

First record of albinism in the Taragüi Gecko *Homonota taragui* (Squamata: Phyllodactylidae)

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Albinism is a rare, congenital, genetically inherited condition characterized by a partial or complete lack of melanin; the pigment that colors the skin, eyes and hair or feathers (López and Ghirardi, 2011). This condition results from the expression of a recessive allele, which causes tyrosinase inactivity, an enzyme involved in melanin biosynthesis (Krecsák, 2008). There are two types of albinism, complete albinism, a condition expressed phenotypically as the complete absence of melanin in the entire body; and partial albinism, when melanin is reduced in the whole body or the absence is located in just one part of the body (Klug and Cummings, 1999).

In reptiles, albinism is an uncommon phenomenon in nature, which may be due to certain factors such as high detectability to predators or difficulty to thermoregulate (Kornilios, 2014). Albinism has been recorded in snakes, (*Rhinechis scalaris* - Rollinat, 1934; Lesparre, 2001; *Coronella girondica* - Martínez-Silvestre et al., 2009; *Natrix maura* - Pérez and Collado, 1975; Braña, 1997), turtles (*Testudo hermanni* - Alderton, 1994), amphibiaenians (*Blanus cinereus* - Cabana and Vázquez, 2008), and less frequently in lizards (Delaugerre, 1981). In the infra order Gekkota, it has been recorded in the families Sphaerodactylidae (*Euleptes europaea* - Delaugerre, 1982), Gekkonidae (*Hemidactylus turcidus*

- Rivera et al., 2001), Eublepharidae (*Eublepharis macularius* - Gamble et al., 2006) and Phyllodactylidae (*Tarentola boettgeri bischoffi* - Rocha and Rebelo, 2010). Here, we report the first case of albinism in a species of the genus *Homonota* (Phyllodactylidae).

The South American genus *Homonota* includes ten species of nocturnal and terrestrial lizards distributed in Argentina, Bolivia, Brazil, Paraguay and Uruguay (Avila et al., 2012; Cajade et al., 2013). The normal coloration consists of irregular brown or black reticulation or regular brownish rectangles superimposed on either a yellowish brown or grayish black ground color; brown or black bar on snout anterior to eye always present, in some cases very obscure; ventral surfaces immaculate to densely covered with chromatophores (Kluge, 1964).

The Taragüi Gecko (*Homonota taragui*, Cajade, et al., 2013) is a small lizard with a maximum size of 42 mm, characterized by a dark reticulated dorsal pattern on a light background (Figure 1A). As other species of the genus, *H. taragui* has nocturnal habits, and it is a microhabitat specialist, living under the small rocks that lay on a rocky substrate, and especially in sites where the rocks lay on large, exposed outcrops of quartz sandstone (Cajade et al., 2013; Odriozola, 2014). *Homonota taragui* has a restricted geographical distribution in three small isolated rock outcrops in the locality Paraje Tres Cerros, Corrientes province, Argentina.

During an ecological study about three syntopic lizard species of the hills of Paraje Tres Cerros (Odriozola, 2014), an albino specimen of *H. taragui* (Figure 1B) was recorded on 4th October of 2013, in one of the three hill, call Capará (29°9'14.6"S, 56°51'44.6"W; 140 m a.s.l., at 15:52 hs) under a rock and photographed. The registered specimen had a partial albinism, as it is observed that the coloration of the eyes is normal (Figure 1B).

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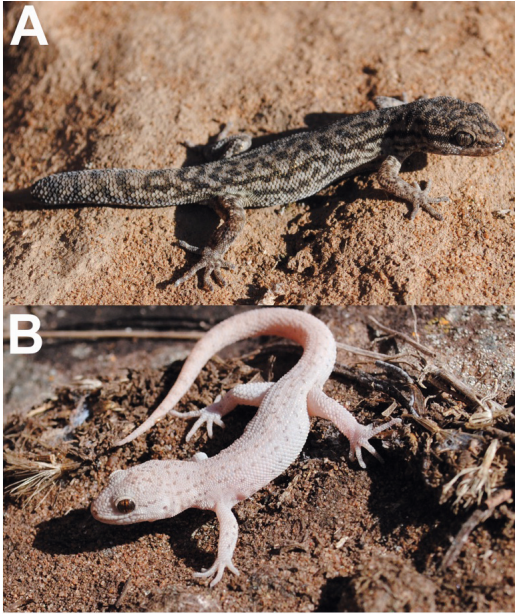


Figure 1. Normal colored (A) and albino (B) specimens of *Homonota taragui* from Paraje Tres Cerros, Corrientes province, Argentina.

Considering the conservation status of *H. taragui*, probably under threat (Cajade *et al.*, 2013), the specimen was not collected. The proportion of albino specimens of *H. taragui* in this hill was 1/29 individuals.

The albinism in *H. taragui* could be related to its nocturnal and secretive habits, as different studies suggest that the occurrence frequency of albino animals in nature is favored in animals that show less dependency to camouflage to survive (Sazima and Di-Bernardo, 1991). On the other hand, the albino animals increase in fragmented populations for natural causes or for human effect (Vaardijk and Veldonkstraat, 2000) causing inbreeding and a rise in the chances of expression of recessive alleles such as those of albinism, and other congenital deleterious traits, producing a reduction on the survival (Childs, 1953; Sazima, 1974; Maneyro and Achaval, 2004; Browder, 2005; Sanabria *et al.*, 2010). Species as *H. taragui* with a restricted geographic distribution and with small populations fragmented in three small isolated hills, offers an ideal setting for the expression of recessive alleles with a probably risk of endogamic depression for the population.

In conclusion the record of albinism in *H. taragui*

must be considered a call of attention about its conservation status, and a motivation to promote studies on the population and conservation genetics of this microendemic species.

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References

- Alderton, D. (1994): Tortugas terrestres y acuáticas del mundo. Barcelona, Spain, Omega.
- Avila, L.J., Pérez, C.H.F., Minoli, I., Morando, M. (2012): A new species of *Homonota* (Reptilia: Squamata: Gekkota: Phyllodactylidae) from the Ventania mountain range, Southeastern Pampas, Buenos Aires Province, Argentina. *Zootaxa* **3431**: 19-36.
- Braña, F. (1997): *Natrix maura* (Linnaeus, 1758). In: Fauna Ibérica, p. 440-454. Ramos, M.A. *et al.*, Eds., Madrid, Spain, Museo Nacional de Ciencias Naturales. CSIC.
- Browder, L.W. (2005): Genetic and embryological studies of albinism in *Rana pipiens*. *Journal of Experimental Zoology* **180**: 149-155.
- Cabana, M., Vázquez, R. (2008): Albinismo parcial y total de *Blanus cinereus* (Vandelli, 1797) en la Península Ibérica. *Munibe* **35**: 87-88.
- Cajade, R., Etchepare, E.G., Falcione, C., Barraso, D.A., Alvarez, B.B. (2013): A new species of *Homonota* (Reptilia: Squamata: Gekkota: Phyllodactylidae) endemic to the hills of Paraje Tres Cerros, Corrientes Province, Argentina. *Zootaxa* **3709**: 162-176.
- Childs, H.E. (1953): Selection by predation on albino and normal spade foot toads. *Evolution* **7**: 228-233.
- Delaugerre, M. (1981): Cas d'albinism echez *Phyllodactylus europaeus* Gene, 1838: 1er cas signale dans la famille des Gekkonidae (Sauria, Reptilia). *Bulletin bi-mensuel de la Société linnéenne de Lyon* **50**: 213-216.
- Gamble, T., Aherns, J.L., Card, V. (2006): Tyrosinase activity in the skin of three strains of albino Gecko (*Eublepharis macularius*). *Gekko, Spencer* **5**: 39-44.
- Klug, W.S., Cummings, M.R. (1999): *Conceptos de Genética*. Madrid, Spain, Prentice – Hall.
- Kluge, A.G. (1964): A revision of the South American gekkonid lizard genus *Homonota* Gray. *American Museum Novitates* **2193**: 1-41
- Kornilios, P. (2014): First report of piebaldism in scolecophidians: a case of *Typhlops vermicularis* (Squamata: Typhlopidae). *Herpetology Notes* **7**: 401-403.
- Krecsák, L. (2008): Albinism and leucism among European Viperina: a review. *Russian Journal of Herpetology* **15**: 97-102.
- Lesparre, D. (2001): Un caso de albinismo en culebra de escalera (*Elaphescalaris*). *Boletín de la Asociación Herpetológica Española* **12**: 17-18.

- López, J.A., Ghirardi, R. (2011): First Record of Albinism in *Rhinella fernandezae* (Gallardo, 1957). *Belgian Journal of Zoology* **141**: 59-61.
- Maneyro, R., Achaval, F. (2004): *Melanophryniscus montevidiensis* (Darwin's toad). Albino larvae. *Herpetological Review* **35**: 261.
- Martínez-Silvestre, A., Soler, J., Gener, J.M., García, M., Martí, C. (2009): Albinismo total de *Coronella girondica* en la Península Ibérica. *Boletín de la Asociación Herpetológica Española* **20**: 4-4.
- Odriozola, M.P. (2014): Complementariedad y solapamiento entre los nichos espacial y temporal de tres especies sintópicas de lagartijas del Paraje Tres Cerros, Corrientes, Argentina. Unpublished PhD thesis, Universidad Nacional del Nordeste, Corrientes, Argentina.
- Pérez, M., Collado, E. (1975): Hallazgo de *Natrix maura* albina. Doñana, *Acta Vertebrata* **2**: 271-27.
- Rivera, X., Arribas, O., Martí, F. (2001): Anomalías pigmentarias en las especies de reptiles presentes en la Península Ibérica, Islas Baleares y Canarias. *Butlletí de la Societat Catalana d'Herpetologia* **15**: 76-88.
- Rocha, R., Rebelo, R. (2010): First record of a piebald Selvagens Gecko *Tarentola boettgeri bischoffi* (Squamata: Gekkonidae). *Herpetology Notes* **3**: 361-362.
- Rollinat, R. (1934): *La vie des reptiles de la France centrale*. Delegrave. Paris.
- Sanabria, E.A.; Quiroga, L.B., Laspiur, A. (2010): First Record of Partial Albinism and Scoliosis in *Odontophrynus occidentalis* Tadpoles (Anura: Cycloramphidae). *Brazilian Archives of Biology and Technology* **52**: 641-642.
- Sazima, I. (1974): An albino hylid frog, *Phrynohyas mesophaea* (Hensel). *Journal of Herpetology* **8**: 264-265.
- Sazima, I., Di-Bernardo, M. (1991): Albinismo em serpentes neotropicais. *Memórias do Instituto Butantan* **53**: 167-173.
- Vaardijk, J.N., Veldonkstraat, H.K. (2000): First report of an albino *Rana temporaria* in Flanders, Belgium. *Podacris* **1**: 59-63.