.* (2010), Herne *et al.* (2016), Poropat *et al.* (2018), Duncan *et al.* (2021)
Atlascopcosaurus loadsi	Eumeralla Formation	lower Albian	Rich & Rich (1989), Agnolin *et al.* (2010), Duncan *et al.* (2021)
Diluvicursor pickeringi	Eumeralla Formation	lower Albian	Herne *et al.* (2018)

(*continued*)

Table A10. Continued.

Taxon	Rock unit	Age range	Reference
cf. *Qantassaurus intrepidus*	Eumeralla Formation	lower Albian	Herne *et al.* (2019)
cf. *Galleonosaurus dorisae*	Eumeralla Formation	lower Albian	Duncan *et al.* (2021)
Nanantius eos	Toolebuc Formation	upper Albian	Molnar (1986), Kurochkin & Molnar (1997), Kear *et al.* (2003)
Nanantius sp.	Toolebuc Formation	upper Albian	Kurochkin & Molnar (1997)
Titanosauriformes indet.	Toolebuc Formation	upper Albian	Molnar (2001b), Molnar & Salisbury (2005), Poropat *et al.* (2017)
Ankylosauria indet.	Toolebuc Formation	upper Albian	Molnar (1996b), Frauenfelder *et al.* (2022)
Ornithopoda indet.	Toolebuc Formation	upper Albian	Molnar (1984)
Austrosaurus mckillopi	Allaru Mudstone	upper Albian	Longman (1933), Molnar (2011b), Poropat *et al.* (2017)
Ankylosauria indet.	Allaru Mudstone	upper Albian	Molnar (1996b), Leahey *et al.* (2015)
Kunbarrasaurus ieversi	Allaru Mudstone	upper Albian	Molnar (1996b, 2001a), Molnar & Clifford (2000, 2001), Leahey *et al.* (2015)
Ornithopoda indet.	Allaru Mudstone	upper Albian	Molnar (1996a)
Muttaburrasaurus sp.	Allaru Mudstone	upper Albian	Molnar (1995, 1996a)
Muttaburrasaurus langdoni	Mackunda Formation	upper Albian	Bartholomai & Molnar (1981), Molnar (1996a)
Theropoda *incertae sedis* (*Walgettosuchus woodwardi*)	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Huene (1932)
Noasauridae indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Brougham *et al.* (2020)
Avetheropoda indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Brougham *et al.* (2019)
Megaraptora indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Brougham *et al.* (2019)
Megaraptoridae indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Bell *et al.* (2016), Kotevski & Poropat (2022)
Rapator ornitholestoides	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Huene (1932), White *et al.* (2013a)
Avialae indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Molnar (1999), Bell *et al.* (2019b)
Titanosauriformes indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Molnar & Salisbury (2005), Molnar (2011a), Frauenfelder *et al.* (2021)
Titanosauria indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Frauenfelder *et al.* (2021)
Ankylosauria indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Bell *et al.* (2018a)
Ornithopoda indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Molnar & Galton (1986), Bell *et al.* (2018b), Kitchener *et al.* (2019)
Ornithopoda *incertae sedis* (*Fulgurotherium australae*)	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Huene (1932), Molnar (1980a), Agnolin *et al.* (2010)
Weewarrasaurus pobeni	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Bell *et al.* (2018b)
Iguanodontia indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Bell *et al.* (2018b)
Fostoria dhimbangunmal	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Bell *et al.* (2019a)
Ankylopollexia indet.	Wallangulla Sandstone Member (Griman Creek Formation)	lower–middle Cenomanian	Bell *et al.* (2018b)
Megaraptoridae indet.	'upper' Winton Formation	Cenomanian–lowermost Turonian	White *et al.* (2020)
Australovenator wintonensis	'upper' Winton Formation	Cenomanian–lowermost Turonian	Hocknull *et al.* (2009), White *et al.* (2012, 2013a, 2013b, 2015a, 2015b, 2016)
Titanosauriformes indet.	'upper' Winton Formation	Cenomanian–lowermost Turonian	Coombs & Molnar (1981), Molnar (2001b, 2010, 2011b), Molnar & Salisbury (2005)
Wintonotitan wattsi	'upper' Winton Formation	Cenomanian–lowermost Turonian	Coombs & Molnar (1981), Hocknull *et al.* (2009), Poropat *et al.* (2015a)
Diamantinasaurus matildae	'upper' Winton Formation	Cenomanian–lowermost Turonian	Hocknull *et al.* (2009), Poropat *et al.* (2015b), Poropat *et al.* (2016), Klinkhamer *et al.* (2018,

(*continued*)

Table A10. Continued.

Taxon	Rock unit	Age range	Reference
			2019), Rigby *et al.* (2022), Poropat *et al.* (2021a), Poropat *et al.* (2022), Poropat *et al.*, (2023)
Savannasaurus elliottorum	'upper' Winton Formation	Cenomanian–lowermost Turonian	Poropat *et al.* (2016, 2020b)
Australotitan cooperensis	'upper' Winton Formation	Cenomanian–lowermost Turonian	Hocknull *et al.* (2021)
Ankylosauria indet.	'upper' Winton Formation	Cenomanian–lowermost Turonian	Leahey & Salisbury (2013)
Ornithopoda indet.	'upper' Winton Formation	Cenomanian–lowermost Turonian	Hocknull & Cook (2008), Herne *et al.* (2019)
Theropoda indet.	Molecap Greensand	Cenomanian–Coniacian	Long (1995)

Table A11. Chronostratigraphically arranged inventory of Australian Mesozoic synapsid occurrences (including Mammalia).

Taxon	Rock unit	Age range	Reference
Dicynodontoidea indet.	upper Parmeener Supergroup	uppermost Permian/lowermost Triassic	Rozefelds *et al.* (2011)
Dicynodontia indet.	Arcadia Formation	lower–mid-Olenekian	Thulborn (1983a, 1983b, 1990), King (1983)
Therapsida indet.	Arcadia Formation	lower–mid-Olenekian	Thulborn (1990)
Cynodontia indet.	Arcadia Formation	lower–mid-Olenekian	Thulborn (1990)
Ausktribosphenos nyktos	upper Strzelecki Group	upper Barremian–lower Aptian	Rich *et al.* (1997, 1998, 1999, 2022b)
Bishops whitmorei	upper Strzelecki Group	upper Barremian–lower Aptian	Rich *et al.* (2001b, 2009a, 2016)
Kryoparvus gerriti	upper Strzelecki Group	upper Barremian–lower Aptian	Rich *et al.* (2020c)
Teinolophos trusleri	upper Strzelecki Group	upper Barremian–lower Aptian	Rich *et al.* (1999, 2016)
Corriebaatar marywaltersae	upper Strzelecki Group	upper Barremian–lower Aptian	Rich *et al.* (2009b, 2022)
Sundrius ziegleri	Eumeralla Formation	lower Albian	Rich *et al.* (2020b)
Bishops sp. cf. *B. whitmorei*	Eumeralla Formation	lower Albian	Rich *et al.* (2009a)
Kryoryctes cadburyi	Eumeralla Formation	lower Albian	Pridmore *et al.* (2005)
Mammalia indet.	Toolebuc Formation	upper Albian	Godthelp (2006)
Kollikodon ritchiei	Wallangulla Sandstone Member (Griman Creek Formation)	lower–mid-Cenomanian	Flannery *et al.* (1995), Pian *et al.* (2016)
Steropodon galmani	Wallangulla Sandstone Member (Griman Creek Formation)	lower–mid-Cenomanian	Archer *et al.* (1985)
Stirtodon elizabethae	Wallangulla Sandstone Member (Griman Creek Formation)	lower–mid-Cenomanian	Clemens *et al.* (2003), Rich *et al.* (2020a)

Table A12. Chronostratigraphically arranged inventory of Australian end-Permian and Mesozoic tetrapod ichnofossil occurrences.

Taxon	Rock unit	Chronostratigraphic Range	Reference
Sauropsida isp. indet.	Frazer Beach Member (Moon Island Beach Formation)	uppermost Changhsingian	Warren (1997)
Dicynodontipus bellambiensis	Frazer Beach Member (Moon Island Beach Formation)	uppermost Changhsingian	Retallack (1996)
Reniformichnus australis	Frazer Beach Member (Moon Island Beach Formation)	uppermost Changhsingian	McLoughlin *et al.* (2020)
Tetrapoda isp. indet.	Tuggerah Formation	Lower Triassic	Bamberry & Herbert (1996)
Tetrapoda isp. indet.	Patonga Claystone	Lower Triassic	Bamberry & Herbert (1996)
Tetrapoda isp. indet.	Terrigal Formation	mid-Olenekian–lower Anisian	Bamberry & Herbert (1996)
Temnospondyli isp. indet.	Rouse Hill Siltstone Member (Ashfield Shale)	Anisian	Pepperell & Grigg (1974)
Temnospondyli isp. indet.	Hawkesbury Sandstone	Anisian	Fletcher (1948), Sherwin (1969a, 1969b), Farman & Bell (2020)
Plectropterna isp.	Blackstone Formation	Norian	Molnar (1982, 1991), Thulborn (2000, 2003)
Evazoum isp. indet. (= cf. *Eubrontes*)	Blackstone Formation	Norian	Staines & Woods (1964), Romilio *et al.* (2021b)
cf. *Grallator*	Blackstone Formation	Norian	Thulborn (1986b), Thulborn (2000, 2003), Romilio *et al.* (2021b)
Temnospondyli isp. indet.	Tingalpa Formation	Norian	Colliver (1956), Thulborn (1986b)
Dinosauria isp. indet.	Tingalpa Formation	Norian	Colliver (1956), Thulborn (1986b)
?*Steropoides* isp.	Precipice Sandstone	Hettangian–Sinemurian	Grant-Mackie *et al.* (2000)
Anomoepus cf. *A. scambus* (= *Anomoepus* cf. *A. gracillimus*)	Precipice Sandstone	Hettangian–Sinemurian	Thulborn (1994), Romilio (2021a)
cf. *Eubrontes*	Razorback Beds	Sinemurian–lower Pliensbachian	Cook *et al.* (2010)
Skartopus isp.	Razorback Beds	Sinemurian–lower Pliensbachian	Cook *et al.* (2010)
Grallator isp.	Razorback Beds	Sinemurian–lower Pliensbachian	Cook *et al.* (2010), Romilio *et al.* (2021c)

(*continued*)

Table A12. Continued.

Taxon	Rock unit	Chronostratigraphic Range	Reference
Anomoepus isp.	Razorback Beds	Sinemurian–lower Pliensbachian	Cook *et al.* (2010), Romilio *et al.* (2021c), Romilio (2021b)
Theropoda isp. indet.	Razorback Beds	Sinemurian–lower Pliensbachian	Cook *et al.* (2010)
Ornithopoda isp. indet.	Razorback Beds	Sinemurian–lower Pliensbachian	Cook *et al.* (2010)
Tetrapoda isp. indet.	Marburg Subgroup	upper Pliensbachian	McLoughlin et al. (2014)
cf. *Kayentapus* (= cf. *Wintonopus*)	Walloon Coal Measures	lower Callovian–lower Tithonian	Anonymous (1952b), Bartholomai (1966a), Turner *et al.* (2009), Romilio *et al.* (2021a)
Kayentapus isp. indet. (= *Changpeipus bartholomaii;* cf. *Eubrontes)*	Walloon Coal Measures	lower Callovian–lower Tithonian	Haubold (1971), Thulborn (1997), Turner *et al.* (2009), Romilio *et al.* (2021a)
cf. *Anchisauripus* (= cf. *Anomoepus)*	Walloon Coal Measures	lower Callovian–lower Tithonian	Thulborn (1997), Romilio *et al.* (2021a)
Theropoda isp. indet.	Walloon Coal Measures	lower Callovian–lower Tithonian	Romilio *et al.* (2021a)
cf. *Garbina*	Walloon Coal Measures	lower Callovian–lower Tithonian	Anonymous (1952a), Hill et al. (1966), Romilio *et al.* (2021a)
Oobardjidama foulkesi	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Broome sauropod morphotype A	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Broome sauropod morphotype B	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Broome sauropod morphotype C	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Broome sauropod morphotype D	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Broome sauropod morphotype E	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Megalosauropus broomensis	Broome Sandstone	upper Valanginian–lower Barremian	Colbert & Merrilees (1967), Salisbury *et al.* (2017)
Yangtzepus clarkei	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Broome theropod morphotype A	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Broome theropod morphotype B	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Broome theropod morphotype C	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Garbina roeorum	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
cf. *Garbina*	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Luluichnus mueckei	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
cf. *Luluichnus*	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Broome thyreophoran morphotype A	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Broome thyreophoran morphotype B	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Wintonopus latomorum	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Wintonopus middletonae	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Walmadanyichnus hunteri	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Amblydactylus cf. *A. kortmeyeri*	Broome Sandstone	upper Valanginian–lower Barremian	Salisbury *et al.* (2017)
Dinosauria isp. indet. (= burrow trace)	Eumeralla Formation	lower Albian	Martin (2009), Poropat *et al.* (2018)
Theropoda isp. indet.	Eumeralla Formation	lower Albian	Martin *et al.* (2012), Poropat *et al.* (2018)
Megalosauropus isp. indet	Eumeralla Formation	lower Albian	Romilio & Godfrey (2022)
Avialae isp. indet.	Eumeralla Formation	lower Albian	Martin *et al.* (2014), Poropat *et al.* (2018)
Ornithopoda isp. indet.	Eumeralla Formation	lower Albian	Martin (2016), Poropat *et al.* (2018)
cf. *Wintonopus*	Eumeralla Formation	lower Albian	Romilio & Godfrey (2022)
Testudines isp. indet.	'upper' Winton Formation	Cenomanian–lowermost Turonian	Poropat *et al.* (2021b)
Hatcherichnus isp. indet.	'upper' Winton Formation	Cenomanian–lowermost Turonian	Poropat *et al.* (2021b)
Skartopus australis	'upper' Winton Formation	Cenomanian–lowermost Turonian	Thulborn & Wade (1984), Thulborn & Wade (1989), Poropat *et al.* (2021b)

(*continued*)

Table A12. Continued.

Taxon	Rock unit	Chronostratigraphic Range	Reference
Sauropoda isp. indet.	'upper' Winton Formation	Cenomanian–lowermost Turonian	Poropat *et al.* (2021b)
Theropoda isp. indet.	'upper' Winton Formation	Cenomanian–lowermost Turonian	Poropat *et al.* (2021b)
Wintonopus latomorum	'upper' Winton Formation	Cenomanian–lowermost Turonian	Thulborn & Wade (1984), Romilio *et al.* (2013), Salisbury *et al.* (2017), Poropat *et al.* (2021b)
cf. *Iguanodontipus* (= cf. *Tyrannosauropus*; = *Amblydactylus* cf. *A. gethingi*)	'upper' Winton Formation	Cenomanian–lowermost Turonian	Thulborn & Wade (1984), Romilio & Salisbury (2011), Thulborn (2013), Romilio & Salisbury (2014)