

Alborz Heritage: Geographic distribution and genetic differentiation of
the Iranian *Paradactylodon* (Amphibia: Hynobiidae)

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Supplementary material

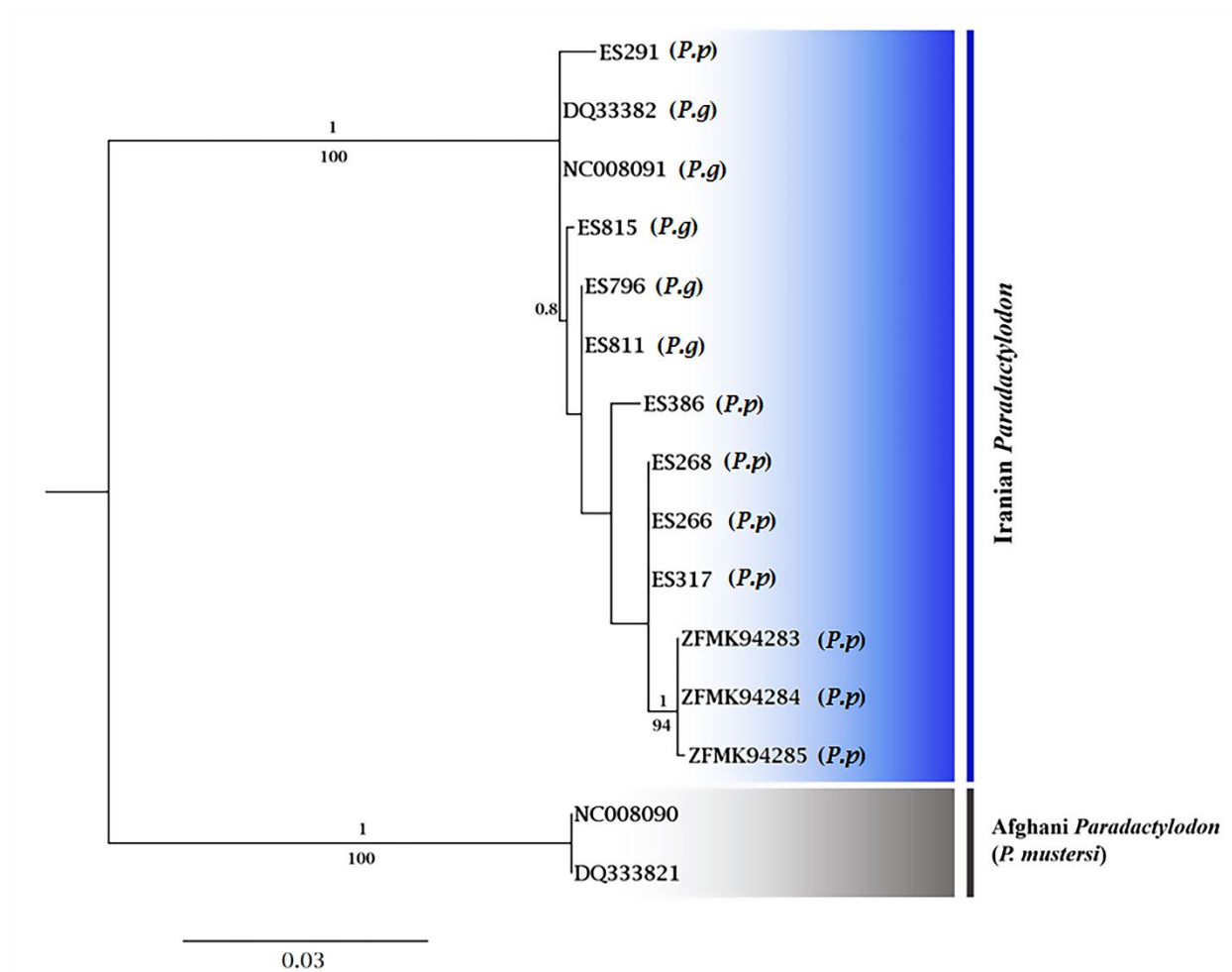


Figure S1. The phylogenetic tree of *Paradactylodon* using two mtDNA genes (COI and 16S); above and below the branches Bayesian posterior probability values and bootstrap values, respectively, are given (PP/BS). Only values higher than 0.8 /80% are shown. Isolate codes correspond to those given in supplementary table S2. *P.g* = *Paradactylodon gorganensis*; *P.p* = *Paradactylodon persicus*.

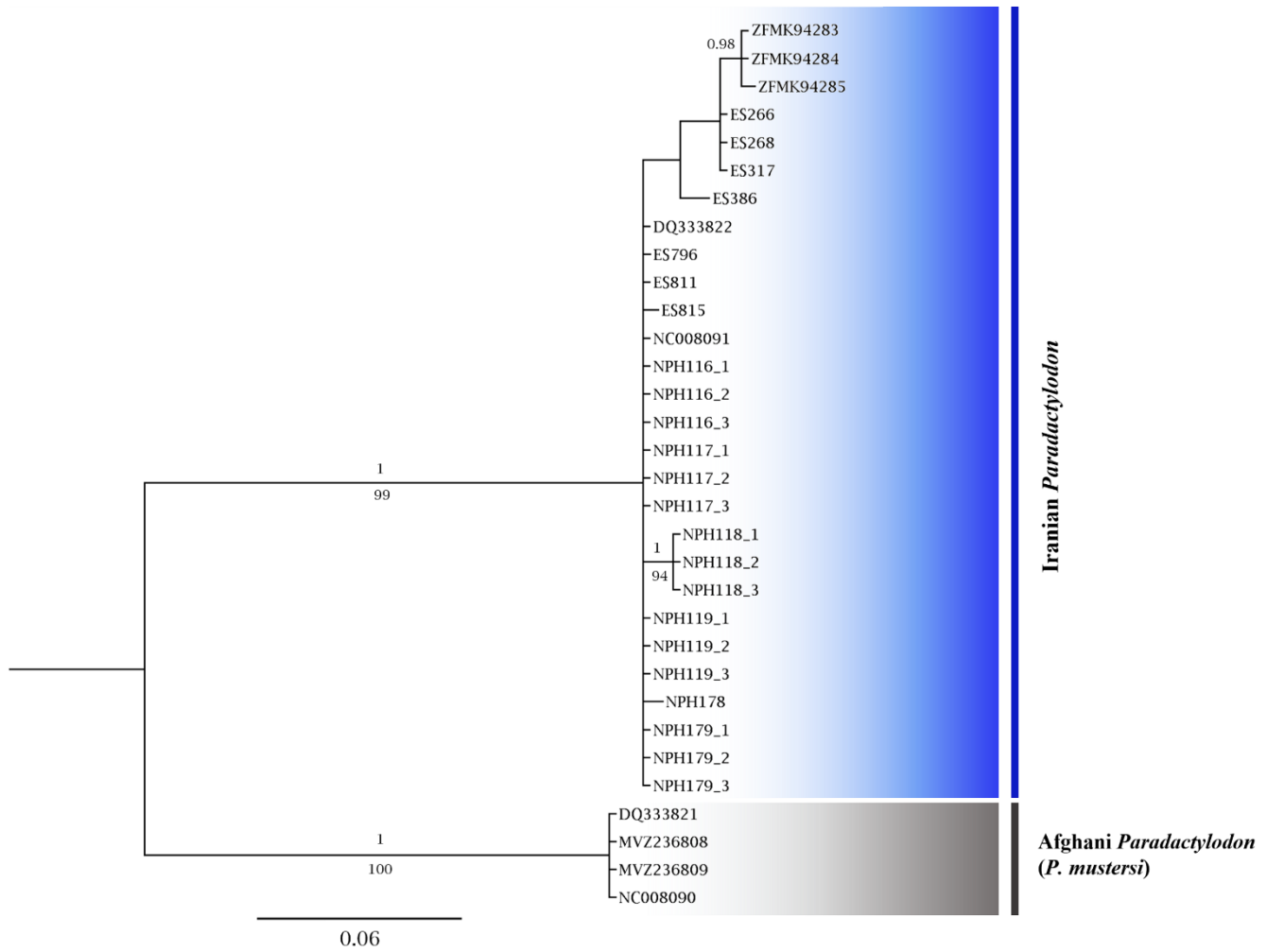


Figure S2. The phylogenetic tree of *Paradactylodon* based on COI gene; in the branches Bayesian posterior probability values and bootstrap values are given (PP/BS). Only values higher than 0.8 /80% are shown.

Table S1. Distribution points of the Middle-Eastern *Paradactylodon*. All presently known localities are presented.

| Number | Locality | Altitude (m a.s.l.) | Latitude | Longitude | Reference |
|----------------------------------|--|------------------------|----------|-----------|---|
| Iran: Gilan Province | | | | | |
| 1 | Near Assalem, in Talysh mountains | 800 | 37.832 | 48.749 | Eiselt and Steiner, 1970 [Terra typica of <i>P. persicus</i>] |
| 2 | Talysh, Jahangirieh Spring | 1682 | 37.5566 | 48.7252 | This study |
| 3 | W from Ardeh, Rezvanshahr county (Rezvan Shahr) | 1622 | 37.465 | 48.786 | Ahmadzadeh et al., 2011 |
| 4 | Yeilagh-e-Sarasi, environs of Tanian and Almas | 1300 | 37.435 | 48.851 | Kami, 1999 |
| 5 | W from Fowman (Fuman, Fooman) | 456 | 37.208 | 49.160 | Kami and Vakilpoure, 1996; Stock, 1999 |
| 6 | Environs of Kuh-e Shaft, Shaft district | 476 | 37.101 | 49.296 | Kami, 1990; Baloutch and Kami, 1995 |
| 7 | Khasib Dasht, Halou Sara | 1786 | 36.9375 | 50.0749 | This study |
| Iran: Ardabil Province | | | | | |
| 8 | Kuh-e Saddareh-sar, Delmadeh environs | 1500 | 37.401 | 48.789 | This study |
| 9 | 45 km SE from Khalkhal, Delmadeh (Dilmadeh) | 2034 | 37.376 | 48.793 | Kami and Vakilpoure, 1996; Stock, 1999; Ahmadzadeh and Kami, 2009 |
| 10 | Karmen mountain, environs of Dilamdeh [Delamdeh] | 1782 | 37.353 | 48.810 | This study |
| Iran: Mazandaran Province | | | | | |
| 11 | Mountains near Khanian | 2300 | 36.516 | 50.676 | This study Ebrahimi, Kami and Stöck, 2004; Kami, 2004; this study |
| 12 | Zereshk Dareh Forest | 3016 | 36.439 | 51.414 | Ahmadzadeh and Kami, 2009 |
| 13 | Chalus | 1526 | 36.510 | 51.444 | This study |
| 14 | Envrions of Chalus | 1300 | 36.500 | 51.478 | This study |
| 15 | WeySer (Weyzer, Wysar), 30 km S from Nowshar (Now Shahr) | 1200 | 36.382 | 51.504 | Steiner, 1973 |
| Iran: Golestan Province | | | | | |
| 16 | Mountains near Amol | >1000 | ? | ? | Baloutch and Kami, 1995 |
| 17 | Shast Kolah (Shast Kalateh , Shastkola) forest | 820 | 36.736 | 54.378 | Kami, 2004 |
| 18 | Road from Shast Kolah to Kuh-e Jowzband | 820 | 36.727 | 54.403 | This study |

| | | | | | |
|----|---|------|--------|--------|--|
| 19 | Barankouh, about 10 km SW of Gorgan | 1100 | 36.758 | 54.425 | Kami, 2004 |
| 20 | Spring of Khonakou, situated SSW of Gorgan, Jahannama Protected Area, Valley of Sorkh Cheshmeh, below elevations of Pir-e-zan (elevations of Pahlavan Ghaleh) | 1800 | 36.743 | 54.451 | Kami, 2004 |
| 21 | Manzolak (Manzoulak Spring) | 820 | 36.700 | 54.350 | Ebrahimi, Kami and Stöck, 2004; Kami, 2004; this study |
| 22 | Vantakhteh | 1200 | 36.675 | 54.425 | Kami, 2004 |
| 23 | Elevations of Yakhkesh, about 15 km S of Gorgan | 2300 | 36.708 | 54.392 | Kami, 2004 |
| 24 | Between Gorgan and Aliabad | 450 | 36.792 | 54.575 | Stöck, 1999 |
| 25 | Environs of Eldigah | 900 | 36.708 | 54.592 | This study |
| 26 | Valley Loushan, about 30 km SE of Gorgan | ? | 36.705 | 54.692 | Kami, 2004 |
| 27 | Village of Aliabad (around Aliabad - Mohammadabad-e-Katul City) | 450 | 36.852 | 54.881 | Kami, 2004; this study |
| 28 | Region of Aram-e-Sorkhcheshmeh opposite side of Siah Marzkouh | ? | 36.795 | 54.926 | Kami, 2004 |
| 29 | Spring Khoulou | 1500 | 36.742 | 54.892 | Kami, 2004 |
| 30 | Khakpirzan near Shirabad | 1344 | 36.858 | 55.051 | This study |
| 31 | S slope of Ghale Miran (Ghalee Maran) | 1287 | 36.852 | 55.112 | This study |
| 32 | Shirabad waterfalls | 380 | 36.961 | 55.021 | Kami, 2004 |
| 33 | Environs of Sefidcheshme, near Shirabad | 500 | 36.953 | 55.065 | This study |
| 34 | 20 m above Shirabad Cave | 420 | 36.958 | 55.058 | Kami, 2004 |
| 35 | Shirabad Cave, Shirabad | 400 | 36.958 | 55.025 | Clergue-Gazeau and Fracy, 1978; Clergue-Gazeau and Thorn, 1979 [Terra typica of <i>P. gorganensis</i>]; Stöck, 1999; Kami, 2004; this study |

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|---|---|-----------|---------|---------|--|
| 36 | Ziarat Waterfall | | 36.7094 | 54.4793 | This study |
| Afghanistan: Ghazni Province | | | | | |
| 37 | Dasht-i-Navar [Dacht-i-Navar] | >3000 | 33.954 | 67.918 | Bohme, 1982 |
| Afghanistan: Wardak Province | | | | | |
| 38 | Gardan Diwal in the Koh-i-Baba Massif | >2900 | 34.507 | 68.231 | Mertens, 1970 |
| 39 | Darreh-ye Sanglakh [Sanglakh in Maidan Province, south of Kabul] | >2800 | 34.602 | 68.745 | Bohme, 1982 |
| 40 | Rakul', border of Wardak and Kabul provinces | >3300 | 34.569 | 68.856 | This study |
| Afghanistan: Kabul Province | | | | | |
| 41 | Paghman valley; Paghman mountains | 2750-3050 | 34.612 | 68.893 | Smith, 1940 [Terra typica of <i>P. mustersi</i>]; Nawabi, 1965 |
| 42 | Paghman valley; three tributaries of Paghman stream | 2440-3750 | 34.640 | 68.904 | Reilly, 1983 |
| Afghanistan: Parwan Province | | | | | |
| 43 | Offsprings of Paghman stream in Parwan Province | >3700 | 34.639 | 68.867 | This study |
| 44 | Salang pass north-east of Kabul, border of Parwan and Baghlan provinces | >3000 | 35.305 | 69.056 | Bohme, 1982 |
| Pakistan: Khyber Pakhtunkhwa Province (North-West Frontier Province) | | | | | |
| 45 | Mastuj, Chitral valley (?) | >2800 | 35.891 | 71.738 | Wall, 1911 [Unconfirmed locality] |

Table S2. Specimens of *Paradactylodon* and outgroups used in the molecular phylogenetic analysis with isolate codes, locations, and accession numbers.

| Isolate code | Population | Locality | Accession number | | Reference |
|--------------|-----------------------|---|------------------|----------|--------------------|
| | | | COI | 16S | |
| NPH116-1 | <i>P. gorganensis</i> | Iran, Golestan, Shirabad Cave | MT299823 | - | This study |
| NPH116-2 | <i>P. gorganensis</i> | Iran, Golestan, Shirabad Cave | MT299824 | - | This study |
| NPH116-3 | <i>P. gorganensis</i> | Iran, Golestan, Shirabad Cave | MT299825 | - | This study |
| ES815 | <i>P. gorganensis</i> | Iran, Golestan, Shirabad Cave | MT299822 | MT279041 | This study |
| NPH117-1 | <i>P. gorganensis</i> | Iran, Golestan, Shastkola Forest | MT299826 | - | This study |
| NPH117-2 | <i>P. gorganensis</i> | Iran, Golestan, Shastkola Forest | MT299827 | - | This study |
| NPH117-3 | <i>P. gorganensis</i> | Iran, Golestan, Shastkola Forest | MT299828 | - | This study |
| NPH119-1 | <i>P. gorganensis</i> | Iran, Golestan, Near Shirabad | MT299832 | - | This study |
| NPH119-2 | <i>P. gorganensis</i> | Iran, Golestan, Near Shirabad | MT299833 | - | This study |
| NPH119-3 | <i>P. gorganensis</i> | Iran, Golestan, Near Shirabad | MT299834 | - | This study |
| NPH179-1 | <i>P. gorganensis</i> | Iran, Golestan, Manzoulak Spring | MT299836 | - | This study |
| NPH179-2 | <i>P. gorganensis</i> | Iran, Golestan, Manzoulak Spring | MT299837 | - | This study |
| NPH179-3 | <i>P. gorganensis</i> | Iran, Golestan, Manzoulak Spring | MT299838 | - | This study |
| ES811 | <i>P. gorganensis</i> | Iran, Golestan, Ziarat Waterfall | MT299821 | MT279040 | This study |
| ES796 | <i>P. gorganensis</i> | Iran, Golestan, Ziarat Waterfall | MT299820 | MT279039 | This study |
| - | <i>P. gorganensis</i> | Iran | DQ333822 | DQ333822 | Zhang et al., 2006 |
| - | <i>P. gorganensis</i> | Iran | NC008091 | NC008091 | Zhang et al., 2006 |
| ES291 | <i>P. persicus</i> | Iran, Mazandaran , Zereshk Darreh | - | MT279035 | This study |
| ES292 | <i>P. persicus</i> | Iran, Mazandaran , Zereshk Darreh | - | MT279036 | This study |
| NPH118-1 | <i>P. persicus</i> | Iran, Mazandaran, Khanian environs | MT299829 | - | This study |
| NPH118-2 | <i>P. persicus</i> | Iran, Mazandaran, Khanian environs | MT299830 | - | This study |
| NPH118-3 | <i>P. persicus</i> | Iran, Mazandaran, Khanian environs | MT299831 | - | This study |
| NPH178 | <i>P. persicus</i> | Iran, Mazandaran, Chalus | MT299835 | - | This study |
| ES386 | <i>P. persicus</i> | Iran, Gilan, Khasib Dasht, Halousara | MT299819 | MT279038 | This study |
| ES266 | <i>P. persicus</i> | Iran, Gilan, Talysh, Jahangirieh Spring | MT299816 | MT279031 | This study |
| ES267 | <i>P. persicus</i> | Iran, Gilan, Talysh, Jahangirieh Spring | - | MT279032 | This study |
| ES268 | <i>P. persicus</i> | Iran, Gilan, Talysh, Jahangirieh Spring | MT299817 | MT279033 | This study |
| ES269 | <i>P. persicus</i> | Iran, Gilan, Talysh, Jahangirieh Spring | - | MT279034 | This study |
| ES317 | <i>P. persicus</i> | Iran, Gilan, Talysh, Jahangirieh Spring | MT299818 | MT279037 | This study |

| | | | | | |
|-----------|--------------------------------|--|----------|----------|--------------------|
| ZFMK94283 | <i>P. persicus</i> | Iran, Ardabil, Talysh mountains, Khalkal | MT299839 | MT279028 | This study |
| ZFMK94284 | <i>P. persicus</i> | Iran, Ardabil, Talysh mountains, Khalkal | MT299840 | MT279029 | This study |
| ZFMK94285 | <i>P. persicus</i> | Iran, Ardabil, Talysh mountains, Khalkal | MT299841 | MT279030 | This study |
| MVZ236808 | <i>P. mustersi</i> | Afghanistan | MT299842 | - | This study |
| MVZ236809 | <i>P. mustersi</i> | Afghanistan | MT299843 | - | This study |
| - | <i>P. mustersi</i> | Afghanistan | NC008090 | NC008090 | Zhang et al., 2006 |
| - | <i>P. mustersi</i> | Afghanistan | DQ333821 | DQ333821 | Zhang et al., 2006 |
| - | <i>Onychodactylus fischeri</i> | - | NC008089 | NC008089 | Zhang et al., 2006 |
| - | <i>Ranodon sibiricus</i> | - | NC004021 | NC004021 | Zhang et al., 2003 |

Table S3. Retrieved samples from Zheng et al. (2011) for estimating divergence date.

| Taxon | Specimen Catalogue No. | Accession numbers |
|--|---|-------------------|
| | | mt genome |
| <i>Ambystoma mexicanum</i> | —/— | AJ584639 |
| <i>Ambystoma rosaceum</i> | MVZHerp132964 | — |
| <i>Amphiuma means</i> | RMB2489/APPSU23768 ^a , — | GQ368656 |
| <i>Amphiuma tridactylum</i> | MVZHerp241480 | — |
| <i>Andrias davidianus</i> | —/MVZHerp204245 | AJ492192 |
| <i>Dicamptodon aterrimus</i> | MVZHerp228774 | GQ368657 |
| <i>Dicamptodon tenebrosus</i> | UTA56596 ^a , MVZHerp192601 ^b | — |
| <i>Batrachuperus londongensis</i> | —/CIB-XM120 ^c | DQ333809 |
| <i>Batrachuperus pinchonii</i> | —/CIB-XM863 ^c | DQ333815 |
| <i>Batrachuperus tibetanus</i> | —/CIB-XM153 ^c | DQ333817 |
| <i>Batrachuperus yenyuanensis</i> | —/CIB-XM903 ^c | DQ333818 |
| <i>Hynobius amjiensis</i> | —/CIB-XM2221 ^c | DQ333808 |
| <i>Hynobius chinensis</i> | CIB-XM2853 ^c /CIB-XM2853 ^c | HM036353 |
| <i>Hynobius guabangshanensis</i> | —/CIB-XM1992 ^c | DQ333819 |
| <i>Hynobius leechii</i> | —/CIB-XM1875 ^c | DQ333811 |
| <i>Hynobius maoershanensis</i> | CIB-XM2121 ^c /CIB-XM2121 ^c | HM036355 |
| <i>Hynobius nebulosus</i> | CIB-XM3140 ^c /CIB-XM3140 ^c | HM036356 |
| <i>Hynobius quepaertensis</i> | CIB-XM3134 ^c /CIB-XM3134 ^c | HM036352 |
| <i>Hynobius retardatus</i> | CIB-XM3144 ^c /CIB-XM3144 ^c | HM036351 |
| <i>Hynobius tokyoensis</i> | CIB-XM3146 ^c /CIB-XM3146 ^c | HM036357 |
| <i>Hynobius yiwuensis</i> | CIB-XM2843 ^c /CIB-XM2843 ^c | HM036354 |
| <i>Liua shihi</i> | —/CIB-XM2043 ^c | DQ333810 |
| <i>Liua tsinpaensis</i> | —/CIB-XM719 ^c | DQ333813 |
| <i>Onychodactylus fischeri</i> | —/CIB-XM1988 ^c | DQ333820 |
| <i>Pachyhynobius shangchengensis</i> | —/CIB-XM2099 ^c | DQ333812 |
| <i>Paradactylodon gorganensis</i> | MVZHerp241494/MVZHerp241494 ^c | DQ333822 |
| <i>Paradactylodon mustersi</i> | MVZHerp236807/MVZHerp236810 ^c | DQ333821 |
| <i>Pseudohynobius flavomaculatus</i> | CIB-XM2084/CIB-XM2084 ^c | FJ532059 |
| <i>Pseudohynobius puxiongensis</i> | CIB-XM3126/CIB-XM3126 ^c | FJ532058 |
| <i>Pseudohynobius shuichengensis</i> | CIB-XM2855/CIB-XM2855 ^c | FJ532060 |
| <i>Ranodon sibiricus</i> | —/CIB-XM3436 ^c | AJ419960 |
| <i>Salamandrella keyserlingii</i> | —/CIB-XM2064 ^c | DQ333814 |
| <i>Aneides ferreus</i> ^e | MVZHerp219942 | — |
| <i>Aneides flavipunctatus</i> ^e | MVZHerp219973/MVZHerp219973 | AY728214 |
| <i>Aneides hardii</i> | MVZHerp226110/MVZHerp226110 | AY728226 |
| <i>Bolitoglossa sombra</i> | MVZHerp225875/MVZHerp225875 | AY728235 |
| <i>Desmognathus fuscus</i> | MVZHerp224931/MVZHerp224931 | AY728227 |
| <i>Ensatina eschscholtzii</i> | MVZHerp236229/MVZHerp236171 | AY728216 |
| <i>Eurycea bislineata</i> | MVZHerp225074/MVZHerp225074 | AY728217 |
| <i>Gyrinophilus porphyriticus</i> | MVZHerp173504/ASB123 ^a , MVZHerp173504 ^b | AY728230 |
| <i>Hemidactylium scutatum</i> | MVZHerp225077/UTA56604 ^a , MVZHerp225078 ^b | AY728231 |
| <i>Hydromantes brunus</i> | MVZHerp230641/MVZHerp238576 | AY728234 |
| <i>Phaeognathus hubrichti</i> | MVZHerp173507/MVZHerp173507 | AY728233 |
| <i>Plethodon elongatus</i> ^f | MVZHerp220003/RH75-29 ^a , MVZHerp220003 ^b | AY728223 |
| <i>Plethodon jordani</i> ^g | MVZHerp206567 | — |
| <i>Plethodon petraeus</i> ^g | MVZHerp222650 | AY728222 |
| <i>Pseudotriton ruber</i> | MVZHerp220897/ASB130 ^a , MVZHerp137304 ^b | AY728220 |

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|--------------------------------|--|----------|
| <i>Stereochilus marginatus</i> | MVZHerp233227/MVZHerp233227 | AY728212 |
| <i>Rhyacotriton variegatus</i> | MVZHerp222581SUH11528 ^a , /LMVZHerp222581 ^b | AY728219 |
| <i>Pleurodeles poireti</i> | MVZHerp235673/MVZHerp235673 | EU880329 |
| <i>Tylotriton wenxianensis</i> | MVZHerp236638/MVZHerp236638 | EU880341 |
| <i>Ascaphus truei</i> | —/MVZHerp187732 | AJ871087 |
| <i>Xenopus tropicalis</i> | —/— | AY789013 |
