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Mammalia, Rodentia, Sigmodontinae, *Akodon molinae* Contreras, 1968: New locality records and filling gaps

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Akodon molinae Contreras, 1968 is a large (holotype: 42.5 g), diurnal species with long and hispid fur, the dorsum is dark grey and the belly is whitish. The tail is shorter (holotype: 78 mm) than head and body (holotype: 108 mm), black dorsally and white in its centrally proximal third. The skull is large and strong, the zygomatic plate is wide and its edge is slightly convex and directed obliquely backwards and down (type description, Contreras 1968). The mandible has a short and robust coronoid process and an anteromedian flexus/flexid on the first upper and lower molars respectively, like other species in the genus *Akodon*. Cranial and dental remains of *A. molinae* are shown in Figure 1.

The holotype was collected in *vivero del Ministerio de Asuntos Agrarios*, Laguna Chasicó, Buenos Aires province, Argentina, in grasslands near water bodies (Contreras 1968). Near the Atlantic coast, it lives in shrub steppes and halophilic plant communities (Daciuk 1974). Its distribution in northern Patagonia was associated with the Monte Phytogeographical Province (Pardiñas et al. 2003).

However, the distribution of these southern populations is still fragmented and poorly explored. Some authors have raised doubts about the taxonomic status of *A. molinae* (for the discussion on taxonomic aspects, see Wittouck et al. 1995, Pardiñas et al. 2003, 2006).

Figure 1. *Akodon molinae* collected in the *Área Natural Protegida Península Valdés*, province of Chubut (MN 37). 1: dorsal view 2: ventral view 3: lower right molars 4: right mandible in lateral view. Scale= 10 mm.

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Braun et al. (2008) have suggested that the species *A. molinae* and *A. dolores* Thomas, 1916 are synonymous (with different chromosomal races, 2n=42-44 for *A. molinae* and 2n=34 for *A. dolores*) and *A. dolores* is the valid name for priority. In this work, we refer the studied specimens to the species *A. molinae* until this synonymy is broadly accepted.

In this paper, we present 23 new locality records for *A. molinae* in the provinces of Río Negro and Chubut and we discuss its distribution in northeastern Patagonia. The specimens were collected on two protected areas from the arid and semiarid extra-andean Patagonia in Argentina: Meseta de Somuncurá (Río Negro) and Á*rea Natural Protegida Península Valdés* (Chubut), and in some surrounding localities. Field work was conducted between 2004 and 2007.

Somuncurá is a 25,000 km^2 volcanic plain located in the middle of the North extra-andean Patagonian steppes, lying in the provinces of Río Negro and Chubut. The vegetation is associated with the altitudinal gradient (between 600 - 1,600 m a.s.l. Beeskow et al. 1982). While the Monte Phytogeographical Province dominates the lower levels, the Patagonian Phytogeographical Province prevails above. These units gradually interchange species in an ecotone area (Ecotono Rionegrino, *sensu* León et al. 1998). Área Natural Protegida Península Valdés with its 4,000 km^2 is located in northeastern Chubut, within the Monte Phytogeographical Province and Península Valdés Ecotone (Ecotono de la Península de Valdés, *sensu* León et al. 1998).

Collected material is mostly constituted by craniodental remains recovered from Barn Owl (*Tyto alba*; Aves, Ttytonidae), Magellanic Horned Owl (*Bubo magellanicus;* Aves, Strigidae) and Burrowing Owl (*Athene cunicularia*; Aves, Strigidae) pellets. Osteological remains were picked apart from pellets and *A. molinae* was identified by comparison with the reference collection of the "*Unidad de Arqueología y Antropología*" and "*Unidad de Ecología Terrestre*", *Centro Nacional Patagónico* (CENPAT-CONICET), Puerto Madryn, Argentina. Additionally, some specimens were collected through live traps and pitfall traps. Animals were processed according to standard preparations (Díaz et al. 1998). The material referred in this contribution is housed at *Colección de Zooarqueología y Zoología, Unidad de Arqueología y Antropología*, CENPAT-CONICET and is currently being processed, so catalog numbers are not yet available. Below we provided collector's field numbers to owl pellets (as lots, AA-E and MN-E) and to specimens collected in traps (AA and MN). New collecting localities (Figure 2) are listed below, from west to east, followed by specimen numbers:

1- Chipauquil, Río Negro (40°58' S, 66°39' W): AA 38, 39.
2- Estancia Liempi, Río Negro (41°39' S, 66°41' W): AA 217.
3- Estancia Los Manantiales, Río Negro (41°42' S, 66°37' W): AA 105, 120, 148.
4- Estancia El Luján, Río Negro (41°45'35" S, 66°32'03"W): AA-E 8.
5- Estancia El Luján, Río Negro (41°45'44" S, 66°32'21" W): AA-E 26.
6- Estancia Campana Mahuida, Río Negro (41°36' S, 66°26' W): AA-E 1.
7- Estancia El Porvenir, Río Negro (41°39' S, 66°24' W): AA 126, 128.
8- Quintas del Mirador, Puerto Madryn, Chubut (42°07' S, 65°02' W): MN-E 80.
9- Estancia La Juanita, Chubut (42°09' S, 65°03' W): MN-E 56.
10- Estancia La Esperanza, Chubut (42°08' S, 64° 57' W): MN-E 100.
11- Estancia La Esperanza, Chubut (42°11' S, 64°54' W): MN-E 116.
12- Estancia El Desempeño, Chubut (42°30' S, 64°44' W): MN-E 8, 121.
13- Estancia La Entrada, Chubut (42°24' S, 64°42' W): MN-E 87, 90, MN 462.
14- Estancia Las Charas, Chubut (42°29' S, 64°40' W): MN-E 15, 134.
15- Estancia El Pampero, Chubut (42°25' S, 64°36' W): MN-E 10, 131.
16- Estancia La Isla, Chubut (42°26' S, 64°33' W): MN-E 105.
17- Estancia La Anita, Campamento 39, Chubut (42°22' S, 64°03'W): MN 26.
18- Estancia Los Dos Hermanos (Puesto La Estrella), Chubut (42°46' S, 63°57' W): MN 280.

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19- Estancia San Lorenzo, Chubut (42°07' S, 63°53' W): MN-E 3.
20- Estancia San Lorenzo, Chubut (42º05' S, 63º54' W): MN 37, 51, 57.
21- Estancia La Paloma, Chubut (42°39' S, 63°52' W): MN 120, 187, 204, 205, 396, 430, 432, 467.
22- Estancia Salina Chica, Chubut (42°39' S, 63°51' W): MN-E 7.
23- Estancia La Irma, Chubut (42°16' S, 63°41' W): MN 131, 375.

Localities 1-7 belong to Somuncurá Plateau; 9-23 to Península Valdés and 8 is located outside these Protected Areas.

The overall distribution of *A. molinae* in the study area is associated with the Monte Phyto-geographical Province. However, 11 of the 23 localities reported here are located within the ecotone area between the Monte and the Patagonian Phytogeographical Provinces (*sensu* León et al. 1998): the Rionegrino Ecotone (1, 2, 7) and the Península Valdés Ecotone (16 to 23).

Previous records of this rodent species in the *Área Natural Protegida Península Valdés* were from coastal localities at Isla de los Pájaros (Daciuk 1974), Playa El Doradillo (Apfelbaum and Reig 1989), Riacho San José (Massoia et al. 1988 [here mentioned as *A. varius neocenus*]) and Puerto Lobos (Udrizar Sauthier and Pardiñas 2006). Nabte et al. (2008) referred this species for the Protected Area but they did not detail in which localities it was registered. These localities are presented in this paper (12, 14 and 15). In or near Somuncurá, the species was previously recorded in Sierra Pailemán (Trejo and Lambertucci 2007), Estancia Campana Mahuida and Sierra Grande (Andrade 2007) and El Rincón (Pardiñas et al. 2003).

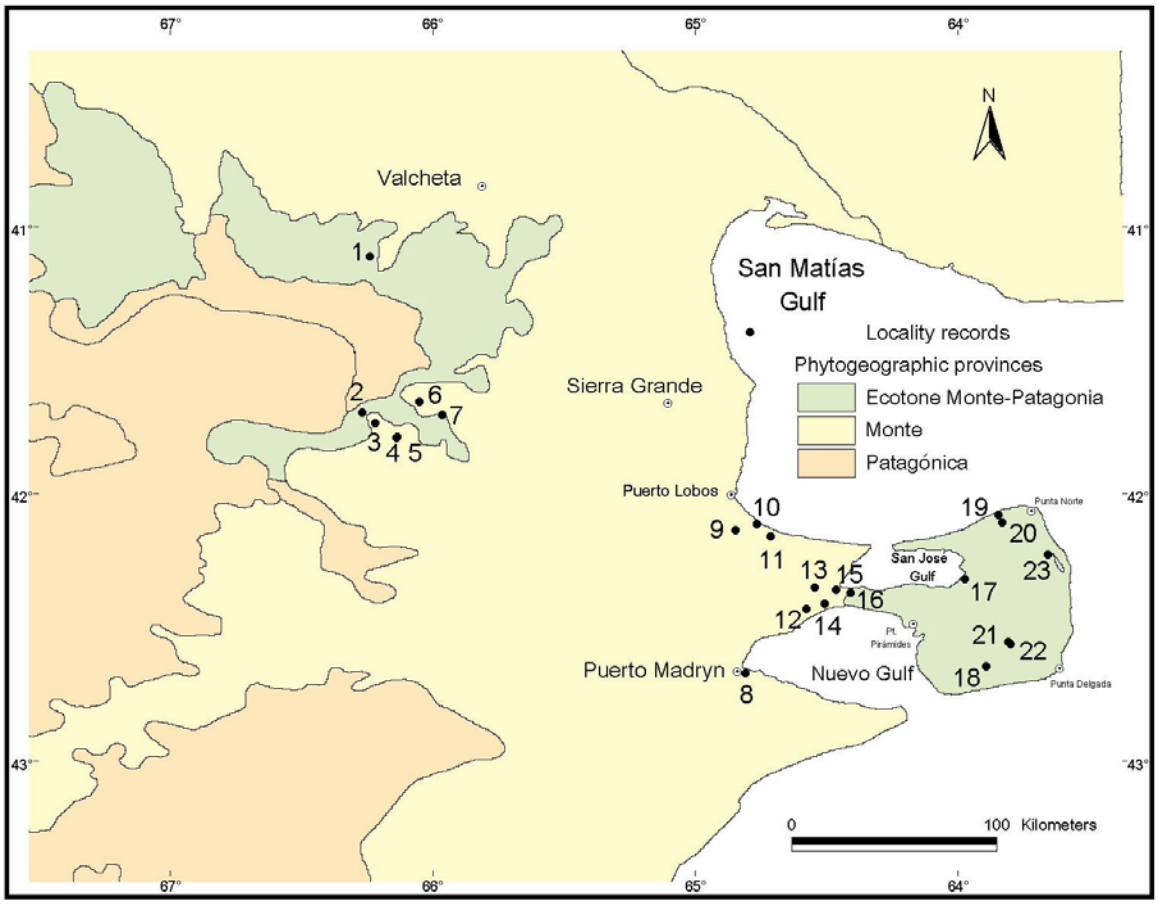

Figure 2. New locality records for *Akodon molinae* in the province of Río Negro and Chubut (Patagonia, Argentina).

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Considering known locality records, the distribution of the Argentinean endemic *A. molinae* could be delimited approximately from 31º S in the north (Córdoba province, Wittouck et al. 1995) to Laguna Blanca, 15 km south of Puerto Madryn, in the southeast (Chubut province, De Santis and Pagnoni 1989). Some of those localities are within or near the limits of the Espinal Phytogeographical Province (*sensu* Cabrera 1971). Even the type locality of *A. molinae* is within those limits (a summary of the distribution in central Argentina was performed by Pardiñas et al. 2004).

The 23 new records reported in this paper contribute to fill in the information gaps of the poorly known *A. molinae* and to broaden its distribution towards the west within northern Patagonia. This paper also reaffirms its distribution in association with the Monte Phytogeographical Province and extends it into ecotone areas with the Patagonian Phytogeographical Province (Ecotono Rionegrino and Ecotono de la Península Valdés), in agreement with Pardiñas et al. (2003) who proposed the ingression of *A. molinae* into the Rionegrino Ecotone. It is important to notice that if the synonymy of *A. molinae* and *A. dolores* is accepted, the distribution of this species will be widely extended.

Meseta de Somuncurá and Península Valdés were declared as a Protected Area by the Provincial Government of Río Negro and Chubut respectively. As for most of Patagonia, both areas have been grazed since the beginning of the twentieth century. There is evidence that grazing by domestic herbivores has modified the vegetation and accelerated soil degradation processes (e.g. Beeskow et al. 1987; Rostagno and del Valle 1988; Bisigato and Bertiller 1997). It would be necessary to evaluate the possible influence of ovine and goats livestock on the *A. molinae* populations, to protect the biodiversity of those reserves.

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Literature cited

Andrade, A. 2007. Los pequeños mamíferos como indicadores de cambios ambientales en la Meseta de Somuncurá (Río Negro y Chubut, Argentina); p. 443-451 *In* F. Morello, M. Martinic, A. Prieto and G. Bahamonde (ed.), Arqueología de Fuego-Patagonia. Levantando piedras, desenterrando huesos...y develando arcanos. Punta Arenas. Chile.

Apfelbaum, L. I. and O. A. Reig. 1989. Allozyme genetic distances and evolutionary relationships in species of akodontine rodents (Muridae: Sigmodontinae). Biological Journal of the Linnean Society 38: 257-280.

Beeskow, A. M., C. Beltramone, and H. F. Del Valle. 1982. Relevamiento fisiográfico expeditivo de la Meseta de Somuncurá. Subsecretaría de Estado de Ciencia y Técnica. CONICET. Centro Nacional Patagónico, Puerto Madryn, Chubut.

Beeskow, A. M., H. F. del Valle, and C. M. Rostagno. 1987. Los sistemas fisiográficos de la región árida y semiárida de la provincia de Chubut. Secretaría de Ciencia y Tecnología Bariloche, Río Negro. 139 p.

Bisigato, A. J. and M. B. Bertiller. 1997. Grazing effects on patchy dryland vegetation in northern Patagonia. Journal of Arid Environments 36: 639-653.

Braun, J. K., S. B. Coyner, M. A. Mares, and R. A. Van Den Bussche. 2008. Phylogenetic relationships of South American grass mice of the *Akodon varius* group (Rodentia, Cricetidae, Sigmodontinae) in South America. Journal of Mammalogy 89: 768-777.

Check List **5**(2): 320–324, 2009.
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NOTES ON GEOGRAPHIC DISTRIBUTION

Cabrera, A. 1971. Regiones fitogeográficas de la Argentina. Boletín de la Sociedad Argentina de Botánica 14: 1-50.

Contreras, J. R. 1968. *Akodon molinae*, una nueva especie de ratón de campo del sur de la provincia de Buenos Aires. Zoología Platense. Investigaciones zoológicas y paleontológicas 1: 9-12.

Daciuk, J. 1974. Notas faunísticas y bioecológicas de Península Valdés y Patagonia. XII. Mamíferos colectados y observados en la Península Valdés y zona litoral de los Golfos San José y Nuevo (Provincia de Chubut, República Argentina). Physis 33: 23-39.

De Santis, L. J. M. and G. O. Pagnoni. 1989. Alimentación de *Tyto alba* (Ave: Tytonidae) en localidades costeras de la provincia del Chubut (Republica Argentina). Neotrópica 35: 43-49.

Díaz, M. M., D. A. Flores, and R. M. Barquez. 1998. Instrucciones para la preparación y conservación de mamíferos. Tucumán. Argentina. 44 p.

León, R. J. C., D. Bran, M. Collantes, J. M. Paruelo, and A. Soriano. 1998. Grandes unidades de vegetación de la Patagonia extra andina; p. 125-144 *In* M. Oesterheld, M.R. Aguiar, and J.M. Paruelo, (ed.), Ecosistemas patagónicos Ecología Austral 8(2).

Massoia, E., A. A. S. Vetrano, and F. R. La Rossa. 1988. Análisis de regurgitados de *Athene cunicularia* de Península Valdés, Departamento Biedma, Provincia de Chubut. Aprona 4: 4-13.

Nabte, M. J., U. J. F. Pardiñas, and S. L. Saba. 2008. The diet of the Burrowing Owls, *Athene cunicularia*, in the arid lands of northeastern Patagonia, Argentina. Journal of Arid Environments 72: 1526-1530.

Pardiñas, U. F. J., A. M. Abba, and M. L. Merino. 2004. Micromamíferos (Didelphimorphia y Rodentia) del sudoeste de la provincia de Buenos Aires (Arnentina): taxonomía y distribución. Mastozoología Neotropical 11: 211-232.

Pardiñas, U. F. J., G. D´Elía, P. Teta, P.E Ortiz, J.P. Jayat, and S.Cirignoli. 2006. Akodontini Vorontzov, 1959 (*sensu* D´Elía, 2003); p. 146-166 *In* R. Barquez, M. Díaz, and R. Ojeda (ed.). *Mamíferos de Argentina: sistemática y distribución*. Mendoza: Sociedad Argentina para el Estudio de los Mamíferos.

Pardiñas, U. F. J., P. Teta, S. Cirignoli, and D. H. Podestá. 2003. Micromamíferos (Didelphimorphia y Rodentia) de Norpatagonia Extra Andina, Argentina: taxonomía alfa y biogeografía. Mastozoología Neotropical 10: 69-113.

Rostagno, C. M. and H. F. del Valle. 1988. Mounds associated with shrubs in arid soils of northeastern Patagonia: characteristics and probable genesis. Catena 15: 347-359.

Trejo, A. and S. Lambertucci. 2008. Feeding habits of barn owls along a vegetative gradient in northern Patagonia. Journal of Raptor Research 41: 277-287.

Udrizar Sauthier, D. E. and U. F. J. Pardiñas. 2006. Micromamíferos terrestres de Puerto Lobos, Chubut Argentina. Mastozoología Neotropical 13: 259-262.

Wittouck, P., E. Pinna Senn, C. Soñez, M. Provensal, J. Polop, and J. Lisanti. 1995. Chromosomal and synaptonemal complex analysis of robertsonian polymorphisms in *Akodon dolores* and *Akodon molinae* (Rodentia, Cricetidae) and their hybrids. Cytologia 60: 93-102.

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