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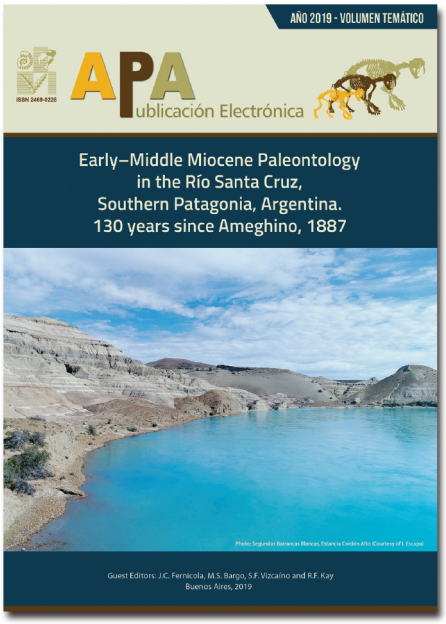

REVISION OF THE MIOCENE CAVIOMORPH RODENTS FROM THE RÍO SANTA CRUZ (ARGENTINEAN PATAGONIA)

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ARTÍCULO

REVISION OF THE MIOCENE CAVIOMORPH RODENTS FROM THE RÍO SANTA CRUZ (ARGENTINEAN PATAGONIA)

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Abstract. Fossil rodents from the Río Santa Cruz (RSC) classic localities (Santa Cruz Formation, Early–Middle Miocene) are known by the works of F. Ameghino and W.B. Scott since the end of the 19th and beginning of the 20th centuries. These caviomorph rodents have not been comprehensively reviewed since then. In this contribution, we studied new fossil specimens from the cliffs of the RSC (Province of Santa Cruz, Argentina) collected with accurate stratigraphic and geographic data during fieldtrips in 2013 and 2014. An increase in the caviomorph taxonomic richness is observed, based upon our taxonomic study of caviomorphs previously recorded in the RSC. Also, these fieldworks recovered for the first time several taxa previously found in other Santacrucian and even older Patagonian localities (Colhuehuapian, Early Miocene). As a general evolutionary pattern, we note an increase of derived euhypsodont taxa (*Prolagostomus*, *Pliolagostomus*, *Schistomys*, and *Eocardia*) in Segundas Barrancas Blancas (16.47–15.3 Ma). In addition, a taxonomic replacement of *Phanomys* by *Schistomys* is noted between Barrancas Blancas (17.21–16.3 Ma) and Segundas Barrancas Blancas, as well as a notably increase in the abundance of the large *Perimys onustus* in the latter locality. The present study provides a revision of the caviomorph systematics, and intends to be the starting point to understand the diversity (in all its aspects) and the evolution of this group during the Santacrucian, a major event in the South American mammalian history.

Key words. Santacrucian. Province of Santa Cruz. Hystricognathi. Taxonomy. Systematics. Biostratigraphy. Evolution.

Resumen. REVISIÓN DE LOS ROEDORES CAVIOMORFOS MIOCENOS DEL RÍO SANTA CRUZ (PATAGONIA ARGENTINA). Los roedores fósiles provenientes de localidades del Río Santa Cruz (RSC; Formación Santa Cruz, Mioceno Temprano–Medio) se conocen desde fines del siglo 19 y principios del 20, gracias a los trabajos de F. Ameghino y W.B. Scott. Sin embargo, no fueron estudiados a nivel integral desde ese momento. En este sentido, analizamos nuevos ejemplares recolectados en las barrancas del RSC (Santa Cruz, Argentina) durante los años 2013 y 2014 que cuentan con datos de procedencia estratigráfica y geográfica precisos. El estudio taxonómico permitió reconocer taxones previamente descriptos para el RSC, así como nuevos taxones conocidos en otras localidades santacrucenses o en localidades más antiguas de Patagonia (Colhuehuapense, Mioceno Temprano). Se corroboró un aumento en la riqueza taxonómica del conjunto de roedores del RSC. Como patrón evolutivo general, se observa un incremento de formas euhipsodontes derivadas (*Prolagostomus*, *Pliolagostomus*, *Schistomys*, *Eocardia*) en Segundas Barrancas Blancas (16,47–15,3 Ma). A su vez, observamos un reemplazo taxonómico de *Phanomys* por *Schistomys* desde la localidad de Barrancas Blancas (17,21–16,3 Ma) a Segundas Barrancas Blancas y un notable aumento en la abundancia de *Perimys onustus*, la especie más grande del género, en esta última localidad. El presente estudio es una puesta al día de la sistemática de los caviomorfos del RSC y pretende ser el punto de partida para entender la diversidad y la evolución de los caviomorfos durante el Santacrucense, un periodo crucial en la historia de los mamíferos sudamericanos.

Palabras clave. Santacrucense. Provincia de Santa Cruz. Hystricognathi. Taxonomía. Sistemática. Bioestratigrafía. Evolución.

CAVIOMORPHS are the endemic hystricognath rodents of Central and South America (Wood, 1955; Upham and Patterson, 2015). They constitute the most diverse group of rodents from a morphological and ecological point of view, and have a long evolutionary history during the Cenozoic (Vassallo and Antenucci, 2015; Vucetich *et al.*, 2015). The systematics and biology of extant taxa have been intensively studied and are relatively well-known (Álvarez *et al.*, 2011; Patton *et al.*, 2015; Vassallo and Antenucci, 2015). However, these aspects still require intensive study in fossils. In this regard, the Early Miocene represents a crucial moment in the evolutionary history of caviomorphs since the fossil record indicates that Santacrucian rodents were a critical part of an important caviomorph diversification (Pérez and Pol, 2012;

Arnal and Vucetich, 2015a; but see Verzi *et al.*, 2014). The Early–Middle Miocene of Patagonia (Colhuehuapian, "Pinturan", Santacrucian, and "Colloncuran" South American Land Mammal Ages, SALMA), has yielded an excellent record of mammals (*e.g.*, Ameghino, 1887a,b, 1889; Scott, 1905; Kramarz, 2001, 2002, 2004, 2006a,b; Kramarz *et al.*, 2010, 2013; Pérez, 2010a; Pérez *et al.*, 2010; Vucetich *et al.*, 2010; Pérez and Vucetich, 2012; Vizcaíno *et al.*, 2012a; Arnal and Pérez, 2013; González Ruiz *et al.*, 2013, 2017; Brandoni *et al.*, 2017, 2019; Vera *et al.*, 2017, 2018; Busker *et al.*, 2018; Rasia and Candela, 2019). In particular, the Santa Cruz Formation (Early–Middle Miocene; Santacrucian) is widely distributed in the Province of Santa Cruz, Argentina (Fig. 1; Cuitiño *et al.*, 2016, 2019). It is one of the richest Cenozoic vertebrate fossil units bearing abundant and well-preserved specimens. Caviomorphs recorded in the cliffs of the classic localities of the Río Santa Cruz (RSC; Fig. 1) were first studied by F. Ameghino (1887a,b, 1889, 1891a,b, 1894) who erected 23 caviomorph genera and 45 species (Tab. 1). These rodents were later revised by Scott (1905) who described new species from other Santacrucian localities of the Province of Santa Cruz (Fig. 1), but no new caviomorph genera were identified. In this regard, Scott (1905, p. 384) stated: "*It must not be supposed that the full number of Santa Cruz genera has been already discovered, though it is improbable that the list will be very greatly extended in the future*". Since that time, several other Santacrucian-age localities have been identified at high and middle latitudes of South America. However, caviomorphs have been listed or mentioned in only some of them: coastal localities in the Province of Santa Cruz (Tauber, 1997; Candela *et al.*, 2012), Las Hornillas, Province of San Juan, Argentina (López *et al.*, 2011), Alto Río Cisnes (Marshall and Salinas, 1990), Pampa Castillo (Flynn *et al.*, 2002), Laguna del Laja (Flynn *et al.*, 2008), and Sierra Baguales (Bostelmann *et al.*, 2013) of southern Chile, and Chucal of northern Chile (Croft *et al.*, 2004). In agreement with Scott's conclusion, almost no new taxa were formally recognized since Ameghino's work (but see Arnal and Vucetich, 2015b).

Santacrucian rodents are very abundant in number of specimens but relatively homogeneous in their morphological disparity (Scott, 1905; Vucetich *et al.*, 2015). When compared with rodents from the lower and middle sequences of the Pinturas and Sarmiento formations ("Pinturan" and Colhuehuapian SALMAS, Early Miocene), those from beds of the Santa Cruz Formation show some differences. Santacrucian octodontoids are characteristically more hypsodont and more lophate than their predecessors; euhypsodont cavioids predominate for the first time; erethizontoids are less abundant and less diverse, and chinchilloids reach their greatest diversity (Vucetich *et al.*, 2015, and literature therein). The dental changes toward increasing hypsodonty and trend towards more simplified occlusal surfaces were traditionally related to the environmental and climatic changes that occurred since the Late Eocene–Early Oligocene, which were more marked in Patagonia at that time (Pascual *et al.*, 1996; Zachos, 2001; Ortiz Jaureguizar and Cladera, 2006; Madden, 2015; Vizcaíno *et al.*, 2012a).

Despite the importance of this rodent fauna owing to their excellent fossil record and widespread geographical distribution, no comprehensive studies of the caviomorph assemblages either from the RSC or from other Santacrucian localities have been performed to date. Only partial revisions or isolated studies of specimens from different Santacrucian localities have been published (Pérez, 2010b; Arnal, 2012; Pérez and Vucetich, 2012; Arnal and Vucetich, 2015b; Arnal *et al.*, 2017).

A particular problem of this fauna is that the abundant fossil remains found by Carlos Ameghino in the RSC and other localities lack accurate geographic and stratigraphic data, which makes comparisons between localities and biostratigraphic correlations difficult (Fernicola *et al.*, 2019). Since those first collections, almost no new intensive field work had been made to remedy this deficiency. At the beginning of the 21th century a group of scientists headed by Drs. S.F. Vizcaíno, M.S. Bargo (Museo de La Plata, MLP), R.F. Kay (Duke University, USA), and J.C. Fernicola (Museo Argentino de Ciencias Naturales "Bernardino Rivadavia"), launched a project focused on the Santa Cruz rocks (Santa Cruz Formation, Early–Middle Miocene) cropping out along the Atlantic coast of the Province of Santa Cruz, and along the cliffs on the southern bank of the RSC. Within this project, numerous new specimens with good stratigraphic provenance were collected (Vizcaíno *et al.*, 2012a; Fernicola *et al.*, 2014, 2019; Cuitiño *et al.*, 2016), which considerably

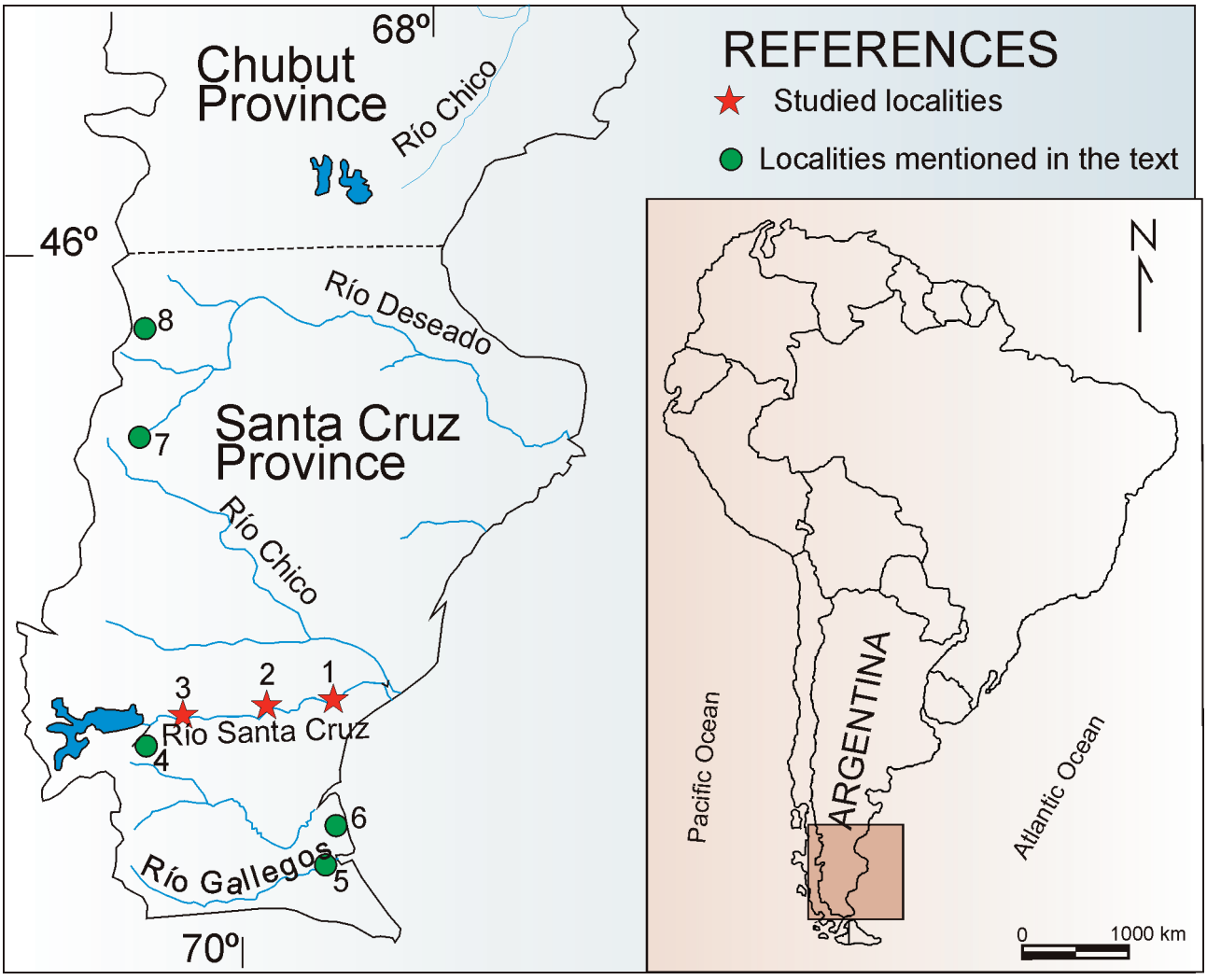


Figure 1. Location map showing the Santacrucian and other localities mentioned in the text. **1,** Barrancas Blancas **(BB)**; **2,** Segundas Barrancas Blancas **(SBB)**; **3,** Yaten Huageno **(YH)**; **4,** Río Bote; **5,** Killik Aike; **6,** Guer Aike; **7,** río Pinturas area; **8,** río Jeinemeni area.

enlarge the Santacrucian caviomorph collections and allow integral studies of the whole Santacrucian assemblage to be performed. Furthermore, on the basis of a systematic revision and owing to the precise provenance data, different Santacrucian localities bearing rodents can now be harnessed in the search for evolutionary trends related to climatic and environmental changes. In this contribution, a revision of the caviomorph rodents from the Santa Cruz Formation at the RSC is performed, including new specimens. Their taxonomic richness is compared with those from other Santacrucian localities of the Province of Santa Cruz (Scott, 1905; Candela *et al.*, 2012; Fernicola *et al.*, 2019). Additionally, general evolutionary trends of the group are also discussed.

MATERIALS AND METHODS

More than 750 fossil specimens (Appendix 1) housed at the Vertebrate Paleontology Collection of the Museo Regional Provincial "Padre Manuel Jesús Molina" (MPM-PV) were studied. Several Santacrucian caviomorphs specimens were used for comparison, mainly those housed at the American Museum of Natural History (AMNH), New York, USA; Field Museum of Natural History (FMNH), Chicago, USA; Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Ameghino National Collection (MACN-A), Buenos Aires, Argentina; Museo de La Plata, La Plata, Argentina (MLP); Museum National d'Histoire Naturelle (MNHN), Paris, France; Museo Paleontológico Egidio Feruglio (MPEF-PV),

Table 1 - Caviomorph rodents from the Río Santa Cruz described by Ameghino

Ameghino, 1887a	*Ameghino, 1887b*	*Ameghino, 1889*	*Ameghino, 1891a,b*	*Ameghino, 1902*	*Current taxonomy*
Acaremys murinus					Acaremys murinus[1]
		Acaremys messor			Acaremys messor[1]
Acaremys minutus					Acarechimys minutus[2]
Acaremys minutissimus					Acarechimys minutissimus[2]
Sciamys principalis					Sciamys principalis
Sciamys varians					Sciamys varians
Adelphomys candidus					Adelphomys candidus
Stichomys regularis					Stichomys regularis
Stichomys constans					Acarechimys constans[2]
Spaniomys riparius					Spaniomys riparius
Spaniomys modestus					Spaniomys modestus
					Acarechimys gracilis[2]
					Pseudoacaremys kramarzii[1]
					Sciamys latidens[3]
					Dudumus *sp. nov.?*[3]
					Prospaniomys *sp. nov.?*[3]
Steiromys detentus					Steiromys detentus
Steiromys duplicatus					Steiromys duplicatus
Neoreomys australis					Neoreomys australis[4]
Neoreomys indivisus					
Neoreomys decisus					
		Neoreomys insulatus[4]			
	Eocardia montana				Eocardia montana[5]
Eocardia divisa					
Eocardia perforata					
			Dicardia excavata[b]		"Eocardia" excavata[5]
			Eocardia fissa[a]		"Eocardia" fissa[5]
Schistomys erro					Schistomys erro
Phanomys mixtus					Phanomys mixtus
			Phanomys vetulus[a]		Phanomys vetulus
Hedymys integrus					*Nomen nudum*[6]
Perimys erutus					Perimys erutus[7]
		Perimys procerus			
Sphodromys scalaris					
Perimys onustus					Perimys onustus
			Perimys planaris[a]		
				Perimys incavatus	Perimys incavatus[3]
Sphiggomys zonatus					Perimys zonatus[8]
		Olenopsis uncinus[9]			
Prolagostomus pusillus					Prolagostomus pusillus[10]
Prolagostomus divisus					
Prolagostomus profluens					
Prolagostomus imperialis					
		Lagostomus lateralis			
		Lagostomus primigenius			
Sphaeromys irruptus[11]					
Scotaeumys imminutus[12]					
Pliolagostomus notatus					Pliolagostomus notatus[13]
Scleromys angustus					Scleromys angustus
Calladontomys vastatus					*Nomen dubium*[14]

[1]*Arnal and Vucetich (2015b);* [2]*Arnal* et al. *(2017);* [3]*this work;* [4]*Kramarz (2006b);* [5]*Pérez (2010b);* [6]sensu *Wood and Patterson (1959);* [7]*Kramarz (2002);* [8]*Ameghino (1894) transferred this species to* **Perimys zonatus**; [9]*Candela and Nasif (2006) synonymized this species with* **Neoreomys**; [10]*Rasia (2016);* [11]*Scott (1905) synonymized this species with* **Prolagostomus pusillus**; [12]*Kramarz (2002) synonymized this species with* **Prolagostomus**; [13]*Rasia and Candela (2019);* [14]*Mones.*

Trelew, Argentina; and Princeton University Collection of the Yale Peabody Museum (YPM-PU), New Haven, USA.

Caviomorph systematics follow Pérez (2010a,b), Arnal (2012), Arnal and Vucetich (2015b), Rasia (2016), and references in Table 1.

The studied localities along the southern banks of the RSC are, from East to West (Fernicola *et al.*, 2014; Cuitiño *et al.*, 2016, 2019) (Fig. 1): Barrancas Blancas (BB; 17.21–16.3 Ma), with two sites, Estancia Aguada Grande (EAG) and Estancia Santa Lucía (ESL); Segundas Barrancas Blancas (SBB; 16.47–15.3 Ma), with three sites, Estancia Cordón Alto1 (ECA), Estancia Cordón Alto2 (ECA2), and Estancia el Tordillo (EET); Yaten Huageno (YH; 17.21–16.68 Ma) with one site, Estancia El Refugio (EER).

SYSTEMATIC PALEONTOLOGY

Order Rodentia Bowdich, 1821
Suborder Hystricognathi Tullberg, 1899
Superfamily Octodontoidea Waterhouse, 1839

Genus ***Spaniomys*** Ameghino, 1887a

Type species. *Spaniomys riparius* Ameghino, 1887a. Pinturas Formation, Early Miocene and Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz.

Spaniomys riparius Ameghino, 1887a

Referred materials. See Appendix 1.
Locality and Horizon. See Appendix 1.

Spaniomys sp.
Figure 2.1–4

Referred materials. See Appendix 1.
Locality and Horizon. See Appendix 1.
Comments. *Spaniomys* is characterized by being higher crowned than *Acaremys* Ameghino, 1887a and *Acarechimys* Patterson in Kraglievich, 1965. Cheek teeth have planar occlusal surfaces and undifferentiated cusps (Fig. 2.1–3), unlike *Acarechimys*, but resembling *Adelphomys* Ameghino, 1887a and *Stichomys* Ameghino, 1887a. This genus retains the deciduous premolar through life, unlike acaremyids (= *Acaremys*, *Sciamys* Ameghino, 1887a, *Pseudoacaremys* Arnal and Vucetich, 2015b, *Galileomys* Vucetich and Kramarz, 2003, and *Platypittamys* Wood, 1949; Arnal and Vucetich 2015b). Lophs and lophids are thin with pointed labial and lingual ends respectively, unlike *Adelphomys* and *Stichomys*. Lower cheek teeth have four lophids (MPM-PV 20178; Fig. 2.1–2) and upper cheek teeth have four (MPM-PV 20310; Fig. 2.3) or five lophs.

Ameghino recognized three species: *S. riparius*, *S. modestus* Ameghino, 1887a, and *S. biplicatus* Ameghino, 1894 that differ in size and in the number of flexi on lower cheek teeth. However, size differences are not great. In this work, several well-preserved specimens were recognized as *S. riparius* owing to their slightly larger size (MPM-PV 20115, MPM-PV 20524, MPM-PV 20557; Appendix 1; Tab. 2), but most of them (Fig. 2.1–4) were recognized as *Spaniomys* sp. (MPM-PV 20562; MPM-PV 20618; MPM-PV 20770; Appendix 1; Tab. 2) until a systematic revision is performed. Within the new rodents sample, *Spaniomys* is present and abundant in EAG and ESL (BB) and ECA, ECA2, and EET (SBB). In EER (YH) rodents are very scarce, but it is represented by one specimen (MPM-PV 20770; Tab. 2).

Genus ***Stichomys*** Ameghino, 1887a

Type species. *Stichomys regularis* Ameghino, 1887a. Pinturas Formation, Early Miocene, and Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz; Río Frías Formation, Middle Miocene, Province of Chubut.

Stichomys regularis Ameghino, 1887a
Figure 2.5–6, 9–10

Referred materials. See Appendix 1.
Locality and Horizon. See Appendix 1.

Stichomys sp.
Figure 2.7–8

Referred materials. See Appendix 1.
Locality and Horizon. See Appendix 1.

Stichomys? sp.

Table 2 - Caviomorph rodents reported in this contribution with a comparison of the taxonomic richness between the Río Santa Cruz localities

Taxa		*n*	*BB*	*n*	*SBB*	*n*	*YH*
Octodontoidea	**Spaniomys riparius**	*X*	*1*	*X*	*6*		
	Spaniomys *sp.*	*X*	*18*	*X*	*38*	*X*	*1*
	Stichomys regularis			*X*	*14*	*X*	*1*
	Stichomys *sp.*	*X*	*7*	*X*	*28*		
	Acarechimys minutus			*X*	*5*		
	Acarechimys minutissimus	*X*	*1*	*X*	*14*		
	Acarechimys constans			*X*	*7*		
	Acarechimys gracilis			*X*	*6*		
	Dudumus *sp. nov.?*			*X*	*1*		
	Prospaniomys *sp. nov.?*	*X*	*1*	*X*	*2*		
	Acaremys murinus			*X*	*2*		
	Acaremys *sp.*	*X*	*2*	*X*	*1*		
	Sciamys principalis	*X*	*2*	*X*	*10*		
	Sciamys latidens			*X*	*1*		
	Sciamys *sp.*	*X*	*1*	*X*	*4*		
Erethizontoidea	**Steiromys detentus**	*X*	*1*	*X*	*5*		
	Steiromys duplicatus	*X*	*11*	*X*	*1*		
	Steiromys *sp.*	*X*	*2*				
Cavioidea	**Neoreomys australis**	*X*	*51*	*X*	*66*	*X*	*1*
	Phanomys mixtus	*X*	*13*				
	Phanomys *sp.*			*X*	*4*		
	Eocardia montana	*X*	*8*	*X*	*22*		
	"Eocardia" excavata	*X*	*5*	*X*	*4*		
	Eocardia *sp.*	*X*	*22*	*X*	*32*		
	Schistomys erro			*X*	*3*		
Chinchilloidea	**Prolagostomus pusillus**			*X*	*34*		
	Prolagostomus *sp.*	*X*	*2*	*X*	*80*		
	Pliolagostomus notatus			*X*	*37*		
	Perimys erutus	*X*	*11*	*X*	*3*		
	Perimys onustus	*X*	*1*	*X*	*23*		
	Perimys incavatus	*X*	*1*				
	Perimys *sp.*	*X*	*7*	*X*	*6*		
	Scleromys *sp.*	*X*	*8*	*X*	*4*		

*BB, barrancas Blancas; SBB, Segundas Barrancas Blancas; YH, Yaten Huageno; n, number of specimens (see Appendix 1). *Dubious taxa (?) are not included in the table.*

Referred materials. See Appendix 1.

Locality and Horizon. See Appendix 1.

Stichomys sp./***Adelphomys*** sp.

Referred materials. See Appendix 1.

Locality and Horizon. See Appendix 1.

Comments. *Stichomys* is characterized by being relatively high-crowned, resembling *Adelphomys* and *Spaniomys* in this respect. It has derived cheek teeth with planar occlusal surfaces, undifferentiated cusps, and retention of the deciduous premolars through life (Fig. 2.5–10), also as in *Adelphomys* and *Spaniomys*. Nevertheless, their cheek teeth have broader lophs/ids with rounded end tips (Fig. 2.5–7 and 2.9), as *Adelphomys* and unlike *Spaniomys*. Upper molars with four lophs and lowers with three main lophids, as

in *Adelphomys* and *Spaniomys*. *Adelphomys* is very similar to *Stichomys*. The two genera differ in that the former has planar anterior face on the incisors and the latter convex ones (Ameghino, 1887a). In general terms, *Stichomys* is more abundant than *Adelphomys* (convex incisors are more abundant than planar incisors; see Appendix 1). Nevertheless, in the new rodent collection several specimens have no incisors preserved, and thus, they could not be recognized at generic level. These specimens were referred to as *Stichomys* sp./*Adelphomys* sp. (MPM-PV 20356, MPM-PV 20550; Appendix 1).

Seven species of *Stichomys* were described (Ameghino, 1887a, 1891a). Three of them were transferred to *Acarechimys* (Arnal *et al.*, 2017). The remaining species require taxonomic revision. At present, we recognize several large and well-preserved specimens as *S. regularis* (Fig. 2.5–6, 9–10), but the remaining specimens only as *Stichomys* sp. (MPM-PV 20415; Fig. 2.7–8).

Within the new rodent sample *Stichomys* is the most abundant octodontoid with more than 60 specimens (Appendix 1). We identified *Stichomys regularis*, *Stichomys* sp., *Stichomys* sp./*Adelphomys* sp., and *Stichomys*? sp. (Appendix 1). These taxa are more abundant in ECA, ECA2, and EET (SBB), while in BB (ESL and EAG) they are only represented by three specimens recognized as *Stichomys* sp. (Tab. 2). In EER (YH) there is one specimen recognized as *Stichomys regularis* (MPM-PV 20771). The phylogenetic relationships of *Stichomys* and *Adelphomys* are not clear. Based on the dental morphology they have been included in "Adelphomyinae", an echimyid fossil lineage (Wood and Patterson, 1959; Kramarz, 2001). Nevertheless, most phylogenetic analyses (Arnal *et al.*, 2014; Arnal and Vucetich, 2015a; Verzi *et al.*, 2014) do not recover this clade. In fact, both *Stichomys* and *Adelphomys*, together with *Spaniomys* and other fossil octodontoids (*i.e.*, *Eodelphomys* Frailey and Campbell, 2004 from the late Eocene? of Peru and *Xylechimys* Patterson and Pascual, 1968 from the late Oligocene of Patagonia), represent a basal radiation of crown-octodontoids (Arnal and Vucetich, 2015a).

Genus ***Acarechimys*** Patterson in Kraglievich, 1965

Type species. *Acaremys minutus* Ameghino, 1887a. Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz; Collon Curá Formation, early Middle Miocene, Province of Neuquén; unnamed formation, late Middle Miocene, Quebrada Honda, Bolivia.

Acarechimys minutus (Ameghino, 1887a)
Figure 2.11–13

Referred materials. See Appendix 1.
Locality and Horizon. See Appendix 1.

Acarechimys minutissimus (Ameghino, 1887a)

Referred materials. See Appendix 1.
Locality and Horizon. See Appendix 1.

Acarechimys constans (Ameghino, 1887a)

Referred materials. See Appendix 1.
Locality and Horizon. See Appendix 1.

Acarechimys gracilis (Ameghino, 1891)
Figure 2.14–15

Referred materials. See Appendix 1.
Locality and Horizon. See Appendix 1.
Comments. *Acarechimys* was a successful evolutionary lineage of octodontoids with brachydont cheek teeth, thin loph/lophids, and identifiable cusps, unlike *Stichomys*, *Adelphomys*, and *Spaniomys*. It retained the deciduous premolars through life (Fig. 2.11, 14), unlike acaremyids. Upper cheek teeth have four lophs (Fig. 2.11) and lowers have three main lophids with another variably developed (Fig. 2.14; Arnal *et al.*, 2017). This genus represents the octodontoid with the widest temporal (Late Oligocene–Late Miocene) and geographic distribution (southern Argentinean Patagonia to Colombia), reaching its maximum recorded diversity in the Santacrucian (Arnal *et al.*, 2017). Five species are recognized: *A. leucotheae* Vucetich *et al.*, 2014 (Late Oligocene, Province of Chubut), *A. minutus*, *A. minutissimus* (Early–Middle Miocene of Argentinean Patagonia, Bolivia, and Colombia), *A. constans* and *A. gracilis* (Early–Middle Miocene, provinces of Chubut and Santa Cruz, Argentina). For detailed descriptions of the species see Arnal *et al.* (2017).

Acarechimys is represented in all the stratigraphic levels of SBB (Appendix 1). Four of the five known species are recorded: *A. minutus* (MPM-PV 15088, MPM-PV 15089; Fig. 2.11–13), *A. minutissimus* (MPM-PV 15100, MPM-PV 20069, MPM-PV 20346; see Appendix 1), *A. constans* (MPM-PV 15093, MPM-PV 15096, MPM-PV 20637; see Appendix 1), and *A. gracilis* (MPM-PV 17430; Fig. 2.14–15). On the other hand, only one specimen of *A. minutissimus* is recorded in BB (MPM-PV 20069; EAG-80 mts) and none in YH.

Genus ***Dudumus*** Arnal *et al.*, 2014

Type and only species. *Dudumus ruigomezi* Arnal *et al.*, 2014. Sarmiento Formation, Trelew Member, Early Miocene, Province of Chubut.

Dudumus sp. nov.?
Figure 2.16

Referred material. MPM-PV 20561, right M1-M2.
Locality and horizon. Segundas Barrancas Blancas (ECA2), Río Santa Cruz, Province of Santa Cruz, Early–Middle Miocene.
Comments. One small maxillary fragment with M1-M2 is here assigned to *Dudumus* sp. nov.? The molars are bunolophodont, brachydont, and slightly terraced (Fig. 2.16), as in *Dudumus ruigomezi* and *Caviocricetus* Vucetich and Verzi, 1996. As in *Dudumus ruigomezi* and *Caviocricetus*, the third loph, interpreted as a mesolophule, is shorter than the remaining lophs and does not reach the metacone. The length of this crest and the degree of terracing in the molars are more similar in these respects to *Dudumus ruigomezi* than to *Caviocricetus*. Nevertheless, the new specimen has different teeth proportions and therefore is here interpreted as a possible new species.

MPM-PV 20561 (Fig. 2.16) was found in ECA2 of SBB locality (Tab. 2). It represents the first record of *Dudumus* for the Santa Cruz Formation, since it was previously known for Colhuehuapian (Early Miocene) of the Province of Chubut.

Genus ***Prospaniomys*** Ameghino, 1902

Type species. *Prospaniomys priscus* Ameghino, 1902. Sarmiento Formation, Early Miocene, Province of Chubut.

Prospaniomys sp. nov.?
Figure 2.17–18

Referred materials. See Appendix 1.
Locality and horizon. Barrancas Blancas (ESL) and Segundas Barrancas Blancas (ECA2), Río Santa Cruz, Province of Santa Cruz, Early–Middle Miocene.
Comments. Three bunolophodont specimens are identified as *Prospaniomys* sp. nov.? MPM-PV 20294 (Fig. 2.17) is a right maxillary fragment with DP4-M1 and MPM-PV 20560 is an isolated upper molar. These cheek teeth have four lophs of which the anterior most (= anteroloph) does not contact the paracone and the third and fourth lophs are labially fused to the metacone, delimiting a posterior fossette (Fig. 2.17), unlike *Protacaremys* Ameghino, 1902. MPM-PV 20207 (Fig. 2.18) is an isolated lower molar that has four thin lophids and acuminated labial cuspids, as in *Prospaniomys priscus* and unlike *Protacaremys*. Nevertheless, these specimens seem to be a new species since they are smaller than the type species and have slightly higher crowns.

These new findings are remarkable since *Prospaniomys* was previously only recognized in Colhuehuapian sediments (Early Miocene) of the Province of Chubut. MPM-PV 20207 was recorded in ESL (BB); and MPM-PV 20294 and MPM-PV 20560 were found in ECA2 from SBB (Tab. 2; Appendix 1).

Family Acaremyidae Wood, 1949

Genus ***Acaremys*** Ameghino, 1887a

Type species. *Acaremys murinus* Ameghino, 1887a. Sarmiento Formation, Colhue Huapi Member, Early Miocene, Province of Chubut; Pinturas Formation, upper sequence, late Early Miocene, and Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz.

Acaremys murinus Ameghino, 1887a

Referred materials. See Appendix 1.
Locality and Horizon. See Appendix 1.

Acaremys sp.

Referred material. See Appendix 1.

Locality and Horizon. See Appendix 1.

Comments. *Acaremys*, *Sciamys* and other octodontoids are grouped within Acaremyidae, the only extinct octodontoid family recognized (Arnal and Vucetich, 2015b). *Acaremys* is lower-crowned than *Sciamys* and higher-crowned than *Galileomys* and *Platypittamys*. Cheek teeth have discernible cusps, relatively thin lophs/ids, and replace the deciduous premolars with age, unlike most fossil octodontoids. Upper and lower molars have four main lophs/ids, unlike *Acarechimys*. *Acaremys* is recognized by three valid species: *A. murinus*, *A. messor* Ameghino, 1889 and *A. major* Scott, 1905 (Early–Middle Miocene, Province of Santa Cruz). For a detailed description of these species see Arnal and Vucetich (2015b).

Within the new rodent sample, *Acaremys* is represented in ESL from BB by *Acaremys* sp. (MPM-PV 20175, MPM-PV 20216; Tab. 2); in SBB by *A. murinus* in ECA (MPM-PV 20272) and ECA2 (MPM-PV 20538), and by *Acaremys* sp. in ECA2 (MPM-PV 20653) (Tab. 2).

Genus ***Sciamys*** Ameghino, 1887a

Type species. *Sciamys principalis* Ameghino, 1887a. Pinturas Formation, upper sequence, late Early Miocene and Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz.

Sciamys principalis Ameghino, 1887a
Figure 2.19–20

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.

Sciamys latidens Scott, 1905
Figure 2.21–22

Referred material. MPM-PV 20668, right mandible with p4-m2.
Locality and horizon. Segundas Barrancas Blancas (ECA2), Río Santa Cruz, Province of Santa Cruz. Early–Middle Miocene.

Sciamys sp.

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.

Comments. *Sciamys* is similar to *Acaremys*, but differs in having higher crowns and less discernible cusps. As in *Acaremys*, it has upper and lower molars with four lophs/ids and replaces the deciduous premolar through life. *Sciamys* is more abundant than *Acaremys* (Appendix 1) and it is recognized by at least six species: *S. principalis*, *S. varians* Ameghino, 1887a, *S. robustus* Ameghino, 1894, *S. rostratus* Scott, 1905, *S. latidens* Scott, 1905 (Early–Middle Miocene, Province of Santa Cruz), and *S. petisensis* Arnal and Pérez, 2013 (Middle–Late Miocene, Province of Chubut).

Within the new rodent sample, the genus is present but scarce at EAG (*Sciamys principalis* and *Sciamys* sp.) of BB, but absent in ESL (Tab. 2). On the contrary, it is very abundant in SBB, especially in ECA2 where *S. principalis, S. latidens*, and *Sciamys* sp. have been identified (Tab. 2; Appendix 1). The genus is absent in YH. A notably new record for the RSC is the presence of *Sciamys latidens* in ECA2 (MPM-PV 20668; Fig. 2.19–20). This species is well-characterized by having a molarized posterior portion of the p4 (Fig. 2.19), as in *Sciamys petisensis* and unlike all the remaining Early Miocene species, and was previously known only for Killik Aike, coastal Santa Cruz Province, Argentina (Scott, 1905; Fig. 1).

Several specimens could not be recognized at generic level and are listed as Acaremyidae (Appendix 1).

Superfamily ERETHIZONTOIDEA Simpson, 1945
Family ERETHIZONTIDAE Thomas, 1897

Genus ***Steiromys*** Ameghino, 1887a

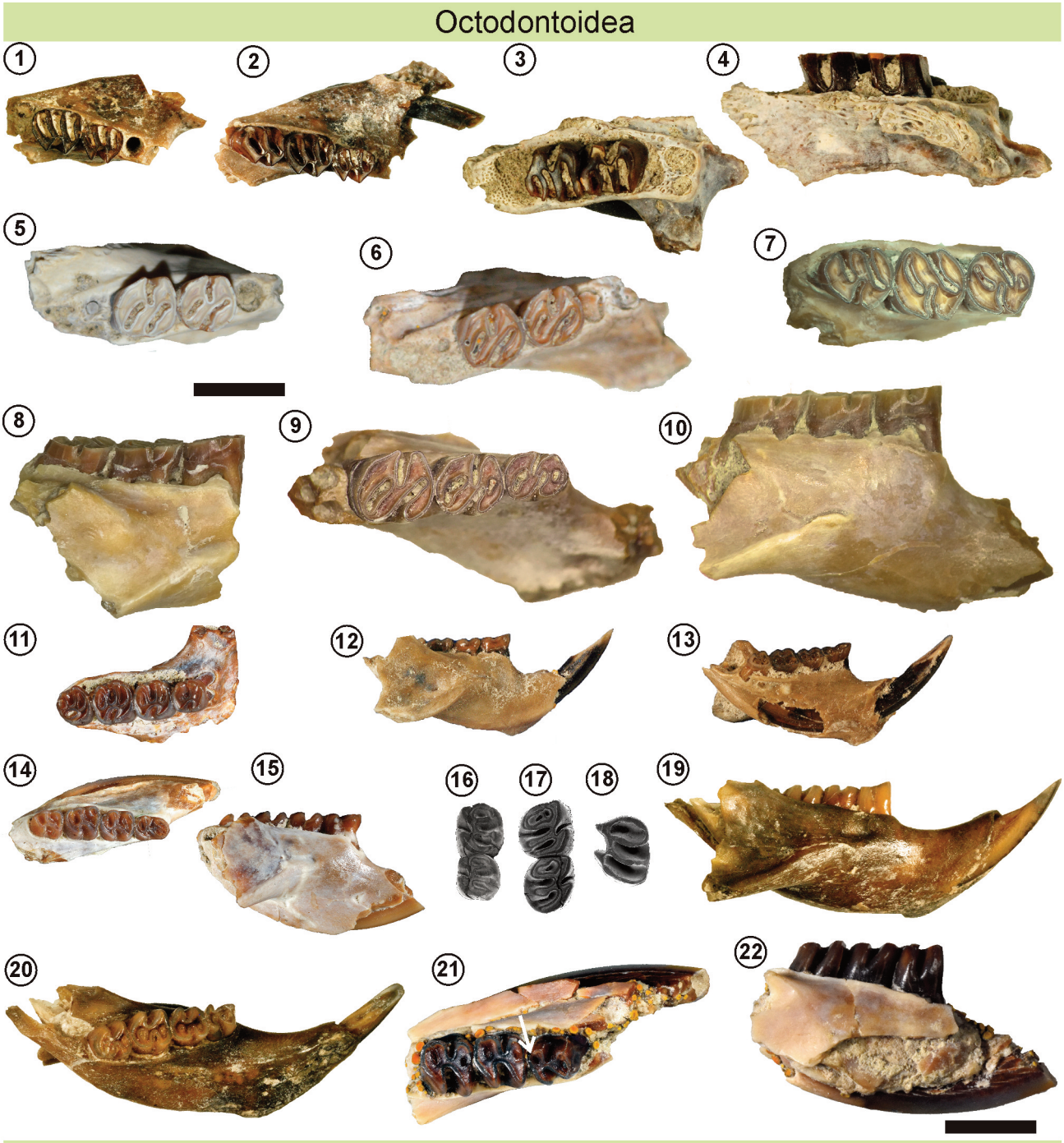
Type species. *Steiromys detentus* Ameghino, 1887a. Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz.

Steiromys detentus Ameghino, 1887a
Figure 3.23–24

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.

Steiromys duplicatus Ameghino, 1887a

Referred material. see Appendix 1.
Locality and horizon. See Appendix 1.


Octodontoidea
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Erethizontoidea
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Steiromys duplicatus?

***Referred material*s.** See Appendix 1.

Locality and horizon. See Appendix 1.

Steiromys sp.

***Referred material*s.** See Appendix 1.

Locality and horizon. See Appendix 1.

Comments. Erethizontids are medium-size caviomorphs. Extant and fossil erethizontids have generally conservative skull and dental morphologies, with low-crowns and bunolophodont to lophodont cheek teeth (Patton *et al.*, 2015). They replace the deciduous premolars, with the exception of the extant *Chaetomys* Gray, 1843 (Patterson and Wood, 1982). In occlusal view the dentine in erethizontids has very thin enamel (Fig. 2.23), unlike octodontoids. Laterally, the molar crowns are bulging (Fig. 2.24). *Steiromys* is slightly higher-crowned than *Eosteiromys* Ameghino, 1902.

Within the new rodent sample, *Steiromys detentus* was found in EAG (MPM-PV 20058) from BB, and ECA (MPM-PV 20384) and ECA2 (MPM-PV 20598; MPM-PV 20652) from SBB (Tab. 2; Appendix 1). Upper molars have four main lophs and relatively well-individualized cusps (MPM-PV 20058). Lower cheek teeth have four lophids that wear the two anterior and the two posterior ones delimiting an anterior and posterior fossettid (Fig. 2.23). Molars are rectangular. The p4 is relatively longer than the molars, the anterior portion is labio-lingually shorter, and can bear four (MPM-PV 20442; Fig. 2.23) or five lophids (MPM-PV 20384). The incisors are robust with a plane anterior face. *Steiromys duplicatus* is less abundant, but was also recorded in EAG (MPM-PV 20086–20095) from BB, and in ECA2 (MPM-PV 20630) from SBB (Appendix 1). This species differs from *S. detentus* in having five lophs in upper (MPM-PV 20087; MPM-PV 20630) and lower (MPM-PV 20094) molars.

Several broken teeth were recognized as *Steiromys* sp. in BB (MPM-PV 20096, MPM-PV 20097; Tab. 2; Appendix 1).

Superfamily CAVIOIDEA (Fischer de Waldheim, 1817)

Genus ***Neoreomys*** Ameghino, 1887a

Type species. *Neoreomys australis* Ameghino, 1887a. Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz.

Neoreomys australis Ameghino, 1887a
Figure 3.1–3

***Referred material*s.** See Appendix 1.

Locality and horizon. See Appendix 1.

Comments. *Neoreomys* is traditionally characterized by having hypsodont and rooted cheek teeth, more high crowned than in *Dasyprocta* Illiger, 1811, *Myoprocta* Thomas, 1903, *Asteromys* Ameghino, 1897, and *Luantus initialis* Ameghino, 1902. Cheek teeth have more penetrating flexus/id with persistent fossettes/ids: the hypoflexus is joined to the paraflexus and the hypoflexid joined to a posteroflexid (Fig. 3.1). The enamel is continuous around the entire crown and cementum is present in the hypoflexus/id.

Ameghino recognized nine species of *Neoreomys* from the Santa Cruz Formation (Ameghino, 1887a; 1891; 1894). Scott (1905) considered only three of those to be valid. Fi-

Figure 2. Octodontoidea (**1–22**) and Erethizontoidea (**23–24**). **1–4, *Spaniomys*** sp.; **1, MPM-PV 20182,** right mandibular fragment with m1-m2 in occlusal view; **2, MPM-PV 20178,** left mandible with m1-m3 and incisor in occlusal view (inverted); **3–4, MPM-PV 20310,** left maxillary fragment with M1-M2 (inverted) in occlusal (3) and lingual (4) views; **5–6, *Stichomys regularis***; **5, MPM-PV 20237,** left mandibular fragment with m1-m2; **6, MPM-PV 20276,** left mandibular fragment with m1-m2; **7–8, *Stichomys*** sp., **MPM-PV 20415,** left mandible with m1-m3 in occlusal (7) and labial (8) views; **9–10, *Stichomys regularis***, **MPM-PV 20444,** left mandible (inverted) in occlusal and ventral views; **11–13, *Acarechimys minutus***; **11, MPM-PV 15088,** left maxilla with DP4-M3 in occlusal view (inverted); **12–13, MPM-PV 15089,** right mandible in labial (12) and lingual (13) views; **14–15, *Acarechimys gracilis***, **MPM-PV 17430,** left mandible with dp4-m3 (inverted) in occlusal (14) and labial (15) views; **16, *Dudumus*** sp. nov.? **MPM-PV 20561,** right DP4-M1; **17–18, *Prospaniomys*** sp. nov.?; **17, MPM-PV 20294,** right DP4-M1; **18, MPM-PV 20207,** left lower molar; **19–20, *Sciamys principalis***, **MPM-PV 20308,** right mandible with p4-m3; **21–22, *Sciamys latidens***, **MPM-PV 20668,** right mandible with p4-m2; **23–24, *Steiromys detentus* MPM-PV 20442,** right mandible in occlusal (23) and lingual (24) views. Anterior to right. Scale bars= 5 mm (**1–15**, **19–22**), 1 mm (**16–18**), and 10 mm (**23–24**).

nally, Fields (1957) and later authors (*e.g.*, Kramarz and Bellosi, 2005; Kramarz, 2006b; Pérez, 2010b; Vucetich *et al.*, 2015) recognized *Neoreomys australis* as the sole species present in the Santa Cruz Formation. Other two species of *Neoreomys* have been described elsewhere in South America: *Neoreomys huiliensis* Fields, 1957 from Villavieja Formation (La Venta, Colombia) and *N. pinturensis* Kramarz, 2006b from the Pinturas Formation (Province of Santa Cruz, Argentina). *Neoreomys australis* is the largest and most abundant caviomorph (more than 120 specimens; see Appendix 1). An exhaustive revision of this genus (currently under study by MEP) is necessary to corroborate the taxonomic status of the species of *Neoreomys*, and its specific richness in the Santa Cruz Formation. Within the new rodent sample, *Neoreomys* is the only cavioid present in YH, the oldest locality (Tab. 2). Moreover, this genus is well-represented in the other localities of the SCR: EAG and ESL from BB, and ECA, ECA2, and EET from SBB (Tab. 2; Appendix 1).

Genus ***Phanomys*** Ameghino, 1887a

Type species. *Phanomys mixtus* Ameghino, 1887a. Río Jeinemení Formation, Pinturas Formation and Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz.

Phanomys mixtus Ameghino, 1887a
Figure 3.4–5

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.

Phanomys sp.

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.
Comments. *Phanomys* is known by two species *P. mixtus* and *P. vetulus* Ameghino, 1894. *Phanomys mixtus is* represented by fragmentary maxillae, mandibles, and isolated teeth (Appendix 1). *Phanomys* is characterized by having high-crowned and rooted cheek teeth (with a greater degree of hypsodonty compared with other basal cavioids such as species of *Luantus* Ameghino, 1902), the presence of cementum in earlier stages of wear, relatively ephemeral fossettes/ids, and enamel discontinuities along the entire labial wall of upper cheek teeth and the lingual wall of lower cheek teeth (Fig. 3.4–5; for a detail description of the genus see Pérez and Vucetich, 2012).

Interestingly, in RSC *Phanomys* is much more abundant in EAG from BB, but its richness decreases while that of the euhypsodont cavioids (*i.e.*, *Schistomys*) increases in ECA and ECA2 (SBB) (Tab. 2; Appendix 1).

Recent phylogenetic study suggests that *Phanomys* is the sister group of the euhypsodont cavioids. Additionally, *P. mixtus* was proposed as a useful biostratigraphic indicator because it was found in different Miocene localities of the Province of Santa Cruz (Pérez and Vucetich, 2012).

Genus ***Eocardia*** Ameghino, 1887b

Type species. *Eocardia montana* Ameghino, 1887b. Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz.

Eocardia montana Ameghino, 1887b
Figure 3.6–9

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.

"*Eocardia*" *excavata* Ameghino, 1891b
Figure 3.10

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.

Eocardia sp.

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.
Comments. *Eocardia* was originally defined by Ameghino (1887b) and traditionally several species were included in this genus or subgenus (*e.g.*, Ameghino, 1887a, 1891b, 1894, 1906; Scott, 1905). Pérez (2010b) reduced the nominal diversity of Santacrucian forms to three species: the type species *Eocardia montana*, "*E.*" *excavata* and the smaller "*E.*" *fissa* Ameghino, 1891a. *Eocardia* is characterized by having continuous growth of the cheek teeth without root formation, double and heart-shaped cheek teeth, ephemerous fossettes/ids, presence of cementum beginning at very

early ontogenetic stages, and a narrow and discontinuous enamel layer surrounding the crown (Fig. 3.6–10). *Eocardia* is the only euhypsodont cavioid whose upper premolar has only one lobe (Fig. 3.6). The new RSC remains are assigned to *E. montana*, "*E.*" *excavata*, and *Eocardia* sp. (Tab. 2). It is interesting to note that although "*E.*" *fissa* has not been recorded in the new collections, this species was mentioned as coming from the RSC by Ameghino (1891; Pérez, 2010).

Eocardia is present at EAG and ESL from BB, and ECA, ECA2, and EET from SBB.

Genus ***Schistomys*** Ameghino, 1887a

Type species. *Schistomys erro* Ameghino, 1887a. Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz.

Schistomys erro Ameghino, 1887a
Figure 3.11

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.
Comments. *Schistomys* was established by Ameghino (1887a); later, additional species were assigned to this genus (Ameghino, 1891; Scott, 1905). Currently, only two species are considered valid (Pérez, 2010): the type species *Schistomys erro* and *S. rollinsii* (Scott, 1905). *Schistomys* is characterized by the same morphological characters as *Eocardia*, however they differ in that the upper premolar (P4) has two well-developed lobes similar to those of molars (Fig. 3.11). The only species recorded at SCR is *S. erro* which is present at ECA2 and EET from SBB (Tab. 2; Appendix 1).

It should be noted that in ECA2 (SBB), where the abundance of *Phanomys* is lower, *Schistomys* appears for the first time at SCR (Tab. 2). Whereas in EET, where *Schistomys* abundance is greater, *Phanomys* is not recorded.

Superfamily CHINCHILLOIDEA Bennett, 1833
Family CHINCHILLIDAE Bennett, 1833

Genus ***Prolagostomus*** Ameghino, 1887a

Type species. *Prolagostomus pusillus* Ameghino, 1887a. Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz.

Prolagostomus pusillus Ameghino, 1887a

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.

Prolagostomus sp.
Figure 3.12

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.
Comments. *Prolagostomus* is a small to medium sized caviomorph, similar to *Pliolagostomus* Ameghino, 1887a. The upper and lower cheek teeth are euhypsodont and bilophodont, with the exception of the M3, which has three lophs. The hypoflexus/id are narrower than in *Perimys* Ameghino, 1887a, but broader than in *Lagostomus* Brookes, 1828. Molar crown walls are more curved and hypoflexid is more sinuous (Fig. 3.12) than in *Pliolagostomus*. The anterior lophid of lower molars is more labially extended (Fig. 3.12), unlike *Perimys*. The p4 is more obliquely oriented than molars (Fig. 3.12), unlike *Pliolagostomus*.

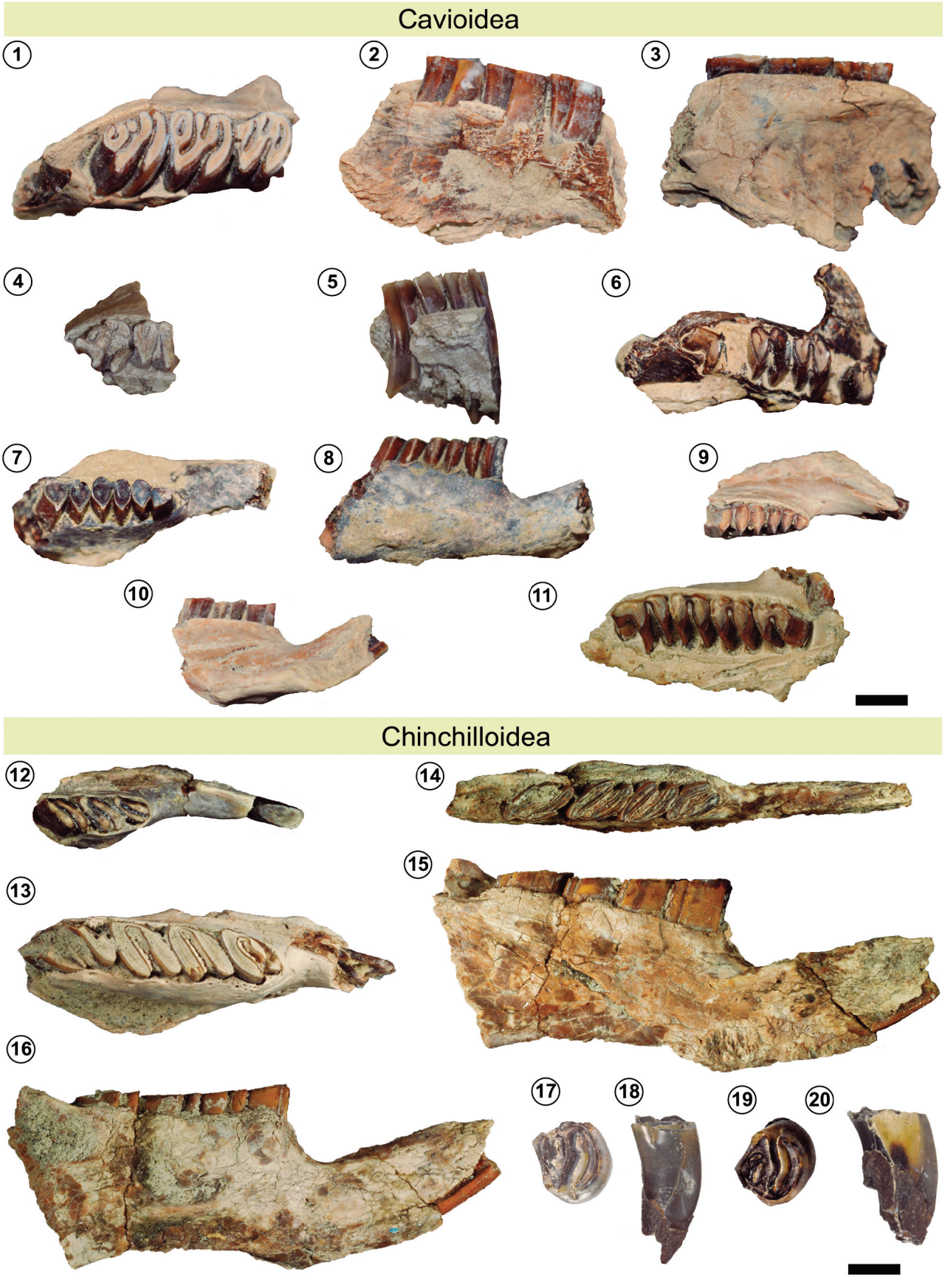
Prolagostomus is in general more abundant than *Pliolagostomus* (Appendix 1). Within the new rodent sample this genus is relatively well-represented in ECA, ECA2, and EET from SBB (Tab. 2; Appendix 1). It is only represented by two broken molars of *Prolagostomus* sp. (MPM-PV 20231, MPM-PV 20232; Tab. 2) in ESL from BB and is absent in YH.

Genus ***Pliolagostomus*** Ameghino, 1887a

Type species. *Pliolagostomus notatus* Ameghino, 1887a. Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz.

Pliolagostomus notatus Ameghino, 1887a

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.
Comments. *Pliolagostomus* is a small to medium sized caviomorph, similar to *Prolagostomus*. Upper and lower cheek teeth are euhypsodont and bilophodont, with the exception of the M3 which has three lophs. Cheek-tooth crown walls are straighter than *Prolagostomus*. Hypoflexus/


Cavioidea
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id is narrow, as in *Prolagostomus*. For a detailed description of this species see Rasia and Candela (2019).

As in *Prolagostomus*, this species is relatively well-represented in the three sites of SBB (ECA, ECA2, and EET; Tab. 2; Appendix 1). Notably, it is absent in BB and YH. Several specimens could not be identified at generic level and were assigned to *Prolagostomus* sp./*Pliolagostomus* sp. (MPM-PV 20259, MPM-PV 20349, MPM-PV 20381; Appendix 1).

Family Neoepiblemidae Kraglievich, 1926

Genus ***Perimys*** Ameghino, 1887a

Type species. *Perimys erutus* Ameghino, 1887a. Pinturas Formation, Early Miocene, and Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz.

Perimys erutus Ameghino, 1887a
Figure 3.13

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.

Perimys onustus Ameghino, 1887a
Figure 3.14–16

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.

Perimys incavatus Ameghino, 1902

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.

Perimys sp.

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.
Comments. *Perimys* is a medium to large sized caviomorph. Cheek teeth are protohypsodont, unlike *Prolagostomus* and *Pliolagostomus*. Upper and lower cheek teeth are bilophodont, with the exception of the M3 which has three lophs, as in *Prolagostomus* and *Pliolagostomus*. Nevertheless, *Perimys* differs in that this third loph is parallel to the anterior two lophs, and in that the hypoflexus/id are conspicuously broader and filled with more cementum. Thus, these teeth have a U-shape occlusal surface (Fig. 3.13–16).

The genus was abundantly recovered in both in BB and SBB, but notably, the largest species, *P. onustus*, is very abundant in SBB, while in BB it is represented by a single specimen (MPM-PV 20160), and the small species, *P. incavatus*, is more abundant in BB (Tab. 2; Appendix 1).

Family Dinomyidae Alston, 1876

Genus ***Scleromys*** Ameghino, 1887a

Scleromys angustus. Ameghino, 1887a. Santa Cruz Formation, Early–Middle Miocene, Province of Santa Cruz.

Scleromys sp.
Figure 3.17–20

Referred materials. See Appendix 1.
Locality and horizon. See Appendix 1.
Comments. Among the species of *Scleromys* recognized in

Figure 3. Cavioidea (1-11) and Chinchilloidea (12-17). **1–3,** ***Neoreomys australis*** **MPM-PV 20292,** right maxillary fragment with M1-M3 in occlusal, lingual, and labial views; **4–5,** ***Phanomys mixtus*** **MPM-PV 20048,** right maxilla with M2-M3 in occlusal and lingual views; **6,** ***Schistomys erro*** **MPM-PV 20529,** right maxilla with P4-M3 in occlusal view; **7,** **"*Eocardia*" *excavata*** **MPM-PV 20241,** right maxilla with P4-M3 in occlusal view; **8–9,** ***Eocardia montana*** **MPM-PV 20401**, left mandible with p4-m2 in occlusal and labial views (inverted); **10–11,** ***Eocardia montana*** **MPM-PV 20053,** right mandible with p4-m2 in occlusal and lingual views; **12,** ***Prolagostomus*** **sp. MPM-PV 20314,** right mandible with p4-m2 in occlusal view; **13,** ***Perimys erutus*** **MPM-PV 20671,** right mandible with p4-m3 in occlusal view; **14–16,** ***Perimys onustus*** **MPM-PV 20670,** left mandible with p4-m3 in occlusal, lingual and labial views (inverted); **17–18,** ***Scleromys*** sp. **MPM-PV 20098,** left upper molar; **19–20,** ***Scleromys*** sp. **MPM-PV 20099,** left upper molar. Anterior to the right. Scale bars= 5 mm (**1–13**), 7.5 mm (**14–16**), and 3 mm (**17–20**).

the Santa Cruz Formation, *S. osbornianus* Ameghino, 1894 is the largest and the most abundant, whereas the type species, *S. angustus*, is less common. *Scleromys* is characterized by high-crowned molariforms with root formation and an occlusal pattern that consists in a long posterior labial flexid and an anterior lingual flexus. During the ontogeny, this genus displays a great amount of dental morphological change due to flexi/ids closure, fossette/ids disappearance, and changes in molar size and outline. For this reason, isolated teeth are difficult to assign to a species.

In the RSC the genus is not abundant, but *Scleromys* sp. was recorded both in BB and SBB (Tab. 2; Appendix 1).

DISCUSSION

Caviomorph assemblages of the Río Santa Cruz localities

In this contribution, a revision of the rodent fauna recorded in the localities of the RSC is presented (Tab. 1). The three fossil localities (BB, SBB, and YH; Appendix 1) represent different age ranges, and only the upper part of BB overlaps with the lowest part of SBB (Cuitiño *et al.* 2016, 2019). Not all the Santacrucian caviomorphs were found in all these localities (see above). SBB is the most fossiliferous locality with 557 specimens (72.5% of the fossil caviomorphs; ECA n= 179, ECA2 n= 272, and EET n= 106). In BB we found 208 specimens (27%; EAG n= 124, ESL n= 84) and in YH only three caviomorphs (0.4%) were recorded, making it the least fossiliferous locality (Appendix 1).

Octodontoidea. Octodontoids are the richest taxonomically and morphologically diverse group in the RSC with nine genera and 16 species (Appendix 1). This group is represented by low-crowned taxa. Some have low crowns with slightly terraced cheek teeth (*e.g.*, *Dudumus* sp. nov.? and *Acarechimys*). Others have slightly higher crowns (*e.g.*, *Prospaniomys* sp. nov.?, *Acaremys*). Still others have much higher crowns and planar occlusal surfaces (*e.g.*, *Sciamys*, *Stichomys*, *Spaniomys*). The most abundant taxa are *Spaniomys, Stichomys*, *Sciamys*, and *Acarechimys*, all of them broadly represented in all the localities of the RSC (see results above; Appendix 1). Within acaremyids we note the first record at RSC of *Sciamys latidens* from (ECA2, SBB; Appendix 1). It differs from the remaining Santacrucian *Sciamys* species in having a p4 with a molarized posterior portion (presence of hypolophid; Fig. 2.21). This species was previously known only by its holotype recorded at Killik Aike, near Río Gallegos, Province of Santa Cruz (Scott, 1905; Fig. 1). We also identify two new brachydont taxa (*Prospaniomys* sp. nov.? and *Dudumus* sp. nov.?). *Prospaniomys* sp. nov.? was recorded in ESL from BB and in ECA2 from SBB (Tab. 2; Appendix 1). In turn, *Dudumus* sp. nov.? was recorded in ECA2 (SBB). These records extend the biochron of both genera from the Colhuehuapian to the Santacrucian, as well as their geographic distributions (provinces of Chubut and Santa Cruz). Additionally, other brachydont specimens found in ESL (BB) could represent new taxa (*e.g.*, MPM-PV 20184, MPM-PV 20205; Appendix 1). These specimens are important because low-crowned octodontoids dominated older caviomorph assemblages of Patagonia (Vucetich *et al.*, 2010; Kramarz, 2004) and, until now, they were scarce in the Santa Cruz Formation –represented only by *Acarechimys*; Arnal *et al.* (2017)–. Thus, these new records expand the number of brachydont octodontoids for the Santacrucian.

Erethizontidae. Erethizontids have the least specific richness and abundance in the RSC. Within the new sample only 22 specimens are identified as *Steiromys detentus* (Fig. 3.23), *S. duplicatus*, and *Steiromys* sp. They have been found in BB (in EAG) and in SBB (in ECA, ECA2, and EET) (Appendix 1). This low abundance is in accordance with previous works (Ameghino, 1887a, 1889; Scott, 1905; Candela, 2000), in which *Steiromys* is the only recognized Santacrucian genus. Scott (1905) described *Steiromys intermedius*, another species from Guer Aike Department, Province of Santa Cruz (Fig. 1), that is not recorded in the RSC localities. As with octodontoids, the abundance of erethizontoids in the Santacrucian late Early–Middle Miocene greatly contrasts with that of the Colhuehuapian Early Miocene, where they are represented by four genera and several species (Vucetich *et al.*, 2015). Neither erethizontids nor octodontoids show any biostratigraphic zonation within the RSC localities.

Cavioidea. Unlike the above mentioned caviomorph clades, cavioids and chinchilloids have interestingly different distribution and taxonomic abundance in the different RSC localities. Within cavioids the derived euhypsodont *Schistomys* is present in SBB (ECA2 and EET) but absent in BB and YH. *Phanomys* and *Eocardia* are present in BB and in SBB

(Tab. 2; Appendix 1), but they differ in their generic distribution. On the one hand, the primitive protohypsodont *Phanomys* is more abundant in BB, in which it is represented by 17 specimens –EAG (n= 16) and ESL (n= 1)–, while in SBB only by 5 specimens –ECA (n= 1) and ECA2 (n= 4)–. On the other hand, the derived euhypsodont *Eocardia* is much more abundant in SBB (n= 65) than in BB (n= 36; Appendix 1). Although biostratigraphic information generally is based on presence/absence of taxa in each locality, we interpret that the differences in abundance of *Phanomys* and *Schistomys* observed in BB and SBB are related to a taxonomic replacement of both taxa. The euhypsodont *Eocardia* was present in both localities, but became much more abundant in SBB.

Neoreomys australis is the most abundant cavioid represented by 131 specimens found in the three localities of the RSC (BB, SBB, and YH; Appendix 1). Thus, this cavoid provides no biostratigraphic information.

Chinchilloidea. Within chinchilloids *Perimys* is present in BB (n= 21) and in SBB (n= 35). Nevertheless, between both localities the species distribution is different. In SBB the largest species, *Perimys onustus*, is clearly dominant with respect to the small and medium sized species of *Perimys* (*P. erutus*, *P. incavatus*, and *Perimys* sp.; Appendix 1), while in BB *P. onustus* is represented by a single specimen. In this regard, we note the first RSC record of the small species *Perimys incavatus* in BB (EAG). *P. incavatus* was previously recorded in the Colhuehuapian (Early Miocene) of the Province of Chubut (Vucetich *et al.*, 2010) and in the Santacrucian (Early–Middle Miocene) of southern Chile (Bostelmann *et al.*, 2013). A different generic and specific distribution is observed for the derived euhypsodont *Prolagostomus* and *Pliolagostomus*. They are the most abundant chinchilloids in SBB (n= 176), while they are represented by only two specimens of *Prolagostomus* sp. in BB (Appendix 1). *Scleromys* is represented in BB and SBB by 12 specimens assigned to *Scleromys* sp. (Appendix 1).

Caviomorphs of other Santacrucian localities are poorly known. Ameghino (1891a,b, 1894) described new species of those Santacrucian genera described in 1887a,b and 1889. But unfortunately, precise geographic and stratigraphic information is uncertain (Fernicola *et al.*, 2014). Scott (1905) studied several caviomorphs from the Santa Cruz Formation recovered from the cliffs of RSC and coastal localities of the east of the Province of Santa Cruz (Killik Aike, 10 miles south of Coy inlet; Marshall, 1976; Vizcaíno *et al.*, 2012b; Fig. 1). Except for a few species, all of them belong to the genera recovered previously in the RSC cliffs (*i.e.*, *Neoreomys*, *Phanomys*, *Schistomys*, *Eocardia, Stichomys*, *Spaniomys*, *Steiromys, Sciamys, Acaremys*, *Acarechimys*, and *Scleromys*).

In summary, we observed a reduction in the taxonomic diversity but an increased in the morphological disparity of the rodent assemblage from the RSC (Tab. 1 and discussion above) than previously known (Ameghino, 1887a,b, 1889, 1891; Scott, 1905; Tab. 1). This work is the first comprehensive attempt in revising the Santacrucian caviomorphs. Similar systematic revisions should be approached with the caviomorph materials collected in other Santacrucian localities, in order to better understand the Santacrucian caviomorph assemblage as a whole.

GENERAL EVOLUTIONARY ASPECTS

Santacrucian rodents show significant changes compared with those of older Colhuehuapian and "Pinturan" SALMAs (Kramarz, 2004, 2006a,b; Kramarz and Bellosi, 2005; Vucetich *et al.* 2010; Pérez and Pol, 2012; Arnal and Vucetich, 2015a). Several lineages experienced a progressive increase in hypsodonty (*e.g.*, octodontoids with *Sciamys*, *Stichomys*, *Spaniomys*) or even acquired euhypsodonty for the first time (*e.g.*, cavioids, chinchillids). Those rodents with more generalized dental patterns (*e.g.*, *Steiromys*) became less common. Within Cavioidea, the acquisition of hypsodonty is first seen during the Santacrucian SALMA (Pérez and Pol, 2012), but the increase in dental crown height is already recorded in previous ages (*e.g.*, *Luantus* in the Colhuehuapian and "Pinturan"; *Chubutomys* Wood and Patterson, 1959 in the Deseadan SALMA), unlike what is observed in octodontoids, which show increased crown height for the first time in the Santacrucian. In the RSC localities, meso-, proto, and euhypsodont taxa coexisted for some time during the Santacrucian (see previous section). Until now mesodont forms that would eventually give origin to the modern Dasyproctidae on the one hand and euhypsodont forms that would originate the Family Caviidae on the other hand, were recorded only in younger ages (*e.g.*, "Colloncuran", Laventan, Mayoan, early Late Miocene). Interestingly, a similar trend

occurs within Chinchilloidea. During the Santacrucian, *Perimys* is the most abundant chinchilloid in BB and had the greatest specific richness. In SBB this taxonomic richness decreased (represented mostly by *P. onustus*); the record from SBB marks the last appearance of the genus. This taxonomic decrease is observed together with the rise in the abundance of specimens of the derived lagostomines *Pliolagostomus* and *Prolagostomus*. Noteworthy, one *Perimys* species in SBB coexisted, which is larger than the abovementioned lagostomines. This may be related to the biology of these taxa, probably *P. onustus* not competing for ecological requirements with the other chinchilloids.

Within octodontoids, the record of *Dudumus* sp. nov.? and *Prospaniomys* sp. nov.? expand the biochron and geographic distribution of these genera. Both taxa and *Acarechimys* are the only brachydont octodontoids in the RSC and are also recorded in older Colhuehuapian beds. Nevertheless, they differ in that *Dudumus* and *Prospaniomys* were abundant in older beds and are represented by only four specimens in the RSC, while *Acarechimys* is much more abundant in the Santacrucian. In addition, *Acarechimys* and *Sciamys* are the only octodontoids recorded in younger Middle Miocene beds (Arnal and Pérez, 2013; Arnal *et al.*, 2017). These younger *Acarechimys* maintained the brachydont cheek tooth structure, and are not recorded in Patagonia but in middle latitudes of the continent (Quebrada Honda, Bolivia; see Arnal *et al.*, 2017). This geographic distribution was proposed to be the result of a migration event (from Patagonia to lower latitudes regions) induced by the marked aridization and cooling of higher latitudes of South America after the Early Miocene (Arnal *et al.*, 2017). On the other hand, the last record of *Sciamys* is that of *Sciamys petisensis*, found in the locality of El Petiso, Province of Chubut (Arnal and Pérez, 2013). The fossil-bearing bed of El Petiso is estimated to be of Middle–Late Miocene Age. *Sciamys petisensis* is higher-crowned than its Santacrucian relatives. In fact, it is the highest-crowned and last recorded acaremyid (Arnal and Pérez, 2013). This survival would be the result not of a migration like *Acarechimys*, but of increasing hypsodonty in order to counteract the aridization of these latitudes. Erethizontids became scarce in Patagonia by the Santacrucian, being since then recorded only in lower latitudes (*e.g.*, Bolivia, Colombia).

In addition to this turnover in teeth morphology, Santacrucian rodents have different sizes: they were large (*Neoreomys*, *Perimys onustus*), medium-sized (*Scleromys*, *Steiromys*, *Eocardia*, and the remaining *Perimys* species) and small (octodontoids). This diversity reflects a wide range of habits, suggesting they had acquired broad paleobiologic adaptations by the Early–Middle Miocene (Candela *et al.*, 2012; Muñoz *et al.*, 2019). This, in turn, is related to the environment in which they lived. Recent works proposed more humid and forested paleoenvironments for the Santa Cruz Formation (Kay *et al.*, 2008, 2012; Brea *et al.*, 2012; Rasia, 2016) than historically proposed (Pascual *et al.*, 1996; Vucetich *et al.*, 2015). Evidently, these varied landscape scenarios (that resulted from considerable climatic changes) permitted the evolution and diversification of the Santacrucian caviomorphs. Paleobiological aspects deserve further detailed analyses which are beyond the scope of this systematic study.

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Appendix 1 - List of fossil caviomorph specimens from the Río Santa Cruz. In different shades of green: Barrancas Blancas (BB), Estancia Aguada Grande (EAG), and Estancia Santa Lucia (ESL); in different shades of blue: Segundas Barrancas Blancas (SBB), Estancia Cordón Alto (ECA), Estancia Cordón Alto2 (ECA2), and Estancia El Tordillo (EET); Orange: Yaten Huageno (YH) and Estancia El Refugio (EER)

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
BB	*Estancia Aguada Grande (EAG)*	*MPM-PV 20773*	**Sciamys principalis**	*left mandible with p4-m3*
		MPM-PV 20036	**Phanomys mixtus**	*right P4*
		MPM-PV 20037	**Phanomys mixtus**	*right M1 or M2*
		MPM-PV 20038	**Neoreomys australis**	*right M1 or M2*
		MPM-PV 20039	**Perimys** *sp.*	*isolated upper tooth*
		MPM-PV 20040	**Spaniomys** *sp.*	*right upper molar*
		MPM-PV 20041	**Spaniomys** *sp.*	*right upper molar*
		MPM-PV 20042	**Spaniomys** *sp.*	*right upper molar*
		MPM-PV 20043	*Acaremyidae*	*left lower molar*
		MPM-PV 20044	**Sciamys***?*	*left p4*
		MPM-PV 20045	**Neoreomys australis**	*right maxilla with DP4-M3*
		MPM-PV 20046	**Neoreomys australis**	*left M1 or M2*
		MPM-PV 20047	**Neoreomys australis**	*right p4*
		MPM-PV 20048	**Phanomys mixtus**	*right M2-M3*
		MPM-PV 20049	**Perimys erutus**	*left M1 or M2*
		MPM-PV 20050	**"Eocardia" excavata***?*	*left upper molar*
		MPM-PV 20051	**"Eocardia" excavata***?*	*left m1*
		MPM-PV 20052	**"Eocardia" excavata***?*	*right m3*
		MPM-PV 20053	**Eocardia montana**	*right mandibular fragment with p4-m2*
		MPM-PV 20054	**Eocardia** *sp.*	*left m3*
		MPM-PV 20055	**Perimys/ Prolagostomus**	*right m3*
		MPM-PV 20056	**Neoreomys australis**	*right upper molar*
		MPM-PV 20057	*Octodontoidea*	*edentulous left zygomatic fragment*
		MPM-PV 20058	**Steiromys detentus**	*right upper molar*
		MPM-PV 20059	*Acaremyidae*	*broken P4*
		MPM-PV 20060	**Spaniomys**	*right lower tooth broken*
		MPM-PV 20061	**Neoreomys australis**	*right M1-M2*
		MPM-PV 20062	**Neoreomys australis**	*left m1 or m2*
		MPM-PV 20063	**Neoreomys australis**	*left M1 or M2*
		MPM-PV 20064	**Eocardia montana**	*left p4*
		MPM-PV 20065	**Eocardia montana**	*right m1*
		MPM-PV 20066	**Eocardia montana**	*right m2*
		MPM-PV 20067	**"Eocardia" excavata**	*left mandible with m1-m2*
		MPM-PV 20068	**Spaniomys** *sp.*	*right mandible with m1-m2*
		MPM-PV 20069	**Acarechimys minutissimus**	*right mandible with m1-m2*
		MPM-PV 20070	*Octodontoidea*	*lower incisor*
		MPM-PV 20071	*Caviomorpha*	*lower incisor*
		MPM-PV 20072	**Phanomys mixtus**	*left M3*
		MPM-PV 20073	**Phanomys mixtus**	*right M3*
		MPM-PV 20074	**Phanomys mixtus**	*right M1*
		MPM-PV 20075	**Phanomys mixtus**	*left M1*
		MPM-PV 20076	**Phanomys mixtus**	*right M2*
		MPM-PV 20077	**Phanomys mixtus**	*left M2*
		MPM-PV 20078	**Phanomys mixtus**	*right m1 or m2*
		MPM-PV 20079	**Phanomys mixtus**	*left m1*
		MPM-PV 20080	**Phanomys mixtus**	*left m1 or m2*

APPENDIX 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20081	**Spaniomys** *sp.*	*upper cheek teeth*
		MPM-PV 20082	**Neoreomys australis**	*right M1 or M2*
		MPM-PV 20083	**Scleromys** *sp.*	*left M1 or M2*
		MPM-PV 20084	**Scleromys** *sp.*	*left M1 or M2*
		MPM-PV 20085	**Scleromys** *sp.*	*P4?*
		MPM-PV 20086	**Steiromys duplicatus**	*left DP4*
		MPM-PV 20087	**Steiromys duplicatus**	*right M1 or M2*
		MPM-PV 20088	**Steiromys duplicatus**	*right M1 or M2 (broken)*
		MPM-PV 20089	**Steiromys duplicatus**	*right M1 or M2 (broken)*
		MPM-PV 20090	**Steiromys duplicatus**	*left M1 or M2*
		MPM-PV 20091	**Steiromys duplicatus**	*left M1 or M2*
		MPM-PV 20092	**Steiromys duplicatus**	*left M3*
		MPM-PV 20093	**Steiromys duplicatus**	*left dp4*
		MPM-PV 20094	**Steiromys duplicatus**	*left mandibular fragment with m2*
		MPM-PV 20095	**Steiromys duplicatus**	*left lower incisor*
		MPM-PV 20096	**Steiromys** *sp.*	*2 incisor fragments*
		MPM-PV 20097	**Steiromys** *sp.*	*2 broken teeth*
		MPM-PV 20098	**Scleromys** *sp.*	*left upper molar*
		MPM-PV 20099	**Scleromys** *sp.*	*left upper molar*
		MPM-PV 20100	*Rodentia?*	*1 phalanx*
		MPM-PV 20101	*Rodentia?*	*distal left humerous*
		MPM-PV 20102	*Rodentia?*	*right astragalus*
		MPM-PV 20103	**Stichomys** *sp.*	*left maxillary fragment with DP4-M1*
		MPM-PV 20104	**Stichomys** *sp.*	*right m1 or m2*
		MPM-PV 20105	*Octodontoidea*	*left lower molar broken*
		MPM-PV 20106	**Stichomys** *sp.*	*right m3*
		MPM-PV 20107	**Steiromys duplicatus***?*	*right DP4?*
		MPM-PV 20108	**Perimys erutus**	*right M3*
		MPM-PV 20109	**Eocardia montana**	*right m1 or m2*
		MPM-PV 20110	**Eocardia montana**	*right m1 or m2*
		MPM-PV 20111	*Caviomorpha*	*2 incisors*
		MPM-PV 20112	*cf.* **Scleromys**	*right P4*
		MPM-PV 20113	**Neoreomys***?*	*mandibular fragment with incisor*
		MPM-PV 20114	**Eocardia** *sp.*	*right m1 or m2*
		MPM-PV 20115	**Spaniomys riparius**	*left mandibular fragment with dp4-m2*
		MPM-PV 20116	**Perimys erutus**	*left M1 or M2*
		MPM-PV 20117	**Sciamys** *sp.*	*left M1 or M2*
		MPM-PV 20118	**Phanomys** *sp.*	*left M1*
		MPM-PV 20119	**Phanomys** *sp.*	*left p4*
		MPM-PV 20773	**Eocardia** *sp.*	*broken tooth*
		MPM-PV 20774	*Caviomorpha*	*brachydont molar*
		MPM-PV 20775	*Caviomorpha*	*brachydont molar*
		MPM-PV 20776	**Eocardia** *sp.*	*left lower molar*
		MPM-PV 20777	**Eocardia** *sp.*	*left m2 or m3*
		MPM-PV 20778	**Eocardia** *sp.*	*left m3*
		MPM-PV 20779	**Eocardia** *sp.*	*right mandibular fragment with molar*
		MPM-PV 20120	**Neoreomys australis**	*right lower molar*

Appendix 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20121	**Neoreomys australis**	*left M1 or M2*
		MPM-PV 20122	**Eocardia** *sp.*	*left upper molar*
		MPM-PV 20123	*Octodontoidea*	*left lower incisor*
		MPM-PV 20124	**Neoreomys australis**	*left lower molar*
		MPM-PV 20125	**Neoreomys australis**	*right upper molar*
		MPM-PV 20126	**Neoreomys***?*	*lower incisor fragment*
		MPM-PV 20127	*Octodontoidea*	*incisor fragment*
		MPM-PV 20128	**Neoreomys australis**	*left p4*
		MPM-PV 20129	**Neoreomys australis**	*left m1 or m2*
		MPM-PV 20130	**Neoreomys australis**	*left m3 (broken)*
		MPM-PV 20131	**Neoreomys australis**	*lower tooth?*
		MPM-PV 20132	**Neoreomys australis**	*right P4*
		MPM-PV 20133	**Neoreomys australis**	*right M1 or M2*
		MPM-PV 20134	**Sciamys principalis**	*left lower molar*
		MPM-PV 20135	**Stichomys** *sp.*	*left DP4*
		MPM-PV 20136	**Stichomys** *sp.*	*right M1 or M2*
		MPM-PV 20137	**Stichomys** *sp.*	*left lower molar*
		MPM-PV 20138	**Perimys incavatus**	*right upper molar*
		MPM-PV 20139	**"Eocardia" excavata**	*left m1*
		MPM-PV 20140	**Eocardia** *sp.*	*right lower molar (broken)*
		MPM-PV 20141	**Phanomys/ Eocardia**	*left M1 or M3*
		MPM-PV 20142	*Caviomorpha?*	*long bone*
		MPM-PV 20143	**Spaniomys** *sp.*	*right mandible with m1-m2*
		MPM-PV 20144	**Phanomys mixtus**	*left M1 or M2*
		MPM-PV 20145	**Neoreomys australis**	*left mandible with p4-m1*
		MPM-PV 20146	**Neoreomys australis**	*right upper molar*
		MPM-PV 20147	**Neoreomys australis**	*left lower molar*
		MPM-PV 20148	**Neoreomys australis**	*left m1(broken)-m2 and left molar*
		MPM-PV 20149	**Spaniomys** *sp.*	*left mandible with m1(broken)-m2*
		MPM-PV 20150	**Neoreomys australis**	*right upper molar (broken)*
		MPM-PV 20151	**Perimys** *sp.*	*right P4*
		MPM-PV 20152	**Eocardia** *sp.*	*right lower molar*
	Estancia Santa Lucia (ESL)	*MPM-PV 20153*	**Neoreomys australis**	*mandibular symphysis with right m1, m2, and p4; and left , 1, m2, and p4*
		MPM-PV 20154	**Neoreomys australis**	*3 incisor fragments*
		MPM-PV 20155	**Perimys** *sp.*	*upper molar*
		MPM-PV 20156	**Eocardia** *sp.*	*right upper molar fragment*
		MPM-PV 20157	**Spaniomys** *sp.*	*right maxillary with DP4-M2*
		MPM-PV 20158	**Perimys** *sp.*	*right lower molar*
		MPM-PV 20159	**Neoreomys australis**	*right lower molar*
		MPM-PV 20160	**Perimys onustus**	*right mandible with p4-m1*
		MPM-PV 20161	**Perimys erutus**	*right mandibular fragment with p4*
		MPM-PV 20162	**Perimys erutus**	*right mandibular fragment with p4-m1*
		MPM-PV 20163	**Perimys erutus**	*left mandible with p4(broken)-m3*
		MPM-PV 20164	**Perimys erutus**	*left m3*
		MPM-PV 20165	**Eocardia montana**	*right mandible with m1-m2*
		MPM-PV 20166	**Neoreomys australis**	*right maxilla with DP4-M1*
		MPM-PV 20167	*Caviomorpha?*	*petrosal*

APPENDIX 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20168	*Eocardidae*	*right mandible with cheek teeth*
		MPM-PV 20169	**Neoreomys***?*	*broken molar*
		MPM-PV 20170	**Scleromys** *sp.*	*right P4*
		MPM-PV 20171	**Perimys** *sp.*	*left upper tooth*
		MPM-PV 20172	**Neoreomys australis**	*left m1 or m2*
		MPM-PV 20173	**Neoreomys australis***?*	*incisor*
		MPM-PV 20174	**Eocardia** *sp.*	*tooth fragments and left DP4*
		MPM-PV 20175	**Acaremys** *sp.*	*p4, m1, and incisor*
		MPM-PV 20176	*Rodentia*	*edentulous right maxillary*
		MPM-PV 20177	**Perimys** *sp.*	*left lower tooth*
		MPM-PV 20178	**Spaniomys** *sp.*	*left mandible with m1-m3 and incisor*
		MPM-PV 20179	**Spaniomys** *sp.*	*right mandible with dp4-m2*
		MPM-PV 20180	**Spaniomys** *sp.*	*right maxillary fragment with DP4-M1*
		MPM-PV 20181	**Neoreomys australis**	*right mandibular fragment with m1*
		MPM-PV 20182	**Spaniomys** *sp.*	*right mandible with m1-m2*
		MPM-PV 20183	**Eocardia montana**	*right mandibular fragment with m2*
		MPM-PV 20184	*Octodontoidea*	*broken posterior portion of a lower tooth*
		MPM-PV 20185	*Acaremyidae*	*left upper molar*
		MPM-PV 20186	**Eocardia** *sp.*	*left M1*
		MPM-PV 20187	**Eocardia** *sp.*	*left M1*
		MPM-PV 20188	**Eocardia** *sp.*	*3 tooth fragments*
		MPM-PV 20189	**Perimys erutus**	*right mandibular fragment with p4*
		MPM-PV 20190	**Perimys erutus**	*left mandibular fragment with p4*
		MPM-PV 20191	**Perimys** *sp.*	*broken tooth*
		MPM-PV 20192	**Stichomys** *sp.*	*right M1 or M2*
		MPM-PV 20193	**Phanomys***?*	*broken lower tooth*
		MPM-PV 20194	**Neoreomys australis**	*left mandibular fragment with m1-m3*
		MPM-PV 20195	**Neoreomys australis**	*right upper molar*
		MPM-PV 20196	**Neoreomys australis**	*left m3*
		MPM-PV 20197	**Neoreomys australis**	*left m3*
		MPM-PV 20198	**Neoreomys australis**	*right p4*
		MPM-PV 20199	**Neoreomys australis**	*right mandibular fragment with m1 or m2*
		MPM-PV 20200	**Neoreomys australis**	*left m1 or m2*
		MPM-PV 20201	**Spaniomys** *sp.*	*left mandibular fragment with m1-m2*
		MPM-PV 20202	**Spaniomys** *sp.*	*left M3*
		MPM-PV 20203	**Spaniomys** *sp.*	*left upper molar*
		MPM-PV 20204	**Perimys erutus**	*right M3*
		MPM-PV 20205	*Octodontoidea*	*left mandibular fragment with dp4*
		MPM-PV 20206	**Eocardia** *sp.*	*left upper molar (broken)*
		MPM-PV 20207	**Prospaniomys** *sp. nov.?*	*left lower molar*
		MPM-PV 20208	**Perimys erutus**	*right P4*
		MPM-PV 20209	*Octodontoidea*	*right upper incisor*
		MPM-PV 20210	**Eocardia** *sp.*	*left lower molar*
		MPM-PV 20211	*Rodentia?*	*metapodial*
		MPM-PV 20212	**Scleromys** *sp.*	*left upper molar*
		MPM-PV 20213	**Neoreomys australis**	*right upper molar*
		MPM-PV 20214	**Neoreomys australis***?*	*incisor fragment*
		MPM-PV 20215	**Neoreomys australis***?*	*incisor fragment*
		MPM-PV 20216	**Acaremys** *sp.*	*left mandibular fragment with m2-m3(broken)*
		MPM-PV 20217	**Neoreomys australis**	*right lower molar*

Appendix 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20218	*Caviomorpha*	*left auditory fragment*
		MPM-PV 20219	**Neoreomys australis**	*right P4*
		MPM-PV 20220	**Neoreomys australis**	*right upper molar*
		MPM-PV 20221	**Neoreomys australis**	*right upper molar*
		MPM-PV 20222	**Neoreomys australis**	*right M3*
		MPM-PV 20223	**Eocardia** *sp.*	*palatal fragment with broken left P4*
		MPM-PV 20224	**Eocardia** *sp.*	*right maxilla with M2-M3*
		MPM-PV 20225	**Eocardia** *sp.*	*2 broken upper tooth and 3 maxillary fragments*
		MPM-PV 20226	**Eocardia** *sp.*	*right m1 or m2*
		MPM-PV 20227	**Neoreomys australis**	*left M3?*
		MPM-PV 20228	**Neoreomys australis**	*right P4*
		MPM-PV 20229	**Eocardia** *sp.*	*right upper molar*
		MPM-PV 20230	**Spaniomys** *sp.*	*right upper molar*
		MPM-PV 20231	**Prolagostomus** *sp.*	*broken molar*
		MPM-PV 20232	**Prolagostomus** *sp.*	*broken molar*
		MPM-PV 20233	**Neoreomys australis***?*	*incisor fragment*
		MPM-PV 20234	**Neoreomys australis**	*left m3*
		MPM-PV 20235	**Neoreomys australis***?*	*incisor fragment*
		MPM-PV 20236	**Spaniomys** *sp.*	*left mandibular fragment with m1-m2*
SBB	*Estancia Cordón Alto (ECA)*	*MPM-PV 20237*	**Stichomys regularis**	*left mandibular fragment with m1-m2*
		MPM-PV 20238	**Prolagostomus** *sp.*	*isolated tooth*
		MPM-PV 20239	**Pliolagostomus notatus**	*left lower molar*
		MPM-PV 20240	**Pliolagostomus notatus**	*left lower molar*
		MPM-PV 20241	**"Eocardia" excavata**	*right maxilla with P4-M3*
		MPM-PV 20242	**Prolagostomus** *sp.*	*right lower molar*
		MPM-PV 20243	*Acaremyidae*	*right lower molar*
		MPM-PV 20244	**"Eocardia" excavata**	*right m1*
		MPM-PV 20245	**"Eocardia" excavata**	*right m2*
		MPM-PV 20246	*Octodontoidea*	*edentulous left mandible*
		MPM-PV 20247	*Acaremyidae*	*right upper molar*
		MPM-PV 20248	**Scleromys** *sp.*	*left p4*
		MPM-PV 20249	**Stichomys** *sp.*	*left DP4*
		MPM-PV 20250	**Phanomys** *sp.*	*left upper molar*
		MPM-PV 20251	**Pliolagostomus notatus**	*2 right low molars*
		MPM-PV 20252	**Pliolagostomus notatus**	*left lower molar*
		MPM-PV 20253	**Pliolagostomus notatus**	*2 left lower molars*
		MPM-PV 20254	**Pliolagostomus notatus**	*right p4*
		MPM-PV 20255	**Prolagostomus pusillus**	*2 left p4s*
		MPM-PV 20256	**Prolagostomus pusillus**	*right p4*
		MPM-PV 20257	**Prolagostomus pusillus**	*left upper molar*
		MPM-PV 20258	**Prolagostomus pusillus**	*right upper molar*
		MPM-PV 20259	**Pliolagostomus/Prolagostomus**	*2 broken tooth*
		MPM-PV 20260	**Prolagostomus pusillus**	*left lower molar*
		MPM-PV 20261	**Perimys onustus**	*right lower molar*
		MPM-PV 20262	**Prolagostomus pusillus**	*left lower tooth*
		MPM-PV 20263	**Neoreomys australis**	*right lower molar (broken)*
		MPM-PV 20264	**"Eocardia" excavata**	*right M3 (broken)*
		MPM-PV 20265	**Eocardia** *sp.*	*left lower molar*
		MPM-PV 20266	**Pliolagostomus notatus**	*right lower molar*
		MPM-PV 20267	**Prolagostomus** *sp.*	*right lower molar*

APPENDIX 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20268	**Acarechimys***?*	*right lower incisor*
		MPM-PV 20269	**Neoreomys australis**	*left upper molar*
		MPM-PV 20270	**Neoreomys australis**	*right upper molar (broken)*
		MPM-PV 20271	**Perimys onustus**	*broken molar*
		MPM-PV 20272	**Acaremys murinus**	*right mandibular fragment with m1-m3*
		MPM-PV 20273	**Eocardia montana?**	*right p4*
		MPM-PV 20274	**Eocardia montana?**	*right m1*
		MPM-PV 20275	**Eocardia montana?**	*left m1 or m2*
		MPM-PV 20276	**Stichomys regularis**	*left mandibular fragment with m1-m2*
		MPM-PV 20277	**Stichomys regularis**	*right mandibular fragment with m2-m3*
		MPM-PV 20278	**Prolagostomus** *sp.*	*lower cheek teeth*
		MPM-PV 20279	**Eocardia montana**	*left m1 or m2*
		MPM-PV 20280	**Eocardia montana**	*right p4*
		MPM-PV 20281	**Eocardia montana**	*right m1*
		MPM-PV 20282	**Eocardia montana**	*right m2*
		MPM-PV 20283	**Neoreomys australis**	*right maxillary fragment with M1-M2*
		MPM-PV 20284	**Neoreomys australis**	*left M1 or M2*
		MPM-PV 20285	**Neoreomys australis**	*right M3*
		MPM-PV 20286	**Neoreomys australis**	*left M3*
		MPM-PV 20287	**Neoreomys australis**	*left M1 or M2*
		MPM-PV 20288	**Neoreomys australis**	*right m1*
		MPM-PV 20289	**Neoreomys australis**	*right m2*
		MPM-PV 20290	**Neoreomys australis**	*right m3*
		MPM-PV 20291	**Scleromys** *sp.*	*left P4*
		MPM-PV 20292	**Neoreomys australis**	*right maxillary fragment with M1-M3*
		MPM-PV 20295	**Eocardia** *sp.*	*right maxillary fragment with DP4-M1*
		MPM-PV 20296	**Eocardia** *sp.*	*right upper molar*
		MPM-PV 20297	**Pliolagostomus notatus**	*left upper molar*
		MPM-PV 20298	*Octodontoidea*	*left upper incisor*
		MPM-PV 20299	**Spaniomys** *sp.*	*right mandible with dp4-m2*
		MPM-PV 15098	**Acarechimys minutissimus**	*left mandible with dp4 and broken incisor*
		MPM-PV 20300	**Eocardia montana**	*right mandible with m1-m2*
		MPM-PV 20301	**Eocardia montana**	*right m3*
		MPM-PV 20302	**Prolagostomus** *sp.*	*left m3*
		MPM-PV 20303	*Caviomorpha*	*mandibular fragment with broken incisor*
		MPM-PV 20304	**Stichomys** *sp.*	*left mandibular fragment with m2*
		MPM-PV 20305	**Prolagostomus** *sp.*	*right lower molar*
		MPM-PV 20306	**Eocardia montana***?*	*right mandibular fragment with p4-m2 and broken incisor*
		MPM-PV 20307	**Eocardia montana***?*	*left m1 or m2*
		MPM-PV 20308	**Sciamys principalis**	*right mandible with p4-m3*
		MPM-PV 20309	*Octodontoidea*	*left mandibular fragment with incisor*
		MPM-PV 20310	**Spaniomys** *sp.*	*left maxillary fragment with M1-M2*
		MPM-PV 20311	*Octodontoidea*	*right lower incisor fragment*
		MPM-PV 20312	**Eocardia montana**	*right mandible with p4-m3*
		MPM-PV 20313	**Neoreomys australis**	*right upper molar (broken)*
		MPM-PV 20314	**Prolagostomus** *sp.*	*left mandibular fragment with p4-m2 and incisor*
		MPM-PV 20315	**Prolagostomus** *sp.*	*left M3*
		MPM-PV 20316	**Prolagostomus** *sp.*	*isolated incisor*

Appendix 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20317	**Prolagostomus pusillus**	*right maxillary fragment with M1-M2*
		MPM-PV 20318	**Prolagostomus pusillus**	*right mandible with m1-m3*
		MPM-PV 20319	**Pliolagostomus***?*	*M3?*
		MPM-PV 20320	**Pliolagostomus***?*	*right mandibular fragment with p4*
		MPM-PV 15091	**Acarechimys constans**	*right mandible with dp4-m2*
		MPM-PV 20321	**Perimys erutus**	*right mandible with p4-m3*
		MPM-PV 20322	**Prolagostomus** *sp.*	*left lower molar*
		MPM-PV 20323	**Neoreomys australis**	*right lower molar*
		MPM-PV 20324	**Neoreomys australis**	*right lower molar*
		MPM-PV 20325	**Neoreomys australis**	*left P4*
		MPM-PV 20326	**Eocardia montana**	*left mandible with p4-m3*
		MPM-PV 20327	**Eocardia montana**	*left m2 or m3*
		MPM-PV 20328	**Eocardia***?*	*portion of a lower incisor*
		MPM-PV 20329	**Neoreomys australis**	*right M1 or M2*
		MPM-PV 20330	**Neoreomys australis**	*left M1 or M2*
		MPM-PV 20331	**Neoreomys australis**	*right M1 or M2*
		MPM-PV 20332	**Neoreomys australis**	*right upper premolar*
		MPM-PV 20333	**Neoreomys australis**	*left upper molar*
		MPM-PV 20334	**Neoreomys***?*	*2 incisor fragments*
		MPM-PV 20335	**Stichomys** *sp.*	*mandibular fragment with m2*
		MPM-PV 20336	**Prolagostomus** *sp.*	*right lower molar*
		MPM-PV 20337	**Spaniomys** *sp.*	*right lower molar*
		MPM-PV 20338	**Stichomys** *sp.*	*right lower molar*
		MPM-PV 20339	*cf.* **Scleromys**	*upper tooth fragment*
		MPM-PV 20340	*Octodontoidea*	*edentulous left mandibular fragment*
		MPM-PV 20341	**Stichomys** *sp.*	*right DP4-M1*
		MPM-PV 20342	**Stichomys** *sp.*	*left M1 or M2*
		MPM-PV 20343	**Prolagostomus pusillus**	*left p4-m2*
		MPM-PV 20344	**Neoreomys***?*	*right upper molar (broken)*
		MPM-PV 20345	**Stichomys***?*	*lower incisor*
		MPM-PV 20346	**Acarechimys minutissimus**	*left mandible with p4-m3*
		MPM-PV 20347	**Stichomys** *sp.*	*left DP4*
		MPM-PV 20348	**Prolagostomus** *sp.*	*right p4*
		MPM-PV 20349	**Prolagostomus/Pliolagostomus**	*upper molar*
		MPM-PV 20350	*Rodentia?*	*humerous distal portion*
		MPM-PV 20351	*Rodentia?*	*metatarsal?*
		MPM-PV 20352	**Sciamys** *sp.*	*left mandible with p4-m1 and incisor*
		MPM-PV 20353	**Pliolagostomus notatus**	*left lower tooth*
		MPM-PV 20354	**Eocardia** *sp.*	*lower molar fragment*
		MPM-PV 20355	**Perimys onustus**	*right mandible with m1-m3*
		MPM-PV 20356	**Stichomys/ Adelphomys**	*right mandible with dp4-m2*
		MPM-PV 20357	**Neoreomys australis**	*left upper molar*
		MPM-PV 20358	**Neoreomys australis**	*right lower molar*
		MPM-PV 20359	**Prolagostomus pusillus**	*left upper molar*
		MPM-PV 20360	**Pliolagostomus notatus**	*left lower molar*
		MPM-PV 20361	**Neoreomys australis**	*skull fragment and broken teeth*
		MPM-PV 20362	**Prolagostomus pusillus**	*right mandibular fragment with p4-m2(broken) and incisor*
		MPM-PV 20363	**Eocardia** *sp.*	*right p4*
		MPM-PV 20364	**Acarechimys minutissimus**	*right mandible with m1-m3*

APPENDIX 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20365	**Eocardia** *sp.*	*right m3*
		MPM-PV 20366	**Neoreomys australis**	*right lower molar*
		MPM-PV 20367	**Prolagostomus pusillus**	*right mandible with m1-m3(broken)*
		MPM-PV 20368	**Prolagostomus pusillus**	*maxilla with right and left P4-M3*
		MPM-PV 15100	**Acarechimys minutissimus**	*right mandible with dp4(broken)-m2*
		MPM-PV 15101	**Acarechimys minutissimus**	*right mandible with dp4-m1*
		MPM-PV 20369	**Eocardia** *sp.*	*left upper cheek teeth*
		MPM-PV 20370	**Perimys** *sp.*	*right lower molar*
		MPM-PV 20371	**Prolagostomus pusillus**	*left maxillary fragment with P4-M3*
		MPM-PV 15092	**Acarechimys constans***?*	*right mandible with dp4-m2 and incisor*
		MPM-PV 20372	**Steiromys***?*	*left maxillary fragment with P4-M1*
		MPM-PV 20373	**Stichomys** *sp.*	*left M1 or M2*
		MPM-PV 20374	**Eocardia** *sp.*	*left mandible with m1 or m2*
		MPM-PV 20375	**Perimys onustus**	*left mandibular fragment with p4*
		MPM-PV 20376	**Prolagostomus pusillus**	*left mandibular fragment with p4-m3 and broken incisor*
		MPM-PV 20377	**Prolagostomus** *sp.*	*left maxillary fragment with P4-M2*
		MPM-PV 20378	**Eocardia** *sp.*	*left upper molar*
		MPM-PV 20379	**Prolagostomus pusillus**	*right p4*
		MPM-PV 20380	**Prolagostomus pusillus**	*right lower cheek teeth*
		MPM-PV 20381	**Prolagostomus/Pliolagostomus**	*broken cheek teeth*
		MPM-PV 20382	**Prolagostomus/Pliolagostomus**	*broken cheek teeth*
		MPM-PV 20383	**Acarechimys***?*	*right mandible with m1-m2*
		MPM-PV 20384	**Steiromys detentus**	*right mandible with dp4-m3(broken)*
		MPM-PV 20385	**Perimys onustus**	*left lower molar*
		MPM-PV 20386	**Neoreomys australis**	*right upper molar*
		MPM-PV 20387	**Pliolagostomus notatus**	*left M3*
		MPM-PV 20388	**Acarechimys minutissimus**	*right mandible with m1-m3*
		MPM-PV 20389	**Spaniomys** *sp.*	*right maxillary fragment with M1-M3*
		MPM-PV 20390	**Spaniomys** *sp.*	*left maxillary fragment with M1-M2*
		MPM-PV 20391	**Sciamys principalis**	*right mandibular fragment with p4-m2*
		MPM-PV 15099	**Acarechimys minutissimus**	*left mandible with m1-m2 and broken incisor*
		MPM-PV 20392	**Spaniomys** *sp.*	*M2-M3*
		MPM-PV 20393	**Eocardia** *sp.*	*right upper molar*
		MPM-PV 20394	**Eocardia montana**	*right upper molar*
		MPM-PV 20395	**Perimys** *sp.*	*left M1 or M2*
		MPM-PV 20396	**Prolagostomus** *sp.*	*left M3*
		MPM-PV 20397	**Prolagostomus** *sp.*	*left lower molar*
		MPM-PV 20398	**Prolagostomus/Pliolagostomus**	*broken tooth*
		MPM-PV 20399	*Cavioidea*	*broken tooth*
		MPM-PV 20400	**Eocardia** *sp.*	*isolated m1 or m2*
		MPM-PV 20401	**Eocardia montana**	*left mandible with p4-m2*
		MPM-PV 20402	**Eocardia** *sp.*	*left m3*
		MPM-PV 20403	**Prolagostomus pusillus**	*right M3*
		MPM-PV 20404	**Prolagostomus pusillus**	*left lower molar*
		MPM-PV 20405	**Pliolagostomus notatus**	*right maxillary fragment with P4-M3*
		MPM-PV 20406	**Pliolagostomus notatus**	*left lower molar*
		MPM-PV 20407	**Prolagostomus/Pliolagostomus**	*left p4*
		MPM-PV 20408	**Neoreomys australis**	*right lower molar*
		MPM-PV 20409	**Eocardia montana**	*left mandible with dp4-m1 and incisor*

Appendix 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20410	**Eocardia** *sp.*	*right M3*
		MPM-PV 20411	**Eocardia** *sp.*	*right lower molar*
	Estancia Cordón Alto2 (ECA2)	*MPM-PV 20412*	*cf.* **Neoreomys**	*lower isolated molar*
		MPM-PV 20413	**Pliolagostomus notatus**	*right upper molar*
		MPM-PV 20414	**Prolagostomus** *sp.*	*left mandibular fragment with p4-m2*
		MPM-PV 20415	**Stichomys** *sp.*	*left mandibular fragment with m1-m3*
		MPM-PV 20416	**Spaniomys** *sp.*	*left lower molar*
		MPM-PV 20417	**Neoreomys australis**	*left dp4*
		MPM-PV 20418	*cf.* **Neoreomys**	*right dp4*
		MPM-PV 20419	**Phanomys***?*	*left upper molar*
		MPM-PV 20420	**Eocardia montana**	*left upper molar*
		MPM-PV 20421	**Perimys** *sp.*	*left p4?*
		MPM-PV 20422	**Pliolagostomus notatus**	*right lower molar*
		MPM-PV 20423	**Neoreomys australis**	*left m1 or m2*
		MPM-PV 20424	**Sciamys principalis**	*left mandibular fragment with p4(broken)-m1*
		MPM-PV 20425	**Spaniomys** *sp.*	*left mandibular fragment with m1-m2*
		MPM-PV 20426	**Stichomys** *sp.*	*left mandibular fragment with dp4-m2*
		MPM-PV 20427	**Prolagostomus** *sp.*	*left M3*
		MPM-PV 20428	**Prolagostomus** *sp.*	*left lower molar*
		MPM-PV 20429	**Stichomys** *sp.*	*right mandibular fragment with m1 and incisor*
		MPM-PV 20430	**Stichomys***?*/**Adelphomys***?*	*left DP4*
		MPM-PV 20431	**Eocardia** *sp.*	*right mandibular fragment with p4-m2*
		MPM-PV 20432	**Eocardia***?*	*right M3*
		MPM-PV 20433	**Eocardia** *sp.*	*right upper molar*
		MPM-PV 20434	**Neoreomys australis**	*right lower molar*
		MPM-PV 20435	**Neoreomys australis**	*left M3*
		MPM-PV 20436	**Prolagostomus** *sp.*	*left mandible with p4 and incisor*
		MPM-PV 20437	**Neoreomys australis**	*left upper tooth*
		MPM-PV 20438	**Neoreomys australis**	*left p4*
		MPM-PV 20439	**Neoreomys australis**	*right lower molar (broken)*
		MPM-PV 20440	**Neoreomys australis**	*P4*
		MPM-PV 20441	**Eocardia** *sp.*	*left lower molar*
		MPM-PV 20442	**Steiromys detentus**	*right mandibular fragment with p4-m3*
		MPM-PV 20443	**Perimys erutus**	*right mandibular fragment with p4-m1*
		MPM-PV 20444	**Stichomys regularis**	*left mandibular fragment with dp4-m2*
		MPM-PV 20445	**Spaniomys** *sp.*	*right mandible with m1-m2*
		MPM-PV 20446	**Prolagostomus** *sp.*	*right maxillary fragment with M1-M2*
		MPM-PV 20447	**Stichomys** *sp.*	*right mandible with m1-m2*
		MPM-PV 20448	**Pliolagostomus notatus**	*right maxillary fragment with M1-M2*
		MPM-PV 20449	**Spaniomys** *sp.*	*left upper molar*
		MPM-PV 20450	**Eocardia** *sp.*	*right M1 or M2*
		MPM-PV 20451	**Eocardia** *sp.*	*broken upper molar*
		MPM-PV 20452	**Eocardia montana**	*lower molar*
		MPM-PV 20453	**Pliolagostomus notatus**	*right lower molar*
		MPM-PV 20454	**Pliolagostomus notatus**	*left lower molar*
		MPM-PV 20455	**Pliolagostomus notatus**	*left lower molar*
		MPM-PV 20456	**Prolagostomus** *sp.*	*isolated cheek teeth*
		MPM-PV 20457	**Prolagostomus** *sp.*	*isolated cheek teeth*
		MPM-PV 20293	**Neoreomys australis**	*right maxillary fragment with P4-M1*

APPENDIX 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20294	**Prospaniomys** *sp. nov.?*	*right DP4-M1*
		MPM-PV 20458	**Neoreomys australis**	*right P4*
		MPM-PV 20459	**Neoreomys australis**	*right lower molar*
		MPM-PV 20460	**Prolagostomus** *sp.*	*right lower molar*
		MPM-PV 20461	**Sciamys principalis**	*right maxillary fragment with P4*
		MPM-PV 20462	**Sciamys principalis**	*left mandible with p4-m2*
		MPM-PV 20463	**Spaniomys** *sp.*	*left maxillary fragment with M1*
		MPM-PV 20464	**Spaniomys** *sp.*	*left upper molar*
		MPM-PV 20465	**Spaniomys** *sp.*	*right upper molar (broken)*
		MPM-PV 20466	**Stichomys** *sp.*	*right m3*
		MPM-PV 20467	*Acaremyidae*	*left lower molar*
		MPM-PV 20468	**Prolagostomus** *sp.*	*left lower molar*
		MPM-PV 20469	*Octodontoidea*	*right upper incisor*
		MPM-PV 20470	*Caviomorpha*	*right upper incisor*
		MPM-PV 20471	*Caviomorpha*	*left lower incisor*
		MPM-PV 20472	**Pliolagostomus/Prolagostomus**	*left p4*
		MPM-PV 20473	**Prolagostomus** *sp.*	*left mandibular fragment with p4-m2*
		MPM-PV 20474	**Pliolagostomus notatus**	*right mandibular fragment with p4*
		MPM-PV 20475	**Spaniomys** *sp.*	*left maxillary fragment with M1*
		MPM-PV 20476	**Spaniomys** *sp.*	*right maxillary fragment with DP4*
		MPM-PV 20477	*Chinchilloidea*	*broken teeth*
		MPM-PV 20478	**Acarechimys minutus**	*left mandibular fragment with dp4-m2*
		MPM-PV 20479	**Acarechimys minutissimus**	*left maxillary fragment with DP4-M1*
		MPM-PV 20480	**Acarechimys minutissimus**	*left maxillary fragment with M1-M2*
		MPM-PV 20481	*Octodontoidea*	*left mandibular fragment with incisor*
		MPM-PV 20482	*Caviomorpha*	*right mandibular fragment with incisor*
		MPM-PV 20483	**Spaniomys** *sp.*	*right upper cheek teeth*
		MPM-PV 20484	**Stichomys** *sp.*	*right DP4*
		MPM-PV 20485	**Stichomys** *sp.*	*left upper molar*
		MPM-PV 20486	**Stichomys** *sp.*	*right upper molar*
		MPM-PV 20487	*Acaremyidae*	*broken cheek teeth*
		MPM-PV 20488	**Prolagostomus** *sp.*	*right cheek teeth*
		MPM-PV 20489	**Prolagostomus** *sp.*	*left cheek teeth*
		MPM-PV 20490	**Prolagostomus** *sp.*	*left cheek teeth*
		MPM-PV 20491	**Prolagostomus** *sp.*	*left cheek teeth*
		MPM-PV 20492	**Pliolagostomus notatus**	*left upper cheek teeth*
		MPM-PV 20493	**Pliolagostomus notatus**	*right p4*
		MPM-PV 20494	**Pliolagostomus notatus**	*right upper cheek teeth*
		MPM-PV 20495	**Pliolagostomus notatus**	*right upper cheek teeth*
		MPM-PV 20496	**Pliolagostomus/Prolagostomus**	*isolated cheek teeth*
		MPM-PV 20497	**Pliolagostomus/Prolagostomus**	*isolated cheek teeth*
		MPM-PV 20498	**Eocardia** *sp.*	*left lower cheek teeth*
		MPM-PV 20499	**Eocardia** *sp.*	*upper cheek teeth*
		MPM-PV 20500	*Octodontoidea*	*left lower incisor*
		MPM-PV 20501	*Octodontoidea*	*edentulous left mandible*
		MPM-PV 20502	**Prolagostomus** *sp.*	*left M3*
		MPM-PV 20503	**Stichomys** *sp.*	*right m2*
		MPM-PV 20504	**Prolagostomus** *sp.*	*isolated cheek teeth*
		MPM-PV 20505	**Perimys onustus**	*left lower molar*
		MPM-PV 20506	**Prolagostomus** *sp.*	*right p4*

Appendix 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20507	**Prolagostomus** *sp.*	*right lower molar*
		MPM-PV 20508	**Eocardia** *sp.*	*left lower molar*
		MPM-PV 20509	*Caviomorpha*	*left mandible with broken incisor*
		MPM-PV 20510	*Octodontoidea*	*left mandible with broken incisor*
		MPM-PV 20511	**Prolagostomus** *sp.*	*left mandibular fragment with p4-m3*
		MPM-PV 20512	**Pliolagostomus/Prolagostomus**	*isolated broken cheek teeth*
		MPM-PV 20513	**Pliolagostomus/Prolagostomus**	*isolated broken cheek teeth*
		MPM-PV 20514	**Stichomys** *sp.*	*right DP4*
		MPM-PV 20515	**Stichomys** *sp.*	*left dp4*
		MPM-PV 20516	**Stichomys** *sp.*	*upper molar (broken)*
		MPM-PV 20517	**Neoreomys australis**	*right lower cheek teeth*
		MPM-PV 20518	**Neoreomys australis**	*right lower cheek teeth*
		MPM-PV 20519	*Caviomorpha*	*incisor*
		MPM-PV 20520	*Octodontoidea*	*incisor*
		MPM-PV 20521	*Octodontoidea*	*left lower incisor*
		MPM-PV 20522	*Octodontoidea*	*left upper incisor*
		MPM-PV 20523	*Rodentia?*	*isolated phalanx*
		MPM-PV 20524	**Spaniomys riparius**	*right mandible with m1-m2*
		MPM-PV 20525	**Neoreomys australis**	*left lower tooth*
		MPM-PV 20526	**Neoreomys***?*	*upper tooth*
		MPM-PV 20527	**Neoreomys***?*	*broken tooth*
		MPM-PV 20528	**Prolagostomus** *sp.*	*right m1-m2*
		MPM-PV 20529	**Schistomys erro**	*right maxillary fragment with P4-M3*
		MPM-PV 20530	**Prolagostomus** *sp.*	*left lower molar*
		MPM-PV 20531	**Prolagostomus** *sp.*	*left lower molar*
		MPM-PV 20532	**Pliolagostomus/Prolagostomus**	*isolated tooth*
		MPM-PV 20533	**Stichomys** *sp.*	*DP4*
		MPM-PV 17430	**Acarechimys gracilis**	*left mandible with dp4-m3*
		MPM-PV 20534	**Perimys** *sp.*	*right lower molar*
		MPM-PV 20535	**Perimys** *sp.*	*right lower molar (broken)*
		MPM-PV 20536	*Chinchilloidea?*	*left mandibular fragment with incisor*
		MPM-PV 20537	**Prolagostomus** *sp.*	*right mandibular fragment with p4*
		MPM-PV 20538	**Acaremys murinus**	*right mandible with m2-m3 and isolated m1*
		MPM-PV 20539	**Neoreomys australis**	*left lower molar*
		MPM-PV 20540	**Neoreomys australis**	*broken lower molar*
		MPM-PV 20541	**Prolagostomus** *sp.*	*lower cheek teeth*
		MPM-PV 20542	**Eocardia/ Schistomys**	*left lower molar*
		MPM-PV 20543	**Eocardia montana**	*right mandibular fragment with m2*
		MPM-PV 20544	**Eocardia** *sp.*	*left mandibular fragment with m1-m2*
		MPM-PV 20545	**Eocardia** *sp.*	*left mandibular fragment with m3*
		MPM-PV 20546	*Caviomorpha*	*right maxilla with broken incisor*
		MPM-PV 20547	**Prolagostomus** *sp.*	*cheek teeth*
		MPM-PV 15093	**Acarechimys constans**	*right mandible with dp4-m2*
		MPM-PV 15102	**Acarechimys minutissimus**	*left mandible with m1*
		MPM-PV 17426	**Acarechimys minutissimus**	*right mandible with dp4-m1 and incisor*
		MPM-PV 20548	**Perimys***?*	*broken tooth*
		MPM-PV 20549	**Stichomys regularis**	*right mandible with m1-m2*
		MPM-PV 20550	**Stichomys/ Adelphomys**	*left mandibular fragment with m2*
		MPM-PV 20551	**Perimys onustus**	*right p4*
		MPM-PV 20552	**Prolagostomus** *sp.*	*broken tooth*

APPENDIX 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20553	**Eocardia montana**	*right mandibular fragment with p4-m2*
		MPM-PV 20554	**Phanomys** *sp.*	*right mandible with p4-m1*
		MPM-PV 20555	**Steiromys detentus**	*right mandible with p4 and incisor*
		MPM-PV 20556	**Spaniomys riparius**	*right mandible with m1-m2*
		MPM-PV 20557	**Spaniomys riparius**	*left mandibular fragment with m1-m3*
		MPM-PV 20558	**Spaniomys riparius**	*left mandibular fragment with m1-m2*
		MPM-PV 20559	**Stichomys regularis**	*left mandibular fragment with m1-m2*
		MPM-PV 17433	**Acarechimys gracilis**	*left mandibular fragment with m1-m2*
		MPM-PV 17434	**Acarechimys gracilis**	*left mandibular fragment with dp4-m2*
		MPM-PV 20560	**Prospaniomys** *sp. nov.?*	*upper molar*
		MPM-PV 20561	**Dudumus** *sp. nov.?*	*right DP4-M1*
		MPM-PV 20562	**Spaniomys** *sp.*	*left lower molar*
		MPM-PV 20563	**Prolagostomus pusillus**	*right M3*
		MPM-PV 20564	**Prolagostomus pusillus**	*right mandibular fragment with p4-m2*
		MPM-PV 20565	**Prolagostomus pusillus**	*left maxillary fragment with P4*
		MPM-PV 20566	**Prolagostomus pusillus**	*left mandibular fragment with m2-m3*
		MPM-PV 20567	**Prolagostomus** *sp.*	*right lower molar*
		MPM-PV 20568	**Pliolagostomus notatus**	*right upper molar*
		MPM-PV 20569	**Prolagostomus** *sp.*	*right upper molar?*
		MPM-PV 20570	**Prolagostomus** *sp.*	*left lower molar*
		MPM-PV 20571	**Eocardia** *sp.*	*right upper molar*
		MPM-PV 20572	**Neoreomys australis**	*right upper molar*
		MPM-PV 20573	**Prolagostomus** *sp.*	*left maxillary fragment with M1-M2*
		MPM-PV 20574	**Prolagostomus pusillus**	*right mandibular fragment with p4*
		MPM-PV 20575	**Stichomys regularis**	*left dp4*
		MPM-PV 20576	**Pliolagostomus notatus**	*right maxillary fragment P4-M2*
		MPM-PV 20577	**Perimys onustus**	*right m3*
		MPM-PV 20578	**Eocardia** *sp.*	*left mandibular fragment with p4-m1*
		MPM-PV 20579	**Pliolagostomus/Prolagostomus**	*left maxilla with P4-M2 (broken)*
		MPM-PV 20580	**Pliolagostomus/Prolagostomus**	*left maxillary fragment with P4-M1*
		MPM-PV 20581	**Eocardia montana**	*right mandible with dp4-m1*
		MPM-PV 20582	**Eocardia** *sp.*	*left? broken molar*
		MPM-PV 20583	**Neoreomys australis**	*left lower molar*
		MPM-PV 20584	**Neoreomys australis**	*left lower molar (broken)*
		MPM-PV 20585	**Perimys onustus**	*left M1 or M2*
		MPM-PV 20586	**Prolagostomus pusillus**	*left maxillary fragment with P4*
		MPM-PV 20587	**Prolagostomus pusillus**	*left M1*
		MPM-PV 20588	**Eocardia montana**	*left p4*
		MPM-PV 20589	**Prolagostomus pusillus**	*left maxillary fragment with M1-M2*
		MPM-PV 20590	**Prolagostomus** *sp.*	*left upper molar*
		MPM-PV 20591	**Prolagostomus** *sp.*	*right upper molar*
		MPM-PV 20592	**Prolagostomus** *sp.*	*isolated tooth*
		MPM-PV 20593	**Prolagostomus** *sp.*	*isolated tooth*
		MPM-PV 20594	**Prolagostomus** *sp.*	*left maxillary fragment with P4*
		MPM-PV 20595	**Acarechimys** *sp.*	*left maxillary fragment with DP4-M1*
		MPM-PV 20596	*cf.* **Acarechimys minutissimus**	*left mandibular fragment with dp4-m3*
		MPM-PV 20597	**Prolagostomus** *sp.*	*isolated molar*
		MPM-PV 20598	**Steiromys detentus**	*left p4*
		MPM-PV 20599	**Pliolagostomus notatus**	*left M3*
		MPM-PV 20600	**Prolagostomus pusillus**	*right M3*

Appendix 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20601	*Cavioidea*	*broken tooth*
		MPM-PV 20602	*Octodontoidea*	*maxillary fragment with tooth*
		MPM-PV 20603	**Prolagostomus** *sp.*	*isolated tooth*
		MPM-PV 20604	**Prolagostomus** *sp.*	*right lower molar*
		MPM-PV 20605	**Prolagostomus** *sp.*	*left upper molar*
		MPM-PV 20606	**Prolagostomus pusillus**	*right mandibular fragment with p4 and broken incisor*
		MPM-PV 20607	**Prolagostomus** *sp.*	*left mandibular fragment with p4*
		MPM-PV 20608	**Prolagostomus pusillus**	*left M3*
		MPM-PV 20609	**Prolagostomus pusillus**	*left M3*
		MPM-PV 20610	**Prolagostomus pusillus**	*left M3*
		MPM-PV 20611	**Prolagostomus** *sp.*	*isolated tooth*
		MPM-PV 20612	**Pliolagostomus/Prolagostomus**	*left p4*
		MPM-PV 20613	**Prolagostomus** *sp.*	*right upper molar*
		MPM-PV 20614	**Pliolagostomus notatus**	*left upper molar*
		MPM-PV 20615	**Prolagostomus** *sp.*	*isolated tooth*
		MPM-PV 20616	**Prolagostomus** *sp.*	*broken tooth*
		MPM-PV 20617	**Stichomys** *sp.*	*right M1 or M2*
		MPM-PV 20618	**Spaniomys** *sp.*	*left mandibular fragment with m2*
		MPM-PV 20619	**Stichomys** *sp.*	*left dp4*
		MPM-PV 20620	**Stichomys** *sp.*	*left m2*
		MPM-PV 20621	**Spaniomys** *sp.*	*upper molar (broken)*
		MPM-PV 20622	**Acarechimys***?*	*right DP4-M1*
		MPM-PV 20623	*Octodontoidea*	*broken upper tooth*
		MPM-PV 20624	**Neoreomys australis**	*left upper molar*
		MPM-PV 20625	**Neoreomys australis**	*left upper molar*
		MPM-PV 20626	**Neoreomys australis**	*left p4*
		MPM-PV 20627	**Prolagostomus pusillus**	*left p4*
		MPM-PV 20628	*Octodontoidea*	*left mandible with broken incisor*
		MPM-PV 15096	**Acarechimys constans**	*left mandible with dp4-m2 and incisor*
		MPM-PV 20629	**Prolagostomus** *sp.*	*right p4*
		MPM-PV 20630	**Steiromys duplicatus**	*left upper molar*
		MPM-PV 20631	**Stichomys** *sp.*	*left M1 or M2*
		MPM-PV 20632	**Spaniomys** *sp.*	*left upper molar*
		MPM-PV 20633	**Spaniomys** *sp.*	*left M3*
		MPM-PV 20634	**Stichomys regularis**	*left mandibular fragment with m2-m3*
		MPM-PV 20635	**Neoreomys australis**	*right upper molar*
		MPM-PV 20636	**Neoreomys australis**	*left lower molar*
		MPM-PV 20637	**Acarechimys constans**	*right mandible with dp4 and incisor*
		MPM-PV 20638	**Eocardia / Schistomys**	*broken tooth*
		MPM-PV 20639	**Prolagostomus pusillus**	*left M3*
		MPM-PV 20640	**Stichomys regularis**	*left mandible with m1-m2 and incisor*
		MPM-PV 17431	**Acarechimys gracilis**	*right mandible with m1-m3*
		MPM-PV 20641	**Acarechimys** *sp.*	*right mandible with m1-m2*
		MPM-PV 20642	**Stichomys regularis**	*left mandible with dp4-m1 and incisor*
		MPM-PV 20643	**Stichomys regularis**	*right maxillary fragment with DP4-M2*
		MPM-PV 20644	**Stichomys regularis**	*left maxillary fragment with DP4-M3*
		MPM-PV 20645	**Stichomys regularis**	*right mandibular fragment with m3*
		MPM-PV 20646	**Spaniomys riparius**	*right mandible with dp4-m3*
		MPM-PV 20647	**Spaniomys riparius**	*left maxillary fragment with DP4-M2*

APPENDIX 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 17432	**Acarechimys gracilis**	*right mandibular fragment with dp4 (broken)-m3*
		MPM-PV 20648	**Phanomys** *sp.*	*right mandible with m1-m2*
		MPM-PV 20649	*Octodontoidea*	*edentulous right mandibular fragment*
		MMP-PV 17427	**Acarechimys minutissimus**	*right mandible with dp4-m2 and incisor*
		MPM-PV 15094	**Acarechimys constans**	*left mandibular fragment with dp4-m1*
		MPM-PV 20650	**Sciamys** *sp.*	*left maxillary fragment with P4-M3*
		MPM-PV 20651	**Perimys onustus**	*right maxillary fragment with P4-M3*
		MPM-PV 20652	**Steiromys detentus**	*left mandibular fragment with p4*
		MPM-PV 20653	**Acaremys** *sp.*	*left mandibular fragment with p4-m2*
		MPM-PV 20654	*caviomorpha?*	*basicranium/left auditory bulla?*
		MPM-PV 20655	**Perimys onustus**	*left maxillary fragment with P4-M3*
		MPM-PV 15095	**Acarechimys constans**	*right mandibular fragment with m1-m3*
		MPM-PV 20656	**Stichomys/ Adelphomys**	*right m1*
		MPM-PV 20657	**Phanomys** *sp.*	*right upper molar?*
		MPM-PV 20658	**Perimys onustus**	*right p4*
		MPM-PV 20659	**Perimys onustus**	*right p4*
		MPM-PV 20660	**Perimys onustus**	*left M1 or right M3*
		MPM-PV 20661	**Perimys onustus**	*left lower molar?*
		MPM-PV 20662	**Perimys onustus**	*left lower molar?*
		MPM-PV 20663	**Perimys onustus**	*left lower molar?*
		MPM-PV 20664	**Perimys onustus**	*left lower molar?*
		MPM-PV 20665	**Perimys onustus**	*cheek tooth*
		MPM-PV 20666	**Perimys onustus**	*cheek tooth*
		MPM-PV 20667	**Sciamys principalis**	*right mandible with p4-m3*
		MPM-PV 20668	**Sciamys latidens**	*right mandibular fragment with p4-m2*
		MPM-PV 20669	**Neoreomys australis**	*right upper molar*
		MPM-PV 15097	**Acarechimys constans**	*right mandible with m2-m3*
	Estancia El Tordillo (EET)	*MPM-PV 20670*	**Perimys onustus**	*left mandible with p4-m3 and incisor*
		MPM-PV 20671	**Perimys erutus**	*right mandible with p4-m3*
		MPM-PV 20672	**Perimys***?*	*right mandible with broken incisor*
		MPM-PV 20673	**Perimys***?*	*incisor fragment*
		MPM-PV 20674	**Eocardia /Schistomys**	*right maxillary fragment with M1-M3*
		MPM-PV 20675	**Prolagostomus** *sp.*	*right lower molar*
		MPM-PV 20676	**Neoreomys australis**	*left p4*
		MPM-PV 20677	**Neoreomys australis**	*right p4*
		MPM-PV 20678	**Neoreomys australis**	*right M3*
		MPM-PV 20679	**Neoreomys australis**	*left lower molar*
		MPM-PV 20680	**Neoreomys australis**	*left lower molar*
		MPM-PV 20681	**Neoreomys australis**	*left P4*
		MPM-PV 20682	**Neoreomys australis**	*right p4*
		MPM-PV 20683	**Neoreomys australis**	*left upper molar*
		MPM-PV 20684	**Neoreomys australis**	*left upper molar*
		MPM-PV 20685	**Neoreomys australis**	*left lower molar*
		MPM-PV 20686	**Prolagostomus** *sp.*	*right mandibular fragment with p4-m2*
		MPM-PV 20687	**Stichomys regularis**	*palate with left and right DP4-M3*
		MPM-PV 20688	**Spaniomys** *sp.*	*right mandible with dp4-m2(broken)*
		MPM-PV 20689	**Spaniomys** *sp.*	*left mandibular fragment with dp4-m3*
		MPM-PV 20690	**Stichomys** *sp.*	*right mandible with dp4-m1*
		MPM-PV 20691	**Spaniomys** *sp.*	*left maxilla with 2 broken teeth*

Appendix 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20692	**Prolagostomus** *sp.*	*2 right upper teeth*
		MPM-PV 20693	**Spaniomys** *sp.*	*left dp4*
		MPM-PV 20694	*Caviomorpha*	*left mandibular fragment with incisor*
		MPM-PV 20695	**Spaniomys** *sp.*	*right mandibular fragment with m1*
		MPM-PV 20696	**Prolagostomus** *sp.*	*right P4*
		MPM-PV 20697	**Stichomys/ Adelphomys**	*left m2*
		MPM-PV 20698	**Eocardia** *sp.*	*left upper molar*
		MPM-PV 20699	**Spaniomys** *sp.*	*left upper molar*
		MPM-PV 17438	**Acarechimys minutissimus**	*left mandibular fragment with dp4-m2*
		MPM-PV 15087	**Acarechimys minutus**	*right mandibular fragment with m2*
		MPM-PV 20700	**Neoreomys australis**	*right mandible with m2-m3*
		MPM-PV 20701	**Prolagostomus** *sp.*	*left maxillary fragment with P4-M2*
		MPM-PV 20702	**Stichomys** *sp.*	*right maxillary fragment with DP4-M1*
		MPM-PV 20703	**Stichomys** *sp.*	*left maxillary fragment with DP4*
		MPM-PV 20704	**Prolagostomus** *sp.*	*left upper molar*
		MPM-PV 20705	**Prolagostomus** *sp.*	*left M3*
		MPM-PV 20706	**Pliolagostomus notatus**	*right upper molar*
		MPM-PV 20707	**Pliolagostomus notatus**	*right upper molar*
		MPM-PV 20708	**Spaniomys** *sp.*	*right lower molar (broken)*
		MPM-PV 20709	**Prolagostomus** *sp.*	*left lower molar (broken)*
		MPM-PV 20710	**Neoreomys** *sp.*	*broken tooth*
		MPM-PV 20711	**Eocardia** *sp.*	*broken tooth*
		MPM-PV 20712	**Prolagostomus** *sp.*	*right lower molar*
		MPM-PV 20713	**Perimys** *sp.*	*upper molar*
		MPM-PV 20714	**Perimys onustus**	*P4 and small left maxillary with M1*
		MPM-PV 20715	**Prolagostomus** *sp.*	*left mandibular fragment with p4-m3*
		MPM-PV 20716	**Prolagostomus** *sp.*	*right mandibular fragment with p4*
		MPM-PV 20717	**Eocardia/ Schistomys**	*right maxillary fragment with M1-M2*
		MPM-PV 20718	**Prolagostomus** *sp.*	*right maxilla with M1-M3(broken)*
		MPM-PV 15088	**Acarechimys minutus**	*left maxillary fragment with DP4-M3*
		MPM-PV 20719	**Spaniomys** *sp.*	*left mandibular fragment with m1*
		MPM-PV 20720	**Spaniomys** *sp.*	*left lower molar*
		MPM-PV 20721	**Eocardia** *sp.*	*isolated tooth*
		MPM-PV 20722	**Prolagostomus** *sp.*	*right lower molar*
		MPM-PV 20723	**Sciamys principalis**	*left mandible with p4-m3*
		MPM-PV 20724	*cf.* **Scleromys**	*right p4*
		MPM-PV 20725	**Steiromys***?*	*left dp4*
		MPM-PV 20726	**Prolagostomus** *sp.*	*left mandibular fragment with m1-m3*
		MPM-PV 20727	**Stichomys/ Adelphomys**	*left DP4-M1*
		MPM-PV 20728	**Prolagostomus** *sp.*	*right upper molar*
		MPM-PV 20729	**Prolagostomus** *sp.*	*left p4*
		MPM-PV 20730	**Pliolagostomus notatus**	*left upper molar*
		MPM-PV 20731	**Pliolagostomus notatus**	*left M3*
		MPM-PV 20732	**Spaniomys** *sp.*	*left maxillary fragment with DP4*
		MPM-PV 20733	**Prolagostomus** *sp.*	*right lower molar*
		MPM-PV 20734	**Stichomys***?*	*left dp4*
		MPM-PV 20735	**Stichomys/ Adelphomys**	*right upper molar*
		MPM-PV 20736	**Prolagostomus** *sp.*	*2 broken teeth*
		MPM-PV 20737	**Prolagostomus/Pliolagostomus**	*right upper molar*

APPENDIX 1 - Continued

Locality	*Estancia*	*Collection number*	*Systematic taxonomy*	*Material*
		MPM-PV 20738	**Schistomys erro**	*right maxilla with P4-M1 and M2-M3 and left maxilla with M1-M2*
		MPM-PV 20739	**Spaniomys** *sp.*	*edentulous left mandible*
		MPM-PV 20740	**Sciamys principalis**	*left mandibular fragment with dp4-m1*
		MPM-PV 20741	**Sciamys principalis**	*right maxillary fragment with P4-M3*
		MPM-PV 20742	**Sciamys principalis**	*left mandibular fragment with p4-m3*
		MPM-PV 17436	**Acarechimys minutus**	*right mandibular fragment with dp4*
		MPM-PV 20743	**Sciamys** *sp.*	*right maxillary fragment with P4-M1*
		MPM-PV 20744	**Spaniomys** *sp.*	*right maxillary fragment with M2*
		MPM-PV 20745	**Spaniomys** *sp.*	*right M1 or M2 (broken)*
		MPM-PV 17439	**Acarechimys gracilis**	*left mandibular fragment with molar*
		MPM-PV 17437	**Acarechimys minutus**	*left dp4*
		MPM-PV 20746	**Spaniomys** *sp.*	*left DP4*
		MPM-PV 20747	*Octodontoidea?*	*left lower molar*
		MPM-PV 20748	**Schistomys erro***?*	*left M3*
		MPM-PV 20749	**Neoreomys australis**	*right m1 or m2*
		MPM-PV 20750	**Prolagostomus** *sp.*	*left mandibular fragment with m1-m2*
		MPM-PV 20751	**Perimys onustus**	*left upper molar*
		MPM-PV 20752	**Prolagostomus** *sp.*	*left p4*
		MPM-PV 20753	**Eocardia** *sp.*	*left lower molar*
		MPM-PV 20754	**Eocardia** *sp.*	*right lower molar (broken)*
		MPM-PV 20755	**Pliolagostomus notatus**	*isolated molar*
		MPM-PV 20756	**Pliolagostomus notatus**	*right lower molar*
		MPM-PV 20757	**Pliolagostomus notatus**	*right lower molar*
		MPM-PV 20758	**Pliolagostomus notatus**	*lower molar*
		MPM-PV 20759	**Pliolagostomus notatus**	*isolated molar*
		MPM-PV 20760	*Octodontoidea*	*right mandibular fragment with incisor*
		MPM-PV 20761	**Stichomys/ Adelphomys**	*right maxillary fragment with DP4(broken)-M2*
		MPM-PV 20762	**Sciamys** *sp.*	*right mandible with m1-m2*
		MPM-PV 20763	**Neoreomys** *sp.*	*right upper molar (broken)*
		MPM-PV 20764	*Caviomorpha?*	*proximal ulna fragment?*
		MPM-PV 20765	**Neoreomys australis**	*right lower molar*
		MPM-PV 20766	**Spaniomys** *sp.*	*left mandibular fragment with m1-m2*
		MPM-PV 20767	**Spaniomys** *sp.*	*right lower molar*
		MPM-PV 20768	**Prolagostomus** *sp.*	*left M3*
		MPM-PV 20769	**Spaniomys** *sp.*	*left maxillary fragment with DP4-M1*
Yaten Huageno (YH)	*Estancia El Refugio (EER)*	*MPM-PV 20770*	**Spaniomys** *sp.*	*left mandibular fragment with m1*
		MPM-PV 20771	**Stichomys regularis**	*right maxillary fragment with DP4-M1*
		MPM-PV 20772	**Neoreomys australis**	*left upper molar*