**Supplementary Material**

**Table S1.** Specimens examined in this study using mitogenomes and single mitochondrial genes. We show the name of the species, the study where the sequences were obtained (Used-means that we used the sequences from that study but they were originally obtained in a different study), and GenBank accession numbers for each mitogenome or genes. Mitochondrial genes include ND3, tRNA-Arginine, ND4L, and partial ND4.

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| --- | --- | --- | --- | --- |
| **Species** | **Study** | **Mitogenome****(GenBank number)** | ***Cytb*****(GenBank number)** | **Mitochondrial genes****(GenBank number)** |
| *Onychomys leucogaster* | Used in this study | KU168563 |  |  |
| *Peromyscus eremicus* | This study | MT078819 |  |  |
| *Peromyscus mekisturus* | This study | MT078818 |  | MT078814 |
| *Peromyscus melanophrys* | This study | MT078816 |  | MT078815 |
| *Peromyscus perfulvus* | This study | MT078817 |  |  |
| *Habromys simulatus* | Castañeda-Rico et al. (2014) |  |  | KF885886 |
| *Osgoodomys banderanus* | Castañeda-Rico et al. (2014) |  |  | KF885885 |
| *Peromyscus mekisturus* | Castañeda-Rico et al. (2014) |  |  | KF885810 |
| *Peromyscus melanophrys* | Castañeda-Rico et al. (2014) |  |  | KF885811toKF885884 |
| *Peromyscus mexicanus* | Castañeda-Rico et al. (2014) |  |  | KF885887 |
| *Peromyscus perfulvus* | Castañeda-Rico et al. (2014) |  |  | KF885789toKF885809 |
| *Akodon montensis* | Used in Sullivan et al. (2017) | KF769456 |  |  |
| *Habromys ixtlani* | Sullivan et al. (2017) | KY707304 |  |  |
| *Isthmomys pirrensis* | Sullivan et al. (2017) | KY707312 |  |  |
| *Neotoma mexicana* | Sullivan et al. (2017) | KY707300 |  |  |
| *Neotomodon alstoni* | Sullivan et al. (2017) | KY707310 |  |  |
| *Peromyscus attwateri* | Sullivan et al. (2017) | KY707299 |  |  |
| *Peromyscus aztecus* | Sullivan et al. (2017) | KY707306 |  |  |
| *Peromyscus crinitus* | Sullivan et al. (2017) | KY707308 |  |  |
| *Peromyscus megalops* | Sullivan et al. (2017) | KY707305 |  |  |
| *Peromyscus mexicanus* | Sullivan et al. (2017) | KY707303 |  |  |
| *Peromyscus pectoralis* | Sullivan et al. (2017) | KY707309 |  |  |
| *Peromyscus polionotus* | Sullivan et al. (2017) | KY707301 |  |  |
| *Podomys floridanus* | Sullivan et al. (2017) | KY707302 |  |  |
| *Reithrodontomys mexicanus* | Sullivan et al. (2017) | KY707307 |  |  |
| *Sigmodon hispidus* | Sullivan et al. (2017) | KY707311 |  |  |
| *Baiomys taylori* | Used in Bradley et al. (2007) |  | AF548469 |  |
| *Habromys ixtlani* | Used in Bradley et al. (2007) |  | DQ861395DQ000482 |  |
| *Habromys ixtlani* | Bradley et al. (2007) |  | DQ973099 |  |
| *Isthmomys pirrensis* | Bradley et al. (2007) |  | DQ836299 |  |
| *Megadontomys cryophilus* | Used in Bradley et al. (2007) |  | DQ861373 |  |
| *Megadontomys thomasi* | Used in Bradley et al. (2007) |  | AY195795 |  |
| *Neotoma mexicana* | Used in Bradley et al. (2007) |  | AF294345 |  |
| *Neotomodon alstoni* | Used in Bradley et al. (2007) |  | AY195796AY195797DQ861374 |  |
| *Nyctomys sumichrasti* | Used in Bradley et al. (2007) |  | AY195801 |  |
| *Ochrotomys nuttalli* | Used in Bradley et al. (2007) |  | AY195798 |  |
| *Onychomys arenicola* | Used in Bradley et al. (2007) |  | AY195793 |  |
| *Oryzomys palustris* | Used in Bradley et al. (2007) |  | DQ185382 |  |
| *Osgoodomys banderanus* | Used in Bradley et al. (2007) |  | AF155383DQ000473 |  |
| *Ototylomys phyllotis* | Used in Bradley et al. (2007) |  | AY009789 |  |
| *Peromyscus attwateri* | Used in Bradley et al. (2007) |  | AF155384AF155385 |  |
| *Peromyscus aztecus* | Used in Bradley et al. (2007) |  | U89968 |  |
| *Peromycus beatae* | Used in Bradley et al. (2007) |  | AF131921AF131922AF131914 |  |
| *Peromyscus boylii* | Used in Bradley et al. (2007) |  | AF155386AF155392AF155388 |  |
| *Peromyscus californicus* | Used in Bradley et al. (2007) |  | AF155393 |  |
| *Peromyscus crinitus* | Used in Bradley et al. (2007) |  | AY376413DQ861378 |  |
| *Peromyscus crinitus* | Bradley et al. (2007) |  | EF028168 |  |
| *Peromyscus difficilis* | Used in Bradley et al. (2007) |  | AY376419 AY376415AY387488 |  |
| *Peromyscus eremicus* | Used in Bradley et al. (2007) |  | AY195799AY322503 |  |
| *Peromyscus eremicus* | Bradley et al. (2007) |  | DQ973100 |  |
| *Peromyscus evides* | Bradley et al. (2007) |  | U89970 |  |
| *Peromyscus furvus* | Used in Bradley et al. (2007) |  | AF271032AF271012AF271005 |  |
| *Peromycus gossypinus* | Bradley et al. (2007) |  | DQ973101DQ973102 |  |
| *Peromyscus gratus* | Used in Bradley et al. (2007) |  | AY322507AY376421AY376422 |  |
| *Peromyscus guatemalensis* | Bradley et al. (2007) |  | EF028171EF028172 |  |
| *Peromyscus gymnotis* | Bradley et al. (2007) |  | EF028169EF028170EF028169 |  |
| *Peromyscus hooperi* | Bradley et al. (2007) |  | DQ973103 |  |
| *Peromyscus hylocetes* | Used in Bradley et al. (2007) |  | U89976DQ000481 |  |
| *Peromyscus keeni* | Used in Bradley et al. (2007) |  | X89787AF119261 |  |
| *Peromyscus leucopus* | Used in Bradley et al. (2007) |  | AF131926DQ000483 |  |
| *Peromyscus leucopus* | Bradley et al. (2007) |  | DQ973104 |  |
| *Peromyscus levipes* | Used in Bradley et al. (2007) |  | AF131928AY322509AF155396 |  |
| *Peromyscus madrensis* | Used in Bradley et al. (2007) |  | AF155397 |  |
| *Peromyscus maniculatus* | Used in Bradley et al. (2007) |  | DQ000484AY322508 |  |
| *Peromyscus maniculatus* | Bradley et al. (2007) |  | DQ973111 |  |
| *Peromyscus mayensis* | Bradley et al. (2007) |  | DQ836300DQ836301 |  |
| *Peromyscus megalops* | Used in Bradley et al. (2007) |  | DQ000475 |  |
| *Peromyscus melanocarpus* | Bradley et al. (2007) |  | EF028173 |  |
| *Peromyscus melanophrys* | Used in Bradley et al. (2007) |  | AY322510AY376424 |  |
| *Peromyscus melanophrys* | Bradley et al. (2007) |  | DQ973105 |  |
| *Peromyscus melanotis* | Used in Bradley et al. (2007) |  | AF155398 |  |
| *Peromyscus mexicanus* | Used in Bradley et al. (2007) |  | AY376425 |  |
| *Peromyscus mexicanus* | Bradley et al. (2007) |  | EF028174 |  |
| *Peromyscus nasutus* | Used in Bradley et al. (2007) |  | AF155399AY376426 |  |
| *Peromyscus nudipes* | Used in Bradley et al. (2007) |  | AY041200 |  |
| *Peromyscus oaxacensis* | Used in Bradley et al. (2007) |  | U89972 |  |
| *Peromyscus ochraventer* | Bradley et al. (2007) |  | DQ973106 |  |
| *Peromyscus pectoralis* | Used in Bradley et al. (2007) |  | AF155400AY322511AY376427 |  |
| *Peromyscus perfulvus* | Used in Bradley et al. (2007) |  | DQ000474 |  |
| *Peromyscus polionotus* | Used in Bradley et al. (2007) |  | X89792 |  |
| *Peromyscus polius* | Used in Bradley et al. (2007) |  | AF155403 |  |
| *Peromyscus sagax* | Used in Bradley et al. (2007) |  | AF155404 |  |
| *Peromyscus schmidlyi* | Used in Bradley et al. (2007) |  | AY322520AF155405AY370610 |  |
| *Peromyscus simulus* | Used in Bradley et al. (2007) |  | AF131927 |  |
| *Peromyscus spicilegus* | Used in Bradley et al. (2007) |  | AY322512DQ000480 |  |
| *Peromyscus spicilegus* | Bradley et al. (2007) |  | DQ973107 |  |
| *Peromyscus stephani* | Used in Bradley et al. (2007) |  | AF155411 |  |
| *Peromyscus stirtoni* | Bradley et al. (2007) |  | DQ973108 |  |
| *Peromyscus truei* | Used in Bradley et al. (2007) |  | AY376433AF108703AY376428 |  |
| *Peromyscus winkelmanni* | Used in Bradley et al. (2007) |  | AF131930U89983 |  |
| *Peromyscus zarhynchus* | Used in Bradley et al. (2007) |  | AY195800 |  |
| *Podomys floridanus* | Bradley et al. (2007) |  | DQ973109DQ973110 |  |
| *Reithrodontomys megalotis* | Used in Bradley et al. (2007) |  | AF176248 |  |
| *Reithrodontomys mexicanus* | Used in Bradley et al. (2007) |  | AY859447 |  |
| *Sigmodon hispidus* | Used in Bradley et al. (2007) |  | AF155420 |  |
| *Tylomys nudicaudatus* | Used in Bradley et al. (2007) |  | AF307839 |  |
| *Isthmomys pirrensis* | Platt II et al. (2015) |  | FJ214681 |  |
| *Peromyscus crinitus* | Platt II et al. (2015) |  | FJ214684 |  |
| *Peromyscus eremicus* | Used in Platt II et al. (2015) |  | AY322503 |  |
| *Peromyscus evides* | Platt II et al. (2015) |  | FJ214685 |  |
| *Peromyscus levipes* | Used in Platt II et al. (2015) |  | DQ000477 |  |
| *Peromyscus mexicanus* | Platt II et al. (2015) |  | JX910118 |  |
| *Peromyscus nudipes* | Platt II et al. (2015) |  | FJ214687 |  |
| *Peromyscus ochraventer* | Platt II et al. (2015) |  | JX910119 |  |
| *Peromyscus spicilegus* | Platt II et al. (2015) |  | FJ214669 |  |
| *Reithrodontomys fulvescens* | Used in Platt II et al. (2015) |  | AF176257 |  |
| *Reithrodontomys sumichrasti* | Used in Platt II et al. (2015) |  | AF176256 |  |
| *Reithrodontomys mexicanus* | Used in Platt II et al. (2015) |  | AY859453 |  |