**Supplementary Appendix 1.** List of specimens assigned to *Acarechimys*. Abbreviations: CL, coastal localities; CSCr, cliffs of the Santa Cruz river; Fm, Formation; Mb, Member; SCP, Santa Cruz Province. Within parentheses are previous systematic assignations. For the ‘old collections' localities we translate what is written in the collection labels. For a discussion about the localities names see Vizcaíno *et al*. (2012) and Fernicola *et al*. (2014).

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| *Acarechimys minutus* | Description | Locality | Horizon |
| MACN-A 237 (syntype of *Acaremys minutus*) | Right mandible with dp4-m3 | Santa Cruz | Santa Cruz Fm, late early Miocene |
| MACN-A 238 (syntype of *Acaremys minutus*) | Right mandible with dp4(broken)-m3 | Santa Cruz | Santa Cruz Fm, late early Miocene |
| MACN-A 4070 | Left maxilla with DP4-M3 | Seuhen, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 4071 | Right mandible with dp4-m3 and incisor | Seuhen, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 4072a | Right mandible with dp4-m3 | Monte Observación, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 4073 | Left mandible with dp4-m2 | Monte Observación, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 4082 | Right mandible with dp4-m3 | Santa Cruz | Santa Cruz Fm, late early Miocene |
| MACN-A 4264 | Left mandibular fragment with dp4 | Sehuen, SCP | Santa Cruz Fm, late early Miocene |
| MACN-PV SC4098 | Right mandible with dp4-m1 | Karaiken, SCP | Santa Cruz Fm?, late early Miocene |
| MLP 15-410a (syntype of *Acaremys minutus*)  | Left mandibular fragment with m1-m3 | CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MLP 82-XII-1-31 | Right mandible with m1 | Santa Cruz Province | Santa Cruz Fm, late early Miocene |
| MLP 91-IX-1-199a | Right m1 or m2 | Cañadón del Tordillo, Neuquén Province | Collon Curá Fm, middle Miocene |
| MLP 91-IX-1-200 | Left m1 or m2 | Cañadón del Tordillo, Neuquén Province | Collon Curá Fm, middle Miocene |
| MMP-PV 4193 | Left mandible with dp4-m3 | Puesto La Costa, SCP  | Santa Cruz Fm, late early Miocene |
| MMP-PV 15039 | Right mandible with dp4-m2 | Cañadón Silva, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15087 | Right m2  | Estancia el Tordillo, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15088 | Left maxilla with DP4-M3 | Estancia el Tordillo, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15089 | Right mandible with dp4-m3 and incisor | Rincón del Buque, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15090 | Right mandible with dp4-m3 | Rincón del Buque, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17435 | Right mandible with m1-m2 | Rincón del Buque, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17436 | Right mandibular fragment with dp4 | Estancia El Tordillo, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17437 | Left dp4 | Estancia El Tordillo, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17440 | Right maxilla with DP4 | Rincón del Buque2, SCP | Santa Cruz Fm, late early Miocene |
| UATF-V-001262 | Skull with left and right DP4-M3 | Quebrada Honda, Bolivia | Unnamed Fm, middle Miocene |
| YPM-PU 15806 | Skull with left and right DP4-M3 and incisors | Killik Aike, SCP | Santa Cruz Fm, late early Miocene |
| *Acarechimys* cf. *A. minutus* |  |  |  |
| MLP 91-IV-1-15 | Left mandible with m1-m2 | Cañadón del Tordillo, Neuquén Province | Collón Curá Fm, middle Miocene |
| UATF-V-000934 | Right mandible with dp4-m2 and incisor | Quebrada Honda, Bolivia | Unnamed Fm, middle Miocene |
| UATF-V-000935 | Right mandible with dp4-m3 | Quebrada Honda, Bolivia | Unnamed Fm, middle Miocene |
| UATF-V-000950 | Right mandible with dp4(broken)-m3 | Quebrada Honda, Bolivia | Unnamed Fm, middle Miocene |
| *Acarechimys constans* |  |  |  |
| MACN-A 247 (syntype of *Stichomys constans*) | Left mandible with m1-m2 and right mandible with dp4-m2 | SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 4058 | Right mandible with dp4-m1 | Monte Observación, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 4061 | Left mandible with dp4-m3 | Monte Observación, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 4064 | Left mandible with dp4-m2 and broken incisor | Monte Observación, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 4074 | Left mandible with dp4-m1 | Monte Observación, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 4075 (syntype of *Acaremys minutus*) | Right mandible with dp4-m1 | Monte Observación, SCP | Santa Cruz Fm, late early Miocene |
| MLP 15-57 (syntype of *Stichomys constans*) | Right mandible with m1 (broken)-m3 | Santa Cruz | Santa Cruz Fm?, late early Miocene? |
| MLP 15-200 (syntype of *Stichomys constans*) | Right mandible with dp4-m2 (lost specimen) | CSCr | Santa Cruz Fm, late early Miocene |
| MLP 15-319 | Right mandible with m1-m3 | CSCr | Santa Cruz Fm, late early Miocene |
| MLP 15-391 (syntype of *Stichomys constans*) | Right mandible with dp4-m3 | CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MLP 15-391c (syntype of *Stichomys constans*) | Left mandible with broken dp4-m1 | Suppose ‘curso inferior del río Santa Cruz’ | Santa Cruz Fm, late early Miocene |
| MPM-PV 4223 | Right mandible with dp4-m2 | Puesto Estancia La Costa, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15002 | Broken right mandible with dp4-m1, palatal fragment with both DP4-M2, and isolated vertebra | Puesto Estancia La Costa, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15091 | Right mandible with dp4-m2 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15092 | Right mandible with dp4-m2 and incisor | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15093 | Right mandible with dp4-m2 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15094 | Left mandible with dp4-m1 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15095 | Right mandible with m1-m3 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15096 | Left mandible with dp4-m2 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15097 | Right mandible with m2-m3 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| *Acarechimys gracilis* |  |  |  |
| MACN-A 52-128 (holotype of *Protacaremys pulchellus*) | Left mandible with dp4-m3 | Barranca sur del Colhue Huapí Lake, Chubut Province | Sarmiento Fm, Colhue Huapi Mb, early Miocene |
| MACN-A 4060 | Left mandible with dp4-m3 and incisor | Monte Observación, Santa Cruz | Santa Cruz Fm, late Early Miocene |
| MACN-A 4068 | Right mandible with dp4-m2 | Monte Observación, SCP | Santa Cruz Fm, late Early Miocene |
| MACN-A 4263 (holotype of *Stichomys gracilis*) | Left mandible with dp4-m2 | Seuhen, SCP | Santa Cruz Fm, late Early Miocene |
| MLP 15-39 (syntype of *Stichomys constans*) | Left mandible with m1-m3 | CSCr | Santa Cruz Fm, late Early Miocene |
| MLP 15-346 (syntype of *Stichomys constans*) | Left mandible with dp4-m2 | Santa Cruz river? | Santa Cruz Fm?, late early Miocene |
| MLP 15-391a (syntype of *Stichomys constans* and holotype of *Acarechimys pascuali*) | Right mandible with dp4-m2 | Suppose ‘curso inferior del río Santa Cruz’ | Santa Cruz Fm, late early Miocene |
| MLP 15-391b (syntype of *Stichomys constans*) | Right mandible with m1-m3 | Suppose ‘curso inferior del río Santa Cruz’ | Santa Cruz Fm, late early Miocene |
| MPM-PV 17430 | Left mandible with dp4-m3 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17431 | Right mandible with m1-m3 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17432 | Right mandible with dp4(broken)-m3 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17433 | Left mandible with m1-m2 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17434 | Left mandible with dp4-m2 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17439 | Left m1 in mandibular fragment | Estancia El Tordillo, Santa Cruz  | Santa Cruz Fm, late early Miocene |
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| *Acarechimys leucotheae* |  |  |  |
| MPEF-PV 10677 | Left mandible with dp4-m3 and incisor | Cabeza Blanca, Chubut Province | Sarmiento Fm, late Oligocene |
|  |  |  |  |
| *Acarechimys minutissimus* |  |  |  |
| IGM 184229 | Left mandible with dp4-m3 | La Venta, Colombia | Villa vieja Fm, middle Miocene |
| MACN-A 256 (syntype of *Acaremys minutissimus*) | Left mandible with dp4-m3 | SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 257 (syntype of *Acaremys minutissimus*) | Left mandible with dp4-m3 | SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 258 (syntype of *Acaremys minutissimus*) | Right mandible with dp4-m3 and incisor | SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 1894 | Right mandible with dp4-m3 | Exact provenance unknown |  |
| MACN-A 1896 | Left mandible with dp4-m3  | Exact provenance unknown |  |
| MACN-A 1897 | Right mandible with m1-m2 | Exact provenance unknown |  |
| MACN-A 1898 | Left mandible with m2 | Exact provenance unknown |  |
| MACN-A 4072b | Right mandible with dp4-m2 | Monte Observación, Santa Cruz | Santa Cruz Fm, late early Miocene  |
| MACN-A 4076 | Right mandible with dp4-m3 and incisor | Santa Cruz | Santa Cruz Fm, late early Miocene |
| MACN-A 4077 | Mandíbula izquierda casi completa con m1-m3 e incisivo | Santa Cruz | Santa Cruz Fm, late early Miocene |
| MACN-A 4079 | Right mandible with m1-m3 and incisor | Santa Cruz  | Santa Cruz Fm, late early Miocene |
| MACN-A 4080 | Right mandible with dp4-m3 | Santa Cruz  | Santa Cruz Fm, late early Miocene |
| MACN-A4081 | Right mandible with dp4-m1 | Santa Cruz  | Santa Cruz Fm, late early Miocene |
| MACN-A 4083 | Left mandible with dp4-m2 | Santa Cruz  | Santa Cruz Fm, late early Miocene |
| MACN-A 4084 | Edentulous left mandible with incisor | Santa Cruz  | Santa Cruz Fm, late early Miocene |
| MACN-A 4085 | Right edentulous mandible and a m1 or m2 stick on the mandible | Santa Cruz  | Santa Cruz Fm, late early Miocene |
| MACN-A 4086 | Left mandible with m1-m2 and a m3 stick on the mandible | Santa Cruz | Santa Cruz Fm, late early Miocene  |
| MACN-A 4087 | Right mandible with dp4-m2 and incisor | Santa Cruz  | Santa Cruz Fm, late early Miocene |
| MACN-A 4088 | Left mandible with m1-m3 | Santa Cruz  | Santa Cruz Fm, late early Miocene |
| MACN-A 4089 | Left mandible with m1-m3 | Santa Cruz | Santa Cruz Fm, late early Miocene |
| MACN-A 4090 | Right mandible with m1-m3 and incisor | Santa Cruz  | Santa Cruz Fm, late early Miocene |
| MACN-A 4091 | Left mandible with dp4-m1 and incisor | Territorio de Santa Cruz | Santa Cruz Fm, late early Miocene |
| MACN-A 4092 | Right mandible with dp4-m2 and incisor | Territorio de Santa Cruz | Santa Cruz Fm, late early Miocene |
| MACN-A 4093 | Left mandible with m1-m3 | Territorio de Santa Cruz | Santa Cruz Fm, late early Miocene |
| MACN-A 4094 | Right mandible with dp4-m2 and incisor | Territorio de Santa Cruz | Santa Cruz Fm, late early Miocene |
| MACN-A 4145 (syntype *Sciamys tenuissimus*) | Right maxillary fragment with DP4 | Monte Observación, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 4146 (syntype *Sciamys tenuissimus*) | Left mandibular fragment with dp4 and right mandibular fragment with m2 | Monte Observación, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 4265 (holotype *Stichomys diminutus*) | Right dp4-m1 | Monte Observación, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 4266 | Fragmento mandibular derecho con dp4-m1 | Monte Observación, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A10093 | Fragmento mandibular derecho con dp4-m2 | Yacimiento Dipilus 1897-98, SCP | Santa Cruz Fm, late early Miocene |
| MACN-A 12683 | Right mandible with dp4-m2; right maxilla with DP4-M2 |  Santa Cruz Province? | Santa Cruz Fm, late early Miocene |
| MACN-PV SC2158 | Right mandible with dp4 and incisor | Portezuelo Sumich Norte, SCP | Pinturas Fm, late early Miocene |
| MACN-PV SC2589 | Right dp4-m2 | Toldos Sur, SCP | Pinturas Fm, late early Miocene |
| MACN-PV SC2590 | Right maxillary with DP4-M1 | Toldos Sur, SCP | Pinturas Fm, late early Miocene |
| MACN-PV SC4045 | Right mandible with m1-m3 | Gobernador Gregores, SCP | Pinturas Fm, late early Miocene |
| MACN-PV SC4091 | Left mandible with dp4-m1 | Lago Cardiel, SCP | Pinturas Fm, late early Miocene |
| MLP 15-1 | Left mandible with dp4-m3 and incisor | Santa Cruz | Santa Cruz Fm?, late early Miocene? |
| MLP 15-188 (syntype of *Acaremys minutissimus*) | Left mandible with dp4-m3 | CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MLP 15-188a | Right mandible with dp4-m2 and incisor | CSCr | Santa Cruz Fm, late early Miocene |
| MLP 15-398 | Left mandible with dp4-m2 | CSCr | Santa Cruz Fm, late early Miocene |
| MLP 15-408 | Left mandible with m1-m3 | CSCr | Santa Cruz Fm, late early Miocene |
| MLP 91-IX-1-95 | Left dp4 | Cañadón del Tordillo, Neuquén Province | Collon Curá Fm, middle Miocene |
| MLP 91-IX-1-199b | Right m3 | Cañadón del Tordillo, Neuquén Province | Collon Curá Fm, middle Miocene |
| MLP 91-IX-1-201a | Right dp4 | Cañadón del Tordillo, Neuquén Province | Collon Curá Fm, middle Miocene |
| MLP 91-IX-1-201b | Right m1-m2 | Cañadón del Tordillo, Neuquén Province | Collon Curá Fm, middle Miocene |
| MLP 91-IX-1-201c | Left M1 or M2 | Cañadón del Tordillo, Neuquén Province | Collon Curá Fm, middle Miocene |
| MLP 91-IX-2-168 | Left dp4 | Estancia Collon Curá, Neuquén Province | Collon Curá Fm, middle Miocene |
| MPM-PV 15098 | Left mandible fragment with dp4 and incisor | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15099 | Left mandible with m1-m2 and incisor | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15100 | Right mandible with dp4(broken)-m2 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15101 | Right mandible with dp4-m2 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 15102 | Left mandible with m1 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17426 | Right mandible with dp4-m1 | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17427 | Right mandible with dp4-m2 and incisor | Estancia Cordón Alto, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17438 | Left mandible with dp4-m2 | Estancia El Tordillo, CSCr, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17429 | Left mandible with dp4-m2 | Rincón del Buque 2, SCP | Santa Cruz Fm, late early Miocene |
| MPM-PV 17441 | Left dp4 | Rincón del Buque 2, SCP | Santa Cruz Fm, late early Miocene |
| YPM-PU 15178 | Partially preserved skull with right DP4-M2 and left DP4-M1 | 10 miles South of the Coy Inlet, SCP | Santa Cruz Fm, late early Miocene |
| *Acarechimys* cf. *A. minutissimus* |  |  |  |
| UATF-V-000960 | Right mandibular fragment with dp4-m1 | Quebrada Honda, Bolivia | Unnammed fm, middle Miocene |
|  |  |  |  |
| *Acarechimys* sp.  |  |  |  |
| MACN-A 1895 | Left mandible with m1 |  Santa Cruz Province? | Santa Cruz Fm, late early Miocene |
| MACN-A 4062 | Left mandible with dp4-m3 | Monte Observación, Santa Cruz | Santa Cruz Fm, late early Miocene  |
| MACN-A 4067 | Left mandible with dp4-m3 | Monte Observación, Santa Cruz | Santa Cruz Fm, late early Miocene |