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A taxonomic study of the South American genus *Euneomys* (Cricetidae, Rodentia)

Un estudio taxonómico del género *Euneomys* (Cricetidae, Rodentia) de América del Sur

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ABSTRACT

We examined 114 specimens of the genus *Euneomys* from samples of five geographic areas. Biometric measurements were subjected to univariate and multivariate analyses and plotted together with measurements of the type specimens obtained from the literature. Different karyotypes were found for *E. mordax* and *E. chinchilloides petersoni.* Color and dental patterns were analyzed. Ecological preferences and distribution patterns were indicated. *E. mordax* is re-evaluated as a full species . *E. petersoni, E. noei* are recognized as subspecies of *E. chinchilloides.*

Key words: Distribution, ecology, karyotypes, morphology, statistical analyses, taxonomy.

RESUMEN

Se examinaron 114 ejemplares del género *Euneomys* provenientes de muestras de cinco áreas geográficas. Las medidas biométricas fueron analizadas con métodos uni- y multivariados y evaluadas con medidas de especímenes tipo obtenidos de la literatura. Se encontraron diferentes cariotipos para *E. mordax* y *E. chinchilloides petersoni.* Se analizaron patrones de coloración y de dentadura. Se indican las preferencias ecológicas y patrones de distribución. *E. mordax* es reevaluado como especie plena. *E. petersoni, E. noei* son reconocidas como subespecies de *E. chinchilloides.*

Palabras claves: Análisis estadísticos, cariotipos, distribución, ecología, morfología, taxonomía.

INTRODUCTION

Waterhouse (1839) described *Reithrodon chinchilloides* from the southern shore of the Straits of Magellan. Coues (1874) created *Euneomys* as a subgenus of the genus *Reithrodon.* A second species *Reithrodon (Euneomys fossor)* was described by Thomas (1899), and Osgood (1943) outlined in detail the systematic problems of *fossor.* We agree with him to keep *fossor* only in a 'hypothetical' list. Thomas (1901) gave full generic rank to *Euneomys.* From South Patagonia, Allen (1903) described *E. petersoni* based on its smaller size and different coloration. Thomas (1912) published the description of *E. mordax* from San Rafael, Argentina, separated by its larger size compared with *E. chinchilloides.* Thomas (1916) also described *E. ultimus* from Cape Horn Islands based on its larger size relative to *E. chinchilloides.* *Euneomys dabbeni,* found near Lake Viedma, Santa Cruz, Argentina, was separated by Thomas (1919) from *E. petersoni.* Osgood (1943) declared *E. dabbeni* synonymous to *E. petersoni,* as the type of *E. dabbeni* was a young animal and its small size understandable on that basis. Mann (1944) described *E. noei* from near Santiago, Chile, based on size difference relative to *E. chinchilloides.* Pine *et al.* (1979) preferred to maintain two other Chilean populations of *Euneomys* undetermined until more material for classification were available. One population based on specimens from Paso Pino Hachado, Malleco province collected by Greer, the other based on specimen from the Andes near Santiago collected by Schamberger (Pine *et al.* 1979).

The genus *Euneomys* was critically revised by Hershkovitz (1962). He placed

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E. petersoni as a subspecies of *E. chinchillloides*; and also questioned the validity of the species *E. noei* as well as *E. mordax*. In a recent revision, Yáñez *et al.* (1987) restricted the genus to one species, *E. chinchilloides* (Waterhouse, 1839) and questioned even the existence of subspecies. The main reasons for this decision were presumably scarcity of material, absence of clear-cut differences among localities, and probable sampling errors. The obvious differences between poor trapping records of *Euneomys* and its frequent appearance as prey of owls previously assumed to be sampling errors, may be better explained by few trapping because of the difficult access to the rough habitats of these animals. Additional materials, collected in recent years, allow statistical analysis, and demonstrate geographical and ecological separations between operational taxonomic units (OUT's).

In the present paper, the taxonomy of the following taxa are revised using new material for morphometric and phenotypic comparison as well as additional ecological and karyopytic data: *Euneomys chinchilloides* Waterhouse (1839); *E. petersoni* Allen, 1903; *E. mordax* Thomas, 1912; *E. ultimus* Thomas, 1916; *E. noei* Mann, 1944; *E.* sp. Greer, 1965; and *E.* sp. Pine *et al.* (1979). Thus we hope to get a better understanding to the taxonomy of this genus.

MATERIAL AND METHODS

A total of 114 specimens from the following localities in Chile and Argentina was examined: La Parva (Santiago; 70°16'S, 33°20'W), 12; Chillán (Bío-Bío; 71°25'S, 36°54'W), 2; Antuco (Bío-Bío; 71°18'S, 37°12'W), 2; Paso Pino Hachado (Araucanía; 38°38'S, 70°51'W), 17; Bariloche (Río Negro, Argentina; 41°08'S, 71°24'W), 11; Coihaique (Aisén; 45°27'S, 71°37'W), 1; Puerto Ibáñez (Aisén; 71°58'S, 46° 16'W), 17; Paine (Magallanes; 51°02'S, 72°30'W), 13; Lago Sarmiento (Magallanes; 51°03'S, 72°37'W), 15; Cueva del Milodón (Magallanes; 51°35'S, 72°35'W), 2; Río Ciaike (Magallanes; 52°05'S, 70° 00'W), 3; Okerer Aike (Magallanes; 52°15' S, 69°22'W), 1; Estancia La Frontera (Tierra del Fuego; 54°00'S, 68°54'W), 3; Cerro Cóndor (Tierra del Fuego; 68°36:S, 54°59'W), 12; Isla Grevy (Tierra del Fuego; 55°32'S, 67°37'W), 2.

External and cranial measurements were taken by the senior author, except for a few specimens, from Lago Sarmiento and Bariloche. Cranial measurements were taken with dial calipers or a graduated ocular. Only adult and subadult specimens (Reise, 1972) were used for numerical analyses. The following 14 measurements were analyzed statistically: head plus body length, tail length, hindfoot length, length of ear, condylobasal length, diastema length, maxillary alveolar length, length of mandible, length of posterior palatal foramen, zygomatic breadth, least interorbital breadth, breadth and height of braincase, and height of mandible.

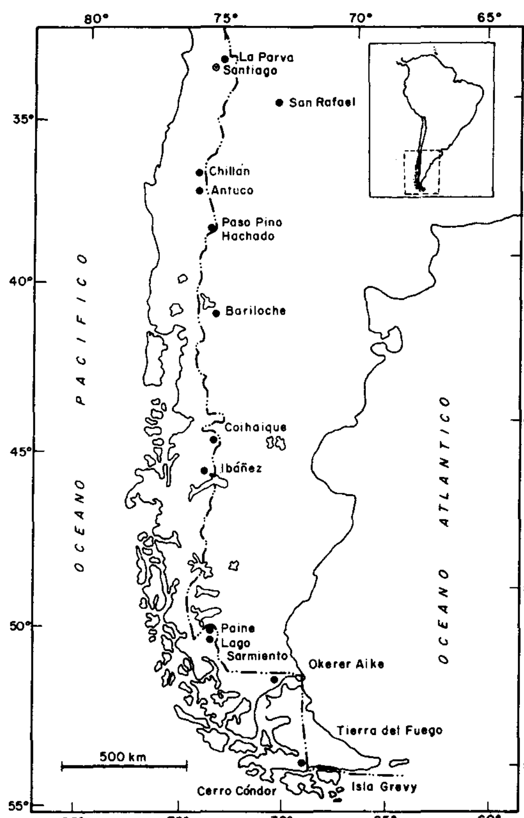

Fig. 1: Geographic location of specimens of *Euneomys* examined in this study.

Ubicación geográfica de especímenes de *Euneomys* examinados en este trabajo.

Uni- and multivariate statistical analyses were performed using KMSS programs (Kleiter 1985) and NTSYS packages (Rohlf 1987). Univariate standard statistics were computed and samples were tested for normality. There were no significant differences between sexes, so these were pooled for further analyses. On the basis of geographic proximity, climatic conditions, and habitat characteristics, samples were grouped into five major units: La Parva, Paso Pino Hachado, Bariloche, Paine, and Tierra del Fuego.

A distance phenogram was calculated with NTSYS using the UPGMA method on the arithmetic means of 9 characters. The measurements of the braincase as well as of the mandible were excluded, to maintain sample sizes in the face of incomplete material. For the same reason, multiple discriminant function analyses (MDFA) were carried out with 14, 9 and 6 characters, based on 46, 66, and 52 specimens respectively. Analyses with 9 characters permitted the inclusion of measurements from types and paratypes of *Euneomys* (taken from the literature) and from additional material from Lago Sarmiento and Bariloche. Multiple discriminant function analysis with 6 characters was performed in order to incorporate measurements of fragmentary skulls from raptor pellets from the *E. petersoni* distribution area. Accordingly, head plus body length, tail length, hindfoot length, length of ear, length of condylobasal, breadth across zygomatic arches, breadth and height of the braincase were excluded. Multiple discriminant function analysis was chosen because it maximizes the between-population variation in relation to the local variation (Thorpe 1983). Moreover, using morphometric characters they can negate the effect of information redundancy (Thorpe 1976). Homoscedasticy of the within-group covariance matrices was met in the analyzed material.

Chromosomal variation was analyzed in six specimens from three localities sampled (Bariloche: 2 males, 2 females; Paso Pino Hachado: 1 male; Coyhaique Alto: 1 male). Preparations were obtained from bone marrow following the conventional colchicine-hypotonic technique (Patton 1967) with yeast pretreatment as outlined by Lee and Elder (1980) to increase the mitotic rate. Karyotypes were prepared from selected material and a minimum of 10 counts of metaphase spreads were scored for each specimen. Chromosome morphology and fundamental number (FN) follow Patton (1967). Chromosomes were arranged and sequentially numbered in decreasing size with biarmed elements arranged first, and the single-armed elements last.

Skins of the specimens from the five geographic areas were arranged according to color variation from light gray to dark brown, considering back and belly separately. The resultant gradients were compared between samples.

Dental pattern shows high variability with aging. Therefore, all skulls were classified into five cohorts analyzing molar wear (Reise 1972). One representative example of upper and lower molar rows of each cohort was drawn with a 10x magnification. Comparison of dental pattern was based on these drawings.

RESULTS

Results of standard univariate statistical analysis are given in Table 1. Geographic samples overlap across all measurements. Separation is not possible by any single character, but we can indicate the value of some characters and some general tendencies of their variation for taxonomic differentiation by comparing the different samples. Specimens from Tierra del Fuego have relatively long tails and hindfeet, but shorter ears, and a flat, broad braincase. Those from Paso Pino Hachado are heavy bodied with a relatively long tail and a short, stout skull. Individuals from Bariloche and Paine are the smallest externally and cranially. Specimens from La Parva are heavy bodied, with short tails, long ears but with a long, slender skull.

The distance phenogram depicting the relationships among five geographic samples of *Euneomys* is shown in Figure 2. The cophenetic correlation coefficient is 0.839.

TABLE 1

Geographic variation in external and cranial measurements of subadult and adult specimens in five samples of *Euneomys*. Means ± standard error (range).

Variación geográfica en las medidas externas y craneanas de especímenes subadultos y adultos de cinco muestras de *Euneomys*. Promedios ± error estándar (rango).

Characters	La Parva (*noei*) (N = 11)	P. Hachado (*mordax*) (N = 17)	Bariloche (*pertesoni*) (N = 12)	Paine (*petersoni*) (N = 12)	T. Fuego (*chinchilliodes*) (N = 9)
Head plus body length	126.46 ± 12.23 (111 — 149)	126.53 ± 14.78 (108 — 158)	121.31 ± 5.75 (114 — 130)	122.83 ± 9.17 (108 — 138)	121.33 ± 15.24 (103 — 143)
Tail length	72.18 ± 9.62 (59 — 88)	84.53 ± 14.36 (66 — 107)	67.23 ± 6.06 (60 — 82)	62.71 ± 5.40 (50 — 68)	75.67 ± 8.47 (62 — 90)
Hindfoot length	27.64 ± 1.21 (26 — 29)	27.71 ± 1.43 (26 — 30)	26.23 ± 0.60 (26 — 27)	27.08 ± 1.00 (26 — 28)	28.22 ± 1.92 (25 — 30)
Length of ear	21.73 ± 1.62 (19 — 24)	20.94 ± 0.98 (19.1 — 20.5)	20.67 ± 0.58 (20 — 21)	21.0 ± 1.52 (18.5 — 22.5)	19.88 ± 1.29 (18.5 — 22.2)
Condylobasal length	29.53 ± 1.81 (28.0 — 33.4)	28.80 ± 2.59 (25.6 — 33.7)	29.71 ± 1.61 (26.5 — 31.1)	27.76 ± 1.34 (25.4 — 29.5)	29.11 ± 1.85 (26.8 — 32.0)
Diastema length	8.21 ± 0.73 (7.0 — 9.5)	7.78 ± 1.02 (5.8 — 9.5)	7.49 ± 0.48 (6.9 — 8.5)	7.73 ± 0.71 (6.6 — 8.6)	8.04 ± 0.87 (7.4 — 8.0)
Maxillary alveolar length	6.14 ± 0.34 (5.9 — 7.0)	6.38 ± 0.52 (5.4 — 6.9)	5.63 ± 0.18 (5.2 — 5.9)	5.8 ± 0.29 (5.5 — 6.5)	6.24 ± 0.26 (5.5 — 6.5)
Zygomatic breadth	17.78 ± 1.07 (16.8 — 19.9)	18.18 ± 1.23 (16.5 — 20.8)	17.64 ± 0.29 (16.9 — 18.0)	17.73 ± 0.95 (15.8 — 18.6)	17.82 ± 0.85 (16.4 — 19.1)
Interorbital breadth	4.02 ± 0.31 (3.7 — 4.8)	4.42 ± 0.3 (3.6 — 4.8)	3.83 ± 0.17 (3.5 — 4.0)	3.83 ± 0.21 (3.5 — 4.2)	4.1 ± 0.15 (3.8 — 4.3)
Height of braincase	10.03 ± 0.57 (9.0 — 10.9)	10.23 ± 0.59 (9.0 — 11.3)	9.9 ± 0.1 (9.8 — 10.0)	9.63 ± 0.48 (8.8 — 10.0)	9.73 ± 0.39 (9.3 — 10.5)
Breadth of braincase	13.74 ± 0.31 (13.3 — 14.3)	14.09 ± 0.33 (13.5 — 14.8)	13.77 ± 0.42 (13.3 — 14.1)	13.75 ± 0.45 (13.1 — 14.4)	14.48 ± 0.43 (13.7 — 15.0)
Length of mandible	17.46 ± 1.04 (15.8 — 19.6)	17.37 ± 1.29 (15.8 — 20.0)	17.00 ± 0.1 (16.9 — 17.1)	16.98 ± 0.56 (16.1 — 17.6)	17.21 ± 0.95 (15.5 — 18.5)
Height of mandible	9.18 ± 0.43 (8.3 — 10.0)	8.49 ± 0.83 (7.2 — 10.0)	9.17 ± 0.06 (9.1 — 9.2)	8.93 ± 0.39 (8.3 — 9.3)	8.9 ± 0.64 (7.6 — 9.7)
Length of anterior palatal foramen	8.49 ± 0.30 (8.0 — 9.0)	7.65 ± 0.74 (6.6 — 8.6)	7.47 ± 0.39 (7.0 — 8.0)	7.87 ± 0.52 (6.9 — 8.4)	8.37 ± 0.79 (6.8 — 9.5)

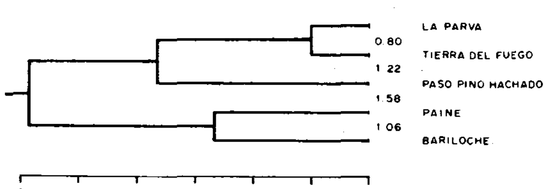

Fig. 2: Distance phenogram of the genus *Euneomys* computed from the distance matrix based on 9 standardized characters and clustered by UPGMA. The cophenetic correlation for the phenogram is 0.839.

Fenograma de distancias del género *Euneomys* computados de una matriz de distancia basada en 9 caracteres estandarizados y ordenados por el método de UPGMA. La correlación cofenética para el fenograma es 0.839.

The geographic samples fall into two major clusters: The upper group (La Parva, Tierra del Fuego, Paso Pino Hachado) is composed of large, stout individuals. The lower group (Paine, Bariloche) represents smaller individuals.

Loadings and the scattergram for multiple discriminant function analysis performed of 14 characters is shown in Figure 3, and in Table 2. The first two functions explain 76% of the total variance. La Parva and Paine units overlap significantly. Least interorbital breadth and length of tail are the most strongly loaded characters on the first function, which separates the

Paso Pino Hachado sample from La Parva, Paine. Specimens from Tierra del Fuego are discriminated mainly on the second function, which loads most heavily by breadth of braincase and ear length (Table 2). Two specimens from Paso Pino Hachado appear to be outliers of this otherwise well defined group.

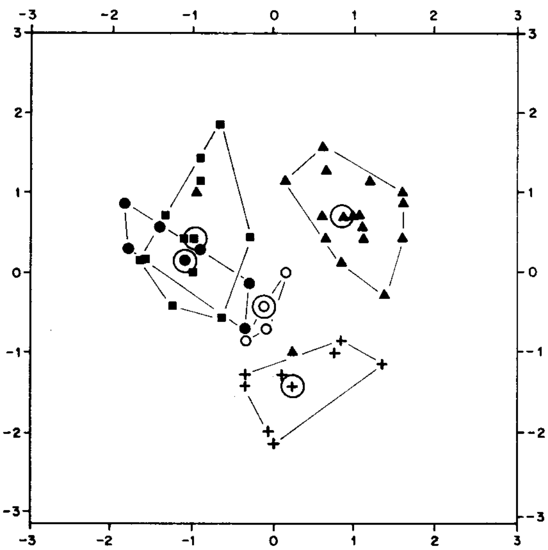

Fig. 3: Discriminant - z - scores for function 1 (abscissa) and function 2 (ordinate) of multiple discriminant function analysis including 14 characters. Variance explained by the first two functions is 76%. Symbols: ■ = La Parva, ▲ = Paso Pino Hachado, ○ = Bariloche, ● = Paine, + = Tierra del Fuego, ◯ = Centroids.

Puntajes discriminantes - z para función 1 (abscisa) y función 2 (ordenada) del análisis de funciones discriminantes múltiples incluyendo 14 caracteres. La varianza explicada por las dos primeras funciones es 76%.

The scattergram of the second MDFA based on 9 characters and additional material, is quite different from that of the above analysis (Figure 4, Table 2). The first two functions explain 89.4% of the total variance. Least interorbital breadth and tail length are again the defining characters on the first function, segregating Paso Pino Hachado specimens from the other samples. The type specimen of *E. mordax* is included here. Samples from La Parva, Tierra del Fuego, Bariloche, and Paine fail to segregate on the first function. The second function, loaded mostly by the length of the palatal foramen and the hindfoot length, separates the sample from Bariloche (Table 2). The type of *E. petersoni* appears nearer to the centroid of the Paine sample than to that of Bariloche. The type of *E. noei* shows an intermediate position between the units of La Parva and Paso Pino Hachado. The paratype of *E. chinchilloides* is most related to the centroid of Tierra del Fuego sampling. The specimen from Isla Grevy is well incorporated in this group, while *E. ultimus* is positioned between the samples from Paine and Bariloche.

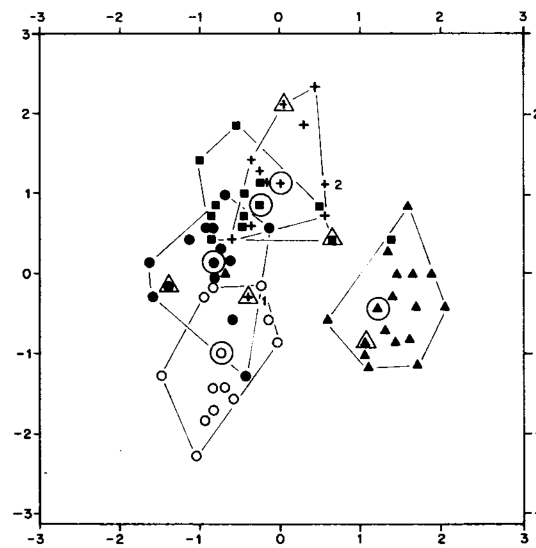

Fig. 4: Discriminant - z - scores for function 1 (abscissa) and function 2 (ordinate) including the measurements of types and paratypes, using 9 characters. Variance explained by the first two functions is 89.4%. Symbols: ■ = La Parva, ▲ = Paso Pino Hachado, ○ = Bariloche, ● = Paine, + = Tierra del Fuego, Δ = *types*, ■ = *noei*, ▲ = *mordax*, ● = *petersoni*, ⨹ = paratype of *chinchilloides*, 1 = *ultimus*, 2 = Isla Grevy, ◯ = Centroides.

Puntajes discriminantes - z para función 1 (abscisa) y función 2 (ordenada) incluyendo medidas de tipos y paratipos, usando 9 caracteres. La varianza explicada por las dos primeras funciones es 89,4%.

In the third MDFA, carried out on six characters and with additional material from owl pellets, the first two functions explained 97% of the total variance (Table 2). Least interorbital breadth and length of palatal foramen were the most heavily loaded characters on the first function, which again separated the Paso Pino Hachado sample from the remaining complex. The second function was loaded most by the length of the palatal foramen and the height of the mandible (Table 2). The positions of the centroids were nearly identical to those of the previous analyses.

Qualitative analysis of color patterns shows high variability in *Euneomys.* Younger specimens tend to be more uniformly grayish than older ones, usually having a brownish back and light brown, washed with ochraceus underparts. Specimens from Tierra del Fuego in general have the darkest and brownest pelage, and those from La Parva are the lightest and grayest. Animals from Paso Pino Hachado also are lighter colored, but old specimens with a rich brown pattern are known as well. Individuals from Bariloche and Paine tend to be more brown than gray and creamy underneath below.

Dental patterns are very similar throughout these samples. Specimens from Tierra del Fuego show the most complex pattern, whereas those from Bariloche and Puerto Ibáñez have the simplest. Additional antero-internal folds seen frequently in the second and third upper molars make the interpretation of the dental pattern more complex. This is also aggravated by the presence of postero-internal folds in

TABLE 2

Loadings on the first two functions calculated for the different characters used in the multiple discriminant function analyses.

Pesos de las dos primeras funciones calculados para los diferentes caracteres usados en los análisis de funciones discriminantes múltiples.

CHARACTERS	LOADINGS					
	MDA 14 characters		MDA 9 characters		MDA 6 characters	
	func. 1	func. 2	func. 1	func. 2	func. 1	func. 2
Head/body length	0.028	0.224	0.208	0.099		
Tail length	0.624	0.173	0.753	0.088		
Hindfoot length	0.174	−0.149	0.316	0.545		
Length of ear	−0.269	0.458	0.034	−0.036		
Condylobasal length	−0.052	0.001				
Diastema length	−0.166	−0.056	0.109	0.374	−0.076	0.422
Maxillary alveolar length	0.373	0.125	0.692	0.328	0.534	0.396
Zygomatic breadth	0.149	0.143	0.277	0.124		
Interorbital breadth	0.658	0.340	0.889	0.001	0.907	0.346
Heigth of braincase	0.279	0.370				
Breadth of braincase	0.482	−0.493				
Length of mandible	0.038	0.094			0.217	0.332
Height of mandible	−0.446	−0.169			−0.356	0.489
Length of palat. for.	−0.449	−0.289	−0.142	0.791	−0.527	0.578

the first two lower molar, and in a few cases, in the third lower molar. This complex pattern tends to disappear with advancing molar wear.

The karyotype of *Euneomys chinchilloides* (2n = 36, FN = 66) from Bariloche and Coihaique is formed by 12 pairs of metacentric to submetacentric autosomes, four pairs of subtelocentrics, and one pair of acrocentric chromosomes. The sex pair is formed by a medium-sized acrocentric X and a small subrelocentric Y (Figure 5).

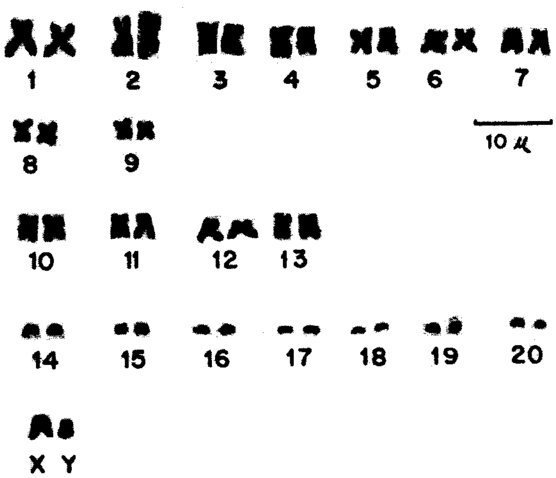

Fig. 5: Nondifferentially stained karyotype of *Euneomys mordax* (2 n = 42, FN = 66).

Cariotipo de *Euneomys mordax* sin tinción diferencial (2 n = 42, FN = 66).

The karyotype of a specimen from Paso Pino Hachado *Euneomys mordax* consists of 42 chromosomes (FN = 66). It is formed by nine pairs of metacentric to submetacentric chromosomes, four pairs of subtelocentrics, and seven pairs of acrocentric chromosomes. The sex pair is formed by a medium-sized X and a small subtelocentric Y (Figure 6).

DISCUSSION AND TAXONOMIC CONCLUSIONS

The MDFAs revealed a clear separation of the sample from Paso Pino Hachado. The phenogram also separates this unit well, but shows a closer phenetic relationship to the cluster La Parva-Tierra del Fuego.

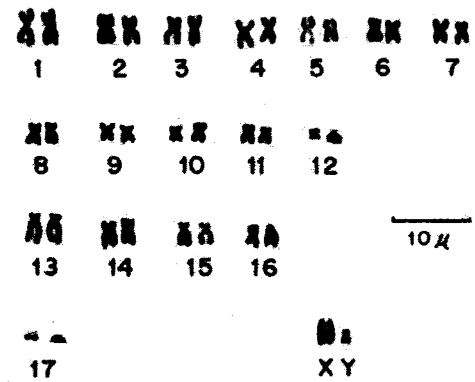

Fig. 6: Nondifferentially stained karyotype of *Euneomys chinchilloides petersoni* (2 n = 36, FN = 66).

Cariotipo de *Euneomys mordax* sin tinción diferencial (2 n = 36, FN = 66).

Specimens from Paso Pino Hachado are the largest sized, possess the longest tails and hindfeet, widest zygomatic arches, and greatest interorbital breadth. Nevertheless, they are intermediate in condylobasal length, produced by a very short an heavy rostrum (Figure 7). These characteristics fit best with the type of *E. mordax,* a species which has not been found again at the type locality of San Rafael (Mendoza Province, Argentina).

We suggest that the material dispatched by Bridges (Thomas 1912) from San Rafael (the only large village in this area by that time), was catalogued erroneously under this locality. There are striking ecological differences between Paso Pino Hachado and San Rafael, the latter being situated more than 100 km east of the high Andes and surrounded by a semiarid shrub vegetation. The environment at Paso Pino Hachado is characterized by dry, open grassland with thickets of *Nothofagus antarctica* above the timberline, and crossed by small rivulets with fresh herbaceous vegetation. Near San Rafael we did neither collect *Euneomys* nor other species such as *Chelemys macronyx* and *Akodon longiplis hirtus* which were also reported to be from this area (Thomas 1894, 1895). At Chillán, Antuco as well as at Paso Pino Hachado we caught these three species in the same traplines.

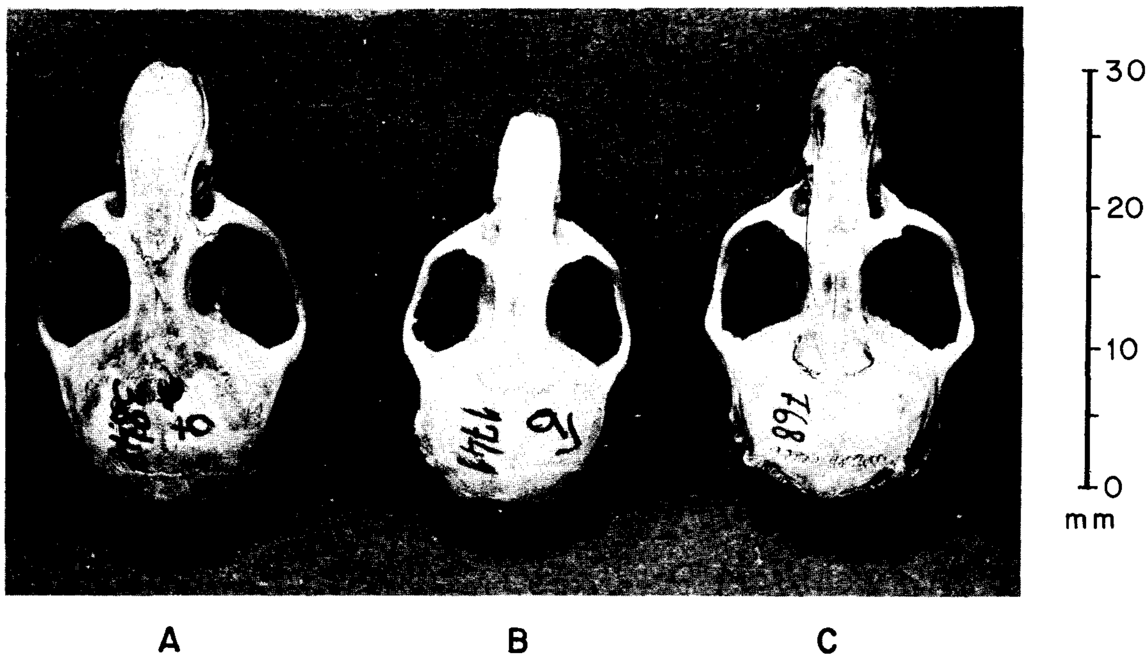

Fig. 7: Dorsal view of crania of *Euneomys.* (A) *E. mordax,* (B) *E. chinchilloides petersoni,* (C) *E. chinchilloides chinchilloides.*

Vista dorsal de los cráneos de *Euneomys.* (A) *E. mordax,* (B) *E. chinchilloides petersoni,* (C) *E. chinchilloides chinchilloides.*

Chromosomal data depicts a quite distinctive karyotype for the Paso Pino Hachado specimen. A Robertsonian process is postulated to explain the karyotypic difference observed between this specimen and those from Bariloche and Coihaique, as they maintain the same FN but differ in chromosome number. The kind and degree of difference observed here, reinforces its specific distinctiveness. Consequently, we propose to restore *E. mordax* Thomas, 1912 as a full species and give the following redescription:

Similar to *E. chinchilloides* but larger, with longer tail and hindfeet, lighter colored, adults rich brown on the back, indistinctly becoming lighter and washed with cream buff on the belly. Juveniles and subadults dark gray, very similar to *Auliscomys micropus* in coloration. Skull heavier but shorter, rostrum very short and stout, zygomatic arches wider and interorbital breadth greater, anterior palatal foramen shorter. Measurements: Total length 211.1 (184-252), tail 84.5 (66-107), hindfoot 27.7 (25-30), ear 20.94 (19.1-20.5), condylobasal 28.8 (25.6-33.7), diastema 7.78 (5.8-9.5), upper alveolar 6.38 (5.4-6.9), zygomatic breadth 18.18 (16.5-20.8), interorbital breadth 4.42 (3.6-4.8), anterior palatal foramen 7.65 (6.6-8.6). Distribution: High cordillera from south of Santiago to south of Paso Pino Hachado.

Four specimens caught by Greer (1965) at Paso Pino Hachado and identified as *E. chinchilloides petersoni* (later mentioned as *Euneomys* sp. by Yáñez *et al.* 1987) should be referred to *E. mordax* too. Most probably, those specimens had the same karyotype described for our material from this locality.

The linking of specimens from La Parva with those from Tierra del Fuego in the phenogram is surprising, because it associates the geographically most distant populations. This is confirmed by MDFA with 9 characters, while MDFA based on 14 characters separates the samples from

Tierra del Fuego and La Parva. The reasons are differences in the shape of the brain case, which is flat and broad in the first while long and slender in the second. Further, the rostrums of specimens from Tierra del Fuego are short but not heavy (Figure 7), while those from La Parva are more delicate. The paratype of *E. chinchilloides* appears nearest to the centroid of Tierra del Fuego material and allows the allocation of this sample with this species as *E. chinchilloides chinchilloides.* Externally, it is distinguished from La Parva specimens by darker colors, a smaller body, longer tail and hindfeet, but shorter ears. The specimen from Isla Grevy can be incorporated in *E. chinchilloides* too. The type of *E. ultimus* is placed, unexpectedly for geographic reasons, in the grouping of Bariloche and Paine. The biotope inhabited by *E. chinchilloides* is comparable with that mentioned for *E. mordax*. It is found above the timberline too, but is much more bare, windexposed, and with the grass restricted to bunches, and degenerated ñirre shrub. The only fresh vegetation grows protected in ravines formed by small rivulets. It is distributed in Tierra del Fuego and the northern shores of the Straits of Magellan. *Reithrodon (Euneomys) chinchilloides* Waterhouse (1839) was described as a monotypic taxon. As our results show distinctive grouping, we conclude that *E. chinchilloides* is polytypic. Quantitative, qualitative and ecological differences, permit the allocation of this southern form to *E. chinchilloides chinchilloides.*

The mentioned apparent relationships between La Parva specimens and *E. ch. chinchilloides,* turns out to be even more delicate by the outlying position of the type of *E. noei*, located by MDFA just between the groups of La Parva and Paso Pino Hachado. *E. noei* was found at 2,400 m on sandy flats with rocks and bushes of alpine aspect (Mann 1944). Later on it was caught at 3,000 m in an even more alpine habitat too. Considering all measurements, the wide geographic separation and the ecological differences, we allocate the La Parva specimens to *E. chinchilloides noei.* They are not identical with *mordax* as suggested by Hershkovitz (1962). Their known distribution is in the high Andes around Santiago.

Cluster analysis shows a close relationship between samples from Paine and Bariloche, and a clear separation from the remaining clusters. MDFAs confirm this close relationship, but in contradiction to the phenogram, they do not separate well the specimens of Paine-Bariloche, from those of La Parva-Tierra del Fuego. Specimens from Bariloche and Paine are small, the skull being the most delicate in *Euneomys.* The type of *E. petersoni* fits well with this grouping, so the Paine and Bariloche specimens can be referred to this taxon. The overlapping of the different samples, as shown by MDFAs, prevent a separation as a species from the rest of the *chinchilloides* complex. We prefer to identify *E. petersoni* as a subspecies of *E. chinchilloides* based on its smaller size, more brown coloration, delicate skull with an especially long and slender rostrum (Figure 7). Adults are comparable in size with subadults of *mordax* and *chinchilloides,* but are not uniformly gray. Its preferred habitat is described by Pearson (1987) as bare open, windswept hilltops, with an appreciable expanse of unvegetated fine scree, some scattered bushes and relatively infrequent grasses. The chromosomal data indicates a distinctive karyotype (2 n = 36) from that observed in *E. mordax*. The distribution ranges from Bariloche south to the Magellan Strait.

Of special interest are two outliers of the sample from Paso Pino Hachado, which appear in the complex of *E. chinchilloides* an one outlier of the La Parva group, which is placed in the sample of Paso Pino Hachado. The latter, being a specimen listed by Pine *et al.* (1979) as *Euneomys* sp. Several researchers, such as Pearson (pers. comm. 1988), Pine *et al.* (1979), and Greer (Pearson pers. comm. 1988), proposed the existence of two sympatric species of *Euneomys.* These outliers may support their contention, especially if they correspond to sympatric species differing in chromosome number and morphology. Further collecting at Paso

Pino Hachado will be necessary to test this contention.

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