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Supplementary Materials for

The influence of juvenile dinosaurs on community structure and diversity

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Materials and Methods

Data

Dinosaur assemblages were identified by downloading all vertebrate occurrences known to species or genus level between 200Ma and 65MA from the Paleobiology Database (PaleoDB https://paleobiodb.org/#/ download 6 August, 2018). Using associated depositional environment and taxonomic information, the vertebrate database was limited to only terrestrial organisms, excluding amphibians, pseudosuchians, champsosaurs and ichnotaxa. Taxa present in formations were confirmed against the most recent available literature, as of November, 2020. Synonymous taxa or otherwise duplicated taxa were removed. Taxa that could not be identified to genus level were included as "Taxon X". GPS locality data for all formations between 200MA and 65MA was downloaded from PaleoDB to create a minimally convex polygon for each possible formation.

Any attempt to recreate local assemblages must include all potentially interacting species, while excluding those that would have been separated by either space or time. We argue it is acceptable to substitute formation for home range in the case of non-avian dinosaurs, as range increases with body size. Reaching masses of 80,000kg, it is not unrealistic for gigantic non-avian dinosaurs to have home ranges that spanned the entirety of a geologic formation, particularly as none of the included formations exceed the modern range of some mammalian megafauna (*39*). Further, our research is focused on the overall shape of body size diversity distributions, so while there is time-averaging in our dataset, this is also acceptable, as we are examining the presence/absence of body sizes, rather than the exact species identified within the assemblage. Wherever possible, formations were reduced to biostratigraphic groups recognized in the literature to remedy this potential issue, resulting in an average time span of 4.8 million years for our formations. Only formations with at least 5 species were included in the overall dataset, and only formations containing at least 3 carnivores were included in the carnivore test set.

Mass estimates from the literature were added to the final dataset of terrestrial vertebrates. When a range of masses were available for one species, the average was used to normalize for variability within mass estimate techniques, which included, (but were not limited to) volumetric, limb bone circumference, limb bone length, and polynomial regression. Where no mass estimate was available, estimates from similarly sized species within the same genus, family or order were substituted. Species were assigned to a 0.5 log(10) bin based on mass. While it is noted that a wide variety of mass estimate techniques are included within this dataset, as all analyses were performed on log10 scale, variability between estimates did not have an appreciable effect on our results.

All species were assigned a basic trophic level designator based on species morphological and ecological descriptions in the literature. Species were categorized individually, regardless of taxonomic affinity in order to most accurately capture the intricacies of dinosaur community structuring. "Carnivores" and "Herbivores" were identified as any organism never having been contested in the literature as a non-carnivore or non-herbivore, respectively. As only a small percentage of the species included in our analyses fell outside of these two main categories, we subdivided the "omnivore" group in two, which were then added to either the "carnivore" or "herbivore" group as appropriate. "Meat-dominant omnivore" was assigned to any species that had been suggested as an omnivore after an initial designation of carnivore, or which was identified as an omnivore with identifiable faunivore morphology, and were grouped with carnivores for analysis. A similar method was used to designate "plant-dominant omnivore",

which were grouped with herbivores. Recent accounts of dietary remnants, such as stomach contents and coprolites, were also considered when grouping species into tropic categories. While we endeavored to be as accurate as possible with these descriptions, some species, particularly enigmatic species within caenagnathidae and oviraptoridae, have yet to be definitively described within a single dietary category. Our inclusion of these species within the "meat-dominant omnivore" group may prove to be inaccurate as more evidence is presented in the literature. However, these enigmatic species represent an exceedingly small portion of the overall sample tested (1.6%) and therefore are unlikely to significantly change our results when grouped as herbivores rather than carnivores.

Statistical Analysis

To determine the shape of the M-S distribution, each dinosaur assemblage, as well as each carnivore and herbivore assemblage was tested for fit with K-S Goodness of Fit (alpha=0.05) against the global dataset, bootstrapped 1,000 times. Bimodality was assessed with Sarle's Bimodality Coefficient, summary statistics, and fit to quadratic and 4^{th} degree polynomial regressions. Bimodality was further tested through likelihood of bin occupancy for the entire dataset, as well as on carnivores and herbivores separately. To determine the effect of the presence of megatheropods in an assemblage, a Kendal Rank test was performed on 39 carnivore guild distributions. Likelihood of bin occupancy was further tested in relation to occupancy of surrounding mass bins to determine the influence of any larger species on occupancy.

Ontogenetic Biomass Calculations

In order to identify potential competitive exclusion in dinosaur assemblages, biomass was calculated for megatheropods from nine formations from the total dataset. These formations were selected because they represent multiple geographic locations and geologic periods, and contain theropods for which growth and survivorship curves have been calculated. Growth rates from Erickson and Bybee were multiplied by survivorship of the same species from Erickson, using a 1,000-individual cohort. As it has been hypothesized that giant theropods would all employ a similar rapid growth curve, and as neither growth curves nor survivorship curves for *Acrocanthosaurus atokensis* and *Siats meekerorum* were available in the primary literature, growth curves for these species were created by averaging growth rates from *Tyrannosaurus rex* for its increased size, and *Allosaurus fragilis* for its taxonomic similarity to *A.atokensis* and *S. meekerorum,* Survivorship curves from *Daspletosaurus torosus* were substituted directly, as the mass of all three species is similar. The same method was utilized for *Tarbosaurus bataar,* averaging curves from *T. rex* and *D. torosus.* Biomass estimates for *Achillobator giganticus* were not included as there are no existing comparable growth curves or survivorship estimates available.

The relative biomass for juveniles and adults of each species was multiplied by the proportional biomass for each mass bin, normalized so the adult proportion = 1. Juveniles were defined as individuals in the cohort that had not reached somatic maturity based on asymptotic growth (approximately age 16).

Supplementary Text

Inclusion and exclusion of taxa

Our database of 557 non-avian dinosaur taxa are based on downloads from the Paleobiology Database, an extensive recording of all published taxa, updated and maintained by a group of paleontologists from around the globe. Downloads from the PBDB provided a baseline of all potential taxa to be found in a community, which was then independently verified against the literature, as of November, 2020. Sources for every occurrence of every species were identified independent from the PBDB to confirm their accuracy temporally and spatially, and are listed in Table S1. All obsolete taxa (e.g. *Deinodon)* were excluded. Morphological and phylogenetic reassessments were followed as much as possible, and taxonomy was updated accordingly, specifically pertaining to the following species:

Amtosaurus archibaldi- fragmentary remains that have been described with ankylosaur or hadrosaur affinities have since been renamed as *Bissektipelta* (*40*)

Anatotitan copei- hadrosaur material from western North America which most recently has been demonstrated to be the remains of *Edmontosaurus* (*41*).

Chialingosaurus kuani- based solely on juvenile remains from the Shaximiao formation that cannot be distinguished as a unique taxon, and is therefore a nomen dubium (*42*)

Chungkingosaurus jiangbeiensis- has been identified as a possible juvenile of *Tuojiangosaurus* (*43*)

Compsosuchus solus- based on fragmentary remains from the Lameta formation, has since been determined to be a nomen dubium and is therefore listed as “Noasaurid C” in this paper (*44*)

Drinker nisti- neornithischian remains from this species were reclassified together with at least one other taxon as a single taxon *Nanosaurus agilis* (*45*)

Iguanodon dawsoni- limited post-cranial material from the Wadhurst Clay formation that has since been reclassified as *Barilium dawsoni* (*46*)

Iguanodon orientalis- poorly described skull material from Khuren Dukh that has since been reclassified as *Altirhinus kurzanovi* (*47*)

Jubbulpuria tenuis- based on fragmentary remains from the Lameta formation, has been determined to be a nomen dubium and is therefore listed as “Theropod B” in this paper (*44*)

Koutalisaurus kohlerorum- synonymous with *Pararhabdodon* (*48*)

Leptorhynchos elegans- caenagnathid redescribed as *Citipes elegans* (*49*)

Majungatholus atopus- originally described as a new pachycephalosaur, material has been re-assigned to *Majungasaurus* (*50*)

Maleevus disparoserratus- originally described as a new ankylosaur from the Bayan Shireh formation, has since been determined to be a junior synonym of *Pinacosaurus* (*51*)

Nanotyrannus- based on a skull originally described as *Gorgosaurus lancensis* from the Hell Creek formation, *Nanotyrannus* was erected as a new genus of pygmy tyrannosaur (*52*). Following the discovery of a second, more complete skeleton, numerous morphological analyses have overwhelmingly shown the two specimens attributed to *N. lancensis* to be juvenile specimens of *Tyrannosaurus rex* (*8, 12, 53–56*)

Ornithomimus minutus- based on isolated toe bones from the Laramie formation with likely Alvarezsaurid affinity (*57*), is listed as "Alvarezsauridae" in this paper

Richardoestesia asiatica- although likely a valid species, this tooth taxon cannot be distinguished from *R. isosceles* and has been included within this taxon in this paper (*58*)

Styracosaurus ovatus- ceratopsian remains from the Two Medicine formation that have since been reclassified as *Rubeosaurus* (*59*)

Titanosaurus madagascariensis- based on fragmentary remains from the Maeverano formation, has been identified as synonymous with *Laplatasaurus* (*60*)

Triceratops / Torosaurus- although the validity of the genus *Torosaurus* has been called into question (*61-62*) as a possible ontogenetic stage of the earlier named *Triceratops,* we feel this assertion has yet to be definitively proven, particularly in light of more recent morphometric analyses (*63-64*). As such, we include both genera in our paper.

Ugrunaaluk kuukpikensis- hadrosaurid remains from the Prince Creek formation that have since been reclassified as remains of juvenile *Edmontosaurus* (*65*)

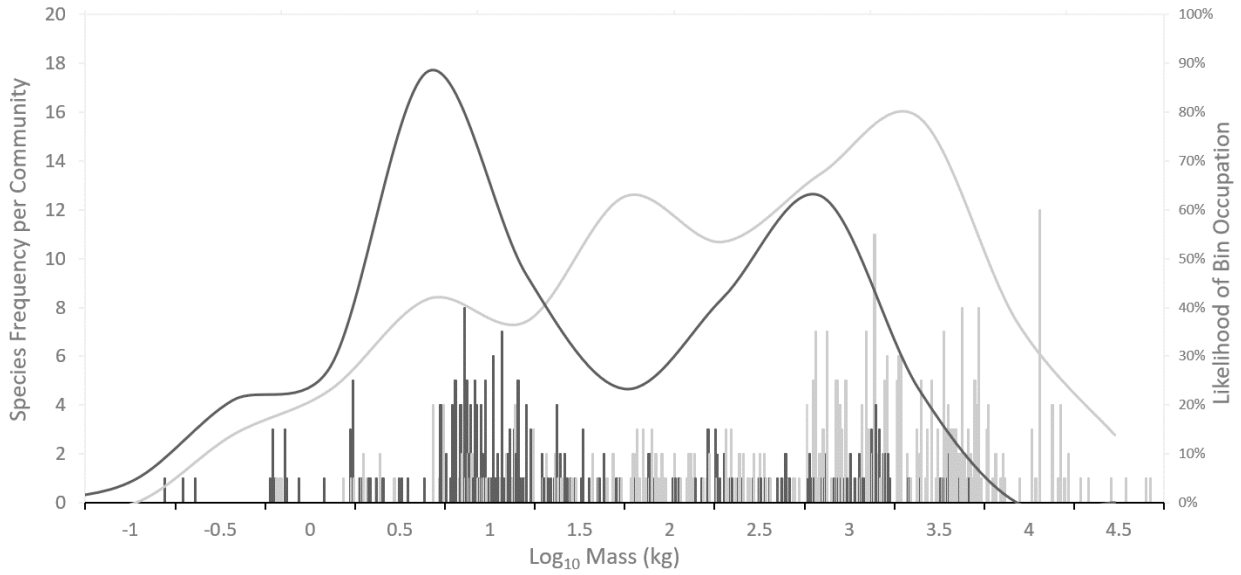
Wuerhosaurus mongoliensis- informally named stegosaur material from the Dzunbain formation which has since been formally described as *Mongolostegus exspectabilis* (*66*)

Willinakaqe salitralensis- originally described as a new saurolophine hadrosaur from the Allen formation(*67*), *W. salitralensis* has since been determined to refer to multiple species and is therefore a nomen dubium (*68*).

Yunnanosaurus robustus- material from the Lufeng formation represents an ontogenetic series, synonymous with *Y. huangi* (*69*)

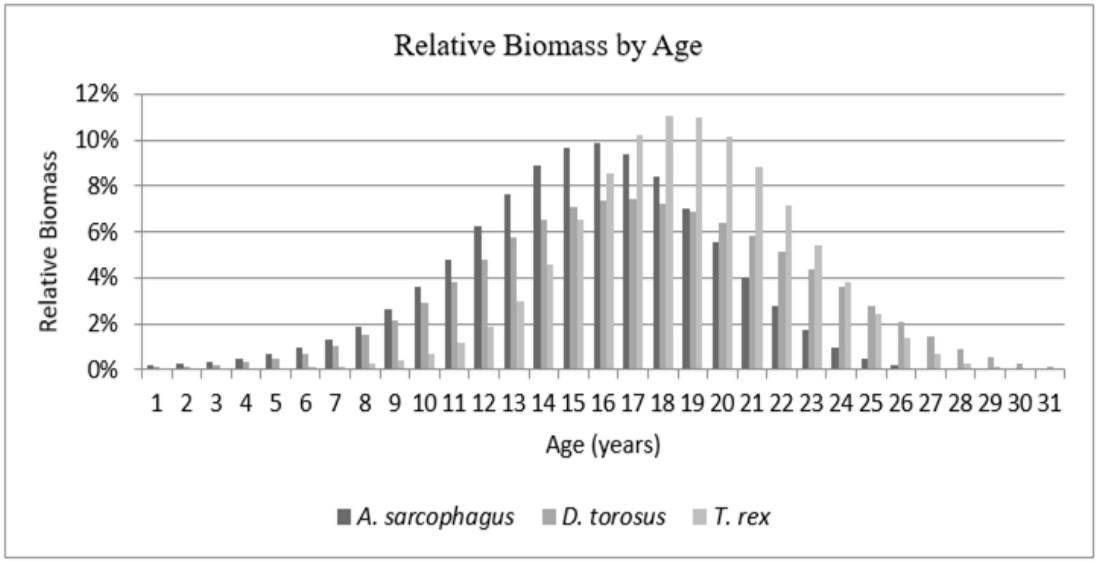
In the interest of capturing as much biodiversity as possible, we removed as few "problematic" taxa as possible. Only those that we found to be definitively synonymous, or those that showed a preponderance of evidence towards synonymizing were excluded.

Fig. S1.



Number of species in each mass bin, by guild, in formations from the Jurassic and Cretaceous eras (bars) appears more normal than global distribution. Herbivores (light grey) mirror their left-skewed global distribution, while carnivores exhibit a unique bimodal trend. Likelihood of at least one species existing in mass bin in any formation (lines) shows the distinctly more platykurtic distribution at local scales, as well as the severe drop in likelihood in medium size carnivore bins.

Fig. S2.



Growth vs survivorship of three megatheropods shows biomass is highest at sexual maturity, which occurs shortly before somatic maturity in dinosaurs.

Table S1.

Assemblage	Herbivores / Plant Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref	Carnivores / Meat Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref
Allen Argentina 79-69MYA	*Bonatitan reigi*	(70)	808.0086	(26, 71)	*Dromaeosaurid A*	(76)	15.142	(43)
	Nodosaurid A	(72)	1788.277	(4, 9, 26, 43, 73)	*Bonapartenykus ultimus*	(83)	20.5	(57)
	Bonapartesaurus rionegrensis	(74)	2071.494	(43, 57, 73)	*Austroraptor cabazai*	(84)	373.849	(4, 26-27, 43)
	Hadrosaurid A	(67)	2071.494	(43, 57, 73)	*Quilmesaurus curriei*	(85)	460	(43, 57, 86)
	Lapampasaurus cholinoi	(75)	2071.494	(43, 57, 73)	*Carcharodontosaurid A*	(70)	491.667	(86)
	Saltasaurid A	(76)	3741.3	(4, 43, 57, 71, 73)				
	Saltasaurine A	(76)	3741.3	(4, 43, 57, 71, 73)				
	Hadrosaurid B	(70)	4000	(43)				
	Aeolosaurus	(77)	6000	(43)				
	Laplatasaurus araukanicus	(72)	8395.233	(4, 43, 71)				
	Panamericansaurus schroederi	(78)	11629.23	(26, 71)				
	Antarctosaurus wichmannianus	(79)	20817.15	(4, 26, 43, 71, 80)				
	Titanosaurian A	(81)	22385.94	(43, 82)				
Anacleto Argentina 84-79MYA	*Gasparinisaura cincosaltensis*	(87)	8.96212	(4, 26, 43)	*Aerosteon riocoloradensis*	(93)	672.43	(26, 43, 86)
	Saltasaurine B	(87)	3741.3	(4, 43, 57, 71, 73)	*Aucasaurus garridoi*	(87)	734.233	(4, 26, 43, 86)
	Neuquensaurus australis	(87)	3802.349	(4, 26-27, 43, 71)	*Abelisaurus comahuensis*	(87)	2325	(43, 86)
	Overosaurus paradasorum	(88)	5250	(43, 71)				
	Pitekunsaurus macayai	(89)	5500	(43, 57)				
	Laplatasaurus araukanicus	(87)	8395.233	(4, 43, 71)				
	Narambuenatitan palomoi	(90)	8919.105	(27, 43, 57, 73, 86)				
	Barrosasaurus casamiquelai	(91)	13500	(71)				
	Nemegtosaurid A	(92)	14139.36	(43, 71)				
	Antarctosaurus wichmannianus	(87)	20817.15	(4, 26, 43, 71, 80)				
	Pellegrinisaurus powelli	(87)	29050	(43, 71)				
Bajo de la Carpa Argentina 85-84MYA	*Ornithopod D*	(94)	8.96212	(4, 26, 43)	*Neuquenornis volans*	(95)	0.3795	(73)
	Elasmarian Ornithopod	(94)	300	(43)	*Alvarezsaurus calvoi*	(95)	2.79242	(26-27, 43, 86)
	Rinconsaurus caudamirus	(95)	3426.56	(26, 43, 71)	*Velocisaurus unicus*	(95)	3.94576	(26, 86)
	Bonitasaura salgadoi	(95)	5250	(43, 71)	*Achillesaurus manazzonei*	(96)	16.5	(43, 86)
	Lithostrotian Sauropod A	(95)	5250	(43, 71)	*Viavenator exxoni*	(95)	700	(43)
	Lithostrotian Sauropod B	(95)	5250	(43, 71)	*Tratayenia rosalesi*	(97)	1150	(43, 86)
	Overosaurus paradasorum	(95)	5250	(43, 71)	*Carnotaurine A*	(98)	1925	(43, 86)
	Laplatasaurus	(87)	6488.299	(4, 43, 71, 73)				
	Traukutitan eocaudata	(95)	32064.56	(26, 71)				
Baruungoyot Mongolia 79-70MYA	*Bagaceratops rozhdestvenskyi*	(99)	4.271304	(4, 26, 43)	*Parvicursor remotus*	(99)	0.16883	(26-27, 43, 86)
	Magnirostris dodsoni	(99)	4.271304	(4, 26, 43)	*Ceratonykus oculatus*	(103)	0.57999	(26-27, 43, 86)
	Tylocephale gilmorei	(100)	40	(43)	*Hulsanpes perlei*	(104)	1.36383	(105)
	Protoceratops hellenikorhinus	(100)	180	(43)	*Shuvuuia deserti*	(103)	2.9821	(26-27, 43, 86)
	Ornithomimid B	(100)	315.6433	(4, 26-27, 43, 73)	*Mononykus olecranus*	(99)	3.95592	(4, 26, 43, 86)
	Pinacosaurus mephistocephalus	(99)	1100.806	(4, 43)	*Machairasaurus*	(99)	10	(86)
	Saichania chulsanensis	(99)	1305.986	(26, 43)	*Avimimus*	(99)	13.2792	(4, 26, 43, 86)
	Tarchia gigantea	(99)	2000	(43)	*Velociraptor osmolskae*	(100)	18.734	(4, 26-27, 43, 73)
	Zaraapelta nomadis	(101)	2500	(101)	*Conchoraptor gracilis*	(99)	24.5	(43, 86)
	Hadrosaurid C	(100)	3062.165	(4, 26, 43, 57, 73)	*Oviraptor philoceratops*	(100)	33.0698	(4, 43, 86)
	Quaesitosaurus	(100)	12172.7	(43, 71, 102)	*Ingenia*	(99)	43.4805	(26)
					Tarbosaurus bataar	(106)	3103.15	(26, 43, 73, 86)
Bayan Shireh / Iren Dabasu Mongolia 101-90MYA	*Yamaceratops dorngobiensis*	(107)	2	(43)	*Avimimus*	(112)	13.2792	(4, 26, 43, 86)
	Graciliceratops mongoliensis	(108)	4.335756	(4, 26)	*Velociraptor*	(112)	18.734	(4, 26-27, 43, 73)
	Amtocephale gobiensis	(109)	50	(109)	*Saurornithoides mongoliensis*	(112)	21.7546	(26, 43, 86)
	Garudimimus brevipes	(100)	99.61264	(26-27, 43, 73, 86)	*Deinonychosaurian A*	(116)	90	(4, 26, 43, 86)
	Archaeornithomimus	(110)	146.8911	(26, 86)	*Achillobator giganticus*	(117)	373.849	(4, 26-27, 43)
	Amtosaurus magnus	(100)	300	(40)	*Alectrosaurus olseni*	(100)	601.026	(26, 86)
	Erlikosaurus andrewsi	(100)	430	(43, 86)	*Theropod A*	(116)	1742.73	(4, 26, 43, 73, 86)
	Tsagantegia longicranialis	(107)	500	(43)				
	Enigmosaurus mongoliensis	(100)	960.1667	(43, 57, 86)				
	Talarurus plicatospineus	(100)	1020.246	(4, 26, 43)				
	Pinacosaurus disparoserratus	(100)	1100.806	(4, 43)				
	Gilmoreosaurus mongoliensis	(111)	1136.287	(4, 26, 43)				
	Bactrosaurus	(112)	1472.773	(4, 26, 43)				
	Gobihadros mongoliensis	(113)	1712.598	(43, 73)				
	Gigantoraptor erlianensis	(114)	2216.107	(4, 26, 43, 86, 115)				
	Segnosaurus galbinensis	(100)	2633.2	(26, 43, 86)				
	Erketu ellisoni	(116)	11225.59	(43, 71, 116)				
	Quaesitosaurus orientalis	(107)	25418.09	(102)				

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Assemblage	Herbivores / Plant Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref	Carnivores / Meat Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref
Bissekty Uzbekistan 92-90MYA	*Levnesovia transoxiana*	(118)	175	(43)	*Caenagnathasia martinsoni*	(122)	1.4	(43)
	Bissektipelta archibaldi	(110)	300	(40)	*Richardoestesia isosceles*	(123)	10.1954	(9, 86)
	Ornithomimid C	(119)	315.6433	(4, 26-27, 43, 73)	*Urbacodon itemirensis*	(123)	10.8333	(57, 86)
	Turanoceratops tardabilis	(120)	483.7592	(26, 43)	*Itemirus medullaris*	(124)	12.422	(26)
	Bactrosaurus	(104)	1472.773	(4, 26, 43)	*Paronychodon asiaticus*	(123)	12.9875	(86)
	Therizinosauroidea	(120)	4750	(43, 86)	*Timurlengia euotica*	(125)	220	(125)
	Non-lithostrotian Titanosaur A	(121)	7000	(43)				
Callovian Oxford Clay United Kingdom 166-163.5MYA	*Callovosaurus leedsi*	(126)	108.3666	(4, 27)	*Eustreptospondylus oxoniensis*	(131)	348.725	(4, 26, 43, 86)
	Sarcolestes leedsi	(127)	187.5	(57)	*Metriacanthosaurus parkeri*	(132)	1184.89	(26, 86)
	Lexovisaurus durobrivensis	(126)	2155.233	(4, 43)				
	Omosaurus durobrivensis	(128)	2155.233	(4, 43)				
	Loricatosaurus priscus	(104)	2257.871	(4, 26, 57, 73)				
	Cetiosauriscus stewarti	(129)	12160.95	(4, 26, 43, 71)				
	Cetiosaurus	(130)	12232.49	(4, 26, 43, 71)				
Cedar Mountain Mussentuchit United States 102-95.64MYA	*Neoceratopsian A*	(133)	1.5	(134)	*Velociraptorine A*	(142)	5.82906	(4, 43, 86)
	Zephyrosaurus	(135)	20	(43)	*Richardoestesia*	(142)	10.2398	(9, 43, 86)
	Pachycephalosaurid A	(136)	27.6576	(4, 26, 43)	*Paronychodon*	(142)	12.9875	(9, 26, 43, 86)
	Animantarx ramaljonesi	(137)	411.8695	(4, 26, 43)	*Caenagnathoid A*	(136)	13.2792	(4, 26, 43, 86)
	Ornithopod E	(136)	500	(43)	*Troodontid C*	(142)	21.7546	(26, 43, 86)
	Tenontosaurus	(138)	818.362	(4, 26-27, 43)	*Dromaeosaurine A*	(142)	83.1907	(4, 26, 43, 86)
	Eolambia caroljonesa	(139)	1000	(43)	*Alectrosaurus*	(135)	601.026	(26, 86)
	Peloroplites cedrimontanus	(140)	2000	(43)	*Siats meekerorum*	(143)	3950	(86, 143)
	Cedarpelta bilbeyhallorum	(140)	5000	(43)				
	Astrodon	(135)	10800	(71, 141)				
Cloverly United States 113-100.5MYA	*Aquilops americanus*	(134)	1.5	(134)	*Microvenator celer*	(144)	3.62685	(4, 26)
	Zephyrosaurus schaffi	(144)	20	(43)	*Deinonychus antirrhopus*	(144)	83.1907	(4, 26, 43, 86)
	Ornithomimus velox	(104)	175.6667	(9, 43, 86)	*Acrocanthosaurus atokensis*	(144)	4558.8	(4, 26, 43, 86)
	Tenontosaurus tilletti	(144)	818.362	(4, 26-27, 43)				
	Sauropelta edwardsorum	(144)	2000	(43)				
	Tatankacephalus cooneyorum	(144)	2505.082	(43, 145)				
	Rugocaudia coonevi	(146)	6300	(71)				
	Sauroposeidon proteles	(144)	34146.02	(26, 43, 147)				
Dinosaur Park MAZ-1b Canada 76-75.5MYA	*Stegoceras validum*	(148)	27.6576	(4, 26, 43)	*Hesperonychus elizabethae*	(152)	2.55	(43, 86)
	Hanssuesia sternbergi	(148)	28.07162	(43)	*Bambiraptor feinbergi*	(153)	5.82906	(4, 43, 86)
	Prencephale	(148)	38.50373	(26, 43)	*Richardoestesia isosceles*	(153)	10.1954	(9, 86)
	Struthiomimus altus	(149)	215.0365	(4, 26-27, 43, 73)	*Richardoestesia gilmorei*	(153)	10.3284	(9, 43, 86)
	Panoplosaurus mirus	(150)	1436.424	(26, 43)	*Zapsalis abradens*	(153)	12.3333	(86, 104)
	Euoplocephalus tutus	(150)	1617.899	(4, 26, 43)	*Dromaeosaurus albertensis*	(153)	14.7467	(9, 43, 86)
	Centrosaurus apertus	(150)	2214.703	(4, 26, 43)	*Saurornitholestes langstoni*	(153)	23.4053	(4, 9, 26, 43, 57)
	Chasmosaurus belli	(150)	2244.365	(4, 26, 43)	*Pectinodon*	(153)	47.3759	(26)
	Chasmosaurus russelli	(151)	2258.128	(4, 26-27, 43)	*Caenagnathus collinsi*	(154)	61.5	(43, 155)
	Edmontonia rugosidens	(150)	2265.253	(26, 43)	*Troodon formosus*	(153)	68.1649	(4, 26, 43, 86)
	Corythosaurus intermedius	(104)	2977.832	(26, 43)	*Chirostenotes pergracilis*	(154)	74.7759	(9, 43, 73, 86)
	Lambeosaurus lambei	(150)	3248.555	(4, 26, 43)	*Gorgosaurus libratus*	(156)	2554.78	(4, 26, 43, 86)
	Lambeosaurus clavinitialis	(150)	3300	(43)	*Daspletosaurus*	(156)	2565.55	(4, 43, 73, 86)
	Parasaurolophus walkeri	(150)	3549.646	(4, 26, 43)				
Djadokhta Mongolia 75-71MYA	*Bagaceratops*	(157)	4.271304	(4, 26, 43)	*Parvicursor remotus*	(159)	0.16883	(26-27, 43, 86)
	Goyocephale lattermorei	(100)	27.6576	(4, 26, 43)	*Mahakala omnogovae*	(160)	0.53745	(26, 43, 86)
	Oviraptor philoceratops	(100)	33.06984	(4, 43, 86)	*Halszkaraptor escuilliei*	(161)	0.76234	(26, 161)
	Protoceratops andrewsi	(100)	99.57581	(4, 26, 43)	*Shuvuuia deserti*	(162)	2.9821	(26-27, 43, 86)
	Aepyornithomimus tugrikinensis	(158)	105.9753	(158)	*Gobivenator mongoliensis*	(113)	12.7809	(26, 43, 86)
	Udanoceratops tschizhovi	(110)	736.087	(26, 43)	*Avimimus portentosus*	(100)	13.2792	(4, 26, 43, 86)
	Pinacosaurus grangeri	(100)	1100.806	(4, 43)	*Byronosaurus*	(163)	13.6	(43, 86)
	Nemegtosaurus	(100)	14139.36	(43, 71)	*Velociraptor mongoliensis*	(100)	18.734	(4, 26-27, 43, 73)
					Kol ghuva	(164)	20	(43)
					Tsaagan mangas	(165)	20.5	(43, 86)
					Saurornithoides mongoliensis	(100)	21.7546	(26, 43, 86)
					Khaan mckennai	(166)	23.9839	(26-27)
					Citipati osmolskae	(116)	93.9976	(26, 43, 86)
					Tyrannosauroid	(99)	3103.15	(26, 43, 73, 86)

Assemblage	Herbivores / Plant Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref	Carnivores / Meat Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref
Griman Creek Australia 99.6-93.5MYA	*Iguanodontian A*	(167-168)	6	(43)	*Noasaurid A*	(174)	13.7896	(4, 26, 43)
	Ornithopod A	(169)	8.9165	(43, 57)	*Noasaurid B*	(174)	26.5	(43, 86)
	Ornithopod B	(169-170)	20	(43)	*Rapator ornitholestoides*	(167)	156.745	(4, 26, 43, 57, 73)
	Weewarrasaurus pobeni	(168-169)	50	(169)	*Megaraptorid A*	(175)	201.729	(26, 43, 86)
	Ornithopod C	(169, 171)	90	(43)	*Avetheropoda A*	(175)	672.43	(26, 43, 86)
	Ankylosaurian A	(168)	300	(43)				
	Fostoria dhimbangunmal	(168, 172)	355.8834	(27, 43)				
	Ankylopollexian A	(168-169)	910.3948	(4, 26-27, 43)				
	Iguanodontian B	(169)	4225.792	(4, 9, 27, 73)				
	Titanosaurian B	(168, 173)	6000	(43)				
Hanson Antarctica 194-188MYA	*Prosauropod A*	(104)	554.9922	(4, 9, 71, 73, 176)	*Coelophysoid A*	(178-179)	6	(43, 178, 180)
	Glacialisaurus hammeri	(177)	745	(71, 177)	*Coelophysoid B*	(179)	25.0459	(26, 43, 86)
					Cryolophosaurus ellioti	(181)	349.387	(26, 43)
Hell Creek United States 66.8-66MYA	*Orodromeus makelai*	(182)	15.1695	(4, 26)	*Richardoestesia isosceles*	(196)	10.1954	(9, 86)
	Stegoceras	(183)	27.6576	(4, 26, 43)	*Richardoestesia gilmorei*	(197)	10.3284	(9, 43, 86)
	Citipes elegans	(184)	56.36128	(9, 43, 185)	*Acheroraptor temertyorum*	(198)	18.5	(86, 199)
	Sphaerotholus buchholtzae	(186)	68.33955	(43, 57, 73)	*Saurornitholestes*	(197)	23.7026	(4, 9, 26, 43, 57)
	Thescelosaurus	(187)	170.3897	(4, 26, 43)	*Pectinodon bakkeri*	(200)	47.3759	(26)
	Leptoceratops gracilis	(188)	212.9821	(4, 26, 43)	*Anzu wyliei*	(201)	246.013	(43, 86, 201)
	Ornithomimus	(189)	221.4634	(4, 9, 26-27, 43)	*Dakotaraptor steini*	(202)	285	(43, 86)
	Pachycephalosaurus wyomingensis	(190)	342.0206	(4, 26, 43)	*Tyrannosaurus rex*	(55)	6428.6	(4, 26, 43, 73, 86)
	Ankylosaurus magniventris	(191)	3872.272	(4, 26, 43)				
	Edmontosaurus annectens	(192)	4595.999	(4, 26, 43)				
	Torosaurus	(63, 193)	7598.517	(4, 26-27, 43, 73)				
	Triceratops horridus	(194)	8318.221	(4, 26-27, 43, 73)				
Horseshoe Canyon Drumheller-Horsethief Canada 73.1-71.5MYA	*Ornithomimus edmontonicus*	(149)	138.7235	(4, 26-27, 73)	*Richardoestesia gilmorei*	(203)	10.3284	(9, 43, 86)
	Struthiomimus	(149)	215.0365	(4, 26-27, 43, 73)	*Paronychodon*	(149)	12.9875	(9, 26, 43, 86)
	Arrhinoceratops brachyops	(149)	1300	(43)	*Dromaeosaurus*	(149)	13.56	(9, 43, 86)
	Edmontonia longiceps	(149)	1985.43	(4, 26, 43)	*Atrociraptor marshalli*	(203)	15.25	(43, 86)
	Anodontosaurus lambei	(203)	2164.816	(43, 204)	*Troodontid D*	(203)	22.496	(86)
	Anchiceratops ornatus	(149)	2229.013	(26, 43)	*Albertavenator*	(203)	50	(205)
	Pachyrhinosaurus canadensis	(149)	3139.13	(4, 26, 43)	*Epichirostenotes*	(149)	98.0518	(86)
	Edmontosaurus regalis	(149)	5260.076	(4, 26, 43)	*Apatoraptor*	(203)	115.552	(206)
					Albertosaurus sarcophagus	(149)	2345.18	(4, 26, 43, 86)
Judith River Coal Ridge Canada 76.2-75.2MYA	*Pachycephalosaurid B*	(207)	27.6576	(4, 26, 43)	*Richardoestesia gilmorei*	(208)	10.3284	(9, 43, 86)
	Hypsilophodontid A	(207-208)	170.3897	(4, 26, 43)	*Zapsalis abradens*	(208)	12.3333	(86, 104)
	Avaceratops lammersi	(208)	579.6361	(4, 43)	*Paronychodon*	(207)	12.9875	(9, 26, 43, 86)
	Nodosaurid B	(208)	1436.424	(26, 43)	*Dromaeosaurus albertensis*	(208)	14.7467	(9, 43, 86)
	Mercuriceratops gemini	(208)	2070.972	(43, 209)	*Troodon formosus*	(208)	68.1649	(4, 26, 43, 86)
	Monoclonius crassus	(207)	2396.318	(43, 210)	*Gorgosaurus libratus*	(104)	2554.78	(4, 26, 43, 86)
	Zuul crurivastator	(211)	2500	(211)				
	Lambeosaurus	(207)	3117.374	(4, 26, 43)				
	Gryposaurus	(208)	3428.063	(4, 26, 43)				
	Spiclypeus shipporum	(208)	3500	(208)				
	Hadrosaurid D	(207-208)	4000	(43)				
Kaiparowits United States 76.1-74MYA	*Stegoceras validum*	(104)	27.6576	(4, 26, 43)	*Richardoestesia*	(213)	10.2398	(9, 43, 86)
	Hypsilophodontid B	(212)	40.23712	(26, 43)	*Paronychodon*	(213)	12.9875	(9, 26, 43, 86)
	Ornithomimus velox	(213)	175.6667	(9, 43, 86)	*Dromaeosaurid B*	(213)	13.56	(9, 43, 86)
	Akainacephalus johnsoni	(214)	1500	(43)	*Velociraptorine B*	(213)	23.7026	(4, 9, 26, 43, 57)
	Nasutoceratops titusi	(215)	1500	(43)	*Talos sampsoni*	(219)	29	(43, 219)
	Kosmoceratops richardsoni	(216)	1850	(43, 216)	*Hagryphus giganteus*	(220)	80	(43, 86)
	Utahceratops gettyi	(216)	2750	(43, 216)	*Teratophoneus curriei*	(221)	1532.18	(26, 43, 86)
	Gryposaurus monumentensis	(217)	3000	(43)				
	Parasaurolophus cyrtocristatus	(218)	3292.803	(4, 43)				
Kayenta/Navajo Sandstone United States 199-182MYA	*Segisaurus*	(222)	6	(43, 178, 180)	*Kayentavenator elysiae*	(227)	17.75	(43, 57)
	Scutellosaurus lawleri	(223)	14.8132	(26, 43)	*Coelophysis kayentakatae*	(228)	30.1113	(26, 43)
	Seitaad ruessi	(224)	85	(43, 71)	*Dilophosaurus wetherilli*	(229)	340.609	(4, 26-27, 43, 86)
	Sarahsaurus aurifontanalis	(225)	163.7259	(26-27, 43, 71)				
	Ammosaurus	(222)	355.1782	(4, 26, 43, 71)				
	Scelidosaurus	(226)	500	(86)				

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Assemblage	Herbivores / Plant Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref	Carnivores / Meat Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref
Khuren Dukh Mongolia 107-100MYA	*Psittacosaurus mongoliensis*	(230)	14.01595	(4, 26, 43)	*Troodontid A*	(230)	2.5	(43)
	Harpymimus okladnikovi	(230)	99.94297	(4, 43, 86)	*Troodontid B*	(232)	10.8333	(86)
	Ornithomimid A	(230)	146.8911	(26, 86)	*Carnosaurian A*	(116)	1742.73	(4, 26, 43, 73, 86)
	Mongolostegus exspectabilis	(66)	950	(43, 57)				
	Choyrodon barsboldi	(231)	1000	(43, 231)				
	Altirhinus kurzanovi	(104)	1100	(43)				
	Shamosaurus scutatus	(230)	2000	(43)				
	Sauropod A	(116)	11225.59	(43, 71)				
Kirtland Hunter-Willow Washes United States 75-73MYA	*Stegoceras validum*	(233)	27.6576	(4, 26, 43)	*Richardoestesia*	(238)	10.2398	(9, 43, 86)
	Sphaerotholus goodwini	(233)	64.06949	(43, 57, 73)	*Dromaeosaurid C*	(239)	13.56	(9, 43, 86)
	Ornithomimus edmontonicus	(234)	138.7235	(4, 26-27, 73)	*Troodontid E*	(240)	17	(86)
	Ornithomimus antiquus	(233)	221.4634	(4, 9, 26-27, 43)	*Saurornitholestes langstoni*	(233)	23.4053	(4, 9, 26, 43, 57)
	Nodocephalosaurus kirtlandensis	(233)	1500	(43)	*Troodon*	(239)	68.1649	(4, 26, 43, 86)
	Ziapelta sanjuanensis	(235)	2164.816	(43, 204)	*Bistahieversor sealeyi*	(241)	2900	(43, 86)
	Anasazisaurus horneri	(233)	2500	(43)				
	Parasaurolophus tubicen	(233)	3183.813	(4, 26, 43)				
	Kritosaurus navajovius	(233)	4000	(43)				
	Naashoibitosaurus ostromi	(233)	4000	(43)				
	Pentaceratops sternbergii	(233)	5471.06	(4, 26, 43)				
	Titanoceratops ouranos	(236)	5500	(43, 236)				
	Alamosaurus sanjuanensis	(233)	37468.47	(4, 26, 43, 71, 237)				
Kota India 152-139MYA	*Ankylosaurian B*	(242)	500	(86)	*Dandakosaurus indicus*	(86)	2300	(86)
	Thyreophoran A	(243)	3374.023	(4, 26, 43, 73)				
	Kotasaurus yamanpalliensis	(244)	5366.125	(4, 26-27, 43)				
	Barapasaurus tagorei	(245)	9286.718	(4, 43, 71)				
Lameta India 72-66MYA	*Titanosaurus blanfordi*	(60)	8650	(57, 71)	*Theropod B*	(248)	9.12639	(4, 9, 43, 57, 73)
	Titanosaurus indicus	(246)	10362.15	(4, 43, 71)	*Noasaurid C*	(249)	12	(86)
	Isisaurus colberti	(246)	15000	(43)	*Laevisuchus indicus*	(246)	34.5	(86, 250)
	Jainosaurus septentrionalis	(247)	15555.35	(26-27, 43)	*Indosaurus matleyi*	(246)	491.25	(86)
					Indosuchus raptorius	(246)	1500	(43, 57, 86, 251)
					Rahiolisaurus gujaratensis	(252)	2519.65	(43, 86, 252)
					Rajasaurus narmadensis	(246)	3500	(43, 86)
Lance United States 66.8-66MYA	*Leptoceratops gracilis*	(253)	212.9821	(4, 26, 43)	*Richardoestesia*	(196)	10.2398	(9, 43, 86)
	Thescelosaurus neglectus	(104)	214.9144	(4, 26, 43)	*Paronychodon*	(196)	12.9875	(9, 26, 43, 86)
	Pachycephalosaurus wyomingensis	(254)	342.0206	(4, 26, 43)	*Dromaeosaurus*	(256)	13.56	(9, 43, 86)
	Ornithomimus sedens	(255)	350	(43)	*Saurornitholestes langstoni*	(153)	23.4053	(4, 9, 26, 43, 57)
	Edmontonia longiceps	(104)	1985.43	(4, 26, 43)	*Pectinodon bakkeri*	(153)	47.3759	(26)
	Ankylosaurus magniventris	(191)	3872.272	(4, 26, 43)	*Chirostenotes*	(104)	65.5686	(43, 86)
	Edmontosaurus annectens	(256)	4595.999	(4, 26, 43)	*Troodon*	(104)	68.1649	(4, 26, 43, 86)
	Dyslocosaurus polyonychius	(257)	5000	(43)	*Anzu*	(258)	246.013	(43, 86, 201)
	Torosaurus	(63)	7598.517	(4, 26-27, 43, 73)	*Tyrannosaurus rex*	(259)	6428.6	(4, 26, 43, 73, 86)
	Triceratops horridus	(63)	8318.221	(4, 26-27, 43, 73)				
	Triceratops prorsus	(63)	8902.168	(4, 26-27, 43)				
Laramie United States 69-68MYA	*Thescelosaurus*	(260)	170.3897	(4, 26, 43)	*Alvarezsauridae*	(104)	8.93	(43)
	Edmontonia	(260)	2125.341	(4, 26, 43)	*Paronychodon*	(104)	12.9875	(9, 26, 43, 86)
	Edmontosaurus annectens	(261)	4595.999	(4, 26, 43)	*Dromaeosaurus*	(260)	13.56	(9, 43, 86)
	Torosaurus	(260)	7598.517	(4, 26-27, 43, 73)	*Tyrannosaurus rex*	(260)	6428.6	(4, 26, 43, 73, 86)
	Triceratops horridus	(260)	8318.221	(4, 26-27, 43, 73)				
	Triceratops prorsus	(261)	8902.168	(4, 26-27, 43)				
Lourinhã Spain 152-146MYA	*Draconyx loureiroi*	(262)	322.0178	(27, 43)	*Coelurosaurian A*	(264)	10.2398	(9, 43, 86)
	Miragaia longicollum	(263)	4729.744	(26, 43)	*Lourinhanosaurus antunesi*	(262)	249.344	(26, 43, 86)
	Dinheirosaurus lourinhanensis	(262)	5000	(43)	*Ceratosaurus nasicornis*	(262)	580.377	(4, 26-27, 43, 73)
	Dacentrurus armatus	(262)	6121.788	(4, 26-27, 43)	*Allosaurus*	(262)	1742.73	(4, 26, 43, 73, 86)
	Lourinhasaurus alenquerensis	(262)	18201.68	(26, 43, 71)	*Torvosaurus*	(262)	3483.33	(26, 43, 86)
	Lusotitan atalaiensis	(262)	32249.65	(26, 43, 71)				
Lufeng BII "Zhangjia'ao" China 199-190.8MYA	*Eshanosaurus deguchiianus*	(265)	26	(86, 265)	*Panguraptor lufengensis*	(265)	9.7	(86, 266)
	Yunnanosaurus huangi	(265)	591.7413	(26-27, 43, 57, 71)	*Coelophysis*	(265)	25.0459	(26, 43, 86)
	Chuxiongosaurus lufengensis	(265)	650	(43, 71)	*Sinosaurus triassicus*	(265)	324.792	(4, 43)
	Lufengosaurus huenei	(265)	1884.985	(4, 26, 43, 71)				
	Jingshanosaurus xinwaensis	(265)	3158.544	(4, 26-27, 43)				
Maevarano Madagascar 70-66MYA	*Rapetosaurus krausei*	(267)	4581.365	(4, 26, 71)	*Rahonavis ostromi*	(269)	0.84205	(26, 43, 86)
	Vahiny depereti	(268)	8672.855	(26, 71)	*Masiakasaurus knopfleri*	(104)	13.7896	(4, 26, 43)
					Majungasaurus crenatissimus	(104)	1195.68	(26, 43, 57, 73, 86)

Assemblage	Herbivores / Plant Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref	Carnivores / Meat Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref
Milk River Canada 84.5-83.5MYA	*Acrotholus audeti*	(270)	40	(270)	*Richardoestesia isosceles*	(272)	10.1954	(9, 86)
	Gryphoceratops morrisoni	(271)	50	(271)	*Richardoestesia gilmorei*	(272)	10.3284	(9, 43, 86)
	Brachyceratops	(104)	1300	(43)	*Zapsalis*	(272)	12.3333	(86, 104)
	Paleoscincus	(104)	1617.899	(4, 26, 43)	*Atrociraptor*	(272)	15.25	(43, 86)
	Nodosaurid C	(272)	2125.341	(4, 26, 43)	*Saurornitholestes langstoni*	(104)	23.4053	(4, 9, 26, 43, 57)
	Ankylosaurid A	(272)	2297.224	(43)	*Saurornitholestes*	(272)	23.7026	(4, 9, 26, 43, 57)
	Hadrosaurid E	(272)	3428.063	(4, 26, 43)	*Tyrannosaurid A*	(272)	2554.78	(4, 26, 43, 86)
	Centrosaurine A	(104)	3500	(43)				
Morrison Brushy Basin Zone 3 United States 150-149.2MYA	*Nanosaurus agilis*	(273)	24.29303	(4, 43, 57, 73)	*Coelurus fragilis*	(273)	20.3806	(26, 43, 86)
	Mymoorapelta maysi	(273)	300	(43)	*Stokesosaurus clevelandi*	(273)	92.5	(43, 86)
	Camptosaurus	(273)	910.3948	(4, 26-27, 43)	*Marshosaurus bicentesimus*	(273)	212.5	(43, 86)
	Stegosaurus stenops	(273)	3353.66	(4, 26, 43)	*Ceratosaurus nasicornis*	(273)	580.377	(4, 26-27, 43, 73)
	Ankylosaurus	(273)	3872.272	(4, 26, 43)	*Allosaurus fragilis*	(273)	1913.75	(4, 26, 43, 73, 86)
	Stegosaurus ungulatus	(273)	5376.958	(26, 43)	*Allosaurus jimmadseni*	(273, 278)	1913.75	(4, 26, 43, 73, 86)
	Diplodocus carnegii	(273)	10877.24	(9, 43, 71, 274)	*Torvosaurus*	(273)	3483.33	(26, 43, 86)
	Camarasaurus lewisi	(273)	12499.94	(4, 26, 43)	*Saurophaganax maximus*	(273)	3758.72	(26, 43, 86)
	Camarasaurus lentus	(273)	13254.41	(4, 26, 43, 71, 275)				
	Haplocanthosaurus	(273)	14217.57	(4, 26, 43, 71)				
	Camarasaurus grandis	(273)	14224.85	(26, 43, 71)				
	Diplodocus longus	(273)	17338.44	(4, 26, 43, 71)				
	Barosaurus	(273)	21136.82	(4, 26, 43, 71)				
	Barosaurus lentus	(273)	21136.82	(4, 26, 43, 71)				
	Camarasaurus supremus	(273)	22974.7	(4, 43, 71)				
	Apatosaurus louisae	(273)	25385.81	(4, 26, 43, 71)				
	Diplodocus hallorum	(273, 276)	26689.4	(26, 43)				
	Apatosaurus ajax	(273)	29708.57	(4, 26-27, 43, 71)				
Oldman Canada 77.5-76.5MYA	*Prenocephale brevis*	(148)	10	(43)	*Saurornitholestes langstoni*	(286)	23.4053	(4, 9, 26, 43, 57)
	Hanssuesia sternbergi	(148)	28.07162	(43)	*Daspletosaurus torosus*	(53)	2631.11	(4, 43, 73, 86)
	Struthiomimus altus	(279)	215.0365	(4, 26-27, 43, 73)				
	Wendiceratops pinhornensis	(280)	1250	(43, 281)				
	Ankylosaurid B	(282)	1617.899	(4, 26, 43)				
	Spinops sternbergorum	(283)	1896.318	(43, 283)				
	Coronosaurus brinkmani	(150)	2000	(43)				
	Nodosaurid D	(150)	2125.341	(4, 26, 43)				
	Centrosaurus apertus	(284)	2214.703	(4, 26, 43)				
	Chasmosaurine A	(150)	2244.365	(4, 26, 43)				
	Hypacrosaurus stebingeri	(150)	3293.245	(4, 43)				
	Albertaceratops nesmoi	(285)	3500	(43)				
	Brachylophosaurus canadensis	(150)	5729.18	(26, 43)				
Prince Creek Alaska 70.6-69.1MYA	*Hypsilophodontid C*	(287)	82.79609	(4, 26-27, 43, 288)	*Dromaeosaurus albertensis*	(34)	14.7467	(9, 43, 86)
	Alaskacephale gangloffi	(287)	130	(289)	*Saurornitholestes langstoni*	(34)	23.4053	(4, 9, 26, 43, 57)
	Ornithomimid D	(287)	221.4634	(4, 9, 26-27, 43)	*Troodon formosus*	(34)	68.1649	(4, 26, 43, 86)
	Ceratopsid A	(290)	1300	(43)	*Nanuqsaurus hoglundi*	(294)	750	(43, 294)
	Pachyrhinosaurus perotorum	(291)	2260.778	(4, 26, 43)				
	Pachyrhinosaurus canadensis	(287)	3139.13	(4, 26, 43)				
	Lambeosaurine A	(292)	3594.614	(4, 26, 43)				
	Edmontosaurus annectens	(293)	4595.999	(4, 26, 43)				
Scollard Canada 66.8-66MYA	*Leptoceratops gracilis*	(203)	212.9821	(4, 26, 43)	*Richardoestesia*	(203)	10.2398	(9, 43, 86)
	Thescelosaurus neglectus	(203)	214.9144	(4, 26, 43)	*Paronychodon*	(203)	12.9875	(9, 26, 43, 86)
	Pachycephalosaurus	(104)	342.0206	(4, 26, 43)	*Dromaeosaurus albertensis*	(203)	14.7467	(9, 43, 86)
	Ankylosaurus magniventris	(203)	3872.272	(4, 26, 43)	*Troodon*	(203)	68.1649	(4, 26, 43, 86)
	Triceratops horridus	(203)	8318.221	(4, 26-27, 43, 73)	*Tyrannosaurus rex*	(203)	6428.6	(4, 26, 43, 73, 86)
Shangshaximiao China 170.3-166.1MYA	*Gongbusaurus shiyii*	(295)	20.05596	(4, 26, 43, 73, 296)	*Sinocoelurus fragilis*	(295)	25.0459	(26, 43, 86, 298)
	Yandusaurus hongheensis	(295)	140	(43)	*Chienkosaurus ceratosauroides*	(295)	420	(86)
	Yingshanosaurus jichuanensis	(295)	1277.148	(4, 43, 73)	*Szechuanosaurus campi*	(295)	1001.33	(57, 86, 299)
	Gigantspinosaurus sichuanensis	(295)	1460.431	(26, 43)	*Yangchuanosaurus shangyouensis*	(295)	2950	(43, 86)
	Daanosaurus zhangi	(295)	3517.054	(4, 43, 71, 73)	*Yangchuanosaurus hepingensis*	(295)	3000	(43)
	Tuojiangosaurus multispinus	(295)	3532.595	(4, 26-27, 43)				
	Omeisaurus maoi	(295)	6232.125	(43, 71, 73)				
	Mamenchisaurus youngi	(295)	6746.814	(26, 43, 71)				
	Omeisaurus changshouensis	(295)	6900	(71-71)				
	Mamenchisaurus fuxiensis	(295)	6967.05	(43, 57, 73, 297)				
	Omeisaurus fuxiensis	(295)	7400	(71)				
	Mamenchisaurus constructus	(295)	11334.89	(4, 26, 43, 71)				
	Mamenchisaurus hochuanensis	(295)	14411.76	(4, 43, 71, 73, 80)				
	Mamenchisaurus anyueensis	(295)	25000	(43)				
	Mamenchisaurus jingyanensis	(295)	28500	(43, 71)				

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Assemblage	Herbivores / Plant Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref	Carnivores / Meat Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref
Tendaguru Middle Saurian Tanzania 157-152MYA	*Dryosaurus lettowvorbecki*	(300)	80	(43)	*Abelisauroid A*	(303)	10.742	(86)
	Dicraeosaurus hansemanni	(301)	7268.766	(4, 9, 43, 71, 274)	*Non-coelurosaurian Tetanuran A*	(303)	15.1685	(4, 26, 43)
	Giraffatitan brancai	(302)	36554.87	(4, 26-27, 43, 71)	*Elaphrosaurus bambergi*	(303)	248.155	(4, 26, 43)
					Ceratosaurid B	(303)	481.333	(86)
					Ceratosaurid C	(300)	712.644	(86)
					Abelisaurid A	(303)	1002.5	(86)
					Veterupristisaurus milneri	(303)	1175	(57, 86)
					Allosaurus tendagurensis	(300)	2143.4	(4, 26, 43, 73, 86)
					Carcharodontosaurid B	(303)	2981.55	(86)
Tendaguru Upper Saurian Tanzania 152-145MYA	*Kentrosaurus aethiopicus*	(305)	1149.464	(4, 26, 43)	*Abelisauroid A*	(303)	10.742	(86)
	Australodocus bohetti	(305)	4000	(43)	*Ceratosaurid A*	(300)	481.333	(86)
	Dicraeosaurus sattleri	(301)	7154.417	(26, 43, 71)	*Abelisaurid A*	(303)	1002.5	(86)
	Tendaguria tanzaniensis	(305)	10000	(57, 71)	*Ostafrikasaurus crassiserratus*	(307)	1150	(86)
	Tornieria africana	(305)	12025.71	(26-27, 43, 71)	*Megalosauroid A*	(303)	1966.67	(86)
	Janenschia robusta	(305)	12332.74	(4, 27, 43, 71)	*Megalosaurus ingens*	(303)	5700	(86, 251)
	Wamweracaudia keranjei	(306)	12332.74	(4, 27, 43, 71)				
	Giraffatitan brancai	(302)	36554.87	(4, 26-27, 43, 71)				
Tremp Spain 67.6-66MYA	*Euhadrosaurian A*	(308)	600	(43)	*Richardoestesia*	(311)	10.2398	(9, 43, 86)
	Pararhabdodon isonensis	(309)	1250	(43, 57)	*Euronychodon*	(311)	12.9875	(86)
	Nodosaurid E	(104)	1817.855	(4, 9, 43, 73)	*Paronychodon*	(311)	12.9875	(9, 26, 43, 86)
	Hadrosaurid F	(309)	3274.599	(4, 26, 43, 57, 73)	*Dromaeosaurus*	(311)	13.56	(9, 43, 86)
	Lambeosaurine B	(309)	3363.898	(4, 26, 43)	*Pyroraptor olympius*	(311)	14.7361	(86, 312)
	Hypselosaurus	(310)	6300	(57, 71)	*Theropod C*	(311)	757	(313)
	Titanosaurus indicus	(309)	10362.15	(4, 43, 71)				
Two Medicine United States 82.6-74MYA	*Orodromeus makelai*	(314)	15.1695	(4, 26)	*Bambiraptor feinbergi*	(324)	5.82906	(4, 43, 86)
	Prenoceratops pieganensis	(315)	20	(43)	*Richardoestesia isosceles*	(323)	10.1954	(9, 86)
	Stegoceras validum	(314)	27.6576	(4, 26, 43)	*Dromaeosaurus*	(314)	13.56	(9, 43, 86)
	Hanssuesia sternbergi	(314)	28.07162	(43)	*Saurornitholestes*	(323)	23.7026	(4, 9, 26, 43, 57)
	Montanaceratops	(316)	134.4206	(4, 43)	*Troodon formosus*	(323)	68.1649	(4, 26, 43, 86)
	Cerasinops hodgskissi	(317)	151.9703	(4, 26-27, 43)	*Caenagnathus sternbergi*	(314)	74.7759	(9, 43, 73, 86, 325)
	Einiosaurus procurvicornis	(318)	974.7027	(4, 43)	*Daspletosaurus horneri*	(326)	2500	(43)
	Brachyceratops montanensis	(318)	1300	(43)	*Gorgosaurus*	(314)	2554.78	(4, 26, 43, 86)
	Stellasaurus ancellae	(319)	1521.933	(319)				
	Prosaurolophus blackfeetensis	(314)	1532.758	(4)				
	Euoplocephalus tutus	(314)	1617.899	(4, 26, 43)				
	Achelousaurus horneri	(318)	1709.393	(4, 26, 43)				
	Oohkotokia horneri	(320)	1750	(43, 320)				
	Chasmosaurus	(314)	2251.247	(4, 26-27, 43)				
	Edmontonia rugosidens	(314)	2265.253	(26, 43)				
	Rubeosaurus ovatus	(314)	2289.302	(43, 57, 321)				
	Maiasaura peeblesorum	(314)	2873.436	(4, 26, 43)				
	Acristavus gagslarsoni	(322)	3000	(43)				
	Hypacrosaurus stebingeri	(323)	3293.245	(4, 43)				
	Gryposaurus latidens	(323)	3365.19	(26, 43)				
Upper Elliot Lesotho 201-199.3MYA	*Abrictosaurus consors*	(327)	1.797141	(4, 26-27, 43)	*Coelophysis rhodesiensis*	(336)	13.0264	(26, 43)
	Lycorhinus angustidens	(327)	3.763795	(43, 328)	*Dracovenator regenti*	(337)	217.5	(43, 86)
	Pegomastax africanus	(329)	4	(329)				
	Heterodontosaurus tucki	(327)	4.02759	(4, 26, 43)				
	Lesothosaurus diagnosticus	(327)	4.959149	(4, 26, 43)				
	Stormbergia dangershoeki	(327)	35.54129	(4, 26-27)				
	Arcusaurus pereirabdalorum	(330)	51.32899	(331)				
	Massospondylus kaalae	(332)	280	(43, 71)				
	Massospondylus carinatus	(330)	430.3565	(4, 26, 43, 71)				
	Melanorosaurus	(333)	1300	(43)				
	Aardonyx celestae	(330)	2604.76	(4, 71, 334)				
	Pulanesaura eocollum	(330)	3200	(43, 71, 335)				

Assemblage	Herbivores / Plant Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref	Carnivores / Meat Dominant Omnivores	Locality Ref	Mass (kg)	Mass Ref
Wadhurst Clay United Kingdom 141-137MYA	*Valdosaurus canaliculatus*	(338)	29.05354	(27, 43)	*Maniraptoran A*	(351)	0.1	(43)
	Valdoraptor oweni	(339)	435	(86)	*Ornithodesmus*	(352)	13.56	(9, 43, 57, 86)
	Polacanthus foxii	(340)	1148.738	(4, 26, 43)	*Altispinax dunkeri*	(353)	1070.9	(43, 73, 353)
	Stegosaurian A	(340)	1149.464	(4, 26, 43)	*Baryonyx walkeri*	(352)	1600	(43, 86)
	Pleurocoelus valdensis	(341)	1194.873	(26, 71, 73)				
	Hylaeosaurus armatus	(340)	1676.957	(26, 43)				
	Hypselospinus fittoni	(342)	2773.986	(27, 43)				
	Barilium dawsoni	(343)	3589.012	(27, 43, 344)				
	Haestasaurus becklesii	(345)	4047.026	(71, 345)				
	Xenoposeidon proneneukos	(346)	7300	(71, 347)				
	Cetiosaurus brevis	(348)	9000	(71)				
	Ornithopsis hulkei	(349)	15854.83	(71, 350)				
Wahweap United States 80.6-76.1MYA	*Thescelosaurus*	(104)	170.3897	(4, 26, 43)	*Richardoestesia*	(104)	10.2398	(9, 43, 86)
	Diabloceratops eatoni	(354)	1300	(43)	*Paronychodon*	(104)	12.9875	(9, 26, 43, 86)
	Nodosaurid F	(355)	1436.424	(26, 43)	*Dromaeosaurid D*	(355)	13.56	(9, 43, 86)
	Ankylosaurid C	(356)	1500	(43)	*Velociraptorine C*	(213)	18.734	(4, 26-27, 43, 73)
	Hadrosaurine A	(357)	2873.436	(4, 26, 43)	*Troodon*	(213)	68.1649	(4, 26, 43, 86)
	Acristavus gagslarsoni	(322)	3000	(43)	*Lythronax argestes*	(360)	1466.67	(43, 86, 360)
	Gryposaurus monumentensis	(357)	3000	(43)	*Tyrannosaurid B*	(213)	1532.18	(26, 43, 86)
	Adelolophus hutchisoni	(357)	3342.087	(4, 26, 43)				
	Machairoceratops cronusi	(358)	3500	(359)				
	Brachylophosaurus	(358)	5729.18	(26, 43)				
Xiashaximiao China 172-170MYA	*Xiaosaurus dashanpensis*	(295)	5.24155	(26-27)	*Chuandongocoelurus primitivus*	(295)	86.5221	(26, 86)
	Agilisaurus louderbacki	(295)	85.7595	(26, 43)	*Gasosaurus constructus*	(295)	201.054	(4, 26, 86)
	Yandusaurus hongheensis	(295)	140	(43)	*Gasosaurus lini*	(295)	201.054	(4, 26, 86)
	Huayangosaurus taibaii	(295)	440.5137	(4, 43)	*Xuanhanosaurus qilixiaensis*	(295)	250	(43)
	Abrosaurus dongpoi	(361)	4550	(43, 71)	*Yangchuanosaurus zigongensis*	(364)	1745	(43, 86)
	Omeisaurus junghsiensis	(295)	5100.288	(26, 43, 71)	*Yangchuanosaurus shangyouensis*	(365)	2950	(43)
	Shunosaurus lii	(295)	5776.958	(4, 26-27, 43)				
	Protognathosaurus oxyodon	(295)	6300	(71)				
	Datousaurus bashanensis	(295)	7196.814	(4, 43, 71)				
	Dashanpusaurus dongi	(362)	7511.192	(26, 71)				
	Omeisaurus luoquanensis	(295)	8000	(71)				
	Omeisaurus puxiani	(363)	8000	(57)				
	Omeisaurus jiaoi	(363)	10090.81	(26, 71)				
	Omeisaurus tianfuensis	(295)	11952.59	(4, 9, 26-27, 43)				
Yixian Jianshangou China 125-122.5MYA	*Ningyuansaurus wangi*	(366)	2.3	(86-86)	*Sinosauropteryx prima*	(367)	1.12591	(4, 26-27, 43, 86)
	Beipiaosaurus inexpectus	(367)	69.72641	(26, 43, 86)	*Caudipteryx zoui*	(367)	2.2	(43)
	Dongbeititan dongi	(368)	6450	(43, 71)	*Changyuraptor yangi*	(369)	3.06667	(43, 86, 369)
					Sinornithosaurus millenii	(367)	3.47873	(4, 43, 86)
					Protarchaeopteryx robusta	(367)	4.70168	(4, 26, 43, 86)
					Caudipteryx dongi	(367)	6.14309	(4, 43)
					Zhenyuanlong suni	(370)	7.2	(43, 86)
					Dilong paradoxus	(367)	11.7091	(4, 26-27, 43, 86)
					Huaxiagnathus orientalis	(367)	17.3632	(26-27, 43, 86)
					Jianchangosaurus yixianensis	(371)	20	(43)
					Sinocalliopteryx gigas	(372)	35.4102	(26-27, 43, 86)
					Yutyrannus huali	(373)	1300	(43, 86)
Yixian Lujiantun China 130-128.2MYA	*Liaoceratops yanzigouensis*	(367)	2	(43)	*Mei long*	(367)	0.55869	(26, 43, 86)
	Hexing qingyi	(374)	4.33697	(26, 86)	*Liaoningvenator curriei*	(376)	0.78033	(4, 43, 73, 376)
	Incisivosaurus gauthieri	(367)	4.701678	(4, 26, 43, 86)	*Sinovenator changii*	(367)	1.90301	(26, 43, 86)
	Psittacosaurus lujiatunensis	(375)	5	(43)	*Daliansaurus liaoningensis*	(377)	1.90903	(378)
	Jeholosaurus shangyuanensis	(367)	5.667104	(4, 26)	*Changyuraptor yangi*	(369)	3.06667	(43, 86, 369)
	Shenzhousaurus orientalis	(367)	13.08922	(26, 43, 86)	*Sinusonasus magodens*	(367)	3.19335	(26, 43, 86)
	Hongshanosaurus houi	(367)	15	(43)	*Graciliraptor lujiatunensis*	(367)	3.47873	(4, 43, 86)
	Psittacosaurus major	(375)	18	(43)	*Dilong paradoxus*	(367)	11.7091	(4, 26-27, 43, 86)
					Jianchangosaurus yixianensis	(371)	20	(43)

Taxon list for each community with mass in kg and references

Table S2.

Formation		Raw Data = Log2(mass(kg))								M-S Distribution				KS Goodness of Fit (vs Global)		Quadratic Regression (bins)			4th degree polynomial regression			Bimodality Coefficient		
Jurassic	N	Min	Max	IQR	Q1	Q3	Median	Mean	P_{Mean}	Skew	P_{Skew}	kurtosis	P_{kurt}	D	P	F	P	R2	F	P	R2	b1	b2	b (Sarle)
Upper Elliot	14	1.8	3200.0	643.7	4.0	647.8	43.4	582.2	0.032	0.3142	0.157	-1.201	0.555	0.4535	0.0090	3.0044	0.1064	0.4289	1.8307	0.2420	0.5496	0.1159	1.7870	0.1983
Lufeng BII "Zhangjia'ao"	8	9.7	3158.5	1551.0	25.3	1576.2	458.3	833.9	0.254	-0.5714	0.994	-1.729	0.335	0.5249	0.0020	1.3960	0.3020	0.2587	0.5478	0.7084	0.2675	0.4444	1.5102	0.2253
Kayenta/Navajo Sandstone	9	6.0	500.0	331.6	16.3	347.9	85.0	168.1	0.040	0.0363	0.320	-1.818	0.316	0.6402	0.0000	2.5982	0.1351	0.3938	1.5300	0.3051	0.5050	0.0017	1.4454	0.1665
Hanson	5	6.0	745.0	634.5	15.5	650.0	349.4	336.1	0.132	-0.7560	0.794	-2.479	0.171	0.6402	0.0000	0.7537	0.5013	0.1585	0.3046	0.8651	0.1688	1.0160	1.3802	0.2149
Xiashaximiao	21	5.2	11952.6	7183.5	170.5	7354.0	2950.0	3844.0	0.608	-0.6533	0.919	-0.453	0.926	0.2532	0.2620	1.5944	0.2613	0.2850	1.3187	0.3622	0.4678	0.4728	2.3752	0.2503
Shangshaximiao	21	20.1	28500.0	6044.3	1139.2	7183.5	3532.6	6398.5	0.188	-1.4961	0.146	1.883	0.129	0.1693	0.7670	1.8521	0.2183	0.3165	6.5876	0.0220	0.8145	2.4802	4.1911	0.4520
Callovian Oxford Clay	10	108.4	12232.5	4565.9	167.7	4733.6	1670.1	3290.0	0.472	0.3895	0.134	-0.782	0.827	0.3249	0.1280	1.4842	0.2830	0.2706	1.1403	0.4209	0.4319	0.1920	2.0123	0.1877
Tendaguru Middle Saurian	12	10.7	36554.9	2650.0	122.0	2772.0	741.9	4370.2	0.967	0.0157	0.335	-0.113	0.698	0.3582	0.1280	2.4018	0.1524	0.3752	1.2333	0.3890	0.4512	0.0003	2.4675	0.1539
Tendaguru Upper Saurian	14	10.7	36554.9	10989.7	1112.7	12102.5	4850.0	7561.5	0.087	-1.4106	0.186	3.114	0.053	0.2170	0.4850	3.6299	0.0755	0.4757	7.9123	0.0143	0.8406	2.3352	4.7080	0.3901
Kota	5	500.0	9286.7	5926.4	1400.0	7326.4	3374.0	4165.4	0.152	-1.2578	0.277	0.313	0.449	0.3485	0.1280	0.9583	0.4236	0.1933	1.9624	0.2196	0.5668	2.8125	2.0781	0.3783
Morrison Brushy Basin Zone 3	27	20.4	29708.6	16428.0	910.4	17338.4	3872.3	9554.0	0.132	-1.1571	0.346	0.228	0.495	0.1476	0.7670	1.8688	0.2158	0.3184	2.2611	0.1778	0.6012	1.4481	2.9734	0.3853
Lourinhã	11	10.2	32249.7	5799.8	322.0	6121.8	3483.3	6608.3	0.254	-0.7265	0.824	0.552	0.360	0.1667	0.7670	2.5311	0.1407	0.3875	1.9438	0.2226	0.5644	0.6516	2.8312	0.2360
Cretaceous																								
Wadhurst Clay	17	0.1	15854.8	3065.1	753.0	3818.0	1600.0	3204.3	0.657	-2.0267	0.040	4.173	0.023	0.2896	0.2620	1.1494	0.3641	0.2232	2.0168	0.2111	0.5735	4.6736	5.7093	0.6057
Yixian Lujiantun	17	0.6	20.0	10.4	2.0	12.4	4.3	6.7	0.000	0.1170	0.264	-1.516	0.407	0.8865	0.0000	2.1308	0.1812	0.3476	14.2267	0.0032	0.9046	0.0156	1.5610	0.1946
Yixian Jianshangou	15	1.1	6450.0	32.3	3.1	35.4	7.2	529.0	0.000	1.4492	0.002	1.636	0.145	0.6675	0.0000	2.1760	0.1760	0.3523	16.7500	0.0021	0.9178	2.4359	3.7646	0.4561
Cloverly	11	1.5	34146.0	4538.8	20.0	4558.8	818.4	4601.1	0.608	-0.1915	0.535	-0.889	0.761	0.2576	0.2620	1.7993	0.2263	0.3103	0.8358	0.5491	0.3578	0.0453	1.9665	0.1704
Khuren Dukh	12	2.5	11225.6	1546.5	35.5	1582.0	975.0	1616.0	0.562	-0.5796	0.997	-0.370	0.874	0.4416	0.0090	1.0199	0.4032	0.2032	0.5282	0.7206	0.2604	0.4065	2.3054	0.2219
Cedar Mountain Mussentuchit	18	1.5	10800.0	1236.8	13.2	1250.0	247.5	1404.3	0.204	0.1482	0.239	-1.251	0.530	0.3624	0.1280	1.2570	0.3352	0.2391	0.5752	0.6917	0.2772	0.0248	1.7546	0.1909
Bayan Shireh / Iren Dabasu	25	2.0	25418.1	1522.7	70.0	1592.7	500.0	2131.6	0.562	-0.4327	0.828	-0.348	0.854	0.4449	0.0090	2.7860	0.1207	0.4106	1.3721	0.3466	0.4777	0.2039	2.4874	0.2040
Griman Creek	15	6.0	6000.0	652.4	20.0	672.4	156.7	869.2	0.152	0.3391	0.146	-0.654	0.914	0.5068	0.0020	6.0900	0.0247	0.6036	2.9697	0.1131	0.6644	0.1334	2.1694	0.1908
Bissekty	14	1.4	7000.0	719.0	12.0	731.0	197.5	1055.6	0.132	0.2035	0.210	-0.676	0.899	0.4357	0.0410	1.4119	0.2984	0.2609	0.5693	0.6953	0.2751	0.0486	2.1422	0.1753
Bajo de la Carpa	15	2.8	32064.6	5233.5	16.5	5250.0	1925.0	4472.4	0.967	-0.7169	0.834	-0.828	0.799	0.2818	0.2620	0.4695	0.6415	0.1050	0.9024	0.5177	0.3756	0.5960	2.0483	0.2743
Milk River	17	10.2	4000.0	2406.7	19.3	2426.0	50.0	1237.2	0.345	0.1520	0.237	-2.035	0.256	0.3485	0.1280	0.8039	0.4807	0.1673	0.3644	0.8261	0.1955	0.0263	1.1828	0.2120
Anacleto	14	9.0	29050.0	11732.5	1927.3	13659.8	5375.0	8346.8	0.119	-2.1792	0.022	5.608	0.005	0.2072	0.4850	1.5445	0.2709	0.2786	5.3188	0.0356	0.7800	5.5734	6.3964	0.6421
Two Medicine	28	5.8	3365.2	2255.5	27.8	2283.3	1411.0	1263.3	0.562	-0.4497	0.854	-1.528	0.402	0.4535	0.0090	1.1325	0.3689	0.2207	0.5157	0.7284	0.2558	0.2181	1.5248	0.2491
Wahweap	18	10.2	5729.2	3029.7	55.8	3085.5	1483.3	1928.0	0.967	-0.7784	0.756	-1.135	0.599	0.3485	0.1280	1.0083	0.4069	0.2013	0.7372	0.5994	0.3295	0.6840	1.8407	0.3088
Allen	18	15.1	22385.9	6115.1	483.8	6598.8	2071.5	5049.0	0.307	-1.1339	0.370	1.116	0.224	0.1818	0.7670	2.3972	0.1529	0.3747	6.1289	0.0259	0.8034	1.4514	3.5131	0.3440
Oldman	15	10.0	5729.2	2416.1	215.0	2631.1	2000.0	1918.6	0.812	-1.1793	0.327	-0.116	0.699	0.3485	0.1280	0.8121	0.4774	0.1688	0.7073	0.6155	0.3204	1.6130	2.5440	0.4139
Judith River Coal Ridge	17	10.3	4000.0	2814.9	21.2	2836.1	1436.4	1523.5	0.657	-0.3687	0.745	-1.696	0.343	0.3485	0.1280	1.3925	0.3028	0.2582	0.6884	0.6259	0.3146	0.1547	1.4299	0.2270
Kaiparowits	16	10.2	3292.8	1745.9	24.7	1770.5	127.8	989.9	0.276	0.1364	0.248	-1.965	0.278	0.4624	0.0090	1.1112	0.3751	0.2174	0.4196	0.7900	0.2186	0.0214	1.2443	0.2062
Dinosaur Park MAZ-1b	27	2.6	3549.6	2241.8	23.4	2265.3	74.8	1143.5	0.276	-0.0515	0.390	-1.495	0.419	0.4138	0.0410	1.3834	0.3048	0.2570	0.5585	0.7019	0.2713	0.0029	1.5534	0.2033
Djadokhta	21	0.2	14139.4	88.3	8.5	96.8	20.5	785.2	0.001	1.0087	0.023	1.686	0.138	0.6104	0.0000	1.2975	0.3250	0.2449	1.0873	0.4405	0.4202	1.1274	4.0377	0.2819
Kirtland Hunter-Willow Washes	19	10.2	37468.5	3972.3	27.7	4000.0	1500.0	3645.9	0.812	-0.0008	0.351	-1.421	0.441	0.2958	0.2620	1.2698	0.3319	0.2410	0.5260	0.7220	0.2596	0.0000	1.6262	0.1923
Horseshoe Canyon Drumheller-I	17	10.3	5260.1	2178.0	18.9	2196.9	138.7	1124.4	0.345	0.0459	0.313	-1.725	0.336	0.4661	0.0090	1.8652	0.2163	0.3180	0.7229	0.6070	0.3252	0.0024	1.4091	0.1979
Baruungoyot	23	0.2	12172.7	1301.7	4.3	1306.0	33.1	1127.9	0.024	0.2470	0.190	-1.047	0.656	0.4814	0.0090	1.4630	0.2874	0.2678	0.7251	0.6058	0.3259	0.0670	1.9175	0.1985
Lameta	11	9.1	15555.3	10327.7	34.5	10362.2	2519.6	5239.5	0.562	-0.8124	0.718	-0.696	0.885	0.1476	0.7670	1.8320	0.2213	0.3141	4.3288	0.0550	0.7427	0.8149	2.0825	0.2904
Prince Creek	12	14.7	4596.0	2847.7	71.8	2919.5	485.7	1348.4	0.608	-0.1062	0.456	-1.484	0.422	0.3582	0.1280	5.9497	0.0261	0.5980	2.9375	0.1153	0.6620	0.0137	1.6044	0.1798
Maevarano	6	0.8	8672.9	5593.7	10.6	5604.2	2888.5	3174.3	0.812	-1.0837	0.418	-0.839	0.793	0.3485	0.1280	0.1531	0.8605	0.0369	1.0161	0.4686	0.4038	1.8351	1.8551	0.3498
Laramie	10	8.9	8902.2	7765.0	13.4	7778.4	3360.7	3817.5	0.967	-0.6980	0.863	-1.521	0.404	0.3485	0.1280	0.4370	0.6605	0.0985	0.6667	0.6381	0.3077	0.6166	1.5944	0.2724
Hell Creek	22	10.2	8902.2	4026.5	26.7	4053.2	217.2	1975.3	0.390	0.3287	0.153	-1.481	0.423	0.3578	0.1280	1.9890	0.1990	0.3321	0.7490	0.5931	0.3330	0.1191	1.5737	0.2214
Tremp	13	10.2	10362.2	3306.0	13.3	3319.2	757.0	2137.7	0.702	-0.1500	0.494	-1.819	0.315	0.2715	0.2620	0.7828	0.4892	0.1637	0.4703	0.7572	0.2387	0.0268	1.3803	0.1935
Lance	23	10.2	8902.2	4572.6	23.4	4596.0	246.0	2301.2	0.608	0.0280	0.327	-1.748	0.328	0.3485	0.1280	1.4320	0.2940	0.2636	0.5949	0.6798	0.2840	0.0009	1.3593	0.2078
Scollard	10	10.2	8318.2	4497.0	14.3	4511.4	213.9	1949.5	0.431	0.3048	0.160	-1.629	0.365	0.3485	0.1280	1.5372	0.2723	0.2776	0.5775	0.6903	0.2780	0.1176	1.5329	0.1903

Summary Statistics, KS Test and polynomial tests for full communities. $\alpha = 0.05$, Sarle's b = .555

Table S3.

Formation		Raw Data = Log2(mass(kg))								M-S Distribution				KS Goodness of Fit (vs Global)		Quadratic Regression (bins)			4th degree polynomial regression			Bimodality Coefficient		
Jurassic	N	Min	Max	IQR	Q1	Q3	Median	Mean	P_{Mean}	Skew	P_{Skew}	kurtosis	P_{kurt}	D	P	F	P	R2	F	P	R2	b1	b2	b (Sarle)
Upper Elliot	12	1.8	3200.0	1078.6	4.0	1082.6	43.4	660.0	0.006	0.2829	0.110	-1.4683	0.391	0.7917	0.0000	1.2707	0.3317	0.2411	0.8434	0.5454	0.3599	0.0968	1.6143	0.1942
Lufeng BII "Zhangjia'ao"	5	26.0	3158.5	2212.9	308.9	2521.8	650.0	1262.3	0.262	-1.7356	0.246	3.2510	0.176	0.6667	0.0000	1.3061	0.3229	0.2462	0.8051	0.5643	0.3493	5.3551	2.8128	0.5877
Kayenta/Navajo Sandstone	6	6.0	500.0	378.8	12.6	391.4	124.4	187.5	0.007	-0.3827	0.441	-1.4813	0.387	0.7273	0.0000	4.1315	0.0586	0.5081	2.7250	0.1313	0.6450	0.2289	1.6350	0.1559
Xiashaximiao	15	5.2	11952.6	7860.0	140.0	8000.0	5777.0	5019.3	0.957	-1.2712	0.616	0.8317	0.695	0.2051	0.8430	0.7981	0.4830	0.1663	1.0851	0.4414	0.4197	1.8740	3.2042	0.4121
Shangshaximiao	16	20.1	28500.0	8376.6	1974.6	10351.2	6489.5	7935.8	0.452	-2.0360	0.132	4.4682	0.082	0.5000	0.0510	1.3932	0.3026	0.2583	3.6460	0.0774	0.7085	4.7586	5.8361	0.6033
Callovian Oxford Clay	8	108.4	12232.5	9557.0	128.1	9685.2	2155.2	3920.8	0.859	0.2765	0.112	-1.3917	0.418	0.5278	0.0510	1.0217	0.4026	0.2035	0.6426	0.6519	0.2999	0.1041	1.6706	0.1680
Tendaguru Middle Saurian	3	80.0	36554.9	36474.9	80.0	36554.9	7268.8	14634.5	0.684	-0.9352	0.967			0.3333	0.1700	1.1120	0.3749	0.2175	0.6273	0.6607	0.2949	3.4985		
Tendaguru Upper Saurian	8	1149.5	36554.9	7544.1	4788.6	12332.7	11012.9	11943.7	0.076	-0.4877	0.539	0.4208	0.882	0.3750	0.1700	4.7277	0.0441	0.5417	6.1118	0.0261	0.8029	0.3238	2.5337	0.1781
Kota	4	500.0	9286.7	7088.1	1218.5	8306.6	4370.1	4631.7	0.528	-2.0000	0.145	4.0000	0.111	0.6389	0.0090	0.5768	0.5834	0.1260	0.9225	0.5086	0.3808	9.0000	2.3333	0.6316
Morrison Brushy Basin Zone 3	19	24.3	29708.6	17783.2	3353.7	21136.8	13254.4	12946.5	0.213	-2.0478	0.131	3.8594	0.118	0.6316	0.0090	1.4041	0.3002	0.2598	1.4557	0.3238	0.4925	4.7014	5.6160	0.6204
Lourinhã	6	322.0	32249.7	18085.9	3627.8	21713.7	5560.9	11104.1	0.171	-0.4401	0.492	1.3350	0.530	0.3333	0.1700	2.5238	0.1413	0.3869	1.8270	0.2426	0.5491	0.3026	2.6006	0.1472
Cretaceous																								
Wadhurst Clay	13	29.1	15854.8	4524.4	1149.1	5673.5	2774.0	3983.7	0.776	-2.0090	0.144	5.5074	0.040	0.1099	1.0000	1.3285	0.3175	0.2493	3.3187	0.0925	0.6887	4.8031	6.1775	0.5743
Yixian Lujiantun	8	2.0	18.0	10.1	4.4	14.5	5.3	8.5	0.000	-0.4041	0.456	-0.2286	0.826	0.9333	0.0000	1.2138	0.3464	0.2328	4.0217	0.0639	0.7283	0.2222	2.2245	0.1716
Yixian Jianshangou	3	2.3	6450.0	6447.7	2.3	6450.0	69.7	2174.0	0.007	0.4233	0.078			0.6667	0.0000	0.1035	0.9029	0.0252	0.2206	0.9174	0.1282	0.7166		
Cloverly	8	1.5	34146.0	5292.4	58.9	5351.3	1409.2	5745.8	0.262	-0.4742	0.526	0.0175	0.931	0.1389	0.8430	0.9205	0.4367	0.1871	0.4167	0.7919	0.2174	0.3061	2.3417	0.1804
Khuren Dukh	9	14.0	11225.6	1426.6	123.4	1550.0	1000.0	1959.6	0.377	-0.3645	0.427	-0.1324	0.867	0.1111	0.8430	1.6962	0.2432	0.2978	0.9844	0.4817	0.3962	0.1735	2.3305	0.1700
Cedar Mountain Mussentuchit	10	1.5	10800.0	2724.3	25.7	2750.0	659.2	2057.9	0.171	-0.6523	0.716	-0.3727	0.763	0.1545	0.8430	1.0059	0.4077	0.2009	0.7075	0.6154	0.3205	0.5386	2.2437	0.2337
Bayan Shireh / Iren Dabasu	18	2.0	25418.1	1703.4	135.1	1838.5	990.2	2801.6	0.262	-0.8488	0.908	0.7106	0.756	4.0000	0.0000	1.5294	0.2739	0.2766	1.0649	0.4491	0.4152	0.8134	3.2122	0.2657
Griman Creek	10	6.0	6000.0	1722.0	17.2	1739.2	195.0	1196.7	0.033	0.2376	0.128	-1.1019	0.505	0.5000	0.0510	2.8299	0.1176	0.4143	1.1395	0.4212	0.4317	0.0714	1.8312	0.1736
Bissekty	7	175.0	7000.0	4450.0	300.0	4750.0	483.8	2071.0	0.528	0.3587	0.100	-2.0895	0.273	0.6234	0.0090	1.8306	0.2215	0.3140	1.4175	0.3340	0.4859	0.1852	1.3794	0.1748
Bajo de la Carpa	9	9.0	32064.6	4005.9	1863.3	5869.1	5250.0	7032.0	0.776	-1.6337	0.309	2.9275	0.200	0.2222	0.4490	0.5202	0.6132	0.1151	0.5317	0.7184	0.2617	3.4860	3.9370	0.5272
Milk River	9	40.0	4000.0	2789.0	675.0	3464.0	2125.3	2039.8	0.776	-1.2468	0.649	0.1714	0.993	0.3778	0.1700	1.0227	0.4022	0.2036	1.0745	0.4454	0.4174	2.0305	2.4900	0.4292
Anacleto	11	9.0	29050.0	10337.0	3802.3	14139.4	8395.2	10284.0	0.313	-2.9477	0.006	9.2967	0.003	0.8091	0.0000	1.1022	0.3777	0.2160	3.1630	0.1010	0.6783	10.7269	8.0780	0.9577
Two Medicine	20	15.2	3365.2	2144.5	138.8	2283.3	1575.3	1506.1	0.377	-1.0316	0.850	-0.4318	0.744	0.2000	0.8430	0.9518	0.4258	0.1922	0.6369	0.6552	0.2980	1.1858	2.3831	0.3691
Wahweap	11	170.4	5729.2	2063.6	1436.4	3500.0	3000.0	2871.0	0.776	-1.5076	0.393	3.5232	0.141	0.6591	0.0090	0.9631	0.4219	0.1941	1.6611	0.2753	0.5255	2.8061	4.6139	0.4335
Allen	13	808.0	22385.9	7940.7	2071.5	10012.2	3741.3	6886.2	0.377	-0.2108	0.322	-0.5456	0.684	0.3846	0.1700	2.0947	0.1855	0.3437	19.3094	0.0014	0.9279	0.0529	2.2142	0.1714
Oldman	13	10.0	5729.2	2036.3	732.5	2768.8	2000.0	2009.6	0.684	-1.4499	0.437	1.0172	0.620	0.3077	0.4490	0.8705	0.4549	0.1787	0.8863	0.5251	0.3714	2.5018	3.2375	0.4888
Judith River Coal Ridge	11	27.7	4000.0	2848.4	579.6	3428.1	2396.3	2111.5	0.776	-1.6202	0.318	2.7817	0.220	0.5273	0.0510	1.4354	0.2933	0.2641	1.8759	0.2340	0.5557	3.2409	4.1690	0.5088
Kaiparowits	9	27.7	3292.8	2767.0	108.0	2875.0	1500.0	1570.7	0.377	-1.0176	0.863	-0.2875	0.804	0.6667	0.0000	1.0694	0.3876	0.2109	0.7037	0.6175	0.3193	1.3525	2.2491	0.3449
Dinosaur Park MAZ-1b	14	27.7	3549.6	2874.6	170.9	3045.5	2229.5	1815.9	0.528	-1.0848	0.788	-0.2373	0.822	0.3143	0.4490	1.0604	0.3904	0.2095	0.8893	0.5237	0.3722	1.3810	2.4394	0.3791
Djadokhta	8	4.3	14139.4	980.6	29.0	1009.6	102.8	2030.9	0.042	0.5879	0.044	-0.0778	0.893	0.5000	0.0510	4.6877	0.0449	0.5396	2.2795	0.1756	0.6031	0.4705	2.2963	0.2043
Kirtland Hunter-Willow Washe	13	27.7	37468.5	4555.4	180.1	4735.5	2500.0	5095.4	0.859	-0.5558	0.616	-0.2175	0.830	0.6923	0.0000	1.4919	0.2814	0.2716	1.0225	0.4660	0.4053	0.3676	2.4290	0.2152
Horseshoe Canyon Drumheller	8	138.7	5260.1	2425.3	486.3	2911.6	2075.1	2054.0	0.776	-0.9129	0.996	-0.1270	0.870	0.2143	0.8430	0.9315	0.4328	0.1889	0.8808	0.5277	0.3700	1.1343	2.2729	0.2975
Baruungoyot	11	4.3	12172.7	2460.0	40.0	2500.0	1100.8	2062.3	0.171	-0.5413	0.597	-0.5608	0.675	0.5894	0.0090	0.7931	0.4850	0.1655	0.4015	0.8018	0.2111	0.3618	2.1635	0.2151
Lameta	4	8650.0	15555.3	6338.5	9078.0	15416.5	12681.1	12391.9	0.058	-2.0000	0.145	4.0000	0.111	0.6731	0.0000	1.5461	0.2706	0.2788	1.8944	0.2308	0.5581	9.0000	2.3333	0.6316
Prince Creek	8	82.8	4596.0	3327.9	152.9	3480.7	1780.4	1915.6	0.607	-0.5176	0.572	-1.3423	0.435	0.1528	0.8430	1.8825	0.2138	0.3200	1.5478	0.3008	0.5078	0.3647	1.6942	0.2070
Maevarano	3	4581.4	8672.9	4091.5	4581.4	8672.9	4581.4	5945.2	0.262					0.3333	0.1700	0.4018	0.6819	0.0913	0.8214	0.5562	0.3538			
Laramie	6	170.4	8902.2	6827.6	1636.6	8464.2	6097.3	5285.1	0.684	-1.9517	0.159	3.6570	0.130	0.7500	0.0000	0.7206	0.5155	0.1526	1.1472	0.4185	0.4334	5.9518	3.3967	0.7206
Hell Creek	13	15.2	8902.2	5977.9	119.4	6097.3	342.0	2794.7	0.313	-0.3149	0.386	-1.4689	0.391	0.1346	0.8430	1.6267	0.2554	0.2891	0.8608	0.5371	0.3646	0.1180	1.6096	0.2019
Tremp	7	600.0	10362.2	5050.0	1250.0	6300.0	3274.6	3852.6	0.452	-0.2767	0.370	0.0420	0.938	0.3333	0.1700	1.8404	0.2200	0.3151	9.2714	0.0097	0.8607	0.1102	2.2675	0.1448
Lance	12	213.0	8902.2	6604.9	344.0	6948.9	4234.1	3832.4	0.859	-0.8715	0.940	-1.0103	0.531	0.1667	0.8430	0.9629	0.4220	0.1940	1.2439	0.3855	0.4533	0.9191	1.9026	0.3233
Scollard	5	213.0	8318.2	5881.3	213.9	6095.2	342.0	2592.1	0.607	0.3154	0.104	-3.0813	0.151	0.6316	0.0090	1.2132	0.3466	0.2327	0.8350	0.5495	0.3576	0.1768	1.2297	0.1275

Summary Statistics, KS Test and polynomial tests for herbivore guilds. $\alpha = 0.05$, Sarle's b = .555

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Table S4.

Formation		Raw Data = Log2(mass(kg))								M-S Distribution				KS Goodness of Fit (vs Global)		Quadratic Regression (bins)			4th degree polynomial regression			Bimodality Coefficient		
Jurassic	N	Min	Max	IQR	Q1	Q3	Median	Mean	P_{Mean}	Skew	P_{Skew}	kurtosis	P_{kurt}	D	P	F	P	R2	F	P	R2	b1	b2	b (Sarle)
Lufeng BII "Zhangjia'ao"	3	9.7	324.8	315.1	9.7	324.8	25.0	119.8	0.391	1.2933	0.016			0.4424	0.0170	1.0215	0.4026	0.2034	0.7075	0.6154	0.3205			
Kayenta/Navajo Sandstone	3	17.8	340.6	322.9	17.8	340.6	30.1	129.5	0.669	1.7321	0.004			0.4424	0.0170	0.6646	0.5407	0.1425	0.3818	0.8147	0.2029			
Hanson	3	6.0	349.4	343.4	6.0	349.4	25.0	126.8	0.391	1.2933	0.016			0.4424	0.0170	1.0215	0.4026	0.2034	0.7075	0.6154	0.3205			
Xiashaximiao	6	86.5	2950.0	1873.8	172.4	2046.3	225.5	905.6	0.170	0.4899	0.266	-1.4667	0.442	0.2242	0.4720	1.6356	0.2538	0.2902	1.1923	0.4027	0.4429	0.3750	1.6400	0.1743
Shangshaximiao	5	25.0	3000.0	2752.5	222.5	2975.0	1001.3	1479.3	0.034	-1.9245	0.006	3.6667	0.006	0.3309	0.1270	0.8279	0.4712	0.1715	0.5481	0.7082	0.2676	6.5844	2.9167	0.6948
Tendaguru Middle Saurian	9	10.7	2981.6	1527.5	131.7	1659.2	481.3	948.8	0.128	-1.0103	0.190	-0.5336	0.783	0.2216	0.4720	1.6278	0.2552	0.2892	0.8973	0.5200	0.3743	1.3331	2.1198	0.3487
Tendaguru Upper Saurian	6	10.7	5700.0	2536.3	363.7	2900.0	1076.3	1718.5	0.012	-1.7628	0.013	3.5586	0.006	0.3643	0.1270	1.1351	0.3682	0.2210	1.0644	0.4493	0.4151	4.8553	3.3629	0.6091
Morrison Brushy Basin Zone 3	8	20.4	3758.7	2968.4	122.5	3090.9	1247.1	1496.9	0.034	-0.5401	0.577	-1.0500	0.783	0.1559	0.7580	4.4837	0.0494	0.5285	3.4725	0.0850	0.6983	0.3970	1.8333	0.2075
Lourinhã	5	10.2	3483.3	2483.2	129.8	2613.0	580.4	1213.2	0.090	-0.5901	0.513	-0.0219	0.374	0.1840	0.7580	3.8576	0.0672	0.4909	2.3152	0.1714	0.6068	0.6191	1.9945	0.1620
Cretaceous																								
Wadhurst Clay	4	0.1	1600.0	1464.3	3.5	1467.7	542.2	671.1	0.669	-0.8546	0.301	-1.2893	0.574	0.2758	0.2480	0.4395	0.6590	0.0990	0.2361	0.9081	0.1360	1.6431	1.6281	0.1747
Yixian Lujiantun	9	0.6	20.0	6.3	1.3	7.6	3.1	5.2	0.000	0.8248	0.107	-1.0794	0.760	0.7758	0.0000	1.9772	0.2006	0.3308	3.9698	0.0655	0.7258	0.8885	1.8333	0.2949
Yixian Jianshangou	12	1.1	1300.0	16.2	3.2	19.3	6.7	117.7	0.024	1.7714	0.004	4.0246	0.004	0.6091	0.0030	2.1738	0.1762	0.3521	13.7609	0.0035	0.9017	3.7970	5.0714	0.5269
Cloverly	3	3.6	4558.8	4555.2	3.6	4558.8	83.2	1548.5	0.724	0.9352	0.068			0.2826	0.2480	0.2955	0.7519	0.0688	0.3571	0.8309	0.1923			
Khuren Dukh	3	2.5	1742.7	1740.2	2.5	1742.7	10.8	585.4	0.391	0.9352	0.068			0.4424	0.0170	0.3759	0.6982	0.0859	0.3571	0.8309	0.1923			
Cedar Mountain Mussentuchit	8	5.8	3950.0	460.6	10.9	471.6	17.5	587.3	0.669	1.4286	0.010	1.3571	0.055	0.4008	0.0500	1.0008	0.4093	0.2001	0.8257	0.5541	0.3550	2.7778	2.9796	0.4794
Bayan Shireh / Iren Dabasu	7	13.3	1742.7	582.3	18.7	601.0	90.0	408.8	0.796	0.3830	0.345	-2.1066	0.171	0.2437	0.4720	1.6756	0.2467	0.2952	0.7696	0.5824	0.3391	0.2112	1.3723	0.1788
Griman Creek	5	13.8	672.4	416.9	20.1	437.1	156.7	214.2	0.976	-0.1656	0.948	-2.4074	0.106	0.3866	0.0500	1.7421	0.2355	0.3034	1.1822	0.4062	0.4407	0.0488	1.3981	0.1116
Bissekty	7	1.4	220.0	2.8	10.2	13.0	12.4	40.1	0.105	0.0000	0.717	3.0000	0.008	0.6329	0.0000	0.6446	0.5501	0.1388	0.6248	0.6622	0.2940	0.0000	3.5000	0.1124
Bajo de la Carpa	6	2.8	1925.0	1340.1	3.7	1343.8	358.3	633.0	0.976	-0.1526	0.923	-2.5338	0.083	0.2758	0.2480	0.7064	0.5218	0.1501	0.4831	0.7491	0.2436	0.0364	1.2741	0.1377
Milk River	8	10.2	2554.8	12.9	10.8	23.7	19.3	334.2	0.308	2.8284	0.000	8.0000	0.000	0.6508	0.0000	0.3976	0.6845	0.0904	0.3656	0.8254	0.1959	10.8889	6.1429	1.0766
Anacleto	3	672.4	2325.0	1652.6	672.4	2325.0	734.2	1243.9	0.012	1.7321	0.004			0.5309	0.0070	0.9709	0.4193	0.1953	0.9243	0.5078	0.3813			
Two Medicine	8	5.8	2554.8	1882.7	11.0	1893.7	45.9	656.4	0.796	0.9570	0.064	-0.5060	0.762	0.3660	0.1270	1.4517	0.2898	0.2663	0.8841	0.5261	0.3708	1.2466	2.0924	0.3213
Wahweap	7	10.2	1532.2	1453.7	13.0	1466.7	18.7	446.1	0.920	1.0879	0.040	-1.0282	0.796	0.3472	0.1270	0.7415	0.5065	0.1564	0.3938	0.8069	0.2079	1.7044	1.8216	0.3745
Allen	5	15.1	491.7	458.0	17.8	475.8	373.8	272.2	0.622	-0.6086	0.497	-3.3333	0.041	0.3866	0.0500	0.7967	0.4836	0.1661	0.3728	0.8207	0.1990	0.6584	1.1667	0.1809
Judith River Coal Ridge	6	10.3	2554.8	678.0	11.8	689.8	13.9	445.6	0.519	2.1482	0.001	4.6399	0.004	0.4493	0.0170	0.7093	0.5205	0.1506	0.5267	0.7215	0.2599	7.2104	3.7337	0.8224
Kaiparowits	7	10.2	1532.2	67.0	13.0	80.0	23.7	243.1	0.427	2.3466	0.000	5.5804	0.003	0.4901	0.0170	0.6368	0.5538	0.1373	0.5111	0.7313	0.2541	7.9297	4.5751	0.8952
Dinosaur Park MAZ-1b	13	2.6	2565.6	61.2	10.3	71.5	23.4	419.3	0.427	0.9280	0.069	1.0217	0.077	0.4621	0.0170	1.5507	0.2697	0.2794	1.2414	0.3863	0.4528	1.0249	3.2404	0.2825
Djadokhta	14	0.2	3103.1	19.9	2.4	22.3	16.2	239.0	0.012	0.8632	0.097	2.5585	0.022	0.6989	0.0000	0.9229	0.4359	0.1875	0.7649	0.5848	0.3377	0.8745	4.3319	0.2294
Kirtland Hunter-Willow Washe	6	10.2	2900.0	763.4	12.7	776.1	20.2	505.4	0.519	2.1482	0.001	4.6399	0.004	0.4493	0.0170	0.7093	0.5205	0.1506	0.5267	0.7215	0.2599	7.2104	3.7337	0.8224
Horseshoe Canyon Drumheller	9	10.3	2345.2	93.5	13.3	106.8	22.5	298.2	0.572	1.7708	0.004	3.0326	0.008	0.3938	0.0500	1.2662	0.3329	0.2404	0.9668	0.4892	0.3919	4.0957	3.9921	0.5950
Baruungoyot	12	0.2	3103.1	29.2	1.8	30.9	11.6	271.3	0.028	0.8791	0.085	1.4872	0.049	0.5326	0.0070	2.5866	0.1360	0.3927	2.0331	0.2086	0.5754	0.9352	3.4744	0.2578
Lameta	7	9.1	3500.0	2507.6	12.0	2519.6	491.3	1152.4	0.278	-0.3718	0.770	-1.6856	0.325	0.1024	0.9670	2.4335	0.1494	0.3783	1.1934	0.4023	0.4431	0.1990	1.5477	0.1726
Prince Creek	4	14.7	750.0	562.6	16.9	579.5	45.8	214.1	0.669	1.4142	0.011	1.5000	0.049	0.3866	0.0500	1.4257	0.2954	0.2628	0.9957	0.4770	0.3990	4.5000	2.0000	0.3548
Maevarano	3	0.8	1195.7	1194.8	0.8	1195.7	13.8	403.4	0.391	0.9352	0.068			0.4424	0.0170	0.3759	0.6982	0.0859	0.3571	0.8309	0.1923			
Laramie	4	8.9	6428.6	4814.9	9.9	4824.8	13.3	1616.0	0.669	1.8128	0.004	3.4835	0.008	0.5258	0.0070	0.3585	0.7094	0.0823	0.7780	0.5780	0.3415	7.3941	2.2645	0.5325
Hell Creek	9	10.2	6428.6	251.1	14.4	265.5	47.4	791.8	0.865	1.7271	0.004	3.2998	0.008	0.3580	0.1270	1.6144	0.2576	0.2875	1.1516	0.4169	0.4343	3.8962	4.1324	0.5625
Tremp	6	10.2	757.0	188.0	12.3	200.3	13.3	136.9	0.308	2.4495	0.000	6.0000	0.003	0.6091	0.0030	0.4964	0.6263	0.1104	0.4113	0.7955	0.2152	9.3750	4.2000	0.9928
Lance	11	10.2	6428.6	55.2	13.0	68.2	23.4	630.8	0.572	2.3002	0.000	5.8097	0.003	0.4342	0.0500	1.0868	0.3824	0.2136	0.9146	0.5121	0.3788	6.5318	5.9858	0.7419
Scollard	5	10.2	6428.6	3236.8	11.6	3248.4	14.7	1306.9	0.865	2.0315	0.003	4.1512	0.004	0.4160	0.0500	0.5525	0.5960	0.1214	0.4500	0.7703	0.2308	7.3371	3.0378	0.7553

Summary Statistics, KS Test and polynomial tests for carnivore guilds. $\alpha = 0.05$, Sarle's b = .555

Table S5.

		Percentage of Communities Containing at least one Species											
	Log(kg)	-1	-0.5	0	0.5	1	1.5	2	2.5	3	3.5	4	4.5
All	Carnivores	2	5	21	28	88	47	23	42	63	23	0	0
	Herbivores	0	0	14	23	42	37	63	53	67	79	37	14
	Carnivores with larger Carnivore	2	5	21	28	86	47	19	26	9	0	0	0
	Herbivores with larger Herbivore	0	0	14	23	40	37	63	49	65	35	5	0
Cretaceous	Carnivores	2	5	21	23	67	42	12	21	44	16	0	0
	Herbivores	0	0	12	16	33	28	49	35	53	60	23	7
	Carnivores with larger Carnivore	2	5	21	23	65	42	9	12	2	0	0	0
	Herbivores with larger Herbivore	0	0	12	16	30	28	49	35	53	21	0	0
Jurassic	Carnivores	0	0	0	5	21	5	12	21	19	7	0	0
	Herbivores	0	0	2	7	9	9	14	19	14	19	14	7
	Carnivores with larger Carnivore	0	0	0	5	21	5	9	14	7	0	0	0
	Herbivores with larger Herbivore	0	0	2	7	9	9	14	14	12	14	5	0

The likelihood of bin occupation by guild with and without larger species present.

Table S6.

	Biomass Proportion		
Species	**Adult**	**Juvenile**	**RSP_J**
Acrocanthosaurus atokensis	0.32	0.68	211%
Albertosaurus sarcophagus	0.31	0.69	219%
Alectrosaurus olseni	0.31	0.69	219%
Alioramus altai	0.31	0.69	217%
Allosaurus fragilis	0.55	0.45	82%
Daspletosaurus torosus	0.63	0.37	60%
Gorgosaurus libratus	0.40	0.60	148%
Siats meekerorum	0.32	0.68	211%
Tarbosaurus bataar	0.36	0.64	179%
Tyrannosaurus rex	0.40	0.60	148%

Proportional biomass for 10 species of large theropods

Table S7.

Pairwise t-test α = 0.05 (bold) Bonferroni Correction α = 0.000058 (bold & outlined)	Bayan Shireh / Iren Dabasu	Cedar Mountain Mussentuchit	Cloverly	Dinosaur Park MAZ-1b	Hell Creek	Horseshoe Canyon D-H	Oldman	Two Medicine	Allen	Anacleto	Bajo de la Carpa	Bisekty	Callovian Oxford Clay	Djadokhta	Griman Creek	Hanson	Judith River Coal Ridge	Kaiparowits	Kayenta / Navajo Sandstone	Khuren Dukh	Kirtland Hunter-Willow Washes
Baruungoyot	0.729265	0.569573	0.352394	0.673321	0.480607	0.943344	0.356891	0.439320	0.998085	0.165487	0.439290	0.485196	0.475251	0.297476	0.887606	0.777779	0.741626	0.941639	0.781428	0.653161	0.681036
Bayan Shireh / Iren Dabasu		0.726212	0.397203	0.972291	0.589137	0.726543	0.393318	0.578107	0.633004	0.170936	0.565271	0.122716	0.503026	**0.026798**	0.505895	0.441953	0.936694	0.587117	0.444621	0.768572	0.849629
Cedar Mountain Mussentuchit			0.519951	0.705182	0.799543	0.565334	0.583282	0.909003	0.599342	0.466442	0.940619	0.281075	0.855663	0.127217	0.536510	0.553150	0.831276	0.523471	0.555124	0.998293	0.906541
Cloverly				0.100648	0.454536	0.126263	0.908169	0.318064	0.230588	0.827003	0.351604	0.097866	0.645463	**0.021352**	0.213137	0.312906	0.283974	0.153918	0.313586	0.505034	0.319193
Dinosaur Park MAZ-1b					0.616205	0.758362	0.434402	0.640992	0.730186	0.250455	0.658381	0.287860	0.632805	0.126872	0.633755	0.593130	0.961576	0.663504	0.595950	0.818006	0.882727
Hell Creek						0.495448	0.757959	0.868222	0.573300	0.721669	0.857393	0.336152	0.986554	0.177765	0.532584	0.577715	0.707012	0.493313	0.579107	0.871626	0.761648
Horseshoe Canyon D-H							0.354737	0.448250	0.940051	0.151086	0.436545	0.364511	0.448626	0.179901	0.810012	0.697440	0.766319	0.873151	0.701261	0.658786	0.701022
Oldman								0.294997	0.134147	0.929922	0.297150	**0.035031**	0.621191	**0.003123**	0.119310	0.211543	0.228171	0.080737	0.212062	0.465116	0.277879
Two Medicine									0.451769	0.461801	0.965617	0.156130	0.896107	**0.046720**	0.390928	0.422691	0.725118	0.379598	0.424484	0.929678	0.812055
Allen										0.078189	0.269307	**0.020650**	0.195622	0.000550	0.695930	0.376163	0.670934	0.894651	0.376219	0.544816	0.613504
Anacleto											0.197453	**0.003232**	0.495325	0.000048	**0.028365**	0.068389	0.151430	**0.021442**	0.068450	0.366141	0.211698
Bajo de la Carpa												0.053121	0.827871	**0.006891**	0.248778	0.273210	0.706965	0.272156	0.274520	0.941734	0.813503
Bissekty													**0.046028**	0.329954	0.152406	0.412991	0.316496	0.332545	0.379684	0.283627	0.311185
Callovian Oxford Clay														0.000022	0.050514	0.089188	0.474650	0.078317	0.088767	0.754914	0.597731
Djadokhta															0.088996	0.259365	0.283347	0.274944	0.224997	0.250510	0.281290
Griman Creek																0.617165	0.574878	0.897706	0.622519	0.479606	0.532115
Hanson																	0.441261	0.591082	0.983972	0.394576	0.420031
Judith River Coal Ridge																		0.629844	0.584513	0.851787	0.920242
Kaiparowits																			0.728603	0.559353	0.601097
Kayenta/Navajo Sandstone																				0.396308	0.422697
Khuren Dukh																					0.888570

	Lameta	Lance	Laramie	Lourinhã	Lufeng Bll Zhangjia'ao	Maevarano	Milk River	Morrison Brushy Basin Zone 3	Prince Creek	Scollard	Shangshaximiao	Tendaguru Middle Saurian	Tendaguru Upper Saurian	Tremp	Upper Elliot	Wadhurst Clay	Wahweap	Xiashaximiao	Yixian Jianshangou	Yixian Lujiantun
Baruungoyot	0.151888	0.561939	0.370516	0.191532	0.766834	0.826132	0.883459	0.050491	0.901597	0.404466	0.096290	0.130141	0.105236	0.718764	0.801885	0.478391	0.674811	0.275308	0.571215	0.361625
Bayan Shireh / Iren Dabasu	0.191977	0.707040	0.417112	0.230195	0.428881	0.991169	0.839699	0.065727	0.569816	0.462116	0.115424	0.171109	0.131303	0.324349	0.505634	0.575554	0.913084	0.342136	0.158295	0.056649
Cedar Mountain Mussentuchit	0.427843	0.949345	0.516761	0.456840	0.546842	0.825387	0.648141	0.199946	0.584780	0.585633	0.291448	0.509255	0.247000	0.417812	0.618606	0.910747	0.800398	0.650418	0.238317	0.194272
Cloverly	0.685267	0.300063	0.970736	0.773010	0.310670	0.418533	0.167609	0.955709	0.269784	0.876460	0.952114	0.458838	0.887555	0.151292	0.411741	0.468468	0.227351	0.530402	**0.038924**	0.054711
Dinosaur Park MAZ-1b	0.237495	0.735396	0.425992	0.275904	0.583632	0.979839	0.848119	0.086392	0.676367	0.475950	0.147304	0.244592	0.146167	0.478369	0.647525	0.666246	0.950821	0.410992	0.297523	0.188766
Hell Creek	0.694646	0.846078	0.639324	0.698074	0.573622	0.752206	0.558842	0.427804	0.578702	0.728879	0.527076	0.834224	0.422541	0.440179	0.643458	0.911072	0.670355	0.904051	0.263603	0.254223
Horseshoe Canyon D-H	0.150732	0.582807	0.378361	0.189815	0.684860	0.846191	0.927940	0.050044	0.834971	0.413276	0.094301	0.124146	0.107810	0.619278	0.731914	0.471649	0.697037	0.272768	0.448467	0.242804
Oldman	0.808651	0.326816	0.859907	0.894498	0.209171	0.341552	0.107668	0.809446	0.172011	0.988004	0.858670	0.500880	0.689811	0.071339	0.320285	0.423997	0.155405	0.563981	**0.009195**	**0.013975**
Two Medicine	0.451106	0.968723	0.534203	0.473170	0.416127	0.727199	0.516255	0.203366	0.449606	0.611102	0.291328	0.552962	0.253279	0.276309	0.500800	0.982079	0.668423	0.696266	0.118390	0.090718
Allen	0.107061	0.529964	0.366936	0.143873	0.342781	0.717347	0.843183	**0.034086**	0.765611	0.394201	0.067639	0.061222	0.093840	0.366578	0.387697	0.305545	0.525598	0.191631	0.216083	**0.002575**
Anacleto	0.876298	0.326507	0.806504	0.964821	0.066710	0.199485	**0.049703**	0.667131	0.054793	0.959637	0.733283	0.487265	0.584605	**0.012544**	0.130446	0.316770	0.071077	0.550714	**0.000478**	**0.000663**
Bajo de la Carpa	0.374574	0.997084	0.512756	0.400480	0.265705	0.676128	0.459546	0.150100	0.316536	0.584942	0.224745	0.444105	0.215951	0.146504	0.353097	0.940991	0.624235	0.617877	**0.041149**	**0.021409**
Bissekty	**0.042956**	0.301782	0.286120	0.068232	0.420487	0.297738	0.341519	**0.012289**	0.303296	0.294756	**0.028903**	**0.013324**	0.051354	0.426099	0.426638	0.102374	0.135281	0.075643	0.470513	0.177315
Callovian Oxford Clay	0.478846	0.814986	0.578149	0.492269	0.085261	0.434289	0.228213	0.199589	0.100915	0.661170	0.283944	0.614634	0.271525	**0.021791**	0.165616	0.824215	0.316632	0.778701	**0.001494**	**0.000398**
Djadokhta	**0.032941**	0.280442	0.268264	0.053548	0.252880	0.254417	0.301173	**0.008198**	0.228091	0.277269	**0.019693**	**0.008736**	**0.040697**	0.312647	0.215375	0.078295	0.107299	0.060107	0.347201	0.107440
Griman Creek	0.089513	0.467570	0.348253	0.125013	0.581508	0.610220	0.704930	**0.028216**	0.999374	0.369960	0.058549	**0.045859**	0.083690	0.618222	0.614992	0.251333	0.407035	0.159696	0.448865	**0.022857**
Hanson	0.071672	0.381830	0.333442	0.108922	0.957783	0.456591	0.509440	**0.023645**	0.637118	0.343382	0.054680	**0.029614**	0.077546	0.940300	0.936196	0.184703	0.252562	0.123525	0.936711	**0.043215**
Judith River Coal Ridge	0.268549	0.769893	0.448039	0.308792	0.573105	0.948850	0.807274	0.106114	0.653535	0.498202	0.176093	0.282293	0.168980	0.459803	0.640067	0.709594	0.999074	0.449838	0.276769	0.184856
Kaiparowits	0.111611	0.510091	0.356947	0.148489	0.706195	0.727330	0.798874	**0.035448**	0.926440	0.384303	0.070539	0.073647	0.091109	0.670633	0.746051	0.349873	0.539202	0.203470	0.503878	0.196893
Kayenta/Navajo Sandstone	0.072107	0.384113	0.334159	0.109410	0.939909	0.459093	0.514081	**0.023786**	0.643860	0.344311	0.054894	**0.029864**	0.077862	0.955548	0.918512	0.185586	0.255065	0.124278	0.917481	**0.031735**
Khuren Dukh	0.356913	0.941384	0.508498	0.391452	0.386938	0.766606	0.559520	0.149467	0.434907	0.570356	0.231768	0.407641	0.217819	0.244270	0.479177	0.878944	0.736029	0.580443	0.092704	0.059350
Kirtland Hunter-Willow Washes	0.330960	0.847367	0.477055	0.368051	0.556242	0.887962	0.728156	0.140272	0.615470	0.534601	0.220485	0.371885	0.199569	0.433624	0.626426	0.801310	0.903243	0.533459	0.251524	0.184618
Lameta		0.452720	0.769241	0.942016	0.208158	0.385717	0.158278	0.620495	0.193284	0.906555	0.694687	0.710914	0.556090	0.087749	0.297142	0.529074	0.224564	0.727007	**0.016412**	**0.018987**
Lance			0.564147	0.569874	0.639218	0.840759	0.682720	0.305348	0.661545	0.638700	0.408346	0.650529	0.326473	0.524233	0.699092	0.967817	0.805447	0.756151	0.352369	0.319817
Laramie				0.777010	0.394401	0.492021	0.240084	0.916118	0.354629	0.860065	0.922979	0.510007	0.942165	0.230625	0.487802	0.533715	0.306850	0.575409	0.085106	0.109864
Lourinhã					0.192364	0.354642	0.132877	0.682494	0.173391	0.943443	0.749126	0.629253	0.599568	0.075233	0.281110	0.480613	0.190293	0.663442	**0.012092**	**0.015230**
Lufeng Bll Zhangjia'ao						0.443809	0.494597	**0.023020**	0.605639	0.340630	0.053567	**0.028293**	0.076393	0.897459	0.973162	0.178718	0.241454	0.120237	0.984887	**0.039313**
Maevarano							0.850461	0.072886	0.579942	0.470148	0.131724	0.171765	0.144498	0.331036	0.525886	0.573236	0.900123	0.345145	0.159955	0.058768
Milk River								0.065602	0.793753	0.436711	0.118937	0.168754	0.125413	0.594590	0.723701	0.549040	0.786799	0.325936	0.421580	0.257902
Morrison Brushy Basin Zone 3									0.107258	0.887222	0.983776	0.351793	0.821464	**0.039620**	0.206152	0.319241	0.099144	0.431730	**0.004245**	**0.006481**
Prince Creek										0.375022	0.065654	0.051411	0.089101	0.661654	0.690676	0.272436	0.425429	0.169590	0.491465	0.068330
Scollard											0.895942	0.701309	0.758198	0.294707	0.539883	0.646242	0.409564	0.731641	0.131943	0.153182
Shangshaximiao												0.334925	0.801472	**0.031289**	0.187613	0.297727	0.084176	0.418844	**0.002619**	**0.004309**
Tendaguru Middle Saurian													0.387895	0.068003	0.253061	0.647740	0.274191	0.942696	**0.011140**	**0.009429**
Tendaguru Upper Saurian														0.068749	0.273733	0.326044	0.119503	0.379767	**0.010470**	**0.017028**
Tremp															0.920849	0.188794	0.281382	0.121716	0.884677	0.177766
Upper Elliot																0.186276	0.235523	0.124136	0.982221	**0.010413**
Wadhurst Clay																	0.550284	0.665645	**0.027094**	**0.014583**
Wahweap																		0.393635	0.150794	0.067228
Xiashaximiao																			**0.028748**	**0.026346**
Yixian Jianshangou																				0.355788

Pairwise t-test of communities with Bonferroni correction alpha value.

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