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Ocular anomaly in *Rhinella marina* (Anura: Bufonidae) from Cerro Jesús, Nueva Segovia, northern Nicaragua

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Abstract. *Rhinella marina* is a common and resilient species. Occasionally, it can be vector of different diseases due to its dispersion ability. Ocular alteration can be produced by abiotic and biotic factors. One of these factors, are the diseases, such as chytridiomycosis (produced by *Batrachochytrium dendrobatidis*), which in some cases produces stratum corneum hyperkeratinisation. In field-work carried out in August 2011, we found an individual of *R. marina* with a whitish epidermal ocular anomaly. We swab the toad, which tested negative to *Bd*. We consider relevant to highlight these anomalies, which on occasions could reflect some diseases. This is especially important in Cerro Jesús, where we confirmed the presence of some endangered amphibians species.

Key words: amphibians, *Bd*, chytridiomycosis, diseases.

Rhinella marina (L., 1758) or Cane Toad is a large size-toad which distribution is widespread from southern Texas (through Mexico and Central America) to northern South America, and was introduced in many tropical and subtropical localities of different continents (America, Africa, Eurasia and Australia; e.g. Zug & Zug 1979, Cogger 2000). In Nicaragua, *R. marina* can be found in the whole country (Sunyer & Köhler 2010). The Cane toad is a resilient species and can be a potential vector of some diseases in the dispersion in its territory (Kelehear et al. 2013). Ocular anomalies in amphibians can be produced during the development or adult stage by abiotic factors such as exposure to chemicals, UV radiation, and biotic factors, such as injuries produced in aggressions by competitors and predators, mutation, developmental errors, or by infections and diseases like chytridiomycosis (caused by *Batrachochytrium dendrobatidis* (*Bd*); Boon-Hee et al. 2013). This infection produces stratum corneum hyperkeratinisation in the amphibians (Bosch 2003). Despite of this, the macroscopic detection in infected individuals is difficult. In some cases, the infected individuals have skin ulcers caused by secondary bacterial infections (Pessier 2002, Caryn 2009). The effect of the infection with *Bd* is highly variable among species and among individuals of the same species. Symptoms may induce behaviors appetite, incoordination, weakness, skin discoloration, epithelial mucus, abnormal behavior and altered action to escape predators and, in some cases, development of skin erosion (Berger et al. 1999, Pessier et al. 1999).

On August 2011 we sampled the presence of *Bd* in amphibians at Cerro Jesús (13.984°N, 86.190°W, 1080 m elevation), Department of Nueva Segovia, Nicaragua (Fig. 1A). At approximately 20 h., we found a specimen of *R. marina* in a pond together with other smaller frogs of different species (Fig. 1B). The toad had its right eye with a whitish epidermal anomaly, although did not show outwardly other physical abnormalities in the rest of its body. Its mobility seemed unaffected by its own eye damaged, although during our observations the animal was not particularly active, spending for most of the time floating on the water. This specimen was the only of its species that we encountered in the same pond and none of the other anuran specimens found in that same pond presented physical anomalies. Due to this, we took one swab sample of the toad for subsequent analysis. The results tested negative for the presence of *Bd*. Other amphibian species sampled in the same pond tested positive (García-Roa et al. 2014).

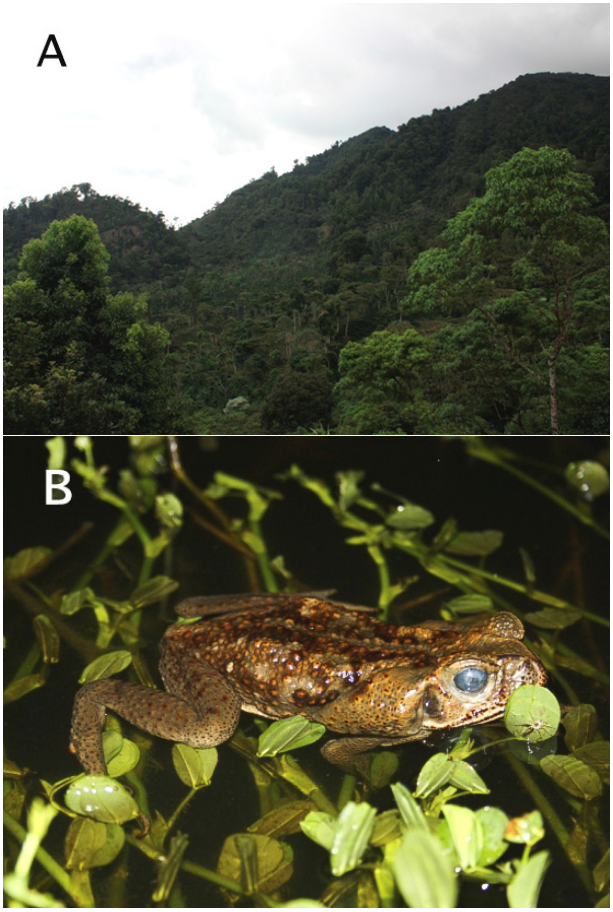

Figure 1. (A) Cerro Jesús (Department of Nueva Segovia, Nicaragua), characterized by the presence of steep patches of relatively well preserved cloud forest corresponding to Lower Montane Moist Forest formation. (B) *Rhinella marina* showing the ocular anomaly in its right eye.

It is especially important to remark this kind of observation because *R. marina* is a common species which could be a vector disease due to its ability to move long distances. This is especially relevant in areas like Cerro Jesús, where the number of herpetological researches are scarce, and where we found species such as *Craugastor lauraster* and *Ptycohyla hypomykter*, which are considered under the IUCN criteria as Endangered [B1ab(iii,v)] and Critically Endangered [A3e], respectively (Acevedo et al. 2010, Cruz et al. 2010). The present account fails to resolve the exact factor to ensure the cause of the ocular anomaly, which could be caused by any of the above-named factors.

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References

Acevedo, M.E., Cruz, G., Wilson, L.D., McCranie, J.R., Köhler, G., Mendelson, III J., Kolby, J.E. (2010): *Ptychohyla hypomykter*. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.2. <www.iucnredlist.org, accessed at: 20 January 2014>.

Berger, L., Speare, R., Daszak, P., Green, D.E, Cunningham, A.A, Goggin, C.L., Slocombe, R., Ragan, M.A, Hyatt, A.D., McDonald, K.R., Hines, H.B., Lips, K.R., Marantelli, G., Parkers, H. (1999): Chytridiomycosis Causes Amphibian Mortality Associated with Population Declines in the Rain Forest of Australia and Central America. Proceedigs of the Natural Academy of Science 95: 9031–9036.

Boon-Hee, K., Wei, C.K., May Lin, J.H., Abdul Majid, N.B., Chew Tee Wah, D. (2013): *Limnonectes palavanensis* (Smooth Guardia Frog). Ocular anomaly. Herpetological Review 44(3): 496–497.

Bosch, J. (2003): Nuevas Amenazas para los Anfibios: Enfermedades Emergentes. Munibe 16: 56–73.

Caryn, P.P. (2009): Wound Management in Amphibians: Etiology and Treatment of Cutaneous Lesions. Journal of Exotic Pet Medicine 18(1): 20–35.

Cogger, H.G. (2000): Reptiles and Amphibians of Australia. 6th. Edition. Ralph Curtis Books, Sanibel Island (FL).

Cruz, G., Wilson, L.D., McCranie, R., Köhler, G. (2010): *Craugastor lauraster*. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.2. <www.iucnredlist.org, accessed at: 20 January 2014>.

García-Roa, R., Sunyer J., Fernández-Loras, A., Bosch, J. (2014): First record of *Batrachochytrium dendrobatidis* in Nicaragua. Herpetological Journal 24: 65–68.

Kelehear, C., Brown, G.P., Shine, R. (2013): Invasive parasites in multiple invasive hosts: the arrival of a new host revives a stalled prior parasite invasion. Oikos 122: 1317–1324.

Pessier, A.P (2002): An overview of amphibian skin disease. Seminars in Avian and Exotic Pet Medicine 11: 162–174.

Pessier, A.P., Nichols, D.K., Longcore, J.E, Fuller, M.S. (1999): Cutaneous Chytridiomycosis in Poison Dart Frogs (*Dendrobates spp.*) and White's tree frogs (*Litoria caerulea*). Journal of Veterinary Diagnostic Investigation 11: 194–199.

Sunyer, J., Köhler, G. (2010): Conservation status of the herpetofauna of Nicaragua. pp. 488–509. In: Wilson, L.D., J.H. Townsend and J.D. Johnson (eds.), Conservation of Mesoamerican amphibians and reptiles. Eagle Mountain Publishing.

Zug, G.R., Zug, P.B. (1979): The marine toad, *Bufo marinus*: a natural history resume´ of native populations. Smithsonian Contributions to Zoology 284: 1–58.