

Supporting Information (online only)

Table S1. Specimens used in phylogenetic analyses, GenBank accession numbers, and locality information. Locality numbers refer to Figure 1. Abbreviations and institution of deposition are explained in the footnote. Taxonomic names within the specimens examined follow Woods and Kilpatrick (2005) and do not reflect taxonomic conclusions proposed later in the paper.

| Taxon | Specimen Number | GenBank Number | Locality Number | Locality | Lat/Long | Bp |
|---------------------------|---------------------------|----------------|-----------------|---|----------------|--------|
| <i>C. aperea pamparum</i> | NK 112985 | gu136750 | 1 | Argentina: Buenos Aires; Pergamino. | -33.88, -60.58 | 1-1140 |
| <i>C. aperea pamparum</i> | NK 113570 | gu136749 | 1 | Argentina: Buenos Aires; Pergamino. | -33.88, -60.58 | 1-1140 |
| <i>C. aperea pamparum</i> | NK 113574 | gu136745 | 1 | Argentina: Buenos Aires; Pergamino. | -33.88, -60.58 | 1-1100 |
| <i>C. aperea pamparum</i> | NK 113587 | gu136744 | 1 | Argentina: Buenos Aires; Pergamino. | -33.88, -60.58 | 1-1140 |
| <i>C. aperea pamparum</i> | NK 113024 | gu136746 | 2 | Argentina: Santa Fe; Maciel. | -32.47, -60.88 | 1-1140 |
| <i>C. aperea pamparum</i> | NK 114341 (MSB 47096) | gu136748 | 3 | Argentina: Santa Fe; Máximo Paz. | -33.48, -60.96 | 1-1140 |
| <i>C. aperea pamparum</i> | NK 110550 (MSB 43306) | gu136747 | 4 | Argentina: Santa Fe; Wheelwright. | -33.78, -61.22 | 1-1140 |
| <i>C. aperea</i> | NK 37808 (CDC 9435952) | gu136743 | 5 | Bolivia: Beni; Villa Olga, 150 m. | -13.22, -64.72 | 1-1140 |
| <i>C. aperea</i> | NK 11632 (MSB 55354) | gu136754 | 6 | Bolivia: Santa Cruz; San Miguel Rincón, 300 m. | -17.38, -63.53 | 1-1140 |
| <i>C. aperea</i> | NK 11816 (AMNH 260799) | gu136753 | 7 | Bolivia: Santa Cruz; Cachuela Esperanza, 300 m. | -16.78, -63.23 | 1-1140 |

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| <i>C. aperea</i> | NK 21047 | gu136741 | 8 | Bolivia: Santa Cruz; NP Noel Kempff Mercado, 3 km E Los Fierros, 400 m. | -14.50, -61.17 | 1-1140 |
| <i>C. aperea</i> | NK 22559 (AMNH 264467) | gu136752 | 9 | Bolivia: Santa Cruz; NP NKM , 3 km S Los Fierros, 400 m. | -14.57, -60.88 | 1-1140 |
| <i>C. aperea</i> | NK 22548 (AMNH 264466) | gu136742 | 10 | Bolivia: Santa Cruz; NP Noel Kempff Mercado, 6 km S Los Fierros, 400 m. | -14.57, -60.89 | 1-1140 |
| <i>C. tschudii nana</i> | NK 116565 (MSB 141629) | gu067538 | 11 | Bolivia: La Paz; Apa Apa, 1605 m. | -16.38, -67.52 | 1-1140 |
| <i>C. porcellus anolaimae</i> | HACM 1-1 | gu136758 | 12 | Colombia: Cundinamarca; near Gachalá, 3100 m. | 04.60, -73.52 | 1-1140 |
| <i>C. aperea guianae</i> | HACM 3-1 | gu136757 | 13 | Colombia: Meta; Near Villavicencio, 550 m. | 04.15, -73.64 | 1-1140 |
| <i>C. aperea guianae</i> | HACM 3-3 | gu136756 | 13 | Colombia: Meta; Near Villavicencio, 550 m. | 04.15, -73.64 | 1-1140 |
| <i>C. aperea guianae</i> | HACM 3-6 | gu136755 | 13 | Colombia: Meta; Near Villavicencio, 550 m. | 04.60, -73.52 | 1-1140 |
| <i>C. aperea patzelti</i> | ZMUH 7593 | gu136760 | 14 | Ecuador: Chimborazo; Hochkordillere von Alao, 3000-3800 m. | -01.90, -78.48 | 10-440, 561-802 |
| <i>C. aperea patzelti</i> | ZMUH 7594 | gu136761 | 14 | Ecuador: Chimborazo; Hochkordillere von Alao, 3000-3800 m. | -01.90, -78.48 | 15-443 |

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| <i>C. aperea hypoleuca</i> | NK 27546 (MSB 82571) | gu136740 | 15 | Paraguay: Concepcion; 7 km NE of Concepcion, 200 m. | -23.36, -57.39 | 1-1140 |
| <i>C. aperea guianae</i> | TK 17830 | gu136759 | 16 | Suriname: Nickeri; Sipaliwini, 358 m. | 02.08, -56.17 | 1-1140 |
| <i>C. aperea pamparum</i> | EL 1105 | gu136751 | 17 | Uruguay: Rio Negro. | -32.75, -57.42 | 1-1140 |
| <i>C. fulgida</i> | MVZ 197734 | gu136737 | 18 | Brazil: Minas Gerais; Parque Estadual do Rio Doce, 13 km E Marliéria, 300 m. | -19.72, -42.65 | 1-1140 |
| <i>C. fulgida</i> | FMNH 47958 | gu136739 | 19 | Brazil: Parana; Faz. Morungaba. | -24.17, -49.33 | 1-423 |
| <i>C. fulgida</i> | NK 85068 (MSB 93984) | gu136738 | 20 | Brazil: Sao Paulo; Juquitiba | -24.03, -47.02 | 1-410 |
| <i>C. magna</i> | 0617-8D9B (UB3) | gu136734 | 21 | Uruguay: Rocha. | -34.00, -54.00 | 1-1140 |
| <i>C. magna</i> | UB1 | gu136736 | 21 | Uruguay: Rocha. | -34.00, -54.00 | 1-1140 |
| <i>C. magna</i> | UB2 | gu136735 | 21 | Uruguay: Rocha. | -34.00, -54.00 | 1-1140 |
| <i>C. tschudii sodalis</i> | OMNH 34558 (ARG 6924) | gu136726 | 22 | Argentina: Jujuy; 5 km E of El Palmar, 794 m. | -24.08, -64.53 | 1-412, 570-1140 |
| <i>C. tschudii</i> | NK 22907 (AMNH 264468) | gu136729 | 23 | Bolivia: Santa Cruz; 3 km N of Torrecillas, 2625 m. | -17.85, -64.63 | 1-1140 |
| <i>C. tschudii</i> | LCM 3080 | dq017048 | 24 | Chile: Tarapaça; Valle de Lluta, 30 m. | -18.40, -70.32 | 1-1140 |
| <i>C. tschudii</i> | LCM 3081 | dq017049 | 24 | Chile: Tarapaça; Valle de Lluta, 30 m. | -18.40, -70.32 | 1-1140 |
| <i>C. tschudii arequipae</i> | LCM 2677 | dq017053 | 25 | Peru: Arequipa; Chiguata, 2960 m. | -16.40, -71.40 | 1-1140 |

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| <i>C. tschudii osgoodi</i> | LCM 2495 | gu136730 | 26 | Peru: Puno; Chucuito, [ca. 18 km SE of Puno, 3871m.] | -15.88, -69.88 | 1-1140 |
| <i>C. tschudii tschudii</i> | LHE 1348 | gu136731 | 27 | Peru: Cuzco; Cordillera de Vilcabamba, 3350 m. | -11.66, -73.67 | 1-1140 |
| <i>C. tschudii tschudii</i> | EV 1466 | gu136728 | 28 | Peru: Ica; Laguna Morón, 279 m. | -13.75, -75.96 | 1-1140 |
| <i>C. tschudii tschudii</i> | VPT 2822 | gu136727 | 29 | Peru: Ica; Pueblo Vernal, lagunilla, 291 m. | -13.88, -76.26 | 1-1140 |
| <i>C. porcellus</i> | NK 116550 (MSB 141626) | gu136732 | 30 | Bolivia: La Paz; Puento Villa, 1488 m. | -16.40, -67.65 | 1-1140 |
| <i>C. porcellus</i> | LCM 2463 | ay382793 | 31 | Chile: Tarapaća; Arica; Mercado del Agro | -18.48, -70.33 | 1-1140 |
| <i>C. porcellus</i> | LCM 2347 | gu136733 | 32 | Colombia: Tolima; Ibaqué. | -04.44, -75.23 | 1-1140 |
| <i>C. porcellus</i> | LCM 2308 | ay228363 | 33 | Peru: Tacna household | -18.02, -70.25 | 1-1140 |
| <i>C. porcellus</i> | LCM 3288 | dq017043 | 34 | Ecuador: Auqui breed. | | 1-1140 |
| <i>C. porcellus</i> | | aj222767 | | Domestic - locality unknown. | | 1-1140 |
| <i>G. musteloides</i> | NK 22940 (AMNH 264469) | gu067519 | | Bolivia: Santa Cruz; 17 km S of Quiñe, at Estancia Laja, 2100 m. | -18.20, -64.30 | 1-1140 |
| <i>M. niata</i> | NK 14529 (AMNH 263000) | gu136725 | | Bolivia: Oruro; 30 km S, 25 km E Sajama, 3850 m. | -18.25, -68.48 | 1-1140 |
| <i>D. salinicola</i> | TK 65003 | gu136723 | | Paraguay: Presidente Hayes; Estancia | -23.47, -59.82 | 1-1140 |

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| | | | Samaklay | | |
| <i>D. patagonum</i> | JCT 1106 | gu136724 | Argentina: San Juan; Depto. Valle Fertil, 15 km sur de Ischigualasto | -30.08, -67.92 | 1-1140 |
| <i>H. hydrochaeris</i> | NK 27254 | gu136721 | Bolivia: Beni; 20 km SW Magdalena, Rio Itonama. | -13.42, -64.15 | 1-1140 |
| <i>K. rupestris</i> | KR40 | gu136722 | Lab Colony, US National Zoo | | 1-1128 |

AMNH=American Museum of Natural History; ARG=Argentina Project (Sam Noble Oklahoma Museum of Natural History);
 CDC=Centers for Disease Control and Prevention; EV=Elena Vivar personal number (Museo de Historia Natural, Universidad
 Nacional Mayor de San Marcos); EL=Enrique Lessa personal number (Universidad de la República, Montevideo, Uruguay);
 FMNH=Field Museum of Natural History; HACM=Hector Anibal Campos Mosos number (Universidad Nacional de Colombia);
 LHE=Louise Emmons personal number (Smithsonian NMNH); LCM=Laboratorio de Citogenética Mamíferos, Universidad de Chile;
 MSB=Museum of Southwestern Biology (UNM); MVZ=Museum of Vertebrate Zoology, UC Berkeley; NK=New Mexico Genomic
 Resources (MSB, University of New Mexico); OMNH=Sam Noble Oklahoma Museum of Natural History; TK=Texas Karyotype
 (NSRL, Texas Tech University); UB=University of Bielefeld; VPT= Victor Pacheco personal number (Museo de Historia Natural,
 Universidad Nacional Mayor de San Marcos); ZMUH=Zoologisches Museum Universität Hamburg.