

Supplementary information: Isolated teeth reveal hidden spinosaurid dinosaur diversity in the British Wealden Supergroup (Lower Cretaceous)

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1. Analysis of HASMG G369a

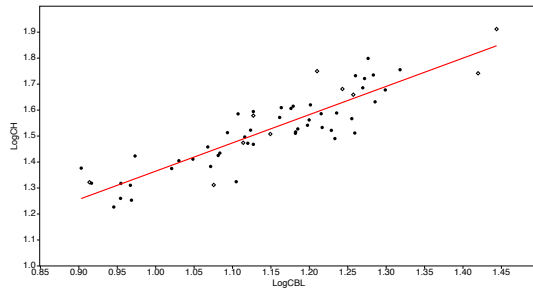
1.1. Full measurements of HASMG G369a

Table S1. Measurements in millimetres (mm). Values based on reconstructed crown height (bold; see main text) marked with an asterisk (*).

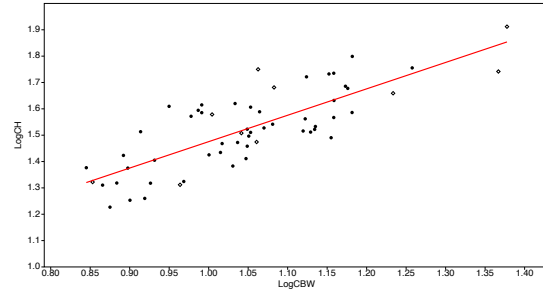
Crown base length (CBL)	8.16
Crown base width (CBW)	7.03
Crown height (CH)	17.2
Apical length (AL)	?
Crown angle (CA)	74
Crown base ratio (CBR)	0.86
Crown height ratio (CHR)	2.1*
Midcrown length (MCL)	5.67*
Midcrown width (MCW)	4.54*
Midcrown ratio (MCR)	0.8*
Mesiobasal Denticle Extension (MDE)	?
Mesiobasal Carina Extension (MCE)	?
Mesial Serrated Carina Length (MSL)	?
Distal Serrated Carina Length (DSL)	?
Mesial Carina Length (MCAL)	?
Distal Carina Length (DCAL)	?
Distal Denticle Height (DDH)	0.195*
Distal Denticle Length (DDL)	0.171*
Distal Denticle Width (DDW)	0.253*
Mesial Denticle Height (MDH)	?

Mesial Denticle Length (MDL)	?
Mesial Denticle Width (MDW)	?
Distal Denticle Height Ratio (DHR)	1.14*
Distal Denticle Base Ratio (DBR)	1.48*
Mesial Denticle Height Ratio (MHR)	?
Mesial Denticle Base Ratio (MBR)	?
Distoapical Denticle Density (DA)	?
Distocentral Denticle Density (DC)	35*
Distobasal Denticle Density (DB)	?
Mesioapical Denticle Density (MA)	?
Mesiocentral Denticle Density (MC)	35*
Mesiobasal Denticle Density (MB)	?
Average Mesial Denticle Density (MAVG)	?
Average Distal Denticle Density (DAVG)	?
Denticle Size Density Index (DSDI)	1*
Transverse Undulation Density (TUD)	n/a
Marginal Undulation Density (TUD)	n/a
Labial Flutes (LAF)	7
Lingual Flutes (LAF)	5

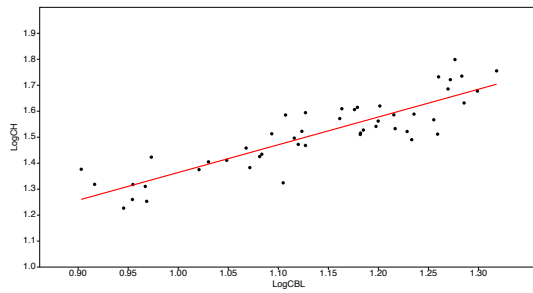
1.2. Regression analyses



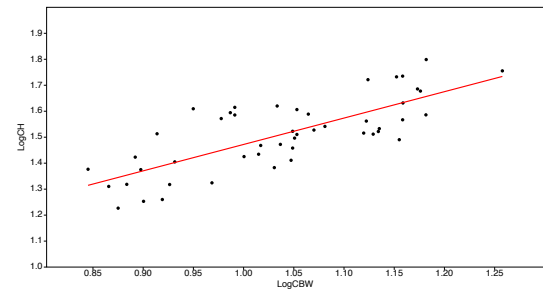
All spinosaurids (all positions), LogCH vs. LogCBL.
Slope: 1.0881, intercept: 0.27671, r2: 0.79069.



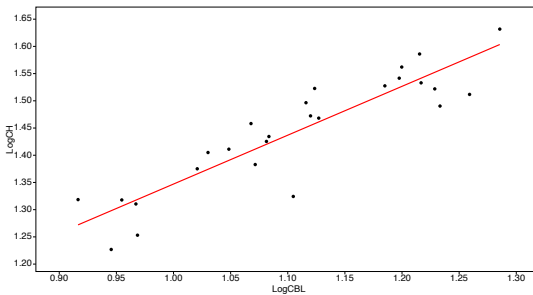
All spinosaurids (all positions), LogCH vs. LogCBW.
Slope: 1.002, intercept: 0.47343, r2: 0.62588.



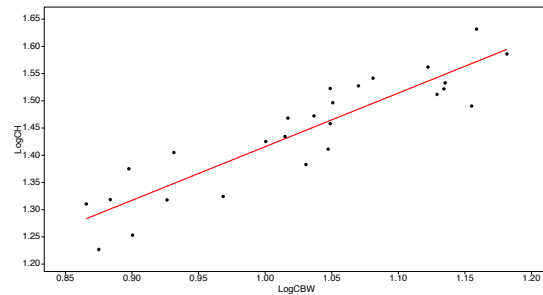
Baryonychine spinosaurids (all positions), LogCH vs. LogCBL.
Slope: 1.0686, intercept: 0.29548, r2: 0.77314.



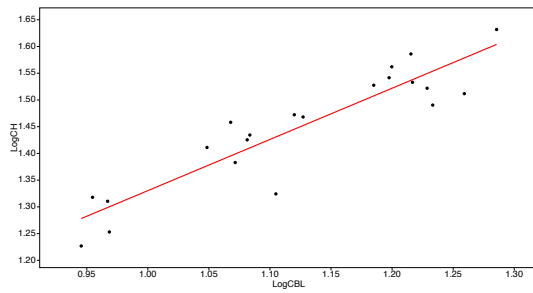
Baryonychine spinosaurids (all positions), LogCH vs. LogCBW.
Slope: 1.0161, intercept: 0.45603, r2: 0.582.



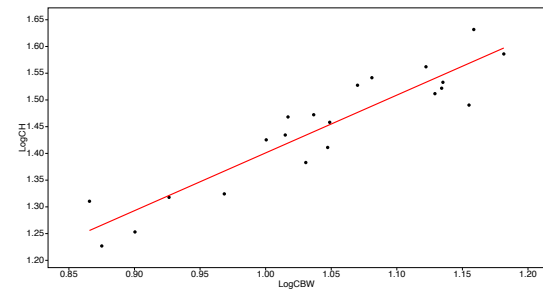
Baryonyx (all positions), LogCH vs. LogCBL.
Slope: 0.89772, intercept: 0.44935, r2: 0.81304.



Baryonyx (all positions), LogCH vs. LogCBW.
Slope: 0.9852, intercept: 0.43051, r2: 0.8198.



Baryonyx (lateral teeth only), LogCH vs. LogCBL.
Slope: 0.95799, intercept: 0.37236, r2: 0.83866.



Baryonyx (lateral teeth only), LogCH vs. LogCBW.
Slope: 1.0807, intercept: 0.32022, r2: 0.86066.

1.3. Full phylogenetic results

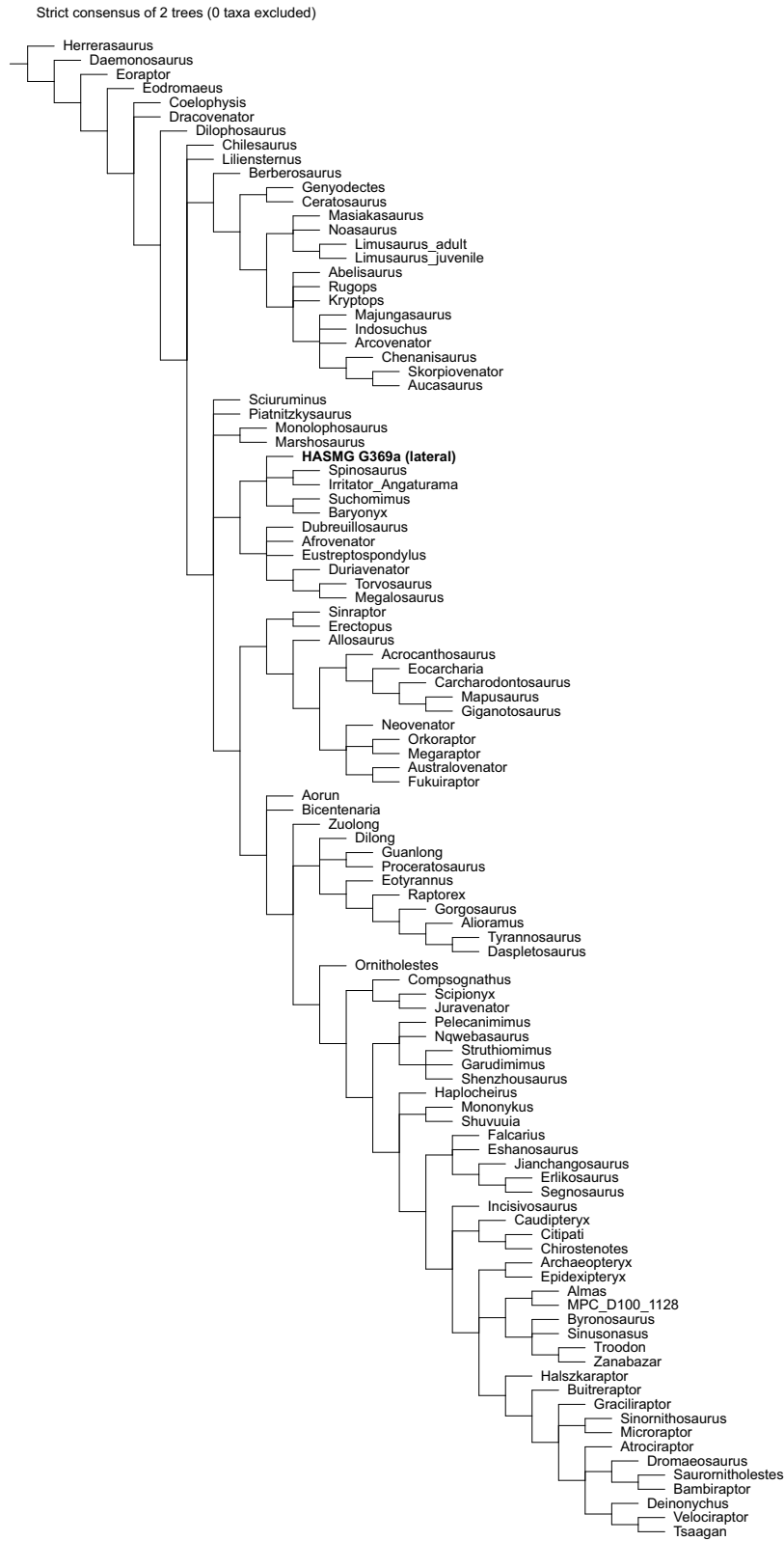


Fig S1 Strict consensus of the constrained analysis using the whole dentition dataset.

Strict consensus of 99999 trees (0 taxa excluded)

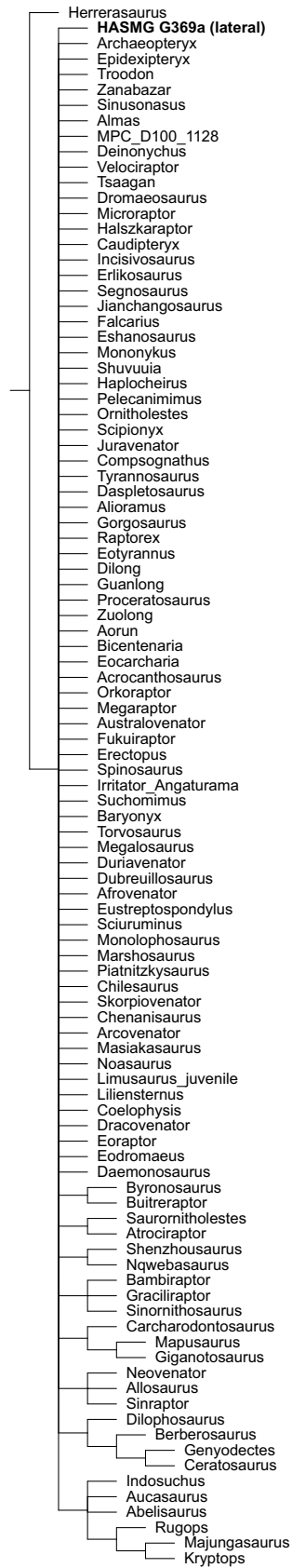


Fig S3 Strict consensus of the unconstrained analysis using the crown-only dataset.

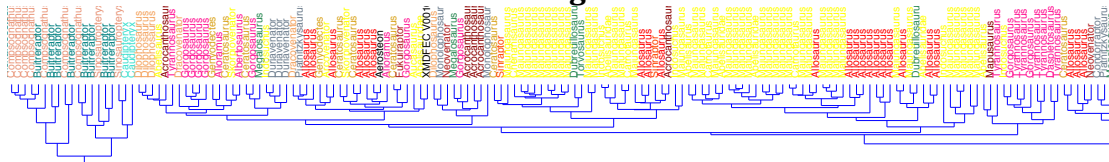
PC1 (%)	PC2 (%)	PC1 (%)	PC2 (%)	Axis 1	Axis 2	Axis 1	Axis 2
50.89	19.86	41.04	21.57	5.7081	2.2272	18.374	9.6563
50.08	19.11	42.86	17.09	5.7905	2.2091	18.01	7.1806
57.04	21.78	41.07	24.73	12.239	4.6732	24.992	15.051
54.09	22.79	41.4	25.68	11.008	4.6388	23.75	14.731
37.97	31.01	35.48	27.85	1.9237	1.5713	6.2636	4.9158
39.64	30.5	36.25	22.59	2.2061	1.6975	6.0601	3.7752
48.45	27.08	54.31	18.43	2.2474	1.2559	12.99	4.4081
57.88	22.98	45.27	21.19	3.4446	1.3678	9.3725	4.3866

2.2. Cluster analyses: results

Table S3. Results of the cluster analyses on the various iterations of the pan-theropodan datasets, with XMDFEC V10010 treated as an unknown taxon.

Dataset	Cluster Analysis	
	Hierarchical clustering	Neighbour joining
Whole dataset	Abelisauridae indet.	Abelisauridae indet. + <i>Fukuiraptor</i>
Whole dataset (no denticles = ?)	Abelisauridae indet.	Abelisauridae indet. + <i>Fukuiraptor</i>
My dataset	Abelisauridae indet.	<i>Arcovenator</i>
My dataset (no denticles = ?)	Abelisauridae indet.	Abelisauridae indet.
Whole dataset with large teeth	Abelisauridae indet.	Abelisauridae indet.
Whole dataset with large teeth (no denticles = ?)	Abelisauridae indet.	Abelisauridae indet. + <i>Fukuiraptor</i>
My dataset with large teeth	Abelisauridae indet.	Abelisauridae indet.
My dataset with large teeth (no denticles = ?)	Abelisauridae indet.	Abelisauridae indet.

Whole dataset - Hierarchical clustering



Whole dataset (no denticles = ?) - Hierarchical clustering

