

Table S1. Samples included in the phylogenetic analysis of mtDNA using the *ND4* gene. Haplotype numbers correspond to sample codes used by Zamudio et al. (1997).

| Species | Voucher | Locality | Latitude | Longitude | Haplotype |
|----------------------|------------|--|-----------|------------|-----------|
| <i>P. ditmarsii</i> | RRM_2464 | Mexico; Sonora | – | – | 44 |
| <i>P. ditmarsii</i> | RRM_2459 | Mexico; Sonora | – | – | 45 |
| <i>P. douglasii</i> | MVZ_223427 | CA; Siskiyou Co., Grasshopper Flats | 41.525 | -121.695 | 1 |
| <i>P. douglasii</i> | MVZ_223429 | CA; Siskiyou Co., Grasshopper Flats | 41.525 | -121.695 | 2 |
| <i>P. douglasii</i> | LVT_955 | OR; Harney Co., 15 mi NW Burns | 43.74 | -119.266 | 3 |
| <i>P. douglasii</i> | LVT_956 | OR; Harney Co., 15 mi NW Burns | 43.74 | -119.266 | 4 |
| <i>P. douglasii</i> | LVT_965 | OR; Linn Co., Santiam Junction | 44.437 | -121.941 | 5 |
| <i>P. douglasii</i> | LVT_966 | OR; Linn Co., Santiam Junction | 44.437 | -121.941 | 5 |
| <i>P. douglasii</i> | LVT_958 | OR; Morrow Co., 6 mi SW Boardman | 45.778 | -119.789 | 6 |
| <i>P. douglasii</i> | LVT_960 | OR; Morrow Co., 6 mi SW Boardman | 45.778 | -119.789 | 6 |
| <i>P. douglasii</i> | MVZ_223227 | WA; Kittitas Co., Clockum Pass | 47.1994 | -120.2758 | 7 |
| <i>P. douglasii</i> | LVT_961 | WA; Lincoln Co., 6 mi N Wilbur | 47.842 | -118.727 | 8 |
| <i>P. douglasii</i> | LVT_962 | WA; Lincoln Co., 6 mi N Wilbur | 47.842 | -118.727 | 8 |
| <i>P. douglasii</i> | LVT_874 | ID; Lemhi Co., NW Idaho Falls | 44.312 | -113.162 | 9 |
| <i>P. douglasii</i> | LVT_875 | ID; Lemhi Co., NW Idaho Falls | 44.312 | -113.162 | 9 |
| <i>P. douglasii</i> | FC_06 | NV; Washoe Co., Fish Creek Mountain | 41.749 | -119.274 | |
| <i>P. douglasii</i> | RD_06 | NV; Washoe Co., Round Mountain | 41.971 | -119.415 | |
| <i>P. douglasii</i> | UWBM_7227 | WA; Kittitas Co., Whiskey Dick Wildlife Area | 46.96 | -120.14 | |
| <i>P. hernandesi</i> | AKI_02 | NV; Eureka Co., Coils Creek | 39.826 | -116.475 | |
| <i>P. hernandesi</i> | ALT_01 | Mexico; Chihuahua, Altamirano | 30.349517 | -108.49098 | |
| <i>P. hernandesi</i> | AMA_04 | NV; Humboldt Co., Martin Creek Guard Station | 41.684 | -117.542 | |
| <i>P. hernandesi</i> | AMA_07 | NV; White Pine Co., 1 mi W Harbecke Ranch | 38.987 | -114.469 | |
| <i>P. hernandesi</i> | AMA_12 | NV; White Pine Co., Steptoe Valley | 39.435 | -114.796 | |
| <i>P. hernandesi</i> | AMA_13 | NV; White Pine Co., Steptoe Valley | 39.435 | -114.796 | |
| <i>P. hernandesi</i> | AMA_22 | NV; Eureka Co., Coils Creek | 39.826 | -116.475 | |
| <i>P. hernandesi</i> | CAS_249834 | OR; Malheur Co., Oregon Canyon Mtns | 42.23644 | -118.04763 | |
| <i>P. hernandesi</i> | JAN_01 | Mexico; Chihuahua, Janos, Cerro La Cal | 30.860161 | -108.47762 | |
| <i>P. hernandesi</i> | JRJ_P01 | NV; Elko Co., Snow Water Lake | 40.826 | -115.025 | |
| <i>P. hernandesi</i> | LSU_18422 | AZ; Cochise Co., Chiricahua Mountains, Cave Creek Road | 31.9094 | -109.25238 | |
| <i>P. hernandesi</i> | LVT_807 | AZ; Mohave Co., Dean Peak, Hualapai Mtns. | 35.118 | -113.868 | 12 |
| <i>P. hernandesi</i> | LVT_808 | AZ; Mohave Co., Dean Peak, Hualapai Mtns. | 35.118 | -113.868 | 12 |
| <i>P. hernandesi</i> | LVT_848 | MT; Rosebud Co., Rosebud | 46.27 | -106.44 | |
| <i>P. hernandesi</i> | LVT_863 | UT; San Juan Co., LaSal Mtn | 38.447 | -109.238 | |
| <i>P. hernandesi</i> | LVT_866 | NM; Otero Co., 25 mi S Cloudcroft | 32.697 | -105.61 | 28 |
| <i>P. hernandesi</i> | LVT_869 | NM; Taos Co., 17.4 mi NW Taos, Hwy 64 | 36.588 | -105.814 | 29 |
| <i>P. hernandesi</i> | LVT_870 | UT; Iron Co., Webster Flat | 37.583 | -112.875 | 27 |
| <i>P. hernandesi</i> | LVT_871 | NM; Sandoval Co., Rio del las Vacas | 35.82 | -106.788 | 31 |
| <i>P. hernandesi</i> | LVT_873 | NM; Catron Co., Pietown | 34.298 | -108.135 | 30 |
| <i>P. hernandesi</i> | LVT_880 | CO; Weld Co., Pawnee National Grassland | 40.745 | -103.978 | |

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|----------------------|-----------|--|-----------|------------|----|
| <i>P. hernandesi</i> | LVT_882 | NE; Sioux Co., Fossil Agate Bed | 42.423 | -103.733 | |
| <i>P. hernandesi</i> | LVT_883 | NE; Sioux Co., Fossil Agate Bed | 42.423 | -103.733 | 36 |
| <i>P. hernandesi</i> | LVT_887 | AZ; Apache Co., Springerville | 34.12 | -109.28 | 32 |
| <i>P. hernandesi</i> | LVT_888 | AZ; Apache Co., Springerville | 34.12 | -109.28 | 33 |
| <i>P. hernandesi</i> | LVT_890 | AZ; Coconino Co., Flagstaff | 35.198 | -111.651 | 14 |
| <i>P. hernandesi</i> | LVT_893 | UT; Kane Co., Duck Creek Campground | 37.52 | -112.697 | 17 |
| <i>P. hernandesi</i> | LVT_894 | UT; Kane Co., Duck Creek Campground | 37.52 | -112.697 | 16 |
| <i>P. hernandesi</i> | LVT_897 | UT; Garfield Co., Mammoth Creek | 37.626 | -112.446 | 18 |
| <i>P. hernandesi</i> | LVT_899 | UT; Garfield Co., Mammoth Creek | 37.626 | -112.446 | 19 |
| <i>P. hernandesi</i> | LVT_900 | ND; Billings Co., Medora Theodore Roosevelt NP | 47.0174 | -103.5709 | 36 |
| <i>P. hernandesi</i> | LVT_901 | AZ; Coconino Co., 2.5 mi S of Williams | 35.25 | -112.191 | 15 |
| <i>P. hernandesi</i> | LVT_909 | UT; Tooele Co., Grantsville | 40.6 | -112.464 | 10 |
| <i>P. hernandesi</i> | LVT_911 | UT; Tooele Co., Grantsville | 40.6 | -112.464 | 10 |
| <i>P. hernandesi</i> | LVT_943 | WY; Fremont Co., 6 mi N of Fort Washakie | 43.091535 | -108.91244 | 36 |
| <i>P. hernandesi</i> | LVT_944 | WY; Fremont Co., 6 mi N of Fort Washakie | 43.091535 | -108.91244 | 36 |
| <i>P. hernandesi</i> | LVT_946 | WY; Washakie Co., Worland | 44.020622 | -107.85853 | 36 |
| <i>P. hernandesi</i> | LVT_947 | MT; Yellowstone Co., near Bighorn | 46.205361 | -107.56841 | 36 |
| <i>P. hernandesi</i> | LVT_950 | SD; Harding Co., Near Redig, base of Crow's Butte | 45.233832 | -103.55013 | 39 |
| <i>P. hernandesi</i> | LVT_951 | SD; Harding Co., Near Redig, base of Crow's Butte | 45.233832 | -103.55013 | 39 |
| <i>P. hernandesi</i> | LVT_953 | WY; Johnson Co., 6 mi SE of Linch | 43.54952 | -106.11278 | 37 |
| <i>P. hernandesi</i> | LVT_970 | MT; Musselshell Co., 7 mi W of Musselshell | 46.495034 | -108.22793 | 36 |
| <i>P. hernandesi</i> | LVT_9955 | NV; Lincoln Co., Cave Valley | 38.533 | -114.803 | |
| <i>P. hernandesi</i> | LVT_9956 | NV; Lincoln Co., Lake Valley | 38.517 | -114.644 | |
| <i>P. hernandesi</i> | ML_02 | ID; Cassia Co., Trout Creek Pass | 42.094 | -114.166 | |
| <i>P. hernandesi</i> | ML_03 | ID; Cassia Co., Trout Creek Pass | 42.091 | -114.165 | |
| <i>P. hernandesi</i> | MEL_03 | CO; Alamosa Co., Zapata Ranch | 37.64127 | -105.64199 | |
| <i>P. hernandesi</i> | MEL_08 | CO; Alamosa Co., Zapata Ranch | 37.64127 | -105.64199 | |
| <i>P. hernandesi</i> | MEL_09 | CO; Alamosa Co., Zapata Ranch | 37.64127 | -105.64199 | |
| <i>P. hernandesi</i> | MEL_39 | CO; Alamosa Co., Zapata Ranch | 37.64127 | -105.64199 | |
| <i>P. hernandesi</i> | MEL_51 | CO; Alamosa Co., Zapata Ranch | 37.64127 | -105.64199 | |
| <i>P. hernandesi</i> | MEL_54 | CO; Alamosa Co., Zapata Ranch | 37.64127 | -105.64199 | |
| <i>P. hernandesi</i> | MEL_69 | CO; Alamosa Co., Zapata Ranch, Antelope Pasture | 37.62977 | -105.68147 | |
| <i>P. hernandesi</i> | MEL_10 | CO; Alamosa Co., 5.3 mi E of Alamosa NWR | 37.43815 | -105.70704 | |
| <i>P. hernandesi</i> | MEL_22 | CO; Conejos Co., McIntyre Springs | 37.28287 | -105.80883 | |
| <i>P. hernandesi</i> | MEL_14 | CO; Conejos Co., Capulin BLM Hills | 37.23573 | -106.15315 | |
| <i>P. hernandesi</i> | MEL_160 | CO; Weld Co., Pawnee National Grasslands | 40.84861 | -104.73669 | |
| <i>P. hernandesi</i> | MEL_25 | CO; Saguache Co., Saguache BLM Hills | 38.12715 | -106.15317 | |
| <i>P. hernandesi</i> | MEL_01 | CO; Alamosa Co., Mosca Pass | 37.73090 | -105.45953 | |
| <i>P. hernandesi</i> | MEL_33 | CO; Costilla Co., 0.3 mi NE of Fort Garland | 37.46216 | -105.39569 | |
| <i>P. hernandesi</i> | MEL_61 | CO; Huerfano Co., Walsenburg | 37.54442 | -104.63581 | |
| <i>P. hernandesi</i> | MEL_23 | CO; Las Animas Co., Pinon Canyon Maneuver Site, Walsenburg | 37.39550 | -104.04867 | |
| <i>P. hernandesi</i> | MSB_74476 | NM; Socorro Co., Cibola National Forest | 33.84616 | -107.57361 | |
| <i>P. hernandesi</i> | MSB_76317 | NM; Rio Arriba Co., Santa Fe National Forest | 36.15124 | -106.43035 | |

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| <i>P. hernandesi</i> | MSB_76377 | NM; Sandoval Co., Cebolleta Grant, Canon de Santa Rosa | 35.333515 | -107.27997 | |
| <i>P. hernandesi</i> | MSB_76415 | NM; Valencia Co., Tome Grant, South Navajo Loop | 34.591374 | -106.58209 | |
| <i>P. hernandesi</i> | MSB_76559 | NM; Sierra Co., Kingston | 32.919502 | -107.67848 | |
| <i>P. hernandesi</i> | MSB_77935 | NM; McKinley Co., near Mesa Cortada | 35.53981 | -107.39703 | |
| <i>P. hernandesi</i> | MSB_78406 | NM; Cibola Co., HWY 547 11 air mi ENE of Grants | 35.236118 | -107.69032 | |
| <i>P. hernandesi</i> | MSB_78412 | NM; Colfax Co., NMHwy 21 S of Philmout Scout Camp HQ | 36.41566 | -104.94913 | |
| <i>P. hernandesi</i> | MSB_79440 | NM; San Juan Co., ca 22 km SE Bloomfield | 36.541944 | -107.85333 | |
| <i>P. hernandesi</i> | MSB_96481 | NM; Socorro Co., Magdalena Mts, Copper Canyon | 34.07129 | -107.14613 | |
| <i>P. hernandesi</i> | MSB_96491 | NM; Socorro Co., Cibola National Forest | 33.732387 | -107.35783 | |
| <i>P. hernandesi</i> | MSB_96529 | NM; Socorro Co., Springtime campground, San Mateo Mts | 33.57586 | -107.40556 | |
| <i>P. hernandesi</i> | MVZ_223191 | CO; Weld Co., NW Co. Rd 124, 5.2 mi. East Jctn. Hwy 71. | 40.890843 | -103.59015 | 40 |
| <i>P. hernandesi</i> | MVZ_223425 | AZ; Gila Co., SW of NE Tonto Natl. Forest | 33.832 | -111.287 | 20 |
| <i>P. hernandesi</i> | MVZ_225549 | AZ; Coconino Co., SW base of Mt. Elden, ca. 2 mi NW Hwy. 89 | 35.2528 | -111.611 | |
| <i>P. hernandesi</i> | MVZ_229181 | WY; Uinta Co., ca. 6 mi NE of Lyman on road to Granger | 41.38195 | -110.1996 | |
| <i>P. hernandesi</i> | MVZ_245874 | AZ; Santa Cruz Co., Gardner Canyon, Santa Rita Mts. | 31.70745 | -110.80456 | |
| <i>P. hernandesi</i> | OD_02 | NV; Humboldt Co., Owyhee Desert | 41.721 | -117.148 | |
| <i>P. hernandesi</i> | OMNH_6627 | MT; Yellowstone Co., Crooked Creek Rd off of Hwy 87 | 46.022056 | -108.53033 | |
| <i>P. hernandesi</i> | OMNH_7021 | MT; Carbon Co., 14.3 mi S Bridger on Cottonwood Creek Rd. | 45.096053 | -108.82177 | |
| <i>P. hernandesi</i> | OMNH_7043 | MT; Carbon Co., 7.84 mi S Bridger on Cottonwood Rd. | 45.180608 | -108.91001 | |
| <i>P. hernandesi</i> | RRM_2474 | TX; Hudspeth Co., Hueco Mountains, east slope | 31.94 | -105.95 | 35 |
| <i>P. hernandesi</i> | t30/WCS5906 | NM; Otero Co., Sacramento Mtns. | 32.901936 | -105.77714 | |
| <i>P. hernandesi</i> | t32/HWG2504 | AZ; Cochise Co., Little Scotia Canyon, Huachuca Mtns. | 31.442 | -110.412 | |
| <i>P. hernandesi</i> | TJ_P03 | NV; Lander Co., Butler Basin | 39.122 | -116.444 | |
| <i>P. hernandesi</i> | UWBM_7365 | AZ; Navajo Co., Five Mile Wash | 34.84 | -110.14 | |
| <i>P. hernandesi</i> | UWBM_7366 | AZ; Navajo Co., Silver Creek, 13 mi. N. Snowflake | 34.67 | -110.04 | |
| <i>P. hernandesi</i> | YPM_018786 | ND; Slope Co., Little Missouri National Grassland | 46.343826 | -103.9743 | |
| <i>P. hernandesi</i> | MVZ_223177 | AZ; Cochise Co., Little Scotia Canyon, Huachuca Mtns. | 31.4428 | -110.4123 | 21 |
| <i>P. hernandesi</i> | MVZ_223181 | AZ; Cochise Co., 0.5 mile South Sycamore Spring | 31.7747 | -109.3439 | 23 |
| <i>P. hernandesi</i> | MVZ_223185 | AZ; Cochise Co., SWRS, Cave Creek Cyn, Chiricahua Mtns. | 31.8825 | -109.2033 | 24 |
| <i>P. hernandesi</i> | MVZ_223183 | AZ; Cochise Co., Krentz Ranch | 31.6472 | -109.3008 | 25 |
| <i>P. hernandesi</i> | RRM_2341 | UT; Grand Co., Thompson | 38.96 | -109.71 | 26 |
| <i>P. hernandesi</i> | MVZ_223214 | NM; McKinley Co., Thoreau, State Hwy 612 | 35.31269 | -108.16694 | 34 |
| <i>P. hernandesi</i> | 1994.004 | Canada; Alberta, Lecuyer's Coulee | 49.297 | -110.467 | 41 |
| <i>P. hernandesi</i> | no voucher | Canada; Alberta, Lecuyer's Coulee | 49.297 | -110.467 | 42 |
| <i>P. hernandesi</i> | no voucher | Canada; Alberta, Lecuyer's Coulee | 49.297 | -110.467 | 43 |
| <i>P. orbiculare</i> | JN809387 | | - | - | |

Table S2. Samples included in the population structure and phylogenetic analyses of *P. hernandesi* and other closely-related species in the *Tapaja* clade using ddRADseq data.

| Species | Voucher | Locality | Latitude | Longitude |
|----------------------|---------------|---|-----------|-------------|
| <i>P. ditmarsii</i> | RRM 2459 | Mexico; Sonora | – | – |
| <i>P. ditmarsii</i> | RRM 2464 | Mexico; Sonora | – | – |
| <i>P. ditmarsii</i> | RRM 2466 | Mexico; Sonora | – | – |
| <i>P. douglasii</i> | MVZ 223427 | USA; CA, Siskiyou Co., Grasshopper Flats, Shasta Trinity Natl. Forest | 41.525 | -121.695 |
| <i>P. douglasii</i> | MVZ 223433 | USA; CA, Siskiyou Co., Grasshopper Flats, Shasta Trinity Natl. Forest | 41.525 | -121.695 |
| <i>P. douglasii</i> | MVZ 223434 | USA; CA, Siskiyou Co., Grasshopper Flats, Shasta Trinity Natl. Forest | 41.525 | -121.695 |
| <i>P. douglasii</i> | LVT 874 | USA; ID, Lemhi Co., NW Idaho Falls | 44.312 | -113.162 |
| <i>P. douglasii</i> | LVT 875 | USA; ID, Lemhi Co., NW Idaho Falls | 44.312 | -113.162 |
| <i>P. douglasii</i> | FC 06 | USA; NV, Washoe Co., Fish Creek Mountain | 41.749 | -119.274 |
| <i>P. douglasii</i> | RD 06 | USA; NV, Washoe Co., Round Mountain | 41.971 | -119.415 |
| <i>P. douglasii</i> | LVT 955 | USA; OR, Harney Co., 15 mi NW Burns | 43.74 | -119.266 |
| <i>P. douglasii</i> | LVT 956 | USA; OR, Harney Co., 15 mi NW Burns | 43.74 | -119.266 |
| <i>P. douglasii</i> | LVT 965 | USA; OR, Linn Co., Santiam Junction | 44.437 | -121.941 |
| <i>P. douglasii</i> | LVT 966 | USA; OR, Linn Co., Santiam Junction | 44.437 | -121.941 |
| <i>P. douglasii</i> | LVT 958 | USA; OR, Morrow Co., 6 mi SW Boardman | 45.778 | -119.789 |
| <i>P. douglasii</i> | LVT 960 | USA; OR, Morrow Co., 6 mi SW Boardman | 45.778 | -119.789 |
| <i>P. douglasii</i> | UWBM 7227 | USA; WA, Kittitas Co., Whiskey Dick Wildlife Area | 46.96 | -120.14 |
| <i>P. douglasii</i> | UWBM 7231 | USA; WA, Kittitas Co., Whiskey Dick Wildlife Area | 46.96 | -120.14 |
| <i>P. douglasii</i> | LVT 961 | USA; WA, Lincoln Co., 6 mi N Wilbur | 47.842 | -118.727 |
| <i>P. douglasii</i> | LVT 962 | USA; WA, Lincoln Co., 6 mi N Wilbur | 47.842 | -118.727 |
| <i>P. hernandesi</i> | UCMZ 1994.009 | Canada; Alberta, Lecuyer's Coulee | 49.297 | -110.467 |
| <i>P. hernandesi</i> | UCMZ 1994.010 | Canada; Alberta, Lecuyer's Coulee | 49.297 | -110.467 |
| <i>P. hernandesi</i> | LVT 887 | USA; AZ, Apache Co., Springerville | 34.12 | -109.28 |
| <i>P. hernandesi</i> | LVT 888 | USA; AZ, Apache Co., Springerville | 34.12 | -109.28 |
| <i>P. hernandesi</i> | HWG 2504 | USA; AZ, Cochise Co., Little Scotia Canyon, Huachuca Mtns. | 31.442 | -110.412 |
| <i>P. hernandesi</i> | HWG 2506 | USA; AZ, Cochise Co., Little Scotia Canyon, Huachuca Mtns. | 31.442 | -110.412 |
| <i>P. hernandesi</i> | LSU 18422 | USA; AZ, Cochise Co., Chiricahua Mountains, Cave Creek Road. | 31.9094 | -109.25238 |
| <i>P. hernandesi</i> | LVT 890 | USA; AZ, Coconino Co., Flagstaff | 35.198 | -111.651 |
| <i>P. hernandesi</i> | LVT 901 | USA; AZ, Coconino Co., 2.5 mi S of Williams | 35.25 | -112.191 |
| <i>P. hernandesi</i> | MVZ 225549 | USA; AZ, Coconino Co., SW base of Mt. Elden, ca. 2 mi NW Hwy. 89 | 35.2528 | -111.611 |
| <i>P. hernandesi</i> | YPM 017857 | USA; AZ, Coconino Co., Willow Spring Lake | 34.309342 | -110.872674 |
| <i>P. hernandesi</i> | MVZ 223425 | USA; AZ, Gila Co., SW of NE Tonto Natl. Forest | 33.832 | -111.287 |
| <i>P. hernandesi</i> | LVT 807 | USA; AZ, Mohave Co., Dean Peak, Hualapai Mtns. | 35.118 | -113.868 |
| <i>P. hernandesi</i> | LVT 808 | USA; AZ, Mohave Co., Dean Peak, Hualapai Mtns. | 35.118 | -113.868 |
| <i>P. hernandesi</i> | UWBM 7364 | USA; AZ, Navajo Co., Five Mile Wash | 34.84 | -110.14 |
| <i>P. hernandesi</i> | UWBM 7365 | USA; AZ, Navajo Co., Five Mile Wash | 34.84 | -110.14 |
| <i>P. hernandesi</i> | UWBM 7366 | USA; AZ, Navajo Co., Silver Creek, 13 mi. N. Snowflake | 34.67 | -110.04 |
| <i>P. hernandesi</i> | UWBM 7368 | USA; AZ, Navajo Co., 5 mi. NW Show Low | 34.33 | -110.11 |
| <i>P. hernandesi</i> | MVZ 245874 | USA; AZ, Santa Cruz Co., Gardner Canyon, Santa Rita Mts. | 31.70745 | -110.80456 |

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| <i>P. hernandesi</i> | MVZ 245875 | USA; AZ, Santa Cruz Co., Gardner Canyon, Santa Rita Mts. | 31.70381 | -110.8067 |
| <i>P. hernandesi</i> | ALT 01 | Mexico; Chihuahua, Altamirano | 30.349517 | -108.490983 |
| <i>P. hernandesi</i> | ALT 03 | Mexico; Chihuahua, Altamirano | 30.349517 | -108.490983 |
| <i>P. hernandesi</i> | ALT 04 | Mexico; Chihuahua, Altamirano | 30.349517 | -108.490983 |
| <i>P. hernandesi</i> | ALT 05 | Mexico; Chihuahua, Altamirano | 30.349517 | -108.490983 |
| <i>P. hernandesi</i> | JAN 01 | Mexico; Chihuahua, Janos, Cerro La Cal | 30.860161 | -108.477619 |
| <i>P. hernandesi</i> | JAN 04 | Mexico; Chihuahua, Janos, Cerro La Cal | 30.860161 | -108.477619 |
| <i>P. hernandesi</i> | LVT 880 | USA; CO, Weld Co., Pawnee National Grassland | 40.745 | -103.978 |
| <i>P. hernandesi</i> | MVZ 223191 | USA; CO, Weld Co., NW Co. Rd 124, 5.2 mi. East Jctn. Hwy 71. | 40.890843 | -103.590147 |
| <i>P. hernandesi</i> | ML 02 | USA; ID, Cassia Co., Trout Creek Pass | 42.094 | -114.166 |
| <i>P. hernandesi</i> | ML 03 | USA; ID, Cassia Co., Trout Creek Pass | 42.091 | -114.165 |
| <i>P. hernandesi</i> | OMNH 7021 | USA; MT, Carbon Co., 14.3 mi S Bridger on Cottonwood Creek Rd. | 45.096053 | -108.821767 |
| <i>P. hernandesi</i> | OMNH 7043 | USA; MT, Carbon Co., 7.84 mi S Bridger on Cottonwood Rd. | 45.180608 | -108.910006 |
| <i>P. hernandesi</i> | LVT 970 | USA; MT, Musselshell Co., 7 mi W of Musselshell | 46.495034 | -108.227934 |
| <i>P. hernandesi</i> | LVT 848 | USA; MT, Rosebud Co., Rosebud | 46.27 | -106.44 |
| <i>P. hernandesi</i> | LVT 947 | USA; MT, Yellowstone Co., near Bighorn | 46.205361 | -107.568412 |
| <i>P. hernandesi</i> | OMNH 6627 | USA; MT, Yellowstone Co., Crooked Creek Rd off of Hwy 87 | 46.022056 | -108.530333 |
| <i>P. hernandesi</i> | LVT 882 | USA; NE, Sioux Co., Fossil Agate Bed | 42.423 | -103.733 |
| <i>P. hernandesi</i> | LVT 883 | USA; NE, Sioux Co., Fossil Agate Bed | 42.423 | -103.733 |
| <i>P. hernandesi</i> | LVT 900 | USA; ND, Billings Co., Medora Theodore Roosevelt NP | 47.0174 | -103.5709 |
| <i>P. hernandesi</i> | YPM 018786 | USA; ND, Slope Co., Little Missouri National Grassland | 46.34382591 | -103.9742976 |
| <i>P. hernandesi</i> | MSB 99892 | USA; NM, Bernalillo Co., Along Via Sedillo Rd | 35.08 | -106.3013 |
| <i>P. hernandesi</i> | LVT 873 | USA; NM, Catron Co., Pietown | 34.298 | -108.135 |
| <i>P. hernandesi</i> | MSB 96345 | USA; NM, Catron Co., NM Hwy 59 | 33.4208 | -108.1019 |
| <i>P. hernandesi</i> | MSB 97944 | USA; NM, Catron Co., San Francisco Mountains, Gila National Forest | 33.7827 | -108.8947 |
| <i>P. hernandesi</i> | MSB 78406 | USA; NM, Cibola Co., HWY 547 11 air mi ENE of Grants | 35.23611782 | -107.6903197 |
| <i>P. hernandesi</i> | MSB 78412 | USA; NM, Colfax Co., NM Hwy 21 S of Philmout Scout Camp HQ | 36.41565974 | -104.9491257 |
| <i>P. hernandesi</i> | MSB 77935 | USA; NM, McKinley Co., near Mesa Cortada | 35.53981 | -107.39703 |
| <i>P. hernandesi</i> | LVT 866 | USA; NM, Otero Co., 25 mi S Cloudcroft | 32.697 | -105.61 |
| <i>P. hernandesi</i> | WCS 5906 | USA; NM, Otero Co., Sacramento Mtns. | 32.901936 | -105.777142 |
| <i>P. hernandesi</i> | MSB 76317 | USA; NM, Rio Arriba Co., Santa Fe National Forest, Polvadera Mesa | 36.15124 | -106.43035 |
| <i>P. hernandesi</i> | LVT 871 | USA; NM, Sandoval Co., Rio del las Vacas | 35.82 | -106.788 |
| <i>P. hernandesi</i> | MSB 76377 | USA; NM, Sandoval Co., Cebolleta Grant, Canon de Santa Rosa | 35.3335151 | -107.2799655 |
| <i>P. hernandesi</i> | MSB 79440 | USA; NM, San Juan Co., ca 22 km SE Bloomfield | 36.54194444 | -107.8533333 |
| <i>P. hernandesi</i> | MSB 76559 | USA; NM, Sierra Co., Kingston | 32.91950243 | -107.678484 |
| <i>P. hernandesi</i> | MSB 74476 | USA; NM, Socorro Co., Cibola National Forest | 33.84616 | -107.57361 |
| <i>P. hernandesi</i> | MSB 96481 | USA; NM, Socorro Co., Magdalena Mts, Copper Canyon | 34.07129 | -107.14613 |
| <i>P. hernandesi</i> | MSB 96490 | USA; NM, Socorro Co., W Red Canyon, San Mateo Mts. | 33.7631 | -107.4387 |
| <i>P. hernandesi</i> | MSB 96491 | USA; NM, Socorro Co., Cibola National Forest | 33.7323865 | -107.3578328 |
| <i>P. hernandesi</i> | MSB 96529 | USA; NM, Socorro Co., Springtime campground, San Mateo Mts. | 33.57586 | -107.40556 |
| <i>P. hernandesi</i> | LVT 869 | USA; NM, Taos Co., 17.4 mi NW Taos, Hwy 64 | 36.588 | -105.814 |
| <i>P. hernandesi</i> | MSB 97947 | USA; NM, Torrance Co., Capilla Peak, Manzano Mountains | 34.6997 | -106.4062 |
| <i>P. hernandesi</i> | MSB 98704 | USA; NM, Torrance Co., Capilla Peak, Gavilan Trail, Manzano Mts. | 34.7039 | -106.4106 |

| | | | | |
|----------------------|------------|---|-------------|--------------|
| <i>P. hernandesi</i> | MSB 76415 | USA; NM, Valencia Co., Tome Grant, South Navajo Loop | 34.59137393 | -106.5820916 |
| <i>P. hernandesi</i> | JRJ P01 | USA; NV, Elko Co., Snow Water Lake | 40.826 | -115.025 |
| <i>P. hernandesi</i> | MRG P02 | USA; NV, Elko Co., Cobb Creek | 41.749 | -115.98 |
| <i>P. hernandesi</i> | AKI 02 | USA; NV, Eureka Co., Coils Creek | 39.826 | -116.475 |
| <i>P. hernandesi</i> | AMA 22 | USA; NV, Eureka Co., Coils Creek | 39.826 | -116.475 |
| <i>P. hernandesi</i> | AMA 04 | USA; NV, Humboldt Co., Martin Creek Guard Station | 41.684 | -117.542 |
| <i>P. hernandesi</i> | OD 02 | USA; NV, Humboldt Co., Owyhee Desert | 41.721 | -117.148 |
| <i>P. hernandesi</i> | TJ P03 | USA; NV, Lander Co., Butler Basin | 39.122 | -116.444 |
| <i>P. hernandesi</i> | LVT 9955 | USA; NV, Lincoln Co., Cave Valley | 38.533 | -114.803 |
| <i>P. hernandesi</i> | LVT 9956 | USA; NV, Lincoln Co., Lake Valley | 38.517 | -114.644 |
| <i>P. hernandesi</i> | AMA 07 | USA; NV, White Pine Co., 1 mi W Harbecke Ranch | 38.987 | -114.469 |
| <i>P. hernandesi</i> | AMA 12 | USA; NV, White Pine Co., Steptoe Valley | 39.435 | -114.796 |
| <i>P. hernandesi</i> | AMA 13 | USA; NV, White Pine Co., Steptoe Valley | 39.435 | -114.796 |
| <i>P. hernandesi</i> | CAS 223428 | USA; NV, White Pine Co., 3.6 mi E of Hwy 93 on Highline Rd. | 38.945317 | -114.446717 |
| <i>P. hernandesi</i> | CAS 249834 | USA; OR, Malheur Co., Oregon Canyon Mtns. | 42.23644 | -118.04763 |
| <i>P. hernandesi</i> | LVT 950 | USA; SD, Harding Co., Near Redig, base of Crow's Butte | 45.233832 | -103.550128 |
| <i>P. hernandesi</i> | LVT 951 | USA; SD, Harding Co., Near Redig, base of Crow's Butte | 45.233832 | -103.550128 |
| <i>P. hernandesi</i> | RRM 2474 | USA; TX, Hudspeth Co., Hueco Mountains, east slope | 31.94 | -105.95 |
| <i>P. hernandesi</i> | LVT 897 | USA; UT, Garfield Co., Mammoth Creek | 37.626 | -112.446 |
| <i>P. hernandesi</i> | LVT 899 | USA; UT, Garfield Co., Mammoth Creek | 37.626 | -112.446 |
| <i>P. hernandesi</i> | LVT 870 | USA; UT, Iron Co., Webster Flat | 37.583 | -112.875 |
| <i>P. hernandesi</i> | LVT 893 | USA; UT, Kane Co., Duck Creek Campground | 37.52 | -112.697 |
| <i>P. hernandesi</i> | LVT 894 | USA; UT, Kane Co., Duck Creek Campground | 37.52 | -112.697 |
| <i>P. hernandesi</i> | LVT 863 | USA; UT, San Juan Co., LaSal Mtn | 38.447 | -109.238 |
| <i>P. hernandesi</i> | LVT 909 | USA; UT, Tooele Co., Grantsville | 40.6 | -112.464 |
| <i>P. hernandesi</i> | LVT 911 | USA; UT, Tooele Co., Grantsville | 40.6 | -112.464 |
| <i>P. hernandesi</i> | LVT 943 | USA; WY, Fremont Co., 6 mi N of Fort Washakie | 43.091535 | -108.912441 |
| <i>P. hernandesi</i> | LVT 944 | USA; WY, Fremont Co., 6 mi N of Fort Washakie | 43.091535 | -108.912441 |
| <i>P. hernandesi</i> | LVT 953 | USA; WY, Johnson Co., 6 mi SE of Linch | 43.54952 | -106.112783 |
| <i>P. hernandesi</i> | MVZ 229181 | USA; WY, Uinta Co., ca. 6 mi NE of Lyman on road to Granger | 41.38195 | -110.1996 |
| <i>P. hernandesi</i> | MVZ 229182 | USA; WY, Uinta Co., ca. 6 mi NE of Lyman on road to Granger | 41.38195 | -110.1996 |
| <i>P. hernandesi</i> | LVT 946 | USA; WY, Washakie Co., Worland | 44.020622 | -107.858526 |
| <i>P. orbiculare</i> | ISZ 561 | Mexico; Mexico, Paraje Juan Diego | – | – |
| <i>P. orbiculare</i> | UOGV 1896 | Mexico; DF, Delegación Milpa Alta, San Pablo Oztotepec | – | – |
| <i>P. orbiculare</i> | UWBM 7284 | Mexico; Mexico, Toluca, Parque Sierra Morelos | – | – |
| <i>P. orbiculare</i> | UWBM 7285 | Mexico; Mexico, Toluca, Parque Sierra Morelos | – | – |

Table S3. Samples included in the reference-based taxonomy analysis of *Phrynosoma*. Sample names correspond to sequence names used in BPP input files.

| Species | Clade | Voucher | Sample name | SRA Accession |
|-----------------------|-------------|-------------|-------------|---------------|
| <i>P. asio</i> | – | CDR279-B | PHAS1 | SRS1054826 |
| <i>P. asio</i> | – | MVZ 161505 | PHAS2 | SRS1054825 |
| <i>P. asio</i> | – | UWBM 7280 | PHAS4 | SRS1054823 |
| <i>P. asio</i> | – | UWBM 7281 | PHAS3 | SRS1054824 |
| <i>P. cornutum</i> | – | AMCC 106073 | PHCN3 | SRS1054807 |
| <i>P. cornutum</i> | – | CAS 228870 | PHCN2 | SRS1054808 |
| <i>P. cornutum</i> | – | MVZ 238582 | PHCN1 | SRS1054809 |
| <i>P. cornutum</i> | – | MVZ 252854 | PHCN4 | SRS1054880 |
| <i>P. blainvillii</i> | Anota | MVZ 161472 | PHBL_KRN3 | SRS1307263 |
| <i>P. blainvillii</i> | Anota | MVZ 230680 | PHBL_MTRY1 | SRS1307262 |
| <i>P. blainvillii</i> | Anota | PHCO LJV28 | PHBL_VNTR1 | SRS1307268 |
| <i>P. blainvillii</i> | Anota | UABC 1304 | PHBL_BCN14 | SRS1307240 |
| <i>P. cerroense</i> | Anota | MVZ 161206 | PHCE2 | SRS1054813 |
| <i>P. cerroense</i> | Anota | MVZ 161208 | PHCE_BCN2 | SRS1307266 |
| <i>P. cerroense</i> | Anota | MVZ 161212 | PHCE5 | SRS1054811 |
| <i>P. cerroense</i> | Anota | WLHMX 1017 | PHCE_BCN8 | SRS1307237 |
| <i>P. coronatum</i> | Anota | SDField 251 | PHCO_BCS4 | SRS1307255 |
| <i>P. coronatum</i> | Anota | SDField 530 | PHCO_BCS7 | SRS1307253 |
| <i>P. coronatum</i> | Anota | SDNHM 620 | PHCO_BCS17 | SRS1307252 |
| <i>P. coronatum</i> | Anota | UABC 1007 | PHCO_BCS1 | SRS1307242 |
| <i>P. mcallii</i> | Anota | CAS 223517 | PHMC2 | SRS1054867 |
| <i>P. mcallii</i> | Anota | CAS 223602 | PHMC4 | SRS1054865 |
| <i>P. mcallii</i> | Anota | CAS 228864 | PHMC3 | SRS1054866 |
| <i>P. mcallii</i> | Anota | CAS 229923 | PHMC1 | SRS1054842 |
| <i>P. solare</i> | Anota | CAS 228866 | PHSO3 | SRS1054854 |
| <i>P. solare</i> | Anota | MVZ 161508 | PHSO1 | SRS1054857 |
| <i>P. solare</i> | Anota | MVZ 241510 | PHSO2 | SRS1054855 |
| <i>P. braconnieri</i> | Brevicauda | ANMO 2161 | PHBR3 | SRS1054816 |
| <i>P. braconnieri</i> | Brevicauda | ANMO 2167 | PHBR2 | SRS1054817 |
| <i>P. braconnieri</i> | Brevicauda | UWBM 7282 | PHBR4 | SRS1054815 |
| <i>P. braconnieri</i> | Brevicauda | UWBM 7283 | PHBR1 | SRS1054818 |
| <i>P. sherbrookei</i> | Brevicauda | UWBM 7286 | PHSH4 | SRS1054849 |
| <i>P. sherbrookei</i> | Brevicauda | UWBM 7287 | PHSH1 | SRS1054852 |
| <i>P. sherbrookei</i> | Brevicauda | UWBM 7288 | PHSH2 | SRS1054851 |
| <i>P. sherbrookei</i> | Brevicauda | UWBM 7294 | PHSH3 | SRS1054850 |
| <i>P. taurus</i> | Brevicauda | AMCC 118241 | PHTA3 | SRS1054836 |
| <i>P. taurus</i> | Brevicauda | AMCC 118305 | PHTA4 | SRS1054846 |
| <i>P. taurus</i> | Brevicauda | UWBM 7295 | PHTA2 | SRS1054847 |
| <i>P. taurus</i> | Brevicauda | UWBM 7296 | PHTA1 | SRS1054848 |
| <i>P. goodei</i> | Doliosaurus | CAS 229922 | PHGO4 | SRS1054834 |
| <i>P. goodei</i> | Doliosaurus | CAS 228865 | PHGO3 | SRS1054873 |
| <i>P. goodei</i> | Doliosaurus | CAS 228867 | PHGO1 | SRS1054875 |
| <i>P. goodei</i> | Doliosaurus | CAS 228874 | PHGO2 | SRS1054874 |
| <i>P. modestum</i> | Doliosaurus | AMCC 106074 | PHMO1 | SRS1054864 |

| | | | | |
|----------------------------|-------------|---------------|-------------------------------|------------|
| <i>P. modestum</i> | Doliosaurus | MVZ 238583 | PHMO2 | SRS1054863 |
| <i>P. Platyrrhinus</i> | Doliosaurus | CAS 249517 | PHPL2 | SRS1054856 |
| <i>P. Platyrrhinus</i> | Doliosaurus | MVZ 161495 | PHPL1 | SRS1054858 |
| <i>P. Platyrrhinus</i> | Doliosaurus | UWBM 7369 | PHPL3 | SRS1054835 |
| <i>P. ditmarsii</i> | Tapaja | RRM 2459 | PHDI1 | SRS1054878 |
| <i>P. ditmarsii</i> | Tapaja | RRM 2464 | PHDI_RRM_2464 | |
| <i>P. ditmarsii</i> | Tapaja | RRM 2466 | PHDI2 | SRS1054833 |
| <i>P. douglasii</i> | Tapaja | LVT 874 | PHDO_ID_LVT_874 | |
| <i>P. douglasii</i> | Tapaja | MVZ 223427 | PHDO_CA_MVZ223427 | |
| <i>P. douglasii</i> | Tapaja | UWBM 7227 | PHDO1 | SRS1054877 |
| <i>P. douglasii</i> | Tapaja | UWBM 7231 | PHDO2 | SRS1054876 |
| <i>P. orbiculare</i> | Tapaja | ISZ 561 | PHOR4 | SRS1054860 |
| <i>P. orbiculare</i> | Tapaja | UOGV 1896 | PHOR3 | SRS1054859 |
| <i>P. orbiculare</i> | Tapaja | UWBM 7284 | PHOR1 | SRS1054862 |
| <i>P. orbiculare</i> | Tapaja | UWBM 7285 | PHOR2 | SRS1054861 |
| <i>P. hernandesi north</i> | Tapaja | LVT 882 | north_NE_Sioux_LVT882 | |
| <i>P. hernandesi north</i> | Tapaja | LVT 950 | north_SD_Harding_LVT950 | |
| <i>P. hernandesi north</i> | Tapaja | MVZ 229181 | north_WY_Uinta_MVZ229181 | |
| <i>P. hernandesi north</i> | Tapaja | OMNH 6627 | north_MT_Yellowstone_OMNH6627 | |
| <i>P. hernandesi north</i> | Tapaja | UCMZ 1994.009 | north_Alberta_UCMZ1994009 | |
| <i>P. hernandesi south</i> | Tapaja | ALT 01 | south_Chihuahua_ALT01 | |
| <i>P. hernandesi south</i> | Tapaja | LVT 863 | south_UT_SanJuan_LVT863 | |
| <i>P. hernandesi south</i> | Tapaja | LVT 869 | south_NM-Taos_LVT869 | |
| <i>P. hernandesi south</i> | Tapaja | LVT 890 | south_AZ_Coconino_LVT890 | |
| <i>P. hernandesi south</i> | Tapaja | LVT 901 | south_AZ_Coconino_LVT901 | |
| <i>P. hernandesi south</i> | Tapaja | MSB 76317 | south_NM_RioArriba_MSB76317 | |
| <i>P. hernandesi south</i> | Tapaja | MSB 78412 | south_NM_Colfax_MSB78412 | |
| <i>P. hernandesi south</i> | Tapaja | MVZ 223191 | south_CO_Weld_MVZ223191 | |
| <i>P. hernandesi south</i> | Tapaja | MVZ 223425 | south_AZ_Gila_MVZ223425 | |
| <i>P. hernandesi south</i> | Tapaja | MVZ 225549 | south_AZ_Coconino_MVZ225549 | |
| <i>P. hernandesi west</i> | Tapaja | CAS 223428 | west_NV_WhitePine_CAS223428 | |
| <i>P. hernandesi west</i> | Tapaja | LVT 807 | west_AZ_Mohave_LVT807 | |
| <i>P. hernandesi west</i> | Tapaja | LVT 808 | west_AZ_Mohave_LVT808 | |
| <i>P. hernandesi west</i> | Tapaja | LVT 909 | west_UT_Tooele_LVT909 | |
| <i>P. hernandesi west</i> | Tapaja | ML 03 | west_ID_Cassia_ML03 | |
| <i>P. "hernandesi"</i> | Tapaja | JAN_01 | PHORNATISS_Ch_JAN_01 | |
| <i>P. "hernandesi"</i> | Tapaja | JAN_04 | PHORNATISS_Ch_JAN_04 | |
| <i>P. "hernandesi"</i> | Tapaja | MSB 76415 | PHORNATISS_NM_MSB_76415 | |
| <i>P. "hernandesi"</i> | Tapaja | RRM 2474 | PHORNATISS_TX_RRM2474 | |

Table S4. Samples included in the time-calibrated species tree analysis of the unlinked SNP data using SNAPP.

| Species | Sample |
|------------------------|---------------------------------|
| <i>P. ditmarsii</i> | ditmarsii_RRM2459 |
| <i>P. ditmarsii</i> | ditmarsii_RRM2464 |
| <i>P. ditmarsii</i> | ditmarsii_RRM2466 |
| <i>P. douglasii</i> | dougalsii_CA_Siskiyou_MVZ223434 |
| <i>P. douglasii</i> | dougalsii_ID_Lemhi_LVT875 |
| <i>P. douglasii</i> | dougalsii_NV_Washoe_RD06 |
| <i>P. douglasii</i> | dougalsii_OR_Harney_LVT956 |
| <i>P. douglasii</i> | dougalsii_OR_Linn_LVT965 |
| <i>P. douglasii</i> | dougalsii_OR_Morrow_LVT958 |
| <i>P. douglasii</i> | dougalsii_WA_Kittitas_UWBM7227 |
| <i>P. douglasii</i> | dougalsii_WA_Lincoln_LVT962 |
| <i>P. hernandesi</i> | AZ_Apache_LVT887 |
| <i>P. hernandesi</i> | AZ_SantaCruz_MVZ245875 |
| <i>P. hernandesi</i> | Alberta_UCMZ1994010 |
| <i>P. hernandesi</i> | CO_Weld_MVZ223191 |
| <i>P. hernandesi</i> | Chihuahua_ALT05 |
| <i>P. hernandesi</i> | UT_Garfield_LVT897 |
| <i>P. hernandesi</i> | NE_Sioux_LVT883 |
| <i>P. hernandesi</i> | NM_Torrance_MSB98704 |
| <i>P. "hernandesi"</i> | Chihuahua_JAN01 |
| <i>P. "hernandesi"</i> | Chihuahua_JAN04 |
| <i>P. "hernandesi"</i> | NM_Valencia_MSB76415 |
| <i>P. "hernandesi"</i> | TX_Hudspeth_RRM2474 |
| <i>P. orbiculare</i> | orbiculare_ISZ561 |
| <i>P. orbiculare</i> | orbiculare_UOGV1896 |
| <i>P. orbiculare</i> | orbiculare_UWBM7284 |
| <i>P. orbiculare</i> | orbiculare_UWBM7285 |

Table S5. Samples included in species tree analysis of *Phrynosoma hernandesi* using the unlinked SNP data in the program SNAPP. The coalescent analysis assumed a model with three populations ($K = 3$) with sample assignments determined using Admixture.

| Population | Samples |
|-------------------|-------------------------------|
| South | south_AZ_Coconino_LVT890 |
| South | south_AZ_Coconino_LVT901 |
| South | south_AZ_Coconino_MVZ225549 |
| South | south_AZ_Gila_MVZ223425 |
| South | south_CO_Weld_MVZ223191 |
| South | south_Chihuahua_ALT01 |
| South | south_NM_Colfax_MSB78412 |
| South | south_NM_RioArriba_MSB76317 |
| South | south_NM-Taos_LVT869 |
| South | south_UT_SanJuan_LVT863 |
| North | north_Alberta_UCMZ1994009 |
| North | north_MT_Yellowstone_OMNH6627 |
| North | north_NE_Sioux_LVT882 |
| North | north_SD_Harding_LVT950 |
| North | north_WY_Uinta_MVZ229181 |
| West | west_AZ_Mohave_LVT807 |
| West | west_AZ_Mohave_LVT808 |
| West | west_ID_Cassia_ML03 |
| West | west_NV_WhitePine_CAS223428 |
| West | west_UT_Tooele_LVT909 |

Table S6. Sample sizes and projections for demographic model comparisons among *Phrynosoma hernandesi* populations using easySFS.

| Population | Projection | Segregating Sites |
|------------|------------|-------------------|
| North | 18 | 360 |
| West | 18 | 1,013 |
| South | 36 | 3,109 |

Table S7. Demographic parameters estimated using the MSC model in BPP for *Phrynosoma* with 500 loci. The guide tree is shown with branch label identifiers for divergence times (τ). ESS is the estimated samples size.

| Summary Statistic | Mean | 95% HPD | ESS |
|--------------------------------|----------|----------------------|-------|
| θ_{asio} | 2.21E-03 | [1.719E-3, 2.704E-3] | 4,008 |
| $\theta_{mcallii}$ | 1.86E-03 | [1.417E-3, 2.27E-3] | 585 |
| θ_{solare} | 1.73E-03 | [1.293E-3, 2.142E-3] | 738 |
| $\theta_{coronatum}$ | 4.92E-03 | [3.844E-3, 6.062E-3] | 5,859 |
| $\theta_{cerroense}$ | 0.0107 | [7.186E-3, 0.0145] | 2,857 |
| $\theta_{blainvillii}$ | 5.22E-03 | [3.783E-3, 6.801E-3] | 5,719 |
| $\theta_{cornutum}$ | 2.92E-03 | [2.511E-3, 3.364E-3] | 1,879 |
| $\theta_{braconnieri}$ | 2.59E-03 | [2.004E-3, 3.192E-3] | 1,973 |
| θ_{taurus} | 3.58E-03 | [2.279E-3, 5.057E-3] | 4,250 |
| $\theta_{sherbrookei}$ | 6.08E-04 | [4.46E-4, 7.61E-4] | 209 |
| $\theta_{modestum}$ | 1.80E-03 | [1.41E-3, 2.191E-3] | 1,263 |
| $\theta_{platyrhinos}$ | 4.88E-03 | [3.125E-3, 6.834E-3] | 7,720 |
| θ_{goodei} | 3.90E-03 | [2.53E-3, 5.421E-3] | 5,107 |
| $\theta_{orbiculare}$ | 2.58E-03 | [2.16E-3, 3.009E-3] | 2,695 |
| $\theta_{ditmarsii}$ | 1.28E-03 | [1.018E-3, 1.557E-3] | 1,347 |
| $\theta_{\text{"hernandesi"}}$ | 1.94E-03 | [1.591E-3, 2.319E-3] | 1,163 |
| $\theta_{douglasii}$ | 3.05E-03 | [2.412E-3, 3.731E-3] | 2,570 |
| $\theta_{hernandesi\ north}$ | 1.01E-03 | [7.98E-4, 1.246E-3] | 236 |
| $\theta_{hernandesi\ south}$ | 0.0197 | [0.0136, 0.0266] | 1,300 |
| $\theta_{hernandesi\ west}$ | 3.48E-03 | [2.396E-3, 4.644E-3] | 2,028 |
| τ_{21} | 7.18E-03 | [6.302E-3, 8.057E-3] | 407 |
| τ_{22} | 2.87E-03 | [2.622E-3, 3.116E-3] | 388 |
| τ_{23} | 2.82E-03 | [2.562E-3, 3.09E-3] | 470 |
| τ_{24} | 2.43E-03 | [1.757E-3, 2.95E-3] | 421 |
| τ_{25} | 1.71E-03 | [1.454E-3, 1.966E-3] | 963 |
| τ_{26} | 1.28E-03 | [1.025E-3, 1.53E-3] | 1,862 |
| τ_{27} | 2.82E-03 | [2.586E-3, 3.077E-3] | 399 |
| τ_{28} | 2.79E-03 | [2.56E-3, 3.044E-3] | 414 |
| τ_{29} | 1.86E-03 | [1.466E-3, 2.26E-3] | 1,195 |
| τ_{30} | 6.71E-04 | [4.76E-4, 8.77E-4] | 804 |
| τ_{31} | 2.76E-03 | [2.52E-3, 3.005E-3] | 446 |
| τ_{32} | 2.52E-03 | [1.975E-3, 2.917E-3] | 453 |
| τ_{33} | 9.27E-04 | [6.73E-4, 1.181E-3] | 3,122 |
| τ_{34} | 2.57E-03 | [2.332E-3, 2.822E-3] | 625 |
| τ_{35} | 2.00E-03 | [1.771E-3, 2.231E-3] | 451 |
| τ_{36} | 1.85E-03 | [1.605E-3, 2.084E-3] | 589 |
| τ_{37} | 1.63E-03 | [1.404E-3, 1.85E-3] | 618 |
| τ_{38} | 8.08E-04 | [7.2E-4, 9.08E-4] | 291 |
| τ_{39} | 7.17E-04 | [5.79E-4, 8.43E-4] | 354 |

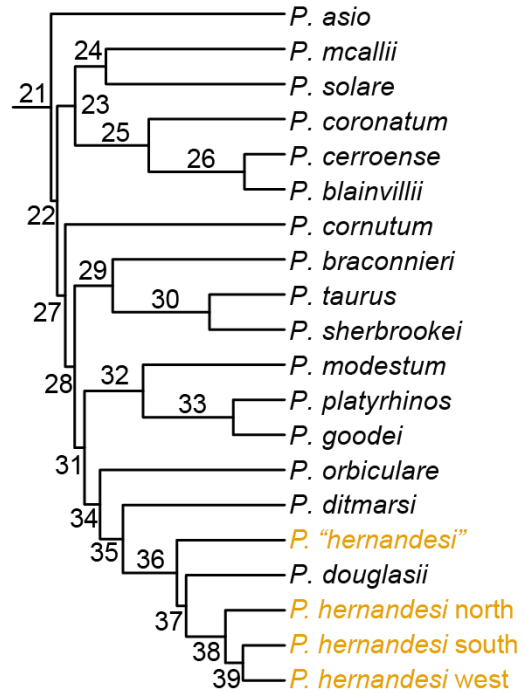


Figure S1. Three demographic models used to study the history of population divergence in *Phrynosoma hernandesi*. The isolation model includes five population size parameters (N) and two divergence times (T). The isolation-migration model (IM) includes five population size parameters, two divergence times, and eight migration rates (asymmetric migration; shown with arrows) allowing divergence with gene flow among all contemporary and ancestral populations. The secondary contact model (SC) adds an extra parameter to the IM model for the time of secondary contact (T_{sc}) when contemporary populations reconnect and exchange migrants (gene flow) after a period of isolation.

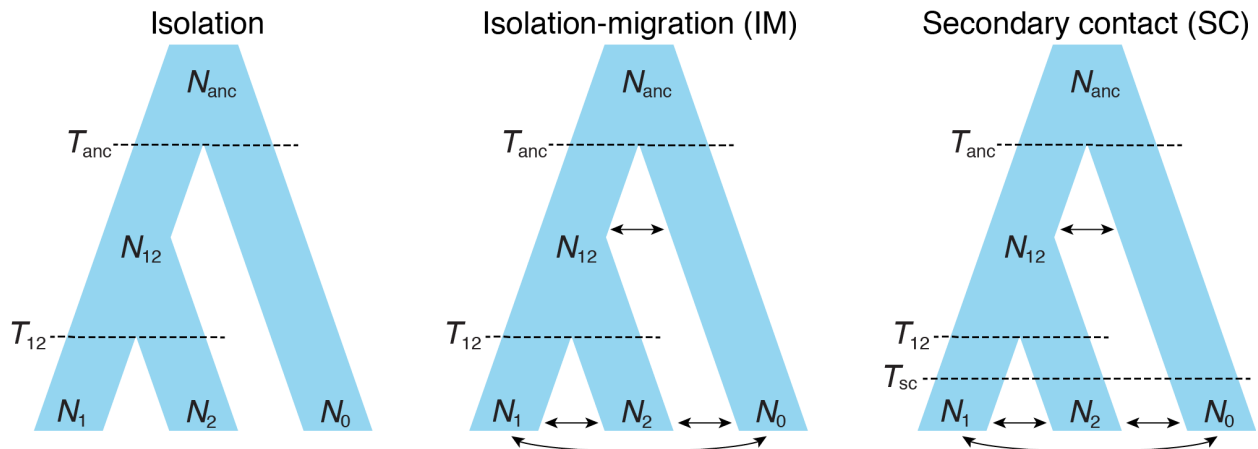


Figure S2. Concatenated phylogenetic analysis of the ddRADseq data (118 samples and 52,171 base pairs) using maximum likelihood. Numbers on nodes are bootstrap values ($\geq 50\%$). The concatenated phylogeny differs from the coalescent-based species tree analysis by supporting a sister relationship between *P. ditmarsii* and *P. "hernandesii"*, although this clade is weakly supported (bootstrap = 52%).



Figure S4. Geographic distributions of *Phrynosoma hernandesi* and *P. ornatissimum* in New Mexico, Texas, and northern Mexico. Sample locations are from VertNet, iNaturalist, and additional locality records verified using morphological data (Montannuci 2015). *Phrynosoma ornatissimum* occurs at lower elevations compared to *P. hernandesi*, resulting in isolated montane populations of *P. hernandesi* in several mountain ranges, including the Davis Mts., Organ Mts., Guadalupe Mts., and Sacramento Mts.

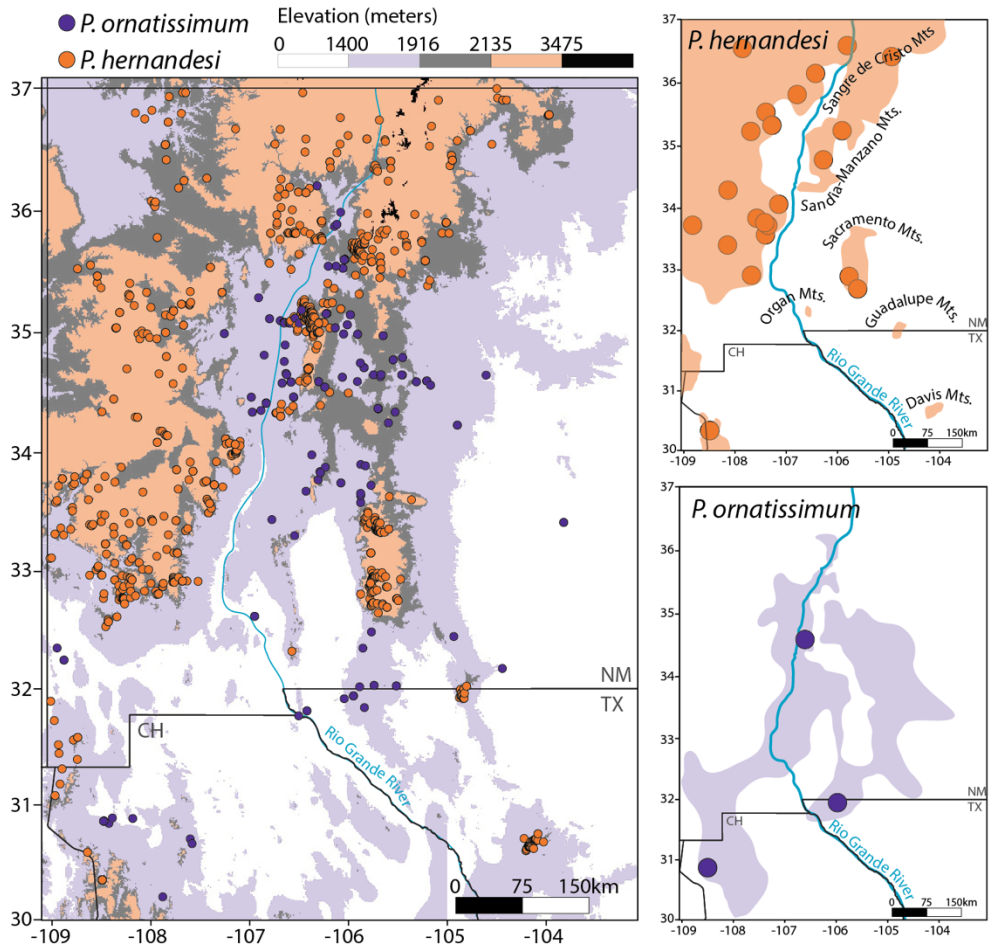


Figure S5. Summary of previous systematic studies of the *Phrynosoma hernandesi* species complex and closely related species belonging to the *Tapaja* clade with reference to the nuclear DNA phylogeny. (A) Concatenated phylogenetic analysis of the ddRADseq data (118 samples and 52,171 base pairs) using maximum likelihood. Four samples of *Phrynosoma orbiculare* were used to root the tree (not shown). Numbers on nodes are bootstrap values ($\geq 50\%$). The phylogeny is color-coded to illustrate the species-level taxonomy and phylogeographic groups within *P. hernandesi* supported by the phylogeographic analyses. (B) Geographic distributions of the mtDNA clades within *P. hernandesi* modified from Zamudio et al. (1997). (C) Geographic distributions of species and subspecies identified by morphological data modified from Montanucci (2005). The hatched area in the Colorado Plateau is one of several putative hybrid zones hypothesized to exist between taxa. Mapping the mtDNA and morphological assignments onto the nuclear DNA phylogeny illustrates their discordances, and suggests discordance is generally restricted to samples at the geographic boundaries between population/species. (D) Geographic distributions of species and populations based on the nuclear DNA results. Samples that show evidence of admixture are shown in the hatched area on the map and identified with arrows on the phylogeny.

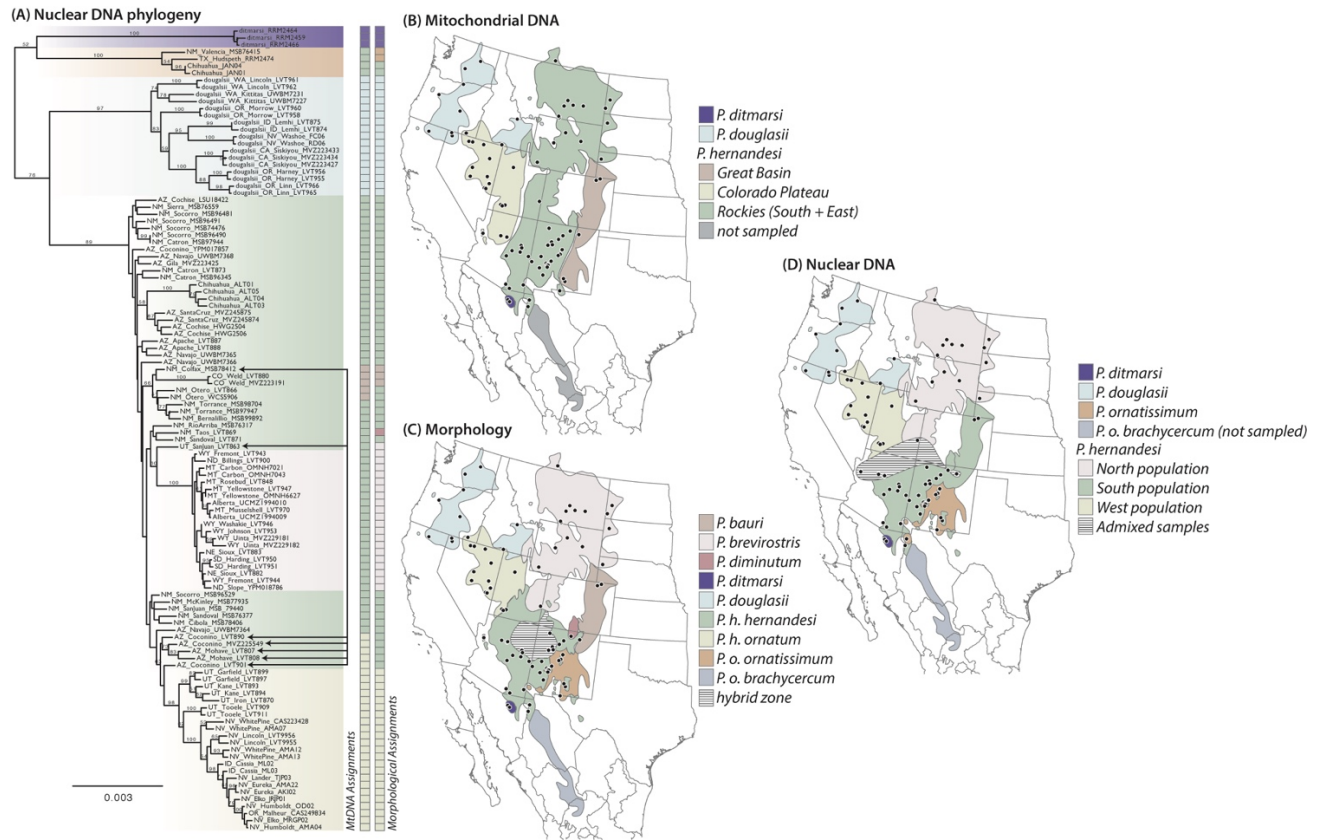


Figure S6. Nuclear and mtDNA discordance in the *Phrynosoma hernandesi* species complex and closely related species belonging to the *Tapaja* clade. Only samples with overlapping data are shown (86 samples). (A) Concatenated phylogenetic analysis of the ddRADseq data using maximum likelihood with RAxML. *Phrynosoma orbiculare* was used to root the tree (not shown). The phylogeny is color-coded to illustrate the species-level taxonomy and phylogeographic groups within *P. hernandesi* supported by the phylogeographic analyses. (B) Mitochondrial DNA gene tree inferred using RAxML. The tree is rooted with *P. orbiculare* (not shown). Samples are labeled according to the nuclear DNA assignments to highlight areas of discordance. Notable discordance includes the paraphyly of *P. hernandesi* in the mtDNA genealogy with respect to *P. ditmarsii* and *P. ornatissimum*, and the alternative placements of the sample ALT01 from Chihuahua, Mexico (shown with arrows).

