

## Supplementary Information

### Hocknull et al. 2021. A new giant sauropod, *Australotitan cooperensis* gen. et sp. nov., from the mid-Cretaceous of Australia.

Character with character state changes for *Wintonotitan wattsi*, *Diamantinasaurus matildae* and *Savannasaurus elliottorum*.

Characters from Royo-Torres et al, 2021 & Poropat et al 2021	Taxon	Former State	New State	Estimated State	Justification
36	<i>A. cooperensis</i> <i>W. wattsi</i>			0 0	Estimated based on reconstructed scapulae.
37	<i>Au. cooperensis</i> <i>W. wattsi</i> <i>D. matildae</i>			0 0 0	Estimated based on reconstructed scapulae.
40	<i>D. matildae</i>			1	Estimate based on reconstructed humerus.
41	<i>Au. cooperensis</i> <i>D. matildae</i> <i>W. wattsi</i>			0 0 0/1	Estimate based on reconstructed humerus Estimate based on reconstructed humerus Estimate is close to 0.4, therefore could be either 0 or 1
43	<i>D. matildae</i>	1	0		Humeral shaft eccentricity <3.0 (2.8)
45	<i>W. wattsi</i>	0	?		Not preserved, estimate difficult
46	<i>W. wattsi</i>	1	?		Not preserved, estimate difficult
50	<i>W. wattsi</i>	0	?	0	Not well preserved, estimated
51	<i>D. matildae</i>	1	0		Ratio = 1.11, <1/4 = 0
52	<i>W. wattsi</i>	1	?		Not preserved, estimate difficult

53	<i>W. watsi</i>	0	?		Not preserved, estimate difficult
58	<i>D. matildae</i> <i>S. elliottorum</i>	0 1	1 ?		Ratio 2.63/2.81 = 1 Not preserved, estimate difficult
59	<i>D. matildae</i>	1	0/1		0.39 ratio close to range definition so include both possibilities
62	<i>D. matildae</i> <i>S. elliottorum</i> <i>W. watsi</i>	0 0 0	1 1 ?		0.85 = 1 0.83 = 1 Not preserved, estimate difficult
217	<i>W. watsi</i>	0	1		D-shaped scapular base cross-section, equivalent to <i>D. matildae</i>
224	<i>S. elliottorum</i>	1	0		Concave lateral margin of humeral diaphysis present.
228	<i>S. elliottorum</i> <i>W. watsi</i>	1 0	? ?	1 1	Not preserved, estimated to have a deeply concave (1) as in <i>D. matildae</i> .
229	<i>W. watsi</i>	0	?		Not preserved, estimate difficult
230	<i>W. watsi</i>	0	?		Not preserved, estimate difficult
233	<i>W. watsi</i>	0	?	1	Not well preserved, estimated to project above proximal articulation (1).
236	<i>W. watsi</i>	1	?	0	Not preserved, estimated to be prominently expanded posteriorly similar to <i>D. matildae</i> .
252	<i>W. watsi</i>	0	?	0	Not well preserved, predicted to be strongly concave similar to <i>D. matildae</i> and <i>A. cooperensis</i> .
282	<i>W. watsi</i>	0	?		Not preserved, estimate difficult
365	<i>W. watsi</i> <i>S. elliottorum</i>	? ?	? ?	1 1	Not preserved, estimated overall shape. Not preserved, estimated overall shape.
367	<i>D. matildae</i>	1	?	?	Cannot define a vertical ridge.

369	<i>W. watsi</i>	0	?		Not preserved, estimate difficult
386	<i>W. watsi</i> <i>D. matildae</i>	0 1	? 0		Not preserved, estimate difficult Ratio = 1.96 > 1.0 = 0
413	<i>W. watsi</i>	0	?		Not preserved, estimate difficult
511	<i>W. watsi</i>	0	?		Not preserved, estimate difficult
513	<i>W. watsi</i> <i>D. matildae</i>	0 ?	1 1		Muscle scar / tuberosity present Muscle scar / tuberosity present
514	<i>D. matildae</i> <i>W. watsi</i>	? ?	? ?	1 1	<5.5 (1) <5.5 (1)
515	<i>W. watsi</i> <i>A. cooperensis</i>	? ?	? ?	0 0	Not preserved, estimated Not preserved, estimated
516	<i>W. watsi</i>	?	?	0	Not preserved, estimated from reconstructed humerus
521	<i>W. watsi</i> <i>D. matildae</i> <i>S. elliottorum</i>	0 0 0	? 1 ?		Not preserved, estimate difficult Meets at right angle Not preserved, estimate difficult
533	<i>W. watsi</i>	?	?	1	Not preserved, estimated based on ischial similarities with <i>D. matildae</i> , <i>A. cooperensis</i> .