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DUCHESNEAN (MIDDLE EOCENE) THROUGH ARIKAREEAN (EARLY MIOCENE) BIOSTRATIGRAPHIC DISTRIBUTION OF RODENT TAXA IN NORTH AMERICA

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ABSTRACT

In a recent review of the North American rodent fossil record during the Whitneyan biozone (32.0 to 30.0 Ma) a publication error resulted in the table containing the primary data on reported occurrences of rodent taxa not being published in its entirety. This report publishes the full Whitneyan data table used in that study, along with additional tables documenting Duchesnean, Chadronian, Orellan, and Arikareean occurrences of rodent taxa within North America. These data serve as an updated resource for facilitating biostratigraphic correlations and studying patterns in rodent evolution during the late Paleogene and early Neogene.

INTRODUCTION

The North American Land Mammal Age (NALMA) system of defining biozones remains a key tool for assessing the age of lithostratigraphic units, correlating between geographic areas, and for studying trends in the evolution of North American faunae. Beginning in the Eocene, rodent taxa become key components for characterizing many biozones within the NALMA system (e.g., Woodburne, 2004). Recent work conducted on rodent fossils recovered from rocks of the White River Group in southcentral North Dakota resulted in the recognition of four new rodent faunae from the Whitneyan biozone (32.0 through 30.0 Ma: Prothero and Emry, 2004), prompting a review of the overall rodent fossil record during the Whitneyan in North America (Korth et al., 2019a, 2019b). While several unique patterns were noted in that study, the table of taxonomic occurrences upon which most of the reported results were based was inadvertently truncated, with over half of the taxa originally included in the table left out of the published paper (Korth et al., 2019b: Table 11). Specifically, all rodent taxa that are known only from the Whitneyan biozone and those with a first appearance (FAD) during the Whitneyan were excluded. Without those data many of the observations made in that study cannot be properly assessed by the reader. This report provides the primary data tables used to assess patterns in rodent evolution during the Duchesnean through Arikareean biozones in Korth et al. (2019b), including the full version of the truncated Whitneyan rodent occurrences table. The goal of this report is that providing these data will allow them to be more easily incorporated into future studies of rodent biostratigraphic trends and evolutionary patterns and assist with biostratigraphic correlations that that are based at least in part on rodent taxa.

METHODS

The first phase of data collection was conducted by searching the online resource The Paleobiology Database for reported records of rodent occurrences from North America from the Duchesnean through Arikareean. Reports of rodent taxa identified to at least the genus level were recorded. Localities with reports of at least seven rodent taxa identified to the genus level were included as separate columns in the final data tables, while additional reports of rodent taxa from less diverse localities during a given biozone are denoted in the tables by the addition of a "†" symbol after the species epithet. The oldest and youngest reports of each taxon in the tables was then identified by accessing their respective records on The Paleobiology Database. A deeper literature search was then conducted to find any additional localities or individual reports of rodent taxa from the time period of interest that were not present on The Paleobiology Database, often in the form of recently published studies that were not yet added to the database. It should be noted that in all cases when

compiling these data the prior taxonomic identifications were not re-evaluated. Spreadsheets of the data tables provided in this study, including all relevant citations, are available upon request from the author.

It is important to note when comparing rodent assemblages from these biozones that they do not span equal amounts of time. The Duchesnean through Whitneyan NALMAs cover a total of 10.1 million years, while the Arikareean alone covers 11.2 million years. Thus, these data are intended for use as a guide for biostratigraphic assessment of rock units and for interpreting general trends in rodent evolution during the late Paleogene and into the early Neogene and are not sufficiently temporally refined to allow detailed study of rates of evolutionary change within or between rodent clades. Additionally, it was not possible at this time to definitively parse these data into the previously proposed subdivisions of each biozone, though future work may facilitate such a use for these data.

RESULTS

Tables 1 through 5 provide the primary data on the distribution of rodent species from the Duchesnean, Chadronian, Orellan, Whitneyan, and Arikareean biozones, respectively. The discussion presented in Korth et al. (2019b) regarding patterns in rodent diversity also considered reports of rodents that were referred to a specific genus but were not identified to the species level. Therefore, another table was compiled that summarizes the distribution of rodent genera for these same biozones that includes those reports, as in some cases the first or last appearances of rodent genera was impacted (Table 6).

DISCUSSION

This report is intended to capture a snapshot of the current state of our understanding of the rodent fossil record, much in the same way as previously presented in some other studies (e.g., Korth, 1994). Though these data will quickly be out of date as new studies are published that describe new rodent faunae, assess prior identifications of rodent specimens, or revise the alpha-level taxonomy of rodent taxa. They will serve as a useful point of reference and hopefully make it easier for researchers to conduct in-depth studies on this clade moving forward, much in the same way as previously presented in some other studies (e.g., Korth, 1994). Though these data will quickly be out of date as new studies are published that describe new rodent faunae, assess prior identifications of rodent specimens, or revise the alpha-level taxonomy of rodent taxa, they will serve as a useful point of reference and hopefully make it easier for researchers to conduct in-depth studies on this clade moving forward.

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TABLE 1. Duchesnean rodent species and their distributions in well-described North American faunae. Abbreviations: †, species also reported from other locations; 1, Turtle Basin; 2, Diamond O Ranch; 3, Carnivore Den (Porvenir local fauna in part); 4, Simi Valley Landfill; 5, Wood Locality; 6, Badwater Locality 20; 7, Lac Pelletier lower fauna; Ch, Chadronian biozone; IP, inferred presence of species based on presence in older and younger faunae; NBU, species is not biostratigraphically useful as it is present in older and younger faunae; Ui, Uintan biozone.

Taxa	Ui	1	2	3	4	5	6	7	Ch	
Paramys compressidens	X								X	IP
Leptotomus guildayi†	X					X	X	X	X	NBU
Pseudotomus johanniculi†	X								X	
Anomoemys lewisi	X						X			Duchesnean LADs
Griphomys alecer†	X									
Microparamys dubius	X					X	X			
Microparamys tricus†	X									
Mytonomys robustus†	X									
Pareumys milleri†	X									
Protadjidaumo typus†	X									
Pseudotomus petersoni†	X									
Simimys simplex†	X				X					
Spurimus selbyi	X						X			
Aguafriamys raineyi†										Restricted to the Duchesnean
Argorheomys septentrionalis								X		
Churcheria baroni								X		
Cristadjidaumo mckennai		X								
Eutypomys acares								X		
Eutypomys obliquidens								X		
Heliscomys walshi					X					
Ischyromys blacki†										
Janimus dawsonae								X		
Litoyoderimys lustrorum†				X						
Metanoiamys korthi					X					
Metanoiamys lacus		X						X		
Microeutypomys tilliei								X		
Microparamys nimius								X		
Microparamys perfossus†				X						
Mytonomys coelumensis†										
Nonomys gutzleri†										
Paradjidaumo reynoldsi					X					
Pareumys guensburgi†										
Passaliscomys priscus		X								
Presbymys lophatus†										
Protadjidaumo pauli								X		
Pseudocylindrodon lateriviae								X		
Pseudocylindrodon tobeyi†						X	X			
Pseudotomus timmys								X		
Quadratomus gigans†										
Simiacritomys whistleri					X					

Simimys landeri				X				
Spurimus scotti†					X	X		
Viejadjidaumo magniscopuli†								
Adjidaumo craigi							X	X
Adjidaumo minimus		X						X
Adjidaumo minutus†			X					X
Ardynomys occidentalis		X						X
Aulolithomys bounites†			X					X
Eutypomys inexpectatus†			X					X
Ischyromys douglassi		X						X
Paradjidaumo alberti	X							X
Paradjidaumo trilophus		X						X
Pseudocylindrodon neglectus†			X					X

Duchesnean FADs

TABLE 2. Chadronian rodent species and their distributions in well-described North American faunae. Abbreviations: †, species also reported from other locations; 1, McCarty's Mountain; 2, Florissant; 3, Dirty Creek Ridge; 4, Little Pipestone Creek; 5, Horsetail Creek; 6, Chadronia Pocket; 7, Pipestone Springs; 8, Kealey Springs West; 9, Flagstaff Rim IV; 10, Pilgrim Creek; 11, Bone Cove; 12, Twin Buttes; 13, Flagstaff Rim II; 14, Calf Creek; 15, Medicine Pole Hills; 16, Flagstaff Rim I; 17, Raben Ranch; Du, Duchesnean biozone; FAD, first appearance datum; LAD, last appearance datum; NBU, not biostratigraphically useful; Or, Orellan biozone.

Taxon	Du	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Or	
Adjidaumo minimus†	X		X	X		X	X	X		X		X	X	X	X		X	X	X	NBU
Adjidaumo minutus†	X			X								X	X					X	X	NBU
Paradjidaumo trilophus†	X	X	X	X	X	X	X					X	X	X		X		X	X	NBU
Adjidaumo craigi	X																X			Chadronian LADs
Ardynomys occidentalis†	X	X																		Chadronian LADs
Aulolithomys bounites†	X			X	X		X	X					X	X	X			X		Chadronian LADs
Eutypomys inexpectatus†	X																			Chadronian LADs
Ischyromys douglassi†	X	X	X															X		Chadronian LADs
Leptotomus guildayi	X														X					Chadronian LADs
Paradjidaumo alberti†	X																			Chadronian LADs
Paramys compressidens	X																X			Chadronian LADs
Pseudocylindrodon neglectus†	X					X	X	X	X			X	X		X			X		Chadronian LADs
Pseudotomus johanniculi†	X																			Chadronian LADs
Adjidaumo burkei†														X			X			Restricted to Chadronian
Agnotocastor galushai†																				Restricted to Chadronian
Ardynomys saskatchewaensis															X					Restricted to Chadronian
Aulolithomys vexilliames										X				X			X			Restricted to Chadronian
Centimanomys galbreathi						X														Restricted to Chadronian
Centimanomys gigantus†																				Restricted to Chadronian
Centimanomys major						X						X						X		Restricted to Chadronian
Cristadjidaumo skinneri																	X			Restricted to Chadronian
Cupressimus barbarae															X					Restricted to Chadronian
Cylindrodon collinus															X	X				Restricted to Chadronian
Cylindrodon fontis†					X			X												Restricted to Chadronian
Cylindrodon natronensis†										X				X			X			Restricted to Chadronian
Cylindrodon nebraskensis						X							X					X		Restricted to Chadronian
Cylindrodon solarborus†										X										Restricted to Chadronian
Douglassciurus jeffersoni†								X		X		X		X	X	X	X			Restricted to Chadronian
Eutypomys parvus†			X											X	X	X				Restricted to Chadronian
Heliscomys ostranderi†		X						X		X				X	X		X			Restricted to Chadronian
Hesperopetes thoringtoni																	X			Restricted to Chadronian
Ischyromys junctus															X	X				Restricted to Chadronian
Jaywilsonomys ojinagaensis†																				Restricted to Chadronian
Litoyoderimys auogoleus																	X			Restricted to Chadronian
Meliakrouniomys skinneri†																				Restricted to Chadronian
Meliakrouniomys wilsoni†																				Restricted to Chadronian
Metanoiamys paradoxus														X			X			Restricted to Chadronian
Metaparamys dawsonae																X				Restricted to Chadronian
Montanamus bjorki								X												Restricted to Chadronian

Mytonomys gaitania†																				
Namatomys erythrus																X				
Namatomys lloydi†						X	X	X			X			X	X					
Nonomys simplicidens†								X												
Paradjidaumo hansonorum												X	X							
Paranamatomys storeri															X					
Pelycomys rugosus					X															
Pipestoneomys bisulcatus†				X		X				X							X			
Proischyromys perditus†																				
Prosciurus vetustus†			X	X			X		X	X	X	X		X	X	X	X			
Pseudocylindrodon medius	X									X										
Pseudocylindrodon pintoensis†																				
Pseudocylindrodon texanus†																				
Yoderimys bumpi†																				
Yoderimys stewarti													X	X	X					
Yoderimys yarmeri†																				
Zemiodontomys burkei						X					X	X	X							
Adjidaumo intermedius				X														X		
Adjidaumo lophatus†																		X		
Adjidaumo maximus								X										X		
Altasciurus relictus										X								X		
Eumys elegans†								X										X		
Eutypomys thomsoni†																		X		
Heliscomys hatcheri								X										X		
Heliscomys vetus			X			X				X					X		X	X		
Ischyromys typus†		X			X													X		
Ischyromys veterior†				X	X	X	X		X	X	X		X		X	X	X	X		
Oligospermophilus douglassi			X															X		

Chadronian FADs

TABLE 3. Orellan rodent species and their distributions in well-described North American faunae. Abbreviations: †, species also reported from other locations; 1, Cook Ranch; 2, Cedar Creek (lower); 3, Cedar Creek (middle); 4, Cedar Ridge; 5, Dout West; 6, Rabbit Graveyard (lower); 7, UNSM Sx-17; 6, UNSM Sx-14; 9, Slim Buttes Brule D; Ch, Chadronian biozone; FAD, first appearance datum; LAD, last appearance datum; NBU, not biostratigraphically useful; Wh, Whitneyan biozone.

Taxon	Ch	1	2	3	4	5	6	7	8	9	Wh	
Adjidaumo minimus†	X	X									X	
Adjidaumo minutus†	X		X			X	X		X		X	
Altasciurus relictus†	X		X	X	X	X			X		X	
Eumys elegans†	X	X	X	X	X	X	X				X	NBU
Heliscomys vetus	X		X		X			X	X		X	
Ischyromys typus†	X		X	X		X	X	X	X	X	X	
Paradjidaumo trilophus†	X		X	X		X	X	X			X	
Willeumys viduus†	X	X				X					X	
Adjidaumo intermedius†	X											
Adjidaumo lophatus†	X											
Adjidaumo maximus†	X											Orellan LADs
Eutypomys thomsoni†	X						X					
Heliscomys hatcheri†	X				X	X	X	X	X			
Ischyromys veterior†	X											
Oligospermophilus douglassi†	X											
Agnotocastor readingi†							X					
Altasciurus albiclivus†												
Ansomys nexodens†												
Apletotomeus crassus												
Apletotomeus incohatus			X									
Brachygaulus nicholsi		X										
Brachygaulus leistneri†												
Brachygaulus xerobothrus†												
Diplolophus insolens†				X		X		X	X			
Ecclesimus tenuiceps			X	X				X	X			
Eoeumys vetus†												
Epeiromys spanius†						X						
Eumys cricetodontoides		X										
Eutypomys hibernodus†												
Haplomys galbreathi										X		Restricted to Orellan
Megaheliscomys mcgrewi		X			X	X		X				
Manitsha tanka†												
Orelladjidaumo xylodes†												
Paradjidaumo hypsodus					X							
Paradjidaumo spokanensis†												
Paradjidaumo validus†												
Pelycomys brulanus†												
Pelycomys placidus				X	X				X	X		
Prosciurus parvus†		X							X			
Scottimus longiquus†												

Tenudomys basilaris						X				
Agnotocastor coloradensis		X						X		
Cedromus wardi†		X	X	X	X	X	X	X		
Cedromus wilsoni†								X		
Dakotallomys lillegraveni†								X		
Eumys parvidens	X							X		
Heliscomys gregoryi	X							X		
Heliscomys senex							X	X		Orellan FADs
Leptoromys wilsoni							X	X		
Metadjidaumo hendryi				X				X		
Ninamys annectens						X	X	X		
Oligotheriomys magnus†								X		
Prosciurus magnus						X		X		
Protosciurus mengi†						X		X		
Scottimus ambiguus		X	X	X				X		
Scottimus exiguus†								X		
Wilsoneumys planidens		X		X	X			X		

TABLE 4. Whitneyan rodent species and their distributions in well-described North American faunae. Abbreviations: †, species also reported from other locations; 1, White Hills local fauna; 2, Fitterer Ranch Fauna A; 3, Fitterer Ranch Fauna B; 4, Fitterer Ranch Fauna C; 5, Obritsch Ranch Fauna B; 6, Slim Buttes unit F; 7, Cedar Pass local fauna; 8, Harris Ranch units B through D; 9, Blue Ash local fauna; Ar, Arikareean biozone; IP, inferred presence of species based on presence in older and younger faunae; NBU, species is not biostratigraphically useful as it is present in older and younger faunae; Or, Orellan biozone.

Taxon	Or	1	2	3	4	5	6	7	8	9	Ar	
Agnotocastor coloradensis	X										X	IP
Metadjidaumo hendryi	X										X	
Eumys elegans	X								X		X	NBU
Adjidaumo minimus	X		X	X	X	X						Whitneyan Last Appearances (LADs)
Adjidaumo minutus	X		X	X	X							
Altasciurus relictus†	X	X										
Cedromus wardi	X			X								
Cedromus wilsoni	X									X		
Dakotallomys lillegraveni	X						X					
Eumys parvidens	X									X		
Heliscomys gregoryi	X	X										
Heliscomys senex	X				X							
Heliscomys vetus	X					X						
Ischyromys typus†	X		X	X	X	X		X	X			
Leptoromys wilsoni	X						X					
Ninamys annectens	X					X						
Oligotheriomys magnus	X			X		X						
Paradjidaumo trilophus	X		X	X	X			X	X	X		
Prosciurus magnus†	X									X		
Protosciurus mengi	X									X		
Scottimus ambiguus	X					X						
Scottimus exiguus†	X								X			
Willeumys viduus	X		X	X	X							
Wilsoneumys planidens	X								X			
Agnotocastor praetereadens†				X	X			X				Restricted to the Whitneyan
Allomys storeri†							X					
Altasciurus leonardi			X	X	X							
Ansomys cyanotephrus										X		
Dakotallomys pelycomyoides†							X					
Disallomys intermedius										X		
Disallomys robustus								X		X		
Douglassciurus bjorki								X		X		
Douglassciurus sapphrius										X		
Eumys lammersi				X								
Eutypomys wilsoni								X		X		
Geringia copiosus										X		
Heliscomys borealis			X	X	X							
Heliscomys medius					X	X				X		
Hesperopetes blacki			X		X	X				X		

Hesperopetes jamesi				X	X		X		X		
Kirkomys martintau							X		X		
Kirkomys parvus									X		
Leidymys juxtaparvulus							X		X		
Lophiocylindrodon expiratus	X										
Montanacastor simplicidens	X										
Niglarodon brachyodon									X		
Oligospermophilus emryi									X		
Orelladjidaumo amplus									X		
Orelladjidaumo exiguus	X										
Oropyctis pediasius†											
Paciculus cedrus							X				
Paciculus dakotensis									X		
Palaeocastor wahlerti							X				
Paradjidaumo obritschorum					X						
Prosciurus clausulus									X		
Prosciurus hogansoni		X	X	X							
Scottimus lophatus†						X	X		X		
Willeumys argosorus	X										
Zophapeomys indicus									X		
Campestrallomys dawsonae							X		X	X	Whitneyan First Appearances (FADs)
Campestrallomys siouxensis†									X	X	
Eumys brachyodus†	X	X	X	X	X		X	X	X	X	
Florentiamys kingi									X	X	
Haplomys liolophus†										X	
Kirkomys nebraskensis†								X		X	
Leidymys blacki							X		X	X	
Leptodontomys douglassi	X								X	X	
Paciculus nebraskensis							X		X	X	
Proharrymys fedti					X					X	
Proharrymys wahlerti							X			X	
Protosciurus rachelae									X	X	
Scottimus kellamorum									X	X	
Tylionomys voorhiesi									X	X	

TABLE 5. Arikareean rodent species and their distributions in well-described North American faunae. Abbreviations: †, species also reported from other locations; 1, John Day Units G, H, I, and J; 2, Nipple Butte Quarry; 3, Peterson Creek; 4, Reunion Creek; 5, SDSM V5354; 6, SDSM V5359; 7, Durnal Ranch Quarry; 8, SDSM V5360; 9, SDSM V5362; 10, SDSM V541; 11, Wagner Quarry; 12, Collins Ranch; 13, SDSM V6215; 14, Skarboe Spur; 15, SDSM V6229; 16, Stage Hill II; 17, Olson Ranch; 18, McCann Canyon Quarry; 19, Kealey Springs; 20, Ridgeview; FAD, first appearance datum; He, Hemphillian biozone; LAD, last appearance datum; NBU, not biostratigraphically useful; Wh, Whitneyan biozone.

Taxon	Wh	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	He	
Leidymys blacki†	X		X				X	X	X	X	X	X									X	X	NBU
Agnotocastor coloradensis†	X																						
Campestrallomys dawsonae†	X					X		X	X	X	X									X	X		
Campestrallomys siouxensis†	X																						
Eumys brachyodus†	X		X																				
Eumys elegans†	X																						
Florentiamys kingi†	X																						
Haplomys liolophus†	X																						
Kirkomys nebraskensis	X											X											Ar LADs
Leptodontomys douglassi†	X																				X		
Metadjidaumo hendryi	X																				X		
Paciculus nebraskensis†	X												X		X			X	X	X			
Proharrymys fedti†	X		X			X					X										X		
Proharrymys wahlerti	X																				X		
Protosciurus rachelae†	X																						
Scottimus kellamorum†	X																						
Tylionomys voorhiesi	X																				X		
Agnotocastor montanus†																							
Allomys cavatus†																							
Allomys cristabrevis†																							
Allomys nitens†																							
Allomys reticulatus†																							
Allomys simplicidens		X																					
Allomys tessellatus†																							
Alwoodia harkseni†														X				X	X				
Alwoodia magna		X										X											
Arikareeomys skinneri																		X	X				
Capacikala gradatus†		X				X	X		X	X	X												
Capacikala parvus†																							
Capatanka cankpeopi†																							
Capatanka minor†							X																Restricted to Arikareean
Cedromus savannae†								X				X											
Crucimys milleri†										X										X			
Downsimus chadwicki†												X								X	X		
Entoptychus basilaris†																							
Entoptychus cavifrons†																							
Entoptychus fieldsi				X																			
Entoptychus germannorum†																							
Entoptychus grandiplanus†					X												X	X	X				

Entoptychus leptophrys†																				
Entoptychus minor†																				
Entoptychus montanensis†																				
Entoptychus sheppardi†																				
Entoptychus transitorius†																				
Entoptychus wheelerensis†																				
Euhapsis breugerorum†																				
Euhapsis ellicottae†																				
Euhapsis platyceps†																				
Eutypomys montanensis†															X				X	
Fanimus clasoni†								X	X											
Florentiamys agnewi								X												
Florentiamys kinseyi†																				
Florentiamys loomisi†																				
Florentiamys tiptoni													X		X				X	X
Fossorcastor brachyceps†																				
Fossorcastor greeni†																				
Geringia gloveri†																			X	
Geringia mcgregori†		X					X	X			X									X
Gregorymys curtus†																				
Gregorymys douglassi†																				
Gregorymys formosus†													X	X	X	X		X		
Gregorymys kayi†																				
Gregorymys riggsi†																				
Gregorymys riograndensis†																				
Heliscomys macdonaldi																				X
Hitonkala andersontau†					X															
Hitonkala macdonaldtau				X										X			X	X	X	
Jimomys lulli	X																			
Leidymys alicae†																				
Leidymys cerasus																	X	X		
Leidymys korthi																			X	
Leidymys lockingtonianus†																				
Leidymys nematodon†																				
Leidymys parvus†																				
Meniscomys editus†																				
Meniscomys hippodus†					X															
Meniscomys uhtoffi	X																			
Metadjidaumo cedrus†																				
Migmacastor procumbodens†																				
Miosciurus ballovianus†																				
Mylagaulodon angulatus†																				
Neatocastor hesperus†																				
Niglarodon blacki†																				
Niglarodon koerneri†						X														

Niglarodon loneyi†																				
Niglarodon petersonensis			X																	
Niglarodon progressus†																				
Niglarodon yeariani†																				
Nototamias quadratus															X		X	X	X	
Paciculus insolitus†																				
Paciculus woodi†						X			X	X										
Palaeocastor nebrascensis†																				
Palaeocastor peninsulatus†								X	X											
Parallomys americanus																	X	X	X	
Pleurolicus dakotensis†																				
Pleurolicus exiguus†																				
Pleurolicus sellardsi†																				
Priusaulax browni†																				
Proharrymys schlaikjeri†																				X
Proheteromys cejanus†																				
Proheteromys gremmelsi†						X			X	X										
Proheteromys ironcloudi†													X						X	
Proheteromys matthewi†																				
Proheteromys parvus†																				
Proheteromys sabinensis†																				
Proheteromys toledoensis†																				
Promylagaulus riggsi†				X								X		X		X	X	X	X	
Protosciurus condoni†																				
Protosciurus tecuyensis†																				
Protospermophilus vortmani	X																			
Pseudopalaeocastor osmagnus†																				
Sanctimus falkenbachi†																				
Sanctimus simonisi†																				
Sanctimus stouti†																				X
Sanctimus stuartae†		X			X												X	X		X
Schizodontomys sulcidens†																				
Sespemys thurstoni†																				
Similisciurus maxwelli†																				
Tenudomys bodei†																				
Tenudomys dakotensis†										X										
Tenudomys macdonaldi†																				
Tenudomys ridgeviewensis																				X
Tenudomys titanus							X													X
Trilaccogaulus lemhiensis			X																	
Trilaccogaulus montanensis†																				
Trilaccogaulus ovatus†															X		X	X	X	
Tylionomys woodi†				X								X								X
Zetamys nebraskensis		X																		

Ziamys tedfordi†														
Dikkomys matthewi†									X				X	
Entoptychus individens†													X	
Entoptychus planifrons†													X	
Fossorcastor fossor†							X		X		X	X	X	
Galbreathia novellus†													X	
Harrymys magnus†													X	
Mesogaulus paniensis†													X	
Paciculus montanus		X					X		X				X	Ar FADs
Pleurolicus sulcifrons†	X												X	
Proheteromys floridanus†													X	
Pseudopalaeocastor barbouri†													X	
Pseudotheridomys hesperus												X	X	
Schaubeumys clivosus				X							X	X	X	
Schaubeumys grangeri†							X		X				X	
Schizodontomys greeni†													X	
Schizodontomys harkseni†						X		X				X	X	
Trogomys rupinimenthae†													X	

TABLE 6. Distribution of rodent genera in late Paleogene through early Neogene faunae in North America. Based on published reports of taxa identified to at least the genus level. Abbreviations: >Du, known from older biozone; Ar, Arikareean biozone; Ar>, known from younger biozone; Ch, Chadronian biozone; Du, Duchesnean biozone; FAD, First appearance datum; LAD, last appearance datum; Or, Orellan biozone; Wh, Whitneyan biozone.

Taxon	>Du	Du	Ch	Or	Wh	Ar	Ar>	FAD	LAD
Anomoemys	X	X							
Churcheria	X	X							
Janimus	X	X							
Microeutypomys	X	X							
Pareumys	X	X							
Presbymys	X	X						>Du	Du
Protadjidaumo	X	X							
Quadratomus	X	X							
Rapamys	X	X							
Sciuravus	X	X							
Argorheomys		X							
Aguafriamys		X							
Passaliscomys		X						Du	Du
Simiacritomys		X							
Viejadjidaumo		X							
Griphomys	X	X	X						
Leptotomus	X	X	X						
Mytonomys	X	X	X						
Pauromys	X		X						
Paramys	X		X					>Du	Ch
Pseudotomus	X	X	X						
Simimys	X	X	X						
Spurimus	X	X	X						
Ardynomys		X	X						
Aulolithomys		X	X						
Cristadjidaumo		X	X						
Cylindrodon		X	X						
Litoyoderimys		X	X					Du	Ch
Metanoiamys		X	X						
Nonomys		X	X						
Pipestoneomys		X	X						

Centimanomys			X				
Cupressimus			X				
Jaywilsonomys			X				
Meliakrouniomys			X				
Metaparamys			X				
Montanamus			X			Ch	Ch
Paranamatomys			X				
Proischyromys			X				
Prolapsus			X				
Yoderimys			X				
Zemiodontomys			X				
Pseudocylindrodon	X	X	X	X		>Du	Or
Namatomys			X	X		Ch	Or
Pelycomys			X	X			
Apletotomeus				X			
Brachygaulus				X			
Diplolophus				X			
Ecclesimus				X		Or	Or
Eoeumys				X			
Manitsha				X			
Megaheliscomys				X			
Douglassciurus	X		X		X		
Ischyromys	X	X	X	X	X	>Du	Wh
Microparamys	X	X			X		
Paradjidaumo	X	X	X	X	X		
Adjidaumo		X	X	X	X	Du	Wh
Orelladjidaumo		X		X	X		
Altasciurus			X	X	X		
Hesperopetes			X		X	Ch	Wh
Oligospermophilus			X	X	X		
Willeumys			X	X	X		
Dakotallomys				X	X		
Epeiromys				X	X	Or	Wh
Leptoromys				X	X		
Ninamys				X	X		

Oligotheriomys			X	X			
Wilsoneumys			X	X			
Disallomys				X		Wh	Wh
Zophoapeomys				X			
Eumys	X	X	X	X	X	Du	Ar
Eutypomys	X	X	X	X	X		
Agnotocastor		X	X	X	X	Ch	Ar
Cedromus		X	X	X	X		
Haplomys			X	X	X	Or	Ar
Metadjidaumo			X		X		
Scottimus			X	X	X		
Sespemys			X		X		
Tenudomys			X		X		
Allomys				X	X	Wh	Ar
Campestrallomys				X	X		
Downsimus				X	X		
Geringia				X	X		
Kirkomys				X	X		
Niglarodon				X	X		
Palaeocastor				X	X		
Proharrymys				X	X		
Tylionomys				X	X		
Zetamys				X	X		
Alwoodia					X	Ar	Ar
Arikareeomys					X		
Capacikala					X		
Capatanka					X		
Crucimys					X		
Euhapsis					X		
Hitonkala					X		
Meniscomys					X		
Miosciurus					X		
Neatocastor					X		
Parallomys					X		
Promylagaulus					X		

Trilaccogaulus						X			
Gregorymys	X					X	X	>Du	<Ar
Jimomys	X					X	X		
Heliscomys		X	X	X	X	X	X	Du	<Ar
Prosciurus		X	X	X	X	X	X		
Ansomys				X	X		X	Or	<Ar
Protosciurus				X	X	X	X		
Florentiamys					X	X	X	Wh	<Ar
Leidymys					X	X	X		
Leptodontomys					X	X	X		
Miospermophilus					X	X	X		
Nototamias					X	X	X		
Paciculus					X	X	X		
Cupidinimus						X	X	Ar	<Ar
Dikkomys						X	X		
Entoptychus						X	X		
Fanimus						X	X		
Fossorcastor						X	X		
Harrymys						X	X		
Mookomys						X	X		
Mylagaulodon						X	X		
Petauristodon						X	X		
Pleurolicus						X	X		
Proheteromys						X	X		
Protospermophilus						X	X		
Pseudopalaeocastor						X	X		
Pseudotheridomys						X	X		
Sanctimus						X	X		
Schaubeumys						X	X		
Schizodontomys						X	X		
Texomys						X	X		
Trogomys						X	X		
Ziamys						X	X		