

A HALF-BLIND CANE TOAD *RHINELLA MARINA* (ANURA: BUFONIDAE) FROM THE ISLAND OF MONTSERRAT

UN SAPO MEDIO CIEGO *RHINELLA MARINA* (ANURA: BUFONIDAE) DE LA ISLA DE MONTSERRAT.

BÁRBARA FERREIRA¹, CATARINA COUTINHO², ANDRÉS FERNÁNDEZ-LORAS^{3,4} AND GONÇALO M. ROSA^{2,3,5,*}

¹ Faculdade de Medicina Veterinária, Universidade de Lisboa, Avenida da Universidade Técnica Pólo Universitário da Ajuda, Lisboa, Portugal

² Centre for Ecology, Evolution and Environmental Changes (CE3C), Faculdade de Ciências da Universidade de Lisboa, Lisboa, Portugal

³ Durrell Wildlife Conservation Trust, Les Augrés Manor, La Profonde Rue, Trinity, Jersey, Channel Islands, UK (previous affiliation)

⁴ Departamento de Biogeografía y Cambio Global, Museo Nacional de Ciencias Naturales, CSIC, Madrid, Spain

⁵ Institute of Zoology, Zoological Society of London, London, UK

*Correspondence: goncalo.m.rosa@gmail.com

Resumen.— Reseñamos el hallazgo de un individuo adulto de sapo de caña (*Rhinella marina*) con el globo ocular derecho ausente en la isla de Montserrat. El individuo también presentaba lesiones en la parte superior de su cabeza, probablemente como resultado de intentos fallidos de depredación por parte de roedores invasores en la isla. Aunque esta pueda ser la explicación más probable para el párpado hundido, registros previos de una prevalencia anormal de ojos ausentes en poblaciones introducidas de *Rhinella* en islas pequeñas pueden sugerir la presencia de un patrón que valga la pena investigar.

Palabras clave.— anoftalmia, lesión ocular, especies invasoras.

Abstract.— We report on an adult individual of Cane toad (*Rhinella marina*) found with a missing eyeball in the island of Montserrat. The half-blind individual also presented lesions on top of its head, probably resulting from failed predation attempts by invasive rodents in the island. Although this can be the most likely explanation for the sunken eyelid, previous records of an abnormal prevalence of missing eyes in introduced populations of *Rhinella* toads in small islands may suggest the emergence of a pattern worth investigation.

Keywords.— anophthalmia, ocular lesion, invasive species.

While morphological abnormalities occur naturally in wild amphibians, the percentage of the population carrying such afflictions remains low, rarely exceeding 10% (Lannoo, 2008; Laurentino et al., 2015). These often derive from trauma or genetic factors (Blaustein & Johnson, 2003; Lannoo, 2008), and particular cases of unusually high prevalence have caught the attention of scientists (see Toledo & Ribeiro, 2009) or have even become a conservation concern (Burkhart et al., 2000; Blaustein & Johnson, 2003).

Ocular abnormalities (e.g. Boon-Hee et al., 2013; Fernández-Loras et al., 2016; Toledo & Toledo, 2015) are amongst the least frequently reported cases (Reeves et al., 2013; Laurentino et al., 2015), and can be the result of many factors such as environmental contaminants (metals and petroleum hydrocarbons) (Bacon et al., 2013), pesticides (Gurushankara et al., 2007), emerging diseases (Burton et al., 2008) and predation (Lannoo, 2008).

Rhinella marina is an introduced toad in the Caribbean island of Montserrat (Young, 2008). Despite the potent defensive chemicals of the species (Price-Rees et al., 2010), several predators seem not to be affected by this trait (Cabrera-Guzmán et al., 2014), or have simply learnt to consume only the less toxic body parts of the toad (e.g. Beckmann & Shine, 2010). Thus, failed predation attempts likely result in the physical trauma to the surviving individuals (Johnson et al., 2001).

On 5 October 2009, whilst conducting field work in the Centre Hills (Montserrat), we found an adult of *R. marina* displaying a peculiar clinical condition. The individual presented an ocular lesion of the right eye with the presence of a running creamish-grey translucent fluid (Fig. 1), resulting in the eyelid being partially sunken over the eye cavity. In addition, skin lesions were visible between the eyes and on the back of its head. We hypothesise that both the skin and ocular lesions are the result of (different) failed predation attempts. This would not be surprising due to

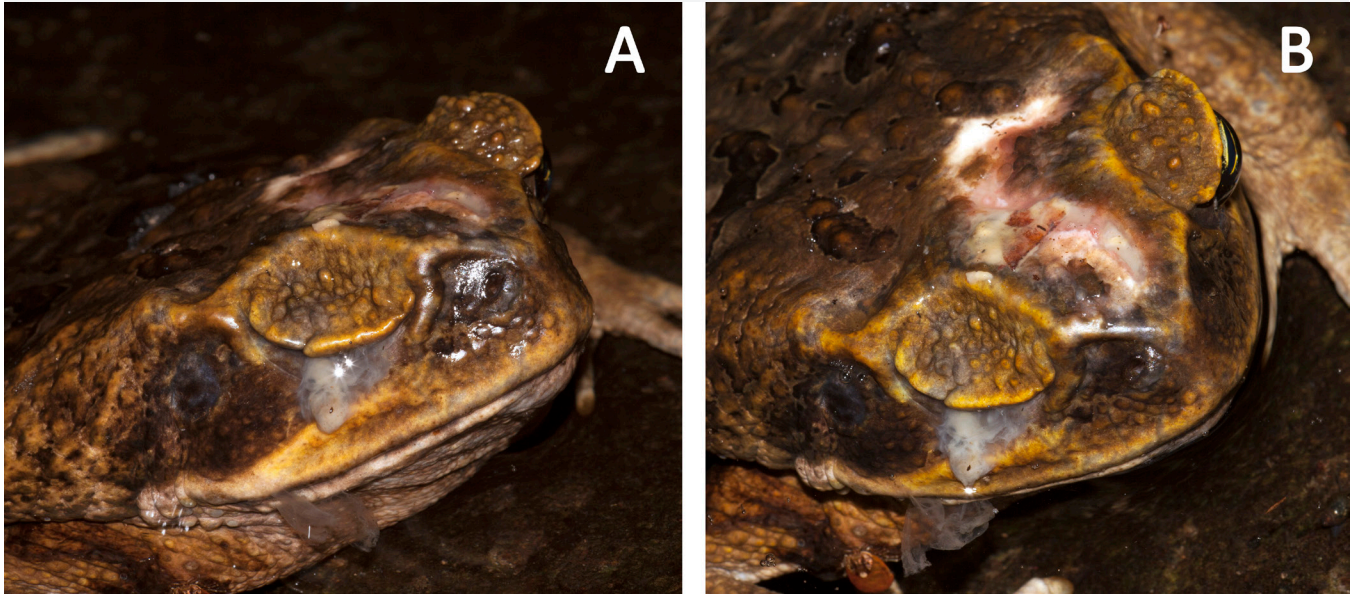


Figura 1. Individuo adulto de *Rhinella marina* con lesiones en la piel y en el ojo derecho (globo ocular ausente), encontrado en Centre Hills, Montserrat: A. vista lateral; B. vista dorsal. Fotos de Gonçalo M. Rosa.

Figure 1. Adult individual of *Rhinella marina* presenting lesions on the skin and on the right eye (missing eye), found in the Centre Hills, Montserrat: A. lateral view; B. upper view. Photos by Gonçalo M. Rosa.

previous records of predation by rats (*Hydromys chrysogaster* and *Rattus rattus*) (Cabrera-Guzmán et al., 2014) which are tolerant to *R. marina* toxicity (Fitzgerald, 1990; Cabrera-Guzmán et al., 2014). The ophthalmologic lesion appears to result from a recent event, as the discharge may be a residue of the vitreous humour or possibly an infectious exudate. Nevertheless, we would expect eyelids to be damaged after the failed attempt, which is not observed, with the structure appearing to be intact with no visible scars (Fig. 1). Furthermore, the ocular lesion could result from additional bacterial infection or other unknown causes. Eye infections caused by Gram-negative bacteria *Pseudomonas aeruginosa* and *Aeromonas hydrophila*, are extremely severe and may well end up with a perforated eye, if not treated quickly with antibiotics (Spencer, 1953; Whitaker, 2001). A bacterial infection might have occurred after a predation attempt, causing corneal ulceration in the toad's eye, and developing into an eye perforation.

Similar eye deformities in toads have also been reported in at least two other island systems: firstly on the *R. marina* population in Bermuda (Bacon et al., 2006), and later on a Cururu toad (*Rhinella jimi*) population introduced to the island of Fernando de Noronha (Brazil) (Toledo & Ribeiro, 2009; Toledo & Toledo, 2015). Although toads show high rates of malformations in both cases, the causes have yet to be confirmed. Even with no

prevalence data for Montserrat and a lack of definitive diagnosis for the case presented here, the report of events like this one can provide new information about natural phenomena in free-ranging animals.

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