

## First Record of Albinism in *Rhinella fernandezae* (Gallardo, 1957)

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Albinism is a rare congenital and inherited condition characterized by an alteration in the amount and distribution of dermal pigment via recessive allele expression that causes an enzyme deficiency involving the metabolism of melanin during prenatal development. Phenotypically, this condition is expressed as: (a) total albinism: absence of melanin involving the entire body; or (b) leucism or dilute or partial albinism: absence of melanin in part of the body or reduction of melanin in the entire body or a part of it (1; 2; 3).

The different kinds of albinism have been widely reported among the major vertebrate lineages, including cartilaginous fishes, snakes and lizards (*e.g.* 4; 5; 6). There are also reports in amphibians, principally salamanders (*e.g.* 7; 8; 9), and a lower number on anurans (10; 11; 12). For Argentinean wild batrachian fauna there is only one previous report of albinism (13).

In this paper we report the first known case of albinism in the yellow belly toad *Rhinella fernandezae* (Anura, Bufonidae).

On 01 September 2009 in the course of a faunal survey in the Lower Paraná River flood plain valley, ten adults of *R. fernandezae* were sampled at El Rico Island (Santa Fe Province, Argentina) (32°16'36.34''S, 60°41'8.16''W; 19m of altitude). The habitat is a flood plain with an open lake surrounded by a forest of predominantly *Salix sp.*. The climate is warm temperate and damp (14).

In the normal colour pattern, live adults of *R. fernandezae* are ventrally blackish yellow and dorsally dark to clear green or chestnut with darker blotches and a yellowish vertebral line (15). The decoloured specimen collected at El Rico Island differed in having a whitish body with darker but transparent blotches in the flanks and chest (Fig. 1). However, its eyes were normally pigmented, indicating a case of leucism (1; 2; 3). The leucistic specimen (gravid female, 52.7mm SVL) (deposited in the Amphibian Reference Collection of INALI: INALI-777) was captured together with nine normally-pigmented toads (seven males: 57.4±2.7mm SVL; and two females: 47.5±3.54mm SVL). Although we have surveyed amphibians in Paraná River flood plain localities intensively for several years, this is the first leucistic specimen found, indicating that albinism is not common in this environment.

Albinism occurs as a result of inherited gene alterations occurring in several forms. It can be inherited when the alleles are autosomal and recessive, autosomal and dominant, or sex-linked. If a population is very isolated and albinism is more prevalent than normal in that population, the expression of this recessive gene may be explained by this isolation and potentially low genetic flow. However, the El Rico Island population of *R. fernandezae* is widely connected with other populations of the extensive flood plain valley of the Paraná River, forming part of a metapopulation matrix. Likely, this specimen represents a single rare case in an otherwise normal pigmented population.

The behaviour, in both field and captivity, of our leucistic toad appeared typical in every respect. It showed normal feeding during the two months of captivity and none of the diminished activity described in albino specimens of other amphibian species (16). However, these deviant phenotypes are assumed more likely to be selected against in nature (17). In amphibians, albinism seems to be more frequent in larvae (*e.g.* 3; 12; 13; 18) than in adults (19; 20; 21), perhaps indicative of a difference in survival rate between normal and albino larvae. Ultimately, for those albino larvae that achieve metamorphosis, the nocturnal activity patterns of adults probably reduce any disadvantage of the white colour (21).

Although albinism has been reported in different species of anurans, the phenomenon remains quite rare considering the total number of species in the order. It is notable that most of the reports come from North American species (3) and, therefore, it is crucial that herpetologists be encouraged to report albinism in this order to increase our understanding of the spread, frequency and ecological implications of this condition.

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### REFERENCES

1. KLUG WS & CUMMINGS MR (1999). Conceptos de Genética. Prentice Hall, Madrid. 814pp.
2. WAREHAM DC (2005). Elsevier's Dictionary of Herpetological and Related Terminology. Bournemouth, England. 227pp.

3. BECHTEL HB (1995). Reptile and Amphibian Variants: Colors, Patterns and Scales. Krieger Publishing Co., Malabar FL. 206p.
4. TEIXEIRA SF & ARAÚJO ML (2002). First record of albinism in the smooth dogfish *Mustelus schimitti*, 1939 (Carcharhini-formes: Triakidae) from Southern Brazil. Brazilian Archives of Biology and Technology, 45(2):241-243.
5. MITCHELL JC & McGRANAGHAN L (2004). An unusually colored eastern milksnake (*Lampropeltis triangulum triangulum*) from Virginia, with notes on her offspring. Banisteria, 24:49-50.
6. MALKMUS R (1997). Partial albinism in the mediterranean worm lizard, *Blanus cinereus* (Vandelli, 1797) in Portugal (Reptilia: Amphisbaenidae). Sauria, 19:31-34.
7. BRAME AHJr (1962). A survey of albinism in salamanders. Abhandlungen und Bereichte Naturkunde Vorgeschichte, 11:65-81.
8. MITCHELL JC & CHURCH DR (2002). Leucistic Marbled Salamanders (*Ambystoma opacum*) in Virginia. Banisteria, 20:67-69.
9. DIEGO-RASILLA FJ, LUENGO RM & RODRÍGUEZ-GARCÍA L (2007). *Triturus marmoratus* (Marbled Newt). Limb abnormalities. Herpetological Review, 38(1):68.
10. FEDERIGHI H (1938). Albinism in *Rana pipiens* Shreber. Antioch College, Ohio, 38:37-40.
11. NORMAN BR & MOLLIER M (2002). Concerning an albino foothill yellow-legged frog, *Rana boylei* (Amphibia, Anura, Ranidae), from Red Cap Creek Drainage, Humboldt County, California. Bulletin of Chicago Herpetological Society, 37(1):2-3.
12. MITCHELL JC & McGRANAGHAN L (2005). Albinism in American bullfrog (*Rana catesbeiana*) tadpoles from Virginia. Banisteria, 25:51.
13. SANABRIA EA, QUIROGA LB & LASPIUR A (2010). First Record of Partial Albinism and Scoliosis in *Odontophrynus occidentalis* Tadpoles (Anura: Cycloramphidae). Brazilian Archives of Biology and Technology, 53(3):641-642.
14. SANCHEZ LC; PELTZER PM, MANZANO AS & LAJMANOVICH RC (2007). Dinámica de un ensamble de anuros en un humedal del tramo inferior del río Paraná, Argentina. Inter-ciencia, 32(7):463-470.
15. GALLARDO JM & VARELA DE OLMEDO E (1992). Anfíbios de la República Argentina: ecología y comportamiento. Fauna de agua dulce de la República Argentina. PROFADU (CON-ICET), 41(1):116p.
16. WELLS MM (1964). An incidence of albinism in *Tarzcha torosa*. Herpetologica, 19(4):291.
17. MØLLER AP & MOUSSEAU TA (2001). Albinism and phenotype of Barn Swallows (*Hirundo rustica*) from Chernobyl. Evolution, 55(10):2097-2104.
18. MANEYRO R & ACHAVAL F (2004). *Melnophryniscus montevidiensis* (Darwin's Toad). Albino larvae. Herpetological Review, 35(3):261.
19. RUBIN D (1963). An albino two-lined salamander. Herpetologica, 19(1):72.
20. SMITH PB & MICHENER MC (1962). An adult albino ambystoma. Herpetologica, 18(1):67-68.
21. PETROVIC CA (1973). An "Albino" frog, *Eleutherodactylus planirostris* Cope. Journal of Herpetology, 7(1):49-51.

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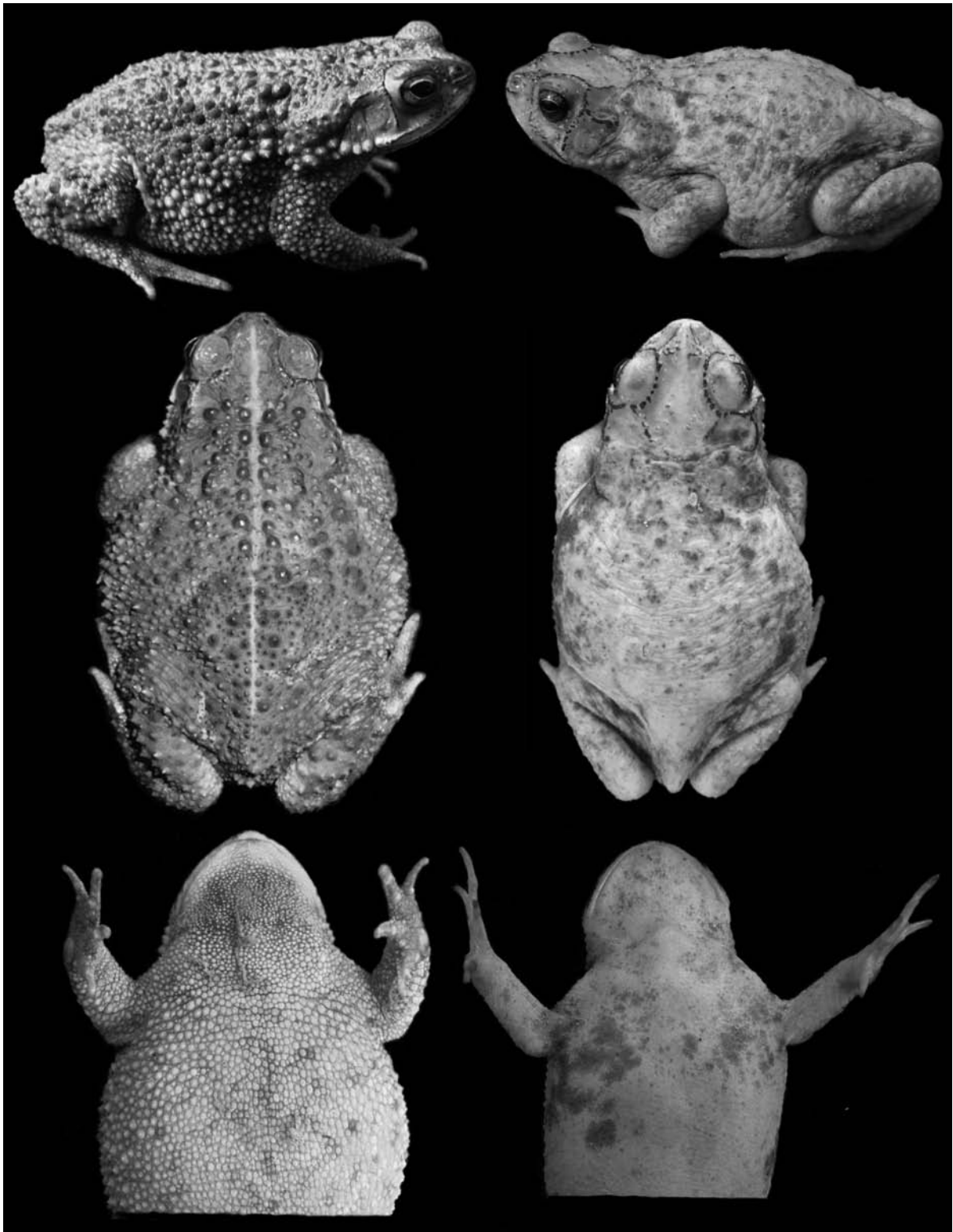


Fig. 1. – Dorsal, lateral and ventral view of a normal (A) and the leucistic specimen (B) of *Rhinella fernandezae*. Note in leucistic specimen the absence of yellowish vertebral line and the presence of darker blotches in the flanks and chest but normally-pigmented eyes. Body granulation is also less evident in leucistic specimen.